

COLLABORATIVE CONSERVATION GOVERNANCE IN  
MULTIFUNCTIONAL LANDSCAPES:  
A CONTEXTUAL ANALYSIS OF TWO SOUTH  
AFRICAN BIOSPHERE RESERVES IN THE BOLAND

MICHAEL KLAVER

2024

**COLLABORATIVE CONSERVATION GOVERNANCE IN  
MULTIFUNCTIONAL LANDSCAPES:  
A CONTEXTUAL ANALYSIS OF TWO SOUTH AFRICAN BIOSPHERE  
RESERVES IN THE BOLAND**

By

Michael Klaver

**NELSON MANDELA**  
UNIVERSITY

Submitted in fulfilment of the requirements for the Degree of Master of Science  
Nature Conservation to be awarded at the Nelson Mandela University

December 2024

Supervisor: Dr Bianca Currie

Co-supervisors: Dr James George Sekonya and Dr Kaera Coetzer



## DECLARATION AND PERMISSION TO SUBMIT FINAL COPY

I, Michael Klaver 217117244, hereby declare that the thesis for the Degree of Master of Science Nature Conservation to be awarded is my own work and that it has not previously been submitted for assessment or completion of any postgraduate qualification to another University or for another qualification.

This research was funded by the National Research Foundation's (NRF) Global Change Social Sciences Research Programme (GCSSRP V2), Grant UID: 129482, in support of the Governance in UNESCO Biosphere's project titled, *"GOVERNANCE MODELS IMPLEMENTED IN BIOSPHERE RESERVES: PROGRESSION TOWARDS SOCIAL-ECOLOGICAL SYSTEMS FOR SUSTAINABILITY"*.



In accordance with Rule G5.11.4, I hereby declare that the above-mentioned treatise/dissertation/ thesis is my own work and that it has not previously been submitted for assessment to another University or for another qualification. However, material from publications by the student may be embodied in a treatise/dissertation/thesis.

I, *MICHAEL KLAVER*, declare that in the course of conducting my research for the thesis titled “*COLLABORATIVE COVSERVATION GOVERNANCE IN MULTIFUNCTIONAL LANDSCAPES: A CONTEXTUAL ANALYSIS OF TWO SOUTH AFRICAN BIOPHERE RESERVES IN THE BOLAND*”, I have utilised AI tools, including Otter.ai and ChatGPT, in the following aspects of my study:

1. Otter.ai was used to transcribe audio recorded interviews into text.
  
2. ChatGPT was used during editing and interrogating the thesis, asking the search engine questions like:
  - *How can I improve* [my written abstract or conclusion]?
  - *List abbreviations within the following* [paragraph].
  - *How can I shorten this* [paragraph I wrote]?
  - *What are the key findings from* [my written discussion]?

I further acknowledge that the responsibility for formulating research questions, hypotheses, and purpose statements lies with the researcher, and AI tools are employed as supportive aids only. In no area/s of the text was ChatGPT or similar generative AI tools used to write and/or create content in this dissertation.

-----  
Michael Klaver



## ABSTRACT

The Man and the Biosphere Programme (MAB) has been earmarked as one of the most promising ways of tackling the grand challenges of our time and achieving the Sustainable Development Goals. Furthermore, it may have the potential to make positive contributions to one of the most troubling conservation challenges of our time – winning spaces for large carnivores in human-dominated landscapes.

This study aims to assess the interpretation and implementation of MAB in two South African Biosphere Reserves (BRs) and explore how BRs as landscape level collaborative initiatives can support Cape leopard conservation in the Boland region of the Western Cape, South Africa. This study is informed by two objectives. First, to understand how the chosen governance strategy and structure of two South African BRs have helped to achieve a context appropriate interpretation and actioning of MAB in the landscape. Second, to understand how landscape-level collaborative conservation initiatives support leopard conservation across a multifunctional landscape.

This study takes on a mixed methods approach in which qualitative data takes priority and quantitative data is used for support in an embedded multiple-case study design. The sampling techniques used include purposive sampling of strategically targeted participants, *i.e.* those governing BRs and those leading the collaborative initiative and snowballing thereon. Data collection included a combination of semi-structure interviews (n=20) (the principal collection method), a review of archival, policy and other documents (n=15), and supported by a mixed methods survey questionnaire (n=5). Data were analysed through thematic and content analysis.

Findings suggest that organisations working at a landscape-level utilise forms of adaptive co-management and/or governance as a means to being both adaptive and collaborative. Important themes which emerge include cross-sectoral approaches, networks, leadership and trust for building partnerships, shared visions and '*filling gaps*' left by, or collaborating with the state to fulfil mutually beneficial objectives.

This research provides empirical studies on MAB, important for sharing knowledge across the World Network of BRs, meeting the need for further research on collaborative initiatives in social-ecological systems and conservation programmes for large free-roaming carnivores in multifunctional landscapes.

**Key words:** UNESCO; Man and the Biosphere Programme; social-ecological systems; governance; sustainable development goals; biodiversity conservation; collaboration.

## DEDICATION

This research is dedicated to those who dare to think differently, who passionately strive for balancing biodiversity conservation with social justice, who embody the collaborative spirit, who envision harmony between humans and nature, and who are committed to preserving our natural heritage for generations to come.

*“There is inherent, in nearly everybody, some love of nature, an instinct inherited from remote ancestors, however blanketed over it may have become through artificial environment; the call of the wild usually appeals in greater or less degree, if it can only make itself heard.” – James Stevenson-Hamilton South African Eden (1937:305)*

## ACKNOWLEDGEMENTS

I am grateful to all who have contributed to this research endeavour.

Foremost, I must state my appreciation to the research participants from the Cape Leopard Trust, Cape Winelands and Kogelberg Biosphere Reserves, who generously shared their time, insights, and experiences. Your contributions have been invaluable in advancing our understanding of South African BRs and collaborative conservation efforts.

To my mentors and supervisors, Bianca, George and Kaera, I cannot thank you enough for your guidance, wisdom, and support throughout this journey. Working with you has been a transformative experience, challenging me, and encouraging me to think differently. Thank you for all the stimulating discussions over coffee, and constructive, sometimes unbelievably quick, feedback which have all helped me grow personally and as a young researcher.

Further, I extend this gratification to those who have had an influence in my growth through this journey, the Governance in UNESCO Biospheres team and those within the TRANSECTS community, empowering the next generation of change agents; offering unforgettable, life-changing, *comfortable yet uncomfortable* spaces and experiences to learn, grow, exchange, inspire, motivate and give hope to one another.

I am thankful to those who provided the necessary financial support and resources for this research, including the National Research Foundation, Nelson Mandela University and the Global Change Institute of the University of Witwatersrand.

A special thanks is due to my parents, fiancé and friends for their patience, encouragement, and belief in my pursuits. Your support has been a source of strength, light and motivation in my journey of becoming who I believe I need to be. Of course, thank you to my furry friends, Jet and Pilot, for keeping me smiling during tough times.

Each of you have played a significant role in this research endeavour, and I am forever grateful for your contributions and encouragement.

## **DISCLAIMER**

The thesis contains three data chapters, all of which have been submitted to international journals for publication. Therefore, the data chapters are written in journal article format and style. As a result, there is a certain amount of repetition across some chapters within the thesis. The language, spelling and style reflects the journal in which it is published, in press, or under review. However, to maintain consistency throughout this thesis, referencing of literature, figures, tables and appendices have been formatted accordingly.

## CONTENTS

<b>DECLARATION AND PERMISSION TO SUBMIT FINAL COPY</b> .....	<b>I</b>
<b>ABSTRACT</b> .....	<b>IV</b>
<b>DEDICATION</b> .....	<b>V</b>
<b>ACKNOWLEDGEMENTS</b> .....	<b>VI</b>
<b>DISCLAIMER</b> .....	<b>VII</b>
<b>CONTENTS</b> .....	<b>VIII</b>
<b>LIST OF FIGURES</b> .....	<b>XIII</b>
<b>LIST OF TABLES</b> .....	<b>XIV</b>
<b>LIST OF APPENDICES</b> .....	<b>XV</b>
<b>LIST OF ABBREVIATIONS</b> .....	<b>XVI</b>
<b>CHAPTER 1</b> .....	<b>1</b>
<b>General Introduction</b> .....	<b>1</b>
1.1 RATIONALE FOR THE STUDY.....	1
1.2 LITERATURE REVIEW.....	3
1.2.1 UNESCO'S Man and the Biosphere Programme.....	3
1.2.2 Biosphere Reserves: Concept and Practice.....	4
1.2.3 The Man and the Biosphere Programme in South Africa.....	7
1.2.4 Brief History of Conservation Paradigms: Progressions Towards Social-Ecological Systems for Sustainability.....	10
1.2.5 Collaborative Conservation Governance in Social-Ecological Systems.....	17
1.2.6 Leopards of the Cape.....	19
1.3 AIMS AND OBJECTIVES.....	23
1.3.1 Aim.....	23
1.3.2 Objectives.....	23
1.4 THESIS STRUCTURE.....	23
<b>CHAPTER 2</b> .....	<b>25</b>
<b>Methodology</b> .....	<b>25</b>
2.1 RESEARCH DESIGN.....	25
2.1.1 Summary of Methods.....	26
2.1.2 Context-Mechanism-Outcome Framework.....	27
2.2 STUDY SITE.....	28
2.3 RESEARCH METHODS.....	30
2.3.1 Sampling Strategy.....	30
2.3.2 Data Collection.....	33

2.3.3 Data Analysis.....	35
2.4 RESEARCH QUALITY MEASURES .....	37
2.5 RESEARCHER POSITIONALITY .....	38
2.6 ETHICAL CONSIDERATIONS .....	39
2.6.1 Principle 1: Respect for persons.....	39
2.6.2 Principle 2: Beneficence.....	40
2.6.3 Principle 3: Justice .....	40
2.6.4 Ethical Clearance .....	40
2.6.5 Dissemination of Results.....	41
2.7 LIMITATIONS.....	41
<b>CHAPTER 3 .....</b>	<b>43</b>
<b>Preface .....</b>	<b>43</b>
<b>Learning through Place-Based Implementation of the UNESCO MAB Program in South Africa’s Oldest Biosphere Reserve: A Case Study of the Kogelberg Biosphere Reserve .....</b>	<b>43</b>
3.1 ABSTRACT.....	43
3.2 INTRODUCTION.....	44
3.3 MATERIALS AND METHODS .....	46
3.3.1 Study Area .....	46
3.3.2 Methods and Data .....	49
3.4 RESULTS .....	51
3.4.1 Governance Model: Initial Establishment and Evolution.....	51
3.4.2 Governance Model: Structure, Responsibilities and Decision-Making.....	53
3.4.3 Governance Model: Evolution and Lessons Learned .....	58
3.4.4 Envisioned Role: Visions of Success .....	58
3.4.5 Envisioned Role: Present Role in the Landscape .....	60
3.4.6 Envisioned Role: Challenges.....	60
3.4.7 Envisioned Role: Effectiveness.....	64
3.4.8 Stakeholders and Critical Relationships.....	66
3.4.9 Stakeholders and Critical Relationships: Challenges with Participation .....	67
3.4.10 Stakeholders and Critical Relationships: Institutional Overlap and Disruptive Stakeholders.....	69
3.4.11 Lessons Learned to Share across the World Network of Biosphere Reserves .....	69
3.5 DISCUSSION .....	70
3.5.1 Envisioned Role of the KBR and Their Alignment with UNESCO Policy.....	70

3.5.2 Governance Model and Structure Adopted by the KBRC.....	71
3.5.3 Implementation Challenges in the KBR.....	74
3.6 CONCLUSION.....	79
<b>CHAPTER 4 .....</b>	<b>82</b>
<b>Preface .....</b>	<b>82</b>
<b>Exploring the implementation of UNESCO’s MAB Program in South Africa: A case study of the Cape Winelands Biosphere Reserve .....</b>	<b>82</b>
4.1 ABSTRACT.....	82
4.2 INTRODUCTION.....	83
4.3 METHODS.....	85
4.3.1 Study Area .....	85
4.3.2 Methods and Data .....	87
Semi-structured interviews.....	88
Document analysis .....	89
4.4 RESULTS .....	89
4.4.1 Governance Model: Initial Establishment and Evolution.....	89
4.4.2 Governance Model: Structure, Responsibilities and Decision-Making.....	90
4.4.3 Envisioned Role: Present Role in the Landscape .....	94
4.4.4 Envisioned Role: Challenges.....	95
4.4.5 Envisioned Role: Effectiveness.....	97
4.4.6 Stakeholders and Critical Relationships .....	98
4.4.7 Stakeholders and Critical Relationships: Participation Challenges .....	98
4.4.8 Stakeholders and Critical Relationships: Institutional Overlap and Disruptive Stakeholders.....	99
4.4.9 Lessons Learned to Share Across the World Network of Biosphere Reserves.....	99
4.5 DISCUSSION .....	100
4.5.1 Envisioned role of the Cape Winelands Biosphere Reserve and their alignment with UNESCO policy.....	100
4.5.2 Governance model and structure adopted by the Cape Winelands Biosphere Reserve.....	101
4.5.3 Implementation challenges in the Cape Winelands Biosphere Reserve.....	105
4.6 CONCLUSION.....	107
<b>CHAPTER 5 .....</b>	<b>110</b>
<b>Preface .....</b>	<b>110</b>
<b>Exploring Collaborative Conservation in a Multifunctional Landscape: A case study of the leopards in the Boland, South Africa.....</b>	<b>110</b>
5.1 ABSTRACT.....	110

5.2 INTRODUCTION .....	111
5.3 METHODS .....	113
5.3.1 Case Description .....	113
5.3.2 Study Area .....	113
5.3.3 Research Design .....	115
Methods and Data .....	115
Context-Mechanism-Outcome Framework .....	115
5.4 RESULTS .....	117
5.4.1 Introducing the case and context .....	117
Biosphere Reserve Involvement .....	119
5.4.2 Mechanism (process) variables this case highlights .....	120
5.4.3 Collaborative Outcomes .....	124
5.5 DISCUSSION .....	125
5.5.1 Biodiversity, ecosystem services and leopards .....	125
5.5.2 Biodiversity conservation and stewardship in the Boland .....	125
5.5.3 Fit for purpose: the Boland Project .....	127
5.6 CONCLUSION .....	129
<b>CHAPTER 6 .....</b>	<b>131</b>
<b>Think Globally, Act Locally: Conclusion .....</b>	<b>131</b>
6.1 INTRODUCTION .....	131
6.2 SUMMARY AND DISCUSSION OF KEY FINDINGS .....	132
6.1.1 Biosphere Reserve Governance Models and Envisioned Role in the Boland .....	132
6.1.2 Biosphere Reserve Stakeholders: Participation and Relationships .....	135
6.1.3 Collaboration across a Multifunctional Conservation Landscape .....	139
6.1.4 Commonalities and success factors across cases .....	141
Cross-sectoral approaches .....	141
Learning <i>together</i> and building knowledge and capacity .....	141
Building legitimacy .....	142
The importance of trust and networks .....	143
Supplementing shortfalls of, or collaborating with the state .....	144
6.3 IMPLICATIONS AND RECOMMENDATIONS .....	144
6.1.5 Improved awareness and communication strategies .....	145
6.1.6 Dealing with limited resources .....	145
6.1.7 Learning to understand BR stakeholders .....	146
6.1.8 Considering diversity and representation of BR personnel .....	147

6.1.9 Need for more in-depth case studies.....	147
6.1.10 Understanding the perceptions and motivations for stewardship .....	148
6.1.11 Need for more research on collaborative carnivore conservation .....	149
6.1.12 Need for more collaborative initiative case studies .....	149
<b>CHAPTER 7 .....</b>	<b>150</b>
<b>Reflections: From There to Here and Back Again.....</b>	<b>150</b>
<b>CHAPTER 8 .....</b>	<b>153</b>
<b>Consolidated Reference List.....</b>	<b>153</b>
<b>Appendices .....</b>	<b>168</b>

## LIST OF FIGURES

<b>Figure 1.1</b> Diagram illustrating the spatial zoning pattern of a typical biosphere reserve (Pool-Stanvliet & Coetzer, 2020:1) .....	6
<b>Figure 1.2</b> Number of biosphere reserves established pre- and post-Seville (Coetzer <i>et al.</i> , 2014) .....	6
<b>Figure 1.3</b> Vertical governance structure of biosphere reserves in the South African context, including the local, regional, national and international levels (DEA, 2016) .....	8
<b>Figure 1.4:</b> Protected areas through a systems perspective, indicating social, ecological, economic and political influences and how these dynamics can influence outputs (Cumming & Allen, 2017:1711) ...	14
<b>Figure 1.5</b> Graphic representation of the thesis structure .....	24
<b>Figure 2.1</b> Illustration of the embedded multiple case study design for Objectives 1 and 2. The outer box represents the case study context, and the inner boxes represent the cases with their embedded units of analysis. ....	26
<b>Figure 2.2</b> Graphic illustration of the connection between the aim, objectives, and methods .....	27
<b>Figure 2.3</b> Map and location of the Boland Mountain Complex including the Cape Winelands Biosphere Reserve (north), Kogelberg Biosphere Reserve (south), and their individual zonation patterns (Bohdanowicz, 2023a) .....	29
<b>Figure 3.1</b> Map of the Kogelberg Biosphere Reserve, illustrating the core (31%, 31,629 ha), buffer (39%, 40,000 ha) and transition (30%, 32,000 ha) zones, important points of interest, and major towns and transport routes (Bohdanowicz, 2023b).....	47
<b>Figure 3.2</b> Schematic diagram of the Kogelberg Biosphere Reserve Company, including its technical committee, professional advisory group, registered members, and other stakeholders .....	53
<b>Figure 4.1:</b> Map of the Cape Winelands Biosphere Reserve illustrating the core (30%, 99 459ha), buffer (42%, 133 844ha) and transition (28%, 88 727ha) zones, important points of interest, and major towns and transport routes (Bohdanowicz 2023c).....	86
<b>Figure 4.2:</b> Schematic diagram of the Cape Winelands Biosphere Reserve personnel, including its technical assistance, board of directors, management and implementation team, youth board, volunteers and other stakeholders.....	90
<b>Figure 5.1:</b> Map illustrating the Boland Project domain, spanning the Kogelberg and Cape Winelands Biosphere Reserves, and its multifunctionality, including protected, forested, cultivated, built-up and other land-uses (Geospatial Information Services Unit, 2024) .....	114
<b>Figure 5.2:</b> Contextual or social-ecological system characteristic variables, mechanism or rules and process variables, and outcome codes found in the Boland Project case study .....	116
<b>Figure 5.3:</b> Survey respondents' (n=5) perception on why a collaborative effort is necessary .....	119
<b>Figure 5.4:</b> Roles which participants (n=8) believe biosphere reserves can fulfil in leopard conservation .....	120

## LIST OF TABLES

<b>Table 1.1</b> South African Biosphere Reserves, including their year of designation, size (ha) and links to their online webpage.....	9
<b>Table 2.1</b> Table indicating the targeted organisations, the samples collected and the response rates of the targeted groups.....	32
<b>Table 2.2</b> Phases of a thematic analysis followed in the study as informed by Braun and Clarke (2006) .....	36
<b>Table 3.1</b> Descriptions of beneficial skills within the Kogelberg Biosphere Reserve Company helping to fulfil the envisioned role of the biosphere reserve .....	55
<b>Table 3.2</b> Motivations for personnel joining and continuing to serve on the KBRC .....	55
<b>Table 3.3</b> Kogelberg Biosphere Reserve Company's visions of success for the Kogelberg Biosphere Reserve.....	59
<b>Table 3.4</b> Awareness, 'buy-in', communities and 'biosphere living' as a challenge for the Kogelberg Biosphere Reserve Company in fulfilling their envisioned role in the Kogelberg Biosphere Reserve ..	61
<b>Table 3.5</b> Environmental challenges for the Kogelberg Biosphere Reserve Company in fulfilling their envisioned role in the Kogelberg Biosphere Reserve .....	62
<b>Table 3.6</b> Illegal activities as a challenge for the Kogelberg Biosphere Reserve Company in fulfilling its envisioned role in the Kogelberg Biosphere Reserve .....	63
<b>Table 3.7</b> Government as a challenge for the Kogelberg Biosphere Reserve Company in fulfilling its envisioned role in the Kogelberg Biosphere Reserve .....	64
<b>Table 3.8</b> Factors instrumental in the increased effectiveness of the Kogelberg Biosphere Reserve..	65
<b>Table 3.9</b> Successes (areas going well) and failures (areas for improvement) of the Kogelberg Biosphere Reserve .....	66
<b>Table 3.10</b> Stakeholder participation challenges within the Kogelberg Biosphere Reserve.....	67
<b>Table 4.1:</b> Descriptions of beneficial skills within the Cape Winelands Biosphere Reserve office helping to fulfil its envisioned role.....	92
<b>Table 4.2:</b> Resources as a challenge for the Cape Winelands Biosphere Reserve in fulfilling their envisioned role.....	95
<b>Table 4.3:</b> Government as a challenge for the Cape Winelands Biosphere Reserve in fulfilling their envisioned role.....	96
<b>Table 4.4:</b> Awareness and communities as a challenge for the Cape Winelands Biosphere Reserve in fulfilling their envisioned role.....	97
<b>Table 4.5:</b> Lessons learned by the Cape Winelands Biosphere Reserve to be shared across the World Network of Biosphere Reserves .....	100
<b>Table 5.1:</b> Summary of outcomes of the Boland Project case study .....	124

## LIST OF APPENDICES

<b>Appendix 1:</b> Klaver M, Currie B, Sekonya JG, Coetzer K (2024) Learning through Place-Based Implementation of the UNESCO MAB Program in South Africa’s Oldest Biosphere Reserve: A Case Study of the Kogelberg Biosphere Reserve. <i>Land</i> 13(455):1-28.....	168
<b>Appendix 2:</b> Klaver M, Currie B, Sekonya JG, Coetzer K (2024) Exploring the Implementation of UNESCO’s MAB Program in South Africa: A Case Study of the Cape Winelands Biosphere Reserve. <i>Environmental Management</i> 1-16.....	169
<b>Appendix 3:</b> Research permission letters from the Kogelberg and Cape Winelands Biosphere Reserves .....	170
<b>Appendix 4:</b> CapeNature research permit.....	172
<b>Appendix 5:</b> Recruitment letter sent to invite prospective participants to the study .....	173
<b>Appendix 6:</b> Nelson Mandela University Research Ethics Committee (Human) clearance certificate .....	176
<b>Appendix 7:</b> Enrolment letter sent to participants who agreed to participate in the study .....	177
<b>Appendix 8:</b> Example of the participant consent form .....	179
<b>Appendix 9:</b> Interview guide used for interviews with the Cape Winelands and Kogelberg Biosphere Reserves .....	181
<b>Appendix 10:</b> Interview guide used for interviews with the Cape Leopard Trust and CapeNature ...	190
<b>Appendix 11:</b> Summarised codebook of the Context-Mechanism-Outcome methodology .....	195
<b>Appendix 12:</b> Online questionnaire survey sent to officials from CapeNature and City of Cape Town Biodiversity Management Unit .....	197
<b>Appendix 13:</b> Thematic analysis results including themes and theme descriptions of the Kogelberg (Chapter 3) and Cape Winelands (Chapter 4) Biosphere Reserve case studies.....	202
<b>Appendix 14:</b> A summary of dominant themes and associated topics (vertical) presented in results. For each theme, the frequency ( <i>f</i> ) count is provided to indicate its level of prioritization/importance .....	205
<b>Appendix 15:</b> Kogelberg Biosphere Reserve’s role in socio-economic development and conservation at the time of data collection. Socio-economic development programs include those focused on economic growth, environmental education, and youth development, whereas conservation programs include securing water and protecting nature. Within these programs there are various projects .....	206
<b>Appendix 16:</b> Stakeholders participating in the Kogelberg Biosphere Reserve at the time of data collection. An indication is given of which stakeholders participate with the KBRC to fulfil the specific envisioned roles of the KBR, <i>i.e.</i> , collaboration and coordination, conservation, and socio-economic development. Additionally, their relationships, including who they believe they are accountable to, who their critical partners are, and which stakeholders are believed to be missing (with opportunities for further engagement), are also provided. Where no ‘envisioned role’ or ‘relationship’ is mentioned, the specifics were not mentioned in the documents or interviews .....	208
<b>Appendix 17:</b> Data references for Chapter 4 which were removed and submitted as supplementary material for the submission to <i>Environmental Management</i> . .....	211
<b>Appendix 18:</b> Timeline of the Cape Leopard Trust’s collaborative effort in the Boland .....	216

## LIST OF ABBREVIATIONS

AfriMAB	African Network of Man and Biosphere Reserves
AGM	Annual general meeting
BofD	Board of Directors
BP	Boland Project
BR	Biosphere reserve
CBD	Convention on Biological Diversity
CEO	Chief executive officer
CFR	Cape Floristic Region
CLT	Cape Leopard Trust
CMO	Context-Mechanism-Outcome
CoCT	City of Cape Town
CWBR	Cape Winelands Biosphere Reserve
CWDM	Cape Winelands District Municipality
DEA	Department of Environmental Affairs
DFFE	Department of Forestry, Fisheries and the Environment
DR	Document result
ECD	Early childhood development
ES	Ecosystem services
GDA	Grabouw Development Agency
GWUA	Groenland Water User Association
IAP	Invasive alien plant
IR	Interview respondent/result
IUCN	International Union for Conservation of Nature
K2C	Kruger to Canyons
KBR	Kogelberg Biosphere Reserve
KBRC	Kogelberg Biosphere Reserve Company
KNP	Kruger National Park
KOBIO	Kogelberg Biosphere Association
LAP	Lima Action Plan
MAB	Man and the Biosphere programme
NGO	Non-governmental organisation
NPO	Non-profit organisation
ODM	Overberg District Municipality
OECM	Other effective area-based conservation measure
PA	Protected area
PAG	Professional advisory group

SANBI	South African National Biodiversity Institute
SDG	Sustainable Development Goal
SES	Social-ecological system
SR	Survey respondent/result
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organisation
WNBR	World Network of Biosphere Reserves
WWF	World Wide Fund for Nature

# CHAPTER 1

## General Introduction

This chapter states the rationale of the study, provides a comprehensive literature review which delves into the Man and the Biosphere Programme (MAB), the biosphere reserve (BR) concept and the South African MAB experience. Furthermore, the literature review introduces a brief history of conservation paradigms, social-ecological systems (SES) and collaborative conservation before introducing Cape leopards. Thereafter, the aims and objectives of the study are introduced before laying out the structure of the thesis.

### 1.1 RATIONALE FOR THE STUDY

In our current epoch we face what is known as the *triple challenge*, including climate change, biodiversity loss and unsustainable land use (Kremen & Merenlender, 2018; Folke *et al.*, 2021). The MAB has been earmarked as a promising way of tackling these inter-linked challenges and achieving the Sustainable Development Goals (SDGs) (UNESCO, 2017). The MAB, through a people-centred landscape approach, serves to pioneer sustainability and reconcile sustainable socio-economic and human development with biodiversity conservation. Further, it may have the potential to make positive contributions to a troubling conservation challenge of our time, *i.e.* winning spaces for area-demanding species, such as large carnivores under global change scenarios (UNESCO, 2017; Durant *et al.*, 2022). Biosphere reserves do so by promoting environmental and ecological stewardship on private lands, expanding the conservation sphere and transcending isolated formal protected areas (PAs) (Cockburn *et al.*, 2019; Hedden-Dunkhorst & Schmitt, 2020). Leopards are an area-demanding keystone species (Martins & Martins, 2006; Estes *et al.*, 2011; Devens *et al.*, 2018; CapeNature, 2022), often occurring on unprotected land (Swanepoel *et al.*, 2015a; Webb *et al.*, 2020), associated with high biodiversity levels (McManus *et al.*, 2022) yet susceptible to anthropogenic disturbances (Balme *et al.*, 2014; Devens *et al.*, 2018). Leopard persistence in these areas could reflect their ability to adapt to human-dominated environments (Carter & Linnell, 2023) or indicate healthy interactions between social and ecological systems conducive to their survival, contributing to what is known as '*SES health*' (De Garine-Wichatitsky *et al.*, 2021). Therefore, in this research study the Cape leopard is used to demonstrate how

collaboration initiatives across multifunctional landscapes can contribute to the conservation of a species and subsequently biodiversity. Biosphere reserves, with the key objective of conserving biodiversity (UNESCO, 1996), position themselves as relational hubs (after Cockburn *et al.*, 2020b), enabling collaboration and coordination among a network of diverse actors around sustainability issues (Barracough *et al.*, 2023; Klaver *et al.*, 2024) making them interesting arenas to explore such a collaboration.

If successful, MAB will contribute to global SES sustainability and resilience (Barracough *et al.*, 2023). According to Barracough *et al.* (2023) the research community has, for a long time, called upon international networks for comparative sustainability and SES research. This stems from the need for collective action that can conserve biodiversity, build resilience and meet societal needs – with UNESCO and BRs expected to fulfil a crucial role in this endeavour contributing to the SDGs and Convention on Biological Diversity (CBD) (DEA, 2016; Barracough *et al.*, 2023). BRs are well-positioned to significantly contribute to these interconnected global challenges due to the cross-sectoral approach and purpose (DEA, 2016).

However, what will enable the success of BRs in this regard is to pioneer sustainability by testing various integrated approaches through the implementation of MAB in various local contexts (DEA, 2016, UNESCO, 2021). A strength of MAB is the lack of prescriptions for implementation – an intentional avenue for learning-by-doing (Ishwaran *et al.*, 2008; Pool-Stanvliet & Coetzer, 2020). Literature on BRs has identified the need for a place-based understanding of the institutional context, governance strategies of BRs and understanding how global MAB policy is contextualised for local application (Coetzer *et al.*, 2014; Ferreira *et al.*, 2018; Pool-Stanvliet & Coetzer, 2020; Barracough *et al.*, 2023). Importantly, these lessons and experiences, if shared, can improve MAB implementation and success globally (Ishwaran *et al.*, 2008; Coetzer *et al.*, 2014; DEA, 2016; Pool-Stanvliet & Coetzer, 2020; UNESCO, 2021).

## 1.2 LITERATURE REVIEW

### 1.2.1 UNESCO'S Man and the Biosphere Programme

The MAB launched in the early 1970s, with the idea originating at the Biosphere Conference in September 1968 (Ishwaran *et al.*, 2008; Pool-Stanvliet, 2013; Bridgewater, 2016; UNESCO, 2017; Pool-Stanvliet & Coetzer, 2020; Azadi *et al.*, 2021). The emergence of MAB is the outcome of UNESCO being tasked with initiating an interdisciplinary international research programme focussing on the cultural, economic, ecological, and social aspects – a SES perspective, of humans in the biosphere (UNESCO, 2007; Bridgewater, 2016). Signatory countries to MAB were to establish national committees and an Intergovernmental Coordinating Council which decided that, apart from research, MAB should aim to develop a global network of representative ecosystems in which biodiversity conservation was to be combined with everyday living and research (UNESCO, 2007; Bridgewater, 2016). This resulted in the first mention of the term *biosphere reserve* – the tool for implementing MAB (Ishwaran *et al.*, 2008).

In 1974, a special working group of UNESCO's MAB, together with the United Nations Environmental Programme and the International Union for Conservation of Nature (IUCN), developed the criteria, guidelines, objectives, and functions of BRs (Ishwaran *et al.*, 2008; Bridgewater, 2016). Roughly a decade after the first world gathering in Minsk during 1983, the Second International BR Congress in Seville during 1995 saw the establishment of two important foundational documents for MAB, the *Seville Strategy* and *Statutory Framework of the World Network* (UNESCO, 1996; UNESCO, 2007; Ishwaran *et al.*, 2008; Pool-Stanvliet, 2013; Bridgewater, 2016; UNESCO, 2017). The Seville Strategy describes what constitutes a BR, while the Statutory Framework defines the principles, criteria, designation process and details their periodic (ten-year) review process, whereby BRs report on the fulfilment of their functions to maintain their designation (Price, 2002; Price *et al.*, 2010). Further, it encourages networks (regional and thematic) to facilitate shared learning among the World Network of BRs (WNBR), for example the African Network of BRs (AfriMAB) or the World Network of Island and Coastal BRs (UNESCO, 2007; Ishwaran *et al.*, 2008; Bridgewater, 2016; UNESCO, 2022a).

The MAB underwent further modifications to remain a prominent feature in the sustainable development frontier. A Seville +5 meeting was held in Pamplona during 2000 in which, with guidance from Seville Strategy, various actions were decided upon, including placing greater emphasis on sustainable socio-economic development (UNESCO, 2008a; Pool-Stanvliet, 2013). At the Third International BR Congress, the *Madrid Action Plan (2008-2013)* was adopted (Pool-Stanvliet, 2013; UNESCO, 2017), which emphasised BRs should face the challenges of the 21st century, including climate change, the provision of ecosystem services (ES) and urbanisation (UNESCO, 2008a), while also promoting them as internationally important sites dedicated to sustainable development (UNESCO, 2008a; Pool-Stanvliet, 2013).

More recently, MAB adopted the *MAB Strategy (2015-2025)* and *Lima Action Plan (2016-2025)*, which were founded on the Seville Strategy, Statutory Framework and lessons from implementing the Madrid Action Plan (UNESCO, 2017). Latest MAB policy emphasises BR contributions to reaching the SDGs and other multilateral environmental agreements, for example the CBD, United Nations (UN) Framework Convention on Climate Change, UN Convention to Combat Desertification, UN Convention on the Protection and Promotion of the Diversity of Cultural Expressions, and the Ramsar Convention (UNESCO, 2017; Pool-Stanvliet & Coetzer, 2020; Azadi *et al.*, 2021).

### **1.2.2 Biosphere Reserves: Concept and Practice**

Biosphere reserves serve as the designated landscapes in which MAB is to be implemented, *i.e.* coupling humans with nature in pursuit of specific goals (Coetzer *et al.*, 2014; Palomo *et al.*, 2014). The Lima Action Plan emphasises the WNBR as an integrated global network for shared learning and as ‘*open sky laboratories*’ or ‘*learning sites*’ for sustainable development (Pool-Stanvliet & Coetzer, 2020; Barraclough *et al.*, 2023). Research in the WNBR as a global network for interdisciplinary research, and BRs as contextual testing sites for sustainability science, needs to be strengthened – specifically research focusing on MAB (Pool-Stanvliet & Coetzer, 2020). However, if we are to realise the value of place-based learning for sustainability to overcome global sustainability challenges, individual sites are not sufficient alone, thus the various networks across the WNBR become an important mechanism for collective benefit (Barraclough *et al.*, 2023).

Biosphere reserves, defined in the Seville Strategy as areas or terrestrial and/or aquatic ecosystems internationally recognised by UNESCO and MAB (UNESCO, 1996; Ishwaran *et al.*, 2008), are operationalised through their three complimentary primary functions and a zonation system (UNESCO, 1996; Ishwaran *et al.*, 2008; Stoll-Kleemann *et al.*, 2010; Pool-Stanvliet, 2013; Pool-Stanvliet *et al.*, 2018; Pool-Stanvliet & Coetzer, 2020). Biosphere reserve functions include (UNESCO, 1996):

**Conservation** – to conserve genetic resources, species, ecosystems and landscapes.

**Development** – to foster sustainable socio-economic development.

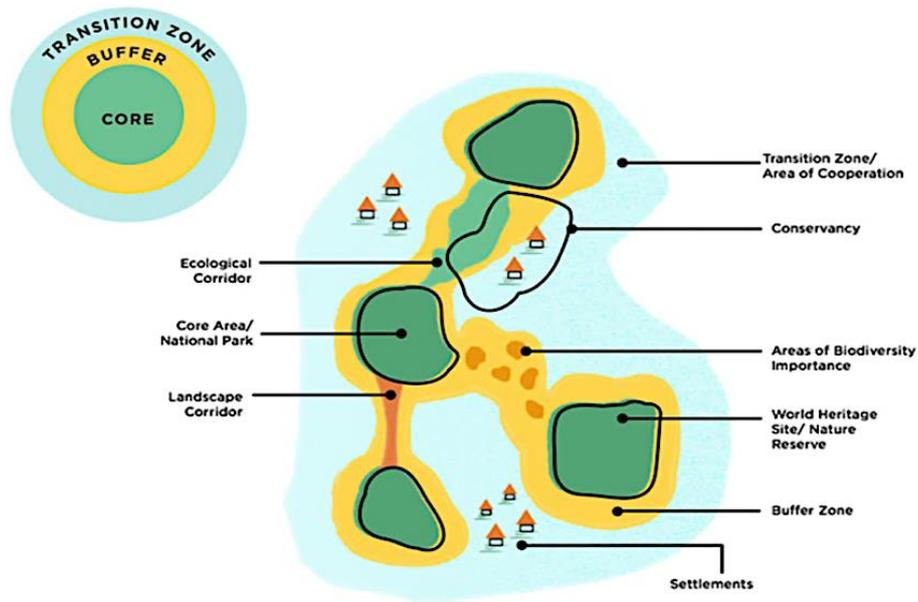
**Logistic** – to support education, research, training and monitoring projects relevant to local, national and international issues of sustainability and conservation.

To achieve their threefold function, BRs are spatially planned according to three zones (Figure 1.1), including the inner ‘*core*’, ‘*buffer*’ and ‘*transition*’ zone (Ishwaran *et al.*, 2008; Pool-Stanvliet, 2013; Reed, 2019; Pool-Stanvliet & Coetzer, 2020). The zonation pattern and use of buffers are to minimise the human pressures exerted on the inner core areas (Batisse, 1982), and are described as follows (UNESCO, 1996):

**Core zones:** Biosphere reserves include one to many core areas protected for biological diversity, monitoring ecosystems with little human disturbance, research and low-impact activities. This zone typically includes formally PAs governed by legislation, such as national parks and nature reserves.

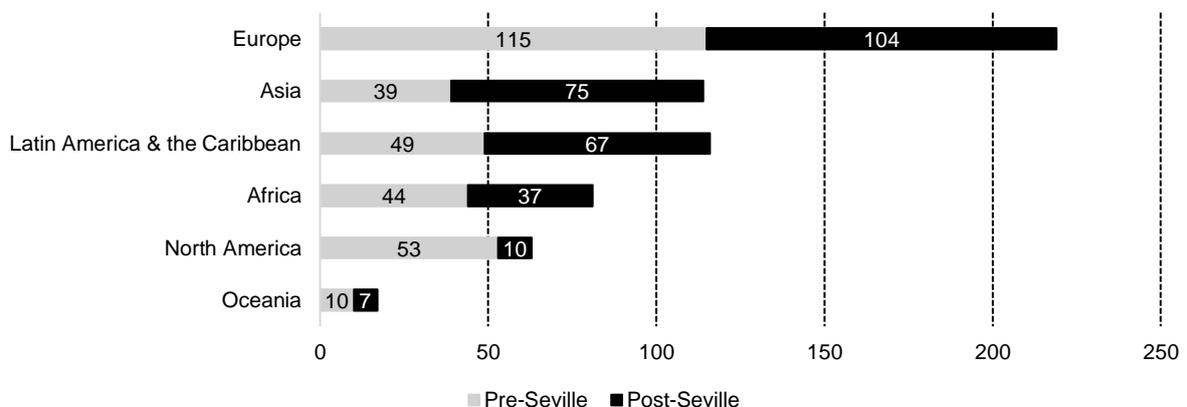
**Buffer zones:** Surrounding and connecting the core areas are buffer zones which are used for activities harmonious with sustainable environmental practices, including education, training, traditional land practices and applied research for ecosystem management.

**Transition zones:** Beyond the buffer are transition zones which serve a variety of uses and is where most socio-economic activity takes place, for example agriculture and settlement. This zone is to be sustainably developed and managed for the benefit of people and biodiversity.



**Figure 1.1** Diagram illustrating the spatial zoning pattern of a typical biosphere reserve (Pool-Stanvliet & Coetzer, 2020:1)

The establishment of BRs were influenced by three different phases, with the first 57 established in 1976 (UNESCO, 2017). The first generation of BRs includes those established prior to the *1984 Action Plan for Biosphere Reserves*, when the focus was primarily on nature protection and research (UNESCO, 2007; Ishwaran *et al.*, 2008). The second generation are those established between 1985 and 1995 when the Seville Strategy and Statutory Framework were formulated, whereas the current generation, or post-Seville phase, are those established after 1996 when the focus shifted to include sustainable socio-economic development as a primary function (Figure 1.2) (Ishwaran *et al.*, 2008).



**Figure 1.2** Number of biosphere reserves established pre- and post-Seville (Coetzer *et al.*, 2014)

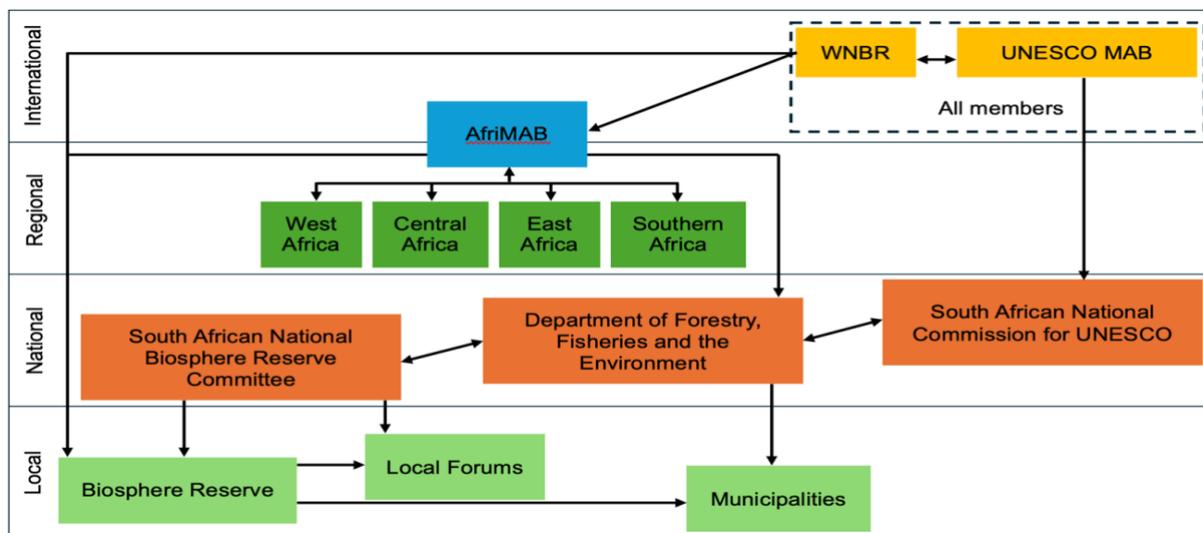
Interest in the BR concept from the Global South is evident. Post-Seville establishments have mostly come out of the Global South when BRs were viewed not only as purely conservation sites, but sites with socio-economic and human development importance, bringing to light the people-centred approach of BRs (Naughton-Treves *et al.*, 2005; Ishwaran *et al.*, 2008; Stoll-Kleemann *et al.*, 2010), in addition to biodiversity conservation. It is evident that community participation (Stoll-Kleemann *et al.*, 2010) and the adaptive multi-use landscape approach (Ishwaran *et al.*, 2008; Pool-Stanvliet & Coetzer, 2020) has attracted much more attention as a strategy for biodiversity conservation in recent years – especially in the developing world. According to Stoll-Kleemann *et al.* (2010), BRs in the Global South prioritise socio-economic and human development as a management objective far more than the first and second generations of BRs, *i.e.* the Global North.

### **1.2.3 The Man and the Biosphere Programme in South Africa**

South Africa's first introduction to BRs and MAB was in the 1990s, coinciding with the country's preparation for a democracy and once again entering the international arena (Pool-Stanvliet, 2013; Carruthers, 2020). In 1990 the Chief Directorate of the then Department of Nature and Environmental Conservation developed a document pertaining to a potential holistic strategy for conserving the Fynbos Biome – highlighting local community involvement as '*critically important*' in dealing with conservation and development challenges (Pool-Stanvliet, 2013). The MAB was identified as an appropriate approach to the conservation of this region, which resulted in the proposition of the Fynbos Biome BR in 1991 (Pool-Stanvliet, 2013). However, it was only in 1995 after the first democratic elections, when agreements were signed between UNESCO and South Africa (Pool-Stanvliet, 2013; Carruthers, 2020).

The Western Cape province was the first to adopt this holistic approach to biodiversity conservation, establishing its first BR in 1998, the Kogelberg BR (KBR) (Pool-Stanvliet, 2013; Carruthers, 2020; Pool-Stanvliet & Coetzer, 2020). UNESCO strongly supported South Africa's interest in BRs, hosting several seminars and workshops in the country in the early 2000s. Thereafter, its then named Department of

Environmental Affairs and Tourism<sup>1</sup> wrote a position paper emphasising BRs as valuable land management tools – sustainably integrating people with the environment while trying to achieve the country’s conservation and socio-economic development goals. The vision was that South African BRs would be “*special landscapes where social-ecological land management is practised for a more sustainable future for all*” (UNESCO, 2008b:4). The Department of Forestry, Fisheries and the Environment is the focal point of executing MAB implementation within South Africa (Pool-Stanvliet, 2013) and was responsible for establishing the national MAB committee in 2010. In Figure 1.3 the governance structure of MAB within the South African context is illustrated – all falling under the AfriMAB regional network.



**Figure 1.3** Vertical governance structure of biosphere reserves in the South African context, including the local, regional, national and international levels (DEA, 2016)

Currently South Africa has ten BRs spanning roughly a tenth of the country, all of which are listed in Table 1.1 (Carruthers, 2020; Pool-Stanvliet & Coetzer, 2020). Unlike formal PAs in the country, there is no enforcement of BRs through legislation, rather through collaborative social networks between the BR management entities and other relevant stakeholders and role players (Pool-Stanvliet, 2013; Carruthers, 2020; Pool-Stanvliet & Coetzer, 2020). However, this ‘*soft law*’ approach (Pool-Stanvliet & Coetzer, 2019 & 2020) does mean BRs can strategically utilise existing legislation to

<sup>1</sup> Currently the Department of Forestry, Fisheries and Environment (DFFE: 2019-present). Previously DFFE was named the Department of Environmental Affairs (DEA: 2009-2019) and the Department of Environmental Affairs and Tourism (DEAT: 1994-2009).

enforce acceptable use in each of the zones. This marked a new and positive shift in South Africa's approach to conservation which was previously characterised by strict forms of a top-down nature and wildlife conservation often attached to ethical injustices, marginalisation, resentment and exclusion (Pool-Stanvliet & Coetzer, 2020). As a result, BRs are thought to be one of the most appropriate bottom-up landscape management tools to face contemporary challenges in the South African context (Palomo *et al.*, 2014; Pool-Stanvliet, 2013; Carruthers, 2020; Pool-Stanvliet & Coetzer, 2020). The overall purpose of these BRs, realised as SESs, is to achieve the SDGs through a flexible and inclusive governance approach (Pool-Stanvliet & Coetzer, 2020), while simultaneously contributing towards other global imperatives such as the 30x30 target of the global biodiversity framework (Barraclough *et al.*, 2023).

**Table 1.1** South African Biosphere Reserves, including their year of designation, size (ha) and links to their online webpage

<b>Biosphere reserve (Province/s)</b>	<b>Year of designation</b>	<b>Size(ha)</b>	<b>Website</b>
Kogelberg (Western Cape)	December 1998	103 629	<a href="http://kogelbergbiosphere.org.za">kogelbergbiosphere.org.za</a>
Cape West Coast (Western Cape)	November 2000	387 000	<a href="http://cwcbcr.co.za">cwcbcr.co.za</a>
Waterberg (Limpopo)	March 2001	417 406	<a href="http://waterbergbiosphere.com">waterbergbiosphere.com</a>
Kruger to Canyons (Limpopo & Mpumalanga)	September 2001	2 608 000	<a href="http://kruger2canyons.org">kruger2canyons.org</a>
Cape Winelands (Western Cape)	September 2007	322 032	<a href="http://capewinelandsbiosphere.co.za">capewinelandsbiosphere.co.za</a>
Vhembe (Limpopo)	May 2009	3 099 163	<a href="http://vhembebiosphere.org">vhembebiosphere.org</a>
Gouritz Cluster (Western & Eastern Cape)	June 2015	3 187 893	<a href="http://gouritz.com">gouritz.com</a>
Magaliesberg (North West & Gauteng)	June 2015	357 437	<a href="http://magaliesbergbiosphere.org.za">magaliesbergbiosphere.org.za</a>
Garden Route (Western Cape & Eastern Cape)	June 2017	698 363	<a href="http://gardenroutebiosphere.org.za">gardenroutebiosphere.org.za</a>
Marico (North West)	July 2018	447 269	<a href="http://maricobiosreserve.org">maricobiosreserve.org</a>

#### **1.2.4 Brief History of Conservation Paradigms: Progressions Towards Social-Ecological Systems for Sustainability**

Protected areas, core strategies of biodiversity conservation (de Vos *et al.*, 2017; Maxwell *et al.*, 2020), are still one of conservations best approaches for ensuring the persistence of ecological populations, communities and ecosystems. However, over the years the objectives of these areas, and our understanding of them, has changed (Mace, 2014; Palomo *et al.*, 2014; Cumming *et al.*, 2015; Cumming & Allen, 2017). They have been successful in protecting species and their habitats from external threats, such as land-use change (Palomo *et al.*, 2014). However, biodiversity, considered a global common-pool resource (Cumming, 2016), continues to decline globally, undermining its capacity to deliver ES and subsequently contribute to human-wellbeing in the long-term (Cumming & Allen, 2017). Therefore, the global network of PAs is not achieving their core goal – preserving biodiversity and ES (Palomo *et al.*, 2014; Cumming, 2016; Cumming & Allen, 2017). Conservation is mission-driven, subject to change as new knowledge and challenges emerge (Mace, 2014), and over the last half century there have been several fundamental shifts – largely due to how we view the relationship between humans and nature (Cumming & Allen, 2017). This change, occurring over a relatively short period, has resulted in multiple views and motives driving conservation at present – sometimes occurring simultaneously, others causing tension (Mace, 2014; Cumming, 2016). Therefore, a brief history of the evolution of PAs and the conservation paradigms behind them is provided below to illustrate how the science driving conservation decision-making and our understanding has changed.

Prior to the 1960s the underlying conservation philosophy was to protect “*nature for itself*” (Mace, 2014), *i.e.* for its intrinsic value (Palomo *et al.*, 2014), and PAs were to be managed to maintain their historically defined “*wild*” form (Cumming & Allen, 2017). Historically, areas were protected for their aesthetic and scenic beauty, recreation and specific wildlife species, not necessarily to conserve biodiversity (Mace, 2014; Western *et al.*, 2020). During this time conservation occurred in ‘*ecological islands*’, where PAs were to separate nature from humans (Mace, 2014; Borsdorf *et al.*, 2014; Palomo *et al.*, 2014; Cumming *et al.*, 2015) – PAs as their own system to be managed. The philosophy had been dualistic, a distinct separation between nature and society – the latter being a threat to the former (Borsdorf *et al.*, 2014; Palomo *et al.*, 2014;

Mabele *et al.*, 2022). The fortress conservation model emerged during this period, with the establishment of world-famous national parks such as Yellowstone National Park in 1872 and Kruger National Park (KNP) in 1898<sup>2</sup> (Venter *et al.*, 2008; Borsdorf *et al.*, 2014; Palomo *et al.*, 2014; Mabele *et al.*, 2022).

During the 1970s and 1980s, there was the realisation that human activities increase the impacts on habitats and species, largely habitat destruction, overharvesting natural resources and invasive species, all of which are social constructs debated in political arenas (Cumming & Allen, 2017). This led to conservation being underpinned by “*nature despite people*” (Mace, 2014). A distinct shift from protecting wilderness areas to protecting species and their habitats occurred (Palomo *et al.*, 2014). The fortress model embodied the separatist philosophy, forcibly removing people and protecting what is ‘*inside*’ from the ‘*outside*’, successfully protecting species and their habitats and trying to reverse or reduce threats to them (Mace, 2014; Palomo *et al.*, 2014). The interest was placed on maintaining the ‘*status quo*’ within the PA boundaries (Cumming & Allen, 2017). Those who benefitted were merely conservationists, scientists and tourists, white or wealthy in the South African context (Büscher, 2015; Mabele *et al.*, 2022), while the history of injustices, exclusion and displacement of local communities in and around PAs, in the South African context, resulted in feelings of resentment to anything termed ‘*conservation*’ (Pollard *et al.*, 2003; Stoll-Kleemann *et al.*, 2010; Pool-Stanvliet & Coetzer, 2020; Hedden-Dunkhorst & Schmitt, 2020).

A shortfall in this paradigm was that PAs were designated by those who had knowledge on biology and ecology, not landscape planning, which resulted in new threats to PAs stemming from isolation and the lack of connectivity (Palomo *et al.*, 2014). Biosphere reserves emerged during this time and their spatial zonation pattern was considered important for managing areas beyond PAs and buffering against threats to them (Hamilton, 2014; Palomo *et al.*, 2014). Despite the shortfalls, this model still provides value in some contexts and has seen resurgence through the ‘*green militarisation*’ in response to poaching (Büscher, 2015).

Protected areas need to adapt and remain relevant through time (Cumming *et al.*, 2015). Their success is determined by their social acceptability and economic

---

<sup>2</sup> Sabie Game Reserve, the predecessor of the Kruger National Park, was established in 1898. Kruger National Park, as it is in its current form, was established in 1926.

feasibility (de Vos *et al.*, 2017) and since the 1980s, consensus was being built that conservation needed to become more socially, economically and politically accountable (Coetzer *et al.*, 2013) periodically requiring the re-consideration of conservation strategies (Venter *et al.*, 2008; Mace, 2014).

Protected areas influence their embedded environments and are also influenced by the context of these environments. For many years isolated PAs were dealing with ‘*on-site*’ or ‘*internal*’ issues, largely traditional ecological concerns, for example managing water, wildlife, fires and fences, however their potential to endure was becoming threatened by increasing ‘*off-site*’ or ‘*external*’ issues which were social, economic and political, for example public hostility and opinion, social pressures, changing legislation, land claims, pollutants and climate change (Western *et al.*, 1989; Venter *et al.*, 2008; Cumming, 2016).

In the 1990s, pressures on PAs were understood to be ubiquitous and persistent, and that even the best conservation efforts were failing because of social, economic, or political reasons – not understanding the plurality of PAs (Mace, 2014; Cumming, 2016; Cumming & Allen, 2017). This led to a period in which conservation was framed as “*nature for people*”, marked by transitions towards integrated approaches focussed on ecosystems, ES and increased stakeholder participation (Borsdorf *et al.*, 2014; Mace, 2014; Palomo *et al.*, 2014) – ES being the connection between PA management and societal wellbeing (de Vos *et al.*, 2017). It was during this period in which conservation, specifically PAs, adopted the World Parks Congress’s “*Benefits Beyond Borders*” (Venter *et al.*, 2008; Palomo *et al.*, 2014) in which PAs can and must consider their surroundings and contribute towards other imperatives such as sustainability and poverty alleviation (IUCN, 2003). Landscape ecology was considered necessary for conservation to be sustainable and therefore ecological corridors, in concept and practise, emerged to deal with the previous era’s challenges of isolation and lack of connectivity, however, this did not curb the loss of biodiversity within PAs (Palomo *et al.*, 2014).

From the mid-2000s until today landscape approaches have been the dominant conservation paradigm, driven by a new value of maintaining ecological processes, and integrating land-use planning, governance, policy and management under a ‘*land-sharing*’ philosophy (Palomo *et al.*, 2014; Arts *et al.*, 2017). Landscape-thinking had been promoted in earlier conservation philosophy, particularly through the theory of

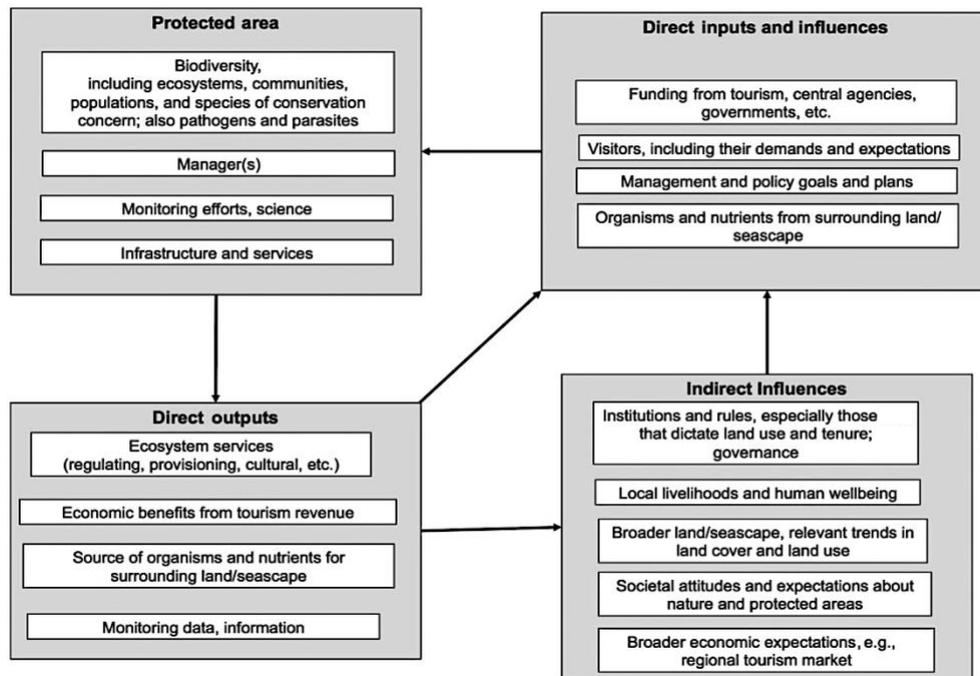
island biogeography, including the appropriate number, size, distribution and connectivity of PAs, and metapopulation theory (Sayer *et al.*, 2013; Hamilton, 2014; Kremen & Merenlender, 2018). Landscape approaches already gained popularity in the 1980s, drawing inspiration from spatial planning, and gaining momentum from debates with regards to trade-offs between the needs of conservation and livelihoods, thus the new era needed to consider multiple objectives and increased stakeholder participation (Palomo *et al.*, 2014; Arts *et al.*, 2017).

As we reconsider our approaches, learning from emerging lessons of previous paradigms, it is important to acknowledge limitations, look forward to what could improve and anticipate what could be expected in the future. There are shortfalls with the traditional landscape approach, including the bias in location and size of PAs, their isolation and drivers of change, and the relationship between society and PAs (Palomo *et al.*, 2014). Historically, PAs were not designated for biodiversity (Mace, 2014; Western *et al.*, 2020). Studies have shown that there are many important and threatened biodiversity hotspots beyond the boundaries of PAs, greater than previously realised in human-dominated landscapes (Cowling *et al.*, 2003; Barendse *et al.*, 2016; Coetzer *et al.*, 2016; Kremen & Merenlender, 2018). This is not a novel consideration as Pimentel *et al.* (1992) argued this fact 30 years ago, that not only did human-dominated landscapes hold most of the biodiversity but that they also provide the broader social-ecological context which determine the success and effectiveness of PAs. Therefore, biodiversity conservation needs to be integrated into the everyday life and not just practiced in far-removed isolated PAs, which if left in isolation are hopeless (Kremen & Merenlender, 2018; Obura *et al.*, 2021).

We are now in the era of “*people and nature*” (Mace, 2014), or “*harmony with nature*” (CBD, 2022). The current vision of the Global Biodiversity Framework (CBD, 2022) reflects this:

*“By 2050, biodiversity is valued, conserved, restored and wisely used, maintaining ecosystem services, sustaining a healthy planet and delivering benefits essential for all people.”*

This means PAs can no longer be implemented as ecological islands in the landscape managed for them but should rather be viewed through the lens of the SES – acknowledging the influence of wider ecological, social and political processes (Figure 1.4) (Palomo *et al.*, 2014; Cumming *et al.*, 2015; Arts *et al.*, 2017; Cumming & Allen, 2017; de Vos *et al.*, 2017).



**Figure 1.4:** Protected areas through a systems perspective, indicating social, ecological, economic and political influences and how these dynamics can influence outputs (Cumming & Allen, 2017:1711)

Social-ecological systems, also known as complex adaptive systems (Preiser *et al.*, 2018), emphasise that humans and nature are intertwined and is based on the notion that delineation between the social and ecological realms is artificial and arbitrary (Biggs *et al.*, 2022). These systems are dynamic, with many interdependent parts interacting that give rise to emergent properties laden with uncertainty (Preiser *et al.*, 2018; Biggs *et al.*, 2022). These interactions influence individual parts of the system resulting in feedback loops and the evolution of the system over time – allowing adaptation to occur (Biggs *et al.*, 2022).

There are some distinct features separating the more traditional landscape approach to that of a landscape through a SES lens, particularly their rationale. Traditional landscape approaches were initially adopted to deal with lessons from the ‘networking’ era – that PAs are affected by their surroundings – and that integration across the landscape was needed to ‘maintain’ its original cultural, historic, symbolic and aesthetic value (Kirchhoff *et al.* 2012) or to manage the landscape to protect PAs (Palomo *et al.*, 2014). Whereas through a SES lens, the goal is to maintain a functional and resilient landscape for sustainability, *i.e.* deliver ES for the long-term (de Vos *et al.*, 2017), with the introduction of concepts such as thresholds and resilience

(Kirchhoff *et al.* 2012; Palomo *et al.*, 2014); '*resilience*' being defined as the system's ability to maintain its identity within a regimes threshold (Folke *et al.*, 2021).

Landscape approaches as viewed through a SES lens for PAs, offers several advantages over the traditional landscape model with regards to conserving biodiversity. In the future, PAs are likely to face increasing pressures from social, economic and political sources, not only broader anthropogenic environmental impacts (Cumming, 2016). The interconnectedness and tele-coupling of these subsystems, *i.e.* ecological, economic, social and political, across scales (Schoon *et al.*, 2021) means that sectoral approaches cannot deal with global biodiversity loss, a wicked problem due to the complexities and uncertainties involved (Arts *et al.*, 2017). Therefore, a multisectoral approach is necessary to build resilience across the landscapes in which PAs are embedded in to achieve sustainability (Cumming & Allen, 2017).

Additionally, The cross-sectoral and multiple scales in drivers of biodiversity loss creates a '*mismatch*' (Bergsten *et al.*, 2014), '*misfit*' (Ekstrom & Young, 2009; Sternlieb *et al.*, 2013) or '*problem of fit*' (Plummer & Hashimoto, 2011) in which ecological processes transcend the scale of environmental institutions and governance boundaries, exacerbating the challenge of achieving institutional '*fit*' (Schoon *et al.*, 2021). However, the SES approach potentially offers a better fit for such scales (Arts *et al.*, 2017; Cumming & Allen, 2017).

Social-ecological systems are adaptive, dynamic and made up relationally, meaning the interactions between subsystems is more important than the properties of subsystems themselves (Arts *et al.*, 2017; Preiser *et al.*, 2018 & 2019; de Vos *et al.*, 2019). Thus, shifting the focus in favour of function and service over individual components, for example a species, recognising that change is inevitable and often needed (Cumming & Allen, 2017). This is evident in KNP which has for a long time reconsidered its approach and adapted to remain the conservation stronghold that it is (Pollard *et al.*, 2003; Venter *et al.*, 2008), moving from an ecological island in which '*command and control*' was the modus operandi, to integrating itself in the greater social, ecological, economic and political landscape and managed as a complex adaptive system since 1995 (Venter *et al.*, 2008). Importantly, poverty, equity and human-wellbeing can no longer be discussed separately from conservation in viewing human-nature relations (Cumming, 2016), and SES enable us to understand the

linkages between humans and their environment (Arts *et al.*, 2017). Further, SES can help us reframe biodiversity conservation and PAs, how they are both defined and define the interactions between humans and nature (Cumming & Allen, 2017).

Reconciling human-wellbeing, societal needs and biodiversity conservation is a key message emanating from the most recent Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services report (IPBES, 2019). Framing these interconnected challenges as complex adaptive SES, has permeated through several concepts which share this underlying philosophy of the current and future conservation paradigm – aiming to sustain biodiversity, provide ES, and enhance SES resilience. These include other effective area-based conservation measures (OECMs) which were adopted by the CBD in 2018 to recognise and support biodiversity conservation beyond PAs which can benefit in-situ conservation efforts (Donald *et al.*, 2019; MacKinnon *et al.*, 2021; Marnewick *et al.*, 2021). This policy tool is important for filling the shortfalls of PA coverage and reaching global conservation targets, specifically 30x30, while strengthening biodiversity conservation for the long-term (Donald *et al.*, 2019; Gurney *et al.*, 2021; MacKinnon *et al.*, 2021; Marnewick *et al.*, 2021). Importantly, it is believed that OECMs are one of the few tools which can simultaneously combat global biodiversity loss and climate change (Diaz *et al.*, 2019; MacKinnon *et al.*, 2021), which is critical considering these are not isolated phenomena and two planetary boundaries which we are in or beyond the zone of uncertainty (Folke *et al.*, 2021). This tool ensures conservation is equitable, effective and legitimate in the eyes of a diverse set of actors who are needed to curb global biodiversity losses (Gurney *et al.*, 2021). It does this by fostering collaboration and enhanced engagement between conservation organisations and a range of diverse landowners to protect economically important natural resources while supporting local economies (Donald *et al.*, 2019; Marnewick *et al.*, 2021). It supports local communities in managing their own lands while conserving nature (Gurney *et al.*, 2021), thereby contributing to broad-scale conservation within the SES by strengthening landscape connectivity (Donald *et al.*, 2019; Marnewick *et al.*, 2021).

Like OECMs, Kremen and Merenlender (2018) and Western *et al.* (2020) refer to working landscapes conservation in the context of biodiversity conservation in human-dominated landscapes, which are essentially what BRs and multifunctional conservation landscapes epitomise. The aim is to manage landscapes in a way that

maintains biodiversity, while providing ES, and supporting abiotic conditions necessary for sustainability and resilience (O'Farrell & Anderson, 2010; Kremen & Merenlender, 2018; Western *et al.*, 2020), thereby supporting multiple environmental, social and economic benefits to diverse stakeholder groups (O'Farrell *et al.*, 2010; Neyret *et al.*, 2023). This is otherwise known as '*multiple-benefit conservation*' (Gardali *et al.*, 2021). These multifunctional landscapes are especially important as they can play a supplementary role to PAs, increase the connectivity to allow the movement of animals, natural processes and provision of ES to persist (Kremen & Merenlender, 2018; Western *et al.*, 2020; Puri *et al.*, 2022). This thinking is founded on the premise that these working lands make up approximately 25-30% of the Earth (Western *et al.*, 2020; Carter *et al.*, 2021), and that to avoid an ecological collapse (and mass extinction), biodiversity conservation needs to be integrated into everyday life (Kremen & Merenlender, 2018; Obura *et al.*, 2021).

### **1.2.5 Collaborative Conservation Governance in Social-Ecological Systems**

The current conservation paradigm necessitates collaboration beyond PA boundaries and across sectors to conserve biodiversity within SESs. Collaborative conservation governance across SES is increasingly becoming the norm due to ecological challenges crossing multiple scales, therefore involving multiple stakeholders (Kark *et al.*, 2015; Clement *et al.*, 2020). In other words, natural resource management and governance in landscapes defined by multiples, *i.e.* many stakeholders, ES, land-uses, institutions, organisations, scales of action and decision-makers) are increasingly implementing collaborative initiatives – the *collaborative turn* (Cockburn *et al.*, 2020a). Cockburn *et al.* (2020a) define *collaborative initiatives* as a process bringing together a diverse set of role-players who work together to achieve SES sustainability.

Governance refers to a broader set of processes and institutions through which society affects the SES (Armitage *et al.*, 2012). Governance takes on several definitions, however, according to the Technical Guidelines for Biosphere Reserves, governance refers to the "*structures and processes that determine how decisions about BRs are taken and how stakeholders are included*" (UNESCO, 2021:51). Further, it describes "*the totality of committees, legal texts, statutes, and their implementation*" (UNESCO, 2015a:18). Drawing on the definitions of the MAB guiding documents, governance within the context of this research is defined as the structures and processes

determining how decisions, *i.e.* the act and process of making decisions, about BRs are taken, how stakeholders are included, and it involves the strategic planning and leadership around setting goals, direction and accountability. Therefore, the governance model refers to the chosen forms of governance approaches and decision-making body.

Governance is collaborative in nature, relying on many actors to deal with public issues or challenges within the commons (Müller, 2008). These many and key societal actors – civil, private or public – interact across the SES to solve societal challenges and create opportunities – referred to as *interactive governance* (Kooiman *et al.*, 2008; Edelenbos and van Meerkerk, 2016). According to interactive governance theory, higher orders of governance, *i.e.* meta- or third order governance involving underlying principles and values, guide the everyday actions of governing (Kooiman *et al.*, 2008). For example, in the context of BRs UNESCO MAB policy provides guidance to BRs, however local BRs tailor the implementation thereof to fit local context.

Literature on collaboration in SES, which has grown across the interlinking themes of collaborative governance, collaborative management, adaptive co-management and adaptive governance, share two common characteristics (Schoon *et al.*, 2021). First, decision-making is complex, uncertain, and can be improved through sharing knowledge, information and experience (Kark *et al.*, 2015; Van der Weyde *et al.*, 2022). Second, *'fit'* between SES scale and the ecological challenge (Cockburn *et al.*, 2019; Clement *et al.*, 2020; Schoon *et al.*, 2021). Importantly, collaboration can facilitate cross-scale coordination, *i.e.* local to national (Wyborn & Bixler, 2013). Moreover, collaboration enhances conservation outcomes, cost-effectiveness, resource availability, adaptive capacity, expands knowledge and encourages experimentation (Kark *et al.*, 2015; Clement *et al.*, 2020). However, the outcomes of collaboration depend on how mechanisms interact with context because context mediates mechanisms to produce certain outcomes (Lauber *et al.*, 2011; Schoon *et al.*, 2021).

Redpath *et al.* (2017) writes *"don't forget to look down"*, referring to bottom-up approaches, and states that both top-down and bottom-up approaches hold value, and are especially pertinent in the developing world, *i.e.* the Global South where collaborative bottom-up approaches may be more suitable. In this context, resources are limited, poverty is rife and governance is often weak, and therefore bottom-up collaborations are particularly useful in that they operate with particular focus on the

realities on the ground and pay attention to local culture and context (Redpath *et al.*, 2017; Genda *et al.*, 2022). For this reason, Wyborn and Bixler (2013:59) believe it seems appropriate to formulate solutions at the lowest level, summing up the philosophy by saying “*as much local solution as possible and only so much government regulation as necessary*”. According to Carter *et al.* (2021), there is evidence supporting place-based collaborations in the context of human-predator coexistence, more specifically they have the potential to reduce negative impacts on both predator populations and human livelihoods, increase tolerance and reduce human-induced mortalities.

### **1.2.6 Leopards of the Cape**

Large carnivores are declining globally (Devens *et al.*, 2018; Amin *et al.*, 2021) and are the most at risk of extinction (Carter *et al.*, 2021) largely due to the pervasiveness of human impacts on nature (Estes *et al.*, 2011; Swanepoel *et al.*, 2012). This decline is not just an aesthetic and ethical issue (Estes *et al.*, 2011), but rather a sustainability issue because they have a strong influence on biodiversity (Bodasing, 2022). The loss of biodiversity results in decreased landscape resilience (Cumming, 2016) and therefore the ability of the SES to buffer against shocks (Folke *et al.*, 2021). Large carnivores play a crucial role in regulating and maintaining healthy ecosystems (Ripple *et al.*, 2014; Devens *et al.*, 2018), yet are highly susceptible to anthropogenic forces, particularly human-induced mortality, land-use changes, habitat loss and fragmentation, poaching and prey-base depletion (Bodasing, 2022; McManus *et al.*, 2022; Strampelli *et al.*, 2022; Hinde *et al.*, 2023). Furthermore, as *keystone species*, the loss of apex consumers may result in trophic cascades with extensive, unanticipated, non-linear and pervasive impacts to ecosystems (Estes *et al.*, 2011).

Globally, large carnivore populations are declining due to habitat loss and human persecution (Bodasing, 2022). While PAs are critical for African large carnivores, most rely on multifunctional areas beyond PA boundaries where they face greater anthropogenic pressure, specifically persecution (Ripple *et al.*, 2014; Strampelli *et al.*, 2022). Several species, such as African wild dog (*Lycaon pictus*), cheetah (*Acinonyx jubatus*), spotted hyaena (*Crocuta crocuta*) and lion (*Panthera leo*), are targeted, especially where there is conflict with livestock (Dickman, 2010; Van der Weyde *et al.*, 2022). Additionally, some species such as lion and tiger (*Panthera tigris*) are persecuted for the global trade of their body parts (Williams *et al.*, 2017). South Africa

has a long history of persecuting large carnivores, having extirpated several species from their historical ranges (Müller *et al.*, 2022).

The Cape leopard (*Panthera pardus*) is the most widespread felid and last remaining free-roaming apex predator in the Western Cape, South Africa (Martins & Martins, 2006; Swanepoel *et al.*, 2012; Amin *et al.*, 2021; Devens *et al.*, 2021; Müller *et al.*, 2022), with spotted hyena and lion having been extirpated centuries ago (Müller *et al.*, 2022). This species is declining from most of its range (Morris *et al.*, 2023; Swanepoel *et al.*, 2012). The Cape leopard was believed to be distinct from other leopards in Africa due to their morphological and genetic identity (Martins & Martins, 2006), which new research now supports (Morris *et al.*, 2024). The species has until recent times been classified as ‘*vermin*’ – and highly persecuted by farmers and conservation officials alike (Martins & Martins, 2006; CapeNature, 2022). They are far smaller and occur at lower densities than others in the region (CapeNature, 2022 predicts fewer than 500 individuals), but occupy much larger ranges (Martins & Martins, 2006). They are highly susceptible to anthropogenic disturbances such as habitat fragmentation and prey depletion (Balme *et al.*, 2014; Devens *et al.*, 2018 & 2021) and persistence may therefore reflect positive interactions between social and ecological systems, contributing to what is known as ‘*SES health*’ (De Garine-Wichatitsky *et al.*, 2021). Additionally, they carry cultural significance in South Africa as ‘*iconic*’ species and national heritage (Griffiths, 2017), and their charismatic nature makes them flagship species for biodiversity conservation, crucial for raising awareness and support (Bodasing, 2022).

There is reason for concern regarding leopard sustainability in South Africa (Swanepoel *et al.*, 2015b), particularly due to suitable habitat being highly fragmented, and most of it situated beyond PAs (Swanepoel *et al.*, 2012 & 2015a). Evidence suggests non-protected landscapes can be home to as many leopards as PAs (Swanepoel *et al.*, 2015a), however, this requires the mitigation of human-carnivore conflict and facilitating human-wildlife coexistence in these corridors outside PAs where their survival rates may be lower (Swanepoel *et al.*, 2015b; McManus *et al.*, 2022). Surprisingly, there appears to be a mismatch between leopard research and conservation priorities (Balme, 2014), specifically an urgency in filling the knowledge gap surrounding their conservation in unprotected landscapes, including actions,

programmes and outcomes (Swanepoel *et al.*, 2015a & 2015b) – which this study hopes to contribute to.

Biosphere reserves potentially have much to offer in terms of creating the right enabling environment and facilitating conducive conditions to support the conservation of leopard and subsequently SES sustainability by promoting environmental and ecological stewardship on private lands, expanding the conservation sphere. Hamilton (2014) believes there is a need for the '*resurrection*' of BRs as a feasible means to enlarging the sphere of conservation, promoting nature-friendly land and water management beyond PAs which can certainly benefit area-demanding species such as large carnivores. Increasing the populations of endangered species has been reported as one of their many positive outcomes (Ferreira *et al.*, 2020).

Durant *et al.* (2022) and Boronyak *et al.* (2022) both write about a theory of change to achieve coexistence between humans and large carnivores. Some specifically important enabling and facilitating conditions overlapping with the mandate of effectively functioning BRs and these theories of change are as follows. First, systems of good governance. During the initiation of BRs there is a level of openness with its stakeholders, enhancing transparency and compliance with regard to rules of the area's designation (Hedden-Dunkhorst & Schmitt, 2020). Second, local empowerment and participation in decision-making, an important characteristic, determinant of success of BRs (Hedden-Dunkhorst & Schmitt, 2020) and positive outcome of BRs (Ferreira *et al.*, 2020). Biosphere reserves do not enforce, rather they incentivise and innovate, empowering local communities to foster sustainability and lead through models of '*best practices*' (Clüsener-Godt *et al.*, 2022) by cooperation among landscape actors (Stoll-Kleemann & O'Riordan, 2017). Third, monitoring and evaluation (research) which are core functions of BRs (UNESCO, 1996), particularly in the buffer zones surrounding PAs (Clüsener-Godt *et al.*, 2022). Fourth, networking and support in terms of financial and other resources. This is believed to be the envisioned role of BRs in South Africa, for example the Kruger to Canyons (K2C) as a '*collaborative platform*' (Schultz *et al.*, 2018), or the KBR as a '*relational hub*' (Klaver *et al.*, 2024), which can help strengthen existing conservation activities beyond PAs (Hedden-Dunkhorst & Schmitt, 2020; Clüsener-Godt *et al.*, 2022). Fifth, education and shared learning, another core function of BRs (UNESCO, 2016) and positive outcome in many BRs (Ferreira *et al.*, 2020). Further, in K2C it was found that conservation

practitioners learned how to better position their practices through engagements with the BR (Schultz *et al.*, 2018). Lastly, a SES approach. Biosphere reserves position themselves '*in between*' social, ecological and economic goals, providing valuable sites to learn-by-doing with regards to the complexities of SESs (Schultz *et al.*, 2018). This research provides empirical studies on MAB and meets the need for further research on collaborative initiatives in SESs and conservation programmes for large free-roaming carnivores in multifunctional landscapes. Currently, how MAB is implemented across various contexts is not well-understood and remains a gap which this research attempts to fill. Additionally, these BRs are multi-use conservation designations that are positioned as relational hubs (after Cockburn *et al.*, 2020b) to enable collaboration and coordination amongst a diverse network of landscape actors to deal with sustainability issues (Barraclough *et al.*, 2023; Klaver *et al.*, 2024). Therefore, this research also builds on the work of Schoon *et al.* (2020; 2021) and Cockburn *et al.* (2020a), and explores a collaborative leopard conservation project spanning two BRs. Although this research is more focused on collaborative processes and less on leopards, the outcome of this research may contribute to the knowledge gap surrounding leopard conservation programmes and actions in unprotected landscapes identified by Swanepoel *et al.* (2015a & 2015b).

## **1.3 AIMS AND OBJECTIVES**

### **1.3.1 Aim**

This study aims to assess the interpretation and implementation of MAB in two South African BRs and explore a landscape-level collaborative initiative supporting Cape leopard conservation in the Boland.

### **1.3.2 Objectives**

**Objective 1:** To understand how the governance strategy and structure of two South African BRs have helped to achieve a context appropriate interpretation and actioning of MAB in the landscape.

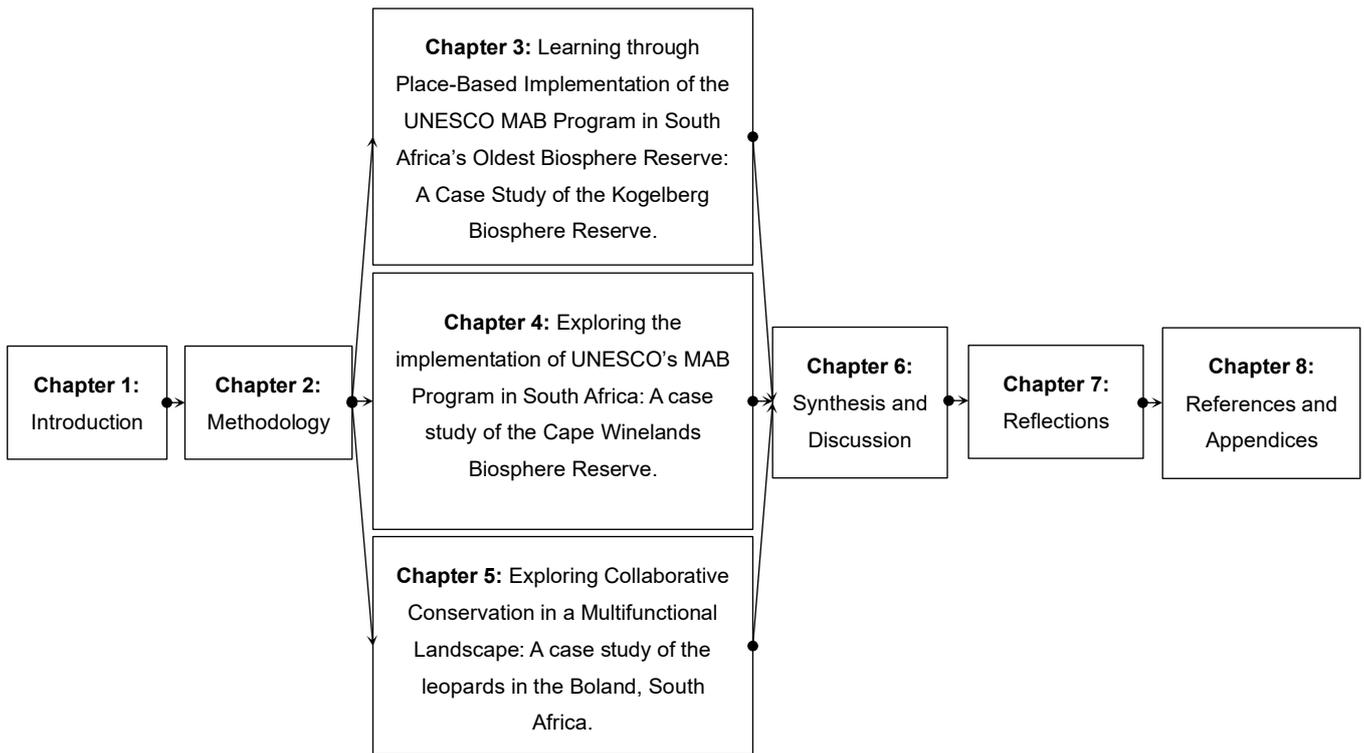
- i. To explore the mode of governance of the individual BR and its envisioned role in the landscape.
- ii. To explore stakeholder involvement within the BR and what these relationships entail.

**Objective 2:** To understand how landscape-level collaborative conservation initiatives support leopard conservation across a multifunctional landscape.

- i. To explore how and why collaborative initiatives operate to support Cape leopard conservation in a multifunctional landscape?

## **1.4 THESIS STRUCTURE**

This thesis contains three data chapters (Figure 1.5), all of which have either been published, in press or undergoing peer review in academic journals. Therefore, there is a certain amount of repetition across some sections of the thesis. These papers have, as far as possible, been re-formatted to maintain consistency throughout the thesis, however, there may be some inconsistencies among the three data chapters.



**Figure 1.5** Graphic representation of the thesis structure

Chapter 1 frames the thesis by stating the rationale for the study, providing a comprehensive literature review and research aims and objectives. Chapter 2 introduces the research methodology, including the paradigm, design, methods, quality measures and my positionality, followed by ethical considerations and limitations of the research. Chapter 3 presents a research article published on the 1<sup>st</sup> of April 2024 in the journal *Land's Special Issue of Biospheres in the Global South* (Appendix 1). Chapter 4 presents a research article published on the 18<sup>th</sup> September 2024 in *Environmental Management* (Appendix 2). Chapter 5 presents a research article prepared for submission to the journal *Conservation Science and Practice*. Chapter 6 provides a synthesis of research findings, implications and recommendations. Chapter 7 includes my personal reflections on the research process. Chapter 8 provides a consolidated list of appendices and an alphabetical reference list including all sources used throughout the thesis, including the articles.

## CHAPTER 2

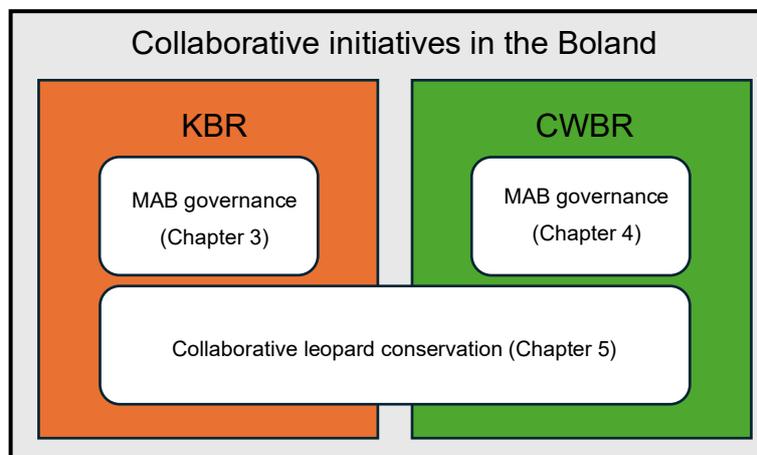
### Methodology

This chapter maps out the methodology followed in this study. To do so, this chapter begins by introducing the research design, discussing the context-mechanism-outcome (CMO) framework and providing an overview of the study site. Thereafter, this chapter introduces the methods used for data sampling, collection and analysis. Finally, this chapter refers to research quality measures, ethical considerations and research limitations.

### 2.1 RESEARCH DESIGN

The nature of this research was mixed, implying its design and methods integrate both quantitative and qualitative research into a single study. Priority is given to the qualitative data, *i.e.* the principal data gathering tool, which will be supported by the quantitative data.

This study used an explorative embedded multiple-case study design (Yin, 2018), as seen in Figure 2.1. Case studies are an all-encompassing mode of enquiry which aligns with a realist orientation (Yin, 2018). Case studies are designed to analyse and describe, for example, processes, institutions or phenomena in detail (Starman, 2013). Furthermore, case studies are appropriate for answering ‘*how*’ and ‘*why*’ questions, conducting research in natural settings, and when the study is interested in contextual factors (Starman, 2013; Baxter & Jack, 2015; Yin, 2018).



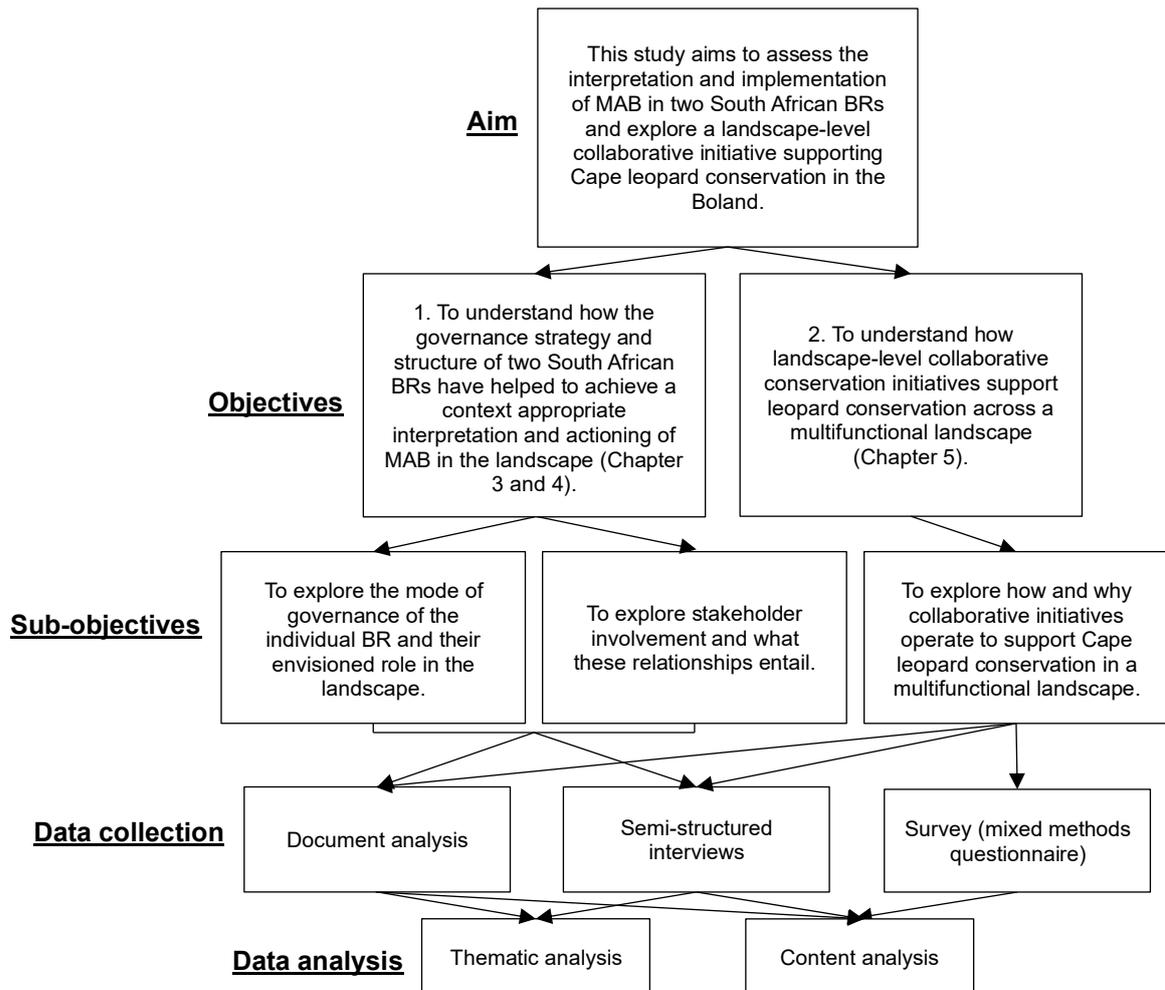
**Figure 2.1** Illustration of the embedded multiple case study design for Objectives 1 and 2. The outer box represents the case study context, and the inner boxes represent the cases with their embedded units of analysis.

This research explored cause-and-effect relationships between governance, structures, processes and outcomes. According to Clement *et al.* (2020), we can develop an understanding of these relationships by collating case studies. Both the objectives of this study contributed to larger research agendas in which case studies are being collected for further comparative analysis across case studies. This research was conducted under an umbrella project currently being undertaken across South Africa's BRs (more available [here](#)), specifically focussing on their modes of governance and their envisioned roles in the landscape while implementing MAB (Objective 1). Furthermore, Objective 2 built on the original work of Schoon *et al.* (2020; 2021) and Cockburn *et al.* (2020a) for understanding collaboration in SES.

The holistic people-centred approach of MAB, and the way in which it plays out (governance) influences the involvement of stakeholders and the relationships between them (collaboration), which in turn determines whether broader goals such as sustainability and biodiversity conservation would be achieved (supporting Cape leopard conservation). To aid cross-case comparisons, these studies make use of the same exploratory tools. For example, the same interview guide across BR case studies (Objective 1) and the use of the CMO framework which is used to guide studies wanting to understand collaboration in SESs (Objective 2).

### **2.1.1 Summary of Methods**

A graphic illustration summarising the protocol can be seen in Figure 2.2, presenting the aim supported by the two overarching key questions guiding Objectives 1 and 2 and subsequently the sub-objectives. Thereafter, clearly illustrating the specific methods of data collection and analysis for the sub-objectives.



**Figure 2.2** Graphic illustration of the connection between the aim, objectives, and methods

### 2.1.2 Context-Mechanism-Outcome Framework

Collaborative initiatives in multifunctional landscapes characterised by many multiples can understandably play out in a diverse set of totally different contexts (Cockburn *et al.*, 2018). Cockburn *et al.* (2020a) propose a realist evaluation methodology, tested in Schoon's *et al.* (2021) proof of concept paper, which helps better understand collaborative initiatives. The CMO allows the comparison of different case studies to identify and share lessons learnt under various contexts – helping to create a generalisable understanding of collaborations within SESs. Within these contexts, various actors will implement various activities, practices and processes of collaboration and learning (mechanism variables). The outcomes are then the result of interactions between the contextual and mechanism variables, or in other words the mechanisms are moderated by context (Schoon *et al.*, 2021). The CMO framework hypothesises that these initiatives succeed (outcome – O) because of the

implementation of some or other mechanism (M) which operates under specific contexts (C) (Cockburn *et al.*, 2020a).

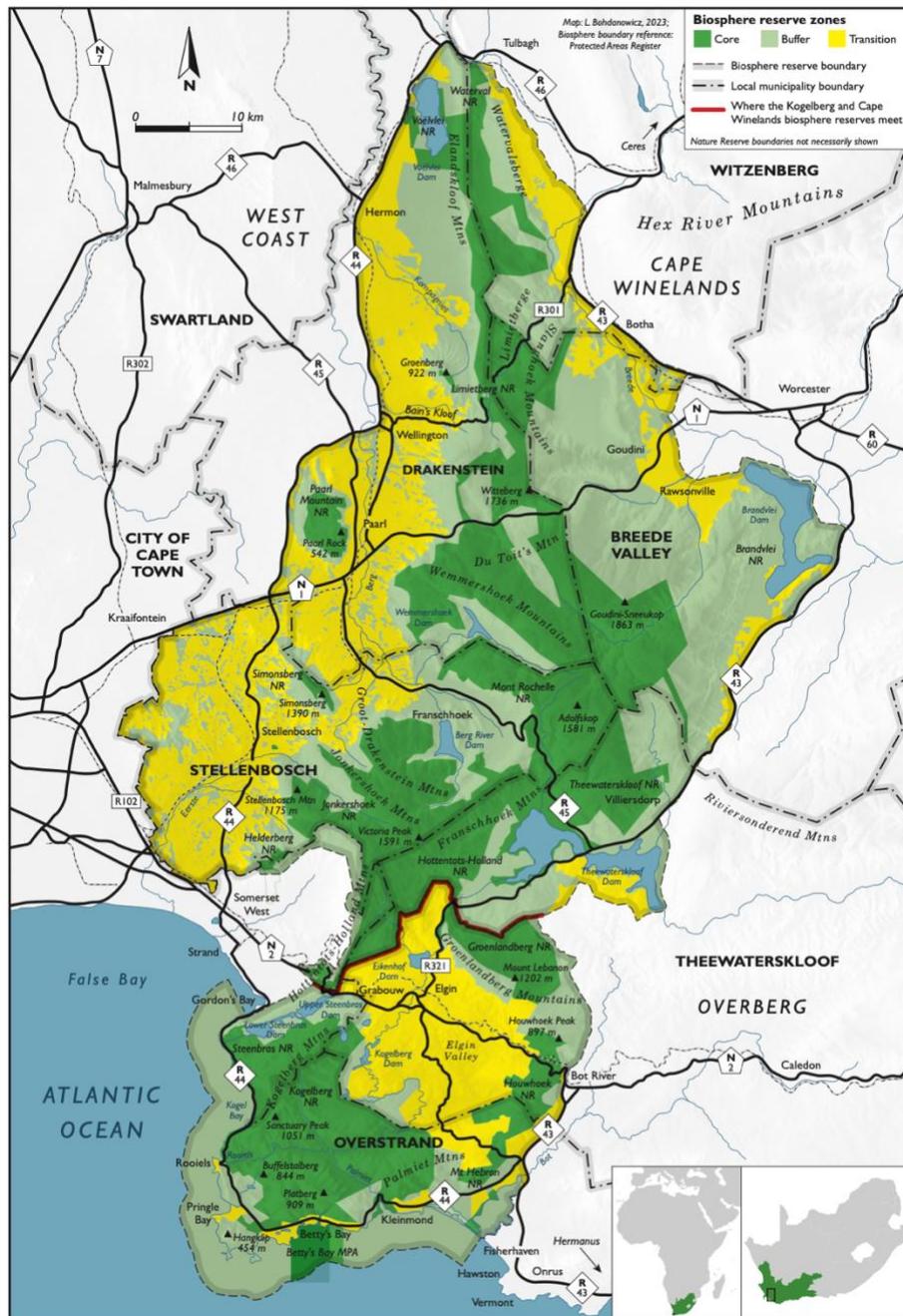
The CMO framework and associated coding manual developed by Schoon *et al.* (2020) helps guide studies seeking to understand how and why collaborative initiatives work and operate within SESs (Schoon *et al.*, 2021). This framework allows SESs researchers to link context to case, thereafter code cases for the online database (available [here](#)) which allows cross-case comparisons, contribute towards developing generalisable statements or configurations and structuring theories on how collaborative initiatives operate in supporting SES sustainability (Cockburn *et al.*, 2020a; Schoon *et al.*, 2021). In Chapter 5 the CMO was used as a framework to build the case study on collaborative Cape leopard conservation, enabling the results to be better suited for further comparative studies.

## 2.2 STUDY SITE

The Boland, defined by its terrestrial location and geography, is situated at a higher altitude along the Cape Fold Mountains in the southwest of the Western Cape province of South Africa, covering approximately 425 000ha (4 250km<sup>2</sup>) (Figure 2.3). The Boland lies within the fynbos biome, renowned as one of “*the world’s great centres of terrestrial biodiversity*” (UNESCO, 2024) and characterised by a Mediterranean-type climate. Further, the Boland supports a substantial portion of the Western Cape’s agrarian economy – considered a significant component of the net economy of the province (Nieman *et al.*, 2020). The human-wildlife interface is a prominent feature in the Boland with substantial populations of wildlife across a network of formal PAs and private land, including one of the Western Cape’s most charismatic species, the Cape leopard (Nieman *et al.*, 2020 & 2021). These PAs in the Boland are almost entirely enveloped by other land uses and are therefore regarded as refugia for biodiversity (Amin *et al.*, 2021).

Leopards, the last free-roaming apex predator in the Western Cape, exist in low numbers, occupy large ranges and therefore cross many jurisdictional boundaries (Martins & Martins, 2006; Swanepoel *et al.*, 2012; Amin *et al.*, 2022). The Boland has one of the highest leopard population densities (1.69/100km<sup>2</sup>) along the Cape Fold Mountains, however they deal with fragmented habitats and growing human settlement, increasing their vulnerability (Amin *et al.*, 2021). Large carnivores, like

leopards, are declining globally due to anthropogenic impacts, posing sustainability challenges as keystone species crucial for ecosystem health (Estes *et al.*, 2011; Swanepoel *et al.*, 2012; Devens *et al.*, 2018).



**Figure 2.3** Map and location of the Boland Mountain Complex including the Cape Winelands Biosphere Reserve (north), Kogelberg Biosphere Reserve (south), and their individual zonation patterns (Bohdanowicz, 2023a)

In 1998 the KBR was established bottom-up in response to the proposed damming of the Kogelberg Valley (Klaver *et al.*, 2024a). In 2004 the Boland Mountain Complex<sup>3</sup>, consisting of eight PAs covering 557 584ha (5 575.84km<sup>2</sup>) and surrounding buffer zones spanning 1 315 000ha (13 159km<sup>2</sup>), was inscribed by the World Heritage Convention as a UNESCO World Heritage Site as part of the Cape Floral Region Protected Areas (CapeNature, 2019). In 2008 the Cape Winelands Biosphere Reserve (CWBR) was established top-down by the Cape Winelands District Municipality as a spatial planning instrument. However, the CWBR has since found a niche in other landscape functions, particularly socio-economic development and conservation. In 2010 the Boland Project (BP), a collaborative initiative between the Cape Leopard Trust (CLT), conservation authorities and private landowners, was established to conserve leopard in the Boland Mountain Complex.

The Boland is a multifunctional landscape with small to large towns, privately owned farmlands, commercial and ex-forestry plantations, several PAs managed by CapeNature and the City of Cape Town (CoCT), and UNESCO designated sites (CapeNature, 2019). Thus, there are a multitude of conservation and sustainability actors in the landscape working towards various goals. This paper provides in-depth case studies of the KBR (Chapter 3), the CWBR (Chapter 4), and the CLT's collaborative leopard conservation initiative, the BP, which extends across the two adjacent BRs (Chapter 5).

## **2.3 RESEARCH METHODS**

This study used purposive and snowball sampling techniques to gain insights from respondents. Data was gathered through semi-structured interviews, a self-administered online questionnaire and document analysis. After numerous cycles of coding and organising the data in ATLAS.ti (2022), thematic (Objective 1) and content (Objective 2) were used to analyse the data.

### **2.3.1 Sampling Strategy**

Qualitative research lends itself to non-probability sampling methods (Bryman, 2012). This study made use of a typical case study purposive sampling technique in addition

---

<sup>3</sup> The Boland Mountain Complex refers to the collection of protected areas in CapeNature's Landscape Central region.

to snowball sampling. Purposive sampling is commonly used in qualitative studies to build information-rich cases and maximise limited resources (Palinkas *et al.*, 2015). Purposive sampling is a method in which the researcher does not attempt to sample participants randomly, rather using their judgement and expertise to recruit participants (Zickar & Keith, 2023). Given the aim and objectives, there were specific groups of people which held important knowledge useful to the study, *i.e.* those governing BRs and those leading the collaborative initiative across the study site, hence why a purposeful sampling technique (Campbell *et al.*, 2020) was used in this research.

Snowball sampling, also known as '*chain referral sampling*' (Bagheri, 2015), is a useful sampling method for studying hard-to-reach populations or in this case a population which was unknown to me (Parker *et al.*, 2019; Raifman *et al.*, 2022; Zickar & Keith, 2023). Snowball sampling relies on peer referral, beginning with initial participants, or '*seeds*' (Raifman *et al.*, 2022). Thereafter, the initial group refers other potential participants to broaden the sample (Raifman *et al.*, 2022). Snowball sampling is particularly useful in this study because the initial participants, *i.e.* those leading the collaborative initiative, have a better understanding of the population than I did.

The goal of these methods was to strategically sample participants relevant to the research questions. Zickar and Keith (2023) refer to this as '*expert sampling*' – to sample participants because they have specific expertise or knowledge pertaining to my aim and objectives. The minimum basic criteria for persons to participate in the study included being over the age of 18 and voluntarily agreeing to participate. Participants were purposefully selected based on the criteria that they are personnel holding a strategic or executive position with the BR (Objective 1) or held first-hand knowledge of the collaborative initiative led by the CLT (Objective 2).

I initially sought permission to access participants from purposefully selected organisations, including the KBR, CWBR and CLT. Letters inviting the BRs to participate in the study were sent via e-mail to their respective chairperson who then approved the study (Appendix 3). Similarly, the CLT were contacted via e-mail through their chief executive officer (CEO) and research coordinator, who then provided contact details for staff who led their work in the Boland.

Once permission was granted from each of the participating organisations, the participant recruitment process began. The CLT participants were recruited for

interviews, while also provided a list and contact details of other potential participants to recruit for the survey (n=10). Further, during discussions with the CLT, they suggested interviewing a CapeNature official with whom they worked closely. I then sought permission from CapeNature by applying for a research permit (Appendix 4).

Recruitment letters (Appendix 5) containing the research proposal, ethics certificate (Appendix 6) and permission letters, were sent to prospective participants to invite them to participate in an interview (n=22). Twenty participants (n=20) were enrolled in the study (Appendix 7) after two (n=2) did not respond during the recruitment phase or were unavailable for an interview. During the enrolment phase, participants signed consent forms (Appendix 8) and dates and times were set for interviews. Details on the targeted and sampled population can be seen in Table 2.1.

**Table 2.1** Table indicating the targeted organisations, the samples collected and the response rates of the targeted groups

Objective	Group	Method	Targeted	Sampled	Response %
1	<u>KBR</u>	Interviews	n = 10	n = 9	90%
	<u>CWBR</u>	Interviews	n = 9	n = 8	89%
2	<u>CLT</u>	Interviews	n = 2	n = 2	100%
	CapeNature	Interviews	n = 1	n = 1	100%
		Survey	n = 7	n = 3	43%
	CoCT	Survey	n = 3	n = 2	67%
			<b>n = 32</b>	<b>n = 25</b>	<b>78%</b>

*Note: underlined groups indicate the purposefully selected participants.*

Purposive sampling was fitting for Objective 1: *“to understand how the governance strategy and structure of two South African BRs have helped to achieve a context appropriate interpretation and actioning of MAB in the landscape”*. This objective required implementing the same research strategy as other cases (already collected) within the multiple-case design of the umbrella project. Purposefully sampled participants for this objective were the Board of Directors (BofD) and executive management teams of each BR. Likewise for the Objective 2: *“to understand how landscape-level collaborative conservation initiatives support leopard conservation*

*across a multifunctional landscape*”, the initial sample was based on the criteria that participants hold expert knowledge on the BP. Thereafter, sampling snowballed by means of one interview and an online survey to other participants, including CapeNature and the CoCT Biodiversity Management Unit.

### **2.3.2 Data Collection**

Methods used consisted of semi-structured interviews (Objectives 1 and 2), a review of documents (Objective 1 and 2), and a self-administered questionnaire survey (Objective 2). Semi-structured interviews are targeted, insightful and find middle ground between open and structured interviews, or in other words between rich, detailed answers and answers which can be coded quickly (Bryman, 2012; Yin, 2018). ‘*Targeted*’ refers to their ability to narrow the topics to that which the research is interested in and provides me the opportunity to listen to the ‘*story*’ of the participants, while allowing the flexibility necessary to change the direction of the interview by asking for more details, clarification, or probing with additional questions following (Naz *et al.*, 2022).

Self-administered questionnaires are cheap, quick to administer and minimise interviewer effects (Bryman, 2012). The strength of using documents is that they are specific, unobtrusive and can be reviewed repeatedly (Yin, 2018). Documents reviewed (n=15) included, those provided by the participants and self-sought, electronic sources, archival, policy, and other guiding documents. Documents were primarily supplementary sources of data used to strengthen findings from the survey and interviews by means of data triangulation.

Semi-structured interviews (n=20) were conducted in-person with participants during the month of May 2023 at their workplace or private residence. The duration of the interviews ranged from 45 to 130 minutes. Not all questions were asked of/answered by each participant during the interviews, for example some participants were new to the BRs and were not sure of the details, or the participants were unfamiliar with the topic being questioned, referring me to their coordinator or CEO for questioning.

Semi-structured interviews follow an interview guide which is a set of questions prepared beforehand based on prior knowledge (Naz *et al.*, 2022). In this study the interview guides were informed by previous experience and knowledge on the research topic. For example, the interview guide for Objective 1 (Appendix 9) was

developed by researchers within the umbrella project of this study who are knowledgeable in BR research and who had already tested the protocol in other BRs. While the interview guide for Objective 2 (Appendix 10) was developed using the codebook (Appendix 11) from the CMO coding manual established by long-serving researchers and practitioners interested in better understanding collaboration in SES.

The interviews were guided by their respective interview guides and audio recorded with the permission of the participants. The interview guide for the first objective consisted of five overarching themes, including 1) governance model, 2) history of involvement, 3) envisioned role, 4) stakeholders and 5) critical relationships. The first theme targeted how the governance models of the BRs were initially formed, how they enable a specific governance approach, *i.e.* how decision-making processes occur and how it has changed over the years. The participants were asked to describe the governance approach they are applying in their BR, their perceptions for the motivations behind using this approach, and any challenges they might have encountered in the process. The second theme aimed to find sources of personal commitment to the BRs and the motivations for the participant's initial, and continued involvement in the BR. The third theme explored the perceived vision for the role of their BR in the SES. The fourth theme asked how their current BR governance model enables or prevents other stakeholders from participating in the BR. The final theme involved knowing the institutional overlap in the landscape the BRs function in, as well as the horizontal and vertical alignment of actors operating in the landscape. Each of the themes began with a main overarching open question after which there were several probing questions.

The interview guide for the second objective consisted of 30 questions. Questions 1 to 25 were developed using the CMO codes as a guide to capture the details necessary to build the case study. These questions provided an opportunity to gain insights on the details of the collaboration, how it was formed, who participates in it, how do they participate, histories and prior networks between the collaborators, the area of collaboration, the objectives and/or goals, and how the collaboration is governed. Governing the collaboration included its facilitation, formality, how decisions are made, levels of trust and funding, and the costs and benefits of collaborating. Additionally, the closing questions 26 to 30 intended to capture the role and involvement of BRs in the collaboration.

The self-administered questionnaire survey (Appendix 12) was developed from the second objective's interview guide. The aim with the survey was to gather more details on the collaborative initiative, specifically from the perspectives of the conservation authorities. The survey, created using QuestionPro's (2023) online survey software, was sent via e-mail to potential participants (n=10) on the 12<sup>th</sup> of June 2023 and remained accessible for one month. Five (n=5) participants responded, while others (n=4) opened the survey but did not complete it or did not respond at all (n=1). Those that completed the survey took on average 28 minutes to do so and participation was anonymous. The questionnaire consisted of 18 questions including yes/no, selecting multiple or the most appropriate answers, and open-ended questions. Respondents were prompted to elaborate where possible. The survey asked the participants about their affiliated organisation, personal motivation for participating and their organisation's role in the collaboration. Furthermore, the survey asked about the formality of the collaboration, its objectives (goals) and whether these are being achieved, if there were previous occasions of working together, a conflict resolution process and what the level of trust is within the group. Thereafter, the survey asked whether shared learning and building knowledge is encouraged within the group, if there were any unanticipated outcomes, and whether participants benefitted from working together even if the objectives were not being met. Finally, the survey asked how necessary collaboration is in their context and what role BRs could fulfil before asking for any additional information regarding the successes or challenges within the collaboration.

### **2.3.3 Data Analysis**

This study made use of thematic analysis (Objective 1) and content analysis (Objective 2). Both thematic and content analysis share a common approach, *i.e.* identifying themes, patterns or codes to be grouped either inductively or deductively, which has made them difficult to distinguish and often used interchangeably (Humble & Mozelius, 2022). However, there are differences between the two, for example, thematic analysis is considered a more inductive, purely qualitative methodology used for deeper analysis to offer in-depth understandings through its intuitive approach (Humble & Mozelius, 2022). Whereas content analysis is a more straightforward, surface-level method of analysis offering wider application – a feature of its quantitative beginnings (Kleinheksel *et al.*, 2020; Humble & Mozelius, 2022).

The study followed Braun and Clarke’s (2006) step-by-step guide to thematic analysis (Table 2.2). Thematic analysis is a flexible and common inductive (bottom-up) qualitative data analysis method used to identify, analyse and report on repeated patterns – providing a rich, detailed and complex account (Braun & Clarke, 2006; Humble & Mozelius, 2022). Themes represent patterns and capture important meaning within the data relating to the research questions. Thematic analysis is well-suited for under-researched areas as it provides a rich and detailed account of the data (Braun & Clarke, 2006). Importantly, this study took a semantic approach to themes, in which themes are identified for their surface meaning – not looking further than what the participants/data said.

**Table 2.2** Phases of a thematic analysis followed in the study as informed by Braun and Clarke (2006)

Phase	Description
1. Becoming familiar with the data	Transcribing the data using Otter.ai’s (2023) online transcriptions software, reading through the transcriptions and making notes of initial ideas.
2. Generating initial codes	In vivo first cycle coding of relevant data, thereafter second cycle coding systematically across the entire data set.
3. Searching for themes	Collating codes into potential themes.
4. Reviewing themes	Reviewing the fit of themes in relation to the coded extracts of the entire data set and mapping out the themes.
5. Defining and naming themes	Refining the specifics of the themes by developing ‘ <i>theme descriptions</i> ’ which are clear definitions of the specific theme (Appendix 13).
6. Reporting	Opportunity for a last and final analysis, selecting compelling extracts and reporting the findings in relation to the research questions and literature.

The mixed data from Objective 2 was analysed through content analysis – making inferences systematically and objectively by looking for specified characteristics (Bryman, 2012). Content analysis is suitable for both quantitative and qualitative research questions, and is a well-established, flexible, transparent method of analysis, lending itself to longitudinal studies (Bryman, 2012; Kleinheksel *et al.*, 2020; Humble & Mozelius, 2022). This study made use of a directed content analysis in which the codes were informed by prior research findings and defined before the data analysis

(Kleinheksel *et al.*, 2020; Humble & Mozelius, 2022). This type of content analysis is deductive (top-down) and is often used in studies extending on prior or existing descriptions of phenomenon – in this case collaboration in SESs (Kleinheksel *et al.*, 2020; Humble & Mozelius, 2022). The specific characteristics in this case were informed by the pre-existing CMO framework and associated coding manual. Since the codes, *i.e.* short, descriptive labels attached to a unit of meaning (Kleinheksel *et al.*, 2020), were developed prior to the data analysis, less steps were required. Like in Braun and Clarke's (2006) thematic analysis, I first familiarised myself with the data by transcribing and reading through the data. Thereafter, I went through numerous cycles of coding the data (two to three times) to ensure nothing had been missed in previous cycles before reporting the findings.

## **2.4 RESEARCH QUALITY MEASURES**

In quantitative research, reference is made to the reliability and validity of the study, whereas, in qualitative research, to the trustworthiness and authenticity. Trustworthiness of the study refers to its credibility (internal validity), transferability (external validity), dependability (reliability), and conformability (objectivity) (Bryman, 2012). There are several strategies which can contribute to the rigour and trustworthiness of a study (Bryman, 2012; Baxter & Jack, 2015; Yin, 2018) which were implemented as follows. First, the process of respondent validation (member checking) which was done after transcribing the participants' interviews. Member checking refers to the process of returning the data collected to the participants to ensure accuracy, and therefore increases the credibility of the results (Birt *et al.*, 2016). Second, data triangulation, which refers to using multiple sources of data to find convergences and expand knowledge around the research area (Brown, 2008). Triangulation is encouraged to build an information-rich case study (Martinsuo & Huemann, 2021). Third, replicating logic models from multiple-case studies, maintaining case study protocols, and contributing to an existing research project to allow for further comparative studies. Fourth, maintaining a strong chain of evidence. The ATLAS.ti (2022) software allowed for keeping a note and coding history, including merging and splitting codes, which also provided the opportunity to discuss the codes with other researchers when building themes, therefore increasing intercoder reliability. Finally, giving due attention to conducting ethical research.

## 2.5 RESEARCHER POSITIONALITY

My positionality is shaped by a combination of theory, experience and perspective. I am passionate about people, biodiversity conservation and the interactions between them while striving to build a sustainable and just future for all.

Theoretically, my background lies in both the social and ecological sciences, specifically public and development management, geography and environmental studies, and sustainable natural resource management and science. My academic journey has equipped me with theoretical knowledge and tools to investigate complex SESs. Professionally, I have experience within public and private conservation fields, having volunteered much of my time within our national parks and working on a private game reserve in the Eastern Cape province of South Africa. Additionally, I have been serving under the Youth portfolio on the BofD of the Garden Route BR, a non-governmental and non-profit organisation. Through these experiences I have become aware of both the challenges and opportunities faced by conservation practitioners and stakeholders, while highlighting the importance of collaborative, holistic and adaptive approaches to biodiversity conservation. Personally, my commitment to conserving our natural environment stems from a lifelong appreciation for wilderness areas, wildlife and the intrinsic value of biodiversity, and I acknowledge that this is a privileged position – to appreciate nature for what it is, not what it provides. This perspective informs my research ethos, forcing me to advocate for inclusivity in biodiversity conservation which balances ecological integrity and societal needs.

Through my research and engagement with its stakeholders, I hope to bridge gaps between theory and practice, with the goal of contributing meaningful insights to the field of conservation and sustainability science. Acknowledging my positionality as a researcher, I believe will not make my research better, but will allow me to become a better researcher (Holmes, 2020), and I recognise that there may be inherent biases and subjectiveness shaping my interpretations and interactions.

I am committed to reflexivity, continuously examining how my background, values, and experiences influence my research. By embracing transparency and reflexivity in my research, I aim to contribute to becoming a change agent, advancing science, and promoting sustainability and justice in biodiversity conservation. I understand that being a young white male may influence my positionality in ways that are important to

acknowledge. I recognise that I may carry certain societal privileges and advantages which could affect my interactions with others. Therefore, it is important that I remain conscious of that. Additionally, there are two other factors specifically relevant to my research that may have been advantageous. Firstly, I spent the first 21 years of my life living in or near the Boland, my study site. This could be perceived as advantageous, being of similar origin, culture and familiar with the often-bilingual dialect spoken in the region. Secondly, having been involved with, and gaining insights from, the Garden Route BR, I believe could have benefitted me during interviews – being able to probe appropriately with follow up questions.

Further, I acknowledge that my identity could sometimes provide me with easier access to certain spaces, opportunities and networks. Therefore, I believe it is important that I strive to ensure the full diversity of voices and perspectives are heard and fairly represented. Being aware of who I am, I believe allows me to practise reflexivity more effectively, continuously reflecting on how my identity, background, biases and privileges may influence my research. Moreover, being fully aware of my position, I believe could help me to mitigate bias, enhancing the validity of my research. My positionality leads me to engage with the ethical considerations in my research, allowing me to build a level of trust and collaboration with stakeholders, thereby contributing to the integrity of my research.

## **2.6 ETHICAL CONSIDERATIONS**

The ethical considerations of this research were informed by the Belmont Report, considered the primary guiding document for ethical qualitative research (Ryan *et al.*, 1979). These principles were followed and applied in my approach. I understood that the research participants have the rights to privacy and confidentiality, fair treatment, protection from harm, and to withdraw from the research at any stage.

### **2.6.1 Principle 1: Respect for persons**

Principle one of the Belmont Report's basic ethical principles is '*respect for persons*', which states that all individuals are autonomous agents, and that those with diminished autonomy should be protected. There are two sets of moral requirements with regards the respect for persons. First, acknowledging autonomy. Second, protecting those with diminished autonomy.

In this research this principle demanded that research participants entered the research voluntarily and with enough information regarding the study. The research participants willingly agreed to participate, were briefed on the purpose, aims and objectives of the research, and asked whether they wish to participate in the study during the recruitment and enrolment stage. Furthermore, participants signed consent forms prior to data collection, acknowledging their autonomy and willingness to participate in the research.

### **2.6.2 Principle 2: Beneficence**

Principle two of the Belmont Report's basic ethical principles is '*beneficence*', which refers to securing the well-being of the research participants. Beneficence is acting in kindness. The Report states there are two rules with regards to this principle. First, cause no harm. Second, maximise benefits while minimising possible harms.

To minimise possible harms and maximise possible benefits, the participants in this research were allowed to withdraw from the study at any stage. Participants were made aware of their right to withdraw throughout the phases of recruitment, enrolment and again during the interviews. Additionally, member checking was used to confirm the data collected reflected participants' positions accurately (respondent validation), again to minimise possible harm but also to ensure the research provided an honest reflection of the research participants' accounts, thus maximising benefits of their participation.

### **2.6.3 Principle 3: Justice**

The final basic ethical principle stated in the Belmont Report is that of '*justice*'. This principle is about fairness in the distribution of benefits and burdens of the research, or in other words, "*equals ought to be treated equally*" (Ryan *et al.*, 1979). This study avoided instances of injustices, *i.e.* imposing burdens, by offering participants the opportunity to select the day, time and location of the interviews.

### **2.6.4 Ethical Clearance**

I obtained ethical clearance for the study from the Nelson Mandela University Human Research Ethics Committee (ethical clearance certificate: H22-SCI-NRM-001; Appendix 6). The human research ethics committee provides various guidelines and documents (e.g. the researcher's code of conduct, policy on research ethics, a summary of the Protection of Personal Information Act, the standard operating

procedures of the human research ethics committee and the Belmont Report) for researchers to familiarise themselves with ethical guiding documents prior to seeking ethics approval. I was required to submit progress reports to the committee for review throughout the study. Additionally, I obtained clearance from CapeNature, the statutory conservation body of the Western Cape to access staff and/or reserves voluntarily participating in the study (research permit number: CN32-87-25882; Appendix 4).

### **2.6.5 Dissemination of Results**

As part of conducting ethical research, there was a plan for disseminating the results. First, this research was submitted in line with the Nelson Mandela University requirements for the completion of a Master of Science Degree. Second, the data chapters are/will be published as articles in appropriate peer-reviewed journals. Third, the results will be provided in a condensed format, such as a policy brief or infographic to research participants. Fourth, in line with the research permit obligations from CapeNature, all outcomes or publications will be shared with them. Fifth, the preliminary results were presented at a conference, the annual Garden Route Interface and Networking Meeting 2023 (presentation can be viewed [here](#)). Finally, research outcomes and publications are/will be shared on the project's website (available [here](#)).

### **2.7 LIMITATIONS**

The critical realist – interpretivist position of this study implied this research was of a qualitative nature, *i.e.* more interested in words than numbers (Bryman, 2012). Quantitative research designs cannot identify causality and do not consider contextual factors (Starman, 2013) – two critical aspects of this study. Furthermore, the interpretivist position is generally contextual, having site-relevance, and thus associated with the production of knowledge and not necessarily the production of generalisable findings – a well-known shortfall of qualitative research (Bisman, 2010; Bryman, 2012). Further, the chosen design, *i.e.* case study, and methodology, *i.e.* non-random sampling, results in the same shortfall of limited generalisability due to representativeness and therefore external validity (Bryman, 2012; Palinkas *et al.*, 2015; Parker *et al.*, 2019; Raifman *et al.*, 2022; Zickar & Keith, 2023).

However, despite the common criticisms of case study research producing findings that lack generalisability, this research was exploratory, with the objective of providing

a contextualised understanding of MAB implementation and collaboration. For this reason, the sample was purposefully based on the specified criteria of being associated with the BR management entity or collaborative initiative, to provide information-rich case studies (Palinkas *et al.*, 2015). This research was motivated by the need to understand the institutional context and governance strategies of BRs in the landscapes in which they operate and to understand how collaborative conservation plays out in these multifunctional landscapes. The purpose of the research was not to produce generalisable findings but rather in-depth, contextualised understandings for which the chosen methods are often advocated for, *i.e.* purposefully sampled case studies (Parker *et al.*, 2019).

## CHAPTER 3

### Preface

Implementing MAB is flexible and driven by local context. It is a promising strategy for dealing with the grand challenges of our time and a tool for land management in Africa, particularly South Africa, in that it aims to conserve biodiversity while achieving other objectives, for example socio-economic development. To improve the success of MAB implementation, we need to understand how it is interpreted and implemented, what challenges and lessons have been learnt, and what BRs envision their role to be within the SES. Importantly, these learnings must be shared across the WNBR for BRs to realise their potential as *'learning laboratories'* for sustainable development. This paper aimed to understand how the governance strategy and structure of the KBR had helped achieve a context-appropriate interpretation and actioning of MAB by exploring its mode of governance, envisioned role, stakeholder involvement and what those relationships entailed. The publication is available online at: <https://doi.org/10.3390/land13040455>

### **Learning through Place-Based Implementation of the UNESCO MAB Program in South Africa's Oldest Biosphere Reserve: A Case Study of the Kogelberg Biosphere Reserve**

#### **3.1 ABSTRACT**

UNESCO's Man and the Biosphere Programme (MAB) is implemented through a world network of biosphere reserves, which offer a holistic people-centered landscape-level conservation approach. When successfully implemented the program enhances social-ecological system sustainability and resilience. However, there remains a research gap in understanding and collating lessons from individual sites for the benefit of the program globally. We assess MAB implementation in South Africa's oldest biosphere reserve, the Kogelberg Biosphere Reserve (KBR; est. 1998). Using semi-structured in-depth interviews with directors and the coordinator, complemented by document analysis, we explore the governance and implementation learnings of the KBR as it has evolved. The KBR program implementation is guided by global necessity, but driven by the local context, which for the KBR translates to a non-profit organization cooperative governance model. The site faces a perceived lack of government financial support and awareness of the 'biosphere reserve' concept.

Despite these challenges, successes have emerged in the formation of local partnerships to fulfil critical roles in socio-economic development and biodiversity conservation. The learnings from KBR, as it strives to become a model site for sustainability, are useful for other sites similarly operationalizing an international designation for local conditions.

### **3.2 INTRODUCTION**

The Man and the Biosphere Programme (MAB) supports the United Nations Sustainable Development Goals (SDGs) (UNESCO, 2017; Carruthers, 2020; Pool-Stanvliet & Coetzer, 2020) and other multilateral agreements, such as the Convention on Biological Diversity targets (Pool-Stanvliet & Coetzer, 2020) and Paris Climate Agreement (UNESCO, 2017). Therefore, it may be one of the most promising ways of tackling the triple challenge of the Anthropocene, i.e., biodiversity loss, climate change and human well-being (Baldwin-Cantello *et al.*, 2023). Biosphere reserves (BRs) are useful landscape management tools in this regard because they involve inclusive, flexible and multistakeholder governance arrangements that are context specific and offer an integrated and holistic approach to deal with these interlinked and cross-sectoral challenges (Pool-Stanvliet, 2013; Carruthers, 2020; Baldwin-Cantello *et al.*, 2023). Furthermore, they act as a global network of learning laboratories for sustainability science and research on climate change (Pool-Stanvliet, 2013; Pool-Stanvliet & Coetzer, 2020; Clüsener-Godt *et al.*, 2022; Barraclough *et al.*, 2023).

Governance structures adopted in BRs serve as a tool to enable stakeholder participation and to sustainably achieve their individual goals, although how they facilitate participation can differ from site to site, and even within the country (UNESCO, 2021). Although guided by overarching documentation, BRs must contextualize their implementation based on local circumstances, with key UNESCO MAB guiding policy, i.e., the Statutory Framework (UNESCO, 1996) and the Technical Guidelines for Biosphere Reserves (UNESCO, 2021), acknowledging prescriptive implementation documents would not work.

However, MAB requires that BR arrangements should provide for stakeholder involvement and participation in both the design and implementation of BR core functions (UNESCO, 1996). The current MAB Strategy 2015-2025 and Lima Action Plan (LAP) 2016-2025 (UNESCO, 2017) calls for participatory planning around

individual BR implementation, which is effective and equitable, and supported by local and national government and the private sector (UNESCO, 2021).

BR scholarship has identified a need for understanding the institutional context and governance strategies of BRs in the landscapes in which they operate, i.e., understanding global strategy and policy contextualization for local purposes (Coetzer *et al.*, 2014; Ferreira *et al.*, 2018; Pool-Stanvliet & Coetzer, 2020; Barraclough *et al.*, 2023). Accordingly, there is a need to understand and compare lessons learnt, and to consider successes and challenges from each site to improve global MAB implementation successes (Coetzer *et al.*, 2014; UNESCO, 2017); herein opportunities for place-based learning are considered a significant MAB strength (UNESCO, 1996; UNESCO, 2021; Barraclough *et al.*, 2023). The absence of a governance blueprint within BRs offers an opportunity for learning and sharing experiences in what works, why, and in what context, which may aid the implementation of a global program for local fit, while fulfilling its obligation for innovation in sustainability science (Barraclough *et al.*, 2023).

Ferreira *et al.* (2020) conducted a systematic literature review of BR management effectiveness, including 66 publications between 1996 and 2017. They found most (57.6%) first authors were from the Global North (Europe and North America – none from Africa), of which none conducted research on their own BRs, and only 6% of papers were single in-depth case studies on BR management or governance. Most of the research on management or governance in BRs was project based – not on the BR itself, and only one study included a BR in its entirety. The review's outcome was that there is a need for greater geographic diversity of research, for more research on BRs as single case studies, and it also produced the finding, like Barraclough *et al.* (2023), that BRs remain underutilized, in terms of their contributions to the theory and practice of sustainability science. Importantly, research on BR governance, i.e., MAB implementation, remains a gap in the literature.

To address the shortfall in geographic diversity, especially for Africa, and BR-specific case studies, as opposed to project-based studies, scholars in South Africa are currently pioneering research on South African BRs (more can be found here <https://researchbiosphere.org>, accessed on 29 March 2024). This project is compiling in-depth case studies to unpack various aspects of BR governance to offer lessons to

newer BRs, share experiences across the WNBR, and potentially contribute to improved MAB implementation success.

In this respect, the Kogelberg Biosphere Reserve (KBR) (Kogelberg Biosphere Reserve, 2024) makes for an interesting in-depth case study of institutional context and governance strategy. It was established as a bottom-up response to a proposal for the construction of a dam and is the oldest BR in South Africa (est. 1998), emerging soon after South Africa signed a country agreement with UNESCO-MAB. Since its establishment, it has passed through multiple generations of UNESCO policy guidelines, evolving and adapting to stay in line with these policy amendments. Furthermore, the KBR holds multiple designations, being in the heart of the Cape Floristic Region World Heritage Site, which presents a complex social-ecological context (DFFE, 2022a; UNESCO, 2022b). Hereafter, we explore the interpretation and implementation of MAB in the context of the KBR, focusing on the translation of the international MAB designation for a local social-ecological and economic fit. We explore the strategic decisions and motivations therein that have enabled this BR to fulfil the role it has envisioned within its broader landscape.

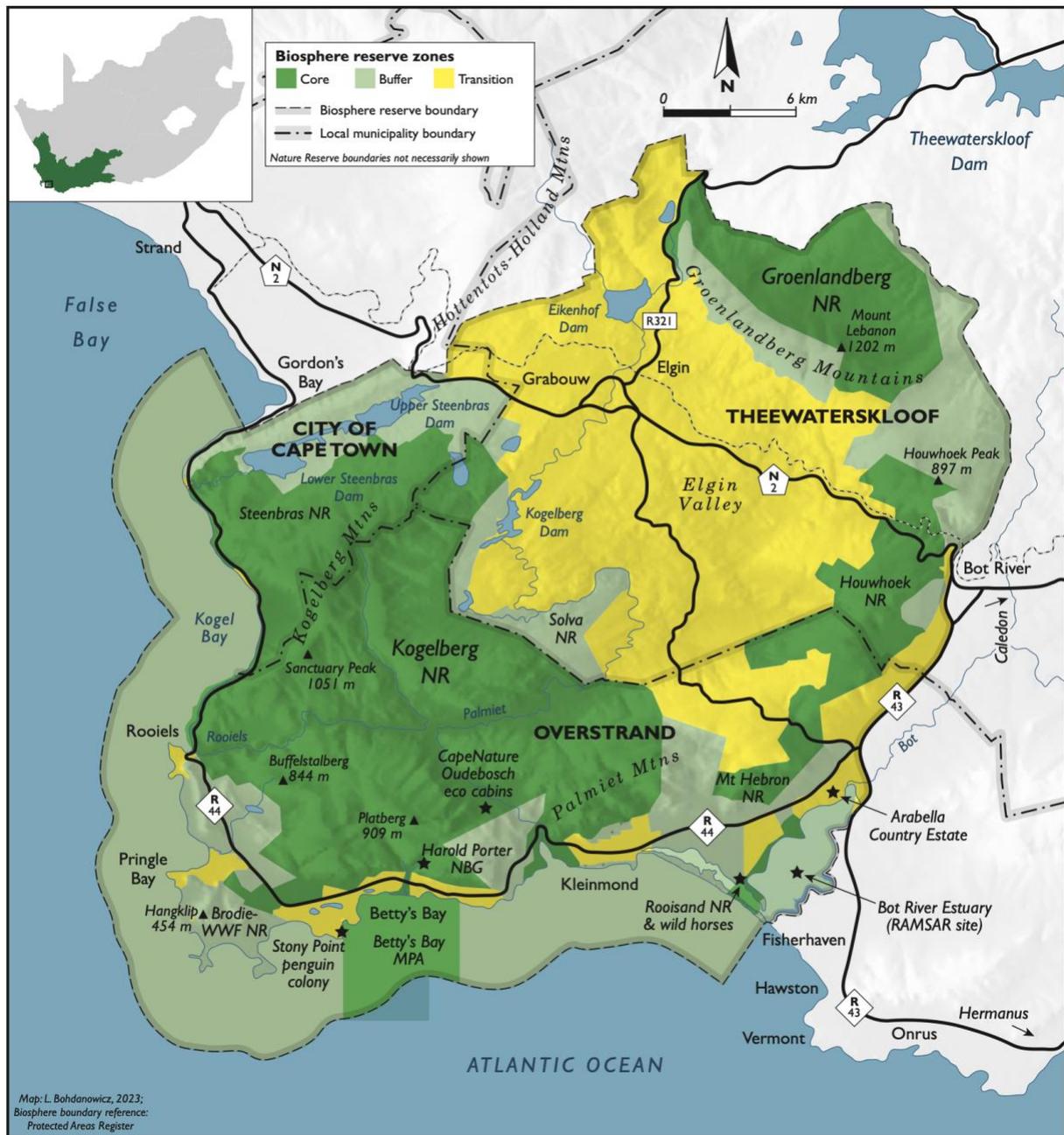
### **3.3 MATERIALS AND METHODS**

#### **3.3.1 Study Area**

The KBR spans 103,629 ha (Figure 3.1), including 24,629 ha of marine area (Kogelberg Biosphere Reserve, 2022; DFFE, 2022a; UNESCO, 2022b). The KBR is considered one of the most ecologically diverse biodiversity hotspots worldwide (DFFE, 2022a; UNESCO, 2022b). Furthermore, the site has economic significance – being “*one of the most important deciduous fruit producing and exporting areas of South Africa*” (Wessels, 2019:190).

The core area constitutes 31%, covering 31,629 ha (30,000 ha terrestrial and 1629 ha marine environments) and is made up of formally protected areas (PAs), in the form of Provincial Nature Reserves, which are category 1A according to the International Union for Conservation of Nature (IUCN), and under the management of CapeNature, the provincial conservation authority of the Western Cape province, South Africa. The core zone prioritizes nature conservation and long-term protection (Schultz *et al.*, 2020; UNESCO, 2021). The buffer zone constitutes 39% of its overall area, stretching 40,000 ha (17,000 ha terrestrial and 23,000 ha marine environments), emphasizing

scientific research, and monitoring and education with limited human use, which is compatible with conservation objectives (Schultz *et al.*, 2020; UNESCO, 2021). The transition zone constitutes 32,000 ha, roughly 30% of the BR footprint, and is where human populations intend to practice sustainable resource management and development (Schultz *et al.*, 2020; UNESCO, 2021).



**Figure 3.1** Map of the Kogelberg Biosphere Reserve, illustrating the core (31%, 31,629 ha), buffer (39%, 40,000 ha) and transition (30%, 32,000 ha) zones, important points of interest, and major towns and transport routes (Bohdanowicz, 2023b)

The site is home to approximately 60,000 permanent residents, with an additional 50,000 non-permanent residents during peak times, i.e., holiday periods and weekends (DFFE, 2022a; UNESCO, 2022b).

Kleinmond and Grabouw are the major towns of the region. The primary economic activities across the BR include agriculture, specifically deciduous fruit and wine in the Elgin Valley, flower production, commercial forestry plantations (*Pinus* species), as well as tourism, specifically eco-tourism, throughout the BR (DFFE, 2022a; UNESCO, 2022b).

The latest national census (2011) data from the six largest municipalities in the transition zones: Rooiels (n = 125), Pringle Bay (n = 801), Betty's Bay (n = 1380), and Kleinmond (n = 6634) of the Overstrand Municipality, and Grabouw (n = 30,337) and Elgin (n = 953) from the Theewaterskloof Municipality (Figure 3.1), shows a population of 40,230 (Stats SA, 2023), characterized as follows:

- **Population groups** present within the KBR are mostly colored<sup>4</sup> (49.12%), thereafter black African (35.78%), white (13.91%), other (0.98%) and Indian/Asian (0.21%). Most of the population speak Afrikaans (61.79%), followed by isiXhosa (25.82%) and English (5.56%), which are the three official provincial languages predominantly spoken in the Western Cape, South Africa.
- **Sex and age distribution:** Males and females are evenly distributed across age groups. The average age of the population is in the 25–29 age category. Most of the population (51.54%) is under 30 years old – a young population – and 57.73% of the population are in the working age category (20-64).
- **Education:** A large portion of the population have some secondary schooling (41.56%), and 22.96% have matric. 9.8% of the population have a higher education.

---

<sup>4</sup> The South African 'coloured' identity, although considered a racial slur in some parts of the world, is not considered a derogatory term in South Africa. In South Africa it refers to a heterogeneous ethnic group that have diverse cultural and ancestral linkages that are neither white nor black African, and therefore remains a population demographic and identity of its own.

- Most (51.33%) of the population's **average household income** is between R9 601/\$1212.25 and R76 400/\$9646.46 (ZAR exchanged at R7.92/ US\$1 during the 2011 census), being however skewed towards the lower end; meanwhile, a significant portion of the population (16.65%) has no income at all – indicating inequality.
- Most of the population have **electricity for lighting** (87.97%) and a **flush toilet** (89.75%), whether connected to sewerage or septic tank, while less (66.95%) have **piped water inside their dwelling**.

The Kogelberg is considered the heart of the Cape Floristic Region and is the smallest, most relatively diverse floral kingdom in the world – one of the world's hottest hotspots in terms of its diversity of threatened and endemic species (CapeNature, 2012; Van Schalkwyk, 2019; UNESCO, 2022b). Approximately 1600 plant species occur in the subregion, of which there are an estimated 150 taxa that are endemic to the area (UNESCO, 2022b) The predominant biome is Fynbos (dominated by Proteaceae, Ericaceae, Restionaceae and Bruniaceae) – a sclerophyllous vegetation type adapted to long periods of dryness and heat, winter rainfall, regular fires, and low soil nutrients (Van Schalkwyk, 2019), which experiences a Mediterranean climate characterized by dry hot summers and cool wet winters.

The marine portion of the BR forms part of the southern Atlantic, which is subject to upwelling events, in which nutrients are brought to the surface – driving a highly productive and diverse marine environment (DFFE, 2022a; UNESCO, 2022b)

### **3.3.2 Methods and Data**

This case study was compiled using an inductive qualitative approach, drawing on in-depth and in-person semi-structured interviews with individuals of the Kogelberg Biosphere Reserve Company (KBRC; ethics certificate: H22-SCI-NRM-001). These data were supplemented through document analysis. The aim of this case study is to provide a contextual understanding by exploring the implementation of MAB in local conditions, and not to produce generalizable findings to be inferred elsewhere – rather, the aim is for lessons and experiences to be shared across the World Network of BRs (WNBR).

Purposefully sampled participants (n=9) for interviewing were the Board of Directors (BofD) and coordinator. Criterion for participants were that they must be personnel of the KBRC. The interview protocol consisted of the following categories:

- i. **Governance model:** How it was initially formed, enables a specific governance approach, i.e., how decision-making processes occur, and how it has evolved over the years. Participants were asked to describe the governance approach applied, their perceptions and motivations behind using this approach, and what challenges they have encountered.
- ii. **History of involvement:** Finding sources of participants' personal commitment to the BR and their initial and continued motivations for continued involvement in the BR.
- iii. **Envisioned role:** Perceived vision for the BR and its role in the social–ecological system (SES).
- iv. **Stakeholders:** How the current BR governance model allows, enables/prevents, other stakeholders from participating in the BR, and how participation is constructed by the BR.
- v. **Critical relationships:** Exploring the institutional overlap and vertical and horizontal alignment with actors operating in the landscape.

The duration of the interviews ranged from 45 to 110 minutes. Not all questions were appropriate for all participants, explaining variable interview times.

Document analysis involved the use of, self-sought and provided, electronic sources, archival, policy, and other guiding documents. Sources used included the website of the KBR (KBR, 2022), a SES model description of the KBR, a project and program plan, a historical timeline, and a strategic management framework/plan.

The interview data were transcribed using Otter.ai (2023), validated to address any misrepresentations, and thematically coded using ATLAS.ti (2022) (dominant themes in Appendix 14). The data were analyzed through an inductive 6-step thematic analysis utilizing the methods of Braun and Clarke (2006).

To maintain anonymity, each respondent or document was allocated a reference code, for example IR5 (interview respondent 5) or DR2 (document result 2). Throughout the results, frequency (*f*) counts refer to the number of participants mentioning a particular

theme (rather than the number of times a theme was mentioned within the interview collective), to get a sense of prioritization or importance of a particular topic. Frequency counts were not for quantitative analysis purposes and were only used to indicate levels of significance.

Attempts have been made to keep verbatim quotes; however, some scenarios required minor alterations to enhance the '*readability*' of the data presented, for example, repetition, hesitations, stumbling speech, or translations (Brennan, 2022). Where specific information in the quotation may identify the respondent/s, redactions have been made in the form of [XXX]. Throughout the paper, quotations have been used in-text or provided in quotation tables. The challenge was to find balance between keeping as much detail as possible without creating too much material to read (Brennan, 2022). Furthermore, verbatim quoting and triangulating quotations from respondents helped develop the credibility of the data (Brennan, 2022).

### **3.4 RESULTS**

#### **3.4.1 Governance Model: Initial Establishment and Evolution**

The impetus for the formation of the KBR came from an environmental threat. IR4 explained that the government had proposals to dam the Palmiet River, which would flood the Kogelberg Valley to provide the City of Cape Town (CoCT) with water. The local community along the coastal villages strongly objected and proposed the establishment of a BR, a concept thought to be a strategy to deal with the threat at the time (IR2; DR3). The KBR, officially declared in 1998, "*was the first one [BR] declared in South Africa and it was declared purely from a conservation point of view*" (IR1; DR4). The Kogelberg Biosphere Association (KOBIO), previously known as the Hangklip Regional Forum in 1991 (DR3) and Greater Kogelberg-Hangklip Regional Forum in 1992 (DR3), lobbied for a BR and submitted the application to UNESCO in 1994 (DR3), and were responsible for the public participation component of managing the BR (DR3). KOBIO was described as "*an organization of scientists and nature lovers, mostly around the coast*" (IR2), and referred to as '*environmental activists*' (IR2). KOBIO had been influential in the area, however, their "*focus is to exclude, stop development, ... just preserve...*" (IR1) – a vision adopted initially by some stakeholders at the time (IR2). The KBRC, a non-profit company in accordance with Section 21 of the Companies Act 61 of 1973 of South Africa, was established in 2002

to manage the KBR in terms of the MAB requirements and to achieve the vision of *“the Cape Floral Kingdom’s model sustainable living environment for all”* (DR4). From 1998 to 2002 this was the role of an elected Management Committee – a *‘large and clumsy’* committee, which necessitated the formation of the KBRC (DR3). Until 2004, when the technical committee was established to support the KBRC, the KBR struggled to become operational and was near collapse (DR3; DR4).

The BR evolved over the years, from being a predominantly top-down to a bottom-up implementer, after realizing their ineffectiveness and diversifying their activities, due to the need for socio-economic development in combination with conservation (IR1). Their initial approach was to directly engage with mayors, explaining to them that they are in a BR and should attend the meetings, however this achieved minimal success (IR1). More recently however, the BR directly engages, through projects, with the more *‘local people’* within the municipalities, i.e., public officials working on the ground, which has increased success (IR1). Increasing their focus on socio-economic activities was spurred by participants perceiving that *“you can’t expect a hungry person to protect the environment”*<sup>5</sup> (IR1) and that there are many people who are dealing with multiple challenges, i.e., poverty, hunger and economic crisis, and so environmental care is not necessarily their immediate priority (IR5).

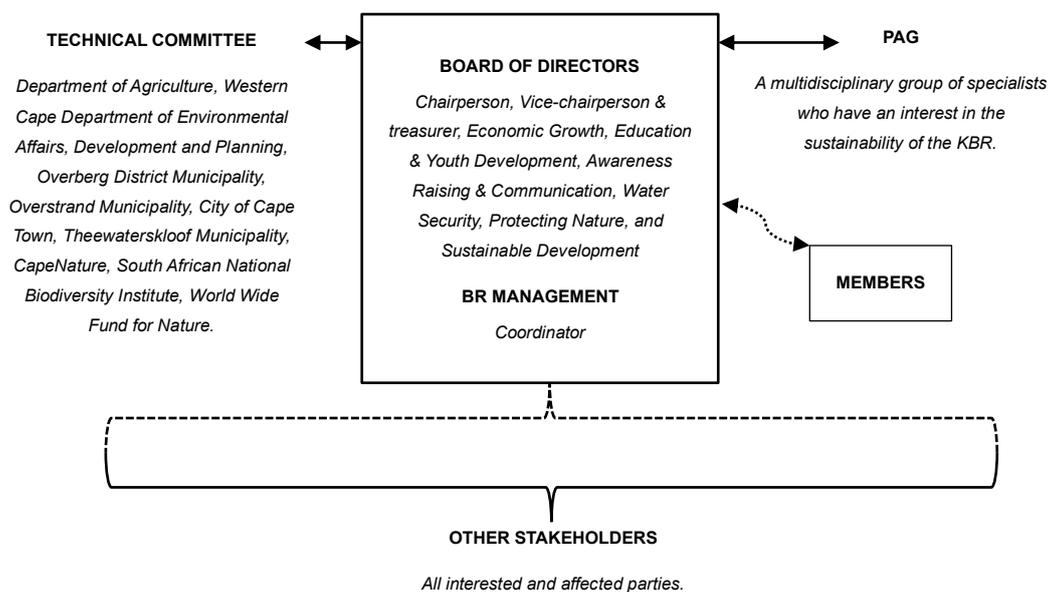
The move towards a more bottom-up implementation brought challenges or similar. The BR is *“trying to get this more bottom-up. ... you just got to find people from the bottom and bring them in. Then of course they never pitch up at the meetings. They didn’t have the resources to even contribute”* (IR2). Participants believe the BR first needs to get to a position where it can provide value – a participant stated: *“I first want us to get to a point where [the KBRC] can be of some use to them. At least give them a lift to the meeting”* (IR2).

---

<sup>5</sup> I have kept quotations verbatim but would like to acknowledge that just because a person is poor or hungry, does not mean they do not (or wish to) care for the environment. I am aware that a person’s attitude is dynamic, changing constantly, and can consist of multiple values co-existing. Further, environmental and social (and physical) needs are often intertwined as a person’s livelihood and well-being are dependent on their local environment.

### 3.4.2 Governance Model: Structure, Responsibilities and Decision-Making

A visual representation of the governing structure for the KBR can be seen in Figure 3.2. Directing the KBR is the BofD and coordinator, who also oversee the day-to-day activities and running of the BR. This management entity makes up the KBRC. Supporting the KBRC are two advisory and support groups, the technical committee, and the professional advisory group (PAG). These two stakeholder groups, along with the KBRC, interact with all other interested and affected parties present within the KBR.



**Figure 3.2** Schematic diagram of the Kogelberg Biosphere Reserve Company, including its technical committee, professional advisory group, registered members, and other stakeholders

The board consists of nine directors (three female, six male), including a chairperson, vice-chairperson and treasurer, and several portfolios (Figure 3.2) (DR5). Each of the directors are assigned to one of the portfolios, also referred to as a ‘*program*’ (DR2), depending on their expertise. Within each program are several projects and it is the responsibility of the director to provide support through their experience and knowledge (IR1). One of the directors is the chairperson of the PAG – providing a direct link between the two bodies (IR1). BR management consists of a full-time coordinator who is responsible for managing the day-to-day activities, i.e., finance, administration and running the projects (IR1).

Directors either approached the KBRC or were sourced to serve on the board in a volunteer capacity. One director approached the KBRC to join the board (IR3) and

another has been on the board since initially serving on the board of KOBIO (IR2). IR1 stated that directors serve a term of three years and can be reelected for a second term not exceeding six years. This is to ensure institutional knowledge is retained – older directors can mentor and train newer members, and newer members join intermittently to bring in new ideas, knowledge and experience (IR1). Three directors joined in 2023, whereas others have been serving two to five years, with the chairperson serving the lengthiest term after becoming a board member in 2016.

The directors steer the focus of the KBR. When asked about the evolution of their focus, one participant stated: *“it depends a lot on your directors and their focus. In the past, the focus of the directors was very much conservation”* (IR1). IR7 said that a ‘shake-up’ occurred in recent years – with greater interest in socio-economic and human development. IR1 believes that there has been what is referred to as a *‘mental shift’* – a shift from focusing purely on conservation and stopping developments, to a focus on creating sustainable solutions and working on developing human well-being.

When the KBRC plan their annual operations, they find alignment between the programs and projects they implement to meet the needs of their immediate local context and the *‘bigger picture’* (global) targets of the SDGs – where the KBRC attempt to find alignment with the UNESCO-MAB policy guidelines (IR1). A focus on the SDGs, as opposed to UNESCO policy guidelines, is because of their overwhelming length, which leaves the BR believing they are not achieving much (IR1).

The KBRC had a part-time coordinator since 2020, which had been outsourced (IR1), and worked 10 days per month, however, as of 2023 the coordinator joined full-time, working 40 hours per week. The coordinator is offered training opportunities, for example attending fundraising and communication workshops. Their social media management has been outsourced (IR1; DR2). Other additional permanent positions that the KBRC needs, given its recent and expected growth, include a secretary, fundraiser, administrator, CEO, and someone doing outreach and communications (IR1; IR2; IR6).

KBRC members are sourced based on their personal ( $f = 7$ ) interest and skills, knowledge ( $f = 6$ ) which they hold, and networks and connections ( $f = 6$ ) that they have (Table 3.1). The criteria sought after in a director are passion, leadership, vision, community ties, and the fact that they reside within the BR (IR1; IR2).

**Table 3.1** Descriptions of beneficial skills within the Kogelberg Biosphere Reserve Company helping to fulfil the envisioned role of the biosphere reserve

Skill	Skill Description
Personal	Being <i>influential</i> (IR2) or <i>patient</i> (IR1), having <i>people skills</i> (IR4)—being able to <i>build relationships</i> (IR6), being a <i>hard worker</i> (IR5) or a <i>visionary</i> (IR7), or being able to <i>bring communities</i> together (IR5).
Knowledge	<i>Ecological, economics and business</i> —especially the interface between <i>economics and the environment</i> (IR3), <i>tourism</i> (IR7), <i>law</i> (IR8) and knowing <i>how government and public office’s function</i> (IR8), <i>administration, community engagement</i> and <i>workshop facilitation</i> (IR6), and being aware of <i>current social, economic, environment and political affairs</i> (IR5).
Networks and connections	Connected with people in the KBR or having built up networks after spending decades working in the field of conservation (IR1; IR2; IR5; IR8; IR9)

Board meetings, which are held every second month, provide a place to plan, discuss and vote on decisions (IR6). Meeting agendas are shared beforehand so further items can be attached (IR5). Decisions are believed to be made quickly and easily (IR1). There is a concern that decisions are made too quickly, which does not allow for fully informed decisions. IR6 stated: “[Board meetings] *almost go too quickly. I sometimes think the decisions are just made on the spot, there and then, because we haven’t got much time...*”.

There are a wide range of motivations for joining and continuing to serve the BR (Table 3.2). These include their passion, enjoyment, love for/interest in the environment and BRs ( $f = 7$ ), recognizing the lack of government capacity and needing an organization to be a change agent ( $f = 5$ ), conservation issues ( $f = 3$ ), the holistic and inclusive approach of BRs ( $f = 3$ ), believing that there are good people doing good work ( $f = 2$ ) in their local environment, sustainability, youth, and future generations ( $f = 2$ ), and the immense potential and opportunities the environment offers ( $f = 2$ ).

**Table 3.2** Motivations for personnel joining and continuing to serve on the KBRC

Theme	Theme Description	Example quotes
Passion, enjoyment, love for/interest in the environment and BRs	Personal interests motivating participants to serve on the KBRC	<p>“<i>I’m passionate about this area, I love this area. I love everything about it</i>” (IR2).</p> <p>“<i>Just love for our environment</i>” (IR8).</p> <p>“<i>I’m a conservationist. I was interested to see how this BR worked</i>” (IR9).</p>

<p>Recognizing the lack of government capacity and needing an organization to be a change agent</p>	<p>Realizing capacity issues and participants wanting to create change</p>	<p><i>"I realized that there is no way that conservation can just be done by government entities. A lot of the focus of the government like CapeNature and SANParks is more exclusion, what you cannot do, and allowed to do. We are way beyond that point where we can say to people who can't do this, we must find a way to do it, but in a sustainable manner... I think a biosphere [reserve] is the perfect vehicle to be doing that. Because the biosphere [reserve] does not only focus on conservation, it's job creation, it's education..." (IR1).</i></p> <p><i>"It's impossible to change anything on your own. You've got to be part of an organization... There are so many ... little organizations or little groups trying to do their thing. They're not always working or pulling together. I think the biosphere [reserve] forms sort of the umbrella organization who can get everyone involved. That's why I'm choosing to be a part of them" (IR6).</i></p> <p><i>"The only real impact that can be made is through an umbrella [organization] like KBRC" (IR8).</i></p>
<p>Conservation issues</p>	<p>Realizing conservation issues and wanting to find solutions</p>	<p><i>"I love the place. But then I realized there's lots of conservation problems. I thought, okay, how to get involved..." (IR6).</i></p> <p><i>"I am seeing glimpses of development that's not sustainable." (IR8).</i></p>
<p>Holistic and inclusive approach of BRs (social, economic and environment)</p>	<p>Attraction to the people-centered approach to landscape conservation</p>	<p><i>"One needs to have activities that will put food on the table before one even talks about conservation" (IR7).</i></p> <p><i>"Lifting the local community that hasn't really benefited from the resources the way they should have. It's been agriculture and forestry. Then the local community has just been [farm] workers, everyone's a [farm] worker except for the 100-odd farmers..." (IR2).</i></p>
<p>Good people doing good work</p>	<p>Motivated by the people and the good work they do</p>	<p><i>"What motivates me is that I see a lot of good people doing the right thing and understanding what we've got here. ... it's under so much threat, but it is one of the most important floral kingdoms on the planet. We don't want to lose it" (IR7).</i></p>
<p>Sustainability, youth, and future generations</p>	<p>Motivated by the youth and sustainability for future generations</p>	<p><i>"I want young people to feel like there's more to life than what they're currently experiencing. I do the stuff that I do with the agenda of introducing them to, 'guys there's so much more than what you see right now. This doesn't have to be the end'" (IR5).</i></p> <p><i>"For the long run and for future generations" (IR8).</i></p>
<p>Immense potential and opportunities the environment offers</p>	<p>Acknowledging the potential of the landscape</p>	<p><i>"I see the immense potential in the natural resources of [KBR]" (IR2)</i></p>

The technical committee, which formed in 2004 (DR3), provides support and convenes their critical partners, including authorities and some conservation bodies (DR2; DR4). It is “*an attempt to get people from these various silos to actually sit in a room together*” (IR4). Additionally, the newly formed PAG, also known as the ‘*KBR Science Affiliation*’ (DR1), was initiated by interested and affected parties interested in the sustainability of the KBR (IR4). The PAG is a diverse group of ‘*scientists and technical specialists*’ who self-organized to bring a scientific approach to prioritizing and addressing challenges, thereby supporting the activities of BR (IR4; IR9; DR1; DR2). The PAG conducted an analysis on the KBR to develop a SES model description and identified what they call ‘*pressure points*’ (IR9; DR1). They presented these results at a workshop – thereafter solidifying their role. The BR orientates their programs and projects to deal with these pressure points. IR6 explained that the BR is lucky to have a supportive group of experts who the BR can seek guidance from.

Stakeholder meetings take two forms in the KBR: meetings of the technical and advisory stakeholders, as represented through the technical committee and PAG, and larger, more inclusive, meetings of all interested and affected parties residing within the KBR. Stakeholder meetings with the technical committee occur directly after board meetings (IR6). This is where the KBRC attempt to broaden the conversation with some of their critical partners (IR1). In these meetings “[the KBRC] *would then discuss projects and how we can collaborate, issues that have come up, ..., find solutions and things like that*” (IR1). These meetings offer a space for information, or knowledge-sharing, and for the various stakeholders to provide feedback on their activities. Twice a year the KBRC will have larger stakeholder meetings that are open to all interested and affected parties who would like to participate (IR1) – one being the annual general meeting (AGM).

The BR has volunteers and memberships. The directors are volunteers and there is a group of wildlife rescuers (IR1; IR5). In the last two years the BR has grown to 25 paid memberships. Membership fees range from R250/\$13.11 to R1000/\$52.44 (ZAR exchanged at R19.07/US\$1 during the time of data collection – May 2023), depending on the nature of their membership (business or individual), and the funds contributed to the BR’s operational capacity (IR1; DR5). Benefits for registered members include, special access to resources such as information and maps only available to members, the use of the KBR logo, a certificate showing commitment to sustainable

development, the opportunity to work with the KBR to network with key stakeholders (e.g., municipalities and local government), the power of the collective voice to bring about positive change, knowing about the project implementation and how to get involved, and access to joint marketing opportunities (DR5).

### 3.4.3 Governance Model: Evolution and Lessons Learned

The governance structure has not changed since its establishment, apart from the inclusion of additional roles – now having a designated treasurer and having diversified the board with younger members and connected it to different networks (IR2; IR4; IR8). There is momentum towards establishing a youth board (IR5). One significant change however has been the removal of incentives (IR2). In early years staff were incentivized to attend meetings (IR2), and there is a perception that previous board members lacked interest and enthusiasm, regarding their role as *‘just a job’* – attracting the *‘wrong’* people (IR2). Previously, *“directors were just people living here, who would attend meetings, somewhat reluctantly, some of them because... I think they could see possibly ways and means of using the facility to gain something out of it. But I didn’t get the feeling that the directors were there really to make the ultimate difference of creating jobs and addressing poverty”* (IR2). Furthermore, *“it’s important that the board is unpaid, in a situation like this, because it’s going to become a club otherwise”* (IR2). Strategically selecting members for the board has helped increase success (IR2; IR5). Rotating the board with the terms of service has also contributed to getting the right mix of people that have a genuine interest in the KBR and its purpose (IR2; IR8), which is reported to have increased their success (IR1; IR6; IR8).

### 3.4.4 Envisioned Role: Visions of Success

Four themes emerged when asked about the vision for success in the BR (Table 3). These include being an **organization connecting stakeholders (f = 6)** to link all the actors in the landscape (IR5; IR6), be their *‘go-to’* (IR7) and a place where everyone talks to each other (IR8). Secondly, **creating awareness, pride, and a sense of place (f = 5)** so that people are aware of the KBR (and BR concept) and proud to live in and promote it (IR5; IR6). Thirdly, **job creation and socio-economic opportunities (f = 4)** to empower youth, encouraging their involvement in the landscape (IR2). An avenue for job creation that was identified is tourism (IR7). Finally, **fostering stewardship and being a model site for sustainability (f = 4)**, to set an example for others through

living and developing in harmony with nature (IR3; IR9), and to have residents care for the land (IR3; IR8). All the above should result in what a participant referred to as a ‘critical mass’, after which success would come (IR9).

**Table 3.3** Kogelberg Biosphere Reserve Company’s visions of success for the Kogelberg Biosphere Reserve

Theme	Theme Description	Example Quotes
Organization connecting stakeholders	The KBR seen to perform as a central hub for stakeholders to connect	<p>“I think it would be being a link between all the institutions and organizations in the area” (IR5).</p> <p>“The KBRC can become strong enough that they’d be the go-to for everyone” (IR7).</p> <p>“A place where the authorities and the people work together, who speak to each other...” (IR8).</p> <p>“To actually be this umbrella body where all the other conservation organizations, all these tiny groups, must sort of get it get pulled in and be part of it” (IR6).</p>
Awareness, pride, and sense of place	Increasing awareness and pride	<p>“The BR having a prominent role in the community, where everyone that stays here knows what it is, knows what it stands for, and they’re proud to have it here... People being aware that ‘I stay in a BR. This is what it means to stay in a BR’, and to see the benefits of staying in one” (IR5).</p> <p>“A critical mass of the people living in the KBR buying into the concept and understanding what it means... I get the feeling that there’s quite a large proportion of people that buy in, but not enough. Then there’s a large proportion of the people that don’t quite understand what it’s about... If you could somehow get more people to buy in and more people to understand... the success would come” (IR9).</p>
Job creation and socio-economic opportunities	Creation of opportunities and employment	<p>“Empowering the younger people... Job opportunities, there needs to be job opportunities. If we can get a very clear... picture of the place—something turning around. The youth getting enthusiastic about getting involved in the whole landscape” (IR2).</p> <p>“This would be a major tourism destination. Because it should be... the most diverse flower kingdom on the planet” (IR7).</p>
Fostering stewardship and being a model site for sustainability	To be an example site for other areas to learn from, including people coexisting with nature	<p>“To be an example of how to live, an appropriate balance, or harmony with the environment and economy. To roll that out into places where it is not a BR” (IR3).</p> <p>“It’s meant to be a model for showing other areas how they can coexist with nature” (IR9).</p> <p>“... getting everyone in, as custodians” (IR8).</p> <p>“Rentmeesters [stewards]” (IR3).</p>

### 3.4.5 Envisioned Role: Present Role in the Landscape

This section details the KBR's present role within the SES (Appendix 15). Collaboration and coordination are about bringing actors in the landscape together and implementing the *'big ideas'* through custodianship (IR8). Addressing inequality and unemployment and supporting non-profit organizations (NPOs) and the youth are their main socio-economic activities. Conservation activities include invasive alien plant (IAP) clearing, wildlife and plant rescue, and supporting conservancies.

**Collaboration and coordination:** Three municipalities; the Overstrand, Theewaterskloof and the CoCT, as well as the Overberg District Municipality (ODM), are all actors within the BR. Additionally, CapeNature, the statutory conservation body of the Western Cape. Moreover, there are civil society bodies acting across the landscape, for example conservancies. They see their responsibility as *"being there to bring those [actors] together in as an effective a way as possible"* (IR4). Their primary role is not necessarily to implement projects but rather, *"[the KBRC] can get the funding, [the KBRC] can get it going, but then someone has to take ownership or champion the project and I think this is where the smaller groups come in"* (IR6). The BR can also give the smaller groups and organizations a *'louder voice'* by utilizing their networks and relationships built with the authorities.

**Conservation and socio-economic development:** The BR sees itself as a vehicle *"to introduce and to create jobs"* (IR7), which is perceived to be important because of the belief that *"when people are hungry, you can tell them don't pollute, but that's not their main concern"* (IR5). They have partnered with other actors to fulfil their role in socio-economic development and create opportunities for those living in the BR. Their conservation role is supporting and facilitating existing conservation organization activities, and in some cases initiating new ones.

### 3.4.6 Envisioned Role: Challenges

Six themes regarding challenges for the BR to fulfil its role in the landscape emerged.

**Awareness, 'buy-in', communities and 'biosphere living' (f = 8)** (Table 3.4) are associated with the lack of awareness of the BR concept and having the *'buy-in'* and support for the KBR (IR3; IR4; IR8), community members not embodying what has been referred to as *'biosphere living'* (IR8), a detachment from the natural environment (IR4; IR5; IR9), and anti-BR stakeholders (IR2).

**Table 3.4** Awareness, ‘buy-in’, communities and ‘biosphere living’ as a challenge for the Kogelberg Biosphere Reserve Company in fulfilling their envisioned role in the Kogelberg Biosphere Reserve

Theme	Theme Description	Example Quotes
Awareness, ‘buy-in’, communities, and ‘biosphere living’	Challenges relating to residents who lack awareness of the KBR and BRs in general, embodying the harmonious lifestyle between humans and nature.	<p>“The biggest challenge is probably that I doubt that people have got buy-in really” (IR3).</p> <p>“People still don’t know what a BR is. They don’t know the purpose of a BR. They don’t know where they’re living. So, they’re not doing things in line with biosphere living” (IR8).</p> <p>“I noticed that there was a fair amount of anti-BR, especially from people in the economy, the farming sector. The KBRC was too closely related to what was known as ‘KOBIO’ before...” (IR2).</p>

**Funding, resources, and international partnerships (f = 7)** relates to a lack of funding, and there is a belief that the KBRC ‘could do a lot more’ if there was more funding available (IR9) – specifically, operational funding (IR4). IR4 stated: “[The KBRC] can get funding for very specific, clearly defined projects. But to get funding for ... giving more capacity to KBRC’s office and admin and publicity... That is proving a real problem” (IR4). The KBRC have limited human resources (IR6), which is related to the challenge of funding (IR5). Additionally, the KBR lack international partners and would like to build a relationship with those who would be willing to contribute to their cause (IR2).

**Cooperation and coordination (f = 5)** are a challenge that relates to what seems to be ‘territorialism’ over who the management entity of the KBR is (IR4; IR8), and dividedness amongst civil society organizations, despite having the similar motivations to conserve the natural environment and its wildlife (See ‘lack of consensus’ in Table 3.10). The experience of territorialism is presented below:

“Every group thinks they are the ones who are managing this biosphere reserve. The other ones are somehow part of the problem. Now I’m saying this to illustrate the point that they have a tremendous sense of ownership of the biosphere reserve, but don’t see the KBRC as the body that can help to coordinate all the activities. There’s a breakdown there. KBRC is regarded either as, ‘are you going to come and tell us [civil society organizations] what to do?’ Or ‘who are [KBRC], what did [KBRC] ever do for us? [KBRC is] useless’. Without knowing anything about what the KBRC is attempting to accomplish. ... they’ll own the land but not the body” (IR4).

Additionally, actors operating in ‘silos’ is believed to be one of the KBR’s ‘biggest challenge[s]’ (IR1) – not communicating with each other despite trying to achieve a common goal. For example, IR9 stated: “There’s ... 10 or more different organizations, clearing invasive alien plants and not talking to each other...”.

**Environmental (f = 5)** challenges (Table 3.5) include wildfires and their associated impacts (IR1) – specifically the municipality’s response to implementing fire protection (IR2; IR9). IAPs are a threat to the environment within the BR (IR9), which is exacerbated by the municipality’s fire prevention strategy and increasing the fire risk through the proliferation of IAP species (IR3).

**Table 3.5** Environmental challenges for the Kogelberg Biosphere Reserve Company in fulfilling their envisioned role in the Kogelberg Biosphere Reserve

Theme	Theme Description	Example Quotes
Environmental	Environmental challenges for the KBR in fulfilling its envisioned role	<p>“Fire is a big threat to us, and the whole impact that all of that has” (IR1).</p> <p>“If we don’t bring these invasive species under control, then they’re going to take over the whole place” (IR9)</p> <p>“[Municipality] would have everybody just clear their plots and cement them so that they have no fuel on them. We’ve been engaging with them over that question. There are different opinions. Some people, they treat, for example, they said all the vegetation must be cut down to point five of a meter. Now, when you’re dealing with, it’s not a grassland, you know, and, or if you’ve got trees, you must trim them two meters above the ground. Now what we’ve got here is shrubs. If you trim them two meters from the ground and leave the top branches, they’re going to die. If you mow them to 0.5 m, they’re going to die. There was no ecological understanding of that” (IR9).</p> <p>“Like this fire thing [municipality’s approach to IAP clearing]. They’re illegal [cutting down milkwoods], they’re illogical. The fact that they cut it down causes aliens to grow, it causes these ‘spansriet’ [pampas grass], the reeds to grow. It increases the fire risk” (IR3).</p>

**Illegal activities (f = 5)** (Table 3.6) include issues of illegal hunting (IR2), which the KBR is responding to through strategic partnerships (see ‘protecting nature’ in Appendix 15), which include the poaching of proteas and perlemoen (abalone, *Haliotis midae*) (IR7; IR9), and the illegal clearing of protected species (IR2; IR4), which is associated with the municipality’s fire prevention strategy (see Table 3.5). Land

invasions and the associated challenges they bring pose a challenge for the KBR (IR4; IR7; IR9). These challenges are difficult to respond to, considering the capacity issues faced by the authorities (see ‘lack of capacity’ Table 3.10).

**Table 3.6** Illegal activities as a challenge for the Kogelberg Biosphere Reserve Company in fulfilling its envisioned role in the Kogelberg Biosphere Reserve

Theme	Theme Description	Example Quotes
Illegal activities	Illegal activity posing a challenge for the KBR to fulfil its envisioned role	<p><i>“The snaring here is shocking!” (IR2). [According to the Nature Conservation Ordinance No.19 of 1974, snaring is a method of trapping and therefore an illegal hunting method in Western Cape, South Africa]</i></p> <p><i>“Number one, big pressure point, is Knoflokskraal. There’s a land invasion. It’s completely outside the law. The government is not in control anymore. They’re [invaders] just going to continue. They’re going to take the next piece of state land and the next piece of state land. That is a major issue” (IR9).</i></p> <p><i>“It’s all kinds of illegal activity, and people go in there with 5 or 10 bakkies [pickup truck] a day, and just clear proteas. They have a photocopied license from DFFE. No one knows whether it’s authentic or not. You phone people and they’re just not interested. We’ve been writing letters, writing emails, we’ve got a paper trail, a couple of kilometers long of all the things that have been going on since the [forestry] exit” (IR7).</i></p> <p><i>“I mentioned that [municipality’s approach to IAP clearing] because fire is a major threat in the area and our municipality sees their responsibility—fire breaks..., they’ll brush cut what’s easy to brush cut. But where alien vegetation is growing in areas that’s difficult to access, and places where they’re responsible, but just difficult to access. ‘No, no, no that I [municipality] will just leave’. These areas that are serious threats to runaway fires, those are left. It’s very easy to tell the plot owner, just by the way, you haven’t developed your plot yet, but you’ve got to give a brush cut once every two to three years. Down to ankle height. There’ll be a milkwood [<i>Sideroxylon inerme</i> are a tree species protected by South Africa’s National Forests Act.84 of 1998] or something—doesn’t matter. You just brush cut it. It is going completely against [ecological understanding and the law]” (IR2).</i></p>

**Government (f = 3)** challenges (Table 3.7) include the perceived lack of support from government, specifically some local municipalities and national that the KBRC have difficulty collaborating with to find solutions to problems – suspected to be due to political reasons (IR1; IR2). Additionally, there are views that government does not

take the KBR seriously (IR7), and that the engagements between government and the KBR seem superficial, in that public officials only engage due to obligations (IR2).

**Table 3.7** Government as a challenge for the Kogelberg Biosphere Reserve Company in fulfilling its envisioned role in the Kogelberg Biosphere Reserve

Theme	Theme Description	Example Quotes
Government	Reference to challenges with local, provincial or national government	<p><i>“One of our BIGGEST challenges is the [XXX] Municipality. Because of all sorts of political reasons, they are just not coming to the party” (IR1).</i></p> <p><i>“The mayor of [XXX] Municipality... [The KBRC] cannot get a meeting with a guy. Not for anything” (IR2).</i></p> <p><i>“I feel that the biospheres [reserves] in the Western Cape don’t get support from national [government]” (IR1).</i></p> <p><i>“But then a big problem has been [the KBRCs] inability to get government to be part of solutions...” (IR2).</i></p> <p><i>“The people attending the [stakeholder] meetings, the stakeholders from government, ... I don’t think they were really taking the [KBRC] board seriously. I think it was a meeting that they [government officials] had to attend. They [government officials] were ticking a box... enduring the meeting” (IR2).</i></p>

### 3.4.7 Envisioned Role: Effectiveness

There was a mixed response to if the BR is believed to be successful in terms of fulfilling its mandate. One participant had conflicting perceptions, saying: *“The old response in Afrikaans would be ‘ja, nee’. Yes and no” (IR4)*. Participants described success in some areas and not in others. Earlier years were unsuccessful, however, with recent years becoming more successful and achieving more. This improvement is captured in the following statement: *“For the first two or three years, I saw absolutely no progress. But I certainly have seen, escalating in the last two years, better and better response. Especially with [coordinator] holding the reins. I think this is what was vital to the organization – having this one person who’s totally passionate about it” (IR2)*. Staff joining in more recent years believe *“[the KBRC] have a lot more to do, but yes [there is success]” (IR5)* and *“it could be better” (IR8)*. IR4 stated: *“How do we know? ... In any formal sense you say that’s our specific outcome that we’re wanting to achieve. You measure success in terms of how close you are to your defined outcome. We don’t have a defined outcome. Maybe that’s something we need to do” (IR4)*.

When asked what accounts for the recent effectiveness (Table 3.8), cited factors included the **type of people involved (f = 5)**, **leadership quality (f = 3)** and **full-time staff (f = 2)**.

**Table 3.8** Factors instrumental in the increased effectiveness of the Kogelberg Biosphere Reserve

Theme	Theme Description	Example Quotes
Type of people involved	Strategically selecting directors with skillsets	<p><i>"Whether [the KBRC's] effective or not, is dependent on who does it" (IR4).</i></p> <p><i>"A nice group of people" (IR8).</i></p> <p><i>"I think that our success now over the last two years, has been, we've got more interest. We've got a good balance of people sitting around the table now who are interested in the growth, the general growth, not conservation, per se, and not development per se. I think that our board we have are more enthusiastic and more interested in moving in the right direction. There was a board [previously] that I don't think was moving in the right direction..." (IR2).</i></p>
Leadership quality	Reference to staff holding a leadership position	<p><i>"When [the chairperson] took over, there was a big shake up. Now it's achieving." (IR7).</i></p> <p><i>"You certainly do need... I want to say charismatic, energetic leadership, whatever you call that leader. [The chairperson], is a wonderful example. [The coordinator] is a wonderful example" (IR4).</i></p> <p><i>"[The chairperson is] enthusiastic, ... Can you imagine if it was someone else? It wouldn't work..." (IR9).</i></p>
Full-time staff	Reference to full-time staff	<p><i>"I think the one full-time [staff] member is the biggest, biggest reason for being more successful now..." (IR6).</i></p>

Participants were asked to describe the BR successes and failures (Table 3.9). Importantly, failures are not only areas that have gone completely wrong but rather where they believe there is room for improvement and recognizing a learning opportunity.

**Table 3.9** Successes (areas going well) and failures (areas for improvement) of the Kogelberg Biosphere Reserve

<b>Successes (Areas Going Well)</b>	<b>Failures (Areas for Improvement)</b>
Alien invasive plant clearing, e.g., Hangklip Conservancy, with the GWUA and on private land (IR1; IR3; IR5; IR6; IR8).	Anti-BR and negative perceptions associated with the KBR because of the predecessors of the KBRC, KOBIO (IR1; IR2; DR4).
Wildlife Rehabilitation Centre and training volunteer wildlife first responders (IR1; IR4).	Broken partnerships due to lack of reporting – capacity issue (IR2)
Source-to-Sea project – youth environmental education and work (IR2; IR5).	Consistent messaging about the KBR and communication with partners–communication model (IR6)
Building and strengthening local partnerships, e.g., WWF and Cape Leopard Trust (IR2; IR6).	Inability to get government to be a part of the solutions (IR2).
Social media growth and network – growing awareness (IR2).	Lack of community involvement and awareness of the KBR (IR2; IR5; IR6; IR7; IR8).
Stony Point and the MPA are believed to not have been established if the KBR were not in the area (IR3).	Policy regarding fire management, which is enforced by the municipality (IR3).
Preventing the Palmiet River from being dammed and the Kogelberg Valley flooded, and water security project with the City of Cape Town (IR3).	Food garden project that withered away because the KBRC saw it as its own and therefore lacked community support (IR4).
Job creation, e.g., forest rangers and in IAP clearing projects (IR5; IR7; IR8).	Not having the correct people (IR6).
Rooiels Ecological Corridor (IR4).	Not keeping up to date with compliance and the rule of law (IR8).

### 3.4.8 Stakeholders and Critical Relationships

Stakeholder participation is *“very much project driven”* (IR1). For specific projects the KBR arrange meetings with relevant stakeholders to explain the need for their help and ask if they are interested in collaborating (IR1). There is a growing interest from stakeholders (IR2) who *“want to come to the meetings, and they want to participate. They say, ‘how can we help you? How can we work with you?’”* (IR1). One avenue of participation believed to be useful are the workshops (IR8; IR9). *“It was nice because we all sat together with the authorities... That was a nice participation method [workshopping] of getting everyone’s ideas out. Not just one-sided ideas”* (IR8).

The KBR believe *“it’s important to build up a good relationship with government”* (IR2), which in some cases they have, for example the Overstrand Municipality (IR9), who

were described to be ‘very much on top of it’ and described themselves as having a “*great working relationship with them, they want to be part of everything*” (IR1). World Wide Fund for Nature (WWF) is also considered a critical partner (IR2; IR9) “*because conservation is not high on the list for government so we’re never going to get the funding or the support that we need from government. But private entities like WWF, ..., they have a lot of funding, ... a lot of resources*” (IR1). More in Appendix 16.

### 3.4.9 Stakeholders and Critical Relationships: Challenges with Participation

Participants identified challenges with regards to stakeholder participation (Table 3.10), including the **lack of capacity (f = 3)**, which is often a limitation (IR4), and **restrictive legislation (f = 2)**, which restricts key stakeholders’ ability to act (IR4; IR8). The tension of capacity and legislation results in civil society believing that key stakeholders do nothing at all (IR4). The **lack of consensus (f = 2)** or ‘*differences in opinion*’, i.e., polarization, is also an issue, but driving specific agendas is also difficult to manage (IR5; IR9).

**Table 3.10** Stakeholder participation challenges within the Kogelberg Biosphere Reserve

Theme	Theme Description	Example Quotes
Lack of capacity	Participants referring to the capacity of stakeholders (i.e., the stakeholders potential or ability to perform a task)	<p><i>“That tension between capacity and having to operate within the parameters that are laid down legislatively. Those are the challenges, the problems that governments up against. On the civil society side, folks don’t understand, don’t realize the extremely limited capacity that they have and the restrictive nature of a lot of the legislation that government works under”</i> (IR4).</p> <p><i>“I think on the government side, one of the things, or two issues... the one is capacity. They just don’t have enough people to do enough things... For example, confronting the poaching issues along this coastline. Neither CapeNature nor municipal law enforcement really has the capacity to police the coastline adequately. That’s just one illustration and various other examples. The whole question of having enough rangers to police the mountains, where just presently there’s a problem with flower poaching. Big problem”</i> (IR4).</p>
Restrictive legislation	Participants referring to legal frameworks in which stakeholders must act	<p><i>“I think with key stakeholders, the regulatory and legislative framework is pretty much set in stone. What we might wish for cannot be done because there’s legislation already designed for it. The authorities could only work within that framework, and their hands are tied with anything else”</i> (IR8).</p> <p><i>“You buy a property; you can do what you like with it. Environmental Management and CapeNature must</i></p>

		<i>stand there with their arms folded. There's absolutely nothing [Environmental Managers or CapeNature] can do" (IR4).</i>
Lack of consensus	Participants referring to differences in opinion	<p><i>"When people don't agree sometimes with what we are trying to achieve, and then try to force their way" (IR5).</i></p> <p><i>"People are highly divided on how to deal with baboons, for example this one group of people that says, 'shoot them all'. There's another group that says, 'let them do what they want'. There are people that say don't feed them, other people do feed them. ..., different interpretations of how to deal with things is a challenge" (IR9).</i></p>

There are key stakeholders, or critical partners, whose participation is believed to be missing. These include representation of the full diversity of landowners (*f* = 5). For example, *'community leaders'* (IR5), as well as farmers which are key actors who manage large portions of land within the KBR are missing. *"[The KBRCs] interaction with farmers is supposed to be good, or strong. ..., but it's not there. We don't interact with the farmers union. Maybe that's a serious gap because they manage land"* (IR3). In terms of demographic, younger people, people of color, and poorer people, are perceived to be missing despite acknowledging the importance of having diverse stakeholder groups (IR1; IR2).

Participants stated that political actors from some **local municipalities (f = 2)** within the BR footprint, including mayors and municipal actors tasked with environmental management, are absent (IR2). There is a perception that *"the whole BR thing as far as [key stakeholders are] concerned is a waste of time"* (IR2), possibly due to the BR not being politically powerful. Furthermore, there is believed to be a lack of support from higher levels within the municipality. IR3 stated: *"I think the [XXX] municipality is there. The lady is there, but I don't think the environmental section in the [XXX] municipality... I think they are so used to not having any real power or support from the top"*.

**Government departments (f = 2)** are believed to be missing. *"There's a huge disconnect between [the KBRC] and national government"* (IR2). In this case it would be beneficial if the BR could engage with them around certain challenges, including issues in the forestry exit areas, i.e., previously commercially driven afforested areas being returned to their natural productive state (IR7).

### 3.4.10 Stakeholders and Critical Relationships: Institutional Overlap and Disruptive Stakeholders

Institutional overlap in terms of mandate occurs with multiple actors in the landscape, for example South African National Biodiversity Institute (SANBI), CapeNature, local municipalities and WWF, in connection with environmental education (IR1) and IAP clearing activities (IR1). Participants believe the challenges therein are coordinating and creating cohesion between the actors so that there is reduced duplication. IR1 stated: *“It’s to get them all together and say, let’s just put all the resources together and work, design a plan and work according to the plan”*. Participants generally perceive overlap presents an opportunity, believing *“that you could be so much more efficient if you coordinated those efforts and put together some kind of plan”* (IR9). One participant stated: *“I think the overlapping of the NPCs [non-profit companies] is vital. The conservancies, WWF, and efforts to protect the natural resources”* (IR2). The idea is that the KBRC *“mustn’t walk, I think, on other people’s jobs, but rather empower the existing groups or empower new groups”* (IR4). While some of the benefits would be greater efficiency and the *“opportunity is probably, if you can coordinate them, they can have a louder voice because we know the world is turned around politics or pressure”* (IR3). The perception is that overlap should enable support from government (IR2; IR5; IR6), however some said it has no impact in this regard (IR3; IR8).

There are few stakeholder groups that participants believed could be or are disruptive – or are in some cases *‘inappropriate’* (IR3), as they do not align to the values of the KBR. These are the more radical activist type groups (IR1; IR2; IR9), political groups (IR3; IR5) and lawbreakers (IR7).

### 3.4.11 Lessons Learned to Share across the World Network of Biosphere Reserves

Lessons the KBRC would share with emerging or newly established BRs include three themes. The **people (f = 6)** are important. Participants believed that having one full-time individual is vital (IR1) and directors need to be chosen strategically, depending on what is needed and for their passion (IR6; IR7). Directors need to be *“people that are genuinely interested in solving the problem. Not people that want to be there because it might be something in it for them”* (IR7). Furthermore, the inhabitants need

*“to really understand the concept of a BR, in which the relationship between the natural processes and ecological processes and the cultural, social, and economic processes of human society are somehow working in sync”* which is believed to be *“critical for a biosphere [reserve] to justify its existence”* (IR4).

In terms of **legality, governance, and compliance (f = 3)**, it is important to *“get the governance thing sorted out quickly”* (IR2), i.e., the correct people as staff and partners, and to get strategic plans in place early on. Furthermore, to keep up to date with the rule of law and *“never lose sight of compliance”* (IR8) and having *‘legal teeth’* (IR9). In the South African context this would be an IUCN Category V *‘protected landscape’* (IR9).

**Understanding the SES (f = 2)**, i.e., *“take the time to know your environment and your community”* (IR5). Understanding the SES is important because *“the [social-ecological] environment should in fact, direct what needs to be done”* (IR3) and will help the BR prioritize activities. This highlights the importance of the local context, and how understanding it may help apply lessons learnt in other areas, both appropriately and successfully (IR5).

### **3.5 DISCUSSION**

#### **3.5.1 Envisioned Role of the KBR and Their Alignment with UNESCO Policy**

The KBRC aims to protect their natural environment and build harmony between humans and nature (KBR, 2022) and has the vision to be *“the Cape Floral Kingdom’s model sustainable living environment for all”* (KBRC, 2006:11). The KBR’s vision for success is to be an organization with a network to connect stakeholders, create awareness and a sense of place amongst its inhabitants, create socio-economic opportunities, foster stewardship, and be a model site for sustainability. The BR taking on this role resembles what Cockburn *et al.* (2020b) refer to as a *relational hub*, which is a central point connecting diverse stakeholders to foster collective action. These hubs enable relationships to be built between humans, much like the KBR’s envisioned role for connecting and coordinating stakeholders for collaboration, and for building it between humans and nature, such as KBR’s vision of fostering stewards of the land (Cockburn *et al.*, 2020a).

In achieving their vision, the KBR focus on the local context, conceptualizing projects based on the current needs in the landscape. Although they are familiar with UNESCO

policy guidelines, such as the LAP, KBR has found implementation of LAP in practice overwhelming, leaving the KBR with the perception that not much is achieved. Instead, the KBR focus on the co-designed and science-based *pressure points* (with the PAG), and social needs considered priorities within the SES, finding greater alignment with the SDGs, a national imperative.

### **3.5.2 Governance Model and Structure Adopted by the KBRC**

Their governance model is strategically positioned to help enable their envisioned role. The KBRC have adopted what the Technical Guidelines (UNESCO, 2021) refer to as the *Non-Governmental Organization (NGO) model*, in this case an NPO. Using this model, the KBRC provides a platform, or relational hub (Cockburn *et al.*, 2020b), to bring together stakeholders to discuss matters, with the best interests of the community in mind. Similar to how Müller (2014) describes BR models, the KBRC is not necessarily responsible for implementation, but rather interacts with other actors in the landscape to implement decisions facilitated through the platform. This model is best described by what Kooiman *et al.* (2014) and Edelenbos and van Meerkerk (2016) refer to as *interactive governance* – a model in which many actors are involved in governing the SES. This form of governance places emphasis on finding solutions to everyday challenges through interactions and creating opportunities through civil, public, and private actors (Kooiman *et al.*, 2008; Santosa, 2022). According to interactive governance theory, higher orders of governance, i.e., *meta-, or third order governance* involving underlying principles and values, guide the everyday actions of governing (Kooiman *et al.*, 2008). This is experienced in the BR model, in which the UNESCO MAB guiding policy, i.e., Statutory Framework, LAP and Technical Guidelines (UNESCO, 1996; 2017; 2021), provide guidance to BRs; however the KBR tailors implementation to fit its SES context.

The Technical Guidelines (UNESCO, 2021) identify three components that must be fulfilled within an effective BR governance structure, i.e., a *management/coordination team* of full-time employed staff who work on activities with an available budget, a *management, steering or executive committee* made up of key stakeholders and who work closely with the coordination team and is responsible for proposing actions and evaluating implementation, and an *advisory board* that provides an oversight function and is used for consultation purposes. The KBR compliments this structure via their

directors, coordinator, technical committee and PAG, but there is significant overlap in performing these roles—possibly to overcome constraints in human resources.

KBRC is led by the BofD, with which the coordinator works closely. Having the coordinator work closely with the directors is known to increase board effectiveness (Bradshaw *et al.*, 1998). There are nine directors that are diverse in terms of age, gender, and culture, serving (a maximum of six years) on the board, all of whom have specific responsibilities, depending on their expertise. Directors are strategically selected based on personal skills, knowledge, expertise networks and connections, which are said to be key qualities of directors (Petrovic, 2008) and believed to have increased the KBR's effectiveness. Strategic selection, in combination with disincentivizing the board and strong leadership, is believed to have contributed to building the KBRC with the correct '*type of people*', i.e., people that are genuinely interested in solving problems and not in it for personal gain, because the success of the BR is determined by the personnel that implement it. This is a lesson offered by the KBR: that BRs need strong, charismatic leaders, people serving for the right reasons and full-time staff. Personnel are also similarly motivated to support the BR and have a shared vision – also proven to increase effectiveness (Bradshaw *et al.*, 1998). Building a board strategically, which is both diverse in skills and expertise, and in demographics, creates a heterogenous group that is less likely to be subject to *groupthink* and more likely to offer creative solutions through their diverse perspectives (Petrovic, 2008). However, to build such a board takes time and can become valuable for the organization. The decision to retain directors for a maximum of 6 years and intermittently allow for change is beneficial because boards continually need upgrading in terms of skills and knowledge, but it also allows knowledge to be transferred between older and newer additions to the board – maintaining institutional memory (Harvey, 2012; Berstein *et al.*, 2015). When thinking of sustainability, the involvement of future generations, including youth, in decision-making processes is important (Mitrofanenko *et al.*, 2018; Barraclough *et al.*, 2021). Including youth on the board and progressing towards establishing a Youth Board is innovative thinking and consistent with transformation occurring within South Africa's BR population, which initiated a national Youth Network in 2023. Furthermore, evidence suggests that increased diversity on boards increases their effectiveness (Bradshaw *et al.*, 1998; Ortega-Rodríguez *et al.*, 2023). Finally, good (regular) meeting practices are

considered essential (Bradshaw *et al.*, 1998; Petrovic, 2008; Ortega-Rodríguez *et al.*, 2023). The KBRC have regular board meetings, which are a place to plan, discuss and vote on decisions, and are held every second month, along with proposed agendas that accommodate the addition of items by participants.

Moreover, in adopting this collaborative approach, and in line with the Statutory Framework (UNESCO, 1996), the KBRC rely on the technical committee and the PAG. This committee is an attempt to deal with the issue of '*silos*' – convening critical partners to build consensus and establish areas for collaboration. Through their SES analysis and model description of the KBR, the PAG have guided the projects and programs that are now prioritized – targeting what have been identified as *pressure points*. Working closely with these two stakeholder groups allows for integrated responses, through defragmentation and breaking silos that are necessary to overcome complex issues (Edelenbos & van Meerkerk, 2016). The integrated responses in identifying problems and finding solutions to them, whether from the technical committee or PAG, also aids in the diversity of responses – an important resilience factor in SES (Müller, 2014).

Characteristic of the NPO model is its *project-orientation* (UNESCO, 2021). Stakeholder participation within the KBRC is *project-driven*, which is why stakeholder involvement is so dynamic, ranging from one-off collaborations to long-term partnerships. The KBRC bring together civil, private, and public institutions to discuss matters with the best interests of the community in mind. This is important considering that when dealing with complex, diverse and multiscale societal and environmental challenges, or wicked problems, no one actor has the knowledge, information, jurisdiction, or capacity to deal with them independently (Armitage *et al.*, 2012; Müller, 2014) and therefore collaborative initiatives or collective action are best suited for dealing with *wicked problems* (Berkes, 2017). Cockburn *et al.* (2020a), define *collaborative initiatives* as multistakeholder arrangements working together to overcome social-ecological challenges. To fulfil their envisioned role and answer the MAB Strategy's (UNESCO, 2017) call for collective action, the KBRC actively search for stakeholders in the landscape with whom they can collaborate with, to find solutions to solve specific challenges. Growing interest in the KBR has resulted in stakeholders seeking opportunities for participation.

The KBR engage with various stakeholders as needed, i.e., their collaboration and coordination role, to fulfil their role within the SES (through projects and activities). Engaging with stakeholders can occur in many ways, ranging from individual volunteers to the involvement of organizations, in which their efforts consist of interacting with other landscape actors, directly addressing specific problems, or working with communities to deal with challenges (Karar & Jacobs-Mata, 2016). These engagements, according to Arnstein's (1969) ladder of citizen participation, occur at levels ranging from *'informing'* and *'consulting'* through outreach and workshops, to *'partnerships'* with actors and, in some cases, *'delegated power'*, e.g., Groenland Water User Association (GWUA) who now manage the IAP clearing project. The KBR's socio-economic development role, which serves their vision in wanting to create opportunities, is fulfilled through partnerships with the ODM, NGOs, and other institutions to implement projects in economic growth, environmental education and youth development, and sustainable natural resource management. Similarly, the KBRC fulfil their role in conservation, which includes protecting nature and securing water, through partnerships. Joining alliances to target the SDGs meets the recommendations provided in the LAP (UNESCO, 2017). Furthermore, these sorts of inclusive governance approaches are considered necessary to meet the SDGs in contexts that involve decentralization and fragmentation of many actors operating at different levels and scales (Karar & Jacobs-Mata, 2016) – the BR context.

Additionally, the KBR's mandate overlaps with multiple actors in the landscape, which according to Müller (2014) can build resilience through the redundancy of actors in the SES. The KBR perceive these overlaps to be vital, as they present opportunity for pooling resources, coordinating responses and collaboration, and potentially gaining government support. However, the challenge is believed to be coordination, creating cohesion, and avoiding duplication.

### **3.5.3 Implementation Challenges in the KBR**

Stakeholders knowing about the BR, being willing to meaningfully participate, and having sufficient interest to do so will enable their participation. According to Pool-Stanvliet (2014), being able to adequately convey the BR concept remains a challenge for many BRs. The KBR struggles with a *'lack of awareness'*, in which many inhabitants do not know about the KBR or what a BR is, which in turn hinders their ability to meaningfully engage with the BR. BRs are dependent on their awareness

and communication for its successful implementation (Van Cuong *et al.*, 2017). One way to overcome this, as Coetzer *et al.* (2014) stated, is using social media and technology to disseminate information about the BR and ensure BR '*brand*' recognition in an accessible and relatable manner. In this respect, the KBR has experienced growth in their online presence, and this has been described as one of their successes. Social media has been an important medium to attain this level due to its self-propagation characteristic (Coetzer *et al.*, 2014; Maniou, 2021) and is believed to have been important in growing awareness of the KBR. However, despite recent growth and being able to successfully build local partnerships, broad-based community stakeholders, i.e., landowners, residents, and farmers, are believed to be missing. The full diversity of participating stakeholders is regarded as integral for increased effectiveness (George & Reed, 2017) and is perhaps a shortfall of the KBR – only meeting with a wider stakeholder group twice a year, one being the AGM, where all interested and affected parties are welcome to attend and engage in dialogue surrounding KBR governance.

KBR inhabitants not conforming to *biosphere living*, i.e., living in harmony with the environment, is a further challenge for the BR. The disconnect between humans and nature is due to living in human-dominated and modified landscapes and lack of interactions with green spaces (Miller, 2005; Soga & Gaston, 2016). Developing a sense of place and connection to the environment is a vision of the KBR, and evidence suggests that people who are more connected to their local environment will be more motivated to protect it (Miller, 2005; Soga & Gaston, 2016). Swemmer's (2020) results in the case of environmental monitors (EM) working in the Kruger to Canyons BR (K2C), South Africa, supports this. Before participation in the EM program, EMs had no understanding of the value of biodiversity, but through their participation they started naturally acting as conservation ambassadors and change agents actively propagating the BR message through their communities, outside of their EM jobs (Swemmer, 2020). The KBR provide the opportunity for locals, particularly youth, to be involved in their conservation efforts, for example through their IAP-clearing hack groups and Source-to-Sea project, which may produce similar outcomes to the EMs in the K2C. Engaging people in dialogues about the natural environment, especially youth, is key to addressing this disconnection (Miller, 2005; Soga & Gaston, 2016).

Establishing management systems for participation, i.e., stakeholder participation and governance structures, and the delivery thereof, i.e., resources and strategic plans, is critical for BR success, even more so than the stakeholders' understanding of the BR concept (Van Cuong *et al.*, 2017). The governance model implemented by the KBRC should allow for adequate stakeholder participation, especially in their structure, keeping their key stakeholders, i.e., technical committee and PAG, close by. However, this could be improved for the wider stakeholder group, and possibly through better awareness of the KBR and its mission. Furthermore, in the delivery thereof, the KBRC have well designed and informed strategic plans that have been developed through the input of the PAG. Therefore, what seems to hinder their implementation are sufficient support and resources required to successfully enact and, in addition, the unfortunate fact that even the best-designed systems can be overruled by external issues, such as poverty, corruption, and weak governance (Stoll-Kleemann & O'Riordan, 2018).

South Africa experiences political infighting and clashing between politics and management within the sphere of local government (Reddy, 2016), which is an important consideration seeing that it is responsible for service delivery. It is within this sociopolitical context that the KBR (and other BRs in South Africa) must operate, which undoubtedly impacts the broader '*buy in*' for the BR '*brand*' in two respects. Firstly, in increasing support for the notion of conservation that can '*work for the poor*' (Coetzer *et al.*, 2014), and secondly, at local scale, where local social-economic factors may overrule longer term sustainability aspirations held by various stakeholders in the landscape.

The KBR lacks support in the form of human and financial resources, specifically operational funds, which is severely constraining their potential impact by limiting their capacity. Like other BRs in the Western Cape, South Africa, the KBR receive limited financial support from the Department of Environmental Affairs and Development Planning – a critical partnership for the KBR. Van Cuong *et al.* (2017) found that the lack of resources available to BRs is a major factor leading to their failure, and that resource limitations have proven to be significant setbacks for implementing the MAB in developing countries. Furthermore, resources are needed to establish continuity and trust in engagement with stakeholders (Van Cuong *et al.*, 2017). Supporting this claim, the BR believes that improved success has come after establishing a fulltime

coordinator – allowing for consistency and continuity and stronger relationships with its stakeholders. This has allowed the BR to experience more growth and success in forging local partnerships. However, determining the success of the KBR seems to remain a subjective task with the lack of a measurement system, i.e., specified goals or outcomes, with which to objectively measure their performance (KBRC, 2006).

Furthermore, government commitment and involvement in BRs are critical for their success (Van Cuong *et al.*, 2017). Pool–Stanvliet (2014) discovered that MAB implementation in South Africa faces issues of horizontal and vertical integration with local actors and national government. The lack of integration undermines the intended purpose of BRs to demonstrate “*sustainable systems and innovative approaches in support of resilience of SES and fostering transparency through partnerships*” (Pool-Stanvliet & Coetzer, 2019:184). This is the experience of the KBR, who have limited support from national authorities, and who have difficulty solidifying partnerships and support from some local municipalities and actors. The KBR have working relationships with some local government actors who are providing operational support and wanting to collaborate. However, the KBR sees an opportunity for more support from local and national government, who they regard as ‘*missing*’ critical partners, to improve its operations. The absence of some government actors is perceived to be because of ‘*political reasons*’ – either political opposition parties or wanting to politicize the BR. The KBR believe politics can be disruptive to the BR and thus avoid those who attempt to use the KBR as a political instrument. This is a setback for the KBR, as they have projects that they hope to launch within regions where a lack of support from government agencies is not forthcoming.

Although subject to change, currently BRs do not feature prominently in South Africa’s national environmental legislation and policy system, and although supported by the national government during the nomination process thereafter, they are expected to forge their own way in successfully implementing the MAB (Pool-Stanvliet, 2014; Stoll-Kleemann & O’Riordan, 2018; Pool-Stanvliet & Coetzer, 2019). The reality for South African BRs is that they operate without legal ‘*teeth*’, apart from the formally protected core zones (Pool-Stanvliet, 2013; Pool-Stanvliet & Coetzer, 2019), and are implemented through ‘*soft law*’ (Pool-Stanvliet & Coetzer, 2019 & 2020) – largely relying on adherence with national policy around linked matters for enforcement and/or management. The absence of legislation to enforce the KBR and lack of sufficient buy-

in from some critical partners and government limits their authority to act, which is believed to weaken NPO governance operations (Van Cuong *et al.*, 2017), limits technical and financial support and thus impact (Edelenbos & van Meerkerk, 2016), and potentially threaten the legitimacy of the BR as an organization (Lockwood *et al.*, 2010).

However, the lack of authority can be overcome by becoming a *legitimate* organization, which is “*the validity of an organization’s authority to govern*” that is earned through social acceptance (Lockwood *et al.*, 2010:991). The data suggests that the KBRC is challenged by not being recognized as the legitimate management entity by some actors in the landscape. This could in part be because of the negative image left by their predecessors or because of a lack of awareness and communication (George & Reed, 2017), which is a perceived failure of the BR. However, at the same time it may be argued that the KBR is increasing its legitimacy, which is evident in building long-term partnerships with NGOs and experiencing increasing membership numbers. Nonetheless, the lack thereof may threaten their ability to fulfil their envisioned role of being an organization that can foster collaboration and coordination, given that their purpose is to provide a platform for cooperation between actors in the BR (Stoll-Kleemann & O’Riordan, 2018). Therefore, greater efforts towards improving their public image and encouraging greater, i.e., regular and consistent, participation in decision-making is required if they want to be fully accepted as a local partner and fulfil all their functions successfully across the SES (George & Reed, 2017; Van Cuong *et al.*, 2017; Stoll-Kleemann & O’Riordan, 2018).

A common criticism of case study research is that its findings are not generalizable, due to issues of external validity (Bryman, 2012). However, this research was exploratory, with the objective of providing a contextualized understanding of MAB implementation within the KBR. For this reason, the sample was purposefully based on the criteria of being associated with the management entity, i.e., the KBRC, to provide an ‘*information-rich*’ case (Palinkas *et al.*, 2015). This research was driven by the need to understand the institutional context and governance strategies of BRs in the landscapes in which they operate (Coetzer *et al.*, 2014; Ferreira *et al.*, 2018; Pool-Stanvliet & Coetzer, 2020; Barraclough *et al.*, 2023). Although the results are not directly transferable to other BRs (cases), there is a need to understand and compare lessons learnt from each site (‘case’), to improve the implementation of the MAB

program (Coetzer *et al.*, 2014; UNESCO, 2017). This research builds on the strength of MAB, which is an opportunity for place-based learning. In the absence of implementation blueprints, case studies such as this can offer valuable lessons and experience in implementing MAB, to ultimately determine what works, why, and for who? Future research should explore other BRs to develop contextual understandings of MAB implementation in their local environments (case studies). This will fulfil the need *“to communicate the experiences and lessons learned, facilitating the global diffusion and application of these models”* identified by UNESCO (2017:52). Future research should possibly include the perspectives of key stakeholders, specifically their perceptions and expectations, which may help provide a more holistic understanding of the BRs local image, i.e., its ‘brand’.

### **3.6 CONCLUSION**

This research explored the KBR context of both interpreting and implementing the MAB and, as such, how global policy is contextualized for local conditions. The place-based nature of the MAB allows the KBR to adapt and evolve to deal with local pressures. In-depth learnings, such as this, can aid implementation elsewhere while providing insights in sustainability science. Lessons provided from the KBR case study may be useful to other BRs operating in similar conditions, and especially to other BRs in the Western Cape of South Africa.

The KBR offered an interesting case, as it was established as being bottom-up. After being established shortly post-Seville in 1998, which turned the focus to sustainable development and arguably motivated South Africa’s buy-in to the program, it has been in operation through several iterations of MAB policy, i.e., MAP and LAP. The KBR operate within the statutory frameworks’ core functions, for example socio-economic development, conservation and fostering collaboration amongst actors and coordinating them.

The KBR implementation strategy is driven bottom-up from local pressure points within the SES, which are aligned with the overarching global SDGs. Local pressure points were co-designed with an important community stakeholder group, the PAG. Instrumental in their growing effectiveness has been the people involved – a lesson provided from the case. Strategically selecting directors to fill the KBRC with the correct type of people who are genuinely interested in solving problems, will provide a

strong, charismatic, and energetic leadership, and full-time staff have increased the effectiveness of the KBRC.

Operational challenges experienced in the KBR, i.e., lack of support, resources and awareness, and illegal and environmental problems, have caused it to lean towards adopting an NPO interactive governance model, in which it performs the role of a relational hub. In doing so, they rely on the formation of partnerships, interacting with actors in the landscape to defragment and break existing silos. This enables them to create opportunities for collective action within the SES. Despite having excellent strategic plans and strong support from some interested and affected parties, a tension exists between their capacity to offer meaningful participation from broad-scale stakeholders, building stakeholder interest and acceptance through awareness and communication, and becoming a legitimate organization that can provide value to its inhabitants. Fundamental to this tension are the limited resources at the BRs disposal, and the inability to gain support from some important public institutions. Looking forward, despite the KBR undergoing a slow establishment and near collapse in early years, it has regenerated itself and become a more effective BR with growing support in recent years.

Pioneering place-based knowledge-action networks for sustainability is an opportunity within the WNBR (Barraclough *et al.*, 2023). If we are to realize the value of place-based learning for sustainability to meet global [un]sustainability challenges, individual sites may not be sufficient alone (Barraclough *et al.*, 2023). However, most of the BR literature available is skewed to the Global North, underrepresenting the Global South – particularly Africa, and in-depth knowledge from individual sites at the scale of the entire BR organization seems to be lacking altogether. This research presents a remedy to this – and while admittedly presenting one site with the limitations of generalizability, which is due to the nature of case study methodology – still allows for learning and knowledge sharing on how things have been ‘done’ in the context of the KBR. South Africa has been a part of the MAB network for over a decade now, and is relatively new, and these case-specific lessons offer much value to the newer BRs in the country from a practical standpoint. Further, if similar in-depth research could be conducted in other globally representative BR ‘cases’ in the future, MAB implementation could certainly benefit from integrated comparative learning of the

experiences, successes, challenges, and lessons provided through these sites by those who learn-by-doing.

## CHAPTER 4

### Preface

The implementation of MAB is flexible, driven by local conditions and a promising strategy for dealing with the complex contemporary challenges. Additionally, it is an appropriate land management tool for South Africa, serving multiple objectives, including biodiversity conservation and socio-economic development. To improve MAB implementation success, it is necessary to understand how it is interpreted and implemented, what challenges and lessons have emerged, and what the envisioned role of BRs are within the SES in which they are realised. Critically though, these learnings should be shared across the WNBR for BRs to realise their potential as *'learning laboratories'* for sustainability. This paper aimed to understand how the governance strategy and structure of the CWBR has helped to achieve a context-appropriate interpretation and actioning of MAB in the landscape. To do this, the paper explored the CWBR's mode of governance, its envisioned role in the landscape, stakeholder involvement and what those relationships entailed. The publication, including in-text data references, is available online at: <https://doi.org/10.1007/s00267-024-02048-3>. Data references were removed from the text to improve its readability and submitted as supplementary material upon recommendation from the journal reviewers (available in Appendix 17).

### **Exploring the implementation of UNESCO's MAB Program in South Africa: A case study of the Cape Winelands Biosphere Reserve**

#### **4.1 ABSTRACT**

The Man and the Biosphere Programme (MAB) responds to challenges of the Anthropocene through an explicit social-ecological approach. Implemented as a world network of biosphere reserves, MAB aims to increase [eco]system sustainability and resilience globally, via individual model sites for learning and sustainable development. This research provides an in-depth case study of MAB implementation in South Africa using the Cape Winelands Biosphere Reserve (CWBR), established in 2007 when a key MAB guiding policy, the Madrid Action Plan came into effect. The study utilized semi-structured in-depth interviews with strategic and operational management, and document analysis. The CWBR prioritizes their role as a landscape coordinator, a driver of socio-economic development and site in which humans derive benefits from

healthy natural environments. The CWBR have adopted a non-profit organization cooperative governance model in support of this vision, fulfilling the socio-economic development function primarily through successful international partnerships. Challenges faced include a perceived lack of sufficient government support, limited stakeholder awareness and insufficient resources for project implementation. Over reliance on the pillar of their model, the chief executive officer in the current governance form, is an instrument in their effectiveness, yet carries significant risk. These are learnings useful for other biosphere reserves translating an international designation for a local context.

## **4.2 INTRODUCTION**

The United Nations Educational, Scientific, and Cultural Organization (UNESCO) Man and the Biosphere Programme (MAB) is implemented through biosphere reserves (BRs) which are holistic social-ecological system (SES) management tools serving three functions, including conservation, sustainable socio-economic development and logistic support, *i.e.* education, research and monitoring (UNESCO 1996). They involve inclusive, integrated, flexible and multistakeholder governance arrangements that are context specific and useful in dealing with the interlinked triple challenge of the Anthropocene, *i.e.* climate change, biodiversity loss and human wellbeing in a growing population (Pool-Stanvliet 2013; Palomo et al. 2014; Carruthers 2020; Baldwin-Cantello et al. 2023). These governance approaches offer both knowledge and functional diversity (Müller 2014). Moreover, BRs are regarded as sustainability science and climate change learning sites (UNESCO 2007; Pool-Stanvliet 2013; Pool-Stanvliet and Coetzer 2020; Clüsener et al. 2021; Barraclough et al. 2023) and when considered as a world network they provide a platform to share innovation and best practice globally. Additionally, the place-based implementation of the program is flexible, meaning BRs can be adaptive, and factors of redundancy and modularity can be incorporated within their governance arrangements – all factors increasing system resilience (Müller 2014).

To improve the effectiveness of BR governance globally UNESCO policy recommends several structural components. The Technical Guidelines for Biosphere Reserves (UNESCO 2021), recommend a dedicated management team, steering or executive committee and advisory board. The Lima Action Plan (LAP) 2016-2025 (UNESCO

2017) calls for joined alliances for open participation and planning, as appropriate models contributing to the implementation of Sustainable Development Goals (SDGs).

In a systematic literature review of BR management effectiveness (66 publications between 1996 and 2017), Ferreira et al. (2020) found 57,6% research emanated from the Global North and very few (6%) publications were in-depth case studies on BR management and governance – of which most were project-based. The outcome of the review was a need for greater geographic diversity and in-depth single case studies of BRs in research. Barraclough et al. (2023) found BRs remain underutilized research contributors to sustainability science theory and practice. Further, literature on BRs has identified the need for a place-based understanding of the institutional context and governance strategies of BRs (Coetzer et al. 2014; Ferreira et al. 2018; Pool-Stanvliet and Coetzer 2020; Barraclough et al. 2023). Currently, there is a drive *“to communicate the experiences and lessons learned, facilitating the global diffusion and application of these models”* (UNESCO 2017:15). Therefore, understanding how MAB is implemented across BR sites and comparing lessons learnt is needed to improve implementation success (Coetzer et al. 2014; Klaver et al. 2024).

To address the need for greater geographic diversity, in-depth case studies and understanding the institutional context and governance strategies of BRs, South African scholars are currently conducting research in South African BRs (more can be found here <https://researchbiosphere.org>, accessed on 4 June 2024). The goal is to compile in-depth case studies of South African BRs to uncover aspects of MAB implementation, *i.e.* lessons and experiences learned, and to share these across the World Network of BRs (WNBR) in the hopes of improving MAB implementation success (see Klaver et al. 2024). A strength of MAB is the lack of prescriptions for implementation – an intentional avenue for learning – however, how global policy is contextualized for local application is not well understood. Therefore, exploring how MAB is implemented in various contexts is important and remains a gap. The ‘one size fits all’ approach does not comply with the BR model which necessitates learning-by-doing and sharing these experiences across the world network of BRs (WNBR) (Ishwaran et al. 2008; Pool-Stanvliet and Coetzer 2020) specifically for understanding what works, why and in which contexts.

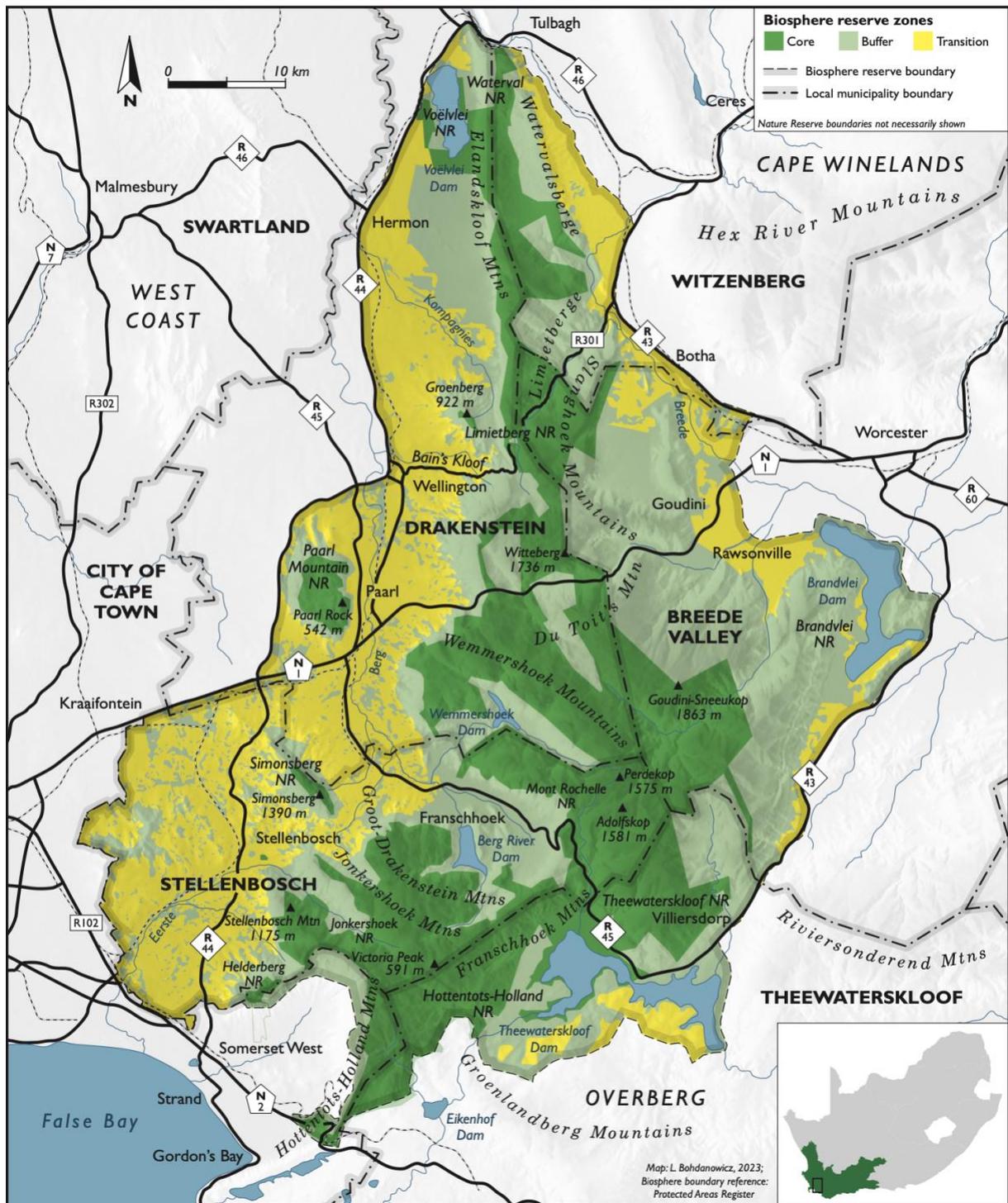
This case study aims to provide a contextual understanding of MAB implementation in local conditions, and not to produce findings which are generalizable. Rather, we aim

to share lessons and experiences learned through MAB's place-based implementation across the WNBR. The Cape Winelands Biosphere Reserve (CWBR) case study may offer valuable lessons for the WNBR as it has passed through multiple generations of MAB action plans, from the Madrid Action Plan (MAP) 2008-2013 to the LAP. Therefore, the CWBR should ideally be adaptive in its approach to ensure continued alignment with UNESCO-MAB strategic policies, for example MAP priorities of climate change, ecosystem services and urbanization (UNESCO 2008) to LAP priority of addressing the SDGs (UNESCO 2017). The CWBR is an important site within the Cape Floristic Region (CFR) World Heritage Site for its locally protected environments and catchment areas (Le Maitre et al. 2019; DFFE 2022b; UNESCO 2022c). This research explores the CWBR context of interpreting and implementing MAB and focusses on how the international designation is translated for the local social-ecological and economic fit, including the strategic decisions and motivations which support the BR in meeting its envisioned role in the landscape. In doing so, we hope to answer the question: how has the governance strategy and structure of CWBR helped achieve a context appropriate interpretation and actioning of MAB in the landscape?

## **4.3 METHODS**

### **4.3.1 Study Area**

The CWBR (Figure 4.1), located 40 kilometers east of Cape Town, South Africa was established in 2007, and spans roughly 322 030ha (UNESCO 2022c). Furthermore, the BR lies within the CFR, which exhibits high levels of endemism and is home to 20% of the total number of plant species which occur on the African continent (DFFE 2022b; UNESCO 2022c). The site constitutes a mosaic of diverse ecosystems and landscape features within the Cape Fold Mountains and surrounding valleys, displaying a variety of land-uses, including historic towns, a world-famous viticultural landscape, and some of the CFRs most important protected environments and river systems which feed the City of Cape Town (CoCT) (Le Maitre et al. 2019; DFFE 2022b; UNESCO 2022c).



**Figure 4.1:** Map of the Cape Winelands Biosphere Reserve illustrating the core (30%, 99 459ha), buffer (42%, 133 844ha) and transition (28%, 88 727ha) zones, important points of interest, and major towns and transport routes (Bohdanowicz 2023c)

The core zone of the CWBR constitutes 30% of the BR (99 459ha) and is made up of formally protected areas managed by CapeNature<sup>6</sup>. The core zone prioritizes nature conservation and long-term protection (Schultz et al. 2020; UNESCO 2021). The buffer zone constitutes 42% of the BR (133 844ha) where emphasis is placed on scientific research, monitoring, and education with limited human use and compatible with conservation objectives (Schultz et al. 2020; UNESCO 2021). The transition zone constitutes 28% of the BR (88 727ha) and where human populations strive for sustainable resource management and development (Schultz et al. 2020; UNESCO 2021).

The CWBR overlaps with several municipalities including, the entire Stellenbosch Municipality, majority of the Drakenstein Municipality and sections of the Breede Valley, Theewaterskloof and Witzenberg municipalities. Furthermore, this region has a winemaking tradition and history dating back approximately 350 years, and accounts for 68% of the total wine production within South Africa (UNESCO 2022c). Other primary economic activities in the area include agriculture, manufacturing, tourism, forestry, business services and real estate (DFFE 2022b).

#### **4.3.2 Methods and Data**

This case study was conducted following a qualitative approach (ethics certificate: H22-SCI-NRM-001), using semi-structured interviews (n=8) and supplemented through document analysis (n=3). Criterion for participant selection were that they represented the current CWBR strategic and operational management personnel, deemed by the research team as the most relevant operationalization of the governance strategy and structure of the CWBR at the time of the research. Therefore, the Board of Directors (BofD) and executive management (chief executive officer and coordinator) were purposefully sampled with a response rate of 88.89% (n=1 participant unavailable for an interview).

Interview transcriptions (and documents) were thematically coded manually by the primary author of this paper using ATLAS.ti 23.2.0 for Mac and analyzed through the inductive 6-step thematic analysis described by Braun and Clarke (2006) following

---

<sup>6</sup> CapeNature is the public entity responsible for conserving biodiversity within the Western Cape Province.

respondent validation. Thematic analysis is an inductive qualitative data analysis method used to identify, analyze and report on repeated patterns, *i.e.* 'themes', observed in the data to provide an in-depth understanding (Braun and Clarke 2006; Humble and Mozelius 2022). The process included transcribing the data, coding interesting features across the entire data set, collating codes into potential themes, reviewing fit of themes in relation to quoted extracts, refining and describing themes, and thereafter, reporting findings.

Frequency (*f*) counts within the results refer to the number of participants mentioning a certain theme and are used to indicate the significance and not for quantitative analysis purposes. Verbatim quotes have been used where possible, however in some cases minor alterations were needed to enhance the 'readability' of the data, *i.e.* repetitions, hesitations, stumbling speech, or translations have been removed (Brennan 2022). Additions for clarification and redactions have been made in the form of [XXX] or '...' to protect identities. Quotations have been used in-text or provided in quotation tables. Source codes for all quotations, verbatim and those incorporated into the narrative structure of the results, were removed to enhance readability (Lingard 2019). All quotations are attributed anonymously in Supplementary Table 1, providing the necessary audit trail for validation of research results.

### **Semi-structured interviews**

The following overarching themes were explored through the interview protocol:

- **Governance model:** How the governance model of the BR was initially formed, how this enables a specific governance approach, *i.e.* how decision-making processes occur, and how it has changed over the years.
- **History of involvement:** Sources of personal commitment to the BR and the motivations for the participant's initial and continued involvement in the BR.
- **Envisioned role:** Perceived vision for the BR, and the BR's role in the SES.
- **Stakeholders:** How the current BR governance model allows, enables/prevents other stakeholders from participating in the BR and how participation is constructed by the BR.

- **Critical relationships:** Knowing the institutional overlap in the landscape the BRs functions within, as well as the horizontal and vertical alignment of actors operating in the landscape.

Interviews were designed to be informal discussions. Interviews ranged from 45 to 130 minutes and were conducted in May 2023 at the interviewee's location and time of choosing (two interviews were conducted virtually). Within each of the overarching themes there were several sub-questions used to facilitate the discussions and probe for more detail, clarification or to change direction of the interview.

### **Document analysis**

Document analysis involved the use of the CWBRs website (<https://www.capewinelandsbiosphere.co.za>), the BR-specific spatial development plan and staff and stakeholder spreadsheet provided by the CWBR.

## **4.4 RESULTS**

### **4.4.1 Governance Model: Initial Establishment and Evolution**

The CWBR was initiated by the Cape Winelands District Municipality (CWDM) and the proposal put together by the Dennis Moss Partnership – a top-down establishment. The CWBR was registered in 2007 after a four year long public participation process. The impetus for its establishment was that it would be an important spatial development planning instrument and that development proposals would have to be approved by the committee. This function is fulfilled by the Department of Environmental Affairs and Development Planning, so to avoid duplication this role was never realized. The CWBR was initially well received by its stakeholders; however, expectations did not meet reality and *'damage control'* was needed for the first two years – seeing to the promises made by the consultants writing up the proposal.

The role of the CWBR has evolved since its establishment. Their initial strategy was to focus on one BR function at a time, build momentum and then focus on the next. The CWBR *"didn't try to deal with all three [BR core functions] at a time. So [the CWBR] concentrate[d] on the education side"*. With the belief that education is the answer to many current issues, their initial foci were conservation and education. They formed partnerships with European funders, thereafter *"[the CWBRs] focus has been more community upliftment and education based"*. *"The next side [the CWBR] were weak,*

was the scientific side”, and recently the CWBR has become more involved in science and research. The CWBRs projects are intended to align with the core functions of BRs as stipulated in The Statutory Framework of the World Network while responding to emergent local challenges.

#### 4.4.2 Governance Model: Structure, Responsibilities and Decision-Making

Leading the CWBR are the BofD. The management team, including executive management, project leaders and others oversee implementation within the CWBR. The BofD, management team, technical advisory and youth board make up the management entity, which is the CWBR, a Section 21 non-profit company<sup>7</sup> (Figure 4.2). Supporting them is the technical committee and a well-established volunteer program.



**Figure 4.2:** Schematic diagram of the Cape Winelands Biosphere Reserve personnel, including its technical assistance, board of directors, management and implementation team, youth board, volunteers and other stakeholders

<sup>7</sup> Refers to Section 21 of the Companies Act 61 of 1973 of South Africa and is a type of non-profit organization.

The board consists of seven directors (one female, six male) with a chairperson, vice-chairperson, secretary, and several portfolios. In terms of the diversity, a participant believes *“getting gender and racial representation on the board remains a challenge”*. Each director is assigned to a portfolio, depending on their expertise, or a portfolio may be established for them. The responsibility of the BofD is to provide an operational oversight role. Linkages are present between the directors and some of the stakeholder groups to allow information to be shared and for fostering collaboration, for example with the CWDM, Heritage Committee, Iziko Museums, CapeNature and universities. The *“board’s role, [to] a large extent, is to communicate and have that relationship with stakeholders”*.

CWBR management consists of a chief executive officer (CEO), administrator and coordinator, and several project leaders, advisors or facilitators. The CEO leads the management, oversees implementation, builds networks and relationships with funders and partners, and is tasked with timely decision-making. The responsibility of the coordinator is reporting, managing records and administrative tasks. Project leaders are appointed through service-level agreements and work part-time managing projects and facilitating various activities.

Directors are either sourced by or approach the CWBR to be elected to serve on the board. Personnel are sourced for their interest, skills and knowledge, and networks (Table 4.1). Other criteria may include whether they are involved in activities aligning with the BR objectives, and although not important at present, reside within the CWBR. Currently, *“the main thing is, what skills do [the CWBR] need?”*. Directors are retained until they are unwilling to serve or the lack of alignment between the objectives of the CWBR and what the director provides. Whilst there are recent additions to the BofD, *i.e.* within the last two years, most of the directors have served for a minimum of five to seven years, with some (n=3) serving since the establishment of the CWBR, including the CEO. The CWBR has had a full-time coordinator since 2018.

**Table 4.1:** Descriptions of beneficial skills within the Cape Winelands Biosphere Reserve office helping to fulfil its envisioned role

Skill	Skill Description
Personal	Personnel bring the people skills and the ability of <i>'connecting with people'</i> , the <i>'collaborative spirit'</i> and <i>'leadership skills'</i> , technical <i>'writing skills'</i> and <i>'objectivity'</i> .
Knowledge	<i>'Built environment'</i> , specifically the interface between the built and natural environments, <i>'environmental and conservation ecology'</i> knowledge, as well as <i>'business'</i> , <i>'town and regional planning'</i> , and <i>'sustainable development'</i> .
Networks & connections	Spheres within government, public institutions, and the field of conservation.

The CWBR has four full-time staff, including the CEO, coordinator, and project leaders whose work hours are flexible. These staff have specific responsibilities or commitments which need to be delivered upon. This generally entails a 40-hour week but can be much longer – depending on what is required. There are five to eight part-time workers depending on project funding, including administration, project leaders, advisors and facilitators. Opportunities for training exist, both formal and informal, for example the coordinator completed a virtual BR management course. Participants believe important full-time positions for the CWBR that should be filled include a CEO, coordinator, administrator, project leaders and a social media manager.

Board meetings, held quarterly, are a place for the BofD and CEO to plan, discuss and vote on decisions. Two thirds (4/6) of the BofD must be present for board meetings, including the secretary, chairperson and CEO, and all present need to vote. Decision-making is perceived to be an informal process and *"the board meetings are a space to have conversations about things – to give input. But I wouldn't say there's a formalized decision-making structure ... I think it's quite loose"*. Meeting agendas are shared beforehand allowing items to be attached. Ad hoc meetings occur regularly, for example with municipalities – allowing decisions to be made quickly. The CWBR has what is called an *'open phone policy'* – meaning the CEO calls on individual directors depending on which portfolio expertise are needed to make decisions quickly. There is trust between the CEO and directors and often decisions are made independently of the BofD and discussed at a later stage. The CEO leads CWBR management meetings, a place to provide updates and work through programs, on a weekly basis.

In these meetings there are usually 14 to 22 individuals depending on absentee numbers.

With regards to decision-making around CWBR projects, decisions are not made without the local communities. CWBR *“spend of lot of time in the communities”* attending community meetings through invitation where there is open dialogue in ‘co-creating’ projects and solutions. Through these relationships being built, communities can regard the CWBR as a channel to the municipalities when they cannot get answers themselves, specifically regarding issues of housing, education and access to land.

There are no memberships, however the CWBR has a volunteer program. There are generally six to eight volunteers (maximum of 14) who are either local or international. Volunteers help with ongoing projects or initiate new projects depending on their skill set, for example the *‘drone project’*. The CEO often meets with the prospective volunteers beforehand in attempt to match the volunteers with specific projects or needs. It is clear that *“BRs couldn’t run as well as they do without volunteers and people being able to give of themselves”* – relying on many voluntary hours and the goodwill of people, including the BofD.

CWBR personnel have similar motivations for joining and continuing their service, including their personal interest ( $f=6$ ), enthusiasm and enjoyment, and appreciating the holistic and inclusive approach of BRs ( $f=5$ ), being able to give back to the community ( $f=4$ ), the dynamics of what the role entails ( $f=3$ ), prospects of personal growth and opportunities ( $f=3$ ), believing that these are good people doing good work ( $f=2$ ) in their local environment, and caring for the environment ( $f=2$ ).

The CWBR has a linked youth board (est. 2021), situated outside the primary board which supports project implementation. The youth board consists of youth from different local communities and is regarded as a *“very powerful way of embedding [the CWBR] in communities”*. It has been an experimental process and seen by some as relatively unsuccessful and therefore to be evolved into a youth committee or forum.

Supporting the effectiveness of the CWBR is the technical advisory and technical committee. The advisory consists of individuals with knowledge on sustainable living and UNESCO-MAB. The committee, which fulfils an advisory role to the board, consists of critical stakeholders, for example the local municipalities, CWDM, Department of Agriculture and CapeNature. The committee meet once or twice a year

and at the annual general meeting (AGM) to share knowledge and information, and feedback on activities. A participant summarizes the experience below:

*“It’s almost like stakeholder involvement... these are all the various stakeholders that are interested in the CWBR, and they need to be represented ... on the technical committee to make sure that they are happy with the direction [the CWBR] is going. ..., most of the time the technical committee is made up of people that are coming from organizations that are already doing things. It should almost be for them to come along and tell us what they’re doing. Then we can find out where we can help them a bit more, which does happen. But generally, those meetings, there’s a lot of very quiet people there.”*

#### **4.4.3 Envisioned Role: Present Role in the Landscape**

The CWBRs current role within the larger SES is grouped into three themes, including socio-economic development, collaborating with, and coordinating actors in the landscape, and conservation. The CWBRs **collaboration and coordination** role is to ‘*support and facilitate*’ actors in the landscape. Participants perceive the CWBR as an organization to network, connect actors and to help those in need. This enables the CWBR to partner with relevant actors when problems arise. A participant stated, “[the CWBR] *will look at the problem. Diagnose it. What partners do [the CWBR] need to sort that out*”.

**Socio-economic development** has been their focus because of the disparity in education in South Africa and the need to understand issues to solve them. Their educational programs have been successful and gained them support. There is an attempt to ‘*align with government departments*’ and ‘*fill the gaps*’ with their projects, for example early childhood development (ECD) a niche of the CWBR. Their ECD program has put teachers through training and offered learning experiences with Iziko Museums. The CWBR offer other forms of training for all interested parties, for example woodwork to upskill the local communities. The CWBR conducts environmental education and outreach programs with the youth and uses a mobile science unit (trailer) to promote conservation at schools.

The CWBRs **conservation** role is fulfilled through partnerships with several organizations, for example invasive alien plant (IAP) clearing with WWF and Idas Valley Trails, and with universities to fulfil their role in science and research. The CWBR have developed strategic partnerships with several universities including, University of Stellenbosch, University of Cape Town – specifically their African Climate Development Initiative, University of Leuven, and the Flemish Institute for Technological Research in Belgium. The CWBR support provincial government, WWF

and CapeNature in research and monitoring through baseline data collection with the use of drones – a project initiated by a volunteer. There are citizen science projects, for example their Source-to-Sea BeResilient project which focuses on conserving rivers and environmental education.

#### 4.4.4 Envisioned Role: Challenges

Three themes emerged as challenges for the CWBR to fulfil its envisioned role, including the lack of resources (Table 4.2), limited support from national government (Table 4.3), and community stakeholders who are unaware of the CWBR or dealing with other social issues (Table 4.4). These challenges are discussed further below.

**Lack of resources (f=7)** is associated with the lack of funding, specifically operational funding which influences human resources and capacity. The CWBR is believed to be over reliant on few human resources. Partnering with other BRs to source funding seems to be an underutilized strategy.

**Table 4.2:** Resources as a challenge for the Cape Winelands Biosphere Reserve in fulfilling their envisioned role

Theme	Example Quotes
Lack of human and financial resources	<p><i>“Funding is a major challenge. Most of the guys are doing it for the love of conservation.”</i></p> <p><i>“[The CWBR are] still very reliant, heavily reliant on [the CEO] and [the coordinator]. There’s a need to invest in human resources for the organization. Which comes along with funding questions.”</i></p> <p><i>“There’s scope for more, but it requires a larger dedicated team and operational funding.”</i></p> <p><i>“I don’t understand why the Western Cape [BR] Forum doesn’t get together more. You know because the power of collaboration. I know it from business. I mean, there is big funding out there, but it’s too big for one biosphere, but all 5 biospheres. We can go for the 50 [or] 100-million-europroject. But working in silos, we can’t do that.”</i></p>

**Limited government support (f=4)** uncovers a perceived lack of MAB program governance within South Africa, and therefore believed to be a lack of clarity in defined roles, structures and responsibilities within the ‘chain of command’, i.e. national MAB governance down to CWBR. Participants believe national government are hesitant in

allocating resources to the Western Cape for what is perceived to be political reasons<sup>8</sup>. There is the perception that their engagement is superficial. It is believed there are structural challenges with regards to government involvement, for example, limited mechanisms to transfer funds, and believing that interacting with BRs is not part of their functional responsibility, *i.e.* no mandated engagements.

**Table 4.3:** Government as a challenge for the Cape Winelands Biosphere Reserve in fulfilling their envisioned role

Theme	Example Quotes
<p>Limited government support</p>	<p><i>"It's frustrating that our system, our top-down structure – we don't have leadership on top."</i></p> <p><i>"Again, who does the CWBR report to? What is our relationship? What are they doing? What is our contribution to helping them achieve their objective? Now for me that's not defined at all. We don't see any real government, either of provincial or national, participation really in terms of what to do. There's got to be a chain of command in all these organizations. Who are you? What are you doing? Why are you doing it? Who's effectively in charge of the whole thing? Power is what, we have no power. Things are devolved down to us to do, and to achieve what? To me those are not well defined, properly defined that people can understand or support for that matter. We have no support ... in real terms from national or provincial government."</i></p> <p><i>"Treasury doesn't want money to come to the Western Cape. I mean, I've had that from [XXX]."</i></p> <p><i>"[During technical committee meetings the CWBR] get a 'representative' from the organization coming along. But not necessarily the right representative. It gets delegated down till somebody gets sent to you. That's not always useful."</i></p> <p><i>"I know they had challenges with the legislation ... they couldn't even transfer funds. I think 10,000 rand for reports. We compiled the report, a ten-year report. They said that that they will fund it, ... they couldn't fund it. They don't have a mechanism of transferring funds..."</i></p> <p><i>"Guys at local government, if they have certain KPIs [key performance indicators], they focus on that. If the CWBR invites them, they just say, no, I'm not available... the person, individual at that organization must have similar interests to get them in."</i></p>

---

<sup>8</sup> At the time of this research, prior to the May 2024 National and Provincial elections producing no outright majority winner, South Africa's national government and the Western Cape provincial government were led by opposition political parties.

**Awareness and communities (f=3)** is associated with the awareness of the CWBR and the concept of BRs, getting people to understand issues which are not their immediate priority, as well as challenging community dynamics due the presence of gangsters. Participants believe the current schooling system does not provide for many extracurricular activities which makes it challenging for the CWBR to engage with the youth.

**Table 4.4:** Awareness and communities as a challenge for the Cape Winelands Biosphere Reserve in fulfilling their envisioned role

Theme	Example Quotes
Awareness & communities	<p><i>"It's not really well known to the public, what we do, that we are there and we do all these things. I mean, the general public is not aware of us. Maybe in Franschhoek, with other projects there. People would know about it. In Stellenbosch, if you say BR. They say, what is that?"</i></p> <p><i>"Getting communities to understand science, and climate change, and conservation is not easy.... hungry stomachs have no ears."</i></p> <p><i>"We've got a difficult biosphere in that a lot of the community is gang controlled."</i></p> <p><i>"It's very, very difficult to get to the kids, which I think is probably one of the most important things. Especially the way things are going now. If you don't have any understanding of the natural world, you're going to have absolutely no desire to do anything about it."</i></p>

#### 4.4.5 Envisioned Role: Effectiveness

There are two factors which have led to the CWBR success, including leadership and the quality of staff. Participants suggested it is the continued perseverance and voluntary commitment of the team. Other factors include the leadership, like-mindedness, personalities and networks within the team involved. Participants attributed much of the success of the CWBR to the CEO. One participant stated: *"If it wasn't for [the CEO], none of this would have happened. None of it would happen. [The CEO is] a rather phenomenal person"*. Some credited the partnership between the CEO and coordinator together with the relaxed and flexible nature of engaging with the team. When asked about instrumental positions which have increased the CWBRs effectiveness, one participant believes success has come from the team's passion and commitment to meaningful work, while another explained that it is more the types of people and personalities involved and not necessarily their position (see below).

*“The structure has got nothing to do with it. If you don't have the right people there. Or if you do have the right people, you can have any structure, the structure isn't the issue. It's the personalities and whether they [are] prepared to do what they're supposed to do or not, you know. You can have the best structure in the world and a bunch of 'palookas' sitting in it and it's still not going to work.”*

#### **4.4.6 Stakeholders and Critical Relationships**

Stakeholder participation occurs “*on a case-by-case basis*” and could include any actors in the CWBR of which CWBR stakeholder mapping has identified for example provincial government departments, non-governmental organizations, community forums and water catchment area working groups, local businesses, community organizations and sports clubs. One participant believes partnerships cannot be forced and that one must attract them by providing value, which the CWBR have done in their educational domain. Participation from all interested and affected parties is encouraged through blog posts on their website, newsletters, word-of-mouth, and via phone call. Participation levels are increasing – several participants said that they have had increasing attendance at their AGMs.

#### **4.4.7 Stakeholders and Critical Relationships: Participation Challenges**

Participants reported challenges with regards to stakeholder participation from local government: there is superficial engagement and lack of perceived significance of the CWBR. Furthermore, some stakeholders are perceived to be prioritizing their own agendas, or that the CWBR does not feature on the stakeholder's agenda, or within their professional ‘*functional responsibility*’ unless the individual has a personal interest.

Stakeholder participation from local and national **government (f=4)** is believed to be missing despite being considered critical partners. Participants believed that municipalities are disinclined to play an active role in CWBR engagement/participation, with room for more engagement. Furthermore, participation from some key **conservation bodies (f=2)** are believed to be missing. The absence of these stakeholders is a ‘*limitation*’ for the CWBR. The CWBR would like more participation from the **public (f=2)** particularly youth groups.

#### **4.4.8 Stakeholders and Critical Relationships: Institutional Overlap and Disruptive Stakeholders**

Institutional overlap occurs with other actors in the landscape in terms of their mandate, for example CapeNature and municipalities. Participants believe the challenge therein is to reduce duplication, and resource competition. Participants mentioned the opportunity is to form partnerships, pool resources and collaborate – ‘*dovetailing*’ projects with CapeNature, for example. Participants were unsure whether such overlap enables or constrains ongoing/further government support. Participants believe it depends on who is involved as one needs a shared vision and the ‘*collaborative spirit*’, while another said that it could enable support, however staff turnover is a challenge when it comes to building long-standing relationships.

Participants perceive some municipal councilors to be disruptive in their attempts to politicize the CWBR and that even directors have the potential to be disruptive by trying to push their agendas and in some way ‘*hijack*’ the CWBR. Furthermore, some government departments are believed to be disruptive and of little help to the CWBR – in some cases perpetuating and exacerbating issues, for example land invasions.

#### **4.4.9 Lessons Learned to Share Across the World Network of Biosphere Reserves**

When asked what lessons the CWBR would share with emerging or newly established BRs, two themes emerged (Table 4.5), including the **type of people (f=6)** involved. Participants believe it is necessary to “*get a nice core team together*” and a good CEO or leader. There were also lessons around **BR infrastructure (f=4)**, for example a physical space is beneficial to have, setting a clear plan (strategy or business plan) early on, to find a niche, and if there are overlaps with other actors look to build partnerships and collaborate. Partnerships and continuity of funding are considered the ‘*lifeline*’ of a BR. A participant advised to try form these early and develop the BR around the personalities involved.

**Table 4.5:** Lessons learned by the Cape Winelands Biosphere Reserve to be shared across the World Network of Biosphere Reserves

Theme	Theme Description	Example Quotes
Type of people	Participants referring to the directors & executive management	<p><i>“Some active individuals who are enthusiastic and make their time available to their own societies... I think the important thing is to identify two or three people who are really committed and prepared to put in time.”</i></p> <p><i>“Get yourself a good CEO.”</i></p> <p><i>“You need a charismatic person that's willing to take on the overall role. Then for him or her using your own personal charisma to persuade other people to join this enterprise.”</i></p>
BR infrastructure	Funding, partnerships, niche, physical space, & structure	<p><i>“I think having the [physical] space [headquarters], where volunteers ... can stay. There's an office ... Everything is in one place... and I think that's valuable... it's really the ideal scenario. You've got someone who is setting up and championing something like this. If they have ... the physical space that they're working in, that can become the HQ... It just makes things a lot easier.”</i></p> <p><i>“Find your niche, ... [where] you can have an impact. It's about just searching for that, networking, understanding the landscape.”</i></p> <p><i>“I think having ... stability of funding in place, I think there's something linked to that around kind of international partnerships and relationships. I think that's something which [the CEO] has done quite well. It's really been a lifeline to the organization, in many ways. I think ... for BRs in the Global South, establishing partnerships and relationships with either funders and/or other BRs in the [Global] North as a way of trying to kind of create some sense of financial stability.”</i></p> <p><i>“... the [BR] is dependent on funding and the personalities that drive it. If the personalities that drives the BR, if they do not conform to a rigid system, a rigid structure. If it's easier for them to implement without that structure, then I just think it should go with the flow. It shouldn't be overregulated in terms of [a] set structure.”</i></p>

## 4.5 DISCUSSION

### 4.5.1 Envisioned role of the Cape Winelands Biosphere Reserve and their alignment with UNESCO policy

The vision of the CWBR is *“to achieve an exemplary connection between people and nature, in a secured comfortable and sustainable living environment”* (CWBR 2022) and being a model site as envisioned for BRs (Clüsener et al. 2021). The findings suggest that the CWBR’s internal vision is for greater recognition and coordination across the landscape to fulfil their role in *‘collaboration and coordination’*, operating as

a 'relational hub' (Cockburn et al. 2020b). These hubs actively develop human-human, *i.e.* collaboration, and human-nature connections, *i.e.* stewardship (Cockburn et al. 2020b). This role is envisioned for other BRs in South Africa, for example Kogelberg (KBR) (Klaver et al. 2024) and the Kruger to Canyons BR who perform as a '*collaborative platform*' (Schultz et al. 2018). The CWBR prioritizes healthy natural environments in which people can connect with and derive benefits from. Furthermore, to ensure the sustainability of the BR through overcoming resource use challenges.

To achieve their vision the CWBR do not use MAB guidelines as prescriptions in a top-down manner, but rather drive their implementation to deal with emergent local pressures identified by the local population, that broadly supports the goals for a BR, *i.e.* work within the framework of the three core functions of a BR (UNESCO 1996). Their approach to fulfilling the BR functions is to focus systematically on one function at a time. This provides a good lesson for dealing with limited resources but can also increase social acceptance and support by delivering positive outcomes (Lockwood et al. 2010). The support the CWBR receive from their partners is believed to be a testament of their success.

#### **4.5.2 Governance model and structure adopted by the Cape Winelands Biosphere Reserve**

The CWBR implementation is structured around what the Technical Guidelines for BRs (UNESCO 2021) refers to as the 'NGO Model'. This model is uncommon in Africa yet prevalent amongst BRs in South Africa (UNESCO 2015; Department of Environmental Affairs 2016; Hedden-Dunkhorst and Schmitt 2020). Key UNESCO-MAB policy identifies that the NGO model allows for more effective action across zones whereas the 'authority model' provides better "control" of the core (UNESCO 2015). Elsewhere in Africa, BRs are also implemented in a top-down fashion through the authority model (UNESCO 2015; Hedden-Dunkhorst and Schmitt 2020) which is dependent on government ministries who are primarily responsible for conservation in core zones (UNESCO 2015; UNESCO 2021). This prioritization may translate to managing BRs as traditional protected areas without consideration for buffer and transition zones – possible symptoms of the pre-Seville Strategy designation (Coetzer et al. 2014; Van Cuong et al. 2017).

In South Africa, however, despite being nominated by national government (Pool-Stanvliet 2014), BRs have mostly been designated through bottom-up processes (Pool-Stanvliet and Coetzer 2019) and are independent, apolitical non-profit organizations (NPO) (Department of Environmental Affairs 2016) which does provide BRs with legal existence (Borsdorf et al. 2014). Core areas are protected by public authorities, in this case CapeNature, while other institutions operating in the buffer and transition zones all have their own leadership structures. In terms of legislation, South African BRs are not regulated by law and their management plans are not legally binding, however the three core functions are recognized and reflected in the country's legislation (Department of Environmental Affairs 2016) with additional regulation of the NPOs by the Companies Act (Act 71 of 2008) (Republic of South Africa 2008). This is like, for example, Swedish BRs (Elbakidze et al. 2013), Fontainebleau-Gâtinais BR in France (Borsdorf et al. 2014) and the Dana BR in Jordan (UNESCO 2021). In the context of the CWBR, this model appears beneficial in that it may support BRs increased autonomy and can balance collaboration equally between state and non-state actors (Department of Environmental Affairs 2016; Pool-Stanvliet and Coetzer 2019).

Under the NGO model, the BR acts as a platform to bring together the interests of local stakeholders and is designed for collaboration, negotiating with other landscape actors as implementers of decisions made by the platform (UNESCO 2021). The CWBR's BofD consists of individuals reflecting diverse stakeholder groups and institutions (UNESCO 2015; Hedden-Dunkhorst and Schmitt 2020) which is believed to be a good strategy for better cooperation amongst actors in the BR (Stoll-Kleemann and O'Riordan 2018) and avoids favoring narrow interests (Roldán et al. 2019). Doing so allows the CWBR to fulfil their collaboration and coordination role in the landscape – taking on the role of supporter and facilitator – as a *'platform'* which brings together diverse stakeholders to deal with everyday challenges and aligning with UNESCO's (1996) broader goals of fostering collaboration and coordinated efforts across BRs. As Müller (2014) and Stoll-Kleemann and O'Riordan (2018) describe the NGO model for BRs, the CWBR are not necessarily the implementers, but rather more often supporting actors in the landscape which are in need or will identify areas in need of action. This is a model in which many actors govern the SES and what Kooiman et al. (2008) and Edelenbos and van Meerkerk (2016) refer to as interactive governance.

Interactive governance is important in this context as it can help deal with resource shortages and build resilience, *i.e.* the perceived lack of government support, human and financial resources, and helps to develop integrated responses and de-fragment actors in the landscape (Armitage et al. 2012; Müller 2014; Edelenbos and van Meerkerk 2016; Berkes 2017).

The CWBR is led by a BofD, which respondents acknowledge lacks gender and racial representation, although has recently begun to diversify through the addition of younger directors, and a female director – diversity is believed to increase board effectiveness (Bradshaw et al. 1998; Petrovic 2008; Ortega-Rodríguez et al. 2023). Directors do not have a fixed term of service, and a few have been serving the CWBR since its inception which benefits the BR in terms of its continuity and maintaining institutional memory. Skills, knowledge, and experience take time to replace, thus a consistent BofD with the addition of younger directors helps to transfer institutional knowledge, bring in new knowledge, ensure organizational memory, and can help mitigate corporate amnesia (Kransdorf 1998; Harvey 2012). Without the strategic addition of new directors (due to natural processes of staff turnover), the CWBR could however risk experiencing a static board in the long term in which new ideas, knowledge and perspectives are not incorporated.

Strategically selecting directors based on their expertise, knowledge, personal skills, and motivations for the company are important board qualities (Petrovic 2008). Directors are purposively selected depending on the skills needed, but also to prevent the possibility of board members '*hijacking*' the organization by driving their personal agendas. Lessons from this model are to have a small board which offers an oversight role and is not involved in the implementation but rather connected to other organizations operating effectively in the landscape. Additionally, these need to be individuals which have an interest and are driven by some level of altruism given that participation on the board is voluntary.

There is significant overlap in the motivations of the board and their vision for the BR – described as '*like-mindedness*', and which is believed by participants to be a factor contributing to their effectiveness. Although this may increase the risk of groupthink (Petrovic 2008), a shared vision and limited internal conflicts have been found to increase the effectiveness of the board (Bradshaw et al. 1998; Ortega-Rodríguez et al. 2023).

Good meeting practices are considered essential for board effectiveness (Bradshaw et al. 1998; Ortega-Rodríguez et al. 2023). The CWBR have regular meetings. Board meetings, held quarterly, are described as a more informal setting, are a place to plan, discuss and vote on decisions. The BR management meet on a weekly basis which allows staff to be up-to-date and provide feedback on their programs. Importantly, ad hoc meetings and an *'open phone policy'* between the CEO and BofD has developed a level of trust and allows decisions to be made quickly and without having to wait for the following meeting. This is consistent with Petrovic (2008) who states open and frequent communication contributes to building a shared vision and trust.

The structure of the CWBR is what Bradshaw et al. (1998) describes as an emergent model – characterized by networks, flexibility, and organic innovation. The CWBR structure grew organically and evolved to deal with new challenges, information, and requirements. However, this model requires strong and charismatic leadership (Bradshaw et al. 1998; George and Reed 2017; Stoll-Kleemann and O'Riordan 2018), and much of the BRs effectiveness and success is attributed to their operational leader, the CEO. However, the overreliance on one individual, the leader, comes with potential risk and consequences when the leadership changes.

Much like the NGO and emergent models which are *'project-orientated'* and *'issue-driven'* (Bradshaw et al. 1998; UNESCO 2021), the CWBR interacts with stakeholders and establishes partnerships on a *'case-by-case basis'* much like its neighboring KBR (see Klaver et al. 2024) to address their most pressing needs. These stakeholders include a diverse group of provincial government departments, parastatals, NGOs, forums and working groups, local businesses, community organizations and sports clubs, while working particularly closely with local communities. This stakeholder engagement philosophy is to *'find out who's battling and help them to do better'* through support and facilitation, or to *'fill the gaps'* or resource and capacity shortfalls within their local environment. The CWBR frequently engage with local communities to co-create projects and solutions for challenges which they face. For example, ECD emerged as a need in the landscape. This agility to respond to challenges and create opportunities through partnerships enhances adaptive capacity (Lockwood et al. 2010). According to George and Reed (2017), collaborative partnerships are better equipped to develop and implement innovative solutions to problems by sharing knowledge and pooling resources. Although the assumption is that higher levels of

participation, according to Arnstein's (1969) ladder would increase BR legitimacy to greater degrees, in Roldán's et al. (2019) survey across 92 BRs they found there is no linear relationship between participation and legitimacy, and that *any* levels of participation increase BR legitimacy amongst local stakeholders. Moreover, consistent engagement and dialogue with stakeholders, as reported numerously in the Seville Strategy (UNESCO 1996), is fundamental to BRs as they are "*not only a designation or an international recognition, [but] a long-term commitment, a responsibility, a social, economic, and ecological project, that must be supported and carried out by its inhabitants*" (Bouamrane et al. 2016:6).

#### **4.5.3 Implementation challenges in the Cape Winelands Biosphere Reserve**

NPO governance and operation can be weakened by a lack of authority (Van Cuong et al. 2017). South African BRs have no '*legal teeth*', apart from the formally protected core zones, and are therefore implemented through '*soft law*' (Pool-Stanvliet 2013; Pool-Stanvliet and Coetzer 2019), largely relying on adherence to national policy around linked matters of enforcement and/or management. However, social acceptance and support for the BR can be increased through stakeholder participation (Van Cuong et al. 2017) as well as effectiveness in producing outcomes (Lockwood et al. 2010) which may serve their recognition and coordination vision, and collaboration and coordination role.

Government involvement and commitment is critical for the BR success (Van Cuong et al. 2017). Although BRs are supported by national government during their nominations, South African BRs must largely find their own way to implement MAB (Pool-Stanvliet 2014). The CWBR, like Pool-Stanvliet (2013) found, lacks significant support from the national government and interest from local municipalities – noted by respondents as critically missing stakeholders, as opposed to better engagements with private stakeholders and communities. This is not particular to the CWBR case, and it has been found that in South Africa MAB faces challenges integrating vertically with national authorities and horizontally at the local level (Pool-Stanvliet 2014). Political buy-in is necessary for the long-term success of BRs (Coetzer et al. 2014), however the technical committee faced challenges in building reliable and consistent relationships between local municipalities and the CWBR. This is an important consideration for future action since the CWBR regards itself as a channel between the local communities and municipalities. Vhembe BR, for example, has

established several *ex officio* non-voting director seats on their BofD (Hedden-Dunkhorst and Schmitt 2020). Doing similarly could result in more frequent engagement with the CWBR's missing local government stakeholders – frequent engagement believed to improve stakeholder participation and support (Roldán et al. 2019).

Sustainable financial resources, or the lack thereof, can result in BR success or failure, and particularly a challenge for innovation, collaboration, and knowledge sharing (Van Cuong et al. 2017). The CWBR, like other South African BRs (Pool-Stanvliet and Coetzer 2020), lack financial resources, specifically operational funding, impacting on their ability to employ full-time staff. It is believed the CWBR could do much more if it were better resourced. Azadi et al. (2021) found that BRs in Africa receive very limited amounts of funding from government partly due to financial management systems hindering the process. This is the perception of the CWBR, which in some cases could not receive funding, for example to compile the ten-year Periodic Review (a UNESCO reporting requirement; UNESCO 1996), because of the mechanisms in place. Several lessons have emerged from this dilemma including building operational funds into project costs, service-level agreements for human resources and using overlaps with other actors in the landscape to pool resources. Taking advantage of the overlaps requires a shared vision and limited staff turnover as it could be detrimental to building/maintaining long-term relationships (Aunger et al. 2022). Although being under-resourced seems to foster innovation, human and financial resources are a necessity for continuity, competence and building trust (Stoll-Kleemann and O'Riordan 2018).

Awareness and communication are important factors determining the success or failure of BRs as it makes the BR concept a reality to those living within it and thereby enabling its implementation (Coetzer et al. 2014; Van Cuong et al. 2017). However, research elsewhere has indicated that BR inhabitants find the concept and its terminology difficult to understand (Pool-Stanvliet 2014). Social media is a useful way to support the dissemination of information, market the BR and build awareness (Coetzer et al. 2014; Van Cuong et al. 2017), which is a way in which the CWBR share news and project updates, and to encourage participation from their stakeholders – although it is believed that their interface with the public needs improvement. The CWBR is well-known in areas where their projects occur, however there are areas

beyond, where the BR is still unknown. Increasing stakeholder engagement at any level, whether informing or delegating power (Arnstein 1969), is beneficial to BRs. Roldán et al. (2019) found BR stakeholders value receiving information in addition to providing inputs, especially project outcomes, which can result in better participation levels. Therefore, the CWBR would find it beneficial to continue their commitments to updating their local stakeholders regularly through various avenues – which is likely to have been key in gaining increased engagement and attendance at their stakeholder meetings.

Case study research is often criticized for non-generalizable findings (Bryman 2012). However, the aim of this research was to provide a contextualized understanding of how the CWBR interpret and implement global MAB policy within their local conditions. Thus, the sample was purposefully selected using specific criteria, which allowed an ‘information rich’ case to be built (Palinkas et al. 2015). The aim of this research was to fill the need for understanding the institutional context and governance strategies of BRs in the landscape in which they are found (Coetzer et al. 2014; Ferreira et al. 2018; Baldwin-Cantello et al. 2023; Barraclough et al. 2023). Despite these results not being directly transferable to other BRs, the need exists to understand and compare lessons learnt from BRs to improve the implementation success of MAB (Coetzer et al. 2014; UNESCO 2017). A strength of MAB, which is the absence of blueprints for implementation, offers an opportunity for place-based learning. Case studies such as this offer lessons and experience in implementing MAB. Future research should consider developing similar case studies in other BRs and “*to communicate the experiences and lessons learned, facilitating the global diffusion and application of these models*” (UNESCO 2017:52) to ultimately determine what works, for who, and why? Furthermore, research could additionally explore stakeholder perceptions and expectations of BRs to develop a holistic understanding of the BRs.

#### **4.6 CONCLUSION**

The CWBR provided an interesting case as it has had to adapt to various iterations of MAB policy. This has meant that their implementation has been driven in response to emergent local needs and landscape priorities. As a result, any overlaps with the SDGs have largely been unintentional.

The CWBR strategy has been to focus on one core function at a time, become effective, achieve success, and thereafter expand efforts to other core functions. Their immediate priority had been their socio-economic development function. Targeting this function first may have alleviated pressures from external factors affecting their ability to successfully implement the program. However, achieving success in this area has also resulted in increased legitimacy, ability to build a brand and attracted international partnerships which have been fundamental for the sustainability of the organization. An instrument in their success has been the type of people involved, strong and charismatic leadership and people willing to contribute to society through goodwill – a lifeline for the BR.

The CWBRs operational challenges – limited support, financial and human resources, and general awareness of the BR concept necessitate an NPO interactive governance model. This enables the CWBR to perform as a relational hub in the landscape relying on partnerships, building on overlaps, and interacting with, and de-fragmenting actors in the landscape to create opportunities for collective action across the BRs landscape actors.

There are no prescriptions for MAB implementation in individual BRs with this intentional program flexibility providing an opportunity for place-based learning-by-doing for broader benefits. The research presented here contributes to a clearer understanding of how MAB is interpreted and implemented within a local African context. The place-based implementation of MAB allows the CWBR to evolve and adapt to local pressures. These in-depth learnings can aid MAB implementation elsewhere and provide insights in sustainability science. Lessons learned from the CWBR can be useful in other cases, and mechanisms used by the CWBR may be suitable for application for BRs operating in similar contexts, especially in the Western Cape of South Africa where four other BRs are located.

Available BR literature lacks in-depth knowledge from individual BRs and is skewed towards the Global North, leaving the Global South under-represented – specifically Africa. This research, although acknowledging the limitations of the chosen methodology, attempts to remedy the needs in BR literature by offering the CWBR as a Global South case study which shares knowledge and lessons of implementing the MAB. South Africa, although relatively new signatories to MAB, has been a part of the MAB network for more than two decades (Pool-Stanvliet and Coetzer 2020), and case

studies such as this can offer valuable lessons in terms of practically implementing MAB in the country. The implementation of MAB could benefit from integrated comparative learning from in-depth BR case studies and therefore future research should follow suit to develop several globally representative 'cases' to share experiences and lessons learnt through the *learning-by-doing* approach of MAB.

## CHAPTER 5

### Preface

Collaboration is increasingly being recognised as a necessity for effective conservation efforts across multifunctional landscapes. To improve and better understand collaborative initiatives within SES, scholars have put together methodologies to help guide studies such as the one presented. This chapter answers Objective 2 of this research which aims to understand how landscape-level collaborative conservation initiatives support leopard conservation across a multifunctional landscape. Further, it presents a paper prepared for submission to *Conservation Science and Practice*. The CMO framework guided this study while using the leopard to explore how and why collaborative initiatives, such as the BP, operate to support Cape leopard conservation across the Boland BRs.

### **Exploring Collaborative Conservation in a Multifunctional Landscape: A case study of the leopards in the Boland, South Africa**

#### **5.1 ABSTRACT**

The Cape leopard (*Panthera pardus*) is the last remaining free-roaming apex predator in the Western Cape province of South Africa. The species occurs across multifunctional landscapes with diverse land uses represented which necessitates a collaborative and landscape-level conservation approach. Outcomes of conservation collaborations depend on the mechanisms used and the context in which they are implemented. Explored through the context-mechanism-outcome (CMO) framework, which facilitates global cross-case comparisons and learning from diverse conservation initiatives, we use the Boland Project (BP) led by the Cape Leopard Trust (CLT) as a case study. We used the CMO framework to analyze data from interviews, surveys, and documents. The study highlights the role of strong leadership, prior collaborative networks, and willingness for landscape-level collaboration in achieving conservation goals and leveraging research for adaptive management and public education. The BP highlights the benefits of partnerships for biodiversity conservation, bridging the gap between public conservation bodies and private landowners. Through their scientific approach, the CLT play a crucial role in providing accurate scientific data on leopards and biodiversity that can inform conservation management. Effective leadership was crucial for initiating collective action, building trust, and coordinating

conservation efforts. The BP emphasized shared learning, knowledge sharing and capacity building, ensuring sustainability of conservation activities and supporting adaptive conservation action, influencing broader conservation actions beyond the project's domain. Insights from the BP had broader conservation implications, guiding conservation efforts at larger scales, demonstrating how local collaborations can have far-reaching impacts.

## 5.2 INTRODUCTION

Ecological challenges often cross scales and boundaries in multifunctional landscapes (Bergsten *et al.*, 2014). Therefore, successful natural resource management and governance has increasingly become collaborative (Kark *et al.*, 2015; Clement *et al.*, 2020). This is acknowledged as the *collaborative turn* (Cockburn *et al.*, 2020a). Collaboration brings together resources to address complex issues collectively, enhancing conservation effectiveness, cost-efficiency, adaptive capacity, and knowledge expansion (Clement *et al.*, 2020; Cockburn *et al.*, 2020a). Additionally, collaboration ensures shared accountability (Hahn, 2011) and is considered necessary in the developing world where wildlife often shares human-dominated landscapes and the state lacks sufficient capacity (Redpath *et al.*, 2017). In South Africa, where important globally recognized biodiversity often extends beyond formal protected areas (PAs) (Cowling *et al.*, 2003; Barendse *et al.*, 2016), public-private partnerships are crucial for conservation on private lands. Typically led by non-governmental organizations (NGOs) (Barendse *et al.*, 2016; Hanson *et al.*, 2016), these collaborations, comparable to other effective area-based conservation measures, help ensure long-term benefits for in-situ conservation efforts (Marnewick *et al.*, 2021).

*Working landscapes conservation* refers to managing social-ecological systems (SES) shaped by human activities like farming, with the aim of sustaining biodiversity, ecosystem services, and building resilience (Kremen and Merenlender, 2018; Western *et al.*, 2020). Shifting biological conservation from 'on-site' to 'off-site', *i.e.* from within to outside of PAs, has been recognized since the late 20th century (Western *et al.*, 1989; Pimental *et al.*, 1992). Furthermore, it is increasingly recognized that multifunctional conservation landscapes play a critical role in achieving global biodiversity targets, inclusion and justice in conservation (Diaz *et al.*, 2019; IPBES, 2019; Obura *et al.*, 2021; CBD, 2024). The urgency to conserve biodiversity across multifunctional landscapes was highlighted by the failure to meet the Convention on

Biological Diversity (CBD) target of achieving a significant reduction in biodiversity loss by 2010 (Butchart *et al.*, 2010), resulting in renewed emphasis on the CBD's other effective area-based conservation measures strategy (Maxwell *et al.*, 2020).

Literature on collaboration in SES covers the interlinked themes of collaborative governance and management, adaptive co-management, and adaptive governance (reviewed in Schoon *et al.* (2021). It highlights two key characteristics: decision-making in complex, uncertain contexts, and institutional fit, ensuring actions align with ecological processes to avoid scale '*mismatch*' (Bergsten *et al.*, 2014), '*misfit*' (Ekstrom and Young, 2009; Sternlieb *et al.*, 2013) or '*problem of fit*' (Plummer and Hashimoto, 2011). Mismatches arise when management actions or ecological processes span different scales or governance boundaries (Bergsten *et al.*, 2014). These challenges often necessitate collaboration among multiple actors to effectively govern at appropriate scales (Bergsten *et al.*, 2014).

Outcomes of collaborative initiatives depend on how implementation context interacts with various collaboration mechanisms, *i.e.* various actions, programs, practices and processes of collaboration (Lauber *et al.*, 2011; Schoon *et al.*, 2021). Methodologies have evolved to understand this interplay in initiatives (Cockburn *et al.*, 2020; Schoon *et al.*, 2020; 2021). This case study builds on the original work of Schoon *et al.* (2020; 2021) and Cockburn *et al.* (2020a), by exploring the Boland Project (BP). Using the context-mechanism-outcome (CMO) as a framework, it examines the BP's context, implementation mechanisms, and resulting outcomes.

The BP, led by the Cape Leopard Trust (CLT), is a compelling case study for several reasons. The BP spans two UNESCO biosphere reserves (BRs), the Kogelberg (KBR) and Cape Winelands (CWBR). These are people-centered, multi-use conservation designations that are positioned as relational hubs (after Cockburn *et al.*, 2020b) to enable collaboration and coordination amongst a diverse actor network around sustainability issues (Barraclough *et al.*, 2023; Klaver *et al.*, 2024). Cape leopards (*Panthera pardus*) are the last free-roaming apex predators in the Western Cape, South Africa, existing in low numbers and occupying extensive ranges that cross jurisdictional boundaries (Martins and Martins, 2006; Swanepoel *et al.*, 2012; Amin *et al.*, 2022). Recent research suggests that the southern and eastern parts of South Africa may hold a genetically distinct leopard population (Morris *et al.*, 2024). Globally, large carnivores like leopards are declining due to human impact, posing sustainability

challenges as keystone species crucial for ecosystem health (Estes *et al.*, 2011; Swanepoel *et al.*, 2012; Devens *et al.*, 2018). There is an urgent need to fill knowledge gaps in leopard conservation outside protected areas (PAs), including effective actions and conservation outcomes (Swanepoel *et al.*, 2015a; Swanepoel *et al.*, 2015b).

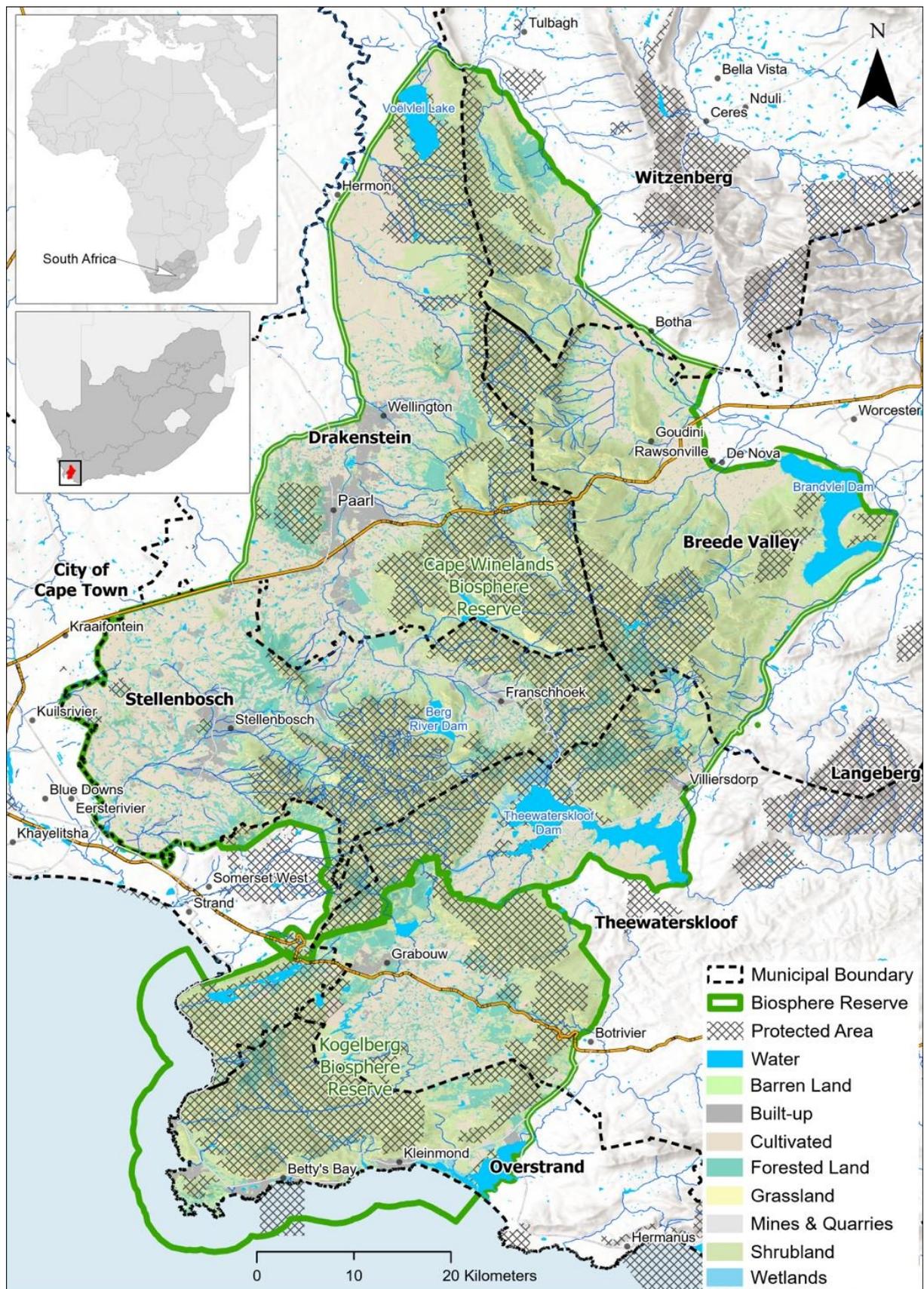
## **5.3 METHODS**

### **5.3.1 Case Description**

Established in 2004, the CLT is a non-profit, public benefit NGO dedicated to leopard and biodiversity conservation through coexistence, landscape protection, partnerships, education, and advocacy informed by scientific research (CLT, 2024). Organized around three pillars – research, conservation, and education – the CLT focuses on areas including the Cederberg and Boland, as well as the Little Karoo, Namaqualand, and other regions across the Western, Northern, and Eastern Cape provinces. Leading the BP, the CLT collaborates with local and international partners and sponsors, notably CapeNature, the statutory conservation body of the Western Cape (More available here: [BP Sponsors and Partners](#)).

### **5.3.2 Study Area**

The Boland (Figure 5.1), located along the Cape Fold Belt Mountain Chain (CLT, 2024), is a mountainous fynbos region with several state-owned PAs managed by two of the Western Cape's conservation authorities, CapeNature and the City of Cape Town's (CoCT) Biodiversity Management Unit (CLT, 2024). Private lands have, in most cases, self-organized into conservancies which are voluntary agreements among landowners aimed at local environmental conservation. Further, the region serves as a critical water catchment area for the CoCT (Le Maitre *et al.*, 2019), encompassing the nationally important Boland Strategic Water Source Area. It overlaps with UNESCO-designated sites known for biological and cultural diversity, including the Cape Floristic Region (CFR) World Heritage Site, KBR and CWBR (UNESCO, 2022b; UNESCO, 2022c; UNESCO, 2024; CapeNature, 2024a).



**Figure 5.1:** Map illustrating the Boland Project domain, spanning the Kogelberg and Cape Winelands Biosphere Reserves, and its multifunctionality, including protected, forested, cultivated, built-up and other land-uses (Geospatial Information Services Unit, 2024)

### **5.3.3 Research Design**

This case study used a deductive mixed-methods approach, using semi-structured interviews with key informants, supplemented by a mixed-methods survey and document analysis (Ethics certificate: H22-SCI-NRM-001, CapeNature research permit: CN32-87-25882).

#### **Methods and Data**

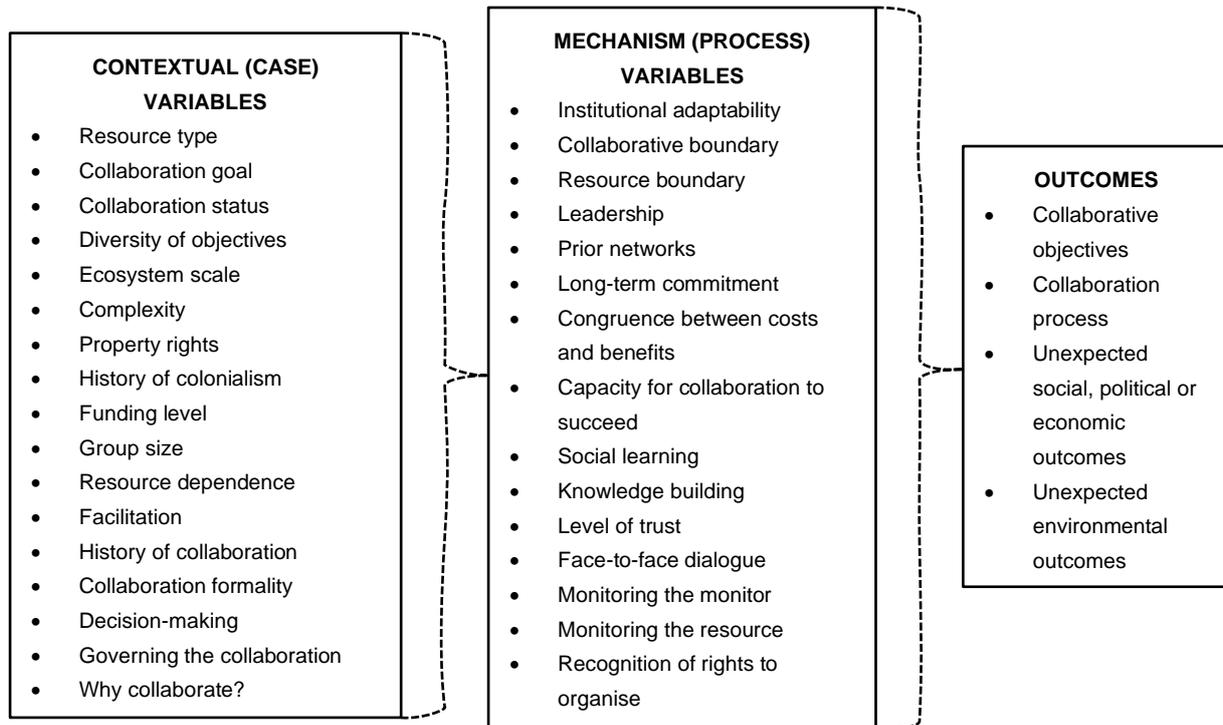
Using a chain-referral sampling technique, two key informants, officials from the CLT leading the BP, were purposefully sampled and provided detailed in-depth, first-hand knowledge. Key informants then identified potential participants for interviews (n=1) or an online survey (n=5; 45% response rate), enhancing representation, particularly from conservation authorities. Document analysis involved electronic documents and available literature relevant to the case, supplementing the data collected.

Semi-structured interviews covered three main themes: collaboration details, governance, and BR involvement. Interview transcripts were processed using Otter.ai's (2023) online transcriptions software. A mixed-methods survey, created using QuestionPro's (2023) online survey software, gathered data on the BP and BR involvement. Qualitative data collected were manually coded in ATLAS.ti 23.2.0 for Mac and analyzed using deductive, directed content analysis (Bryman, 2012; Kleinheksel *et al.*, 2020; Humble and Mozelius, 2022). Quantitative data collected through the survey were managed in Microsoft® Excel 16.78 for Mac.

#### **Context-Mechanism-Outcome Framework**

The CMO framework, designed to understand collaborative initiatives, posits that collaborations achieve outcomes (O) due to specific mechanisms (M) operating within defined contexts (C). This framework guides studies in understanding how and why collaborative initiatives operate within SES (Schoon *et al.*, 2021), enabling cross-case comparisons and the development of generalizable theories on how such initiatives support SES sustainability through the collection of coded cases in an online database (Schoon *et al.*, 2021; Cockburn *et al.*, 2020a). The CMO utilizes primary or secondary data sources like literature, electronic records, interviews, or surveys (Schoon *et al.*, 2020). This framework is well suited to researching collaboration in SES as it can help understand collaborative interventions, learn about the nature of collaboration and the influence of context and mechanisms on producing outcomes (Schoon *et al.*, 2021).

The CMO codebook by Schoon *et al.* (2020) provides 19 contextual variables, 21 mechanism variables, and four outcomes for coding. Contextual variables describe SES conditions, while mechanisms identify factors crucial for collaboration success. In this case study, 17 contextual and 15 mechanism variables, along with all four outcomes, were coded (n=36) and facilitated data organization and case study development (Figure 5.2). These variables have been bolded within the Results text.



**Figure 5.2:** Contextual or social-ecological system characteristic variables, mechanism or rules and process variables, and outcome codes found in the Boland Project case study

To ensure participant anonymity, data were labeled with reference codes like IR1 (interview respondent 1) and SR4 (survey respondent 4). Frequency counts (*f*) in the results indicate theme importance based on how many participants mentioned each theme. Quotes have been incorporated within the narrative and, where possible, verbatim quotes were used with minor edits for readability, such as removing repetitions, hesitations, or translations, and demonstrated by ‘...’ (Lingard, 2019; Brennan, 2022). To maintain confidentiality, redactions are denoted by [XXX]. Publicly available documents and literature used in the results are cited where used.

## 5.4 RESULTS

### 5.4.1 Introducing the case and context

The BP originated from a casual conversation between the CLT and CapeNature officials, stemming from a curiosity about the status of leopards (**resource type**) in the Boland (IR1; IR2). This infers the **collaboration goal** (IR1; IR2). Previous studies were undertaken in the 1980s by Norton and Lawson (1985) and Norton *et al.* (1986), with little known about the contemporary status of leopards (IR2). Initiated in 2010 and ongoing (**collaboration status**), the BP began with large-scale camera trap surveys to determine leopard presence, distribution, and population size (IR1; IR2; CLT, 2024). Over time, the project evolved to include periodic surveys to monitor population trends, diet and create public awareness (**diversity of objectives**) (IR1; IR2; CLT, 2024). Leopards were later collared to study home range sizes, movements, activity patterns, and habitat preferences (IR1). Upon discovering snaring<sup>9</sup> incidents, efforts shifted to understanding and mitigating snaring (**institutional adaptability**), alongside environmental education and outreach initiatives (IR1; IR2). More information on the evolution of the project and its multi-objective approach can be found in Appendix 18.

The BP domain (**ecosystem scale**) spans roughly 2 000km<sup>2</sup> from Nuwekloof Pass west of Tulbagh to coastal villages near Kogelberg Nature Reserve (IR2; CLT, 2024). It encompasses a diverse, multifunctional landscape with varied land-use types (**complexity**) and subsequent management objectives (IR1; IR2; IR3). The Boland landscape is characterized by patchiness, diversity, and fragmentation, marked by distinct transitions. “*You’ve got your natural land and then [a] very hard border going into agricultural towns*” (IR1). For instance, “*the Limietberg Nature Reserve, a CapeNature reserve, [is] surrounded by 80 [to] 100 private landowners*” (IR1). Land uses in the Boland include mostly state and privately-run (**property rights**) conservation, forestry and agriculture, including orchards, vineyards, lucerne, aquaculture, floriculture, and eco-tourism, with livestock farming being largely absent, a preference shared by CapeNature and the CLT stakeholders as it results in less human-wildlife conflict (IR1; IR2; IR3).

---

<sup>9</sup> According to the Nature Conservation Ordinance No.19 of 1974, snaring is a method of trapping and therefore an illegal hunting method in Western Cape, South Africa

South Africa has a **history of colonialism** which persisted until 1994 with the end of apartheid (Oliver and Oliver, 2017). In the latter part of colonial rule, leopards were persecuted as *'problem animals'* or *'vermin'* until 1968, and only recognized as *'protected wild animals'* in 1974<sup>10</sup> (Martins and Martins, 2006; Müller *et al.*, 2022). IR2 noted some private landowners recalled their ancestors' hunting leopards, which initially led to doubts about finding leopards, though they nonetheless expressed interest in participating in the BP.

*"Initially, coming onto a farm, ... especially the older farmers, they would tell stories about their fathers or grandfather's hunting leopards, and you could see that they believed that there weren't any leopards. 'Yeah, you could put up your camera but don't expect to see anything' [the farmers would express]. I think there was a lot of positivity and welcoming, but disbelief ... or doubt that [the CLT] would [find] any leopards."*

The collaboration includes a relatively large **group size** ( $n > 30$ ) considering the number of private landowners within the conservancies, none of whom are directly dependent on the resource (**resource dependence**). The BP involves the CLT, conservation authorities, private landowners, and other supporters providing resources, expertise, training, networks, and a moderate **level of funding** (IR1; IR2; IR3; CLT, 2024). Despite this, the CLT as an NPO, faces ongoing challenges with fundraising (IR1; IR2).

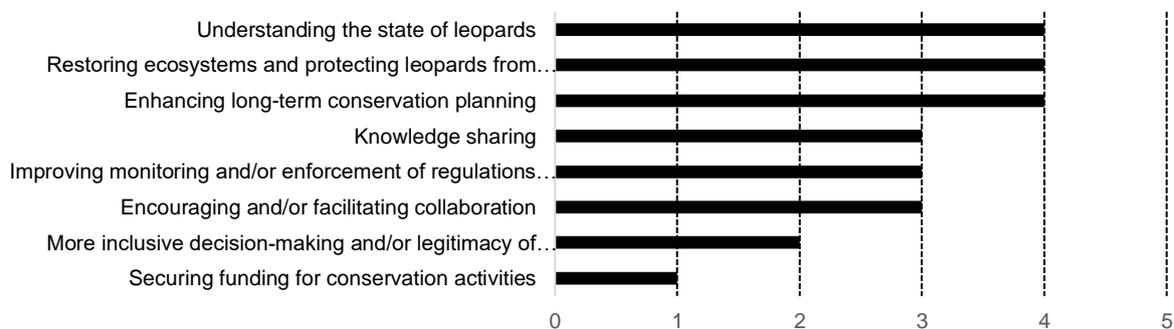
CapeNature plays a crucial role in **facilitating** the collaboration, supporting the CLT with access to study sites and networks with local landowners (IR1; IR2; IR3). "[CapeNature] gave the CLT the platform to kind of run with the thing [BP], and [CapeNature] would set up, [and] invite [the CLT] to conservancy meetings where they can meet the public" (IR3). There is a **history of collaboration** between CapeNature and the CLT. "*CapeNature and [the] CLT have a long-standing relationship*" (SR1), with successful partnerships in the past (IR1; IR2; IR3). The **collaboration formality** between the CLT and conservation authorities is formal, involving data-sharing agreements and memorandums of understanding (IR1; IR2; IR3). In contrast, relationships with private landowners are informal, relying on developing relationships, trust and reputation (IR1; IR2). Involvement of conservation authorities in the BP

---

<sup>10</sup> In South Africa leopards are listed as a threatened or protected species according to the Nature Conservation Ordinance No.19 of 1974 and National Environmental Management: Biodiversity Act 10 of 2004.

allows for potential rule changes and enforcement related to leopards in the province (**decision-making**) and the opportunity to integrate new knowledge into management plans (IR1; IR2). Decision-making lies primarily with the CLT and its advisory boards, however, requiring approval from participating landowners (IR1; IR2; IR3) (**governing the collaboration**).

Participants unanimously believe collaborative efforts are necessary for conserving free-roaming leopards and is considered crucial (**why collaborate**) for accessing state- and privately-owned land, building capacity for undertaking such a landscape-scale initiative, and networking (IR2; IR3; SR5). Survey respondents believe the BP is important for (Figure 5.3): understanding the state of leopards ( $f=4$ ), restoring ecosystems and preventing environmental damage ( $f=4$ ), enhancing long-term conservation planning ( $f=4$ ), improving monitoring and/or enforcement of regulations with regards to human-leopard interactions ( $f=3$ ), knowledge sharing ( $f=3$ ), encouraging and/or facilitating collaboration ( $f=3$ ), more inclusive decision-making and/or legitimacy of decisions ( $f=2$ ), and securing funding for conservation activities ( $f=1$ ).

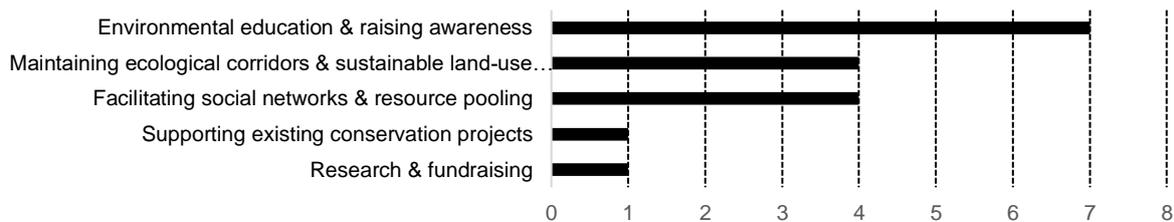


**Figure 5.3:** Survey respondents' (n=5) perception on why a collaborative effort is necessary

### **Biosphere Reserve Involvement**

Biosphere reserve involvement in the collaboration varied over time, initially involvement was minimal despite the collaboration spanning both BR boundaries, but this has increased in recent years as the BRs have matured into functioning landscape-level institutions (IR1; IR2). Their contribution includes networking and environmental education programs such as the CLT Teacher Development Workshops with the CWBR (IR1; IR2; IR3). The KBR has been particularly active in the snare response plan, Snare Free (IR2; IR3; Snare Free, 2023).

All participants (n=8) believe BRs should play a role in leopard conservation, especially outside PAs, as indicated by most survey respondents (80%). Identified roles for BRs include (Figure 5.4): environmental education and awareness raising (f=7), maintaining ecological corridors and promoting sustainable land-use (f=4), facilitating social networks and resource pooling (f=4), supporting existing conservation projects (f=1), and research and fundraising (f=1).



**Figure 5.4:** Roles which participants (n=8) believe biosphere reserves can fulfil in leopard conservation

#### 5.4.2 Mechanism (process) variables this case highlights

**Leadership:** The CLT is the lead organization (IR1) and has been instrumental in initiating and driving the BP (IR2; IR3).

**Collaborative and resource boundary:** Initially focused on formal PAs and surrounding private lands in the Boland, the collaborative scope, particularly the CLT’s focus, has expanded to a ‘*landscape-level approach*’ across the Western Cape, aligning with the distribution of free-roaming leopards (IR1; CLT, 2024).

**Prior networks and long-term commitment:** The ‘*idea*’ is that the CLT remain active and have a presence through the BP in the Boland (IR1). Since their inception in 2004, the CLT have had a longstanding partnership with CapeNature, including other sites across their PA network. “*The collaboration [between CapeNature and the CLT] first started in the Cederberg area before it moved down to the Boland.*” (SR2). The Snare Free project supports this long-term partnership and commitment, and 80% of the survey respondents believe that collaboration is important for long-term planning for leopard conservation.

**Congruence between costs and benefits:** Survey respondents acknowledged collaboration benefits such as resource pooling, knowledge building, and networking. The BP has raised awareness about Cape leopards, subsequently attracting support for biodiversity conservation. “*Leopards are well-known, charismatic and iconic [flagship species], and can be used to promote awareness [environmental education]*”

*and rally support for prey and habitat [biodiversity] conservation” (CLT, 2024). Partnerships provided crucial resources (IR2), benefiting private landowners who gained biodiversity insights (IR1). CapeNature leveraged fire and biodiversity data from the BP.*

*“[CapeNature] saw things on the cameras that [they have] never seen before, and that [they] didn't know [they] had. You know, aardvark and those type of things that you just never see.” – IR3*

*“[CapeNature] collected data before fire and then went back and [the CLT] did the same thing after fire. It was also nice to compare that because CapeNature and every scientist in the book has done a lot of research on the recovery of plants after fires, but nobody's looked at the animals and what happens to animals during the fire.” – IR3*

Additionally, the conservation authorities have improved knowledge to implement in their management plans. For instance, SR3 noted that “[CapeNature] *have a much better understanding of the state/number of leopards in the Boland*”. Leopards serve as umbrella species, meaning “*conservation efforts focused on the continued survival of leopard populations [which includes preserving their habitat and prey species] also benefit other species and ecosystem processes*” (CLT, 2024). CapeNature also reported “*improved relationship with neighbors and opportunities for awareness raising*” (SR1). Further, landowners, including wine farms and eco-tourism operators, are perceived to have capitalized on leopard conservation and the presence of leopards in the area.

*“Some of the bigger wine farms that had a very big tourist compliment to it, they almost capitalized on it. Yeah, it became an icon.” – IR2*

*“I've seen ... farmers using it as a marketing tool. Especially where they have maybe chalets and things, ..., they would say, well, come and spend the evening and you might see a leopard.” – IR3*

The BP imposes minimal direct financial costs on participants apart from the leaders. Stakeholders' willingness to engage in the BP was viewed positively (IR1). According to IR3, “*the [Boland farmers] attitude is completely different... The farmers are actually very excited if they have a leopard on their farm. ... once we started putting up the cameras, [the farmers] were like, 'show me, show me!' But ..., I think it's because they don't have livestock*”.

**Capacity of the collaboration to succeed:** There is evidence that the BP is supported from internal and external sources to sustain its operations in terms of resources, technology, jurisdiction or accessibility, and training. This includes

partnerships with Western Cape conservation authorities to address capacity gaps, and the CLT workshops and training sessions with CapeNature staff.

*“[CapeNature] didn’t really have the capacity to do a lot of this research themselves. They rely on organizations and universities to do the research and then feedback the information to CapeNature – into their state of biodiversity database, then into their management plan[s]. [The CLT] don’t want to just be doing research for the sake of it. [They] want the research to be meaningful... contributing to actual conservation and how things are, how leopards are managed. That I do think [the CLT] have achieved. All [the CLTs] findings, and [they are] very open with CapeNature about what [they] find... That is ..., essentially the point in the end. [CapeNature] gained in that way. Same with the CoCT.” –*

IR1

*“[The] CLT have assisted [CapeNature] with awareness sessions and training of reserve staff especially around [camera] traps and snare detection.” – SR4*

Capacity for the BP success is also evidenced through informal farmer networks. *“Farmers are sometimes hesitant to let people onto their farms, security reasons and things. But if another farmer phones in and says, no but you can trust [the CLT], ..., it’s okay”* (IR3). External capacity building includes financial, human, and equipment resources. Multiple sponsors supported the BP and the CLT, providing necessary resources (CLT, 2024). Organizations contributed vehicles, maintenance, and technical training, and sponsored camera traps for extensive surveys (IR1; IR2; CLT, 2024). Collaborations with universities facilitated research in priority areas, and a leopard database engaged citizen scientists and landowners to report sightings, enhancing data collection and *‘filling in the gaps’* (IR1; IR2). For instance, IR1 mentioned:

*“For instance, when [the CLT] started in 2010, in the Boland. [The CLT] picked up [on the camera traps] an individual [leopard] called Boland Male 7, BM7. Then [the CLT] realized that the landowner there had already got a photograph of this leopard in 2002. At that time, he was already seven years old. Which, in 2002, [the CLT] could see that he wasn’t a cub, or a young one. He was already a mature cat. At that time, [BM7] should have been three when they picked him up [on the camera traps], plus seven, is 10 [years old]. Then we continually picked him up [on the camera traps] until 2014. That was 14 years old.”*

**Social learning and knowledge building:** Survey respondents unanimously highlighted the BP’s role in fostering learning and knowledge exchange. The CLT actively shares information, provides feedback through presentations, and engages in dialogue at conservancy meetings to discuss data collected and contributions made

(see quotes below). Additionally, the CLT hosts the *'Farming with Nature'* workshop series province-wide, facilitating *'learning together'* and exchange between farming communities and conservation practitioners, aiming to *"share principles of holistic land management and sustainable farming"* (CLT, 2024).

*"[Landowners] would send ... [their] photos. [The CLT] would, ..., try to identify the animals, and send them feedback [on which individuals were photographed]." – IR2*

*"But with the conservancies and that, when [the CLT] do presentations or talks at their AGMs... [The CLT] tailor [their] talk to include leopard ecology and behavior..., but then also looking at their area and what leopards [the CLT found] there... also highlighting some of the key issues that [the CLT have] maybe identified in that area so that the actual people living there and doing stuff on the ground can be aware." – IR1*

Respondents noted data being freely shared (SR2) and knowledge disseminated through public speaking engagements with clubs, societies, conservancies, and outdoor centers (IR1; IR2; IR3). *"There's lots of feedback to the public and also on [the CLTs] website [including social media] and in news articles"* (IR2). Educational initiatives include awareness days, school programs fostering conservation ambassadors, and information boards (IR1; IR2; IR3). Scientific knowledge is disseminated through periodic journal publications (IR2), as detailed in Appendix 18.

**Level of trust and face-to-face dialogue:** The survey revealed that 80% of respondents perceive a high level of trust. *"Through the sharing of information, it is clear that there is a level of trust"* (SR2). Developing trust was facilitated by *"regular interaction and knowledge sharing"* (SR3). Joint efforts were directed towards certain aspects of the BP development, as highlighted by IR3:

*"[CapeNature] sat with [the CLT] and we basically, on a map, decided where we would put our camera traps that was part of CapeNature's land. [CapeNature] physically went out with [the CLT] and walked the trails and went back when the batteries were flat... looked at all the data... [CapeNature] was part of the whole thing."*

All BP partners receive regular updates via their mailing list (IR1). IR1 believes, *"you need to feedback and have open communications and good communications. I think that is, ... a pivotal part of [successful collaboration]"*. Trust is fostered through *"consistent and ethical decision-making..., as well as open communication, consistent professional work conduct"* (SR1).

**Monitoring the monitors and the resource:** The CLT, supported by various stakeholders within the BP, monitor leopards in the Boland. Their accountability lies with conservation authorities who grant access (**recognition of rights to organize**) and funders who provide financial support (IR1; IR2; IR3). Further, the CLT are required (and driven) to report to donors which is crucial to maintain funding and ensure responsible resource utilization for sustaining the BP (IR1).

### 5.4.3 Collaborative Outcomes

All participants (n=8) affirmed that **collaborative objectives** are being met, highlighting the benefits of working together even beyond achieving specific goals (**collaboration process**). They emphasized the necessity of collaborative efforts for conserving free-roaming leopards. IR2 stressed the importance of a shared end goal for success. Besides revealing widespread snaring in the Boland, participants noted no **unexpected negative environmental, social, political, or economic outcomes** from the BP. Instead, several **unexpected positive outcomes were identified** (Table 5.1).

*“The CLT do amazing work and have built a really good name in the conservation field. So many more people have become aware of leopards and started seeing them as the charismatic animals they are, playing a vital role in a healthy ecosystem. We are slowly moving away from the old ‘problem animal concept’. This is to a large extent a result of the work of the CLT and partnerships.” – SR1*

**Table 5.1:** Summary of outcomes of the Boland Project case study

<b>Environmental</b>	<b>Social and Economic</b>	<b>Process (internal)</b>
Larger leopard population than anticipated	Raising awareness of Cape leopards and biodiversity	Improved relationships
Successful leopard research and monitoring	Employment (e.g. snare patrol officer)	Strengthening existing partnerships
Coordinated snare removals	Citizen scientists	Increased participation
Dedicated Snare Free project developed	Fostering stewardship	Increased trust
Environmental stewardship	Economic gains through marketing the leopard	Biodiversity data to implement in management plans
		Well-resourced through the growth in awareness

## **5.5 DISCUSSION**

### **5.5.1 Biodiversity, ecosystem services and leopards**

Projects such as the BP are important for conserving free-roaming species and biodiversity across multifunctional landscapes. Leopards serve as surrogate or umbrella species, indicating high biodiversity and landscape connectivity (Tshabalala *et al.*, 2021; McManus *et al.*, 2022). As keystone species, large carnivores are important for maintaining healthy ecosystems (Estes *et al.*, 2011; Devens *et al.*, 2018). Leopards also hold cultural significance in South Africa as ‘iconic’ species and national heritage (Griffiths, 2017). Their charismatic nature makes them flagship species for biodiversity conservation, crucial for raising awareness and support for conservation (Bodasing, 2022; Global Leopard Conference, 2024). From a social perspective, the attractiveness to the charisma of leopards may have increased support and awareness for the BP. Ecologically, their critical role as keystone and umbrella species may have enhanced and provided a clear message or need for conserving the species in the Boland Mountain Complex. Together, both factors could have contributed to overwhelming success and support of the BP.

### **5.5.2 Biodiversity conservation and stewardship in the Boland**

CapeNature, the custodian of biodiversity in the Western Cape, manages wilderness areas crucial for societal wellbeing, supported by accurate scientific data (CapeNature, 2024b). The CLT provides not only accurate data on leopards in the Boland, but an array of biodiversity data collected through surveys – including fire recovery data and species not often seen. Many of the globally recognized biodiversity and threatened environments within South Africa, particularly in the CFR, are found outside of formal PAs (Cowling *et al.*, 2003; Barendse *et al.*, 2016; CLT, 2024) resulting in public-private partnerships and collaboration, such as the BP, for species conservation, habitat preservation, research and monitoring on private land (Barendse *et al.*, 2016; Hanson *et al.*, 2016; Marnewick *et al.*, 2021). Such collaborations ‘bridge the borders’ between public and private sector managers and decision-makers (Schoon *et al.*, 2021), and are crucial in human-dominated landscapes, like the Boland, where state capacity is often limited. Collaboration in this case reduces redundancy and enhances conservation effectiveness, cost-efficiency, resource availability, adaptive capacity,

and knowledge expansion (Clement *et al.*, 2020; Marnewick *et al.*, 2021), reasons cited for why a collaborative effort was necessary in the Boland.

In the South African context, NGOs often collaborate with provincial conservation bodies like in the BP for stewardship projects, and frequently fulfill the role of implementation agents (Barendse *et al.*, 2016). Stewardship takes on a variety of meanings, but ultimately encompasses responsible use and care of natural resources, balancing utilization and protection thereof (Cockburn *et al.*, 2018; Enqvist *et al.*, 2018). Barendse *et al.* (2016) defines *stewardship* as voluntary efforts contributing to, promoting or conserving natural resources in SES. In this regard, the CLT could be seen as stewards of leopards in the province, being one of a few organizations which have taken the responsibility for leading awareness and protection efforts (SANBI, 2024).

Conservancies, a form of stewardship and identified as key partners in the BP, are motivated by reasons such as environmental consciousness, nature conservation, wildlife and livestock security, opposition to development, and tourism opportunities (Barendse *et al.*, 2016). Encouraging stewardship often relies on the proponents convincing potential stewards, such as the CLT facilitating landowners' voluntary commitments (CLT, 2024). These commitments include preserving natural land, rehabilitating unused areas, preventing snaring, and removing invasive species (CLT, 2024), crucial for biodiversity conservation and sustaining leopard populations. Factors influencing landowner participation include their type, land size, and opportunity costs (Barendse *et al.*, 2016). Participants in the BP showed enthusiasm, possibly due to leopard charisma or other intrinsic or extrinsic benefits which could be gained through collaborating – important considering successful conservation on private lands requires motivated participants (Marnewick *et al.*, 2021).

Adaptive co-management, a collaborative conservation approach emerging in the last decade, involves multiple actors working across scales to make decisions aimed at addressing governance-ecosystem 'fit' (Plummer and Hashimoto, 2011). The BP addresses the issue of fit through landscape-level efforts, facilitated largely by the CLT, functioning as a *boundary organization* (Sternlieb *et al.*, 2013) where boundary refers to 'shared space' (Enqvist *et al.*, 2018). The CLT has adopted a '*landscape-level approach*' as an organization, allowing them to fulfill this necessary role and achieve an institutional fit. Boundary organizations, like the CLT, operate at the interface of

science, practice, and policy, bridging public and private sectors with dual responsibility and accountability, fulfilling a crucial role that neither sector could fulfill alone (Sternlieb *et al.*, 2013). This role, as a bridging organization, is often needed to facilitate collaboration (Schultz *et al.*, 2011). Like the CLT's role as a (trans)boundary organization, BRs act as *relational hubs* connecting landscape actors (Barracough *et al.*, 2023; Klaver *et al.*, 2024). BRs in the region fulfill some of the roles believed to be important for conserving leopards in the Boland such as education and raising awareness, promoting sustainable land-use management, assisting conservancies, and supporting other conservation projects (Klaver *et al.*, 2024).

### **5.5.3 Fit for purpose: the Boland Project**

This case exemplifies several factors from Boronyak *et al.* (2022) and Durant's *et al.* (2022) theory of change for human-carnivore coexistence, including a landscape-level approach, local participation, monitoring and evaluation, networking and support, shared learning, and good governance principles such as transparency, communication, participation, trust, legitimacy and collaboration (Bennett *et al.*, 2019). It also demonstrates key aspects of adaptive co-management, such as interactive and communicative processes among diverse stakeholders, shared decision-making and learning, networking across scales, and flexibility to enhance adaptive capacity (Plummer and Hashimoto, 2011; Carr Kelman *et al.*, 2023).

The BP adopts a landscape-level approach, aligning collaboration with the scale of the free-roaming Cape leopard. Given the multifunctionality of the landscape and the large range of Cape leopards, local buy-in from a large and diverse group of stakeholders was essential, along with building trust. Trust and support from private landowners are crucial for conservation efforts on private land (Marnewick *et al.*, 2021). Despite typically smaller, more homogeneous groups in which there is a dependence on the resource being more successful (Carr Kelman *et al.*, 2023), the BP's larger stakeholder group may have facilitated extensive networking, enhanced social capital, and increased resources which enabled its success.

The CLT, as the lead organization, is widely recognized in the landscape for their exemplary work ethic and conduct, embodying principles of good governance (Bennett *et al.*, 2019). They prioritize transparency, open communication, active participation, and collaboration, fostering trust and social capital crucial for their mission. Trust and

social capital are important in supporting such initiatives and is built over time spent together in the field, planned meetings or informal socializing, and aided through established prior networks (Marnewick *et al.*, 2021; Schoon *et al.*, 2021; Carr Kelman *et al.*, 2023). Prior networks, particularly with CapeNature, and informal interactions were instrumental in shaping the BP. Cases presented in Schoon *et al.* (2021) highlighted the importance of building trust and social capital to develop a shared vision and long-term commitment and were key to the BP's success. It is important to note, however, that trust is built over long time periods yet can be broken instantly (Raschke *et al.*, 2023). Therefore, maintaining trust and good relations will be critical for successful long-term collaboration – a key factor of collaboration. This may mean attempting to retain or strategically utilize personnel – those who have prior histories of working together and that have personally taken the time to build trust – as staff turnover can negatively influence the sustainability of long-term relationships (Klaver *et al.*, 2024).

Effective leadership and implementation agencies can result in successful collaboration by initiating collective action for a shared vision and fostering stewardship, and in some cases override the absence of other key variables (Marnewick *et al.*, 2021; Carr Kelman *et al.*, 2023). Further, effective leaders can coordinate efforts, build trust and networks, and are often referred to as ‘champions’ (Carr Kelman *et al.*, 2023). Effective leadership by the CLT has in this case facilitated collective action and stewardship, demonstrating their role as champions for leopard conservation in the region.

Social capital enhances collaboration flexibility and adaptive capacity (Carr Kelman *et al.*, 2023), which were critical traits evident in the BP's conservation efforts driven by new research insights. The collaboration goal was exploratory in nature and research-orientated, yet with significant conservation implications. The BP necessitated skill development, for example through training in camera trap surveying and snare detection, involving decision-makers, securing support, building networks, and increasing the visibility of the project – all of which builds capacity and knowledge (Carr Kelman *et al.*, 2023). Capacity-building reduces the dependency of external support and sustains activities for the long-term (Marnewick *et al.*, 2021). Shared learning and knowledge sharing within the network can help strengthen stewardship (Marnewick *et al.*, 2021) as evident in the BP. Further, the BP built knowledge through scientific

publications and sharing important information relating to fire and ecology, enhancing conservation planning and response strategies for the conservation authorities. The BP's research influence extended beyond the collaborative boundary with initiatives like Snare Free (2023) and the CLT's advocacy for national collaborative conservation efforts to combat snaring (Parliamentary Monitoring Group, 2024), highlighting how insights from the BP can help guide conservation actions across scales.

## **5.6 CONCLUSION**

Multifunctional landscapes are increasingly important for securing adequate space for ecological processes and biodiversity conservation to meet global targets. Urgent action to meet global biodiversity targets of the Global Biodiversity Framework, is crucial to safeguarding ecosystems, species, the services they provide, and ensuring the well-being of current and future generations (IPBES, 2019). These landscapes involve diverse stakeholders, land uses, institutions, and decision-making scales, *i.e.* many multiples (Cockburn *et al.*, 2018), which necessitate collaborative natural resource management and governance. In South Africa, significant biodiversity sites lie outside PAs and are often managed by non-state actors collaborating with the state. Therefore, collaborative initiatives such as the BP are essential for successful conservation implementation across such multifunctional landscapes.

The outcomes of collaborative efforts hinge on the interaction between contextual factors and implementation mechanisms. Recent scholarly focus has centered on understanding how context influences collaboration, resulting in various methodological frameworks. This study applied the CMO framework to analyze a conservation project in the Boland, South Africa, notable for its global conservation significance within the CFR World Heritage Site and as a habitat for the Cape leopard, a South African icon.

The case demonstrated the importance of strong leadership grounded in ethical principles, which fosters trust and stewardship among collaborators. Despite challenges posed by large group size and scale, consensus supported the need for landscape-level collaboration to align with conservation goals. Established networks and prior collaboration history facilitated trust-building, a process acknowledged as crucial yet time-intensive. The collaboration benefited from extensive internal and external support, increasing its capacity for success. Opportunities for knowledge

exchange both within and outside the collaboration empowered participants to adapt and implement effective conservation strategies while raising public awareness about biodiversity conservation.

This study acknowledges the limitations of case studies in generating universally applicable findings, which was not the primary objective. Rather, it investigates how conservation programs can effectively operate within multifunctional landscapes where PAs are fragmented, where some species ranges extend outside of the PAs, and where significant biodiversity requiring protection exists beyond their boundaries. The study aimed to contribute to a global repository of collaborative case studies, enabling cross-case comparisons that can inform generalized insights and theoretical frameworks for enhancing SES sustainability across diverse contexts. Additionally, it hoped to provide insights to address the knowledge gap concerning successful leopard conservation programs outside protected areas.

## CHAPTER 6

### Think Globally, Act Locally: Conclusion

#### 6.1 INTRODUCTION

*“In preparation for the future, it is necessary for us to learn to expand our models of biodiversity conservation, to embrace the diversity and multifunctionality of the landscape, to empower people to be a part of the solutions, and to deal with challenges collectively and holistically.” – Michael Klaver*

The UNESCO MAB is regarded as a promising way of tackling the contemporary challenges and achieving the SDGs (UNESCO, 2017). This programme, through its people-centred landscape approach, serves to pioneer sustainability and reconcile sustainable socio-economic development and biodiversity conservation. BRs are the implementation tool of this global programme across multifunctional landscapes, *i.e.* various local contexts. This study aimed to assess the interpretation and implementation of MAB in two South African BRs and explore a landscape-level collaborative initiative in the Boland. Two in-depth case studies of BRs in the Boland, the KBR (Chapter 3) and CWBR (Chapter 4) were undertaken to understand how their governance strategy and structure have helped to achieve a context appropriate interpretation and actioning of MAB in the landscape. These case studies explored their mode of governance, envisioned role in the landscape, stakeholder involvement within the BRs, and what those relationships entailed.

Additionally, this research was interested in understanding how a landscape-level collaborative conservation initiative operated to conserve leopards across a multifunctional landscape. Therefore, a third case study explored how and why this collaborative initiative operates to support Cape leopard conservation in the Boland (Chapter 5). Leopards are area-demanding keystone species (Martins & Martins, 2006; Estes *et al.*, 2011; Devens *et al.*, 2018), occurring mostly outside of PAs on private lands (Swanepoel *et al.*, 2015a). They are an umbrella species (Tshabalala *et al.*, 2021) associated with high levels of biodiversity (McManus *et al.*, 2022). For this reason the Cape leopard was selected as an illustrative to demonstrate how these initiatives in multifunctional landscapes can contribute to the conservation of a species and subsequently biodiversity outside of PAs. The BP was used as a case study to explore how the relationship between context and mechanisms, *i.e.* the process, produced successful conservation outcomes for the Cape leopard in the Boland. The

BP made for an interesting case study to explore collaboration as it overlaps two BRs which are positioned to enable collaboration and coordination amongst a diverse actor network around sustainability issues (Barraclough *et al.*, 2023; Klaver *et al.*, 2024).

## **6.2 SUMMARY AND DISCUSSION OF KEY FINDINGS**

This study found that organisations working at a landscape-level require some form of adaptive co-management and/or governance to remain adaptive and collaborative, and to enable the utilisation of different types of knowledge and decision-making at different scales (Schultz *et al.*, 2011). According to Folke *et al.* (2005) adaptive governance is operationalised through adaptive co-management which emphasises several overlapping themes which emerged in the case studies presented, including networks, social capital, leadership and trust. Adaptive co-management combines adaptive, collaborative and cooperative management, and is generally defined as a dynamic, ongoing, self-organised learning-by-doing process in which institutional arrangements and knowledge is tested and revised (Folke *et al.*, 2002 & 2005).

### **6.1.1 Biosphere Reserve Governance Models and Envisioned Role in the Boland**

This section speaks to findings of Objective 1.1 which was to explore the mode of governance of the individual BRs and their envisioned role in the landscape. Biosphere reserves in the Boland have adopted models of NPO cooperative governance. Their models are described as the 'NGO model' in the Technical Guidelines which are designed for collaboration (UNESCO, 2021) and believed to allow greater effectiveness across zones (UNESCO, 2015b). This model is prevalent in BRs in South Africa yet less common across Africa where the 'authority model' is more frequently observed (UNESCO, 2015b; DEA, 2016; Hedden-Dunkhorst and Schmitt, 2020). As described by the NGO model, these BRs are positioned as supporters and facilitators in the landscape, not necessarily implementers (Müller, 2014; Stoll-Kleemann & O'Riordan, 2018). To facilitate this position, these BRs implement forms of interactive governance, emphasising collaborative problem-solving among multiple diverse actors which govern the SES, finding solutions to everyday challenges through interactions and creating opportunities for landscape actors (Kooiman *et al.*, 2008; Edelenbos & van Meerkerk, 2016; Santosa, 2022).

South African BRs, with no exception of the KBR and CWBR, are not regulated by public laws in South Africa (DEA, 2016). Despite being nominated by national government (Pool-Stanvliet, 2014), BRs are independent, apolitical NPOs (DEA, 2016) and most often designated bottom-up (Pool-Stanvliet & Coetzer, 2019) as was the case for the KBR. These BRs have no legal ‘teeth’ and are implemented through ‘soft’ law (Pool-Stanvliet, 2013; Pool-Stanvliet & Coetzer, 2019) relying on adherence with national policy, with the core functions of BRs being reflected in the country’s legislation (DEA, 2016). Being registered NPOs does provide BRs with legal existence (Borsdorf *et al.*, 2014) and regulation by the Companies Act 71 of 2008 (Republic of South Africa, 2008). This positioning provides increased autonomy for the BRs and the ability to balance collaboration equally between state and non-state actors (DEA, 2016).

Both the KBR and CWBR envision being model sites for sustainability in the region, as prescribed for BRs (DEA, 2016; Clüsener-Godt *et al.*, 2021), as well as being a platform for collaboration and coordination, bringing diverse stakeholders together to deal with sustainability issues. Their role aligns with UNESCO’s (1996) broader goals of collaboration and coordination, bringing together the interests and diversity of local stakeholders (UNESCO, 2021). These BRs operate as relational hubs (after Cockburn *et al.*, 2020b; Klaver *et al.*, 2024), much like that of the K2C who seek to provide a collaborative platform (Schultz *et al.*, 2018), fostering partnerships and creating opportunities for collective action amongst actors within the SES, as well as human-human and human-nature connections.

Both NPOs leading the BRs are strategically guided by their BofD, with similarities and differences in their structure and roles (see sections 3.4.2 in Chapter 3 and section 4.4.2 in Chapter 4). These boards fulfil a management, steering, or executive committee role described by UNESCO (2021), representing key stakeholders who work closely with BR management and are responsible for proposing actions and evaluating implementation. Retaining directors is important for maintaining institutional knowledge (Berstein *et al.*, 2015) and preventing corporate amnesia (Kransdorf, 1998; Harvey, 2012), however, intermittent change brings new knowledge, ideas and diversifies the board. Board diversity increases its effectiveness (Bradshaw *et al.*, 1998; Ortega-Rodríguez *et al.*, 2023). Both BRs have recently begun to diversify in terms of gender, age, skills and knowledge which is believed to have improved their

effectiveness. Involving youth in decision-making processes is important for BRs (Mitrofanenko *et al.*, 2018; Barraclough *et al.*, 2021) and both have done so, the KBR through a Youth Director and CWBR through a Youth Board. Sourcing directors to voluntarily serve on the board is done strategically (see sections 3.4.2 in Chapter 3 and section 4.4.2 in Chapter 4). Other factors which improve the effectiveness of these boards include working closely with the management team and good (regular) meeting practices (Bradshaw *et al.*, 1998; Ortega-Rodríguez *et al.*, 2023), as frequent communication aids building trust and a shared vision (Petrovic, 2008). Like mindedness, *i.e.* similar motivations and visions particularly in the CWBR (see section 4.5.2 in Chapter 4), has also proven to be effective (Bradshaw *et al.*, 1998; Ortega-Rodríguez *et al.*, 2023), however, homogeneity runs the risk of groupthink (Petrovic, 2008). Importantly, the BofD of the KBR and CWBR have important linkages to other actors within the BRs, thus reflecting diverse stakeholder groups and institutions as they should (UNESCO, 2015b; Hedden-Dunkhorst & Schmitt, 2020). This is believed to be a good strategy for BRs as it facilitates better cooperation among actors (Stoll-Kleemann & O’Riordan, 2018) and avoids favouring narrow interests (Roldán *et al.*, 2019).

In the CWBR the BofD provide an organisational oversight role, however, in addition to oversight, the KBR BofD support programmes linked to their portfolio. Although not involved in the day-to-day activities, the role of the KBR BofD tends to overlap with management – possibly a coping mechanism for resource constraints. Day-to-day activities in the BRs are fulfilled by the management/ coordination team of the BRs who work on activities with their available budget (UNESCO, 2021). This is the responsibility of the one full-time coordinator in the KBR (since 2023; part-time since 2020), and the management team of the CWBR. However, the CWBR have far more human resources available with their management team (see section 4.4.2 in Chapter 4). These BRs believe it is necessary to fill the following full-time positions if possible: CEO, administrator, social media and outreach manager, coordinator, project leaders and fundraiser.

Operationalising MAB within the local context of the KBR and CWBR differs. While both BRs prioritise their activities in response to emergent local priorities, the KBR intentionally align their programmes/projects with the SDGs, *i.e.* the priority areas of the LAP (UNESCO, 2017). The CWBR’s alignment with the SDGs, and therefore the

LAP (UNESCO, 2017) is unintentional. Both BRs, however, do intentionally operate within the core functions of BRs (UNESCO, 1996) – the envisioned roles of both BRs. Focussing on the core functions of BRs, and particularly the SDGs in the case of the KBR, is due to UNESCO-MAB policies, *i.e.* MAP (UNESCO, 2008a) and LAP (UNESCO, 2017), being overwhelmingly lengthy, leaving the BRs feeling like they are not achieving much and therefore they narrow their focus.

### **6.1.2 Biosphere Reserve Stakeholders: Participation and Relationships**

This section speaks to findings of Objective 1.2 which was to explore stakeholder involvement within the BR and what these relationships entail. Fulfilling the advisory role to the BofDs are the critical stakeholders of the BRs who provide oversight and are used for consultation, as recommended by UNESCO (2021). This role, partly fulfilled by their respective BofD, is the responsibility of their technical committees and advisory groups, for example the PAG in the KBR and technical advisory in the CWBR (see sections 3.4.2 in Chapter 3 and section 4.4.2 in Chapter 4). This role complements the third component of an effective governance structure set out by UNESCO (2021). The PAG has played a crucial role in the KBR, identifying their local priorities within which their activities are determined. The KBR's technical committee has been an important arena for convening their critical stakeholders, meeting regularly. Frequent engagement is not only important for developing trust and a shared vision (Petrovic, 2008) but also improves stakeholder support and participation (Van Cuong *et al.*, 2017; Roldán *et al.*, 2019). The CWBR meet with their technical committee less regularly, possibly explaining why it has proved less reliable. However, the CWBR engage with local communities frequently and their local priorities are generally determined by local challenges emerging within these communities.

Characteristic of the NGO model and emergent governance is its project-orientation (UNESCO, 2021) and issue-driven approach. These BRs reflect this in their stakeholder engagement which is project-driven in the KBR and established case-by-case in the CWBR. Stakeholder engagement within the BRs varies, according to Arnstein (1969), from once off consultations to establishing long-term partnerships and delegating power. Whether its informing local inhabitants about BR activities or forming partnerships seems irrelevant as Roldán *et al.* (2019) discovered there is no linear relationship between participation and legitimacy, and that *any* form of participation helps build the BR's legitimacy, particularly producing outcomes (Lockwood *et al.*,

2010). Further, it is the *frequency* of engagements that seem to matter most (Van Cuong *et al.*, 2017; Roldán *et al.*, 2019).

The KBR and CWBR, in response to emergent challenges, seek partnerships with relevant stakeholders in addition to local stakeholders approaching the BR NPOs wanting to collaborate supporting their priority envisioned role of collaboration, coordination and connecting stakeholders. These BRs, through collaborating with stakeholders to deal with local issues, align with MAB Strategy's (UNESCO, 2017) call for collective action and the LAP's (UNESCO, 2017) recommendation for joint alliances in targeting the SDGs. Integrated responses are a necessity for dealing with complex or wicked problems (Edelenbos & van Meerkerk, 2016; Berkes, 2017). Collaborative partnerships are better equipped to develop innovative solutions as no single actor has the knowledge, jurisdiction or capacity to deal with them alone (Armitage *et al.*, 2012; George & Reed, 2017) and diverse responses is an important factor in building SES resilience (Müller, 2014) and adaptive capacity (Lockwood *et al.*, 2010).

These BRs believe that partnerships cannot be forced but must be attracted by providing value to their stakeholders. The CWBR has been particularly successful in this endeavour, through their systematic approach of implementing the BR core functions (see section 4.5.2 in Chapter 4). This has enabled the CWBR to build their brand, attracting international support which has been fundamental in the success and sustainability of the organisation. Developing and marketing a positive BR brand can help stakeholders better understand BRs and their functions, enhancing co-operation, increasing participation, awareness and opportunities for BRs, and importantly, adjusting people's perceptions of BRs (Coetzer *et al.*, 2014). To be successful in implementing all three BR functions simultaneously requires commitment and consistency, and there is difficulty in doing so in a balanced way (Borsdorf *et al.*, 2014). Although there is no lack of commitment within these BRs, to be consistent necessitates them being better capacitated – a serious challenge within both BRs. Therefore, a systematic approach to implementing BR core functions may prove to be a valuable lesson for BRs which suffer financial and human resource constraints. Being under-resourced is believed to foster innovation, although sufficient financial and human resources is required to build trust, continuity and competence in BRs (Stoll-Kleemann & O'Riordan, 2018).

The KBR on the other hand seems to have struggled building its brand and its legitimacy. This could be due to their numerous identity changes from different forums to KOBIO and then the KBRC. Brand identity is known to affect trust – where trust is defined as the “*recognition of the level of validity*” of the company (Hosseini *et al.*, 2014:3498), and therefore closely related to their legitimacy (Lockwood *et al.*, 2010). A perception of the lack of significance of the KBRC and territorialism (see section 3.4.6 in Chapter 3) may have been a result of these identity changes. Alternatively, perhaps because of the KOBIO’s *modus operandi* of nature preservation and being anti-development. By initially establishing itself as a conservation organisation, although significantly supported during its designation, the KBR perhaps neglected the interest of a large portion of their local inhabitants. Conservation has a negative history in South Africa (Carruthers, 2020; Pool-Stanvliet & Coetzer, 2020). Therefore, excluding development in earlier years as an explicit organisational objective or being misunderstood as another fortress conservation organisation may have threatened broader support for the BR. External issues such as poverty, are known to weaken even the best-designed programmes (Stoll-Kleemann & O’Riordan, 2018). Therefore, there is potentially a lesson in choosing to help people first, as in the case of the CWBR, or focusing on nature first, as in the KBR. The KBR, in its current form is becoming increasingly more successful and this could be attributed to a more balanced focus on people and nature, including aspects of skills development and job creation.

There are, however, three common challenges limiting the KBR and CWBR. Firstly, the lack of human and financial resources at their disposal. These resources are inextricably linked as without sufficient operational funding, the case of both BRs, they cannot secure enough human resources, specifically full-time staff which is believed to be critical for their effectiveness as it brings continuity to their operations (Stoll-Kleemann & O’Riordan, 2018). Biosphere reserve success or failure is dependent on sustainable financial resources (Van Cuong *et al.*, 2017). Biosphere reserves across Africa receive very limited funding from the state (Azadi *et al.*, 2021). In South Africa, BRs lack financial resources, specifically operational funding (Pool-Stanvliet & Coetzer, 2020) and these BRs are no exception. Both BRs believe they could do much more if they were better capacitated with human and financial resources. In response to these challenges, there are lessons which could be offered by the KBR and CWBR.

These BRs rely heavily on voluntary commitments, the goodwill of local inhabitants and collaborating with others. Volunteers contribute enormously to the accomplishments and financial sustainability of BRs (Pool-Stanvliet *et al.*, 2018). Additionally, both BRs have learnt to build human resource costs into project funding, and in the case of the CWBR, establish part-time and service-level agreements with those responsible for the BRs implementation. Collaboration is one way to deal with resource shortages as it is more cost-effective and increases resource availability and adaptive capacity (Kark *et al.*, 2015; Clement *et al.*, 2020). Both BRs take advantage of overlapping mandates within the BR, partnering with others to successfully implement MAB. To do so requires a shared common goal and limited staff turnover, which otherwise makes building long-standing relationships a challenge (Aunger *et al.*, 2022).

Secondly, the lack of awareness of the BRs and buy-in to the concept. This is a significant challenge in these BRs, more so in the KBR than the CWBR, possibly because the CWBR is well-established and prominent in the sphere of education. However, the lack of awareness is believed to affect their ability to create meaningful opportunities for stakeholder participation, engage a wide range of stakeholders and effectively communicate and build broad-based support. Compounding this are the limited resources and insufficient support from some public institutions. Effective awareness and communication are vital for BR success (Coetzer *et al.*, 2014; Van Cuong *et al.*, 2017). In both BRs there is a need for improved public outreach to grow awareness beyond areas where their projects are well-known. One of their methods for raising awareness and outreach is social media, an inexpensive and easy methods for BRs to popularise their brand (Coetzer *et al.*, 2014; Van Cuong *et al.*, 2017) and effective due to its self-propagation characteristic (Maniou, 2021). Roldán *et al.* (2019) found that, in addition to providing inputs, BR inhabitants value receiving information, particularly project outcomes – a contributor to legitimacy (Lockwood *et al.*, 2010).

Communication is key to effective conservation strategies and decision-making, resulting in greater stakeholder support (Roldán *et al.*, 2019) and a communication and awareness raising strategy is highlighted as necessary for BRs (DEA, 2016; UNESCO, 2021). However, adequately conveying the BR concept remains a challenge (Pool-Stanvliet, 2014). Technical jargon can make understanding concepts, particularly BRs, difficult to understand, excluding some of its stakeholders (Gardali *et*

*al.*, 2021). The concept of BRs is difficult to understand compared to, for example, national parks (Aschenbrand & Michler, 2021). The difficulty of the BR concept comes from the term 'biosphere' which is less familiar than 'national' or 'natural', the perceived contradiction of 'reserve' and 'development', serving multiple interlinking objectives and creating a vision for conservation and development simultaneously (Aschenbrand & Michler, 2021).

Lastly, these BRs experience limited government support. Boland BRs believe the insufficient support from national and local government, a common issue among South African BRs (Pool-Stanvliet *et al.*, 2018), affects their implementation and constrains their operations. Despite being implemented through the NGO model, government are critical stakeholders of the KBR and CWBR. Both have good working relationships with the Western Cape provincial government, who provide limited annual operational budgets. Additionally, there are good relations between the BRs and some other local public offices, for example KBR and the Overstrand Municipality, and CWBR and the CWDM. However, there is room for improvement with their connection to national government and other local public offices. Pool-Stanvliet (2014) found that MAB implementation in South Africa does face difficulties integrating vertically with national government and horizontally with local actors. Government involvement and commitment is critical for BRs (Van Cuong *et al.*, 2017), and their political buy-in is necessary for long-term success (Coetzer *et al.*, 2014). Perceived challenges emanating from the BRs include the lack of interest in the BRs and thus superficial engagement. Engaging with BRs is not the functional responsibility of local public officials, *i.e.* mandated. Lack of interest is perhaps due to public officials tending to politicise the BRs for their benefit, whereas BRs are meant to remain apolitical actors (DEA, 2016). These "self-interested" stakeholders are seen to be disruptive by the BRs, along with others who seek to use them to drive their own agendas, radical groups and criminals.

### **6.1.3 Collaboration across a Multifunctional Conservation Landscape**

This section speaks to the findings of Objective 2.1 which was to explore how and why collaborative initiatives operate to support Cape leopard conservation in a multifunctional landscape? Collaboration is necessary, stemming from a practical need as many ecological challenges, for example free-roaming leopards, span across scales, jurisdictions, sectors and tenure (Kark *et al.*, 2015; Clement *et al.*, 2020), where

there are many boundaries which need to be crossed (Sattler & Schröter, 2022) and where the landscape is diverse and characterised by many multiples (Cockburn *et al.*, 2020a). Adaptive co-management became essential for the BP given the multifunctionality of the landscape. Adaptive co-management is beneficial in that it helps deal with complexity by being flexible and easily tailored for specific situations (Schultz *et al.*, 2011) and it was clear the BP evolved to adapt to new challenges as they emerged (see section 5.4.1 in Chapter 5).

Collaboration allows for improved fit between SES scales and the ecological challenge (Cockburn *et al.*, 2019; Clement *et al.*, 2020; Schoon *et al.*, 2021). Partnerships between the CLT, the state, private landowners, and resource providers were needed to effectively implement the project which offered a better governance-ecosystem fit, *i.e.* synchronising institutional and organisational landscapes to the ecosystem or ecological challenge to be managed (Plummer & Hashimoto, 2011), in this case for conserving free-roaming leopards in the Boland. Further, collaboration can facilitate cross-scale, *i.e.* local to national, coordination (Wyborn & Bixler, 2013) as the BP demonstrated lessons learned in the Boland informed developing national strategies to combat snaring country-wide.

What is often needed to facilitate collaboration is a bridging organisation (Schultz *et al.*, 2011). The BP addressed the issue of fit through landscape-level efforts, facilitated largely by the CLT, functioning as a boundary organisation (Sternlieb *et al.*, 2013). Boundary organisations, like the CLT, operate in the shared space (Enqvist *et al.*, 2018), at the interface of science, practice, and policy (Sternlieb *et al.*, 2013). The CLT, successfully bridges public and private sectors with dual responsibility and accountability, fulfilling a crucial role that neither sector could fulfil alone (Sternlieb *et al.*, 2013). Thus, the BP was essentially “*as much local solution as possible and only so much government regulation as necessary*” (Wyborn & Bixler, 2013:59). Operating as such is particularly useful in that focus is put on the realities on the ground, paying attention to local culture and context (Redpath *et al.*, 2017; Genda *et al.*, 2022).

Collaboration is known to enhance conservation outcomes by being more cost-effective, increasing resource availability and adaptive capacity, while expanding knowledge (Clement *et al.*, 2020) which is needed for improving decisions and implementation in complex and uncertain contexts (Kark *et al.*, 2015; Van der Weyde *et al.*, 2022). The success of the BP was enhanced by extensive internal and external

support, which increased its capacity for success (see section 5.4.1 in Chapter 5). Furthermore, opportunities for knowledge exchange and shared learning empowered participants to adapt and implement effective conservation strategies while additionally raising public awareness about biodiversity conservation and contemporary threats. These processes expanded the capacity of the group to respond to change, and included training and skills development, increasing visibility of the work and raising awareness, workshopping and spending time together in the field, securing sponsors, building networks and connecting with decision-makers (Carr Kelman *et al.*, 2023). Additionally, there were numerous other factors which led to the success of the BP, with shared themes of what contributed to the increased effectiveness of the BRs, which are discussed below.

#### **6.1.4 Commonalities and success factors across cases**

There were several themes present across the case studies discussed here. These are introduced below.

##### **Cross-sectoral approaches**

These case studies adopted a cross-sectoral approach to drive the SES in a sustainable direction. This approach spanned across biodiversity conservation, science and research, socio-economic and human development. Navigating the social and environmental challenges in our current era poses a significant challenge due to the interconnected nature and dynamics between ecosystems and society, and which are best tackled through a SES perspective (Preiser *et al.*, 2018; de Vos *et al.*, 2019).

##### **Learning *together* and building knowledge and capacity**

Themes of education, shared learning, building knowledge, technical skills, capacity, and raising awareness were common among these case studies. These elements were important in the success and mission of the BRs and BP, as *any* forms of engagement with stakeholders is beneficial in terms of fostering support (Roldán *et al.*, 2019). The BRs current roles overlap conservation, collaboration (logistics function) and socio-economic development (see sections 3.4.5 in Chapter 3 and section 4.4.3 in Chapter), *i.e.* the three BR core functions (UNESCO, 1996 & 2021). Likewise, the BP did not just have a singular objective (see section 5.4.1 in Chapter 5 and Appendix 18). The BP collaboration used science and research to inform conservation management and prioritisation. Additionally, the BP used environmental

education and social learning processes to grow awareness of the importance of biodiversity conservation, fostering stewardship in the landscape – illustrating the CLT's multiple objective approach (CLT, 2024).

Embedded opportunities for building knowledge and shared learning in the BP, *i.e.* through regular meetings, workshops, public speaking events, mailing lists, scientific publications and sharing data, meant stakeholders could be well-informed, allowing them to adapt conservation management strategies. This is important considering stakeholders value receiving information (Roldán *et al.*, 2019) and frequent engagement is critical for successful outcomes (Wyborn & Bixler, 2013). Further, building skills and capacity of stakeholders, for example with camera traps and snaring in the BP, teaching, woodwork and river monitoring in the CWBR, and forest rangers, river monitoring and wildlife volunteers in the KBR allows activities to be sustainable in the long term and with limited support (Marnewick *et al.*, 2021). For example, CapeNature rangers could conduct snare patrols, youth could monitor rivers, and wildlife volunteers could respond to wildlife emergencies on their own. While building skills like woodwork and teaching empowers people to source livelihoods for themselves in the CWBR, equipping them with necessary skills to pursue alternative careers.

### **Building legitimacy**

Furthermore, these case studies illustrated the importance of becoming legitimate organisations, and that there are contextual or process variables which contributed to achieving this, such as leadership, trust, shared visions and prior networks (Carr Kelman *et al.*, 2023). Legitimacy is earned through sound leadership, producing outcomes, shared visions, stakeholder acceptance and local participation (Lockwood *et al.*, 2010). Across the case studies, leadership and the type of people (see sections 3.4.7 in Chapter 3 and section 4.4.5 in Chapter) were key to increased effectiveness and successes. Strong, energetic and charismatic leadership benefitted the CWBR in building trust and partnerships and was crucial in the KBR's positive turnaround. In the BRs it was evident that strategically selecting the right people to serve in the best interest of society helped to improve the effectiveness and increased the success of these institutions. The strategic selection of passionate and problem-solving-oriented individuals has strengthened their impact. BRs, due to the lack of operational funding, were found to be reliant on people acting out of goodwill. Leadership, a key element

in collaborative arrangements, is important for fostering stewardship and collective action towards a shared vision (Carr Kelman *et al.*, 2023). Strong leadership grounded in ethical principles in the BP was crucial for fostering trust and stewardship among collaborators and may have helped overcome challenges working at a landscape level, for example large group sizes and scales (Carr Kelman *et al.*, 2023).

### **The importance of trust and networks**

Trust, essential for building relationships for effective biodiversity conservation, is closely linked to other aspects of successful collaboration, including effective communication, transparency and joint knowledge production, and is crucial for collaborative success (White *et al.*, 2023). Further, trust is a key component of social capital and therefore a collaboration's adaptive capacity (Folke *et al.*, 2005). While local participation helps build trust between stakeholders (Young *et al.*, 2016), the lack of participation compromises trust (Saif *et al.*, 2022). Local participation was a necessity for the BP and crucial for its success (see section 5.4.2 in Chapter 5). The KBR saw improvement after increasing active involvement of community stakeholders, such as the PAG (see sections 3.4.2 and 3.5.2 in Chapter 3), while the CWBR rely on their local communities for guiding their activities (see section 4.4.2 in Chapter 4).

Information exchange, a feature of adaptive co-management, leads to developing a shared vision which is key in successful collaboration towards a common goal (Schultz *et al.*, 2011). A shared vision was regarded as a key success factor in the BP, while overlapping motivations for serving, and positive visions for the future of the BRs is beneficial in their governing structures (Bradshaw *et al.*, 1998; Ortega-Rodríguez *et al.*, 2023). Importantly, having positive visions for the future could be critical for transformation in SESs towards a more sustainable and just future (Hamann *et al.*, 2020). Further, in Hamann's *et al.* (2020) Good Anthropocene visions for southern Africa, several themes emerged which are consistent with the vision and mission of BRs in the Boland. These include decentralised and equitable decision-making, stronger voices for citizens, improved human-human and human-nature relationships.

Effective collaborative initiatives benefit from established networks and a history of collaboration, which helps in building trust, a time-consuming process (Carr Kelman *et al.*, 2023). In the BP, prior networks and positive pre-histories of working together

helped to build trust quickly (see section 5.4.1 in Chapter 5), while longstanding partnerships between BRs and some of their critical partners, for example CapeNature and WWF had resulted in mutually beneficially relationships and successful collaboration.

### **Supplementing shortfalls of, or collaborating with the state**

Interestingly, the theme of limited state capacity or support, and supplementing shortfalls in overlapping mandates, emerged in all case studies. For example, the capacity of conservation authorities to implement at a landscape scale in the BP (see section 5.5.2 in Chapter 5), or limited support from the state in BRs (see sections 3.4.6 in Chapter 3 and section 4.4.4 in Chapter 4). In the BP the CLT were the implementers filling a shortfall of the conservation authorities who have the mandate to conserve biodiversity, however, have limited capacity for such a landscape-level approach. Likewise, in the BRs, their activities often build on overlaps with the state, where possible, or ‘*fill the gaps*’ where there are shortfalls in the state’s implementation. For example, IAP clearing across both BRs, ECD, training teachers and feeding schemes during COVID-19 in the CWBR, or wildlife first responders, restoration, supporting small businesses and establishing forest rangers to patrol forestry exit areas in the KBR. The inherent attributes of MAB, *i.e.* its holistic approach, effectively positions BRs to assist the state in dealing with pressing sustainability challenges intersecting with their core functions (Pool-Stanvliet *et al.*, 2018) and contribute to achieving the states national priorities and international commitments (DEA, 2016).

## **6.3 IMPLICATIONS AND RECOMMENDATIONS**

Despite the limitation of the case study approach in producing findings that are universally applicable, this research contributes to the understanding of MAB implementation in an African context, particularly South Africa. Two in-depth case studies of BRs in the Boland, the KBR (Chapter 3) and CWBR (Chapter 4) were explored to understand how their governance strategy and structure have helped to achieve a context appropriate interpretation and actioning of MAB in the landscape. This study allowed for learning and knowledge sharing on how things have been ‘*done*’, providing valuable insights into the institutional context and governance strategies of BRs in the Boland, South Africa. By developing these case studies and sharing their findings, this study fulfilled another need highlighted in MAB Strategy

which is to compare lessons learnt from BRs to improve MAB implementation. Findings from chapters three and four suggest the following:

### **6.1.5 Improved awareness and communication strategies**

Although the CWBR and KBR have awareness and communication strategies, as prescribed by the South African Strategy for BRs, awareness of the BRs and the BR concept proved to be a significant challenge. Awareness and communication are critical for BR success, making the concept a reality for its local inhabitants and enabling its implementation. Studies have indicated that the BR concept is not an easily conveyed concept, possibly due to technical jargon, contradictory mandates or confusion with PAs and the deep-rooted resistance to them. Therefore, future research could investigate effective means and messages to easily convey the concept of BRs, grow their recognition and raise awareness. Social media is a useful tool in raising awareness and popularising the BR brand. Both BRs have grown their social media use from websites to Facebook in June 2011 (KBR) and May 2012 (CWBR), and most recently Instagram in December 2020 (CWBR) and January 2022 (KBR). The increased reach through various platforms may have contributed to their growth in awareness, however what is also important is people-friendly messaging of what BRs are. The *'Magaliesberg Biosphere video series'* introduces the BR and its purpose (Magaliesberg Biosphere, 2024). Furthermore, some BRs have simple explanatory videos explaining the purpose of BRs, what they are and what they do. For example, the Howe Sound Biosphere Region's *'People and Nature IN BALANCE'* and the Dyfi Biosphere's *'Biosphere reserves in a nutshell'* (Dyfi Biosphere, 2024; Howe Sound Biosphere Region, 2024). Additionally, storytelling could be useful in explaining what BRs do. For example, the Canadian Biosphere Regions Association has *'Reconciliation Stories'* and European BRs have some of their stories shared as *#OurStories* (CBRA, 2024; Innovation Norway, 2024).

### **6.1.6 Dealing with limited resources**

Both the CWBR and KBR value their personnel, particularly their full-time staff who are believed to have been crucial for their increased effectiveness. However, both experienced very limited capacity to afford human resources, relying largely on voluntary commitments and goodwill from local inhabitants. They are limited by insufficient operational funds. Although being able to source sufficient project funds,

both BRs believe their implementation is constrained by very limited operational funding. Sustainable financial resources are a necessity for BRs and a determinant of their success or failure. Previous research has found that South African BRs lack financial resources, specifically operational funding. Despite this, the BRs have proven to be relatively successful, however this research confirms the lack of resources is still a threat, hindering their ability to achieve their desired potential. For this reason, future research should consider exploring sustainable funding mechanisms for BRs, particularly those who are independent from government and adopting the NGO model. In 2023 BRs from South Africa and Zimbabwe attended the *'Enhancing Sustainability: Biosphere Reserves Empowered in Funding Proposal Development and Resource Mobilization'* workshop hosted in collaboration between UNESCO Be Resilient South Africa, Magaliesberg BR and Resilient Waters (UNESCO, 2023; CWBR, 2024). The three-day workshop aimed to capacitate BRs to diversify and mobilise funding resources to support their implementation (UNESCO, 2023). The Gouritz Cluster BR (South Africa) have an online shop which could help raise funds (GCBR, 2024), while the K2C BR (South Africa) employ EMs under a National Government programme, overlapping to build human resources. Additionally, *'biodiversity-positive carbon credits'* and *'nature certificates'* are believed to be useful in generating financial resources (Steele *et al.*, 2023). The Sierra Gorda BR (Mexico) has such a carbon project, offsetting emissions for financial compensation, generating numerous direct benefits for many involved. The Global Environmental Facility and World Bank support several biodiversity conservation trust funds (McNeely & Weatherly, 1996). For example, the Mount Mulanje Conservation Trust who manage Mount Mulanje BR (Malawi) and developed an endowment fund which generates annual revenue for the BR (Hedden-Dunkhorst & Schmitt, 2020). A South African BR Trust, endowment funds and biodiversity off-sets were all explored in the *South African Strategy for the Biosphere Reserve Programme 2016-2020* (DEA, 2016).

### **6.1.7 Learning to understand BR stakeholders**

The lack of awareness and limited capacity of these BRs seems to affect their ability to create meaningful and more frequent public participation processes, particularly in decision making. Local participation is a key feature of BRs, critical in gaining stakeholder support, trust and increasing social acceptance and legitimacy, benefitting the bottom-up NGO implementation model. Future research should therefore explore

stakeholder perspectives and expectations which could provide a more comprehensive view of a BR's local image and effectiveness, moving BRs closer to matching stakeholder experiences with their expectations. Attention to the perceptions of local stakeholders is important because perception influences behaviour (Botha, 2023). Further, it can help BR planners and managers better understand them, including sources of negative or positive associations (Wallner *et al.*, 2007). Additionally, it could help understand how participation could take place and how stakeholders engage in sustainability (Botha, 2023). This understanding will be beneficial because incorporating local stakeholder perceptions into management decisions enhances effectiveness and acceptability (Lecina-Diaz *et al.*, 2023).

### **6.1.8 Considering diversity and representation of BR personnel**

Although not a recommendation for future research, it is perhaps important to mention a recommendation for improved practice of MAB implementation within BRs. The strategic leadership of the Boland BRs, until recent years, lacked diversity – being majority old, white males. These BRs are beginning to include women on their BofD as well as youth – in both cases increasing their effectiveness. Despite being a step in the right directions, these BRs are not entirely representative of the SES demographics (population groups, age, language, education). Although there is currently some diversity in terms of stakeholder groups, it would be beneficial to strive towards strategic leadership that is representative of the SES to avoid favouring narrow interests, groupthink, and improve decision-making by including a greater diversity of perspectives.

### **6.1.9 Need for more in-depth case studies**

The lack of prescriptions and flexibility of implementing MAB within BRs is intentional, allowing the opportunity for place-based learning-by-doing, and therefore as testing sites for sustainability science. This study assessed the interpretation and implementation of MAB in two South African BRs in the Boland to fill the gap in understanding the institutional context and governance strategies of BRs and how global MAB policy is contextualised for local application. Furthermore, this study addressed the underrepresentation of Global South experiences in BR literature. Comparative and shared learning across the WNBRs could provide broader insights and improve the effectiveness of MAB worldwide and could facilitate integrated

learning from diverse experiences. Further, research should develop similar in-depth case studies across a range of globally representative BRs, specifically on MAB implementation in different contexts, which would enhance understanding and implementation of its policies (see our project activities [here](#)). For example, the Biosphere reserves as Effective Conservation Measures ([BECOME](#)) project is currently developing case studies documenting various approaches and effectiveness of BR management (more available [here](#)) (BECOME, 2024; Biodiversa+, 2024).

Chapter 5 focused on why and how conservation programmes function effectively in multifunctional landscapes where PAs are fragmented and biodiversity extends beyond their boundaries. Building on the seminal work of Schoon *et al.* (2020 & 2021) and Cockburn *et al.* (2020a), this study contributed to a global repository of collaborative case studies, facilitating cross-case comparisons to inform generalised insights for enhancing SES sustainability across diverse contexts. By selecting leopards as an illustrative for collaborative processes, the study also sought to address the knowledge gap concerning successful leopard conservation programs outside PAs, providing insights that could benefit similar conservation efforts. Findings from the BP case study may be useful for other regions or species as it provides an example of a successful collaborative effort across a multifunctional landscape. Furthermore, its findings suggest the following:

#### **6.1.10 Understanding the perceptions and motivations for stewardship**

Stakeholders in this study were believed to have positive attitudes towards the collaboration and conservation of leopards. Stewardship takes on multiple meanings and reasons for engaging in stewardship on private land stem from multiple interests. Motivated participants are necessary for successful conservation on private lands. Therefore, stakeholder perceptions and motivations for stewardship, particularly those on private lands in the Boland, could be considered in further research to enhance support of such collaborative projects elsewhere, driving collective action. Motivations are a leverage point in supporting stewardship and can be intrinsic (e.g. self-actualisation, morals, values or beliefs) or extrinsic (e.g. costs vs. benefits or rewards vs sanctions) (Bennet *et al.*, 2018). Chouinard *et al.* (2006) found that motivations for stewardship lie on a continuum of profitability, conservation and stewardship. On the one end farmers could be profit driven and on the other, believe they have a sense of

obligation to others. Other motivations could be a sense of community belonging and benefits of working together, the responsibility of caring for the environment for future generations or personal learning (Bramston *et al.*, 2017).

#### **6.1.11 Need for more research on collaborative carnivore conservation**

Contextual and process factors are important determinants of collaborative success. There are several sites in South Africa which exhibit similar contextual factors, for example free-roaming wild dogs of the Waterberg BR and leopard in the Gouritz Cluster and Garden Route BRs. However, how their collaborative efforts are mediated by their process variables would also make for interesting future research. Further case studies will be useful in addressing the knowledge gap concerning successful leopard conservation programs outside PAs. This is not limited to South Africa, as Marker and Dickman (2005) found more information is needed regarding leopard conservation outside PAs in Namibia as conservation efforts need to expand beyond them. This is because political and natural boundaries rarely coincide (Vitkalova *et al.*, 2018), meaning successful conservation efforts must be less area-centric and more integrated, collaborative (Webb *et al.*, 2020) and at a landscape-level (Searle *et al.*, 2020). Napleton-King (2018) found nurturing human interactions by empowering people and building good relationships will benefit collaborative conservation of threatened felids. While strong stakeholder engagement, knowledge-sharing, improving the flow of information, enhanced collaboration, continuous monitoring and evaluation, and building resilience were believed to be important for collaborative Persian leopard conservation (Rahimi *et al.*, 2024). Further, trust, collaboration and creating a transboundary BR is believed important for conserving the Amur leopards as well as ecological integrity on the boundary of Russia and China (Vitkalova *et al.*, 2018).

#### **6.1.12 Need for more collaborative initiative case studies**

Future research on collaborative initiatives would be beneficial for the global repository of collaborative case studies making use of the CMO – to find out “*what works, for whom, in what circumstance, and why?*” (Cockburn *et al.*, 2020a; Schoon *et al.*, 2020).

## CHAPTER 7

### Reflections: From There to Here and Back Again

Through my research journey my participants were really open and honest with me and I felt welcomed. They reflected on their motivations for what they do, their visions for the future and, in most cases, what brought them to where they are. For this reason I find it fitting that I do the same.

I grew up in Durbanville, what used to be a relatively small town in the northern suburbs of the City of Cape Town Metropolitan area, where the city meets the farmlands. I was privileged during my upbringing. I say this because at the young age of four I had my first “wilderness experience” visiting the KNP. Visiting our many national parks and other places offering similar experiences was something my family was drawn to. More importantly though, it was having these experiences with my dad, mom and sister that was so special to me. It was a time for us to bond and spend quality time together as a family. For many years during winter school holidays we would go on a road trip – something we all hold very close to our hearts. Seeing new and wilder places was something that my family had done for a long time. My parents as well as my grandparents all grew up going on family road trips. It had been passed down through generations, leaving a love for nature in us all.

This master’s degree has been a stimulating journey for me. It has completely changed my mind along the way. The experiences I had in my youth and what I was in some ways trained to believe during my undergraduate years was that nature needed to be separated from people to be protected – that humans were destructive. This is the old conservation paradigm that many cling to. I say I have changed because, although I am eco-centric at heart, I have become anthropocentric in my view of conservation. With new knowledge I look at my past experiences in a different light. I clearly see the marginalisation and injustices of the past and can in some way understand this resentment held by possibly many fellow South Africans. It bothers me. It upsets me, makes me uncomfortable. It motivates me to drive change.

*“Plant seeds of happiness, hope, success, and love; it will all come back to you in abundance. This is the law of nature” – Steve Maraboli*

I love nature for what it is, but I love people for who they are and their potential. I believe people are inherently good, wanting to do the *right* thing. However, many are

limited by their circumstances and subject to lasting legacies of the past. Not everyone is privileged enough to do good things all the time, although most would like to. This is perhaps a naïve view, but I believe it to be true. I know local environmental and social factors drive us to become who we are, and that it is true, for example, that one can be born a “criminal” in the same way I was maybe born to love our natural world. This view, and one of my guiding principles of *‘you are only as strong as the weakest player’*, makes me think that to really protect nature we must help and protect people. I believe nature will be cared for when people derive benefit from it, see the benefit in protecting it or when they are in a position allowing them the *choice* to care for it.

This line of thinking became apparent to me in 2021, during my BSc Honours and after working on a private game reserve in the Eastern Cape during 2020. At this time I did a lot of reading on environmental philosophy, attitudes, values, behaviours, ecosystem services and landscape approaches to biodiversity conservation; and when I first came across BRs and SESs. As part of my mini-thesis I chose to investigate the *“Human perceptions and attitudes towards nature and wildlife in the built environment”*. This was an interesting time because I began to question all my assumptions and continue to do so even today. I chose to study BRs because they are *people-centred, holistic* approaches to biodiversity conservation and sustainability – aligning my passion of people and biodiversity. I want to see biosphere reserves become a success, particularly in South Africa, and therefore I felt compelled to contribute in some way.

At the beginning of my study I was clueless on many things, for example real detail on BRs, governance, qualitative research and analysis, and research in general. I actively did a lot of reading and attended as many workshops as possible so I could prepare for the journey that lay ahead. This journey is more than just my MSc research but rather preparing me for a career in research and as a change agent. It paid off. In the end I was able to help others with which software to use, how to use it, about research methods and pursuing ethical clearance – a big task which resulted in a three-month delay during my MSc. It was these tougher times, pushing myself when I learnt many lessons and experienced a lot of growth. I leave my MSc journey feeling confident. I am not confident in that I know it all and ready to change the world, no. I am confident because I am capable of overcoming adversity, being able to *‘improvise, adapt, overcome’*. I am confident because I am comfortable that I don’t know it all, and that I can work with others to collectively solve problems.

*“If you want to go fast, go alone. If you want to go far, go together” – African Proverb*

I am hopeful for the future. I admit, I did not have a very positive outlook for the future prior to my MSc journey. However, meeting people along the way who are similarly driven led me to believe that I am not alone. There are many others giving their all to make the world a better place. This occurred to me when I attended the mini-TILL, or TRANSECTS summer school, in Germany during 2022. The people that I met, some who are now great friends, gave me hope. The participants in my research did the same. It was the conversations, and in some cases short walks, we had after the recorder had been turned off that I will carry with me. Their passion was tangible. Their motivations for what they do and vision for the future align so closely with mine. Particularly, connected humans which are connected to their environment, that human-wellbeing and societal needs are intertwined with conserving nature, and that there are good people doing good work. Fundamentally, that it is important to use my position and my privilege to bring about positive change.

*“The more privilege you have, the more opportunity you have. The more opportunity you have, the more responsibility you have” – Noam Chomsky*

Looking forward, I will be pursuing my PhD. I was delighted to be recruited by the Centre for Sustainability Transitions to work on their project titled, *“Pathways to transformative scenarios in multi-functional conservation landscapes in Southern Africa”*. In doing so I will be able to further develop myself and follow my passion. I would like to make positive contributions to conserving biodiversity and promoting human-wellbeing, while supporting my peers and others in pursuing their passion. I have always had this fire inside me for wanting to do *more*, to help make the world a *better* place. What cemented the “PhD idea” in me was a conversation with Preven Chetty. He had told me that having a master’s degree is like having a learner’s license, while having a PhD allows you to be the driver. I really want to be the driver. Not only because I want to drive change and research projects in the future, but I want to encourage, mentor and train other aspiring students and researchers. This, I believe, will allow me to be the change agent I envision myself becoming.

## CHAPTER 8

### Consolidated Reference List

- Amin R, Wilkinson A, Williams KS, Martins QE, Hayward J (2022) Assessing the status of leopard in the Cape Fold Mountains using a Bayesian spatial capture-recapture model in Just Another Gibbs Sampler. *African Journal of Ecology* 60(3):299-307. <https://doi.org/10.1111/aje.12944>
- Armitage D, De Loë R, Plummer R (2012) Environmental governance and its implications for conservation practice. *Conservation Letters* 5(4):245-255. <https://doi.org/10.1111/j.1755-263X.2012.00238.x>
- Arnstein SR (1969) A ladder of citizen participation. *Journal of the American Planning Association* 35(4):216-224. <https://doi.org/10.1080/01944366908977225>
- Arts B, Buizer M, Horlings L, Ingram V, Van Oosten C, Opdam P (2017) Landscape approaches: a state-of-the-art review. *Annual Review of Environment and Resources* 42:439-463. <https://doi.org/10.1146/annurev-enviro-102016-060932>
- Aschenbrand E, Michler T (2021) Why do UNESCO biosphere reserves get less recognition than national parks? A landscape research perspective on protected area narratives in Germany. *Sustainability* 13(24):13647. <https://doi.org/10.3390/su132413647>
- ATLAS.ti (2022) ATLAS.ti 23.2.0 for Mac. ATLAS.ti Scientific Software Development GmbH: Berlin, Germany.
- Aunger JA, Millar R, Rafferty AM, Mannion R, Greenhalgh J, Faulks D, McLeod H (2022) How, when, and why do inter-organisational collaborations in healthcare work? A realist evaluation. *PLoS One* 17(4):e0266899. <https://doi.org/10.1371/journal.pone.0266899>
- Azadi H, Van Passel S, Cools J (2021) Rapid economic valuation of ecosystem services in man and biosphere reserves in Africa: A review. *Global Ecology and Conservation* 28:e01697. <https://doi.org/10.1016/j.gecco.2021.e01697>
- Bagheri A (2015) Exploring the Effectiveness of Chain Referral Methods in Sampling Hidden Populations. *Indian Journal of Science and Technology* 8(30):1-8.
- Baldwin-Cantello W, Tickner D, Wright M, Clark M, Cornelius S, Ellis K, Francis A, Ghazoul J, Gordon JE, Matthews N (2023) The Triple Challenge: Synergies, trade-offs and integrated responses for climate, biodiversity, and human wellbeing goals. *Climate Policy* 23(6):782-799. <https://doi.org/10.1080/14693062.2023.2175637>
- Balme GA, Lindsey PA, Swanepoel LH, Hunter LT (2014) Failure of research to address the range-wide conservation needs of large carnivores: leopards in South Africa as a case study. *Conservation Letters* 7(1):3-11. <https://doi.org/10.1111/conl.12028>
- Barendse J, Roux D, Currie B, Wilson N, Fabricius C (2016) A broader view of stewardship to achieve conservation and sustainability goals in South Africa. *South African Journal of Science* 112(5/6). <https://doi.org/10.17159/sajs.2016/20150359>
- Barracough AD, Schultz L, Måren IE (2021) Voices of young biosphere stewards on the strengths, weaknesses, and ways forward for 74 UNESCO Biosphere Reserves across 83 countries. *Global Environmental Change* 68:102273. <https://doi.org/10.1016/j.gloenvcha.2021.102273>
- Barracough AD, Reed MG, Coetzer K, Price MF, Schultz L, Moreira-Muñoz A, Måren IE (2023) Global knowledge–action networks at the frontlines of sustainability: Insights from five decades of science for action in UNESCO's World Network of biosphere reserves. *People and Nature* 5(5):1430-1444. <https://doi.org/10.1002/pan3.10515>
- Batisse M (1982) The Biosphere Reserve: A Tool for Environmental Conservation Management. *Environmental Conservation* 9(2):101-111.
- Baxter P, Jack S (2008) Qualitative case study methodology: Study design and implementation for novice researchers. *The Qualitative Report* 13(4):544-559. <https://doi.org/10.46743/2160-3715/2008.1573>

- [BECOME] Biosphere reserves as Effective Conservation Measures (2024) What are Biosphere Reserves? <https://become.w.uib.no> [Accessed 20<sup>th</sup> August 2024].
- Bennett NJ, Whitty TS, Finkbeiner E, Pittman J, Bassett H, Gelcich S, Allison EH (2018) Environmental stewardship: A conceptual review and analytical framework. *Environmental Management* 61:597-614. <https://doi.org/10.1007/s00267-017-0993-2>
- Bennett NJ, Di Franco A, Calò A, Nethery E, Niccolini F, Milazzo M, Guidetti P (2019) Local support for conservation is associated with perceptions of good governance, social impacts, and ecological effectiveness. *Conservation Letters* 12(4):e12640. <https://doi.org/10.1111/conl.12640>
- Bergsten A, Galafassi D, Bodin O (2014) The problem of spatial fit in social-ecological systems: detecting mismatches between ecological connectivity and land management in an urban region. *Ecology and Society* 19(4):6. <https://doi.org/10.5751/ES-06931-190406>
- Berkes F (2017) Environmental governance for the Anthropocene? Social-ecological systems, resilience, and collaborative learning. *Sustainability* 9(7):1232. <https://doi.org/10.3390/su9071232>
- Bernstein RS, Buse K, Slatten LA (2015) Nonprofit board performance: Board members' understanding their roles and responsibilities. *American Journal of Management* 15(1):24-35.
- Biggs R, de Vos A, Preiser R, Clements H, Maciejewski K, Schlüter M (2022) *The Routledge handbook of research methods for social-ecological systems*. Routledge: New York, USA.
- Biodiversa+ (2024) BECOME. <https://www.biodiversa.eu/2023/04/19/become/> [Accessed 20<sup>th</sup> August 2024].
- Birt L, Scott S, Cavers D, Campbell C, Walter F (2016) Member Checking: A Tool to Enhance Trustworthiness or Merely a Nod to Validation? *Qualitative Health Research* 26(13):1802-1811. <https://doi.org/10.1177/1049732316654870>
- Bisman J (2010) Post-positivism and accounting research: A (personal) primer on critical realism, Australasian Accounting. *Business and Finance Journal* 4(4):3-25.
- Bodasing T (2022) The decline of large carnivores in Africa and opportunities for change. *Biological Conservation* 274:109724. <https://doi.org/10.1016/j.biocon.2022.109724>
- Bohdanowicz L (2023a) Boland Biosphere Reserves.
- Bohdanowicz L (2023b) Kogelberg Biosphere Reserve.
- Bohdanowicz L (2023c) Cape Winelands Biosphere Reserve.
- Boronyak L, Jacobs B, Wallach A, McManus J, Stone S, Stevenson S, Smuts B, Zaranek H (2022) Pathways towards coexistence with large carnivores in production systems. *Agriculture and Human Values* 39:47–64. <https://doi.org/10.1007/s10460-021-10224-y>
- Borsdorf FF, Pelenc J, Reutz-Hornsteiner B, Tourneau FML, Velut S, Coy M (2014) The contribution of biosphere reserves to regional sustainability: an institutional approach. *International Journal of Sustainable Society* 6(1/2):60-81.
- Botha E (2023) Stakeholder perceptions of sustainability and possible behaviour in a biosphere reserve. *Sustainable Development* 31(5):3843-3856. <https://doi.org/10.1002/sd.2629>
- Bouamrane M, Spierenburg M, Agrawal A, Boureima A, Cormier-Salem MC, Etienne M, Le Page C, Levrel H, Mathevet R (2016) Stakeholder engagement and biodiversity conservation challenges in social-ecological systems: some insights from biosphere reserves in western Africa and France. *Ecology and Society* 21(4):25. <https://doi.org/10.5751/ES-08812-210425>
- Bradshaw P, Hayday B, Armstrong R, Levesque J, Rykert L (1998) Non-profit governance models: Problems and prospects. *The Innovation Journal: The Public Sector Innovation Journal* 12(3):5.
- Bramston P, Pretty G, Zammit C (2011) Assessing environmental stewardship motivation. *Environment and behavior* 43(6):776-88.
- Braun V, Clarke V (2006) Using thematic analysis in psychology. *Qualitative Research in Psychology* 3(2):77-101. <https://doi.org/10.1191/1478088706qp063oa>

- Brennan NM (2022) Methodological insights: Interview quotations in accounting research. *Accounting, Auditing and Accountability Journal* 35(9):382-411. <https://doi.org/10.1108/AAAJ-06-2022-5843>
- Bridgewater P (2016) The Man and Biosphere programme of UNESCO: Rambunctious child of the sixties, but was the promise fulfilled? *Current Opinion in Environmental Sustainability* 19:1-6. <https://doi.org/10.1016/j.cosust.2015.08.009>
- Brown PA (2008) A Review of the Literature on Case Study Research. *Canadian Journal for New Scholars in Education* 1(1):1-13.
- Bryman A (2012) *Social Research Methods*, 4th Edition. Oxford University Press: New York, USA.
- Büscher B (2015) Reassessing Fortress Conservation? New Media and the Politics of Distinction in Kruger National Park. *Annals of the Association of American Geographers* 106(1):114-129. <https://doi.org/10.1080/00045608.2015.1095061>
- Butchart SH, Walpole M, Collen B, Van Strien A, Scharlemann JP, Almond RE, Baillie JE, Bomhard B, Brown C, Bruno J, Carpenter KE, Carr GM, Chanson J, Chenery AM, Csirke J, Davidson NC, Dentener F, Foster M, Galli A, Galloway JN, Genovesi P, Gregory RD, Hockings M, Kapos V, Lamarque JF, Leverington F, Loh J, McGeoch MA, McRae L, Minasyan A, Morcillo MH, Oldfield TEE, Pauly D, Quader S, Revenga C, Sauer JR, Skolnik B, Spear D, Stanwell-Smith D, Stuart SN, Symes A, Tierney M, Tyrrell TD, Vié JC, Watson R (2010) Global biodiversity: indicators of recent declines. *Science* 328(5982):1164-1168. <https://doi.org/10.1126/science.1187512>
- Campbell S, Greenwood M, Prior S, Shearer T, Walkem K, Young S, Bywaters D, Walker K (2020) Purposive sampling: complex or simple? Research case examples. *Journal of Research in Nursing* 25(8):652-661. <https://doi.org/10.1177/1744987120927206>
- [CBRA] Canadian Biosphere Regions Association (2024) Reconciliation Stories. <https://biospherecanada.ca/reconciliation-stories/> [Accessed 20<sup>th</sup> August 2024].
- CapeNature (2012) *Kogelberg Nature Reserve Complex Management Plan 2013–2018*. CapeNature: Cape Town, South Africa.
- CapeNature (2019) *Boland Mountain Complex: Protected Area Management Plan 2019-2029*. CapeNature: Cape Town, South Africa.
- CapeNature (2022) Protected areas and stewardship. <https://www.capenature.co.za/protected-areas-and-stewardship> [Accessed 14<sup>th</sup> September 2022].
- CapeNature (2024a) CapeNature Landscapes: Landscape Central. <https://www.capenature.co.za/landscape-central> [Accessed 1<sup>st</sup> June 2024].
- CapeNature (2024b) What we do. <https://www.capenature.co.za/what-we-do> [Accessed 1<sup>st</sup> June 2024].
- Cape Leopard Trust (2024) Cape Leopard Trust. <https://capeleopard.org.za> [Accessed 18<sup>th</sup> April 2024].
- [CWBR] Cape Winelands Biosphere Reserve (2022) Cape Winelands Biosphere Reserve. <https://www.capewinlandsbiosphere.co.za> [Accessed 25<sup>th</sup> April 2022].
- Carr Kelman C, Brady U, Raschke BA, Schoon ML (2023) A Systematic Review of Key Factors of Effective Collaborative Governance of Social-Ecological Systems. *Society and Natural Resources* 36(11):1452-1470. <https://doi.org/10.1080/08941920.2023.2228234>
- Carruthers J (2020) Conservation science and UNESCO Biosphere Reserves. *South African Journal of Science* 116(1-2).
- Carter NH, Nelson P, Easter T (2021) A call for a national collaborative predator coexistence programme. *People and Nature* 3(4):788-794. <https://doi.org/10.1002/PAN3.10245>
- Carter NH, Linnell JDC (2023) Building a resilient coexistence with wildlife in a more crowded world. *PNAS Nexus* 2(3):pgad030. <https://doi.org/10.1093/pnasnexus/pgad030>
- [CBD] Convention on Biological Diversity (2022) *Kunming-Montreal Global Biodiversity Framework*. United Nations Environment Programme: Montreal, Canada.

- Chouinard HH, Paterson T, Wandschneider PR, Ohler AM (2008) Will farmers trade profits for stewardship? Heterogeneous motivations for farm practice selection. *Land Economics* 84(1):66-82.
- Clement S, Guerrero Gonzalez A, Wyborn C (2020) Understanding effectiveness in its broader context: assessing case study methodologies for evaluating collaborative conservation governance. *Society & Natural Resources* 33(4):462-483. <https://doi.org/10.1080/08941920.2018.1556761>
- Clüsener-Godt M, Kück G, Möller L (2022) It is about life: 50 years of UNESCO's Man and the Biosphere Program. *International Journal of Environment and Sustainable Development* 21(4):377-87. <https://doi.org/10.1504/ijesd.2021.10043762>
- Cockburn J, Cundill G, Shackleton S, Rouget M (2018) Towards place-based research to support social-ecological stewardship. *Sustainability* 10(5):1434. <https://doi.org/10.3390/su10051434>
- Cockburn J, Cundill G, Shackleton S, Rouget M (2019) The meaning and practice of stewardship in South Africa. *South African Journal of Science* 115(5/6). <https://doi.org/10.17159/sajs.2019/5339>
- Cockburn J, Cundill G, Shackleton S, Cele A, Cornelius SF, Koopman V, Le Roux JP, McLeod N, Rouget M, Schroder S, Van den Broeck D, Wright DR, Zwinkels M (2020b) Relational hubs for collaborative landscape stewardship. *Society & Natural Resources* 33(5):681-693. <https://doi.org/10.1080/08941920.2019.1658141>
- Cockburn J, Schoon M, Cundill G, Robinson C, Aburto JA, Alexander SM, Baggio JA, Barnaud C, Chapman M, Garcia Llorente M, García-López GA (2020a) Understanding the context of multifaceted collaborations for social-ecological sustainability: a methodology for cross-case analysis. *Ecology and Society* 25(3):7. <https://doi.org/10.5751/ES-11527-250307>
- Coetzer KL, Witkowski ET, Erasmus BF (2014) Reviewing Biosphere Reserves globally: effective conservation action or bureaucratic label? *Biological Reviews* 89(1):82-104. <https://doi.org/10.1111/BRV.12044>
- Coetzer KL, Witkowski ET, Erasmus BF (2016) Thresholds of change in a multi-use conservation landscape of South Africa: historical land-cover, future transformation and consequences for environmental decision-making. *Environmental Conservation* 43(3):253-262. <https://doi.org/10.1017/S0376892916000084>
- Coetzer KL, Witkowski ET, Erasmus BF, Reyers B (2013) The Race for Space: Tracking Land-Cover Transformation in a Socio-ecological Landscape, South Africa. *Environmental Management* 52:595-611. <https://doi.org/10.1007/s00267-013-0094-9>
- Cowling RM, Pressey RL, Rouget M, Lombard AT (2003) A conservation plan for a global biodiversity hotspot – the Cape Floristic Region, South Africa. *Biological Conservation* 112(1/2):192-216. [https://doi.org/10.1016/S0006-3207\(02\)00425-1](https://doi.org/10.1016/S0006-3207(02)00425-1)
- Cumming GS, Allen CR, Ban NC, Biggs D, Biggs HC, Cumming DH, de Vos A, Epstein G, Etienne M, Maciejewski K, Mathevet R (2015) Understanding protected area resilience: a multi-scale, social-ecological approach. *Ecological Applications* 25(2):299-319.
- Cumming GS (2016) The relevance and resilience of protected areas in the Anthropocene. *Anthropocene* 13:46-56. <https://doi.org/10.1016/j.ancene.2016.03.003>
- Cumming GS, Allen CR (2017) Protected areas as social-ecological systems: perspectives from resilience and social-ecological systems theory. *Ecological applications* 27(6):1709-1717. <https://doi.org/10.1002/eap.1584>
- De Garine-Wichatitsky M, Binot A, Caron A, Perrotton A, Ross H, Tran Quoc H, Valls-Fox H, Gordon IJ, Promburom P, Ancog R (2021) “Health in” and “Health of” Social-Ecological Systems: A Practical Framework for the Management of Healthy and Resilient Agricultural and Natural Ecosystems. *Frontiers in Public Health* 8:616328. <https://doi.org/10.3389/fpubh.2020.616328>
- de Vos A, Cumming GS, Roux DJ (2017) The relevance of cross-scale connections and spatial interactions for ecosystem service delivery by protected areas: Insights from southern Africa. *Ecosystem Services* 28:133-139. <https://doi.org/10.1016/j.ecoser.2017.11.014>

- de Vos A, Biggs R, Preiser R (2019) Methods for understanding social-ecological systems: a review of place-based studies. *Ecology and Society* (4):16. <https://doi.org/10.5751/ES-11236-240416>
- [DEA] Department of Environmental Affairs (2016) *The South African Strategy for the Biosphere Reserve Programme (2016-2020)*. Department of Environmental Affairs: Pretoria, South Africa.
- [DFFE] Department of Forestry, Fisheries and the Environment (2022) Kogelberg Biosphere Reserve. <https://www.dffe.gov.za/kogelberg-biosphere-reserve> [Accessed 25<sup>th</sup> April 2022].
- DFFE (2022) Cape Winelands Biosphere Reserve. <https://www.dffe.gov.za/cape-winelands-biosphere-reserve> [Accessed 25<sup>th</sup> April 2022].
- Devens CH, Tshabalala T, McManus JS, Smuts B (2018) Counting the spots: The use of a spatially explicit capture–recapture technique and GPS data to estimate leopard (*Panthera pardus*) density in the Eastern and Western Cape, South Africa. *African Journal of Ecology* 56(4):850-9. <https://doi.org/10.1111/aje.12512>
- Devens CH, Hayward MW, Tshabalala T, Dickman A, McManus JS, Smuts B, Somers MJ (2021) Estimating leopard density across the highly modified human-dominated landscape of the Western Cape, South Africa. *Oryx* 55(1):34-45. <https://doi.org/10.1017/S0030605318001473>
- Díaz S, Settele J, Brondízio ES, Ngo HT, Agard J, Arneth A, Balvanera P, Brauman KA, Butchart SH, Chan KM, Garibaldi LA, Ichii K, Liu J, Subramanian SM, Midgley GF, Miloslavich P, Molnár Z, Obura D, Pfaff A, Polasky S, Purvis A, Razzaque J, Reyers B, Chowdhury RR, Shin YJ, Visseren-Hamakers I, Willis KJ, Zayas CN (2019) Pervasive human-driven decline of life on Earth points to the need for transformative change. *Science* 366(6471):eaax3100. <https://doi.org/10.1126/science.aax3100>
- Dickman AJ (2010) Complexities of conflict: the importance of considering social factors for effectively resolving human–wildlife conflict. *Animal Conservation* 13(5):458-466. <https://doi.org/10.1111/j.1469-1795.2010.00368.x>
- Donald PF, Buchanan GM, Balmford A, Bingham H, Couturier AR, de la Rosa Jr GE, Gacheru P, Herzog SK, Jathar G, Kingston N, Marnewick D, Maurer G, Reaney L, Shmygaleva T, Sklyarenko S, Stevens CMD, Butchart SHM (2019) The prevalence, characteristics and effectiveness of Aichi Target 11's "other effective area-based conservation measures" (OECMs) in Key Biodiversity Areas. *Conservation Letters* 12(5):e12659. <https://doi.org/10.1111/conl.12659>
- Durant SM, Marino A, Linnell JD, Oriol-Cotterill A, Dloniak S, Dolrenry S, Funston P, Groom RJ, Hanssen L, Horgan J, Ikanda D (2022) Fostering Coexistence Between People and Large Carnivores in Africa: Using a Theory of Change to Identify Pathways to Impact and Their Underlying Assumptions. *Frontiers in Conservation Science* 2:698631. <https://doi.org/10.3389/fcosc.2021.698631>
- Dyfi Biosphere (2024) What is a Biosphere Reserve? <https://www.dyfibiosphere.wales/what-is-a-biosphere> [Accessed 20<sup>th</sup> August 2024].
- Edelenbos J, van Meerkerk I (2016) Introduction: Three reflecting perspectives on interactive governance. In: *Critical Reflections on Interactive Governance: Self-Organization and Participation in Public Governance*. Edward Elgar Publishing: Northampton, USA, pp. 1–28.
- Ekstrom JA, Young OR (2009) Evaluating Functional Fit between a Set of Institutions and an Ecosystem. *Ecology and Society* 14(2):16.
- Elbakidze M, Hahn T, Mauerhofer V, Angelstam P, Axelsson R (2013) Legal framework for biosphere reserves as learning sites for sustainable development: A comparative analysis of Ukraine and Sweden. *Ambio* 42:174-187. <https://doi.org/10.1007/s13280-012-0373-3>
- Enqvist JP, West S, Masterson VA, Haider LJ, Svedin U, Tengö M (2018) Stewardship as a boundary object for sustainability research: Linking care, knowledge and agency. *Landscape and Urban Planning* 179:17-37. <https://doi.org/10.1016/j.landurbplan.2018.07.005>
- Estes JA, Terborgh J, Brashares JS, Power ME, Berger J, Bond WJ, Carpenter SR, Essington TE, Holt RD, Jackson JB, Marquis RJ (2011) Trophic downgrading of planet Earth. *Science* 333(6040):301-306. <https://doi.org/10.1126/science.1205106>

- Ferreira AF, Zimmermann H, Santos R, Von Wehrden H (2018) A social–ecological systems framework as a tool for understanding the effectiveness of biosphere reserve management. *Sustainability* 10(10):3608. <https://doi.org/10.3390/su10103608>
- Ferreira AF, Zimmermann H, Santos R, Von Wehrden H (2020) Biosphere reserves' management effectiveness—A systematic literature review and a research agenda. *Sustainability* 12(14):5497. <https://doi.org/10.3390/su12145497>
- Folke C, Carpenter S, Elmqvist T, Gunderson L, Holling CS, Walker B (2002) Resilience and sustainable development: building adaptive capacity in a world of transformations. *AMBIO: A journal of the human environment* 31(5):437-40.
- Folke C, Hahn T, Olsson P, Norberg J (2005) Adaptive governance of social-ecological systems. *Annual Review of Environment and Resources* 30(1):441-73. <https://doi.org/10.1146/annurev.energy.30.050504.144511>
- Folke C, Polasky S, Rockström J, Galaz V, Westley F, Lamont M, Scheffer M, Österblom H, Carpenter SR, Chapin FS, Seto KC (2021) Our future in the Anthropocene biosphere. *Ambio* 50:834-869. <https://doi.org/10.1007/s13280-021-01544-8>
- Gardali T, Dybala KE, Seavy NE (2021) Multiple-Benefit Conservation defined. *Conservation Science and Practice* 3(6):e420. <https://doi.org/10.1111/csp2.420>
- Genda PA, Ngoteya HC, Caro T, Mulder MB (2022) Looking up and down: Strong collaboration is only the first step in tackling parachute science. *Conservation Science and Practice* 4(5): e12677. <https://doi.org/10.1111/csp2.12677>
- George C, Reed MG (2017) Revealing inadvertent elitism in stakeholder models of environmental governance: Assessing procedural justice in sustainability organizations. *Journal of Environmental Planning and Management* 60(1):158-177. <https://doi.org/10.1080/09640568.2016.1146576>
- [GCBR] Gouritz Cluster Biosphere Reserve (2024) Online Store in support of nature. [https://shop.gouritz.com/?\\_gl=1\\*vv15j3\\*\\_ga\\*NzU0NzAxNzM2LjE3MjQxNDYzNjM.\\*\\_ga\\_LM5KLY1YRY\\*MTcyNDE0NjM2Mi4xLjEuMTcyNDE0NjQwNS4xNy4wLjA](https://shop.gouritz.com/?_gl=1*vv15j3*_ga*NzU0NzAxNzM2LjE3MjQxNDYzNjM.*_ga_LM5KLY1YRY*MTcyNDE0NjM2Mi4xLjEuMTcyNDE0NjQwNS4xNy4wLjA) [Accessed 20<sup>th</sup> August 2024].
- Global Leopard Conference (2024) Why are leopards important. <https://www.internationalleopardday.org/about-leopards> [Accessed 22<sup>nd</sup> April 2024].
- Griffiths M (2017) Heritage Lost: The cultural impact of wildlife crime in South Africa. *South African Crime Quarterly* 60:45-50. <https://doi.org/10.17159/2413-3108/2017/v0n60a1728>
- Gurney GG, Darling ES, Ahmadiya GN, Agostini VN, Ban NC, Blythe J, Claudet J, Epstein G, Himes-Cornell A, Jonas HD, Armitage D (2021) Biodiversity needs every tool in the box: use OECMs. *Nature* 595(7869):646-649. <https://doi.org/10.1038/d41586-021-02041-4>
- Hahn T (2011) Self-organized governance networks for ecosystem management: who is accountable? *Ecology and Society* 16(2):18.
- Hamann M, Biggs R, Pereira L, Preiser R, Hichert T, Blanchard R, Warrington-Coetzee H, King N, Merrie A, Nilsson W, Odendaal P (2020) Scenarios of Good Anthropocenes in southern Africa. *Futures* 118:102526. <https://doi.org/10.1016/j.futures.2020.102526>
- Hamilton LS (2014) Protected Areas in a Changing World. *Proceedings of the 2013 George Wright Society Conference on Parks, Protected Areas, and Cultural Sites* pp. 35-40.
- Hanson T, Wiles GJ, Gaydos JK (2016) A novel public–private partnership model for improving the listing of endangered species. *Biodiversity Conservation* 25:193-198. <https://doi.org/10.1007/s10531-016-1048-3>
- Harvey JF (2012) Managing organizational memory with intergenerational knowledge transfer. *Journal of Knowledge Management* 16(3):400-417. <https://doi.org/10.1108/13673271211238733>
- Hedden-Dunkhorst B, Schmitt F (2020) Exploring the potential and contribution of UNESCO Biosphere Reserves for landscape governance and management in Africa. *Land* 9(8):237. <https://doi.org/10.3390/LAND9080237>

- Hinde K, Wilkinson A, Tokota S, Amin R, O’Riain MJ, Williams KS (2023) Leopard density and the ecological and anthropogenic factors influencing density in a mixed-use landscape in the Western Cape, South Africa. *PLoS ONE* 18(10):e0293445. <https://doi.org/10.1371/journal.pone.0293445>
- Holmes AGD (2020) Researcher Positionality - A Consideration of Its Influence and Place in Qualitative Research - A New Researcher Guide. *Shanlax International Journal of Education* 8(4):1-10. <https://doi.org/10.34293/education.v8i4.3232>
- Hosseini SA, Delafrooz N, Fadaei M (2014) Investigating the effects of brand identity on customer loyalty. *Indian Journal of Fundamental and Applied Life Sciences* 4(4):3491-3506.
- Howe Sound Biosphere Region (2024) What is a Biosphere Region? <https://www.howesoundbri.org/what-is-a-biosphere-region> [Accessed 20<sup>th</sup> August 2024].
- Humble N, Mozelius P (2022) Content analysis or thematic analysis: Similarities, differences and applications in qualitative research. *European Conference on Research Methodology for Business and Management Studies* 21(1):76-81.
- Innovation Norway (2024) #OurStories: Biosphere Reserves: Where Humans and Nature Coexist. <https://eea.innovationnorway.com/article/ourstories:-biosphere-reserves> [Accessed 20<sup>th</sup> August 2024].
- [IPBES] Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (2019) Summary for policymakers of the global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. S Díaz, J Settele, ES Brondízio, HT Ngo, M Guèze, J Agard, A Arneth, P Balvanera, KA Brauman, SHM Butchart, KMA Chan, LA Garibaldi, K Ichii, J Liu, SM Subramanian, GF Midgley, P Miloslavich, Z Molnár, D Obura, A Pfaff, S Polasky, A Purvis, J Razzaque, B Reyers, R Roy Chowdhury, YJ Shin, IJ Visseren-Hamakers, KJ Willis, CN Zayas (eds.). IPBES secretariat, Bonn, Germany.
- Ishwaran N, Persic A, Tri NH (2008) Concept and Practice: The Case of UNESCO Biosphere Reserves. *International Journal of Environment and Sustainable Development* 7(2):118-131.
- [IUCN] International Union for Conservation of Nature (2003) *Benefits Beyond Boundaries Proceedings of the Vth IUCN World Parks Congress*. World Parks Congress: Durban South Africa.
- Karar E, Jacobs-Mata I (2016) Inclusive governance: The role of knowledge in fulfilling the obligations of citizens. *Aquatic Procedia* 6:15-22. <https://doi.org/10.1016/j.aqpro.2016.06.003>
- Kark S, Tulloch A, Gordon A, Mazor T, Bunnefeld N, Levin N (2015) Cross-boundary collaboration: key to the conservation puzzle. *Current Opinion in Environmental Sustainability* 12:12-24. <https://doi.org/10.1016/j.cosust.2014.08.005>
- Kendon TA, Comley J, Wilkinson A, Grobler MJ, Nieman WA, Leslie AJ, O’Riain MJ, Naude VN (2022) Evaluating determinants of wire-snare poaching risk in the Boland Mountain Complex of South Africa. *Journal for Nature Conservation* 70:126295. <https://doi.org/10.1016/j.jnc.2022.126295>
- Kirchhoff T, Brand F, Hoheisel D (2012) From cultural landscapes to resilient social-ecological systems: transformation of a classical paradigm or a novel approach. In: Plieninger T, Bieling C (eds.) *Resilience and the cultural landscape: understanding and managing change in human-shaped environments*. Cambridge University Press: Cambridge, UK, pp.49-64.
- Klaver M, Currie B, Sekonya JG, Coetzer K (2024) Learning through Place-Based Implementation of the UNESCO MAB Program in South Africa’s Oldest Biosphere Reserve: A Case Study of the Kogelberg Biosphere Reserve. *Land* 13(4):455. <https://doi.org/10.3390/land13040455>
- Kleinheksel AJ, Rockich-Winston N, Tawfik H, Wyatt TR (2020) Demystifying content analysis. *American Journal of Pharmaceutical Education* 84(1):7113.
- [KBR] Kogelberg Biosphere Reserve (2022) Kogelberg Biosphere Reserve. <https://kogelbergbiosphere.org.za> [Accessed 25<sup>th</sup> April 2022].

- [KBRC] Kogelberg Biosphere Reserve Company (2006) *Towards a Strategic Management Framework for the Kogelberg Biosphere Reserve: Strategic Plan*. Setplan, DJ Environmental Consultants, & Envirocentric: Cape Town, South Africa.
- Kooiman J, Bavinck M, Chuenpagdee R, Mahon R, Pullin R (2008) Interactive governance and governability: An introduction. *Journal of Transdisciplinary Environmental Studies* 7(1):1-11.
- Kransdorf A (1998) Corporate amnesia. *European Business Review* 98(6).  
<https://doi.org/10.1108/eb.1998.05498fab.008>
- Kremen C, Merenlender AM (2018) Landscapes that work for biodiversity and people. *Science* 362(6412):eaau6020. <https://doi.org/10.1126/science.aau6020>
- Lauber TB, Stedman RC, Decker DJ, Knuth BA (2011) Linking knowledge to action in collaborative conservation. *Conservation Biology* 25(6):1186:1194. <https://doi.org/10.1111/j.1523-1739.2011.01742.x>
- Le Maitre D, Seyler H, Holland M, Smith-Adao L, Maherry A, Nel J, Witthüser K (2019) *Strategic water source areas: Vital for South Africa's water, food and energy security*. Pretoria: Water Research Commission.
- Lecina-Diaz J, Campos J, Pais S, Carvalho-Santos C, Azevedo J, Fernandes P, Gonçalves J, Aquilue N, Rocés-Díaz J, Agrelo de la Torre M, Brotons L (2023) Stakeholder perceptions of wildfire management strategies as nature-based solutions in two Iberian biosphere reserves. *Ecology and Society* 28(1):39. <https://doi.org/10.5751/ES-13907-280139>
- Lingard L (2019) Beyond the default colon: Effective use of quotes in qualitative research. *Perspectives on Medical Education* 8(6):360-364. <https://doi.org/10.1007/s40037-019-00550-7>
- Lockwood M, Davidson J, Curtis A, Stratford E, Griffith R (2010) Governance principles for natural resource management. *Society and Natural Resources* 23(10):986-1001.  
<https://doi.org/10.1080/08941920802178214>
- Mabele MB, Krauss JE, Kiwango W (2022) Going Back to the Roots: Ubuntu and Just Conservation in Southern Africa. *Conservation and Society* 20(2):92-102.  
[https://doi.org/10.4103/cs.cs\\_33\\_21](https://doi.org/10.4103/cs.cs_33_21).
- Mace GM (2014) Whose conservation? *Science* 45(6204):1558-60.  
<https://doi.org/10.1126/science.1254704>
- MacKinnon K, Mrema E.M, Richardson K, Cooper D, Gidda SB (2021) Editorial Essay: Protected and Conserved Areas: Contributing to more ambitious conservation outcomes post-2020. *Parks* 27:7-12.
- Magaliesberg Biosphere (2024) Magaliesberg Biosphere Video Series.  
<https://magaliesbergbiosphere.org.za/magaliesberg-biosphere-video-series/> [Accessed 20<sup>th</sup> August 2024].
- Mann GK, Wilkinson A, Hayward J, Drouilly M, O'Riain MJ, Parker DM (2019) The effects of aridity on land use, biodiversity and dietary breadth in leopards. *Mammalian Biology* 98:43-51.  
<https://doi.org/10.1016/j.mambio.2019.07.003>
- Maniou TA (2021) Semantic analysis of cultural heritage news propagation in social media: Assessing the role of media and journalists in the era of big data. *Sustainability* 13(1):341.  
<https://doi.org/10.3390/su13010341>
- Marker LL, Dickman AJ (2005) Factors affecting leopard (*Panthera pardus*) spatial ecology, with particular reference to Namibian farmlands. *South African Journal of Wildlife Research* 35(2):105-15.
- Marnewick D, Stevens CMD, Jonas H, Antrobus-Wuth R, Wilson N, Theron N (2021) Assessing the extent and contribution of OECMs in South Africa. *Parks* 27:57-70.
- Martins Q, Martins N (2006) Leopards of the Cape: conservation and conservation concerns. *International Journal of Environmental Studies* 63(5):579-595.  
<https://doi.org/10.1080/00207230600963486>

- Martinsuo M, Huemann M (2021) Designing case study research. *International Journal of Project Management* 39(5):417-421. <https://doi.org/10.1016/j.iiproman.2021.06.007>
- Maxwell SL, Cazalis V, Dudley N, Hoffmann M, Rodrigues AS, Stolton S, Visconti P, Woodley S, Kingston N, Lewis E, Maron M, (2020) Area-based conservation in the twenty-first century. *Nature* 586:217-227. <https://doi.org/10.1038/s41586-020-2773-z>
- McManus J, Schurch MP, Goets S, Faraut L, Couldridge V, Smuts B (2022) Delineating Functional Corridors Linking Leopard Habitat in the Eastern and Western Cape, South Africa. *Conservation* 2(1):99-121. <https://doi.org/10.3390/conservation2010009>
- McNeely JA, Weatherly WP (1996) Innovative funding to support biodiversity conservation. *International Journal of Social Economics* 23(4/5/6):98-124.
- Miller JR (2005) Biodiversity conservation and the extinction of experience. *Trends in Ecology and Evolution* 20(8):430-434. <https://doi.org/10.1016/j.tree.2005.05.013>
- Mitrofanenko T, Snajdr J, Muhar A, Penker M, Schauppenlehner-Kloyber E (2018) Biosphere reserve for all: Potentials for involving underrepresented age groups in the development of a biosphere reserve through intergenerational practice. *Environmental Management* 62:429-445. <https://doi.org/10.1007/s00267-018-1059-9>
- Morris DR, McWhorter TJ, Boardman WSJ, Simpson G, Wentzel J, Coetzee J, Du Plessis F, Moodley Y (2023) Gene flow connects key leopard (*Panthera pardus*) populations despite habitat fragmentation and persecution. *Biodiversity and Conservation* 32:945-963. <https://doi.org/10.1007/s10531-022-02531-5>
- Morris DR, McWhorter TJ, Boardman WS, Simpson G, Wentzel J, Coetzee J, Moodley Y (2024) Unravelling the maternal evolutionary history of the African leopard (*Panthera pardus pardus*). *PeerJ* 12:e17018. <https://doi.org/10.7717/peerj.17018>
- Müller K (2014) Resilience thinking and the evolution of collaborative environmental governance in the Western Cape. *Administratio Publica* 22(1):5-23.
- Müller L, Briers-Louw WD, Seele BC, Stefanus Lochner C, Amin R (2022) Population size, density, and ranging behaviour in a key leopard population in the Western Cape, South Africa. *PLoS ONE* 17(5):e0254507. <https://doi.org/10.1101/2021.07.23.453562>
- Napleton-King RA (2018) Empowering Conservation Partnerships: Understanding the Human-Related Dimensions of Collaboration in Conservation, using Threatened Felids as a Model. Ph.D. Thesis, University of Kent, Canterbury, England.
- Naughton-Treves L, Holland MB, Brandon K (2005) The Role of Protected Areas in Conserving Biodiversity and Sustaining Local Livelihoods. *Annual Review of Environment and Resources* 30:219-252. <https://doi.org/10.1146/annurev.energy.30.050504.164507>
- Naz N, Gulab F, Aslam N (2022) Development of Qualitative Semi-Structured Interview Guide for Case Study Research. *Competitive Social Sciences Research Journal* 3(2):42-52.
- Neyret M, Peter S, Le Provost G, Boch S, Boesing AL, Bullock JM, Hölzel N, Klaus VH, Kleinebecker T, Krauss J, Müller J, Müller S, Ammer C, Buscot F, Ehbrecht M, Fischer M, Goldmann K, Jung K, Mehring M, Müller T, Renner SC, Schall P, Scherer-Lorenzen M, Westphal C, Wubet T, Manning P (2023) Landscape management strategies for multifunctionality and social equity. *Nature Sustainability* 6:391–403. <https://doi.org/10.1038/s41893-022-01045-w>
- Nieman WA, Leslie AJ, Wilkinson A, Wossler TC (2019) Socioeconomic and biophysical determinants of wire-snare poaching incidence and behaviour in the Boland Region of South Africa. *Journal for Nature Conservation* 52:125738. <https://doi.org/10.1016/j.jnc.2019.125738>
- Nieman WA, Wilkinson A, Leslie AJ (2020) Farmer attitudes and regional risk modelling of human–wildlife conflict on farmlands bordering the Boland Mountain Complex, South Africa. *African Journal of Wildlife Research* 50(1):36-54. <https://doi.org/10.3957/056.050.0036>
- Nieman WA, Schultz BC, Wilkinson A, Leslie AJ (2021) Stakeholders' perceptions of mammal occurrence and abundance on agricultural properties bordering the Boland Mountain Complex, South Africa. *African Zoology* 56(2):104-116. <https://doi.org/10.1080/15627020.2021.1885990>

- Norton P, Lawson A (1985) Radio tracking of leopards and caracals in the Stellenbosch area, Cape Province. *South African Journal of Wildlife Research* 15(1):17-24.
- Norton P, Henley S, Lawson A, Avery G (1986) Prey of leopards in four mountainous areas of the south-western Cape Province. *South African Journal of Wildlife Research* 16(3):47-52.
- O'Farrell PJ, Anderson PM (2010) Sustainable multifunctional landscapes: a review to implementation. *Current Opinion in Environmental Sustainability* 2(1/2):59-65. <https://doi.org/10.1016/j.cosust.2010.02.005>
- O'Farrell PJ, Reyers B, Le Maitre DC, Milton SJ, Egoh B, Maherry A, Colvin C, Atkinson D, De Lange W, Blignaut JN, Cowling RM (2010) Multi-functional landscapes in semi-arid environments: implications for biodiversity and ecosystem services. *Landscape Ecology* 25:1231-1246. <https://doi.org/10.1007/s10980-010-9495-9>
- O'Bryan CJ, Braczkowski AR, Beyer HL, Carter NH, Watson JEM, McDonald-Madden E. (2018) The contribution of predators and scavengers to human well-being. *Nature Ecology and Evolution* 2:229-236. <https://doi.org/10.1038/s41559-017-0421-2>
- Obura DO, Katerere Y, Mayet M, Kaelo D, Msweli S, Mather K, Harris J, Louis M, Kramer R, Teferi T, Samoily M (2021) Integrate biodiversity targets from local to global levels. *Science* 373(6556):746-748.
- Oliver E, Oliver WH (2017) The Colonisation of South Africa: A unique case. *Theological Studies* 73(3): a4498. <https://doi.org/10.4102/hts.v73i3.4498>
- Ortega-Rodríguez C, Martín-Montes L, Licerán-Gutiérrez A, Moreno-Albarracín AL (2023) Nonprofit good governance mechanisms: A systematic literature review. *Nonprofit Management and Leadership* 34(4):927-957. <https://doi.org/10.1002/nml.21598>
- Otter.ai (2023) Otter.ai iOS. Otter.ai Inc.: California, USA. <https://otter.ai> [Accessed 9<sup>th</sup> May 2023].
- Palinkas LA, Horwitz SM, Green CA, Wisdom JP, Duan N, Hoagwood K (2015) Purposeful sampling for qualitative data collection and analysis in mixed method implementation research. *Administration and Policy in Mental Health and Mental Health Services Research* 42:533-544. <https://doi.org/10.1007/s10488-013-0528-y>
- Palomo I, Montes C, Martín-Lopez B, González JA, García-Llorente M, Alcorlo P, Mora MRG (2014) Incorporating the social–ecological approach in protected areas in the Anthropocene. *BioScience* 64(3):181-191. <https://doi.org/10.1093/biosci/bit033>
- Parker C, Scott S, Geddes A (2019) Snowball Sampling. *SAGE Research Methods Foundations*.
- Parliamentary Monitoring Group (2024) Nature Conservation in SA: State of Provincial Reserves; Leopard snaring in the provincial and national parks. <https://pmg.org.za/committee-meeting/38309/> [Accessed 9<sup>th</sup> May 2024].
- Petrovic J (2008) Unlocking the role of a board director: A review of the literature. *Management Decision* 46(9):1373-1392. <https://doi.org/10.1108/00251740810911993>
- Pimentel D, Stachow U, Takacs DA, Brubaker HW, Dumas AR, Meaney JJ, Onsi DE, Corzilius DB (1992) Conserving biological diversity in agricultural/forestry systems. *BioScience* 42(5):354-362.
- Plummer R, Hashimoto A (2011) Adaptive co-management and the need for situated thinking in collaborative conservation. *Human Dimensions of Wildlife* 16(4):222-235. <https://doi.org/10.1080/10871209.2011.585434>
- Pollard S, Shackleton C, Carruthers J (2003) Beyond the Fence: People and the Lowveld Landscape. In: Du Toit JT, Rogers KH, Biggs HC (eds.) *The Kruger Experience: Ecology and Management of Savanna Heterogeneity*. Island Press: Washington DC, USA, pp. 423-446.
- Pool-Stanvliet R (2013) A history of the UNESCO Man and the Biosphere Programme in South Africa. *South African Journal of Science* 109(9/10). <https://doi.org/10.1590/sajs.2013/a0035>
- Pool-Stanvliet R (2014) The UNESCO MAB Programme in South Africa: Current Challenges and Future Options Relating to the Implementation of Biosphere Reserves. Ph.D. Thesis, University of Greifswald, Greifswald, Germany.

- Pool-Stanvliet R, Stoll-Kleemann S, Giliomee JH (2018) Criteria for selection and evaluation of biosphere reserves in support of the UNESCO MAB programme in South Africa. *Land Use Policy* 76:654-663. <https://doi.org/10.1016/j.landusepol.2018.02.047>
- Pool-Stanvliet R, Coetzer K (2019) Innovative implementation of the UNESCO MAB Programme in South Africa. In: Reed MG, Price MF (eds.) *UNESCO biosphere reserves: Supporting biocultural diversity, sustainability and society*, 1<sup>st</sup> Edition. Routledge: New York, USA, pp. 176-189.
- Pool-Stanvliet R, Coetzer K (2020) The scientific value of UNESCO biosphere reserves. *South African Journal of Science* 116(1/2). <https://doi.org/10.17159/sajs.2020/7432>
- Preiser R, Biggs R, de Vos A, Folke C (2018) Social-ecological systems as complex adaptive systems. *Ecology and Society* 23(4):46. <https://doi.org/10.5751/ES-10558-230446>
- Price MF (2002) The periodic review of biosphere reserves: a mechanism to foster sites of excellence for conservation and sustainable development. *Environmental Science & Policy* 5:13-18.
- Price MF, Park JJ, Bouamrane M (2010) Reporting progress on internationally designated sites: The periodic review of biosphere reserves. *Environmental Science & Policy* 13(6):549-557. <https://doi.org/10.1016/j.envsci.2010.06.005>
- Puri M, Marx AJ, Possingham HP, Wilson KA, Karanth KK, Loiselle BA (2022) An integrated approach to prioritize restoration for carnivore conservation in shared landscapes. *Biological Conservation* 273:109697. <https://doi.org/10.1016/j.biocon.2022.109697>
- QuestionPro (2023) Survey Software. <https://www.questionpro.com/survey-software/> [Accessed 17<sup>th</sup> April 2023].
- Rahimi M, Avazpour L, Ghorbani M (2024) Network Analysis of Stakeholders in the Persian Leopard Conservation Program: Uncovering Collaborative Relationships. *The ninth International Conference on Science and Technology of Agricultural Sciences, Natural Resources and Environment of Iran*.
- Raifman S, DeVost MA, Digitale JC, Chen Y, Morris MD (2022) Respondent-Driven Sampling: A Sampling Method for Hard-to-Reach Populations and Beyond. *Current Epidemiology Reports* 9:38-47. <https://doi.org/10.1007/s40471-022-00287-8>
- Reddy PS (2016) The politics of service delivery in South Africa: The local government sphere in context. *The Journal for Transdisciplinary Research in Southern Africa* 12(1). <https://doi.org/10.4102/td.v12i1.337>
- Redpath SM, Linnell JD, Festa-Bianchet M, Boitani L, Bunnefeld N, Dickman A, Gutiérrez RJ, Irvine RJ, Johansson M, Majić A, McMahon BJ (2017) Don't forget to look down—collaborative approaches to predator conservation. *Biological Reviews* 92(4):2157-2163. <https://doi.org/10.1111/BRV.12326>
- Reed MG (2019) The contributions of UNESCO Man and Biosphere Programme and biosphere reserves to the practice of sustainability science. *Sustainability Science* 14:809-821. <https://doi.org/10.1007/s11625-018-0603-0>
- Republic of South Africa (2008) Companies Act 71 of 2008. [https://www.gov.za/sites/default/files/gcis\\_document/201409/321214210.pdf](https://www.gov.za/sites/default/files/gcis_document/201409/321214210.pdf) [Accessed 31<sup>st</sup> July 2024].
- Ripple WJ, Estes JA, Beschta RL, Wilmers CC, Ritchie EG, Hebblewhite M, Berger J, Elmhagen B, Letnic M, Nelson MP, Schmitz OJ, Smith DW, Wallach AD, Wirsing AJ (2014) Status and Ecological Effects of the World's Largest Carnivores. *Science* 343(6167):1241484. <https://doi.org/10.1126/science.1241484>
- Roldán A, Duit A, Schultz L (2019) Does stakeholder participation increase the legitimacy of nature reserves in local communities? Evidence from 92 Biosphere Reserves in 36 countries. *Journal of Environmental Policy & Planning* 21(2):188-203. <https://doi.org/10.1080/1523908X.2019.1566058>
- Ryan K, Brady J, Cooke R, Height D, Jonsen A, King P, Lebacqz K, Louisell D, Seldin D, Stellar E, Turtle R (1979) *The Belmont report: ethical principles and guidelines for the protection of*

- human subjects of research*. The National Commission for the Protection of Human Subjects of Biomedical and Behavioural Research.
- Saif O, Keane A, Staddon S (2022) Making a case for the consideration of trust, justice, and power in conservation relationships. *Conservation Biology* 36(4):e13903. <https://doi.org/10.1111/cobi.13903>
- Santosa EB (2022) Interactive governance framework and its potential for governing protected area landscape. *IOP Conference Series: Earth and Environmental Science* 976(1):012017. <https://doi.org/10.1088/1755-1315/976/1/012017>
- Sattler C, Schröter B (2022) Collective action across boundaries: Collaborative network initiatives as boundary organizations to improve ecosystem services governance. *Ecosystem Services* 56:101452. <https://doi.org/10.1016/j.ecoser.2022.101452>
- Sayer J, Sunderland T, Ghazoul J, Pfund JL, Sheil D, Meijaard E, Venter M, Boedhihartono AK, Day M, Garcia C, Van Oosten C (2013) Ten principles for a landscape approach to reconciling agriculture, conservation, and other competing land uses. *Proceedings of the National Academy of Sciences* 110(21):8349-56.
- Schoon M, Brady U, Carr Kelman C, Baggio J, Goddard K, Rojas C, Lorenzo T, Srinivasan J, Whittaker D, Paillet C, Crippen A, Lee J (2020) *Coding Manual: Characteristics of collaborative governance*. Adaptive Collaborative Management (Schoon & Carr Kelman) Lab: Tempe, Arizona, USA.
- Schoon M, Chapman M, Loos J, Ifejika Speranza C, Carr Kelman C, Aburto J, Alexander S, Baggio J, Brady U, Cockburn J, Cundill G (2021) On the frontiers of collaboration and conflict: how context influences the success of collaboration. *Ecosystems and People* 17(1):383-399. <https://doi.org/10.1080/26395916.2021.1946593>
- Schultz L, Duit A, Folke C (2011) Participation, adaptive co-management, and management performance in the world network of biosphere reserves. *World Development* 39(4):662-71. <https://doi.org/10.1016/j.worlddev.2010.09.014>
- Schultz L, West S, Bourke AJ, d'Armengol L, Torrents P, Hardardottir H, Jansson A, Roldán AM (2018) Learning to live with social-ecological complexity: An interpretive analysis of learning in 11 UNESCO Biosphere Reserves. *Global Environmental Change* 50:75-87. <https://doi.org/10.1016/j.gloenvcha.2018.03.001>
- Schultz L, West S, Florêncio C (2020) Nurturing adaptive governance through environmental monitoring: People, practices, politics in the Kruger to Canyons Biosphere Region, South Africa. In: Glückler J, Herrigel G, Handke M (eds.) *Knowledge for Governance*. Springer: Cham, Switzerland, pp. 293–318.
- Searle CE, Bauer DT, Kesch MK, Hunt JE, Mandisodza-Chikerema R, Flyman MV, Macdonald DW, Dickman AJ, Loveridge AJ (2020) Drivers of leopard (*Panthera pardus*) habitat use and relative abundance in Africa's largest transfrontier conservation area. *Biological Conservation* 248:108649.
- Snare Free (2023) Snare Free, <https://snarefree.co.za> [Accessed 1<sup>st</sup> August 2023].
- Soga M, Gaston KJ (2016) Extinction of experience: The loss of human-nature interactions. *Frontiers in Ecology and the Environment* 14(2):94-101. <https://doi.org/10.1002/fee.1225>.
- South African National Biodiversity Institute (2024) Leopard. <https://www.sanbi.org/animal-of-the-week/leopard/> [Accessed 22<sup>nd</sup> April 2024].
- Starman AB (2013) The case study as a type of qualitative research. *Journal of Contemporary Educational Studies* 1:28-43.
- Statistics South Africa (2023) StatsSA. <https://www.statssa.gov.za> [Accessed 20<sup>th</sup> November 2023].
- Steele P, Ducros A, Patel S, Newman E (2023) Innovative Finance for Nature and People: Opportunities and Challenges for Biodiversity-Positive Carbon Credits and Nature Certificates. Global Environmental Facility.

- Sternlieb F, Bixler RP, Huber-Stearns H, Huayhuaca C (2013) A question of fit: Reflections on boundaries, organizations and social-ecological systems. *Journal of Environmental Management* 130:117-125. <https://doi.org/10.1016/j.jenvman.2013.08.053>
- Stoll-Kleemann S, O'Riordan T (2018) Biosphere reserves in the Anthropocene. *Encyclopaedia of the Anthropocene* 3:347-353. <https://doi.org/10.1016/B978-0-12-809665-9.09828-1>
- Stoll-Kleemann S, De La Vega-Leinert AC, Schultz L (2010) The Role of Community Participation in the Effectiveness of UNESCO Biosphere Reserve Management: Evidence and Reflections from Two Parallel Global Surveys. *Environmental Conservation* 37(3):227-238. <https://doi.org/10.1017/S037689291000038X>
- Strampelli P, Henschel P, Searle CE, Macdonald DW, Dickman AJ (2022) Habitat use of and threats to African large carnivores in a mixed-use landscape. *Conservation biology* 36(6):e13943. <https://doi.org/10.1111/cobi.13943>
- Swanepoel LH, Lindsey P, Somers MJ, Van Hoven W, Dalerum F (2012) Extent and fragmentation of suitable leopard habitat in South Africa. *Animal Conservation* 16(1):41-50. <https://doi.org/10.1111/j.1469-1795.2012.00566.x>
- Swanepoel LH, Somers MJ, Dalerum F (2015a) Density of leopards *Panthera pardus* on protected and non-protected land in the Waterberg Biosphere, South Africa. *Wildlife Biology* 21(5):263-268. <https://doi.org/10.2981/wlb.00108>
- Swanepoel LH, Somers MJ, Van Hoven W, Schiess-Meier M, Owen C, Snyman A, Martins Q, Senekal C, Camacho G, Boshoff W, Dalerum F (2015b) Survival rates and causes of mortality of leopards *Panthera pardus* in southern Africa. *Oryx* 49(4):595-603. <https://doi.org/10.1017/S0030605313001282>
- Swemmer LK (2020) Towards Improved Benefit Sharing: Approaches and Processes for Assessing and Reflecting on the Societal Impact of Biodiversity Conservation. Ph.D. Thesis, University of Witwatersrand, Johannesburg, South Africa.
- Tshabalala T, McManus J, Treves A, Masocha V, Faulconbridge S, Schurch M, Goets S, Smuts B (2021) Leopards and mesopredators as indicators of mammalian species richness across diverse landscapes of South Africa. *Ecological Indicators* 121: 107201. <https://doi.org/10.1016/j.ecolind.2020.107201>
- UNESCO (1996) *Biosphere reserves: the Seville strategy & the statutory framework of the world network*. United Nations Educational, Scientific and Cultural Organization: Paris, France.
- UNESCO (2007) UNESCO Biosphere Reserves: Model Regions with a Global Reputation. *Journal of the German Commission or UNESCO* No. 2/2007.
- UNESCO (2008a) *Madrid Action Plan for Biosphere Reserves (2008-2013)*. United Nations Educational, Scientific and Cultural Organization: Paris, France.
- UNESCO (2008b) *The UNESCO MAB Programme in South Africa*. United Nations Educational, Scientific and Cultural Organization: Paris, France.
- UNESCO (2015a) Management Manual for UNESCO Biosphere Reserves in Africa: A practical guide for managers. Bonn, Germany.
- UNESCO (2015b) Management Manual for UNESCO Biosphere Reserves in Africa: Field version. Bonn, Germany.
- UNESCO (2017) *New Roadmap for the Man and the Biosphere (MAB) Programme and its World Network of Biosphere Reserves*. United Nations Educational, Scientific and Cultural Organization: Paris, France.
- UNESCO (2021) *Technical Guidelines for Biosphere Reserves*. United Nations Educational, Scientific and Cultural Organization: Paris, France.
- UNESCO (2022a) Biosphere Reserves. <https://en.unesco.org/biosphere> [Accessed 14<sup>th</sup> September 2022]
- UNESCO (2022b) Kogelberg Biosphere Reserve, South Africa. <https://www.unesco.org/en/mab/kogelberg?hub=66369> [Accessed 25<sup>th</sup> April 2022].

- UNESCO (2022c) Cape Winelands Biosphere Reserve, South Africa. <https://www.unesco.org/en/mab/cape-winelands?hub=66369> [Accessed 25<sup>th</sup> April 2022].
- UNESCO (2023) *Be-Resilient South Africa, January - June 2023 project newsletter*. United Nations Educational, Scientific and Cultural Organization: Harare, Zimbabwe.
- UNESCO (2024) Cape Floral Region Protected Areas. <https://whc.unesco.org/en/list/1007> [Accessed 3<sup>rd</sup> June 2024].
- Van Cuong C, Dart P, Hockings M (2017) Biosphere reserves: Attributes for success. *Journal of Environmental Management* 188:9-17. <https://doi.org/10.1016/j.jenvman.2016.11.069>
- Van der Weyde LK, Tobler MW, Gielen MC, Cozzi G, Weise FJ, Adams T, Bauer D, Bennitt E, Bowles M, Brassine A, Broekhuis F (2022) Collaboration for conservation: Assessing countrywide carnivore occupancy dynamics from sparse data. *Diversity and Distributions* 28(5):917-929. <https://doi.org/10.1111/ddi.13386>
- Van Schalkwyk J (2019) Beta Diversity across the Complementary Zones of the Kogelberg Biosphere Reserve. Ph.D. Thesis, Stellenbosch University, Stellenbosch, South Africa.
- Venier-Cambron C, Malek Ž, Verburg PH (2023) Avoiding an unjust transition to sustainability: An equity metric for spatial conservation planning. *Proceedings of the National Academy of Sciences* 120(43):e2216693120. <https://doi.org/10.1073/pnas.2216693120>
- Venter FJ, Naiman RJ, Biggs HC, Pienaar DJ (2008) The evolution of conservation management philosophy: Science, environmental change and social adjustments in Kruger National Park. *Ecosystems* 11:173-192. <https://doi.org/10.1007/s10021-007-9116-x>
- Vitkalova AV, Feng L, Rybin AN, Gerber BD, Miquelle DG, Wang T, Yang H, Shevtsova EI, Aramilev VV, Ge J (2018) Transboundary cooperation improves endangered species monitoring and conservation actions: A case study of the global population of Amur leopards. *Conservation Letters* 11(5):e12574. <https://doi.org/10.1111/conl.12574>
- Wallner A, Bauer N, Hunziker M (2007) Perceptions and evaluations of biosphere reserves by local residents in Switzerland and Ukraine. *Landscape and Urban Planning* 83(2/3):104-114. <https://doi.org/10.1016/j.landurbplan.2007.03.006>
- Webb EL, Choo YR, Kudavidanage EP, Amarasinghe TR, Bandara UG, Wanninayaka WA, Ravindrakumar P, Nimalrathna TS, Liang SH, Chua MA (2020) Leopard activity patterns in a small montane protected area highlight the need for integrated, collaborative landscape conservation. *Global Ecology and Conservation* 23:e01182. <https://doi.org/10.1016/j.gecco.2020.e01182>
- Wessels M, Veldwisch GJ, Kujawa K, Delcarme B (2019) Upsetting the apple cart? Export fruit production, water pollution and social unrest in the Elgin Valley, South Africa. *Water International* 44(2):188-205. <https://doi.org/10.1080/02508060.2019.1586092>
- Western D, Tyrrell P, Brehony P, Russell S, Western G, Kamanga J (2020) Conservation from the Inside-Out: Winning Space and Place for Wildlife in Working Landscapes. *People and Nature* 2(2):279-291. <https://doi.org/10.1002/pan3.10077>
- Western D, Pearl MC, Pimm SL, Walker B, Atkinson I, Woodruff DS (1989) An agenda for conservation action. In: Western D, Pearl M (eds.) *Conservation for the Twenty-First Century*. Oxford University Press: New York, USA, pp. 304-323.
- White RM, Schmook B, Calmé S, Giordano AJ, Hausser Y, Kimmel L, Lecuyer L, Lucherini M, Méndez-Medina C, Peña-Mondragón JL (2023) Facilitating biodiversity conservation through partnerships to achieve transformative outcomes. *Conservation Biology* 37(3):e14057. <https://doi.org/10.1111/cobi.14057>
- Williams VL, Loveridge AJ, Newton DJ, Macdonald DW (2017) A roaring trade? The legal trade in Panthera leo bones from Africa to East- Southeast Asia. *PLoS ONE* 12(10):e0185996. <https://doi.org/10.1371/journal.pone.0185996>
- Wyborn C, Bixler RP (2013) Collaboration and nested environmental governance: scale dependency, scale framing, and cross-scale interactions in collaborative conservation. *Journal of Environmental Management* 123:58-67. <https://doi.org/10.1016/j.jenvman.2013.03.014>

- Yin RK (2018) *Case Study Research and Applications*, 6<sup>th</sup> Edition. SAGE Publications: London.
- Young JC, Searle K, Butler A, Simmons P, Watt AD, Jordan A (2016) The role of trust in the resolution of conservation conflicts. *Biological Conservation* 195:196-202. <https://doi.org/10.1016/j.biocon.2015.12.030>
- Zickar MJ, Keith MG (2023) Innovations in Sampling: Improving the Appropriateness and Quality of Samples in Organizational Research. *Annual Review of Organizational Psychology and Organizational Behavior* 10:315-337. <https://doi.org/10.1146/annurev-orgpsych-120920-052946>.

## Appendices

**Appendix 1:** Klaver M, Currie B, Sekonya JG, Coetzer K (2024) Learning through Place-Based Implementation of the UNESCO MAB Program in South Africa's Oldest Biosphere Reserve: A Case Study of the Kogelberg Biosphere Reserve. *Land* 13(455):1-28



Article

# Learning through Place-Based Implementation of the UNESCO MAB Program in South Africa's Oldest Biosphere Reserve: A Case Study of the Kogelberg Biosphere Reserve

Michael Klaver <sup>1,2,\*</sup> , Bianca Currie <sup>2</sup>, James George Sekonya <sup>1,2</sup>  and Kaera Coetzer <sup>3,4</sup>

<sup>1</sup> Department of Conservation Management, George Campus, Nelson Mandela University, George 6529, South Africa; james.sekonya@mandela.ac.za

<sup>2</sup> Sustainability Research Unit, George Campus, Nelson Mandela University, George 6529, South Africa; currieklick@gmail.com

<sup>3</sup> Department of Geography, Geoinformatics and Meteorology, University of Pretoria, Pretoria 0028, South Africa; kaera.coetzer@up.ac.za

<sup>4</sup> Global Change Institute, University of the Witwatersrand, Johannesburg 2000, South Africa

\* Correspondence: m18klaver@gmail.com

**Abstract:** UNESCO's Man and the Biosphere Programme (MAB) is implemented through a world network of biosphere reserves, which offer a holistic people-centered landscape-level conservation approach. When successfully implemented the program enhances social-ecological system sustainability and resilience. However, there remains a research gap in understanding and collating lessons from individual sites for the benefit of the program globally. We assess MAB implementation in South Africa's oldest biosphere reserve, the Kogelberg Biosphere Reserve (KBR; est. 1998). Using semi-structured in-depth interviews with directors and the coordinator, complemented by document analysis, we explore the governance and implementation learnings of the KBR as it has evolved. The KBR program implementation is guided by global necessity, but driven by the local context, which for the KBR translates to a non-profit organization cooperative governance model. The site faces a perceived lack of government financial support and awareness of the 'biosphere reserve' concept. Despite these challenges, successes have emerged in the formation of local partnerships to fulfil critical roles in socio-economic development and biodiversity conservation. The learnings from KBR, as it strives to become a model site for sustainability, are useful for other sites similarly operationalizing an international designation for local conditions.

**Keywords:** UNESCO; Man and the Biosphere Programme; social-ecological systems; governance; sustainable development goals; biodiversity conservation; collaboration; sustainability



**Citation:** Klaver, M.; Currie, B.; Sekonya, J.G.; Coetzer, K. Learning through Place-Based Implementation of the UNESCO MAB Program in South Africa's Oldest Biosphere Reserve: A Case Study of the Kogelberg Biosphere Reserve. *Land* 2024, 13, 455. <https://doi.org/10.3390/land13040455>

Academic Editor: Kenneth R. Young

Received: 28 February 2024

Revised: 25 March 2024

Accepted: 1 April 2024

Published: 2 April 2024



**Copyright:** © 2024 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

## 1. Introduction

The Man and the Biosphere Program (MAB) supports the United Nations Sustainable Development Goals (SDGs) [1–3] and other multilateral agreements, such as the Convention on Biological Diversity targets [3] and Paris Climate Agreement [1]. Therefore, it may be one of the most promising ways of tackling the *triple challenge* of the Anthropocene, i.e., biodiversity loss, climate change and human well-being [4]. Biosphere reserves (BRs) are useful landscape management tools in this regard because they involve inclusive, flexible and multistakeholder governance arrangements that are context specific and offer an integrated and holistic approach to deal with these interlinked and cross-sectoral challenges [2,4,5]. Furthermore, they act as a global network of *learning laboratories* for sustainability science and research on climate change [3,5–7].

Governance structures adopted in BRs serve as a tool to enable stakeholder participation and to sustainably achieve their individual goals, although how they facilitate participation can differ from site to site, and even within the country [8]. Although guided

## Appendix 2: Klaver M, Currie B, Sekonya JG, Coetzer K (2024) Exploring the Implementation of UNESCO's MAB Program in South Africa: A Case Study of the Cape Winelands Biosphere Reserve. *Environmental Management* 1-16

Environmental Management  
<https://doi.org/10.1007/s00267-024-02048-3>



### Exploring the Implementation of UNESCO's MAB Program in South Africa: A Case Study of the Cape Winelands Biosphere Reserve

Michael Klaver<sup>1,2</sup> · Bianca Currie<sup>2</sup> · James G. Sekonya<sup>1,2</sup> · Kaera Coetzer<sup>3,4</sup>

Received: 14 June 2024 / Accepted: 9 September 2024  
© The Author(s) 2024

#### Abstract

The Man and the Biosphere Program (MAB) responds to challenges of the Anthropocene through an explicit social-ecological approach. Implemented as a world network of biosphere reserves, MAB aims to increase [eco]system sustainability and resilience globally, via individual model sites for learning and sustainable development. This research provides an in-depth case study of MAB implementation in South Africa using the Cape Winelands Biosphere Reserve (CWBR), established in 2007 when a key MAB guiding policy, the Madrid Action Plan came into effect. The study utilized semi-structured in-depth interviews with strategic and operational management, and document analysis. The CWBR prioritizes their role as a landscape coordinator, a driver of socio-economic development and site in which humans derive benefits from healthy natural environments. The CWBR have adopted a non-profit organization cooperative governance model in support of this vision, fulfilling the socio-economic development function primarily through successful international partnerships. Challenges faced include a perceived lack of sufficient government support, limited stakeholder awareness and insufficient resources for project implementation. Over reliance on the pillar of their model, the chief executive officer in the current governance form, is an instrument in their effectiveness, yet carries significant risk. These are learnings useful for other biosphere reserves translating an international designation for a local context.

**Keywords** UNESCO · Man and the Biosphere Program · Biosphere reserve · Social-ecological system · Governance · Sustainable development goals.

#### Introduction

The United Nations Educational, Scientific, and Cultural Organization (UNESCO) Man and the Biosphere Program (MAB) is implemented through biosphere reserves (BRs) which are holistic social-ecological system (SES) management tools serving three functions, including conservation, sustainable socio-economic development and logistic support, i.e. education, research and monitoring (UNESCO 1996). They involve inclusive, integrated, flexible and

multistakeholder governance arrangements that are context specific and useful in dealing with the interlinked triple challenge of the Anthropocene, i.e. climate change, biodiversity loss and human wellbeing in a growing population (Pool-Stanvliet 2013; Palomo et al. 2014; Carruthers 2020; Baldwin-Cantello et al. 2023). These governance approaches offer both knowledge and functional diversity (Müller 2014). Moreover, BRs are regarded as sustainability science and climate change learning sites (UNESCO 2007; Pool-Stanvliet 2013; Pool-Stanvliet and Coetzer 2020; Clüsener et al. 2022; Barraclough et al. 2023) and when considered as a world network they provide a platform to share innovation and best practice globally. Additionally, the place-based implementation of MAB is flexible, meaning BRs can be adaptive, and factors of redundancy and modularity can be incorporated within their governance arrangements—all factors increasing system resilience (Müller 2014).

To improve the effectiveness of BR governance globally UNESCO policy recommends several structural components. The Technical Guidelines for Biosphere Reserves (UNESCO 2021), recommend a dedicated management

✉ Michael Klaver  
m18klaver@gmail.com

<sup>1</sup> Department of Conservation Management, Nelson Mandela University, George, South Africa

<sup>2</sup> Sustainability Research Unit, Nelson Mandela University, George, South Africa

<sup>3</sup> Department of Geography, Geoinformatics and Meteorology, University of Pretoria, Pretoria, South Africa

<sup>4</sup> Global Change Institute, University of the Witwatersrand, Johannesburg, South Africa

Published online: 18 September 2024

Springer

**Appendix 3:** Research permission letters from the Kogelberg and Cape Winelands Biosphere Reserves



Kogelberg Biosphere Reserve  
Section 21A Company – 2002/017057/08  
NPO: 133-290 / PBO: 930029252  
Coordinator: [REDACTED]  
082 380 9072  
[admin@kogelbergbiosphere.org.za](mailto:admin@kogelbergbiosphere.org.za)  
22 April 2023

**To Mr M Klaver – Nelson Mandela University**

RE: COLLABORATIVE CONSERVATION GOVERNANCE IN WORKING  
LANDSCAPES: A CONTEXTUAL ANALYSIS OF TWO SOUTH AFRICAN BIOSPHERE  
RESERVES IN THE BOLAND MOUNTAIN COMPLEX

The Kogelberg Biosphere would like to record its full support for the above research. The Kogelberg Biosphere Reserve Company hereby gives you permission to interview the Board of Directors, Coordinator and other individuals as deemed necessary during the time frame of your research.

Sincerely

[REDACTED]

Coordinator  
Kogelberg Biosphere



17<sup>th</sup> April 2023

Dear Mr Klaver

On behalf of the Board of the Cape Winelands Biosphere Reserve I give you permission to conduct a MSc study in the Reserve on the topic Collaborative Conservation Governance in working landscapes: a contextual analysis of two South African Biosphere Reserves in the Boland Mountain Complex. This implies that you may conduct interviews with Board members and staff and have access to our minutes and data.

Yours sincerely



Chairman CWBR

## Appendix 4: CapeNature research permit

### Western Cape Province

Telephone No: (027) 021 483 0000  
 E-mail: [permits.fax@capenature.co.za](mailto:permits.fax@capenature.co.za)  
 PGWC Shared Services Centre  
 cnr Bosduif and Volstruis Streets  
 Bridgetown  
 7764



Facsimile No: (027) 0865567734  
 Internet: [www.capenature.co.za](http://www.capenature.co.za)  
 Private Bag X29  
 Gatesville  
 7766

### PERMIT TO ENTER IN A NATURE RESERVE FOR SCIENTIFIC PURPOSES

Issued in terms of the provisions of the Nature Conservation Regulations no. 955 of 1975  
 Not Transferable

HOLDER			
<b>Full Name:</b>	Mr. Michael Klaver	<b>Identity No:</b>	9607185107086
<b>Trade Name:</b>	Nelson Mandela University	<b>Registration No:</b>	
<b>Postal Address</b>	George Campus, Madiba Rd, Glenwo	<b>Physical Address:</b>	George Campus, Madiba Rd, Glen
<b>City / Town:</b>	George	<b>City / Town:</b>	George
<b>Province / State:</b>	Western Cape	<b>Province / State:</b>	Western Cape
<b>Country:</b>	South Africa	<b>Country:</b>	South Africa
<b>Postal / Zip Code:</b>	6529	<b>Longitude:</b>	
		<b>Latitude:</b>	

In terms of and to the provisions of the abovementioned Regulations framed thereunder, the holder of this permit and persons specified on the attached addendum is authorised to enter or to enter and remain in a nature reserve or any portion thereof for scientific purposes. See conditions on last page.

DETAILS		
<b>Permit / License No:</b>	<b>CN32-87-25882</b>	<b>Stamp:</b> 
<b>Expiry Date:</b>	<b>31/12/2024</b>	
<b>Date Issued:</b>	28/07/2023	
<b>Amount Paid:</b>	R 0.00	
<b>Reference:</b>	No Charge	
<b>File Code:</b>	1/2/4/6/3/14/F15	

DESCRIPTION	PROPERTY
<b>Organization</b>	Nelson Mandela University
<b>Full Name:</b>	Mr. Michael Klaver
<b>Identity Number:</b>	9607185107086
<b>Postal Address</b>	See special conditions for study areas
<b>City / Town:</b>	NA
<b>Province / State:</b>	Western Cape
<b>Country:</b>	South Africa
<b>Postal / Zip Code:</b>	0000
<b>Longitude:</b>	
<b>Latitude:</b>	

SPECIES (SCIENTIFIC NAME)	QTY	NOTE
Note. (Note.)	0	No species collection   Conditions apply, note special conditions.

**Appendix 5: Recruitment letter sent to invite prospective participants to the study**

**NELSON MANDELA**  
UNIVERSITY



Madiba Rd  
Glenwood AH  
6529  
George

April 2023

Dear [REDACTED]

**RECRUITMENT LETTER**

My name is Michael Klaver. I am a MSc Nature Conservation student with the Sustainability Research Unit at Nelson Mandela University researching “Collaborative Conservation Governance in Working Landscapes: A contextual analysis of two South African biosphere reserves in the Boland Mountain Complex”. This project is supervised by Dr Bianca Currie (*Sustainability Research Unit, Nelson Mandela University and Chief Executive, Garden Route Biosphere*) and co-supervised by Dr Kaera Coetzer-Hanack (*Global Change Institute, University of the Witwatersrand*), and Dr James George Sekonya (*Sustainability Research Unit and School of Natural Resource Science and Management, Nelson Mandela University*).

My research project is part of a larger research project titled: “*Governance models implemented in biosphere reserves: Progression towards social-ecological systems for sustainability*”. This project investigates how South African biosphere reserves (BRs), which are recognised as sustainability organisations, operate and how this translates into their implementation successes. The project is interested in mapping the governance structures of each BR, drawing on interviews with key decision-makers of each to identify how the chosen governance model, its history and evolution have shaped the current implementation of each BR in the landscapes they are found. This will be done for all 10 of South Africa’s BRs. My research aims to add the CWBR to the participating BRs in this project as a specific case study.



My study aims to assess the interpretation and implementation of the Man and the Biosphere (MAB) programme in two South African BRs, including the Cape Winelands and Kogelberg, and explore how BRs, as a landscape-level conservation approach, can enable collaborative conservation initiatives amongst diverse stakeholders. In this regard, I use Cape leopard conservation as a potential collaborative conservation case-study impacting upon both BRs. Moreover this study is informed by two objectives. First, to understand how the chosen governance strategy and structure of the two South African BR case-studies have helped to achieve a context appropriate interpretation and actioning of MAB in the landscape. Second, to understand how landscape level collaborative conservation initiatives support leopard conservation across multi-use landscapes and especially in unprotected environments.

As the Board of Directors and members of the Strategic executive team of the [REDACTED], I would like to invite you to participate in this study. I believe your input and insights would be of great value to the project and ensure its success. This letter is to formally invite you to be a participant in the study. Further details of the study can be found in the proposal supporting this letter.

To follow through with the correct researcher ethics procedures, I wish to make explicit your rights as a research participant. Due the fact that I will be interviewing you directly (knowing your identity) and the small sample size with each BR, to minimise risks of disclosing your identity I will take three precautions: **1)** assign randomised codes to the answers you provide **2)** paraphrase any direct quotes if it may be necessary due to patterns of your speech and **3)** give you the opportunity to review the transcripts of the interview to check the accuracy as well as areas of sensitivity post-interview.

What is expected of you is to participate in an interview with me. The interviews will take place during May of 2023. The interview will be guided by several questions (these will be sent to you in advance) and take no longer than 2 hours, more likely in the region of 1 to 1½ hours, at a time of your choosing. You are free to withdraw from participating at any point, as well as refuse answering any specific questions. Your participation is completely voluntary. With your permission, I would like to record the interview using a digital device and have it transcribed. You are welcome to have a copy of the transcription to ensure an accurate representation of what you have said

and to discuss any concerns you might have with any of the information provided during the interview. Your participation will be of no personal costs to you. You will not receive any direct benefits for participating and you will also not receive any penalties or disadvantage should you choose not to participate or withdraw from the study.

The research will be written up and published in an academic journal which will be shared with you. Individual BRs will also receive personalised summary reports of the project findings. The data collected from this research project will be stored in a password protected computer and will be kept for 5 years after final publication, with the raw data only accessible to the research team. With your permission, the data collected from this research project may be used by us, if we expand this research beyond South Africa to compare with other BRs globally.

Should you be willing to participate in the study, inform me by signing and returning the consent letter and I will follow up with an enrolment letter during late April 2023, after which we can arrange a date for the interview. If you do not wish to participate in the study, kindly inform me and I will not send a follow-up letter. If you have any questions, please feel free to contact me or my supervisors.

I would appreciate your input in this project as I believe you have valuable contributions to make. Please see the attached project proposal and consent form. I look forward to hearing from you and hopefully meeting with you soon.

Yours sincerely,

Michael Klaver

**MSc Nature Conservation** (*School of Natural Science and Management, and Sustainability Research Unit, Nelson Mandela University*)

Email: [s217117244@mandela.ac.za](mailto:s217117244@mandela.ac.za)

[m18klaver@gmail.com](mailto:m18klaver@gmail.com)

Cell: (+27) 074 188 6110



## Appendix 6: Nelson Mandela University Research Ethics Committee (Human) clearance certificate



PO Box 77000, Nelson Mandela University, Port Elizabeth, 6031, South Africa [mandela.ac.za](http://mandela.ac.za)

Chairperson: Research Ethics Committee (Human)  
Tel: +27 (0)41 504 3624  
[Dalray.Gradidge@mandela.ac.za](mailto:Dalray.Gradidge@mandela.ac.za)

NHREC registration nr: REC-042508-025

Ref: [H22-SCI-NRM-001] / Approval: 28 March 2023 – 28 March 2024

28 March 2023

Dr J Sekonya  
Faculty: Science

### **COLLABORATIVE CONSERVATION GOVERNANCE IN WORKING LANDSCAPES: A CONTEXTUAL ANALYSIS OF TWO SOUTH AFRICAN BIOSPHERE RESERVES IN THE BOLAND MOUNTAIN COMPLEX**

PRP: Dr J Sekonya  
PI: Mr M Klaver

Your above-entitled application served at the Research Ethics Committee (Human) (meeting of 22 February 2023) for approval. The study is classified as a medium risk study. The ethics clearance reference number is **H22-SCI-NRM-001** and approval is subject to the following conditions:

1. The immediate completion and return of the attached acknowledgement to [Imtiaz.Khan@mandela.ac.za](mailto:Imtiaz.Khan@mandela.ac.za).
2. Approval for data collection is for 1 calendar year from date of receipt of this ethics approval letter.
3. The submission of an annual progress report by the PRP on the data collection activities of the study (form RECH-004 available on Research Ethics Committee (Human) portal) by 15 November this year for studies approved/extended in the period October of the previous year up to and including September of this year, or 15 November next year for studies approved/extended after September this year.
4. In the event of a requirement to extend the period of data collection (i.e. for a period in excess of 1 calendar year from date of approval), completion of an extension request is required (form RECH-005 available on Research Ethics Committee (Human) portal)
5. In the event of any changes made to the study (excluding extension of the study), RECH will have to approve such amendments and completion of an amendments form is required PRIOR to implementation (form RECH-006 available on Research Ethics Committee (Human) portal).
6. Immediate submission (and possible discontinuation of the study in the case of serious events) of a report to RECH in the event of any unanticipated problems, serious incidents or adverse events observed during the course of the study.
7. Immediate submission of a Study Termination Report to RECH (form RECH-008 available on Research Ethics Committee (Human) portal) upon expected or unexpected closure/termination of study.
8. Immediate submission of a report to RECH in the event of any study deviations, violations and/or exceptions.
9. Acknowledgement that the study could be subjected to passive and/or active monitoring without prior notice at the discretion of Research Ethics Committee (Human).

Please quote the ethics clearance reference number in all correspondence and enquiries related to the study. For speedy processing of email queries (to be directed to [Imtiaz.Khan@mandela.ac.za](mailto:Imtiaz.Khan@mandela.ac.za)), it is recommended that the ethics clearance reference number together with an indication of the query appear in the subject line of the email.

We wish you well with the study.

Yours sincerely

A handwritten signature in black ink, appearing to read "D Gradidge", written over a white rectangular background.

**Dr D Gradidge**  
Chairperson: Research Ethics Committee (Human)

Cc: Department of Research Development  
Faculty admin: Science

[Appendix 1: Acknowledgement of conditions for ethical approval](#)

**Appendix 7: Enrolment letter sent to participants who agreed to participate in the study**

**NELSON MANDELA**  
UNIVERSITY



Madiba Rd  
Glenwood AH  
6529  
George

April 2023

Dear [REDACTED],

**ENROLMENT LETTER**

Thank you for your interest in the project and thank you for agreeing to participate in the study. I am pleased to enrol you as a participant. Your contributions will be invaluable for the success of this project.

To follow through with the correct researcher ethics procedure I must make explicit your rights as a research participant. Due the fact that I will be interviewing you directly (knowing your identity) and the small sample size within each BR, to minimise risks of disclosing your identity I will take three precautions: **1)** assign randomised codes to the answers you provide **2)** paraphrase any direct quotes if it may be necessary to do so due to revealing patterns of your speech and **3)** give you the opportunity to review the transcripts of the interview to check the accuracy as well as areas of sensitivity post-interview.

What is expected of you is to participate in an interview with me. The interviews will take place during May of 2023. The interview will be guided by several questions (these will be sent to you in advance) and take no longer than 2 hours, more likely in the region of 1 to 1½ hours, at a time of your choosing. You are free to withdraw from participating at any point, as well as refuse answering any specific questions. Your participation is completely voluntary. With your permission, I would like to record the interview using a digital device and have it transcribed. You are welcome to have a copy of the transcription to ensure an accurate representation of what you have said and to discuss any concerns you might have with any of the information provided



1

during the interview. Your participation will be of no personal costs to you. You will not receive any direct benefits for participating and you will also not receive any penalties or disadvantage should you choose not to participate or withdraw from the study.

The research will be written up and published in a thesis and academic journal which will be shared with you. Individual BRs will also receive personalised summary reports of the project findings. The data collected from this research project will be stored in a password protected computer and will be kept for 5 years after final publication, with the raw data only accessible to the research team. With your permission, the data collected from this research project may be used by us, if we expand this research beyond South Africa to compare with other BRs globally.

Please indicate a date and time that suits you for an interview. If you have any questions, please feel free to contact me.

I really appreciate your input in this project. Please see the attached project proposal, interview guide and consent form. I look forward to hearing from you and hopefully meeting with you soon.

Yours sincerely,

Michael Klaver

**MSc Nature Conservation** (*School of Natural Science and Management, and Sustainability Research Unit, Nelson Mandela University*)

Email: [s217117244@mandela.ac.za](mailto:s217117244@mandela.ac.za)

[m18klaver@gmail.com](mailto:m18klaver@gmail.com)

Cell: (+27) 074 188 6110



**Appendix 8:** Example of the participant consent form



**PARTICIPANT CONSENT FORM**

**Research title:** *Collaborative Conservation Governance in Working Landscapes: A contextual analysis of two South African biosphere reserves in the Boland Mountain Complex.*

**Umbrella project title:** *Governance models implemented in biosphere reserves: Progression towards social-ecological systems for sustainability*

**Researcher:** Mr Michael Klaver (*School of Natural Resource Science and Management, and Sustainability Research Unit, Nelson Mandela University*)

Email: [s217117244@mandela.ac.za](mailto:s217117244@mandela.ac.za) /

[m18klaver@gmail.com](mailto:m18klaver@gmail.com)

Cell: +27741886110

Without any expectation of compensation or other remuneration, now or in the future, I, \_\_\_\_\_, from \_\_\_\_\_ (name of institution, organisation, company or 'other' affiliation) hereby agree to participate in this research project.

I agree to the following:

This consent includes, but is not limited to (highlight options below):

I am over the age of 18 and voluntarily participate in the project.	YES / NO
I understand that due to having a small sample size and conducting face-to-face interviews, this prevents complete anonymity and confidentiality in participation, but that the researcher will do everything within his power to remove any identifying information from	YES / NO

interviews. This will included paraphrasing direct quotes and assigning randomised codes to participants.	
I agree that the interview may be audio recorded using a digital device.	YES / NO
I would like to see the interview transcript to ensure that I am comfortable with what information will be used in this study. Any concerns will be raised with the researcher immediately.	YES / NO
I agree that the information I provide may be used anonymously after this project has ended, for academic purposes by other researchers, subject to their own ethics clearance being obtained.	YES / NO
I am aware that I can withdraw from the research at any time and can refuse to answer any questions I am not comfortable with	YES / NO

1. Signed Consent:

Your signature below indicates that the research has been explained to me. I have had an opportunity to ask questions and my questions have been answered. I consent to being interviewed as part of this research project. A copy of this consent form has been given to me for my records.

2. Verbal Consent (alternative):

To be given to Michael Klaver (the researcher) and audio recorded for the record.

Name of Participant:

---

Signature:

---

Date of interview:

---

**Appendix 9:** Interview guide used for interviews with the Cape Winelands and Kogelberg Biosphere Reserves

**INTERVIEW SCHEDULE: OBJECTIVE 1**

*To understand how the governance strategy and structure of two South African BRs have helped to achieve a context appropriate interpretation and actioning of MAB in the landscape.*

---

You are being interviewed because you are on the Board of Directors, or a member of the Strategic executive team, of either the Cape Winelands (CWBR) or Kogelberg (KBR) Biosphere Reserves (BRs). This interview will be supplemented by data collected from a review of archival, policy and other documents of the respective BRs. The information collected from this interview will be used to explore the following sub-objectives. First, *“the mode of governance of the individual BR and their envisioned role in the landscape”*, and second, *“stakeholder involvement and what these relationships entail.”* Your contribution through this interview is appreciated.

To follow through with the correct researcher ethics procedures, I wish to make explicit your rights as a research participant. Your anonymity will be ensured and your identity not revealed. Your participation will be of no personal cost to you aside from the time it will take you to complete. You will not receive any direct benefits from participating and you will also not receive any penalties or disadvantage should you choose not to participate or withdraw from the study. You are free to withdraw from participating at any point, as well as refuse to answer any specific questions.

---

Verbal consent:

That participant is over the age of 18 Yes/No  
That participant voluntarily participates in the interview Yes/No

Participant ID:

<b>Date:</b>
<b>Participant:</b>
<b>Title:</b>
<b>Organisation:</b>
<b>Location:</b>
<b>Participant code:</b>

1. Could you please tell me the **history of your involvement** with the Biosphere Reserve?

*[## Here, the interviewer will probe the sources of personal commitment to the BR and the motivations for the participant's initial, and continued, involvement in the target BR ##]*

*The following probing questions will help explore this overarching question further:*

- a) What is your professional position in the Biosphere Reserve?
- b) How long have you been involved in the Biosphere Reserve?
- c) What motivates you to be involved in Biosphere Reserve governance and/or its day-to-day management?
  - i. How did you initially get involved in the Biosphere Reserve?
  - ii. Why did you initially get involved in the Biosphere Reserve?
  - iii. Why do you think you were asked to be involved in the Biosphere Reserve?
  - iv. Why do you continue to be involved?
- d) What specific skills do you think have been especially useful for your role in the Biosphere Reserve?
  - i. What skills do you think are lacking/ have had to develop to enable your participation in Biosphere Reserve governance and/ or management?

2. Considering the Biosphere Reserve's role in the landscape, can you describe the **envisioned role** for the biosphere reserve here?

*[## Here the interviewer wants to get a sense of the perceived vision for the BR, the BR's role in the social-ecological system – as that may tie to the nature of the governance model employed ##]*

- a) What was the initial vision/ focus of this Biosphere Reserve?
- b) Was this vision adopted by most stakeholders? If yes, does your institution support this vision?

*[## Given that not all BR decision-makers are officially employed by the BR, but give of their time as volunteers, the [mis]alignment with professional responsibilities and/ or institutional support for their participation is thus key ##]*

- c) How do you see the role of the Biosphere Reserve in the landscape at present?

*[## This question, together with 2d hereafter probes whether the initial role of the BR may differ from its current role, which in turn may have shaped the evolution of the governance mode ##]*

- d) Does this role align with the initial vision first considered for the Biosphere Reserve at its inception?
  - i. If not, why did the Biosphere Reserve follow a different vision/ role?
- e) What are the Biosphere Reserve's main challenges in fulfilling its current role?
- f) Do you believe the Biosphere Reserve has been successful in achieving its goals and objectives? What do you think is the most important thing the Biosphere Reserve is doing right now that has been instrumental in its:
  - i. Success/ growth?
  - ii. Acceptance by the stakeholders in the landscape?
- g) Is there a specific role or position in the Biosphere Reserve governance or management that you consider instrumental in ensuring the Biosphere Reserve's success?

*### Here we are trying to probe what is a 'nice to have' versus what is a critical position that needs to be fulfilled in a BR to ensure its success. Being able to identify this critical position may be a key for a BRs overall 'success' ##]*

- h) Give an opinion on whether this Biosphere Reserve is successful/ effective or not.
  - i. Can you discuss the successes of the Biosphere Reserve?
  - ii. Can you discuss some of the failures of the Biosphere Reserve?
- i) What do you think makes (or would make) a Biosphere Reserve successful and/ or effective in fulfilling its dedicated role?

3. Can you describe the **governance model** of the Biosphere Reserve?

- a) How does the chosen model influence the Biosphere Reserve's decision-making processes?

*### Here, the interviewer will probe how the governance model of the BR was initially formed, how this enables a specific governance approach, i.e. how decision-making processes occur within the chosen approach and how it has changed over the years. This section aims to also identify key moments of learning related to BR governance. The participant will be asked to describe the governance approach they are applying in the BR, their perceptions of the motivations/ value behind using this approach, and any challenges they might have encountered in the process ##]*

*The following questions below will be asked as follow-up questions to the participant's description of the governance model, and will help probe the response to the above in greater detail:*

b) Can you describe the internal organisational structure of the Biosphere Reserve?

*### Which positions are held, by who and from what background/ sector are they? ###*

c) Are there different management/ board subgroups responsible for the Biosphere Reserve goals e.g. working groups, directors with specific portfolios?

d) Why do you think it was set up in this manner?

e) Can you describe how decision-making processes occur within the Biosphere Reserve?

f) Has the current governance approach raised any challenges for the Biosphere Reserve?

i. Can you detail what these were and why you feel these may have occurred?

g) Conversely, can you explain the opportunities/ successes of having this type of governance approach for the Biosphere Reserve?

h) Have there been any changes in the governance model since the Biosphere Reserve was first declared?

i. Could these be described?

*### Here we are interested in the evolution of the original model, and linked to this the learnings (Q3h) that occurred as the BR matured as an organisation ###*

i) What lessons have been learnt about the governance model over time?

j) Do you have a relationship with a sister/ twin Biosphere Reserve nationally or internationally that provides/ provided guidance in the development of your governance model?

i. *If yes, could you explain this relationship and the assistance given?*

*### Often BRs have an international compatriot with whom knowledge exchanges [should] occur. This may have shaped the development of the chosen governance structure ###*

4. From the Biosphere Reserve's perspective, how are **stakeholders** involved in the Biosphere Reserve decision-making processes and other governance or management activities? (include any means of involving local communities/ residents/ traditional leaders/ youth or other stakeholder groupings)

*### Here, the interviewer will probe the current BR governance model and how it allows, enables/ prevents other stakeholders from participating in the BR. The interest is in how 'participation' is constructed by the BR, and how different stakeholders are considered as 'credible' to participate. The BR model emphasise representation and collaboration around a shared vision for landscape*

*management, and BRs considered more 'successful' across the World Network, are those that have enabled this, however this may also bring with its own challenges ##]*

- a) Can you describe who (which stakeholders/ stakeholder groups) are involved in the Biosphere Reserve's decision-making structures and processes?
- b) How is 'participation' by these stakeholders in the Biosphere Reserve decided and encouraged?

*[## Here interviewer wants to get insight into how individuals are selected and included ##]*

- c) Who do you feel is missing from the Biosphere Reserve's 'decision-making table'?
  - i. Why?
- d) What are the challenges in allowing stakeholders to participate in the Biosphere Reserve's decision-making processes?
- e) What are the opportunities for allowing stakeholders to participate in the Biosphere Reserve's decision-making processes?

5. Thinking of the Biosphere Reserve's relationships with other stakeholders/ institutions in its landscape, can you identify any **critical relationships** - and areas of overlap - with other institutions?

*[## Here, we are interested in knowing the institutional overlap in the landscapes the BRs function in, as well as their horizontal and vertical alignment with other actors also operating in the landscape ##]*

- a) Who initially motivated for establishing the Biosphere Reserve?
- b) Is the Biosphere Reserve accountable to anyone?
- c) Does the Biosphere Reserve's role overlap with other institutions/ organisations or provincial, regional, national or international designations?
  - i. *If yes*, does the 'institutional overlap' raise challenges for the Biosphere Reserve's operations? Please explain.
  - ii. *If yes*, does the 'institutional overlap' raise opportunities for the Biosphere Reserve's operations? Please explain.
  - iii. Does this institutional overlap enable support from government entities? Please explain.
  - iv. Does this institutional overlap constrain support from government entities? Please explain.

- d) Who is the Biosphere Reserve's long-term key partners (please include government and other political partners)?
    - i. Why were these relationships established?
    - ii. How were these relationships established?
  - e) Are there particular stakeholders/ institutions in the landscape (and beyond) that are avoided or have been disruptive to Biosphere Reserve's activities? Please explain.
  - f) Have there been any dissolved relationships?
    - i. Why do you feel this happened?
  - g) Are there any relationships that are considered critical to the Biosphere Reserve's success? (Note these do not have to be existing relationships, these can be missing ones)
    - i. Who are these with?
    - ii. Why?
6. Are there **other individuals with the biosphere reserve** that I should be talking to?
7. And finally, could you share any **lessons learned** that might be useful for another newly established Biosphere Reserves currently in the process of setting up its governance model?
8. Is there anything I haven't asked you about that you feel might be **important for me to know about**?
9. Could you describe to me what **success** would be like if we want to say the biosphere reserve is successful?

**QUESTIONS FOR ONLY THE BIOSPHERE RESERVE MANAGER/ CO-  
ORDINATOR/ CEO**

*[## These are additional questions that will only be asked to Biosphere Reserve executive manager/  
co-ordinator in their role as 'operational oversight'. We do not want to overburden the Board with  
questions that lie outside their specific organisational role, however if Board members feel that they  
can also offer insight to any of the below, we would be ever appreciative ##]*

1. **Questions on alignment with UNESCO-MAB strategy and guiding policy:**
  - a. Please elaborate on the positive aspects of the UNESCO-MAB designation for the landscape.
    - i. Please elaborate on the negative aspects.
  - b. How does the Biosphere Reserve attempt to align to both the national and global UNESCO-MAB policy prescriptions/ guidelines (including the MAB Strategy and Lima Action Plan)?
  - c. In your opinion, what is the main challenge the Biosphere Reserve faces in applying the UNESCO-MAB policy for local application?
    - i. What support would help address this?
  
2. **Questions on internal management:**
  - a. What is the legal status of the Biosphere Reserve? Provide detail on all 3 zones as well as the Biosphere Reserve in its entirety?
  - b. Is there a management plan for the Biosphere Reserve in its entirety, or does the Biosphere Reserve rely on management plans for different sections/ zones?
    - i. *If the latter*, how does the Biosphere Reserve reconcile these different plans?
  - c. Please describe the funding mechanisms of the Biosphere Reserve – main sources of funding; operational vs project funding?
    - i. What are the means of fund sourcing? (e.g. dedicated fundraiser)?
  - d. How does the availability and source of funds impact the governance and management structures of the Biosphere Reserve?

3. Questions on internal governance model:

- a. Were the expertise in the governance structures actively sourced? Please explain.
- b. Are there any entry criteria that Board Members have to meet to be considered a suitable candidate?
- c. How long do Board Members retain their positions? Why was this determination made?
- d. Thinking on the Biosphere Reserves' Boards/ designated authorities' representation more generally (not necessarily your own Biosphere Reserve), can you suggest any ways that individuals who perhaps have been traditionally poorly represented in biosphere reserve decision-making structures can be better included?
  - i. Are such methods being employed currently or not?

4. Questions on internal staffing:

- a. How many official employees does the Biosphere Reserve have and what are their professional positions?
- b. Are these positions full time or part-time?
  - i. *If part-time*, how many hours do they work per week/ month?  
No. Full time: \_\_\_\_\_  
No. Part-time: \_\_\_\_\_ (hours)?
- c. How many volunteers are involved in the Biosphere Reserve?
  - i. How many hours do they spend on Biosphere Reserve work per week/ month?
- d. What type of work do volunteers generally help with (e.g. administration, projects, community engagement)?
- e. Do employees or volunteers receive any training?
  - i. What sort of training?
  - ii. How is the training funded/ supported (internal or external training/ funding)?
- f. Does the Biosphere Reserve have an option for the general public to sign up as members or be part of a "Friends of the Biosphere" group?
- g. In your opinion, which 3 permanent positions need to be filled to ensure the success of the Biosphere Reserve?

5. Are there **other individuals with the biosphere reserve** that I should be talking to?
  
6. And finally, could you share any **lessons learned** that might be useful for another newly established Biosphere Reserves currently in the process of setting up its governance model?

**Appendix 10: Interview guide used for interviews with the Cape Leopard Trust and CapeNature**

**INTERVIEW SCHEDULE: OBJECTIVE 2**

*To understand how landscape-level collaborative conservation initiatives support leopard conservation across a multifunctional landscape.*

---

You are being interviewed because you have been identified as an important collaborator and knowledge holder surrounding collaborative conservation initiatives supporting Cape leopard conservation in the Boland Mountain Complex. This interview will be supplemented by data collected from a questionnaire survey surrounding the topic. The information collected from this interview will be used to answer the following sub-objective exploring, *“to explore how and why collaborative initiatives operate to support Cape leopard conservation in a multifunctional landscape?”*. Your contribution through this interview is appreciated.

To follow through with the correct researcher ethics procedures, I wish to make explicit your rights as a research participant. Your anonymity will be ensured and your identity not revealed. Your participation will be of no personal cost to you aside from the time it will take you to complete. You will not receive any direct benefits from participating and you will also not receive any penalties or disadvantage should you choose not to participate or withdraw from the study. You are free to withdraw from participating at any point, as well as refuse to answer any specific questions.

---

Verbal consent:

That participant is over the age of 18 Yes/No  
That participant voluntarily participates in the interview Yes/No

Participant ID:

<b>Date:</b>
<b>Participant:</b>
<b>Title:</b>
<b>Organisation:</b>
<b>Location:</b>
<b>Participant code:</b>

**Questions regarding collaboration(s):**

**Details of the collaboration**

1. Are there any collaborative **groups** (e.g. committees, forums, networks, informal groupings, etc.) focused on leopard conservation/ management?
  - a. Can you list **who** is a part of the collaboration(s) for me?
  - b. Are you **involved** with these collaborative groups you mentioned?
    - i. How are you involved with the collaboration(s)?
    - ii. How long have you been involved in the collaboration(s)?
  - c. How **old** is/ are the collaboration(s)?
  - d. What is your **motivation** behind joining the/ these collaboration(s)?

**Formation of the collaboration**

2. **How** was/ were the collaboration(s) **formed**?
3. **Why** was/ were the collaboration(s) **formed**?

**Participation in the collaboration**

4. Are there any **rules or social norms** that specify who can participate in the collaboration(s)?
5. Are there any **disadvantaged** groups or individuals that find it challenging to participate in the collaboration(s)?
  - a. Can you tell me about any **underrepresented or marginalised stakeholders** in the collaboration(s)?
  - b. Can you tell me about any **groups that should be involved** in the collaboration who are currently not involved?
  - c. Do you have any **suggestions** on how can this underrepresentation/ poor participation be remedied?
6. How are the various collaborators **involved**?
  - a. What **roles** do collaborators play?
7. How does the collaboration(s) **engage with its stakeholders**?
  - a. How **frequently** does/do the collaboration(s) engage with its stakeholders in this manner?

Histories and prior networks

8. Were there **histories** of interaction before the collaboration was formed?
  - a. Where these interactions of a **conflict or cooperative/ collaborative** nature?
9. Were there **prior networks** before the collaboration was formed?
  - a. *If yes*, how are **networks** built by the collaboration(s)?

Action and area

10. How **active** is/ are the collaboration(s)?
11. What is the **spatial scale or boundary** of the collaborative's effort in terms of area of impact?

Objectives, goals and outcomes

12. What are the specific leopard conservation/ management **objectives/ goals** of the collaboration(s)?
  - a. How is/ are the collaboration(s) **achieving its/ their objectives**?
13. Could you identify any **unexpected outcomes** coming from the/ these collaboration(s), whether it is environmental, social, economic or political?
14. Can you describe any collaboration activities or interactions that allow for **building knowledge**, for example engaging in fact-finding missions, engaging with expert knowledge holders or scientists, and traditional knowledge holders?
  - a. How is/ are the collaboration(s) actively encouraging **learning and sharing** of knowledge and information between collaborators?
15. Can you explain how the collaborators **benefit** from working together (even if the objectives or goals are not met)?

**Questions relating to governing the collaboration(s):**

Collaboration governance

16. How is/are the collaboration(s) **governed**?
  - a. How is/ are the collaboration(s) meetings **facilitated**?
  - b. How is/ are the collaboration(s) **administered**?
  - c. Could you describe the **leadership** structure in the collaboration(s)?

Formal vs. informal

17. Is/are the collaboration(s) **formally** mandated in anyway?
- a. Can you elaborate?
  - b. Who mandates them?

Decision-making

18. Can you explain **how the collaboration(s) makes decisions**?
- a. What level of **decision-making authority** does/do the collaboration(s) have?

Trust in the collaboration

19. Is there **trust** amongst the collaborators?
- a. *If yes*, how does the collaboration(s) **develop trust** amongst the collaborators?
  - b. *If yes*, could you describe the **level of trust** held by individuals within the collaboration(s)?
  - c. *If no*, are there any points of **distrust**?

Funding and investment

20. How is/are the collaboration(s) **funded**?
- a. Does/do the collaboration(s) have any **support** from external parties in terms of financial or other resources necessary for its functioning?
    - i. Who are these external parties?
21. Is there any **corporate investment** into leopard conservation?
- a. *If yes*, who is investing?
  - b. *If yes*, how are they investing?

Benefits, negative impacts and conflict

22. Who **benefits** from having leopards in the area?
- a. How do they benefit?
23. Who is **negatively impacted** on by having leopards in the area?
- a. How are they negatively impacted?

24. Can you tell me how **conflicts or disagreements** are resolved within the collaboration(s)?

a. What are the **conflict resolution processes** used by the collaboration(s)?

25. In your opinion what leads to the **success or failure** of the collaboration(s)?

**Questions regarding biosphere reserves in the collaboration(s):**

**Involvement**

26. Is the **biosphere reserve** (Kogelberg or Cape Winelands) involved in the collaboration(s)?

a. *If yes*, how are they involved?

b. *If no*, why not?

c. *If no*, could you see their involvement in the future?

27. What **challenges do the biosphere reserves face** being/becoming actively involved or participating in these types of collaborations?

**Roles**

28. What **role** do you see for biosphere reserves in conserving leopards outside of protected areas?

a. What **strategies** do the biosphere reserve(s) currently employ to conserve leopards outside of protected areas?

29. What **role** do you think the **biosphere reserves should be playing** in these collaborations(s)?

30. Has the **biosphere reserve(s) role** in the collaborations **changed over time**?

a. *If yes*, what do you attribute this to?

**Appendix 11:** Summarised codebook of the Context-Mechanism-Outcome methodology

<b>Code</b>	<b>Description</b>	<b>C-M-O</b>
COL_STATUS	Status of the collaboration	C
HIST_COLONIAL	History of colonialism and independence	C
COL_FORMAL	Formality of the collaboration - how formal is the collaboration?	C
SCALE_ECO	Scale. This variable refers to the spatial scale of the ecosystem that is subject of the collaborative effort.	C
GRP_SIZE	Group size/number of collaborators	C
USE_RTS	User rights refer to the type of access of people to the resource.	C
PRP_RTS	Property rights refer to the type of ownership relationship between a people and the resource	C
DEC_MAKING	What level of decision-making authority does the collaboration hold?	C
DIV_OBJJS	Diversity of objectives	C
WHY_COL	What are the objectives (goals) of the collaboration?	C
RTYPE	Resource type	C
COLLAB_GOV	Governance of the collaboration itself – how are decisions made by the group? (internal decision-making)	C
RES_DEPEND	Dependency on resource ( <i>i.e.</i> whether collaboration partners need it for survival or cultural survival)	C
HIST_COL_CONF	Predominant history of conflict/collaboration	C
FUND	What is the funding situation of the collaboration?	C
FACIL_COLLAB	Facilitated vs non-facilitated (emergent)	C
COL_COMPL	Level of complexity of the collaborative context	<b>C</b>
<b>POW_ASY</b>	<b>Power dynamics/asymmetries</b>	<b>C</b>
<b>LOC_CLT</b>	<b>Does local culture facilitate collaboration (independent/communal, worldviews which inform collaboration)?</b>	<b>C</b>
DP1A_BOUND	Collaborative boundary	M
DP1B	Resource boundary	M
<b>DP2A</b>	<b>Congruence with local ecological conditions</b>	<b>M</b>

<b>DP2B</b>	<b>Congruence of the rules with local culture</b>	<b>M</b>
DP2C	Congruence between benefits and costs	M
DP3	Collective choice arrangements	M
DP4A	Monitoring the resource users and the resource	M
DP4B	Monitoring the monitors	M
<b>DP5</b>	<b>Graduated sanctions</b>	<b>M</b>
<b>DP6</b>	<b>Conflict resolution mechanisms</b>	<b>M</b>
DP7	Minimal recognition of rights to organize	M
<b>DP8</b>	<b>Nested enterprises</b>	<b>M</b>
INST_ADAPT	Institutional adaptability/variety/flexibility	M
SOC_LEARN	Social learning	M
LT_COM	Long-term commitment	M
LEAD	Leadership	M
CAPACITY_BLDG	Capacity of the collaboration to succeed, including provision of adequate resources and the ability to build further capacity (e.g., through providing training and resources)	M
KNOWL_BUILD	Knowledge building by, e.g., learning and information sharing; commissioning of scientific studies etc.	M
PRIOR_NETWORKS	Do prior networks and cooperative efforts exist?	M
FACE	Face-to-face dialogue	M
TRUST	Level of trust among stakeholders in the collaboration	M
COLL_OBJECTIVE	Are the collaboration objectives met?	O
UNEXPECTED ENVIRONMENTAL OUTCOMES	Environmental outcomes from the collaboration that were unplanned and unanticipated	O
UNEXPECTED SOCIAL, POLITICAL OR ECONOMIC OUTCOMES	Social, political or economic outcomes from the collaboration that were unplanned and unanticipated	O
COLL_PROCESS	The process of collaboration is deemed effective by stakeholders	O
<p>Coding manual available –  <a href="https://complexity.asu.edu/sites/default/files/papers/cbie_wp_2020_001_0.pdf">https://complexity.asu.edu/sites/default/files/papers/cbie_wp_2020_001_0.pdf</a></p>		

*Note: Bolded codes were not found in the case study of Chapter 5.*

**Appendix 12:** Online questionnaire survey sent to officials from CapeNature and City of Cape Town Biodiversity Management Unit

**QUESTIONNAIRE SURVEY: OBJECTIVE 2**

*To understand how landscape-level collaborative conservation initiatives support leopard conservation across a multifunctional landscape*

You are receiving this questionnaire because you have been identified as an important collaborator and knowledge holder surrounding collaborative conservation initiatives supporting Cape leopard conservation in the Boland Mountain Complex. This questionnaire supplements data collected from in-field interviews surrounding the topic. The information collected from this questionnaire will be used to answer the following sub-objective exploring, “*how and why collaborative initiatives operate to support Cape leopard conservation in a multifunctional landscape*”. Your contribution through this questionnaire is appreciated. This questionnaire consists of 35 questions, which will take roughly 20-30 minutes to complete. These questions consist of selecting the most appropriate answers, selecting yes/ no answers and providing more details where necessary. The questions start immediately below this introduction with qualifying questions and continues until question 35 which marks the end of the survey.

To follow through with the correct researcher ethics procedures, I wish to make explicit your rights as a research participant. Your identity will remain anonymous. Your participation will be of no personal cost to you aside from the time it will take you to complete. You will not receive any direct benefits from participating and you will also not receive any penalties or disadvantage should you choose not to participate or withdraw from the study. You are free to withdraw from participating at any point, as well as refuse to answer any specific questions.

Thank you for your time.

Qualifying questions:

I am over the age of 18	Yes/No
I voluntarily participate in this survey	Yes/No
I agree that the researchers may use anonymous quotes in the research outputs.	Yes/No

I agree that the information I provide may be used anonymously after this project has ended, for academic publication purposes.	Yes/No
---	--------

Please enter your details below:

1. Organisation or affiliation: \_\_\_\_\_

Please answer the following questions by entering or selecting the most appropriate answer:

*[The following questions relate to the collaborative effort of the Boland Project initiated by the Cape Leopard Trust.]*

2. What is your **personal motivation** for being a part of this collaboration?

\_\_\_\_\_

3. What was your **organisation's role** during the Cape Leopard Trust's Boland Project?

\_\_\_\_\_

4. How **formal** is the collaboration? (*Select the most appropriate answer*)

Formal (legal directives, constitution, etc.)

Informal (collaboration voluntary – self-organised)

Other (*please specify:* \_\_\_\_\_)

5. What are the **objectives (goals)** of the collaboration? (*Select the most appropriate answers, you can select multiple answers*)

Understanding the state of leopards

Restoring ecosystems and protecting leopards from environmental damage (e.g. habitat destruction)

Improve monitoring and/or enforcement of regulations with regards to human-leopard interactions

Enhancement of long-term planning surrounding leopard conservation

More inclusive decision-making and/or legitimacy of decisions

Knowledge sharing

Encouraging and/ or facilitating collaboration

Securing funding for conservation activities

Other (please specify: \_\_\_\_\_)

6. Is the collaboration **achieving its objectives (goals)**?

Yes (please elaborate: \_\_\_\_\_)

No (please elaborate: \_\_\_\_\_)

7. Do the stakeholders in the collaboration have a **previous history** of interacting with one another? (Select yes/no and provide elaboration)

Yes

No

If "Yes",

a) Can you provide details of this previous collaboration?

\_\_\_\_\_

b) Is the history one of collaboration/cooperation, or one of conflict?

Predominant history of collaboration (please elaborate: \_\_\_\_\_)

Predominant history of conflict (please elaborate: \_\_\_\_\_)

8. Does the collaboration have a **conflict resolution** process? (Select yes/no)

Yes

No

9. Is there evidence that the stakeholders in the collaboration **trust** each other? (Select yes/no and provide elaboration)

Yes

No

If "Yes", how is trust built? \_\_\_\_\_

10. Does the collaboration actively **encourage learning** between the participants? (Select yes/no and provide elaboration)

Yes

No

If "Yes", how does the collaboration encourage learning between participants?

\_\_\_\_\_

11. Does the collaboration actively encourage **sharing of knowledge** between the participants? (Select yes/no and provide elaboration)

Yes

No

If "Yes", how does the collaboration encourage sharing of knowledge between participants?

---

12. Where there any **unanticipated environmental outcomes** from the collaboration? (*Select the most appropriate answer and provide elaboration*)

Positive outcomes (*please specify:*\_\_\_\_\_)

Negative outcomes (*please specify:*\_\_\_\_\_)

13. Were there any **unanticipated social, political or economic outcomes** from the collaboration? (*Select the most appropriate answer and provide elaboration*)

Positive outcomes (*please specify:*\_\_\_\_\_)

Negative outcomes (*please specify:*\_\_\_\_\_)

14. By collaborating did the stakeholders **benefit from working together** (even if the goals were not met)? (*Select yes/no*)

Yes

No

If "Yes", indicate how collaborators benefit from working together. (*Select the most appropriate*)

Networking

Leverage and power

Knowledge and learning opportunities

Resource pooling

Other (*please specify:*\_\_\_\_\_)

15. **How necessary** do you think collaborations are in conserving free roaming leopards outside of protected areas? (*Select the most appropriate answer and provide explanation*)

Very necessary

Somewhat necessary

Not necessary at all

Explanation:\_\_\_\_\_

16. Should the **biosphere reserve** (Cape Winelands or Kogelberg) **play a role** in conserving Cape leopards? (*Select yes/no and provide explanation*)

Yes

No

How? \_\_\_\_\_

17. Should the biosphere reserve (Cape Winelands or Kogelberg) help conserve Cape leopards **outside of protected areas**? (*Select yes/no and provide explanation*)

Yes

No

How? \_\_\_\_\_

18. Do you have anything **additional** you would like to share about the successes/ challenges encountered in this collaboration?

---

---

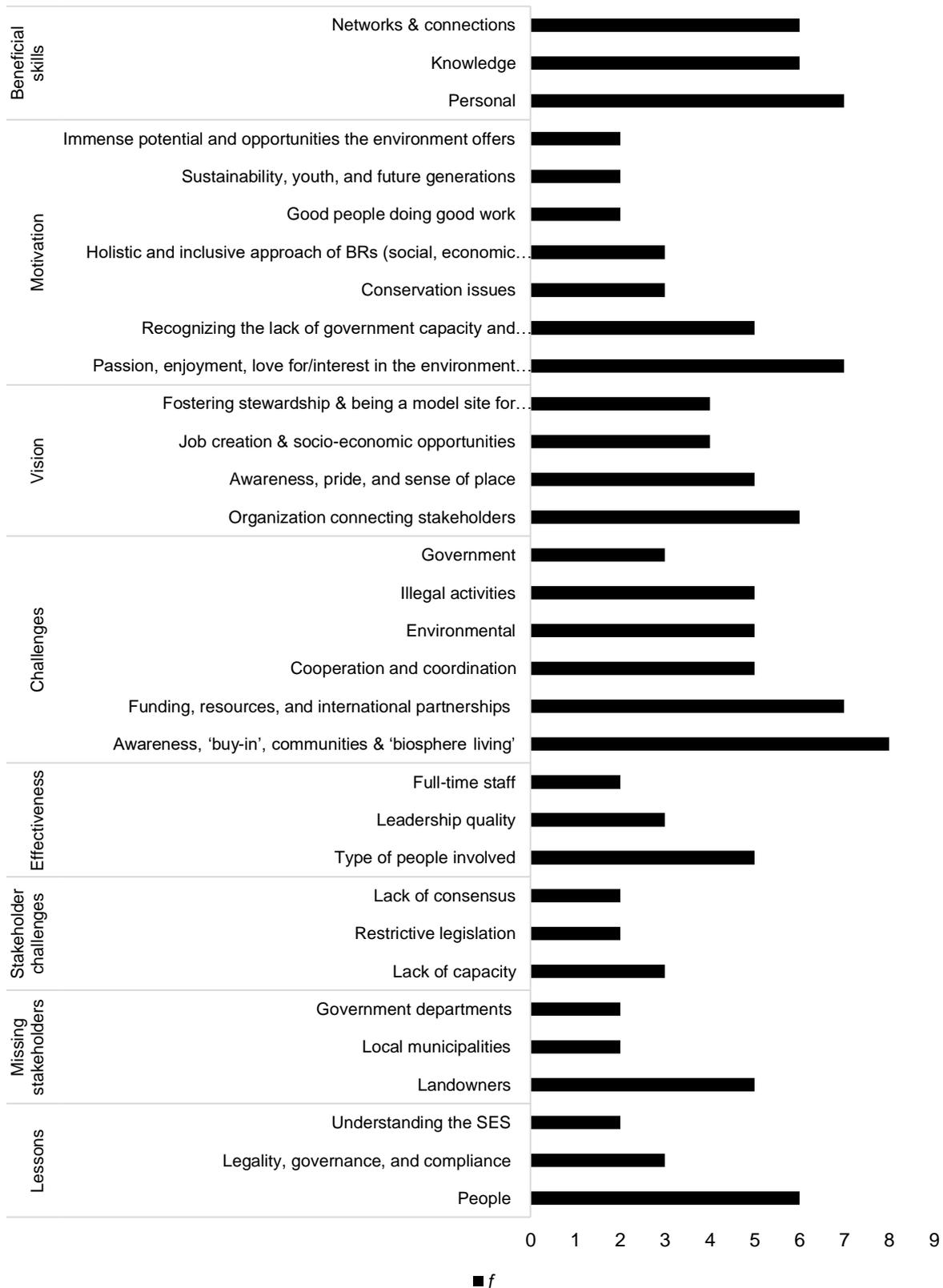
**Appendix 13:** Thematic analysis results including themes and theme descriptions of the Kogelberg (Chapter 3) and Cape Winelands (Chapter 4) Biosphere Reserve case studies

Topic	Theme	Description
Beneficial skills	Personal	Personality traits and soft skills
	Knowledge	Areas of expertise
	Networks and connections	Connectivity in fields overlapping with the BRs envisioned roles
<b>Kogelberg Biosphere Reserve</b>		
Motivation	Passion, enjoyment, love for/interest in the environment and BRs	Personal interests motivating participants to serve on the KBRC
	Recognizing the lack of government capacity and needing an organization to be a change agent	Realizing capacity issues and participants wanting to create change
	Conservation issues	Realizing conservation issues and wanting to find solutions
	Holistic and inclusive approach of BRs (social, economic and environment)	Attraction to the people-centred approach to landscape conservation
	Good people doing good work	Motivated by the people and the good work they do
	Sustainability, youth, and future generations	Motivated by the youth and sustainability for future generations
	Immense potential and opportunities the environment offers	Acknowledging the potential of the landscape
Vision	Organization connecting stakeholders	The KBR seen to perform as a central hub for stakeholders to connect
	Awareness, pride, and sense of place	Increasing awareness and pride
	Job creation and socio-economic opportunities	Creation of opportunities and employment
	Fostering stewardship and being a model site for sustainability	To be an example site for other areas to learn from, including people coexisting with nature
Challenges	Awareness, 'buy-in', communities and 'biosphere living'	Challenges relating to residents which lack awareness of the KBR and BRs in general, embodying the harmonious lifestyle between humans and nature.

	Funding, resources, and international partnerships	Issues of financial and human resources shortages and lack of international partnerships
	Cooperation and coordination	Issues of dividedness, territorialism and lack of consensus amongst stakeholders
	Environmental	Environmental challenges for the KBR in fulfilling its envisioned role
	Illegal activities	Illegal activity posing a challenge for the KBR to fulfil its envisioned role
	Government	Reference to challenges with local, provincial or national government
Effectiveness	Type of people involved	Strategically selecting directors with skillsets
	Leadership quality	Reference to staff holding a leadership position
	Full-time staff	Reference to full-time staff
Stakeholder challenges	Lack of capacity	Participants referring to the capacity of stakeholders ( <i>i.e.</i> the stakeholders potential or ability to perform a task)
	Restrictive legislation	Participants referring to legal frameworks in which stakeholders must act
	Lack of consensus	Participants referring to differences in opinion
Missing stakeholders	Landowners	Full diversity of landowners, specifically community leaders, farmers, and certain demographic cohorts, e.g. youth, poor and people of colour
	Local municipalities	Mention of some local municipalities and municipal actors tasked with environmental management
	Government departments	Reference to the lack of connection with relevant government departments
Lessons	People	Referring to human resources of the BR and their motivations as well as BR inhabitants' understanding of the concept
	Legality, governance, and compliance	Referring to the legal status of BRs, their governance or their role of ensuring compliance with legislation
	Understanding the SES	Knowing the local environment, its communities and their needs
<b>Cape Winelands Biosphere Reserve</b>		
Motivation	Personal interest	Participant interest, enthusiasm and enjoyment

	Holistic and inclusive approach of BRs (social, economic and environment)	Participants attracted to the people-centred approach to landscape conservation of the BR concept
	Community service	Being able to give back to the community
	Role dynamics	The dynamics of what the role entails
	Personal growth	Prospects of personal growth and opportunities it brings
	Good people doing good work	Being motivated by the people and the good work they do
	Environmental care	Participants caring for the environment
Challenges	Lack of resources	Financial and human resource constraints
	Limited government support	Issues relating to government
	Awareness and communities	Difficulties in communities and lack of awareness
Effectiveness	Leadership	Reference to staff holding a leadership position
	Quality of the staff	Reference to the dependence on the quality of its staff
Missing stakeholders	Government	Room for improvement regarding the participation and commitment from some local and national government actors
	Conservation bodies	Limited engagement with some key conservation groups within the BR
	Public	Shortage of participation from the public where projects are not active and particularly youth
Lessons	Type of people	Participants referring to the core team who are <i>'enthusiastic', 'committed' and 'charismatic'</i>
	BR infrastructure	Funding, partnerships, niche, physical space and structure

**Appendix 14:** A summary of dominant themes and associated topics (vertical) presented in results. For each theme, the frequency (*f*) count is provided to indicate its level of prioritization/importance



**Appendix 15:** Kogelberg Biosphere Reserve’s role in socio-economic development and conservation at the time of data collection. Socio-economic development programs include those focused on economic growth, environmental education, and youth development, whereas conservation programs include securing water and protecting nature. Within these programs there are various projects

<b>Role</b>	<b>Program</b>	<b>Project</b>	<b>Description</b>
<b>Socio-economic Development</b>	Economic Growth	Grabouw Development Agency (GDA)	Coordinated the establishment of the GDA, which will address issues of increasing inequalities and unemployment through community business hubs, better-placed shopping centres, a new industrial area, housing for all income levels, sport and recreation areas and job creation through landscape rehabilitation (DR2).
		Grabouw Transformation Project	Partnered with Grabouw Transformation to support local non-profit companies by assisting them with business plans and funding applications (DR2).
		Hangklip and Kleinmond Tourism Working Group	Partnered with the Tourism Department of the Overstrand District Municipality to establish a Tourism Working Group for the Hangklip and Kleinmond areas, to identify tourism opportunities and work to grow them to benefit the local communities and SMMEs (DR2).
<b>Conservation</b>	Environmental Education and Youth Development	Child Welfare Initiative	Partnered with Child Welfare Kleinmond, who are working with Lego Group to support youth in four local schools (DR2).
		Source-to-Sea Eco Rangers	Initiated a Source-to-Sea Kleinmond Estuary Project, supported by UNESCO, which they implement through the Kogelberg Eco Rangers, a group of youth aged between 13 and 22. The project activities include training on Source-to-Sea methodology, organizing a Source-to-Sea race for youth, identifying key flows into the estuary and their sources of alteration, and measuring river quality and quantity (DR2).
	Sustainable Resource Management	Forest Rangers and Trail builders	Collaborated with the ODM and Elgin Grabouw Cycling Association to employ four forest rangers to patrol the forestry exit areas in the buffer zone and report on fires, raise awareness of the importance of conservation and assist youth in trail building.
	Protecting Nature	Kogelberg Wildlife Rescue Unit and Rehabilitation Centre	Partnered with Wildlife Rescue to train volunteers as wildlife first responders who can respond to human-wildlife incidents. They are in the process of establishing a wildlife rescue unit and rehabilitation centre for harmed wildlife and where the training will continue. They also collaborated with the CLT and CapeNature to develop Snare Free, a province-wide snare response protocol dealing with “ <i>who, how, when to respond to animals trapped in snares</i> ” (DR2).

		Conservancies and Conservation Societies	<p><i>“Nurturing conservancies” (IR4) through supporting and providing advice. Their work with the Botanical Society (Kogelberg) includes projects such as ‘garden circle’ and ‘plant rescue’. The ‘garden circle’ is about “encouraging and enabling people to manage their gardens and develop their gardens in ways that are consistent with the natural environment” (IR4). The ‘garden circle’ has now evolved into ‘plant rescue’, which involves rescuing plants when bulldozers arrive at sites of new development and is thereafter used to rehabilitate other areas.</i></p>
		Kogelberg Marine Working Group and Estuary Forum	<p>Member of the Kogelberg Marine Working Group and Botriver Estuary Forum, which focus on managing the marine coastal areas of the Kleinmond and Steenbras Rivers through job creation, ecological data collection and information sharing (DR2).</p>
	Securing Water	IAP clearing	<p>Invasive alien plant (IAP) clearing projects with several hacking groups established through partnerships (DR2).</p> <p><i>“With the assistance of Dr Cluver of the Cluver Wine Estate, the KBRC and WWF coordinated the establishment of an alien clearing project now managed by GWUA. The management funding comes from British retailers and is coordinated by WWF. Clearing costs are covered by Land Care, SANBI and property owners. This project focuses on agricultural land that forms part of the fruit export industry. More recently this project has been able to expand into state owned areas where funding has been supplied by SANBI. These projects are dependent on coordination and support from the KBRC” (DR2).</i></p>

*Note: Appendix 14 does not include all the Kogelberg Biosphere Reserve’s programs and projects but provides examples of some of the work in which they are involved to fulfil their envisioned role in socio-economic development and conservation at the time of data collection (May 2023). More information can be found on their website (<https://kogelbergbiosphere.org.za>).*

**Appendix 16:** Stakeholders participating in the Kogelberg Biosphere Reserve at the time of data collection. An indication is given of which stakeholders participate with the KBRC to fulfil the specific envisioned roles of the KBR, *i.e.*, collaboration and coordination, conservation, and socio-economic development. Additionally, their relationships, including who they believe they are accountable to, who their critical partners are, and which stakeholders are believed to be missing (with opportunities for further engagement), are also provided. Where no 'envisioned role' or 'relationship' is mentioned, the specifics were not mentioned in the documents or interviews

	<b>Stakeholder</b>	<b>Envisioned Role</b>	<b>Relationship</b>
International	UNESCO	Socio-economic Development	Accountable
National	Department of Forestry, Fisheries and Environment	Collaboration and Coordination	Accountable; Critical; Missing
Provincial	Department of Agriculture	Collaboration and Coordination	
	Land Care	Conservation	Critical
	Department of Environmental Affairs and Development Planning		Accountable; Critical
District	Overberg District Municipality	Socio-economic Development	Critical
Local	Overstrand Municipality	Collaboration and Coordination	Critical
	City of Cape Town		Critical; Missing
	Theewaterskloof Municipality		Critical; Missing
Parastatals	South African National Biodiversity Institute	Conservation	Critical
	Custodians of Rare and Endangered Wildflowers	Conservation	
	CapeNature	Collaboration and Coordination; Conservation	Critical
NGOs and NPOs	World Wide Fund for Nature	Collaboration and Coordination; Conservation; Socio-economic Development	Critical
	The Nature Conservancy	Collaboration and Coordination	
	Botanical Society (Kogelberg)	Collaboration and Coordination; Conservation	
	Cape Leopard Trust	Conservation	
	Wildlife Rescue South Africa	Conservation	

	Child Welfare Kleinmond	Socio-economic Development	
	Grabouw Transformation	Socio-economic Development	
	Youth for the Environment	Socio-economic Development	Critical
	Fire Protection Association (Greater Overberg)		Critical
	Lego Group	Socio-economic Development	
	Contour Enviro Group		Critical
	Groenlandberg Water User Association	Conservation	Critical
	Grabouw Development Agency	Socio-economic Development	Critical
	Elgin Grabouw Cycling Association	Socio-economic Development	
Conservancies	Groenlandberg Conservancy	Collaboration and Coordination; Conservation	Critical
	Bettys Bay Conservancy		
	Hangklip Conservancy		
	Pringle Bay Conservancy		
	Rooiels Conservancy		
Civil Groups	Kleinmond Conservation Society	Conservation	
	Landowners/Residents		Accountable; Critical; Missing
	Professional Advisory Group	Collaboration and Coordination	
	Kogelberg Eco Rangers	Socio-economic Development	
Working Groups and Forums	Greater Cape Town Water Fund Operational and Data Working Group	Conservation	
	Boland-Groot Winterhoek Strategic Water Source Collective	Conservation	
	Kogelberg Marine Working Group	Conservation	
	Hangklip and Kleinmond Tourism Working Group	Socio-economic Development	
	Botriver Estuary Forum	Conservation	

	Western Cape Biosphere Reserve Forum		Missing
Biosphere Reserves	Cape Winelands Biosphere Reserve	Socio-economic development	
Business	Love Green Communications	Other (social media)	Critical
	Cluver Wine Estate	Conservation	

*Note: Stakeholder involvement in biosphere reserves is highly dynamic, ranging from one-off collaborations to long-term partnerships. For this reason, it is important to make explicit that the stakeholders in Appendix 15 are subject to change and were referred to in DR2 and DR5 at the time of data collection (May 2023). Therefore, this is not a fully comprehensive list of the KBR stakeholders.*

**Appendix 17: Data references for Chapter 4 which were removed and submitted as supplementary material for the submission to Environmental Management.**

**Supplementary Table 1:** Source codes for all quotations of the results. Quotes incorporated into the narrative structure are written as normal. Verbatim quotes have been *italicized*. Source codes include interview respondents (IR) and document results (DR).

Data	Source
The CWBR was initiated by the Cape Winelands District Municipality (CWDM) and the proposal put together by the Dennis Moss Partnership – a top-down establishment.	DR3, IR2, IR6
The CWBR was registered in 2007 after a four year long public participation process.	IR8
The impetus for its establishment was that it would be an important spatial development planning instrument and that development proposals would have to be approved by the committee.	IR3
This function is fulfilled by the Department of Environmental Affairs and Development Planning (DEADP), so to avoid duplication this role was never realized.	IR8
<i>'damage control'</i>	IR2
The CWBR <i>"didn't try to deal with all three [BR core functions] at a time. So [the CWBR] concentrate[d] on the education side"</i>	IR2
<i>"[the CWBRs] foci has been more community upliftment and education based"</i>	IR1
<i>"The next side [the CWBR] were weak, was the scientific side"</i>	IR2
The CWBRs projects are intended to align with the core functions of BRs as stipulated in The Statutory Framework of the World Network while responding to emergent local challenges.	IR3
<i>"getting gender and racial representation on the board remains a challenge"</i>	IR5
Each director is assigned to a portfolio, depending on their expertise, or a portfolio may be established for them.	IR1, IR7
It is the boards responsibility to provide an operational oversight role.	IR8
Linkages are present between the directors and some of the stakeholder groups to allow information to be shared and for fostering collaboration, for example with the CWDM, Heritage Committee, Iziko Museums, CapeNature and universities...	IR3, IR4, IR6, IR7, IR8
...the <i>"board's role, [to] a large extent, is to communicate and have that relationship with stakeholders"</i>	IR1
CWBR management consists of a chief executive officer (CEO), administrator and coordinator, and several project leaders, advisors or facilitators.	DR1, DR2
The CEO leads the management, oversees implementation, builds networks and relationships with funders and partners, and is tasked with timely decision-making.	IR1, IR3, IR4
The responsibility of the coordinator is reporting, managing records and administrative tasks.	IR2, IR3, IR4
Project leaders are appointed through service-level agreements and work part-time managing projects and facilitating various activities.	DR2
Directors are either sourced by or approach the CWBR to be elected to serve on the board.	IR2, IR7, IR8
Other criteria may include whether directors are involved in activities aligning with the CWBR objectives, and although not important at present, reside within the CWBR.	IR1, IR2
<i>"the main thing is, what skills do [the CWBR] need?"</i>	IR2
Directors are retained for as long as possible – until they are unwilling to serve or the lack of alignment between the objectives of the CWBR and what the director provides.	IR1, IR2
Whilst there are recent additions to the BofD, <i>i.e.</i> within the last 2 years, most of the directors have served for a minimum of five to seven years, but some directors have served since the establishment of the CWBR.	IR1, IR5, IR6, IR7
The CWBR has had a full-time coordinator since 2018.	IR1
<i>'connecting with people'</i>	IR1
<i>'collaborative spirit' and 'leadership skills'</i>	IR7
<i>'writing skills'</i>	IR1, IR5
<i>'objectivity'</i>	IR4
<i>'Built environment'</i>	IR4
<i>'environmental and conservation ecology'</i>	IR3, IR6
<i>'business'</i>	IR2
<i>'town and regional planning' and 'sustainable development'</i>	IR3, IR8
Spheres within government, public institutions, and the field of conservation	IR2, IR7, IR8
The CWBR has four full-time staff, including the CEO, coordinator, and project leaders whose work hours are flexible	DR2
These staff have specific responsibilities or commitments which need to be delivered upon.	IR1

This generally entails a 40-hour week but can be much longer – depending on what is required.	IR1
There are five to eight part-time workers depending on project funding, including administration, project leaders, advisors and facilitators.	DR2
Opportunities for training exist, both formal and informal, for example the coordinator completed a virtual BR management course.	IR1, IR2
Participants believe important full-time positions for the CWBR that should be filled include a CEO, coordinator, administrator, project leaders and a social media manager.	IR1, IR2
Board meetings, held quarterly, are a place for the BofD and CEO to plan, discuss and vote on decisions. Two thirds (4/6) of the BofD must be present for board meetings, including the secretary, chairperson and CEO, and all present need to vote.	IR1
Decision-making is perceived to be an informal process.	IR3, IR7
<i>“the board meetings are a space to have conversations about things – to give input. But I wouldn’t say there’s a formalized decision-making structure ... I think it’s quite loose”.</i>	IR5
Meeting agendas are shared beforehand allowing items to be attached.	IR5
Ad hoc meetings occur regularly, for example with municipalities.	IR1
<i>‘open phone policy’</i>	IR1, IR2
There is trust between the CEO and directors and often decisions are made independently of the BofD and discussed at a later stage.	IR8
The CEO leads CWBR management meetings, a place to provide updates and work through programs, on a weekly basis. In these meetings there are usually 14 to 22 individuals depending on absentee numbers.	IR2
With regards to decision-making around CWBR projects, decisions are not made without the local communities. CWBR <i>“spend of lot of time in the communities”</i> attending community meetings through invitation where there is open dialogue in <i>‘co-creating’</i> projects and solutions. Through these relationships being built, communities can regard the CWBR as a channel to the municipalities when they cannot get answers themselves, specifically regarding issues of housing, education and access to land.	IR2
There are no memberships, however the CWBR has a volunteer program.	IR4
There are generally six to eight volunteers (maximum of 14) who are either local or international.	IR1
Volunteers help with ongoing projects or initiate new projects depending on their skill set, for example the <i>‘drone project’</i> .	IR1
The CEO often meets with the prospective volunteers beforehand in attempt to match the volunteers with specific projects or needs.	IR2
<i>“BRs couldn’t run as well as they do without volunteers and people being able to give of themselves”</i>	IR1
The youth board consists of youth from different local communities...	IR8
<i>“very powerful way of embedding [the CWBR] in communities”</i>	IR2
It has been an experimental process and seen by some as relatively unsuccessful and therefore to be evolved into a youth committee or forum.	IR1, IR5
The advisory consists of individuals with knowledge on sustainable living and UNESCO-MAB.	DR1
The committee, which fulfils an advisory role to the board, consists of critical stakeholders, for example the local municipalities, CWDM, Department of Agriculture and CapeNature.	IR8
The committee meet once or twice a year and at the annual general meeting (AGM) to share knowledge and information, and feedback on activities.	IR6
<i>“It’s almost like stakeholder involvement... these are all the various stakeholders that are interested in the CWBR, and they need to be represented ... on the technical committee to make sure that they are happy with the direction [the CWBR] is going. ..., most of the time the technical committee is made up of people that are coming from organizations that are already doing things. It should almost be for them to come along and tell us what they’re doing. Then we can find out where we can help them a bit more, which does happen. But generally, those meetings, there’s a lot of very quiet people there”</i>	IR6
<i>‘support and facilitate’</i> actors in the landscape.	IR8
Participants perceive the CWBR as an organization to network, connect actors and to help those in need.	IR1, IR6
<i>“[the CWBR] will look at the problem. Diagnose it. What partners do [the CWBR] need to sort that out”</i>	IR2
Socio-economic development has been their focus because of the disparity in education in South Africa and the need to understand issues to solve them.	IR1, IR2
Their educational programs have been successful and gained them support.	IR2

There is an attempt to 'align with government departments' and 'fill the gaps' with their projects, for example early childhood development (ECD) a niche of the CWBR.	IR8
Their ECD program has put teachers through training and offered learning experiences with Iziko Museums.	IR7
The CWBR offer other forms of training for all interested parties, for example woodwork to upskill the local communities	IR2
The CWBR conducts environmental education and outreach programs with the youth and uses a mobile science unit (trailer) to promote conservation at schools.	IR2, IR3
The CWBRs conservation role is fulfilled through partnerships with several organizations, for example invasive alien plant (IAP) clearing with WWF and Idas Valley Trails, and with universities to fulfil their role in science and research.	IR1, IR2, IR5, IR6
The CWBR have developed strategic partnerships with several universities including, University of Stellenbosch, University of Cape Town (UCT) – specifically their African Climate Development Initiative, University of Leuven, and the Flemish Institute for Technological Research (VITO) in Belgium.	IR2
The CWBR support provincial government, WWF and CapeNature in research and monitoring through baseline data collection with the use of drones – a project initiated by a volunteer.	IR1, IR2, IR6
There are citizen science projects, for example their Source-to-Sea BeResilient project which focuses on conserving rivers and environmental education.	IR2
Lack of resources (f=7) is associated with the lack of funding, specifically operational funding which influences human resources and capacity.	IR3, IR6, IR7, IR8
The CWBR is believed to be over reliant on few human resources.	IR3, IR5
Partnering with other BRs to source funding seems to be an underutilized strategy.	IR2
<i>"Funding is a major challenge. Most of the guys are doing it for the love of conservation"</i>	IR8
<i>"[The CWBR are] still very reliant, heavily reliant on [the CEO] and [the coordinator]. There's a need to invest in human resources for the organization. Which comes along with funding questions"</i>	IR5
<i>"There's scope for more, but it requires a larger dedicated team and operational funding"</i>	IR7
<i>"I don't understand why the Western Cape [BR] Forum doesn't get together more. You know because the power of collaboration. I know it from business. I mean, there is big funding out there, but it's too big for one biosphere, but all 5 biospheres. We can go for the 50 [or] 100-million-europroject. But working in silos, we can't do that"</i>	IR2
Limited government support (f=4) uncovers a perceived lack of MAB program governance within South Africa, and therefore believed to be a lack of clarity in defined roles, structures and responsibilities within the 'chain of command', i.e. national MAB governance down to CWBR.	IR4, IR8
Participants believe national government are hesitant in allocating resources to the Western Cape for what is perceived to be political reasons.	IR2
There is the perception that their engagement is superficial.	IR6
It is believed there are structural challenges with regards to government involvement, for example, limited mechanisms to transfer funds, and believing that interacting with BRs is not part of their functional responsibility, i.e. no mandated engagements.	IR8
<i>"It's frustrating that our system, our top-down structure – we don't have leadership on top"</i>	IR8
<i>"Again, who does the CWBR report to? What is our relationship? What are they doing? What is our contribution to helping them achieve their objective? Now for me that's not defined at all. We don't see any real government, either of provincial or national, participation really in terms of what to do. There's got to be a chain of command in all these organizations. Who are you? What are you doing? Why are you doing it? Who's effectively in charge of the whole thing? Power is what, we have no power. Things are devolved down to us to do, and to achieve what? To me those are not well defined, properly defined that people can understand or support for that matter. We have no support ... in real terms from national or provincial government"</i>	IR4
<i>"Treasury doesn't want money to come to the Western Cape. I mean, I've had that from [XXX]"</i>	IR2
<i>"[During technical committee meetings the CWBR] get a 'representative' from the organization coming along. But not necessarily the right representative. It gets delegated down till somebody gets sent to you. That's not always useful"</i>	IR6

<i>"I know they had challenges with the legislation ... they couldn't even transfer funds. I think 10,000 rand for reports. We compiled the report, a ten-year report. They said that that they will fund it, ... they couldn't fund it. They don't have a mechanism of transferring funds..."</i>	IR8
<i>"Guys at local government, if they have certain KPIs [key performance indicators], they focus on that. If the BR invites them, they just say, no, I'm not available... the person, individual at that organization must have similar interests to get them in"</i>	IR8
Awareness and communities (f=3) is associated with the awareness of the CWBR and the concept of BRs, getting people to understand issues which are not their immediate priority, as well as challenging community dynamics due the presence of gangsters.	IR2, IR3
Participants believe the current schooling system does not provide for many extracurricular activities which makes it challenging for the CWBR to engage with the youth.	IR6
<i>"It's not really well known to the public, what we do, that we are there and we do all these things. I mean, the general public is not aware of us. Maybe in Franschoek, with other projects there. People would know about it. In Stellenbosch, if you say BR. They say, what is that?"</i>	IR3
<i>"Getting communities to understand science, and climate change, and conservation is not easy.... hungry stomachs have no ears"</i>	IR2
<i>"We've got a difficult biosphere in that a lot of the community is gang controlled"</i>	IR2
<i>"It's very, very difficult to get to the kids, which I think is probably one of the most important things. Especially the way things are going now. If you don't have any understanding of the natural world, you're going to have absolutely no desire to do anything about it"</i>	IR6
Participants suggested it is the continued perseverance and voluntary commitment of the team.	IR1, IR7
Other factors include the leadership, like-mindedness, personalities and networks within the team involved.	IR1, IR7
Participants attributed much of the success of the CWBR to the CEO.	IR3, IR4, IR6
<i>"If it wasn't for [the CEO], none of this would have happened. None of it would happen. [The CEO is] a rather phenomenal person"</i>	IR6
Some credited the partnership between the CEO and coordinator together with the relaxed and flexible nature of engaging with the team.	IR2, IR3
When asked about instrumental positions which have increased the CWBRs effectiveness, one participant believes success has come from the team's passion and commitment to meaningful work	IR8
while another explained that it is more the types of people and personalities involved and not necessarily their position (see below).	IR6
<i>"The structure has got nothing to do with it. If you don't have the right people there. Or if you do have the right people, you can have any structure, the structure isn't the issue. It's the personalities and whether they [are] prepared to do what they're supposed to do or not, you know. You can have the best structure in the world and a bunch of 'palookas' sitting in it and it's still not going to work."</i>	IR6
Stakeholder participation occurs <i>"on a case-by-case basis"</i> ...	IR5
...and could include any actors in the CWBR of which CWBR stakeholder mapping has identified for example provincial government departments, non-governmental organizations, community forums and water catchment area working groups, local businesses, community organizations and sports clubs.	DR2
One participant believes partnerships cannot be forced and that one must attract them by providing value, which the CWBR have done in their educational domain.	IR8
Participation from all interested and affected parties is encouraged through blog posts on their website, newsletters, word-of-mouth, and via phone call.	IR5, IR7
Participation levels are increasing – several participants said that they have had increasing attendance at their AGMs.	IR4, IR7
Participants reported challenges with regards to stakeholder participation from local government: there is superficial engagement and lack of perceived significance of the CWBR.	IR6, IR8
Furthermore, some stakeholders are perceived to be prioritizing their own agendas...	IR7
... or that the CWBR does not feature on the stakeholder's agenda, or within their professional <i>'functional responsibility'</i> unless the individual has a personal interest.	IR8
Stakeholder participation from local and national government (f=4) is believed to be missing despite being considered critical partners.	IR2

Participants believed that municipalities are disinclined to play an active role in CWBR engagement/participation, with room for more engagement.	IR2, IR8
Furthermore, participation from some key conservation bodies (f=2) are believed to be missing. The absence of these stakeholders is a 'limitation' for the CWBR.	IR3
The CWBR would like more participation from the public (f=2) particularly youth groups.	IR1
Institutional overlap occurs with other actors in the landscape in terms of their mandate, for example CapeNature and municipalities.	IR2, IR6
Participants believe the challenge therein is to reduce duplication, and resource competition.	IR1, IR2, IR7, IR8
Participants mentioned the opportunity is to form partnerships, pool resources and collaborate – 'dovetailing' projects with CapeNature, for example.	IR2, IR4, IR6
Participants were unsure whether such overlap enables or constrains ongoing/further government support. Participants believe it depends on who is involved as one needs a shared vision and the 'collaborative spirit',	IR7
...while another said that it could enable support,...	IR1
however staff turnover is a challenge when it comes to building long-standing relationships.	IR6
Participants perceive some municipal councilors to be disruptive in their attempts to politicize the CWBR...	IR2
...and that even directors have the potential to be disruptive by trying to push their agendas and in some way 'hijack' the CWBR.	IR8
Furthermore, some government departments are believed to be disruptive and of little help to the CWBR – in some cases perpetuating and exacerbating issues, for example land invasions.	IR4
<i>"get a nice core team together"</i>	IR3, IR7
...a good CEO or leader.	IR3, IR4
a physical space is beneficial to have,	IR5
setting a clear plan (strategy or business plan) early on,	IR2
to find a niche...	IR8
and if there are overlaps with other actors look to build partnerships and collaborate.	IR1
Partnerships and continuity of funding are considered the 'lifeline' of a BR (IR5).	IR5
A participant advised to try form these early and develop the BR around the personalities involved (IR8).	IR8
<i>"Some active individuals who are enthusiastic and make their time available to their own societies... I think the important thing is to identify two or three people who are really committed and prepared to put in time."</i>	IR3
<i>"Get yourself a good CEO."</i>	IR3
<i>"You need a charismatic person that's willing to take on the overall role. Then for him or her using your own personal charisma to persuade other people to join this enterprise."</i>	IR4
<i>"I think having the [physical] space [headquarters], where volunteers ... can stay. There's an office ... Everything is in one place... and I think that's valuable... it's really the ideal scenario. You've got someone who is setting up and championing something like this. If they have ... the physical space that they're working in, that can become the HQ... It just makes things a lot easier."</i>	IR5
<i>"Find your niche, ... [where] you can have an impact. It's about just searching for that, networking, understanding the landscape."</i>	IR8
<i>"I think having ... stability of funding in place, I think there's something linked to that around kind of international partnerships and relationships. I think that's something which [the CEO] has done quite well. It's really been a lifeline to the organization, in many ways. I think ... for BRs in the Global South, establishing partnerships and relationships with either funders and/or other BRs in the [Global] North as a way of trying to kind of create some sense of financial stability."</i>	IR5
<i>"... the [BR] is dependent on funding and the personalities that drive it. If the personalities that drives the BR, if they do not conform to a rigid system, a rigid structure. If it's easier for them to implement without that structure, then I just think it should go with the flow. It shouldn't be overregulated in terms of [a] set structure."</i>	IR8

**Appendix 18:** Timeline of the Cape Leopard Trust’s collaborative effort in the Boland

Year	Milestone	Description
2009-2012	Diet Research	Study dietary breadth of leopard in the Boland (in addition to the Little Karoo).
2010	Project Initiated	The CLT initiated the Boland Project.
2010-2012	1 <sup>st</sup> Large-scale Camera Trap Surveys and Public Awareness	Record leopard presence and estimate population numbers. Study leopard activity, movement patterns, etc. Document mammal distribution and relative abundance. Created public awareness about the biodiversity of the Boland.
2011	Online Database developed	The CLT collaborated with University of Cape Town's Animal Demography Unit to develop a Virtual Museum for Mammals, a website where the public can contribute photos of mammal species in southern Africa (more available at: <a href="https://vmus.adu.org.za/">https://vmus.adu.org.za/</a> ).
2012-2014	GPS Collaring of leopards	Distribution, home range sizes, fine-scale movement and activity patterns, habitat use and preference.
2014	Sub-survey w. Camera Traps by post-graduate student	The efficacy of high intensity camera trapping for the detection of female leopards in the Boland.
2015	Public Awareness	Nineteen interpretive signboards erected in the Boland at viewpoints along common routes, popular tourist destinations, and CapeNature and the CoCT nature reserves.
2017-2018	Snare Research	Questionnaire based research in the Boland. Both landowners/managers as well as agricultural laborers were asked about illegal hunting with snares on the properties they lived/worked on.
2019	Publications of Diet and Snare Research	<i>The effects of aridity on land use, biodiversity and dietary breadth in leopards</i> (Mann <i>et al.</i> , 2019). <i>Socioeconomic and biophysical determinants of wire-snare poaching incidence and behavior in the Boland Region of South Africa</i> (Nieman <i>et al.</i> , 2019).

2019-2020	Snare Patrols	Snare Patrol Officer conducting snare patrols.
2020-2022	2 <sup>nd</sup> Large-scale Camera Trap Surveys	Compared population density estimates to previous survey to investigate trends.
2022	Publications of Snare Patrol Data Collected	<i>Evaluating determinants of wire-snare poaching risk in the Boland of South Africa</i> (Kendon <i>et al.</i> , 2022).
2023	Snare Research & Snare Free	<p>Project investigated snaring in the Western Cape and potential solutions to the snaring crisis. Building on the Niemann <i>et al.</i> (2019) work, researching in a broader landscape what communities themselves seen as solutions or alternative to illegal hunting with snares.</p> <p>Snare Free (2023) is a collaborative network of conservation, animal welfare and volunteer organizations providing a coordinated response to snared wildlife incidents in the Western Cape, South Africa, as well as improved training, data collection, and awareness to combat the prevalence of snaring in the Western Cape.</p>