# Conservation and resource-use relations: Analysis for protected area expansion feasibility in the Western Cape

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A thesis submitted in fulfilment of the requirements for the degree of Doctor of Philosophy


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## DECLARATION

I declare that ***Conservation and resource-use relations: Analysis for protected area expansion feasibility in the Western Cape*** is my own work, that it has not been submitted for any examination or degree at any other university and that all the sources I have used or quoted have been indicated and acknowledged by complete references.

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Signature: 

Date: November 2022

## KEYWORDS

Conservation
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West Coast National Park
Hottentots Holland Nature Reserve
Driftsands Nature Reserve

# ABSTRACT

## Conservation and resource-use relations: Analysis for protected area expansion feasibility in the Western Cape

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It is assumed that expanding the size and/or number of protected and conservation areas can contribute to more effective conservation, ecosystem services and environmental protection. Expansion is normally a response to continuous environmental threats and subsequent needs to enhance the protection and conservation of valuable biodiversity, geodiversity and heritage assets. Targets for global, regional and country-based protected area expansion are set and driven by conservation authorities across different geographical scales – from the global International Union for the Conservation of Nature (IUCN) to the local-level protected area. Environmental acts, policies and strategies legitimise needs that have to be fulfilled in order to maintain and enhance biophysical conditions on which humankind is dependent. South Africa's National Protected Area Expansion Strategy (NPAES) sets the framework for protected area expansion plans as contained in the management plans for the different categories of protected areas in South Africa's conservation estate.



The purpose of this study was to revisit the feasibility of expansion at three diverse protected areas in the Western Cape through a spatial analysis of the often conflicting relationships between conservation and resource uses in and around the study sites. The following protected areas were included in the study: the West Coast National Park (WCNP) and its marine protected areas near the town of Langebaan on the West Coast, the Hottentots Holland Nature Reserve (HHNR) near the town of Grabouw and the Driftsands Nature Reserve (DNR) on the Cape Flats, northeast of the intersection of Route R300 and the N2 National Road. Political ecology is used to frame the study theoretically relative to manifestations of traditional (fortress), liberal and neo-liberal conservation approaches across area-based, ecosystem-based and species-based conservation practices.

A descriptive spatial analysis of variables, such as size, shape, space, place, temporality, accessibility and association, formed the basis on which the analysis of resource uses in and around the case study areas was done. The analysis of the spatial dynamics and the varied resource uses was then related to a set of expansion-feasibility indicators to inform the aim of the study. These indicators include the competency of conservation entities/authorities, relationships with right-holders (such as owners, managers and users of land, resources, ecosystem services), abatement of threats to expansion agreements, and the creation of expansion-conducive, site-specific conditions.

A mixed-methods approach was followed in order to collect information and data. Quantitative information on the spatial aspects and metrics of proposed expansion was largely derived from secondary/documentary sources, such as the protected area management plans for the WCNP, DNR and HHNR, as well as the expansion targets set by the overarching NPAES. Qualitative data were derived from interviews with reserve managers, stakeholder and interest groups, resource-use target groups and individuals, and the recording of observations. Content analysis was used to make sense of the responses of participants in the study and observations that were done.

Although the study is not representative of all the protected areas in the province and the conditions that can enable or disable their expansion, the case studies provide critical perspectives on the dynamics that (can) influence conservation and resource-use relations which, in turn, allows for the broadening and revisiting of perspectives on protected area (PA) expansion. As the successes of conventional and protectionist approaches to conservation are questionable and criticised by pro-convivial conservation scholars, so is protected area expansion and/or contraction also questionable if its application is not cognisant of the complexity of site-specific conservation and developmental needs.

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# TABLE OF CONTENTS

## LIST OF FIGURES

## LIST OF TABLES

## LIST OF APPENDICES

## LIST OF ACRONYMNS

ADZ - Aquaculture Development Zone

CA - Conservation Area

CARE - Connectivity, Adequacy, Representativeness and Efficiency (principles)

CBA - Critical Biodiversity Area

CBD - Convention on Biological Diversity

CBNRM - Community-based Natural Resource Management

CFM – Cape Farm Mapper

CFR - Cape Floristic Region

CoCT - City of Cape Town

CWCBR - Cape West Coast Biosphere Reserve

DAFF - Department of Agriculture, Forestry and Fisheries

DEA - Department of Environmental Affairs

DEADP - Department of Environmental Affairs and Development Planning

DEAT - Department of Environmental Affairs and Tourism

DEFF - Department of Environment, Forestry and Fisheries

DFFE - Department of Forestry, Fisheries and Environment

DNR - Driftsands Nature Reserve

DWAF - Department of Water Affairs and Forestry

ECA - Environmental Conservation Act

ECO - Environmental Control Officer

EPWP - Expanded Public Work Programmes

GBO - Global Biodiversity Outlook

GPAP - Global Protected Areas Programmes

HHNR -Hottentots Holland Nature Reserve

HHNRC - Hottentots Holland Nature Reserve Complex

IEM - Integrated Environmental Management

IGU - International Geographical Union

IPBES - Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services

IPCC - Intergovernmental Panel on Climate Change

IUCN - International Union for the Conservation of Nature

KNP - Kruger National Park)

METT - Management Effectiveness Tracking Tool

MLRA - Marine Living Resources Act

MMR - Mixed Methods Research

MPA - Marine Protected Area

MPAF - Marine Protected Area Forum

NBF - National Biodiversity Framework

NCCAS - Draft National Climate Change Adaptation Strategy

NEMA - National Environmental Management Act

NEMBA - National Environmental Biodiversity Act

NEMPAA - National Environmental Management Protected Areas Act

NEMWA - National Environmental Waste Management Act

NHRA - National Heritage Resource Act

NPAES - National Protected Area Expansion Strategy

NPTSA - National Parks Trust of South Africa

NRA - Nuweberg Residents Association

PA - Protected Area

PACA - Protected and Conservation Areas (database)

PADDD - Protected Area Downgrading, Downsizing, and Degazettement

PAME - Protected Area Management Effectiveness (Evaluation)

PAMPS - Protected Area Management Plans

PAR - Protected Area Register

PLCA - Private-land conservation Area

PNR - Private Nature Reserve

SANBI - South African National Biodiversity Institute

SANDF - South African National Defence Force

SANparks - South African National Parks

SAPAD - South Africa's Protected Areas Database

SES - Social-Ecological Systems

SFF - Strategic Fuel Fund

SLL - Save Langebaan Lagoon

SLOSS - Single-Large-or-Several-Small (protected areas)

TAPAS – Tourism and Protected Areas Specialist Group

TNC – The Nature Conservancy

UNEP-WCMC - United Nations Environmental Program's World Conservation Monitoring Centre

WCFP - West Coast Fossil Park

WCNP - West Coast National Park

WCPA - World Commission on Protected Areas

WCPAES - Western Cape Protected Area Expansion Strategy

WDPA -World Database on Protected Areas

WWF - World Wide Fund for Nature

# CHAPTER 1: INTRODUCTION

## 1.1 Introduction

This introductory chapter provides a brief overview of the conceptualisation and framing of the study aim and objectives, methodological aspects and analyses that are elaborated upon in more detail in the chapters that follow.

The global conservation estate is comprised of a variety of protected and conservation areas that cover approximately 20 million km$^2$, i.e. 14.7% of the world's surface, excluding Antarctica (IUCN, 2016). However, the global estate still excludes very crucial biodiversity regions throughout the world. The global target for 2020 is 17% - which can be achieved only by rigorous protected area expansion programmes worldwide (IUCN, 2016). Based on the United Nation's Convention on Biological Diversity 30/30 approach (CBD 30/30), this 2020 target has subsequently increased to 30%. CBD 30/30 deals with the collective efforts to get governments and businesses to agree to protect at least 30% of the world on land and sea in order to address global biological decline. *(https://www.nature.org/en-us/what-we-do/our-insights/perspectives/thirty-percent-protect-best-biodiversity-on-earth/; http://www.cbd.int/)*. These targets are informed by the so-called global Aichi Biodiversity Goals and Targets that set parameters and broad guidelines for addressing biodiversity and conservation challenges. (See Appendix F for a synopsis of the Aichi goals and targets). Aichi Biodiversity Goals and Targets aim to establish conservation plans for species that are highly threatened with extinction (Aichi Targets, 2019). In combination with the Aichi targets, the vision and mission of the strategic plan of the Convention on Biological Diversity (CBD) arguably express best the need for biodiversity protection in the context of global protected area (PA) expansion if the following quote is considered:

> "The vision - By 2050, biodiversity is valued, conserved, restored and wisely used, maintaining ecosystem services, sustaining a healthy planet and delivering benefits essential for all people. The Mission - Take effective and urgent action to halt the loss of biodiversity in order to ensure that by 2020 ecosystems are resilient and continue to provide essential services, thereby securing the planet's variety of life, and contributing to human well-being, and poverty eradication. To ensure this, pressures on biodiversity are reduced, ecosystems

> are restored, biological resources are sustainably used and benefits arising out of utilization of genetic resources are shared in a fair and equitable manner; adequate financial resources are provided, capacities are enhanced, biodiversity issues and values mainstreamed, appropriate policies are effectively implemented, and decision-making is based on sound science and the precautionary approach." (CBD, 2011)

The flipside of expansion also needs to be recognised though. Due to a variety of circumstances, the spatial extent of PAs can be reduced and reconfigured if so required. Mascia and Pailler (2010) refer to the non-expansion processes as PADDD (Protected Area Downgrading, Downsizing, and Degazettement). Dowie (2009) also links dimensions of PADDD to the deliberate marginalisation of ordinary people under the guise of conservation. (The Driftsands Nature Reserve, one of the PAs on which this study focuses, is also characterised by the partial downsizing of some areas in its spatial footprint due to socio-economic pressures caused by communities that surround the reserve.)

The integrity of South Africa's biodiversity estate has been - and still is - challenged significantly by socio-economic needs, such as housing and access to land. Conservation land is increasingly targeted as land-grab/land invasion havens throughout the country at large, and in the Western Cape and the City of Cape Town in particular (Fisher, 2020; Charles, 2020). South Africa's conservation estate is fairly diverse, and, according to the Department of Environmental Affairs, the total coverage of protected and conservation areas amounts to 13.2% (i.e. 160 779km$^2$) of the country's land area of 1 219 090km$^2$ (DEA, 2014). [See Appendix E (Convention on Biological Diversity - South Africa Country Profile) for an overview of South Africa's rich biodiversity and associated management challenges.] Table 1.1 below is a summary of the typology of PAs and conservation areas (CAs) as per the categorisation of the National Department of Environmental Affairs.



**Table 1.1: South Africa's protected and conservation area types**

| Category of Protected/Conservation Area | Number of Sites | Total Area in Hectares |
|---|---|---|
| Biosphere Reserve | 10 | 9 719 884 |
| Botanical Garden | 10 | 7 020 |
| Forest Nature Reserve | 57 | 178 437 |
| Forest Wilderness Area | 12 | 274 489 |
| Marine Protected Area | 39 | 4 382 950 |
| Mountain Catchment Area | 16 | 624 196 |
| National Park | 22 | 4 114 022 |
| Nature Reserve | 1425 | 4 379 077 |

| Category of Protected/Conservation Area | Number of Sites | Total Area in Hectares |
|---|---|---|
| Protected Environment | 52 | 1 490 607 |
| Ramsar Site | 27 | 535 752 |
| Special Nature Reserve * | 1 | 1.5 |
| World Heritage Site | 9 | 3 102 717 |
| **Totals** | 1680 | 28 809 152.5 |

Adapted from the DEA (Protected Area Register), 2022.

* Special Nature Reserve host to the highly threatened Brenton Blue Butterfly

The 1425 listed nature reserves in South Africa include subcategories, such as provincial, local and private nature reserves, as well as conservancies, stewardship areas and concessions areas. Although the category of listed nature reserves does not collectively constitute the largest coverage, if compared to biosphere reserves and marine protected areas, it covers areas in various locations that are not necessarily contiguous. The large number of nature reserves requires significant managerial input to protect their conservation integrity.

The expansion of protected and conservation areas (formal and informal) is guided by South Africa's National Environmental Management: Protected Areas Act/NEMPAA (Act 57 of 2003) and the National Protected Area Expansion Strategy (NPAES, 2008, 2009 & 2016), as well as other similar acts. A PA is a conservation space that is managed and protected by an organ of the State. The South African National Biodiversity Institute (SANBI) considers private and communal nature reserves, conservancies and stewardship conservation areas as informal conservation areas. However, it needs to be acknowledged that PA expansions are not necessarily functions of bona fide concerns for biodiversity, geodiversity and heritage conservation only. Other catalysts for PA expansion, such as vested interests, political-strategic concerns, power relations and capitalist accumulation have been identified and extensively researched to illustrate that conservation, as a philosophy and practice, is not necessarily 'benign' (Brockington & Igoe, 2006; Adams & Hutton, 2007).

At provincial level, the Western Cape Province is arguably the most diverse region in South Africa in terms of its biodiversity, geodiversity and cultural-heritage assets. In as much as the Western Cape is endowed with aforementioned diversity assets, so is it characterised by development and resource-

use demands, as well as related legacies that pose significant challenges to the maintenance and expansion of the province's protected areas. Conservation imperatives and resource uses are often in conflict, but there is potential for greater synergies as well.

The Western Cape Protected Area Expansion Strategy (WCPAES) of 2015 embraces two main overarching, high-level goals to further PA expansion initiatives. The goals are:

> "… to encompass a more representative and resilient suite of areas that support biodiversity and ecological infrastructure, especially those threatened species that remain unprotected as yet; and to regularise existing protected areas so that environmental security is ensured for everyone in South Africa, and the coast and benefits of appropriation accrue to the appropriate entity."
>
> In practical terms it means securing "an additional 348840 ha of priority terrestrial biodiversity and 25 216km$^2$ of our marine environment, as well as increasing the proportion of the current Protected Area network which is fully compliant with NEMPAA from approximately 40% to 50%." (Duffell-Canham et al., 2017:25)

This study, however, assesses the impacts that conflicting and/or collaborative and synergistic conservation and resource uses have on the feasibility of an expansion of selected protected areas in the Western Cape. The investigation is case-study based and focuses on the West Coast National Park (WCNP), Hottentots Holland Nature Reserve (HHNR) and Driftsands Nature Reserve (DNR) as study sites.

The research draws upon analyses of PA management plans, resource-use versus conservation relationships at the case-study sites, as well as conversations and interviews with reserve authorities and managers, as well as resource users. Spatial analysis, in a non-technical and non-spatial techniques manner, is used as general theoretical framework for the study. It will be further supported by perspectives derived from biodiversity assessment, as well as political ecology approaches. Spatial, temporal and management aspects that may influence conservation and resource-use relationships are analysed and compared with a set of indicators that can be used to assess the expansion feasibility of the selected sites. Evidence that emerged from the study is used to revisit conservation and resource-use relationships. This provides a basis for arguments on the feasibility of protected area expansion

in the study areas and also makes possible inferences with regard to expansion initiatives in other areas.

## 1.2 Research aim and questions

The fundamental question of the study is:

> **How do the relationships between conservation and resource-usage in PAs impact on the feasibility of the expansion of such protected areas?**

The study aims to answer this question through an analysis of resource uses as manifested in and around three selected PAs, namely the WCNP, HHNR and DNR in the Western Cape as case studies. Resource-use impacts on spatial variables, such as size, shape, place, space, temporality, accessibility and association, which are then, in turn, used to inform expansion feasibility.

Instead of focusing on PA expansion needs through the scientific-technical assessment and quantification of biophysical and heritage conservation needs and assets, this study focuses on qualitative aspects of the complexity and nuances of spatial relationships that may impact on PA expansion. Aspects, such as the design/creation and declaration of PAs fall, therefore, outside the scope of this study. The study acknowledges, though, the importance of the modelling and design of PAs as facilitated by technical-spatial applications, such as the Marxan Analysis (Ardron et al., 2010; Loos, 2011) and boundary models (Schonewald-Cox & Bayless, 1986). The Marxan Analysis is discussed in greater detail in Chapter 2.

The fundamental research question is pragmatic and explanatory and is concerned with how existing conditions, as shaped by conservation and resource-use relationships, (can) influence protected area expansion. Feilzer (2010) and Pansiri (2005) argue in favour of more mixed-methods of research in which traditional distinctions between pragmatic and explanatory, as well as qualitative and quantitative, research designs are blurred. Thus, an appreciation of the inherent nuances of information and data gathered is important.

This study, therefore, aims to assess the impacts that conflicting and/or collaborative conservation and resource uses have on the feasibility of the expansion of selected protected areas in the Western Cape.

## 1.3 Objectives of the study

To inform the central research question, this study has the following objectives:

1. At the conceptual level, conservation as a practice is largely facilitated and defined by the notion of a protected area and is revisited when necessary against the background of the imperatives that drive the expansion of the conservation estate at different geographical scales. Spatial analysis is used as an overarching theoretical framework for the study. Biodiversity and heritage assessment, as well as political ecology perspectives, are used as lenses through which protected area expansion discourses take place.
2. At the policy level, conservation is guided and facilitated by South Africa's policies and strategies - the National Environmental Management Act/NEMA (Act 107 of 1998) the National Environmental Management: Protected Areas Act/NEMPAA (Act 57 of 2003), the National Protected Area Expansion Strategy/NPAES (2008 & 2016) and the South African Heritage Regulations – which are used as context for protected area expansion imperatives in the Western Cape.
3. At the management level, against the background of the conservation value of the bio-, geo- and heritage diversity of the Western Cape, the historical and current uses of terrestrial and marine resources in, or in proximity to, protected areas are analysed in the chosen case studies which are representative of national, provincial and local protected conservation areas. The WCNP, HHNR and DNR represent a geographical mix of coastal lowland, mountainous and urban locations characterised by diverse conservation assets and resource-use challenges.
4. Finally, a feasibility analysis of the spatial, temporal and management impacts of resource-usage versus conservation relationships on possible expansion of the selected protected areas is provided, based on certain indicators that can be used to inform the prospects for such expansion. Adapted from the Practitioner's Field Guide for Marine Conservation Agreements (The Nature Conservancy and Conservation International, 2012) the envisaged feasibility indicators for investigation include: the competency of conservation entities/authorities,

relationships with right-holders (such as owners, managers and users of land, resources, ecosystem services), abatement of threats to expansion agreements, and the creation of conducive, site-specific conditions.

## 1.4 Operational Definitions

For the purpose of this study, the following meanings apply to the listed concepts:

Admiralty (reserve): Refers to the zone 200m inland from the high-water mark in which development is restricted. (www.hg.org/legal-articles/coastal-zone-to-get-better-protection-in-south-africa-6093)

Biodiversity: Refers to the variety of life on earth and how it varies from region to region, ecosystem to ecosystem and habitat to habitat.

Conservation: Encompassing official and unofficial ways of protecting biodiversity, geodiversity, natural heritage, as well cultural heritage resources, and their sustainable use.

Preservation: Refers to conservation efforts that do not allow for any conceivable usage, albeit sometimes just temporarily. PAs, therefore, stay 'untouched' from a resource-use point of view.

Geodiversity: Refers to the abiotic environment that provides, along with climatic conditions, the basis for the existence of the biotic, as well as natural and cultural, heritage diversity. It encompasses an appreciation for the roles that geology, landscapes, landforms and related processes play in the conservation imperative.

Protected area (PA): Refers to areas that are officially proclaimed and protected by an organ of the State for conservation purposes in entities, such as national parks, provincial nature reserves and local nature reserves. A conservation area is not necessarily an officially protected area, such as conservancies, communal and private nature reserves.

Resource use: Refers to the use of natural resources, as well as environmental goods (resources), and services supplied by and/or in proximity to protected areas.

Protected area expansion: Includes initiatives and practices that endeavour to consolidate spatially and managerially, as well as geographically increase, conservation areas – often based on the critical assessment of the sensitivity and vulnerability of biodiversity, geodiversity and heritage assets.

Reactive conservation: Refers to conservation precipitated by developments to off-set some of the impacts of such developments and to enhance site-specific conservation imperatives.

Ex situ conservation: Refers to the conservation of species in non-native settings - which largely drives the proliferation of private nature and game reserves.

Active consumptive resource uses: Includes the use of environmental goods (and services) that are subject to quantifiable diminishing and degradation of their quantity and quality, e.g. the unsustainable harvesting of marine resources.

Passive consumptive resource uses: Includes uses that conceivably do not have any significant impact on the environment, if exercised responsibly, e.g. hiking and canoeing. Passive non-consumptive uses refer to activities, such as birdwatching and sightseeing.

Spatial analysis: Refers to the study and analysis of factors influencing locational variations of phenomena, patterns and processes in a specific area or across different areas. (For the purpose of this study spatial variables, such as size, shape, place, space, temporality, accessibility and association, are used to inform PA expansion feasibility.)



Feasibility: Refers to a judgement based on the recording and analysis of indicators that may impact on the potential of a proposed project - in this case expansion plans to be successfully implemented and sustained or not.

(Definitions are adapted mainly from Clark, 1998, and Jones et al., 1990.)

## 1.5 Rationale for the study

Conservation spaces and their expansion can be seen as 'luxuries' in the context of the quest for more space to address dire socio-economic challenges, specifically in developing realities (CBD, 2008; Pelser et al., 2015; Scholes, 2020). This study addresses the challenges associated with these

perceived and real schisms. For example, housing needs and the quest for land for productive purposes place significant strain on the conservation integrity and management of PAs. Socio-economic imbalances and challenges are further exacerbated and propelled into the limelight due to the Covid-19 pandemic in general and in South Africa in particular. The global conservation estate, as represented by the totality of protected areas, covered approximately 12% of the world's land area in 2010, and evidence suggests that it could increase to 15%-29% by the year 2030 (McDonald & Boucher, 2011). Conservation imperatives are arguably the strongest collective force that drives the expansion of protected areas (Adams, 2004; Brownlie & Botha, 2009). Regional, national and provincial expansion occurs across the different typologies of protected areas that range in spatial scale from extensive trans-frontier conservation areas to small, local nature reserves. South Africa is richly endowed with genetic, species, ecosystem and landscape diversities that collectively make it a biodiversity hotspot (Duffel-Canham, 2016; White Paper on Biodiversity, 1997). This richness, though, poses specific challenges to the spatial, temporal and management aspects of conservation. The typology of the South African Biodiversity Institute (SANBI) makes provision for two broad categories of protected areas: namely, Formal A Protected Areas and Formal B Protected Areas.

Formal A Protected Areas include: Forest Act protected areas, island reserves, marine protected areas, national parks, other protected areas, provincial nature reserves, special nature reserves and world heritage sites. These areas are all declared as prescribed by environmental management sectoral acts. Formal B Protected Areas include: mountain catchment areas, local nature reserves and national botanical gardens. Informal conservation areas, such as private nature reserves, communal nature reserves and conservancies, as well as non-natural areas within protected areas, do not have official protected area status, though. Expansion is, however, not necessarily a function of bona fide conservation concerns only. Other catalysts, such as vested interests, commoditisation of nature, politico-strategic concerns, power relations and capitalist accumulation have been identified and extensively researched to illustrate that conservation as a philosophy and practice is not necessarily benign (Carruthers, 1989; Wolmer, 2003; Brockington & Igoe, 2006; Adams & Hutton, 2007; Ramutsindela, 2007, 2012).

Scholes (2020) believes that the history of conservation in South Africa is embroiled in so many non-conservation imperatives that the very practice of conservation needs more scrutiny. Chape et al.

(2005) consider the network of global protected area coverage a manifestation of political commitments, and that it does not necessarily speak to the effectiveness of conservation. It is, therefore, important to address factors which influence the level of effectiveness of conservation at different geographical scales, management levels and site-specific conditions. Spatial increases in protected areas are largely facilitated by proactive conservation planning in which the assessment of biodiversity, geodiversity and heritage assets form the basis for decisions as to whether an area will be proclaimed for conservation purposes or not. SANBI's Critical Biodiversity Assessment (CBA), albeit largely based on biodiversity attributes, is arguably the most comprehensive and authoritative platform to be used in proactive planning. The programme provides baseline and spatial information that can be utilised by various stakeholders involved in conservation and conservation planning. Another web-based application (called CapeFarmMapper) is also helpful in assisting conservation planning relative to natural resources and agricultural prospects. It was developed by the Western Cape Department of Agriculture (CFM, 2019). The identification and setting aside of conservation areas and buffers as measures to prevent possible developments, such as urban expansion and land invasions, in sensitive areas, therefore, inform (official) protected area expansion strategies and practices as reflected in NEMPAA (Act 57 of 2003) and NPAES.

South Africa enjoys important conservation status if its biodiversity, geodiversity, natural and cultural heritage assets are considered. Provincially, the Western Cape Province is arguably the most diverse region in the country in terms of the aforementioned attributes. Its rich biodiversity endowment compared to the other provinces is evident in Table 1.2.

**Table 1.2: South Africa's provincial biodiversity endowment**

| | Number of Species | | | | | | |
|---|---|---|---|---|---|---|---|
| **Province** | **Biome** | **Veld Type** | **Plant** | **Mammal** | **Bird** | **Amphibian** | **Reptile** |
| **Eastern Cape** | 6 | 29 | 6383 | 156 | 384 | 51 | 57 |
| **Free State** | 3 | 19 | 3001 | 93 | 334 | 29 | 47 |
| **Gauteng** | 2 | 9 | 2826 | 125 | 326 | 25 | 53 |
| **KZN** | 3 | 19 | 5515 | 177 | 462 | 68 | 86 |
| **Limpopo** | 2 | 14 | 4239 | 239 | 479 | 44 | 89 |
| **Mpumalanga** | 2 | 20 | 4593 | 160 | 464 | 48 | 82 |
| **Northern Cape** | 4 | 20 | 4916 | 139 | 302 | 29 | 53 |
| **North West** | 2 | 10 | 2483 | 138 | 384 | 27 | 59 |
| **Western Cape** | 6 | 19 | 9489 | 153 | 305 | 39 | 52 |

Source: Adapted from Mucina and Rutherford, 2006

Unfortunately, the Western Cape's protected area network does not adequately protect the ecosystems and biodiversity of the province and concerted efforts to expand the network are, therefore, of crucial importance (Turner et al., 2012). However, in the wake of demands for development, the province's protected area expansion plans are under constant scrutiny. This study contextualises conservation and protected area expansion challenges by looking at the pressures exerted by resource-use demands on protected areas - or on spaces in proximity to such protected areas. It, therefore, also counters a-historical and a-contextual protected area expansion imperatives to be able to reflect on resource-use legacies.

Resource-use legacies include the perpetuation of apparent contesting land-uses, marine resource harvesting, apparent lack for geodiversity concerns, and controversial cultural and other livelihood practices. Historically, all resource uses in and close to current protected areas were not necessarily environmentally negative. It is important to recognise the historical existence of resource uses, such as subsistence fishing on the West Coast and commercial agricultural activities in the Hottentots Holland region, prior to the declaration of the protected areas in those regions. Relative to biodiversity, conservation of geodiversity and natural heritage endowment is, in general, receiving far less attention worldwide (Gray, 2003). The conservation roles and mandates of different conservation authorities, such as the South African National Parks (SANParks), Cape Nature, as well as district and local municipalities, also require attention against the background of their protected area management and expansion plans. Over and above their conservation imperatives, expansion plans should take cognisance of other demands as well. There are compelling arguments in favour of a closer look at how strict or how accommodating protected area management should be in relation to multiple uses of such spaces (Dowie, 2009; McDonald & Boucher, 2011). The question as to how - and to what extent - considerations regarding strict versus multiple-use protected areas should/can be informed by historical, current and envisaged resource-use practices is, therefore, important. The role of power and political decision-making are important considerations in protected area dynamics. 'Becoming' a protected area, whether formally protected by an organ of the State, or informally protected via private and stewardship agreements with an organ of the State, is thus far more complex than audits of, and decisions based on, an area's conservation needs.

Within the context of NEMPAA and NPAES, there is a need for a closer look at the planning, consolidation, extension and formalisation of the country's protected conservation estate. Protected area expansion is considered to be imperative for South Africa in so far as its advantages for biodiversity conservation and ecological sustainability, adaptation to climate change, land reform and livelihoods, as well as socio-economic development, are concerned. Adams and Hutton (2007) believe that there is, over and above academic discourses, also a fundamental ethical need always to interrogate the links between conservation, protected areas, vested interests and resource needs. Given this context, this study attempts to assess the feasibility of expansion initiatives in the Western Cape against the background of other land-use and resource-use needs.

The rationale for and relevance of this study can also be positioned against the background of the knowledge gaps and need for further research as expressed in the NPAES (DEA, 2016:65). Outstanding research priorities that still need to be addressed, according to the strategy, include:

- Further exploration of the role of protected areas in supporting ecosystem-based adaptation to climate change
- Research on ecologically meaningful biodiversity targets for marine, estuarine and freshwater ecosystems
- Innovative ways to consider land price and opportunity costs in the identification of priority areas for protected area expansion
- Strategic use of biodiversity offsets to expand the protected area network and secure its ongoing management cost needs to be investigated.



Based on these outstanding research priorities of the NPAES, which are largely concerned with the conservation of biophysical assets and the expansion and protection thereof at national scale, this study is also relevant with regard to the analysis of spatial expansion variables that need to be considered at PA level. (These variables include size, shape, place/location, space, accessibility, association and temporality, and are also examined by this study for each of the case-study areas: namely the DNR, WCNP and HHNR.)

The relevance of, and rationale for, this study is further illustrated by the needs expressed by various conservation authorities for baseline studies, information analysis and project strategy development in support of the improvement of management effectiveness of South Africa's protected area network (SANParks, 2013).

## 1.6 Study areas

The Western Cape with its varied biodiversity, geodiversity and cultural-heritage endowment provides ample opportunity for investigations into how conservation and resource relationships are manifested across different categories of protected areas. For the purpose of this research, three case studies representative of protected areas, such as national parks, marine protected areas, provincial nature reserves and local (urban) nature reserves, were conducted.

Figure 1.1 indicates the locations of the following three case-study areas: the West Coast National Park (WCNP) and its marine protected areas near the town of Langebaan on the West Coast (S33.19º; E18.11º; 36 566.3 ha), the Hottentots Holland Nature Reserve (HHNR) near the town of Grabouw (S34.08º; E19.02º; 26 049.5 ha) and the Driftsands Nature Reserve (DNR) on the Cape Flats (S34.00º; E18.65º; 433.3 ha), northeast of the intersection of Route R300 and the N2 National Road.

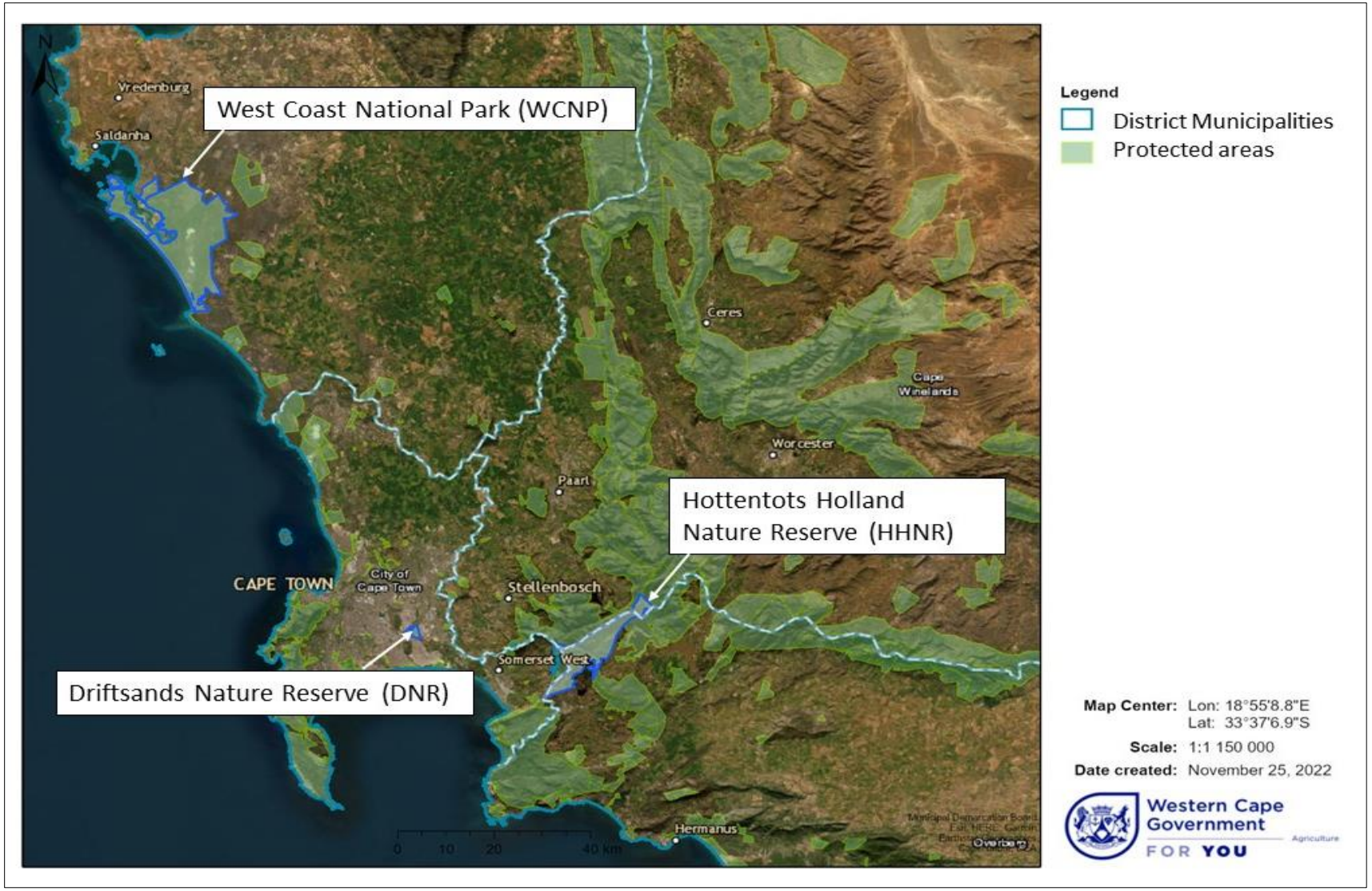



**Figure 1.1: Study areas (source: CFM, 2022)**

These sites are characterised by various degrees of contestations, as well as collaborative initiatives, between their conservation mandates and resource uses in, or close to, their boundaries. Contested land uses, threats to maintenance of ecological goods and services, outstanding land claims, private ownership, natural resource usage, and managerial capacity and support issues are some of the identified challenges related to the chosen sites. The following sections provide short overviews of the study sites and their conservation challenges. Greater detail on the study areas is included in Chapters 5, 6 and 7 which deal with the analysis of each of the chosen PAs.

### 1.6.1 West Coast National Park (WCNP)

The WCNP, managed by SANParks as the conservation authority, is situated 120km north of Cape Town and plays host to a range of terrestrial and marine biodiversity assets, natural-historical (paleontological and archaeological) and cultural-historical resources. The park is a biodiversity hotspot with the Langebaan Lagoon as its most important conservation attribute. The lagoon has Ramsar status which makes it a conservation area of global significance. The lagoon, the Atlantic Ocean coastline adjacent to it, as well as the near-shore islands, also constitute a marine protected area. These characteristics, coupled with land-uses related to tourism, private property and historical landownership, land claims, military activities, industrial, as well as port, activities within and in close proximity to the park, reflect some of the conservation and resource-use complexities (Sunde & Isaacs, 2008; Clark et al., 2009; West Coast National Park Management Plan, 2013). Resource uses in and close to the park need to be seen against the historical background of a broader spatial economy which shaped that part of the Cape's West Coast and which have consequences for park expansion plans. The WCNP Management Plan for the period 2013 to 2023 cautions against variables that may derail the envisaged consolidation and expansion plans by stating that

> "[i]t is important to note that this three-year plan can change due to the availability of funds, willing buyer willing seller concept and the negotiation."
> (West Coast National Park – Park Management Plan 2013-2023:23)

These and other variables will be examined in this study in order to be able to reflect on the spatial variables that shape resource uses and thus inform the feasibility of expansion plans.

### 1.6.2 Hottentots Holland Nature Reserve (HHNR)

The reserve is managed by CapeNature as conservation authority and covers more than 70 000 hectares of largely rugged mountainous terrain in which more than 1300 fynbos species are flourishing. Fauna includes grey rhebuck, klipspringer, common duiker and grysbok, the Cape leopard and more than 100 bird species. Approximately 7 000 hectares of private and state property border the reserve, some of which are characterised by management through conservancies as well as agreements between CapeNature and private landowners. Consumptive and non-consumptive resource uses of the area's tourism and recreational assets are also explored by this study. The reserve has a productive agricultural hinterland, and surrounding towns, such as Grabouw, Franschhoek and Villiersdorp, pose significant challenges to any formalised way of expansion. The management of the reserve is also faced with serious socio-economic challenges as former employees of the then Department of Water Affairs and Forestry (DWAF) still reside in a settlement called Nuweberg Village in the reserve. (CapeNature, 2019)

### 1.6.3 Driftsands Nature Reserve (DNR)

Albeit located in the metropolitan area of Cape Town, Driftsands Nature Reserve is managed by CapeNature. It is surrounded by Cape Flats communities, such as Delft, Wesbank, Mfuleni and Sikhumbule. Informal settlements (known as Green Park, Los Angeles and Driftsands) are also situated within its former proclaimed boundaries. The reserve plays host to endemic Cape Flats Dune Strandveld (CDFS) which is critically endangered. Important habitats are formed by:

> "…three wetland types; a largely artificial permanent open water system, several dune slack depression wetlands and floodplain wetlands associated with the Kuils River. These aquatic features form part of the Kuils River and are all important to the Kuils River as the river is naturally a seasonal system. The wetlands play a crucial role from a process point of view in that they filter the water from the highly impacted and polluted Kuils River and ensure that clean water flows into False Bay. The wetlands are in fact the only natural functional process within the Kuils River system besides the catchment, seeing that most of the river is turned in to a canal system with artificial banks and it is also used as part of the storm water system with numerous drainpipes feeding into it." (Saul, et al., 2015:21)

As part of the lowlands system, conservation efforts at the DNR and other PAs on the Cape Flats are severely influenced by conflicting policies related to housing and critical biodiversity areas (Daraghma, 2009; Holmes et al., 2012; Graham & Ernstson, 2012).

The geography of Cape Town's PAs also displays, over and above the locations of biodiversity that need to be conserved within their boundaries, the socio-economic realities of the urban environments in proximity to them. PAs in proximity to more affluent areas are far less challenged managerially than those in poorer areas. Figure 1.2 shows the location of the DNR relative to that of other PAs in the metropolitan area of Cape Town. PAs, such as the Edith Stephens Wetland Park, the Greater False Bay Ecology Park, the Wolfgat Nature Reserve and the Macassar Dunes Conservation Area, can be associated with the DNR by virtue of their conservation mandates that are largely associated with the protection of different fynbos species, as well as their locations close to predominantly poverty-stricken areas. Dyssel (2020) believes that PAs on the Cape Flats will continue to be subjected to externalities over which they have very little control, such as the quest for land to live on by the urban poor, resultant land invasions, as well the illegal use of resources that need to be conserved.


**Figure 1.2: Locations of PAs in the metropolitan area of Cape Town**

(Source: City of Cape Town, 2010)

Biosphere reserves that incorporate land-use categories, such as core conservation areas, buffer zones and economic nodes (which includes towns and productive land), form cornerstones of a broader, contextual approach to conservation in the province. Case-studying the Hottentots Holland Nature Reserve, which is significant to the Kogelberg Biosphere Reserve in the Overberg, and the WCNP, which is significant to the Cape West Coast Biosphere reserve, is therefore particularly informative for this research.

## 1.7 Limitations of the study

This study is limited to an investigation into the impacts which conflicting or collaborative relationships between conservation and resource uses have as a context for reflecting on protected area expansion feasibility. The envisaged study sites are not spatially representative of all the regions of the Western Cape but are rather a selection of sites characterised by prevalent conflicts, as well as potential synergies.

The study is cognisant of different approaches to biodiversity conservation planning but is adopting a general spatial-analysis framework with a specific focus on the analysis of variables, such as size, shape, place, space, accessibility, temporality and association as factors that shape area-based approaches. The latter is based on the belief that the most realistic method of effective biodiversity conservation is to exercise it within spatial confines (Myers et al., 2000; Jenkins & Williamson, 2003). This approach also better facilitates the inclusion of geodiversity concerns if compared to species-based or wider ecosystems-based approaches. The approach, therefore, offers application value for the analyses of conservation and resource-use relationships in areas characterised by significant geodiversity, as well as natural and cultural heritage attributes. The study acknowledges protected and conservation areas as social constructs and the theoretical and practical difficulties associated with area-based conservation approaches.

The fact that some resource-use groupings in the different study areas did not know and/or had limited knowledge of PA expansion and/or contraction, posed challenges to the nature and extent of questions that were posed to them. Conversations (rather that interviews) were subsequently conducted with such groupings and individuals which included informal settlement dwellers in the DNR, small scale fishers in Langebaan and the Nuweberg community in the HHNR.

Some respondents did not agree to audio recordings of conversations with the researcher. Reasons why some respondents felt uncomfortable with audio recordings included suspicion and the fact that they considered a recording device as intrusive. However, the researcher undertook to capture verbally the information disseminated in an ethical and factually correct way as per the ethical clearance granted by the University of the Western Cape. The study applied a participant observation approach that is, in turn, inherently iterative and subject to the dynamics in the field. As convenience sampling underpinned the interaction with respondents who preferred conversation rather than to be audio-visually recorded, the mental recording of conversations became the mainstay of the capturing of the information. This conversational approach therefore did not lend itself for 'coding' and traditional statistical analysis.

Respondents of the DNR were largely Xhosa speaking and, although most of them could understand English, some preferred to respond in their mother tongue. This language barrier was addressed by a Xhosa-speaking fieldworker who accompanied the researcher on occasions.

A more 'official' conversation/interview schedule (Appendix A) was used as platform for engagements with reserve managers, rangers and tourism stakeholders. The study is not representative of expansion challenges faced by all PAs in the province and neither are the respondents in the study representative of all resource-use groups in the PAs that were investigated.



## 1.8 Framing the study

Spatial analysis is used as a general framework for the study. Spatial analysis refers to the study and analysis of factors influencing locational variations of phenomena, patterns and processes in a specific area or across different areas (Clark, 1998).

The origins of spatial analysis can be linked to the historical development of cartography and surveying. Its various traditions reflect, though, the contributions of many other disciplines in the natural, social, management and numerical sciences. Spatial analysis includes approaches that range from basic spatial interaction descriptions to the application of sophisticated spatial techniques rooted in Geographic Information Systems to satellite image analysis (Longley et al., 2001).

The approach can provide the basis for the analysis of the relationships between conservation and resources uses in, and in close proximity to, protected areas that were studied. The spatial, temporal and management variabilities of the relationships further inform the feasibility of expansion of the study sites.

Conservation is in essence a reaction to environmental degradation and the exploitation and unsustainable use of (natural) resources. Concerns about nature and environmental conservation are functions of societies that have passed the stage of advocating for the sustainable use of environmental/ecological goods and services. These concerns also entered the realm of critique regarding the very existence of PAs as social constructs that are, in themselves, significantly influenced by political and power relationships (Brockington & Igoe, 2006; Adams & Hutton, 2007; Ramutsindela, 2007, 2012).

The following aspects and discourses which, to some extent, shape protected area extension debates and practices, are covered in greater detail in Chapter 2 (Literature Review):

- conservation and preservation discourses
- conceptions of nature
- commoditisation and postcolonial interpretations of nature
- conservation versus protected area expansion imperatives
- informal (private and communal, e.g. conservancies) versus formal protected areas
- conservation relative to sites (as contested/contextual spaces) and locations (as a-contextual/uncontested spaces)
- resource-use diversities
- spatial approaches to conservation orientations, such as single-large-or-several-small (SLOSS) (Helmstedt et al., 2014)
- principles underpinning NEMPAA, NPAES and the Heritage Resources Act (HRA).

The following discussion is presented, though, for the purpose of contextualising the study.

Conservation is often mistakenly equated with preservation. The latter refers to the maintenance of environmental goods and services under isolated conditions, whereas the object(s) of conservation is to ensure primarily that an area remains untouched, and any usage thereof is prohibited (Jones et al., 1990). It is important to recognise the fact that the establishment and management of the world's protected areas network does not necessarily guarantee the most effective platform required to secure

the long-term protection of species (Rodrigues et al., 2004; McDonald & Boucher, 2011). The setting of targets for protected area coverage and expansion needs to be context-specific, and Rodrigues et al. (2004) warn against the setting of uniform targets which, for a variety of reasons, cannot be achieved. Joppa et al. (2008), in turn, also revisit the protected legal status that protected areas have - or should have - on a global scale. Their analyses of protected area initiatives in four regions (the Amazon, Congo, South American Atlantic Coast and West Africa) which collectively used to constitute more than fifty percent of the world's tropical forests, showed significant variation in how such areas are protected by law compared to their physical-managerial on-site protection (Joppa et al., 2008). The variation in the effectiveness of the management of protected areas may also be a function of intra-protected area dynamics and species behaviour relative to outside influences (van der Meer et al., 2011).

Globally, biodiversity hotspots are often not adequately linked. Geographical fragmentation of habitats and attempts to reconnect them need to be factored into protected area planning (Crooks et al., 2011). This will help with strategic thinking and planning of protected area consolidation and expansion, specifically in relation to the so-called edge effects in conservation. Edge-effects refer generally to the variations in species presence and behaviour towards the edges of different habitats and (for the purpose of this study) conservation areas.



*In situ* and *ex situ* conservation practices are also crucial in discourses on species protection and preservation. One way of dealing with declining biodiversity, threats to species, as well as challenges to maintaining the integrity of habitats and ecosystems, is to relocate vulnerable species to areas in which they can be monitored and protected (Schwartz et al., 2017). Species are often relocated to so-called *ex situ* or non-native areas, which contributed to the emergence of different forms of protected areas, such as botanical and zoological reserves and private nature reserves. The proliferation of private nature reserves in many parts of South Africa is reminiscent of the *ex situ* approach to conservation in a country with a tourism industry that is very responsive to visitors' demands. In the Western Cape Province, the increase in private nature and game reserves along the West Coast and in the Southern Cape region is of particular significance (Cape Nature, 2011).

Political ecology can also provide critical angles on conservation and related debates. Political ecology, in the broadest sense of the word, refers to the paradigm that interrogates the nexus between

the social underpinnings of ecological sciences and political economy (Peet & Watts, 1993). Literature reflects two broad strands in political ecology, namely those who adopt structuralist explanations and others who use post-structuralist explanations to analyse conservation dilemmas (Leach & Mearns, 1996; Escobar, 1998). Post-structuralist approaches are more nuanced in terms of their foci on historical and cultural influences on conservation discourses and practices.

Political economy encompasses a variety of interpretations, but common to all of them is the notion that environments and ecologies are not 'apolitical' (Robbins, 2004:5). Understanding the relationship between ecology and decision-making power is fundamental to the explanation of people-conservation relationships. For example, Adams and Hutton (2007) analyse the politics of the setting-aside of land for conservation and the social impact thereof in order to assess the solutions rooted in community-oriented approaches. The latter counter the so-called 'fortress' conservation ethos that underpinned so many conservation practices in the past. Community-oriented conservation approaches include approaches, such as community-based natural resource management (CBNRM) and customary management (Cinner & Aswani, 2007).

The relationship between ecological concerns and economic-political power was always characteristic of the South African conservation landscape (Carruthers, 1989; Geisler & de Sousa, 2001; Anderson & O'Farrell, 2012). Political ecology considers conservation conceptions and practices as necessarily political and explains conservation-society contestations as consequences of power relations. Politico-ecological approaches can take the form of four broad theses, according to Robbins (2004).

Firstly, the degradation and marginalisation thesis serves as a platform to challenge the assumption that marginalised people are primarily to be blamed for environmental degradation. It frames critical questions regarding why and how degradation is occurring.

Secondly, the environmental conflict thesis tries to explain how class, race and gender issues influence environmental conflicts and vice versa. It frames questions on environmental access to resources.

A third thesis deals with conservation and control and questions the assumption that conservation is intrinsically benign. The failures of conservation are often divorced from the political and economic contexts within which it is embedded.

The fourth thesis deals with environmental identities and social movements and tries to link livelihood challenges with conservation agendas at different spatial levels. It may serve as a framework to understand how environmental agendas can help in the economic and political assertion of power by different groups or entities in society. These theses can provide different lenses on the conservation-resources conflicts and/or synergies in the case-study areas.

The geography of South Africa's protected areas is linked to its colonial past and can also be considered part of the spatial footprint of apartheid planning. Pre-colonial forms of resource and area protection were characterised and regulated largely by traditional-cultural beliefs and practices in generally sustainable ways (Anderson & O'Farrell, 2012).

## 1.9 Methodology

### 1.9.1 Data/Information data gathering

The study is based on two information/data-gathering tools. The first one is a literature-based analysis of the chosen case-study sites that manifest various conflicts and/or synergies between resource-use and conservation imperatives. Studies and reports in this regard included the work of Holmes et al. (2012, Turner (2012), Maree and Vromans (2010), Spear et al. (2011) and Daraghma (2009).



The second data-gathering tool is based on analysing the content of conversations and interviews with so-called right-holders (i.e. managers, authorities responsible for selected sites, as well as resource users in, or in proximity to, the sites).

The spatial, temporal and managerial challenges facing conservation of biodiversity, geodiversity, as well as natural and cultural-heritage assets, in the selected protected areas were, therefore, documented and analysed. The selection of the protected areas was precipitated by prevalent resource-use and conservation conflicts and synergies within their boundaries or in proximity to them. They also represent different levels of government involved in exercising conservation jurisdictions, namely national, provincial and local government. (Although the DNR is managed by CapeNature which has provincial jurisdiction, it is for all practical purposes a local nature reserve that, theoretically, should be managed by the City of Cape Town.)

Compared to sample-driven quantitative methods, case-study research provides a philosophical and methodological framework from which more inductive analyses can be made (Eisenhardt, 1989). Despite critique, such as the lack of external validity of case studies, Stoecker (1991) argues in favour of strengthening the position of case studies as a research method which can have strong qualitative and quantitative advantages. Case-study approaches can, therefore, be strengthened by supporting secondary data and document reviews – something upon which this study draws for the chosen cases.

As mentioned in Section 1.3, the following adapted feasibility indicators are used to assess prospects for expansion:

a) The competency of at least one conservation entity (preferably locally based), that is capable of multi-level engagements, as well as designing, overseeing and implementing expansion projects if needs be. A lead conservation entity may not have all the necessary capacities but must be able to partner with others as needed. (The partnering between CapeNature as provincial competent authority and the City of Cape Town as local conservation entity regarding the DNR is important in this regard.)
b) "At least one identifiable right-holder (i.e. owner, manager or user) of the land, species, resources, activities or ecosystem services targeted for conservation who can serve as a clear agreement counterpart. The right-holder should be relatively stable, be capable of making decisions that affect the targeted rights, and generally be interested in the potential conservation outcomes." (The Nature Conservancy and Conservation International, 2012:9)
c) "The actions required to abate threats to the conservation targets can be performed by the right-holders or lead conservation entity, or the agreement can enable the counterpart or implementer to perform the actions". (The Nature Conservancy and Conservation International, 2012:9)
d) Area-based specific characteristics that are conducive and attractive and that can facilitate, if needs be, conditions that enable expansion.

### 1.9.2 Data processing and analysis

Literature, as well as interview-based information regarding the contestations and potential synergies in and around the case-study areas, was documented and analysed. Data and information gathered

regarding some of the most important impacts - such as illegal resource harvesting (e.g. sand), habitat degradation and solid waste dumping - on the conservation of species, ecosystem and landscape diversities of the chosen sites are, in turn, compared with the spatial and temporal nature of consumptive and non-consumptive resource uses. The spatial and temporal nature of differences and similarities emerging from the comparison are further assessed on the basis of how they are managed.

This provides a basis for a reflection on expansion challenges. Against the background of the various factors that may create enabling and/or disabling circumstances for protected area consolidation and expansion, conversations/interviews with protected-area managers and users of resources in, and close to, such areas were conducted. The following questions and aspects formed the basis for interviews that were conducted:

- Is there a need for the spatial consolidation and/or expansion of the particular protected area? And why is this so?
- Provide explanations in favour of spatial consolidation and expansion. Alternatively, provide explanations in favour of maintaining or reducing spatial extent.
- What temporal-situational aspects influenced, are influencing and may influence consolidation and expansion?
- What functional and managerial aspects influenced, are influencing and may influence consolidation and expansion?
- What is the nature of capacity constraints - if any?
- What are the prospects for an optimal expansion structure and framework within which social and economic variables also feature?
- What scope is there for possible partnerships with communities and private landowners?

(Appendices A, B & C contain the interview schedules).

Prospects for co-management and benefit-sharing regarding the commercialisation of environmental goods and services were investigated. The significance of biodiversity, geodiversity and heritage assets was also analysed in order to reflect on the enhancement of co-management, benefit-sharing and the prospects for expansion. The indictors discussed in the previous section were used in Chapters 5, 6 and 7 to reflect on the expansion feasibility in the study areas.

## 1.10 Structure of the thesis

The structure of the thesis and summary content of each chapter are graphically presented in Figure 1.3.

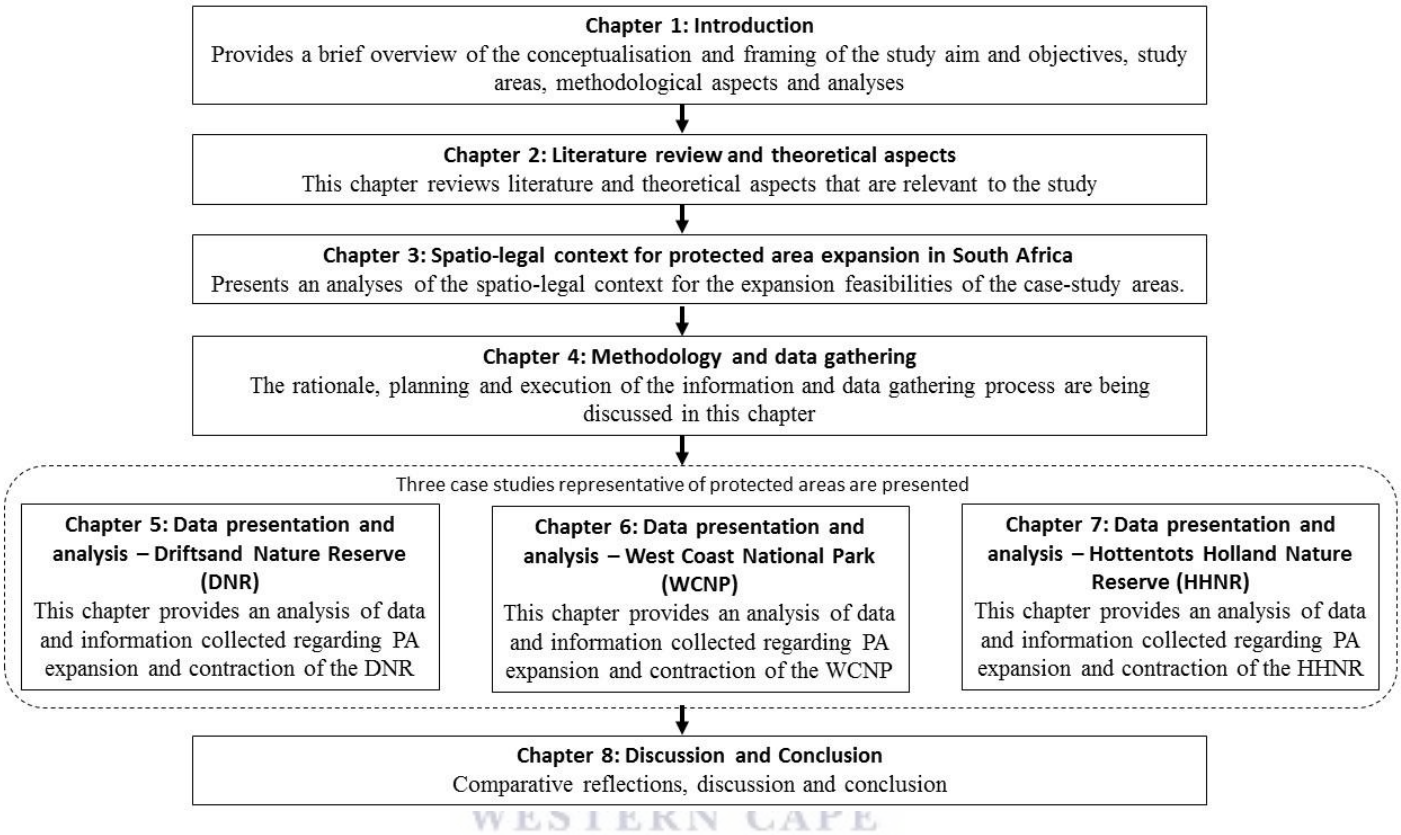





**Figure 1.3 Schematic structure of the thesis**

# CHAPTER 2: LITERATURE REVIEW AND THEORETICAL ASPECTS

## 2.1 Introduction

This chapter reviews literature and theoretical aspects that are relevant to the study. Perspectives derived from biodiversity planning, heritage assessment and political economy are used to contextualise protected area expansion and/or contraction. Approaches to protected area expansion as reflected in official documents, such as NEMA, NEMPAA, NHRA, NPAES, as well as park and reserve management plans, are also revisited.

This chapter positions the study relative to the implementation of protected area expansion initiatives elsewhere, nationally and in the Western Cape in particular. The relationships that people had with the (natural) environment over time were always manifested in the patterns, processes, problems and prospects associated with how resources were used. This also applies to the manifestations of resource uses in protected areas (Naughton-Treves et al., 2005; Licht et al., 2014).

Paterson (1972) categorises these relationships by looking at how human appraisal of the features of the earth changed as the utilitarian value of such features changed. For example, the once important international spice trade became almost insignificant with our ability to develop refrigeration technology in order to preserve food for longer. Resources were, therefore, always 'becoming' as the needs of societies changed over time. The spatial and temporal dimensions of the availability of resources that could satisfy the needs of societies were - and are - manifested in the geographies of resource extraction or harvesting, resource transformation/manufacturing/beneficiation, resource distribution, resource usage, as well as the discarding of resource waste. The uneven distribution of and the demand for resources (e.g. fossil fuels) developed into different versions of the 'conservation' of such resources. Conservation for the sake of maximising profits through the market manipulation of prices, for developmental purposes, for prolonging and securing the earth's vital services to humankind, as well as ensuring that threatened and vulnerable sources and species are protected for future generations, are important broader contexts for this study.

The abiotic environment, i.e. the geodiversity (constituted by the geology, landscapes and landforms of an area) is often not sufficiently appraised if compared to biodiversity and (cultural) heritage conservation (Gray, 2003; Gordon & Barron, 2013). Landscape appreciation in a country, such as

South Africa with its abundance in abiotic diversity, is a crucial part of the conservation mix and to secure ecosystem services. (The country's popular archaeological sites, such as the Sterkfontein Caves, West Coast Fossil Park and the Cango Caves, as well as paleontological sites, such as the Blombos Caves and Mapungubwe, contribute significantly to the tourism industry, as well as to research on the evolution of landscapes and species.)

Proclaimed conservation areas managed multi-nationally and/or by national, provincial and local organs of the State to protect biodiversity, geodiversity and heritage, are considered the best way of achieving conservation targets on different bio-geographical scales (Aichi Targets, 2019). These targets, in almost all cases, are associated with the spatial expansion of such proclaimed areas, i.e. extending the conservation estate. The impediments to - as well as enablers of - expansion are varied. The presence of people in or close to PAs and how they have used, are using, and expect to use resources in future do have implications for the potential of such areas to be expanded.

This chapter provides an overview of literature and theoretical debates on the conservation-resource use nexus in order to frame theoretically the feasibility of the expansion of the DNR, WCNP and HHNR.

It further reviews debates on and issues pertaining to tensions, as well as synergies, between conservation practices and people. (Adams & Hutton, 2007; Agrawal & Redford, 2009; Nustad, 2015; Büscher, 2017). A traditional conceptualisation of human-nature relationships often accepts a duality in terms of nature and ecosystems on the one hand and human agency on the other, with a multiplicity of direct and indirect interaction loops among the different components of the two constituents as visualised in Figure 2.1.

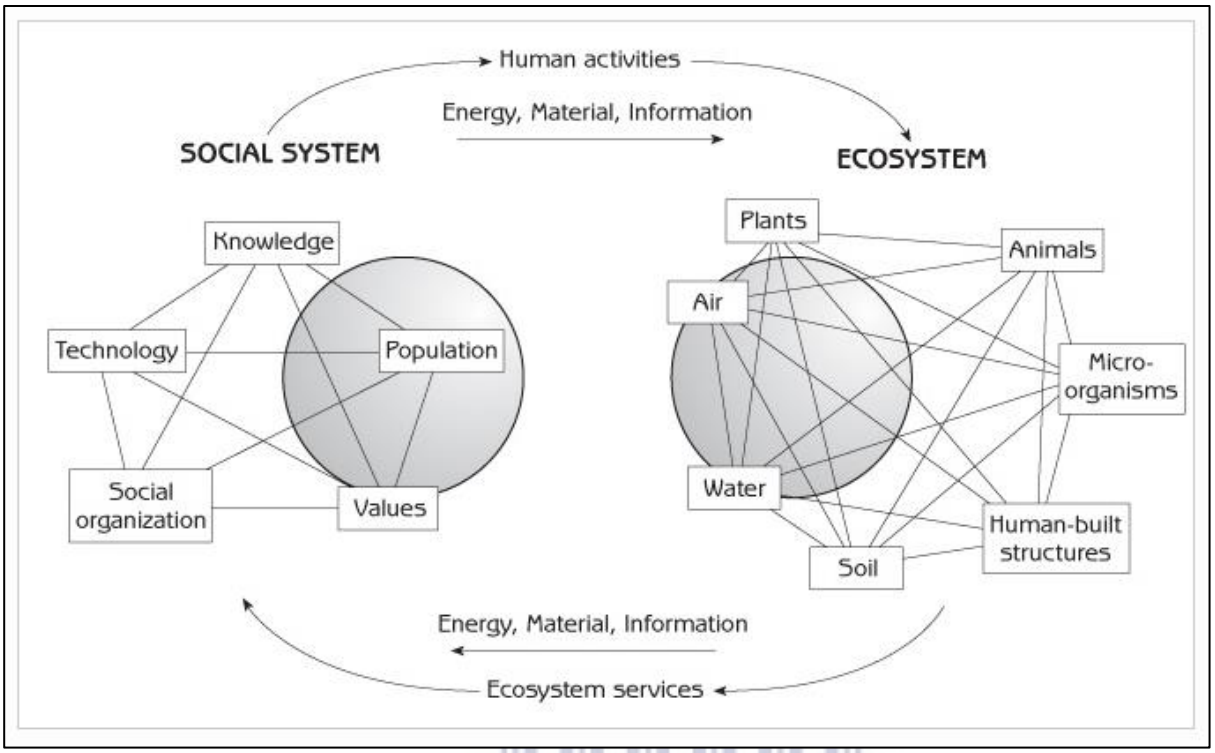



**Figure 2.1: Interactions between social system and ecosystems**

(Source: Marten, 2001)

It is, however, important to understand that these relationships are often far more complex, and associated with varying levels of impact intensity, than illustrated by this study. The conservation of biodiversity, geodiversity and heritage in the PAs under investigation adds other levels of monitoring, management and often tension to such relationships. Section 2.3 discusses some of the general tensions prevalent in PAs globally and typical responses to such tensions.

## 2.2 The geography of conservation and conservation mandates

The history of conservation cannot be separated from the presence of human beings and how they have been influenced by physical environments, as well as how they, in turn, influenced physical environments through movement, settlement, resource use and the application of ingenuity over millennia (Holdgate, 1999; Molnar, 2010). The earliest forms of conservation, i.e. setting aside demarcated land within which ecological assets and processes could flourish, can be traced back to more than two thousand years ago in India (Holdgate, 1999). The history of conservation is also characterised, over and above wide variations in the 'officialisation' of PAs in other parts of the world,

by the imprint of leisure, hunting, tourism, economic and vested interests, as well as large scale environmental destruction in landscapes (Kelleher, 1999; Adams, 2004). The destructive and exclusionary role that PAs (as cultural and social constructs) played and are still playing - sometimes under the guise of conservation - is discussed in greater detail in Section 2.3.

There are a number of definitional nuances applicable to the concept of conservation which need critical consideration. According to the definition of the International Union for the Conservation of Nature (IUCN) a natural protected area can be described as:

> "[a]n area of land/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means." (IUCN 1994)

Perhaps a more encompassing definition to consider is that a PA is:

> "[a] clearly defined geographical space, recognized, dedicated and managed through legal or other effective means, to achieve long-term conservation nature with associated ecosystems services and cultural values." (MPA News, 2008:1)

However, conservation status does not necessarily guarantee comprehensively enforced legal protection (through an organ of the State). Fortress conservation has shown to be as effective as the policing, access control and protection of the boundaries of such spaces. Co-management (with other stakeholders and communities) is often proposed as the solution to top-down, fortress management styles (Kepe, 2008; Graham & Ernstson, 2012). Stewardship and co-management may, however, have inherent limitations that can, in turn, impact on the very conservation mandates that need to be fulfilled.

Various approaches to and priorities of conservation, therefore, offer varied levels of effectiveness. This, in turn, may also influence the identification and proclamation of new formal protected areas. Some of these priorities include biodiversity hotspots, wilderness area, bird sanctuaries, ecoregions and areas of significant plant diversity (Pressy, 2013). There are, in combination with whichever approach taken, also significant other pressures on conservation and protected areas.

PAs experience significant pressure on extended roles which they should fulfil, other than bona fide nature conservation imperatives (Sunde & Isaacs, 2008; Shabangu, 2012). Watson et al. (2014) believe that there is a growing disconnect between the physical increase in the global conservation estate as represented by formally protected areas on the one hand, and political commitment and financial support for conservation endeavours on the other hand. A more integrated approach to supporting protected areas is needed if such areas are supposed to perform optimally. A proper appreciation of the ecosystem services that are generally not paid and officially accounted for, as is found in other (economic) sectors, needs specific attention (Wells, 1996; West et al., 2006).

The International Union for the Conservation of Nature (IUCN) is globally the most representative entity concerned with and involved in matters pertaining to conservation - and, by implication, protected areas. Under the IUCN banner, a Tourism and Protected Areas Specialist Group (TAPAS) is operating with the general aim of mainstreaming the relationship between tourism and PAs worldwide. This mainstreaming is built into priority objectives of PAs as per the IUCN mandates. (See Section 2.2.1 for a discussion of those priorities.) TAPAS provides a platform for the dissemination of information regarding best practices for PA-tourism management, research, as well as the creation of tourism opportunities in PAs. This, in turn, feeds into the IUCN's World Commission on Protected Areas (WCPA).



The existence of the TAPAS group speaks to the importance of the relationship between tourism and PA conservation. The strengthening of reciprocal relationships is vital for the sustainability of tourism and conservation (Newsome et al., 2001; Wall & Mathieson, 2006; Keyser, 2009; Michael Hall & Lew, 2009).

### 2.2.1 The mandates of the IUCN

The most responsive mandates of the IUCN, as expressed in the objectives of its protected areas programme, include the following priority areas:

**Priority Area 1 - Conservation of nature**

The core function of any protected area is the protection of the sensitive (and threatened) biodiversity, geodiversity and heritage attributes. The IUCN's first priority area is, therefore, concerned with the

conservation of nature. Effective (biodiversity) conservation has become almost synonymous with the expansion of the global conservation estate through the increase in and enlargement of PAs that play host to vulnerable and threatened species, landscapes and cultures. The IUCN claims that conservation successes can be associated with the following:

> "…drawing upon traditional and community-based approaches, governance regimes, scientific and traditional knowledge and contemporary practices of governments and conservation agencies." (IUCN, 2016)

This description of the function that protected areas have relative to the conservation of nature encompasses and recognises a variety of 'knowledges' and approaches that should accompany conservation practices. The PA is the preferred conservation measure and entity as it draws strongly on the role and successes of spatially defined protected areas as entities within which conservation is practised most effectively. The historical fortress ethos of conservation is, therefore, reflected in this assumption – very much to the dismay of critical scholars who argue that protected areas are in essence anti-developmental and disadvantageous to disenfranchised people (Carruthers, 1989; Wolmer, 2003; Brockington & Igoe, 2006; Ramutsindela, 2007, 2012; Büscher & Dressler, 2007, 2012).



The success of protected area expansion and geographical space added to the global conservation estate can be assessed by analysing information and data sources of bodies, such as the World Database on Protected Areas (WDPA). The latter receives input from agencies, such as the Convention of Biological Diversity (CBD), Global Biodiversity Outlook (GBO), United Nations Environmental Program's World Conservation Monitoring Centre (UNEP-WCMC), and the World Commission on Protected Areas (WCPA). The WDPA is considered to be the most reliable and authoritative source with regard to PAs in general and can, therefore, be used to track and assess their progress in respect of expansion.

The importance of the conservation of nature, and by implication of PAs, is a key priority area for the IUCN and is perhaps best captured in the following:

> "Decisions on protected areas reached at CBD COP10 in 2010 and that now form part of the CBD's Strategic Plan for Biodiversity 2011-2020 are widely considered to be the most far-reaching and important in decades." (IUCN, 2016)

Despite the critique levelled at PAs as fundamental cornerstones for conservation, the IUCN believes that it is still the most effective measure to ensure success in conservation.

> "Yet, protected areas also suffer from the perception that they are outmoded, or at worst, do not benefit, but cause negative impacts on people. While there may be instances where practice has been less than optimal, and these should be addressed, there is an increasing body of evidence of the significant contributions of protected areas to economy and society." (IUCN, 2016)

**Priority Area 2 - Developing capacity**

The successes and failures of conservation through the proclamation of PAs are dependent on a variety of factors – largely related to management and governance capacities. According to the IUCN, these include the following:

- the production of resource materials
- the education and training of competent professionals
- the achievement of certified high standards of PA management effectiveness
- the measurement of conservation outcomes



It is important for conservation authorities to pay attention to all these elements in order to try to meet targets for the effective development of capacity which, in turn, ensures that PAs are run adequately. Based on the purpose of this study, it can, therefore, be argued that the assessment of management effectiveness at different geographical levels of PAs can provide insight into the feasibility of expansion of PAs in general.

**Priority Area 3 - Achieving quality**

The assessment of capacity needs to be augmented by an assessment of the quality of management. The difficulty, though, is that assessment of quality is a function of benchmark parameters used to assess it. However, objective assessment criteria need to be judged against the background of

prevailing local and global challenges to PAs. The IUCN's fundamental question, therefore, is whether protected areas achieve a sufficient quality of management in order to actually meet their objectives.

In response to the requests from governments and conservation agencies, the efforts of the IUCN - through the Global Protected Areas Programmes (GPAP) - to establish new global, independent measures and a standard whereby PA performance can be measured have led to the formulation of a prescriptive standard. "This standard is being referred to as the IUCN Green List of Well-Managed Protected Areas." (IUCN, 2016)

Management effectiveness is receiving increasingly more attention at provincial level in South Africa. Through the implementation of standards by CapeNature, the Western Cape Government's conservation arm, benchmarks are now being set in the form of indicator programmes, such as the Protected Area Management Effectiveness Evaluation (PAME) and the Management Effectiveness Tracking Tool (METT) (CapeNature 2013/2014). These tools need regular revision, though, as CapeNature recognises the importance of more adaptive management approaches for PAs (Hayward, 2016).

**Priority Area 4 - Respecting people**



A general critique of PAs and how such (modern) spaces are managed by various stakeholders involved in PA management, relates to the relegation of (local) people and their 'knowledges' as unscientific and counterproductive to (western) conservation principles (McDonald & Boucher, 2011). Through the millennia, mobile as well as stationary communities brought beliefs and values to their engagement with the physical environments from which they eked their livelihoods (Molnar, 2010). It is, therefore, vital that sustainable reconciliation between traditional and modern stances be achieved in PA conservation. Such reconciliation forms the basis for the acknowledgement of and respect for the 'others' in conservation. The IUCN's contention in this regard is summarised in the following:

> "In the more recent past, governments have stepped into this conservation and land management role, and while establishing many of the best examples of state-run conservation institutions, have in some cases supplanted other forms of governance. In the

> worst cases this has led to the displacement of people, and their access to resources, but less evidently, to the lack of official recognition of conservation efforts that continue to be undertaken by communities, in both traditional and more contemporary ways. Establishing legitimate and equitable governance arrangements for protected areas in the context of national laws and policies remains a high priority within national commitments to the CBD decisions.... This also reinforces the commitment to comply with the third principle of the CDB on fair and equitable distribution of benefits derived from the utilization of biological diversity." (IUCN, 2016)

**Priority Area 5 - Offering solutions**

The importance of healthy ecosystems, effectively supported by a system of well managed PAs, is key to addressing the multiplicity of developmental and environmental problems which humankind is facing. Ample evidence illustrates how challenges, such as food security, climate adaptation and effective water management, can be supported via the conservation estate. The IUCN's contention is that the

> "[m]aintenance of ecosystem resilience is an essential prerequisite for maintaining resilient socio-economic systems, and an expanded connected network of well managed conservation areas is the most robust proven solution to confront these problems." (IUCN, 2016)



Based on this logic, different thematic foci are forthcoming. The international body's approach to the use of ecosystem-based solutions to contribute to these themes can be summarised as follows:

- improve stocks of clean water (through, for example, PA watershed management)
- enhance food security (through PAs in which species diversity is protected and pollinators are safeguarded)
- contribute to people's health (through the sustainable use of medicinal plants in intact ecosystems in PAs and protecting genetic material for the pharmaceutical industry)
- assist in ecosystem stability (as effective PAs can reduce the impacts of natural disasters, such as floods, landslides, weather extremities, etc., and this can contribute to more effective early-warning systems).

Depending on one's approach to conservation - ranging from fortress to more convivial forms of conservation, developmental mandates of PAs will always be questionable and sometimes contentious. Based on the CBD 30/30 approach and the science that underpins it, benefit sharing on biological resources can add to livelihoods improvement though. (The study, specifically the focus on the West Coast National Park, illustrates the contrary, i.e. the exclusion of communities from certain resource uses).

The mandates discussed in the preceding section can only be fulfilled if effective management of PAs is in place. The IUCN's World Commission on Protected Areas (WCPA) has identified a Protected Area Management Effectiveness (PAME) framework that can be used to assess the efficiency of PA management (Mitchell et al., 2018). It is comprised of six elements (Figure 2.2) that can be used to assess the extent to which a PA fulfils its mandates.


**Figure 2.2: The IUCN WCPA PAME (IUCN, 2016)**

### 2.2.2 Global and regional geography of protected areas

The global conservation estate, as represented by the total of protected and conservation areas, covers approximately 12% of the world's land area, and evidence suggests that it could increase to between 15%-29% by the year 2030 (McDonald & Boucher, 2011). The Aichi Target for 2020 was to have 17% of the global terrestrial land protected. Conservation and protected areas are often mistakenly associated with terrestrial ecoregion locations only. Ecoregions represent a division of the earth into regions of similar habitat. It is important to appreciate the fluidity of the boundaries of such ecoregions and the overlapping that may exist from a species-adaptation point of view. Each of the world's 825 terrestrial ecoregions does represent unique assemblages of ecosystems, habitats and species (Molnar, 2010). Biodiversity conservation imperatives are arguably the strongest collective force that drives the expansion of protected areas. Regional, national and provincial expansions occur across the typologies of protected areas which range in spatial scale from extensive trans-frontier conservation areas to small local nature reserves. Figure 2.3 represents the percentages of terrestrial land area that were formally protected worldwide in 2007.

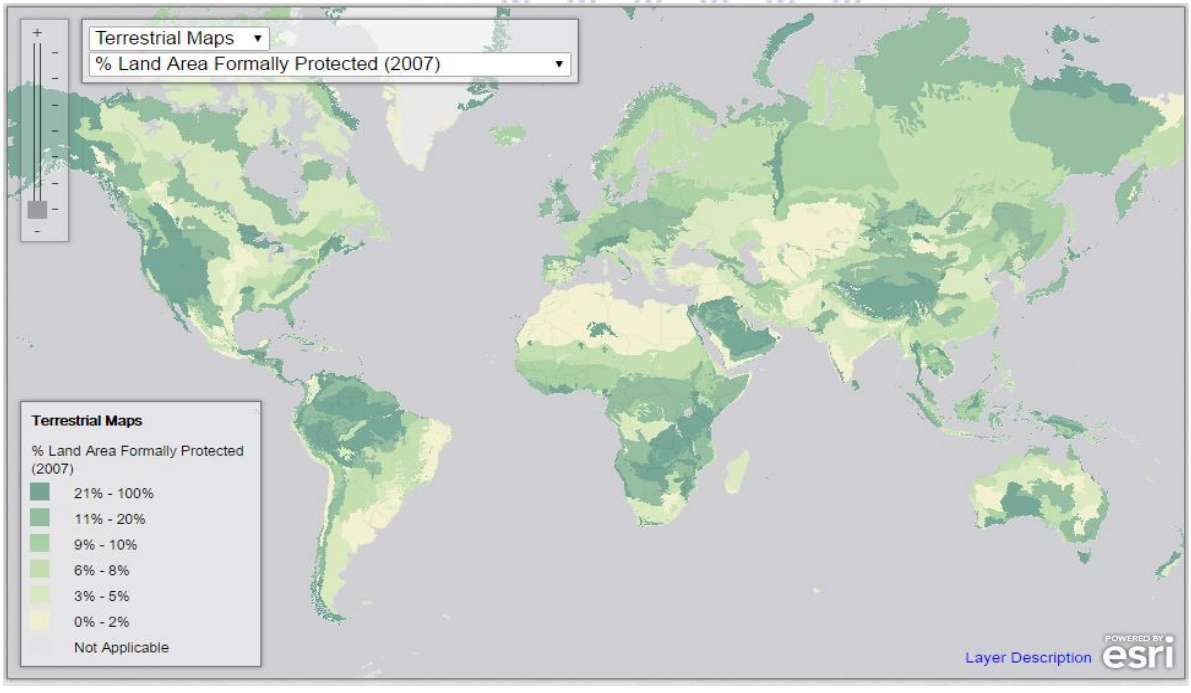



**Figure 2.3: Terrestrial areas officially protected globally**

(Source: http://maps.tnc.org/globalmaps.html)

It is evident from Figure 2.3 that there were wide discrepancies between areas/regions and their proportional PA percentages in 2007. It needs to be kept in mind, though, that these percentages do not necessarily represent the conservation targets for representative ecosystems and species protection to advance the spatial extent of the global conservation estate. However, it is evident that greater conservation efforts, as indicated by the percentages, were concentrated in the more temperate and mid-latitude areas of the globe where biodiversity is, in general, more abundant.

Percentages for central Africa, specifically in the African Lakes Area, are generally higher if compared to the extreme northern and southern parts of the continent. Southern Africa, and South Africa in particular, registered a conservation percentage of 10% and lower of the entire terrestrial land area in 2007.

The latest global coverage figures indicate that there has been an expansion in the coverage of terrestrial and marine protected areas between 2016 and 2020. Terrestrial coverage increased from 14.7% in 2016 to 15.0% in 2020 and marine coverage from 10.2% to 17.5% in the same period (Bingham et al., 2021).

Saura et al. (2019) highlight the importance of addressing the connectivity between PAs in order to further the aims of PA expansion. The authors believe, though, that the so-called permeability of unprotected areas between official PAs is a concern and that it is instrumental in whether expansion targets can be achieved or not. The percentages of protected and connected (ProtConn) land globally for the period 2010 to 2018 is depicted in Figure 2.4.

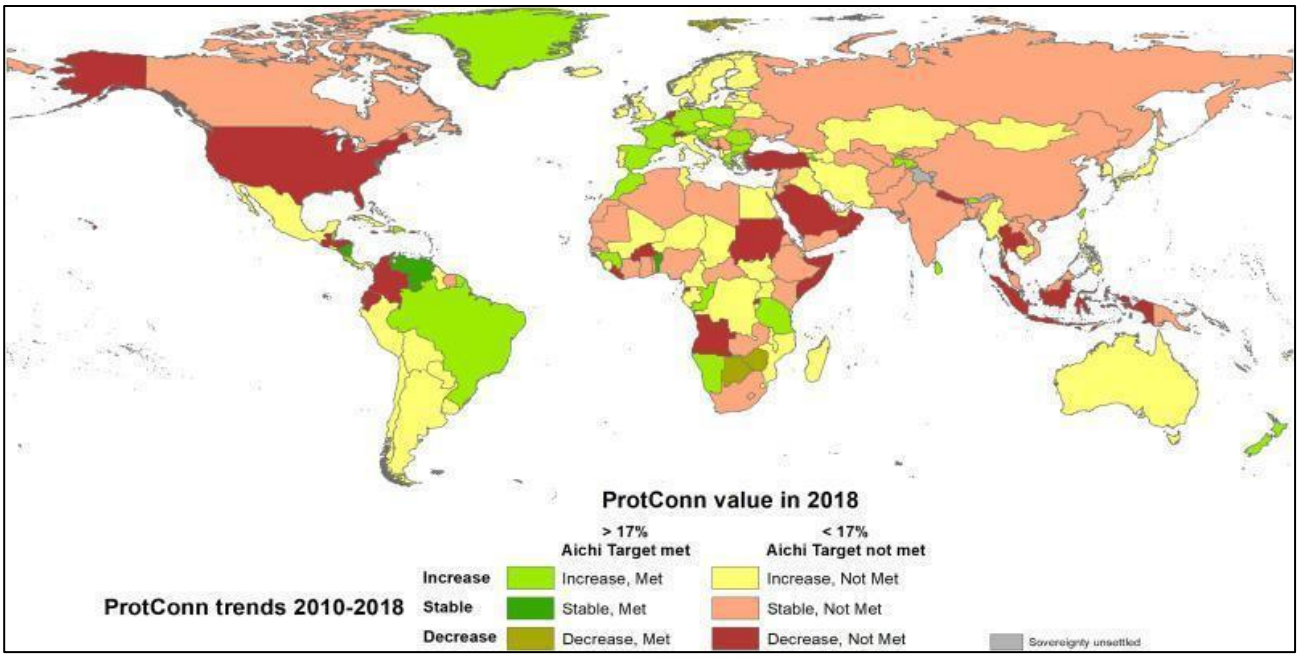



**Figure 2.4: Dynamics in Aichi Targets**

(Source: Saura et al., 2019)

It is evident from Figure 2.4 that vast parts of the globe did not reach the desired 17% of protected and connected areas. Based on the broad categories of Aichi Targets Met versus Aichi Targets Not Met, South Africa is classified as a region that is stable but in which targets have not been met. South Africa's general expansion targets are discussed in greater detail in Section 2.2.3.

### 2.2.3 Geography and typologies of South Africa's protected areas

South Africa is richly endowed with genetic, species, ecosystem and landscape diversities that collectively contribute to the country's status as a biodiversity hotspot (White Paper on the Conservation and Sustainable Use of South Arica's Biological Diversity, 1997). This richness, though, poses specific challenges to the spatial, temporal and management aspects of conservation. The dawn of democracy created significant opportunities and challenges for the maintenance and extension of PAs in the new South Africa. The dispensation that allows for nine, instead of the old four, provinces, along with jurisdiction and authority over PAs on national and provincial levels, created an impetus for the extension of South Africa's conservation estate.

The old National Parks Board, predecessor of the current SANParks, appointed Naas Steenkamp as its CEO in 1994. One of his mandates was to strike a balance between the development-conservation dualities and frictions between the national and the then new provincial authorities. These frictions included challenges related to apartheid conservation evictions, land claims and new proclamation requirements (Die Burger, 1993).

Since 1996, SANParks, which currently manages 20 national parks, has generated eighty percent of its own operational costs with decreasing input from central government. Between 1996 and 2011, the conservation area under the jurisdiction of SANParks increased with almost 1 million hectares. The expansion of the conservation estate under SANParks' jurisdiction, therefore, yielded results fairly early in South Africa's new dispensation (Linnert, 2011).

Protected areas, as they pertain to the South African context, can be considered those areas that are managed by an official arm of the State, i.e. a national state department, provincial government and/or an appointed state agency, such as CapeNature in the case of the Western Cape Province, or a district or local municipality. This definition, therefore, includes conservation areas that may not necessarily fall under official State protection. This category would include areas with biodiversity attributes that form part of private property - or State property that does not belong to a State department responsible for environmental affairs, such as the national Department of Environmental Affairs (DEA) or the provincial Department of Environmental Affairs and Development Planning (DEADP) in the Western Cape.

Non-state conservation areas, i.e. private conservation areas, are normally managed by stewardship, co-management and conservancy agreements. Such agreements often come under scrutiny in terms of how access to such areas is managed and controlled (Kepe, 2008; Williams, 2013).

South Africa's National Environmental Management Act/NEMA (Act 107 of 1998) is the overarching legislation that guides conservation and development in South Africa. Prior to the promulgation of this act, conservation and related matters were guided by the Environmental Conservation Act/ECA (Act 73 of 1989). NEMA provides for more detailed legislation regarding specific aspects of the environment, such as: biodiversity conservation guided by the National Environmental Management: Biodiversity Act/NEMBA (Act 10 of 2004); waste management guided by the National

Environmental Management: Waste Act/NEMWA (Act 59 of 2008); protected area expansion guided by the National Environmental Management: Protected Area Act/NEM:PAA (Act 57 of 2003); etc.

#### 2.2.3.1 Categories of South Africa's protected and conservation areas

For the purpose of this study the concepts of 'protected area' and 'conservation area' will sometimes be used interchangeably as such areas are sometimes spatially inseparable. (Cognisance is taken, however, of the typology of the South African Biodiversity Institute (SANBI) that makes provision for two broad categories of protected areas, namely Formal A Protected Areas and Formal B Protected Areas.)

NEM:PAA makes provision for the following broad categories of PAs and conservation areas (CAs) that collectively constitute the country's conservation estate as per South Africa's Protected Areas Database (SAPAD, 2015-2016). The combined data base for PAs and CAs (PACA) from which data can be extracted, identifies the following categories (PACA, 2013):

**Protected Areas** - The following PA categories are included in PACA:

1. Special nature reserves
2. National parks
3. Nature reserves
4. Protected environments
5. World heritage sites declared in terms of the World Heritage Convention Act
6. Marine protected areas declared in terms of the Marine Living Resources Act
7. Specially protected forest areas, forest nature reserves and forest wilderness areas declared in terms of the National Forests Act (Act 84 of 1998)
8. Mountain catchment areas declared in terms of the Mountain Catchment Areas Act (Act 63 of 1970).

(Categories 1-4 are being declared in terms of the National Environmental Management: Protected Areas Act of 2003.)

**Conservation areas** - The following CA categories are included in PACA:

1. Biosphere reserves

2. Ramsar sites

3. Stewardship agreements (other than nature reserves and protected environments)

4. Botanical gardens

5. Trans-frontier conservation areas

6. Trans-frontier parks

7. Military conservation areas

8. Conservancies

The spatial inseparability referred to above is perhaps best manifested in the WCNP (analysed in this study) with its combination of a Ramsar site, marine protected areas, stewardship agreements and military conservation elements. These definitional nuances are important to consider in the execution of the mandates of different conservation authorities. (In Chapter 3, the jurisdictional-management challenges and their implications for different agencies are analysed.)



### 2.2.3.2 Sub-typologies of South Africa's protected and conservation areas

Table 2.1 and Table 2.2 are summaries of more detailed typologies for the different categories of PAs and CAs as per PACA.

**Table 2.1: Protected areas - sub-types**

| CATEGORY | | DESIGNATION TYPE | | DESIGNATION SUB-TYPE |
|---|---|---|---|---|
| Protected Area | 1 | National Park | 1.1 | National Park |
| | | | 1.2 | NP Wilderness Area |
| | | | 1.3 | Not assigned |
| | | | 1.4 | Contractual Park |
| | 2 | Nature Reserve | 2.1 | Provincial Nature Reserve/Nature Reserve |
| | | | 2.2 | Private Nature Reserve |
| | | | 2.3 | Nature Reserve (Stewardship programme) |
| | | | 2.4 | NR Wilderness Area |
| | | | 2.5 | Bird Sanctuary |
| | | | 2.6 | Development Area Reserve |
| | | | 2.7 | Not assigned |
| | 3 | Special Nature Reserve | 3.1 | Special Nature Reserve |
| | | | 3.2 | Not assigned |
| | 4 | Mountain Catchment Area | 4.1 | Mountain Catchment Area |
| | | | 4.2 | Not assigned |
| | 5 | World Heritage Site | 5.1 | Core |
| | | | 5.2 | Buffer |
| | | | 5.3 | Not assigned |
| | 6 | Protected Environment | 6.1 | Protected Environment |
| | | | 6.2 | Protected Environment (Stewardship programme) |
| | | | 6.3 | Protected Environment (Other) |
| | 7 | Forest Nature Reserve | 7.1 | Forest Nature Reserve |
| | 8 | Forest Wilderness Area | 8.1 | Forest Wilderness Area |
| | 9 | Specially Protected Forest Area | 9.1 | Specially Protected Forest Area |
| | 10 | Marine Protected Area | 10.1 | Marine Protected Area |
| | | | 10.2 | Not assigned |

(Source: PACA, 2013)

**Table 2.2: Conservation areas - sub-types (PACA, 2013)**

| CATEGORY | | DESIGNATION TYPE | | DESIGNATION SUB-TYPE |
|---|---|---|---|---|
| Conservation area | 1 | Biosphere Reserve | 1.1 | Core area |
| | | | 1.2 | Buffer zone |
| | | | 1.3 | Transition area |
| | | | 1.4 | Not assigned |
| | 2 | Ramsar Site | 2.1 | Marine/Coastal Wetlands |
| | | | 2.2 | Inland Wetlands |
| | | | 2.3 | Human-made Wetlands |
| | | | 2.4 | Not assigned |
| | 3 | Stewardship Agreements other than Nature Reserves and Protected Environments | 3.1 | Biodiversity Agreement |
| | | | 3.2 | Voluntary Conservation Area |
| | 4 | Botanical Garden | 4.1 | Botanical Garden |
| | | | 4.2 | Wild Flower Reserve |
| | 5 | Transfrontier Conservation Area [Currently Outside database] | 5.1 | Transfrontier Conservation Area |
| | 6 | Transfrontier Park [Currently Outside database] | 6.1 | Transfrontier Park |
| | 7 | Military Conservation Area (Multi-use conservation areas) | 7.1 | Military Conservation Area |
| | 8 | Conservancy | 8.1 | Conservancy |



(Source: PACA, 2013)

These diverse categories and sub-typologies, their spatiality, and how they are managed pose significant challenges for PA conservation in the context of South Africa as a developmental State (Wells, 1996; Wilkie et al., 2013; Scholes, 2020).

### 2.2.3.3 Guidelines for the declaration of protected areas

NEMPAA also provides guidelines for the declaration of PAs. Section 17 of NEMPAA (as summarised in Veldtman, Shone and Lindani, 2015:24-25) provides the following reasons for declaring certain locations as PAs:

a) to protect ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes in a system of protected areas

b) to preserve the ecological integrity of those areas
c) to conserve biodiversity in those areas
d) to protect areas representative of all ecosystems, habitats and species naturally occurring in South Africa
e) to protect South Africa's threatened or rare species
f) to protect an area which is vulnerable or ecologically sensitive
g) to assist in ensuring the sustained supply of environmental goods and services
h) to provide for the sustainable use of natural and biological resources
i) to create or augment destinations for nature-based tourism
j) to manage the interrelationship between natural environmental biodiversity, human settlement and economic development
k) generally, to contribute to human, social, cultural, spiritual and economic development; or
l) to rehabilitate and restore degraded ecosystems and promote the recovery of endangered and vulnerable species.

PAs (and CAs), therefore, have important protection/conservation, provision and restorative functions and may ideally be declared based on the rarity and vulnerability of species and/or a (balanced) combination of the reasons mentioned. PA challenges often stem from significant imbalances in these functions which they are expected to fulfil.



Such challenges are also largely driven by developmental imperatives that require innovative ways of balancing conservation and development needs (Büscher & Dressler, 2007; Büscher, 2017). In most cases, the balancing act is a difficult one as short- and long-term conservation and development needs normally lead to compromises in which the tangibility of the here-and-now has hitherto received relative preference. This has given rise to the concept of 'reactive conservation', i.e. (adaptive) conservation initiatives in response to and/or driven by development needs. The development agenda of South Africa often leads to reactive instead of pro-active approaches (Büscher, 2017).

SANBI's data and spatial tools provide for an appreciation of Critical Biodiversity Areas (CBAs) that can and should support pro-active conservation approaches. Pro-active conservation approaches to terrestrial and aquatic species have proven to be more cost effective over the long term relative to reactive approaches (Dreschler et al., 2011; Freeman, 2011; Bush et al., 2014). Freeman (2011)

demonstrates how blurry the distinction between pro-active and reactive conservation approaches regarding resource uses at the personal level of human behaviour can be. The study concludes that,

> "…when facing multiple self-control demands, individuals likely do not recognize the need to save resources until after exerting self-control." (Freeman, 2011:67)

The study has extrapolation value applicable to proactive conservation measures at the protected area level in the midst of a dominant reactive conservation ethos.

Duffel-Canham (2012) is, therefore, of the opinion that stronger reciprocal relationships need to be fostered between mandates of PAs, spatial planning and land-use changes in order to support the mainstreaming of biodiversity concerns in planning - i.e. fostering a proactive ethos. Proactive conservation, through the identification of CBAs that can and should ideally be factored into development and land-use planning, can contribute significantly to biodiversity mainstreaming.

The planning of conservation spaces necessitates, therefore, a variety of considerations other than the mere biodiversity, geodiversity and heritage concerns. On a practical level, Marxan applications are arguably the most widely used software programming tool that can be used in conservation planning (Loos, 2011). Ardron et al. (2010:1) maintain that

> "[u]sers may use Marxan to explore and propose possible network configurations, to facilitate collaborative network design, or to guide their own land acquisition / marine zoning. Marxan is not designed to act as a stand-alone reserve design solution. Its effectiveness is dependent upon the involvement of people, the adoption of sound ecological principles, the establishment of scientifically defensible conservation goals and targets and the construction of spatial datasets."

Marxan can assist with decision-making with regard to a variety of conservation problems associated with, among others, the design of new PA systems, socio-ecological concerns, reporting on systems performance, as well as spatial zoning for natural resource management in PAs (Novellie et al., 2016). Marxan applications were utilised to good effect in the expansion programme of the Mountain Zebra National Park near the town of Cradock in South Africa's Eastern Cape Province, as well as the Marakele National Park.

## 2.3 Theoretical aspects

As this study encompasses quantitative, as well as qualitative, dimensions of the conservation-resource PA expansion nexus, it is important - without discrediting orthodox stances - to be more heterodox in appreciating the dynamics that are prevalent in the three areas investigated by this study. Albeit that orthodox conservation (i.e. in essence dichotomising and separating people and conservation) is often acceptable practice, the discourses of conservation as socially embedded practice need to be furthered. Khan (2013) speaks about a 'critical moment' in the theorisation of people-conservation discourses when revisiting the strengths of different theoretical frameworks, specifically as they pertain to political ecology. This 'critical moment'

> "…offers a specific insight into the interplay and autonomy of the actors involved in an event, one that illustrates or informs a political ecology analysis." Khan (2013:460)

It, therefore, takes the debate with regard to the manifestation of vested and institutionalised power in human-nature relations much further. According to Fletcher (2010), it is also important to be aware of the fact that critique aimed at orthodox/mainstream/protectionist approaches to conservation can in itself also be a reflection of a certain 'environmentality' that hinges on notions of neoliberalism. Literature on neo-liberalist conservation points to the



> "'…undermining of social goals', and by implication socially responsible conservation, if the very competitive nature of neo-liberalist mind-sets is allowed to infuse conservation in uncontrolled ways." Fletcher (2010:3).

As this study investigates resource uses as a lens to assess the feasibility of PA expansion of different case-studied PAs, it is important to understand how intertwined resource uses are with people's livelihood struggles. Claus et al. (2010:262) are of the opinion that,

> "[w]hile there is no easy recipe for how local resource users should participate in modern conservation initiatives, attentiveness to resource rights and equity are critical in every conservation project. A successful conservation movement will effectively integrate the natural sciences and diverse fields of social research."

In the absence of flawless blueprints as to how sustainable synergies can be achieved along the rather fictitious conservation-people divide, it is inevitable that tension regarding theoretical assumptions (praxis) and tangible practice (management) will continue to exist.

### 2.3.1 Assumptions and tensions

It is accepted that PAs are arguably the most important building blocks in our endeavours to conserve, protect and preserve vulnerable ecosystems (CBD, 2008; Bingham et al., 2021). Brockington and Wilkie (2015) argue, firstly, that PAs are necessary for conservation and, secondly, that it needs to be accepted that the very existence of PAs is controversial: they will distribute advantages and disadvantages unevenly. The people-and-parks debates and the tensions that underscore these arguments are on-going (Brockington & Igoe, 2006; Ramutsindela, 2007; Agrawal & Redford, 2009; Büscher, 2017). Brockington and Wilkie (2015) argue that the following contentious components have to be properly understood.

The first tension which relates to the fact that conservation is often considered to be a-historical is problematic as the origin of the world's conservation estate is entangled in historical moments of "violence, evictions and dispossession" (Brockington & Wilkie, 2015:2). Since the beginning of time, the demarcation of land for conservation and protection purposes has caused tension between the users of land (and its resources) and those who were entrusted with the responsibility of looking after scarce and vulnerable resources (Norton, 1986; Escobar, 1998; Büscher & Fletcher, 2016).

Claus et al. (2010) argue that effective conservation, and by implication successfully managing tensions, is dependent on a proper appreciation of people's livelihood activities and their roles in conservation. As conservation is a social process that operates in complex social and natural contexts, it will have to consider people's perceptions and conservation behaviour as individuals and as part of bigger collectives, such as organisations and pressure groups, in more nuanced ways.

Such historical tensions still characterise the conservation landscapes, management and practices in many parts of the world and have strong linkages with colonialism and conservation imperialism (Adams & Hutton, 2007; Ramutsindela, 2007; Büscher & Dressler, 2007; Ramutsindela, 2012). The South African conservation landscape is arguably, against the background of its apartheid history, one of the best examples of such historical tensions (Ramutsindela, 2007, 2012).

The second tension is conceptual and forces one to find answers to the question "What sorts of nature parks conserve?" (Redford & Fern, 2007; Brockington & Wilkie, 2015:2). This tension is at the heart of the discourses about the intrinsic value of nature versus the commodified version thereof. As PAs are spatial entities created by human agencies, within which environmental and ecological engineering are manifested, so would the relationships of people living in proximity to PAs also manifest socio-legally engineered arrangements. Many South African examples of PAs managed by national, provincial, local and private management entities can be traced in this regard (Paterson, 2011).

The proclamation of the Dwesa-Gwebe Nature Reserve on the Wild Coast of the former Transkei is a case in point (Daron et al., 2015). Here structural resource alienation occurred as, between the late 1800's and the 1930s, people were systematically removed from the forested areas of Dwesa and Gwebe - from which they eked a living. The creation of Bantustans, in this case the former Transkei, to cornerstone grand apartheid planning, added to local people's misery. The few who remained had access to limited land and marine resources, due to mobility limitations caused by the proclamation of the combined reserves (Southall, 1983; Daron et al., 2015). The very essence of conservation, i.e. protection and sustainable use of vulnerable natural resource assets, has often been negated by attempts to create so-called wilderness and pristine areas. This may lead to over-conservation which in essence refers to practices that are dominated by preservationist concerns, specifically in relation to wildlife.



The third tension, according to Brockington and Wilkie (2015), is structural-political and relates spatially to the contest between traditional territorial claims, seizing of land by landless people or commercial users, and the exclusion of the poor from PAs. The variations in tensions that can be grouped in this category often lead to compromises that are being reached in order to give conservation a more pronounced 'human face' (Brockington & Wilkie, 2015:2) and/or to provide a more ecologically friendly face to industrial and commercial activities in proximity to PAs. In general, the legislative and political correctness of commercial and industrial initiatives, based on principles of industrial ecology (IE), is well documented. Analyses, including critique, of IE identify shortcomings and strengths that need to be recognised in the conceptualisation of conservation-industrial relationships (Røine, 2000; O'Rourke et al., 1996; Ehrenfeld, 2004). Røine (2000), for

example, highlights the importance of the collective interaction, instead of individual efforts, of actors in green(er) industrial activities. O'Rourke et al. (1996) question the validity of IE as a counter to the so-called end-of-the-pipe solutions. These tensions, therefore, cut both ways; i.e. the very (collective) system of capitalist accumulation that often contravenes sound intrinsic, non-commodified conservation, can also facilitate commodified conservation.

Bio-mimicry and IE are often in tandem in efforts to address the impacts of sustainability-conservation-industrial relations. Caution is, however, expressed not to see these approaches as ultimate panaceas to address tensions emanating from these relations. Klein (2004) warns against these approaches as replacement therapy for orthodox industrial processes and design (Volstad & Boks, 2012).

### 2.3.2 Simmering theoretical division and flashpoints

Brockington and Wilkie (2015) argue that, based on these tensions, the necessary debates on the often juxtaposed needs of conservation and people will have to be developed further. As the need for the expansion of the conservation estate, in terms of biodiversity, geodiversity and heritage concerns, is justifiable, so is the concern about the fact that expansion "would simply exacerbate the ills to local livelihoods" (Brockington & Wilkie, 2015:2). Chapin (2004) believes that the relationships between major conservation organisations, such as the World Wildlife Fund (WWF), Conservation International (CI) and The Nature Conservancy (TNC), and corporate interests structurally further marginalise local people.



Chapin (2004) uses the following proof from literature to support this assertion: the global growth and financial muscle of the WWF, the disappearance of talks of strengthening the alliances between local people and conservationists, increased prioritising of large-scale conservation projects, and the questioning of the suitability of indigenous people to work with conservation agencies to further what seem to be more preservationist agendas rather than integrated conservation. The backlash to this critique caused more people-orientated debates and reviews of conservation theory and practice (Redford & Fern, 2007; Wilkie et al., 2013).

Despite the changes in the discourses, Brockington and Wilkie (2015) maintain that four conceptual flashpoints continue to exist and continue to cause problems for conservation management. These flashpoints are:

2.3.2.1 The nature and extent of people's displacement from PAs. Distinction is drawn between physical displacement (i.e. removal of people from where they used to reside in response to a PA proclamation) and economic displacement (i.e. restrictions placed on people's ability to pursue their livelihoods). The debate on which form of displacement represents the lesser of the two evils is on-going (Cernea & Schmidt-Soltau, 2003; Ghmirie & Pimbert, 2013).

2.3.2.2 The quality of data based on available literature is questionable. Studies and arguments that seem to substantiate that conservation-induced displacement of local people leads to disenfranchisement can be countered by anti-disenfranchisement arguments. It is, therefore, a dilemma to prove and then generalise about win-win situations in people-and-parks relationships.

2.3.2.3 Conflicting discourses regarding compensation due to displacement are continuing. Wells (1996): Are indigenous people and Frist Nations automatically eligible for compensation? Matsui (2012): What about non-indigenous people? The many unsettled land claims in and close to South Africa's PAs are indications of this displacement-compensation debate. Walker (2008:11) documented land claims controversies in general in South Africa - and in the Kruger National Park in particular - and reflects on the importance of a sincere appreciation of the "loss and restoration narrative". The highly publicised Makuleke land claims case of the Kruger National Park (KNP) is often referred to in academic literature as an example of a so-called win-win compromise (McCusker et al., 2016). Linnert (2011) indicated that sixty percent of land claims related to the Kruger National Park are, for example, not settled as yet – paving the way for legitimate beneficiaries also to claim a stake in the governance and management of the protected area. The KNP is arguably the most contested PA against the background of the compensation

flashpoint. Based on the conservation importance of the KNP, so-called Phase 1 land claims in the KNP have been finalised, though, and six communities were subsequently compensated to the tune of R84 million for 318 000 hectares that were claimed (Government settles Kruger Park land claims, 2016).

2.3.2.4 The nature of PA governance and management needs constant scrutiny. It is widely acknowledged that some form of devolution of power (away from official conservation authorities) and co-management are needed for effectively carrying out conservation mandates. Management formats, such as stewardship, Community Based Natural Resource Management and Zoning (for conservation-livelihoods balances), are some of the measures documented in literature. Capacity, resource input, vested interest and community heterogeneity are some of the challenges that conservation governance has to contend with (Stevens, 1997; Redford & Fern, 2007).

South Africa's national parks are under constant scrutiny as exclaves that inevitably will have to be transformed in one way or another under the influence of externalities. Carnie (2017:4) rightly asks whether national parks and game reserves in 50 years' time will be the

> "…last bastions of wilderness sheltering remnant animal population or crowded and overexploited tourist destinations…or should these parks be farmed and radically transformed to supply meat, other natural resources and further economic development?"

These questions are not farfetched if one considers that the so-called Half-Earth Proposal (Wilson, 2016) is receiving considerable attention, positively and negatively, from academics and practitioners alike. The idea favours the setting aside of 50% of the earth's surface to sustain and replenish the very bases on which humankind, other species and life sustaining processes are dependent. Critics of the proposal, such as Büscher and Fletcher (2016), consider it to be unrealistic and unsupportive of collaborative and sustainable nature and culture interaction. Büscher (2017) considers the Half-Earth idea as uncritical and dogmatic in favour of mainstream (capitalist) conservation.

### 2.3.3 Manifestations of conservation-eviction hypotheses

Against the background of these theoretical flashpoints the manifestations of the tensions discussed are often to be found in the separation of people from livelihoods supplied by PAs. Brockington and Igoe (2006) are of the opinion that, geographically, the manifestations of conservation-eviction concerns can be summarised by the hypotheses in Table 2.3.

**Table 2.3: Global conservation-eviction hypotheses**

| | |
|---|---|
| 1. | South America, the Pacific, Caribbean and Australia have experienced relatively few incidents of eviction from protected areas compared to the rest of the world. |
| 2. | The countries of the former Soviet Union have a long history of displacement from strictly protected areas. |
| 3. | Most protected areas from which evictions have occurred were established before 1980. |
| 4. | Eviction from protected areas did not occasion significant public debate before the 1980s. |
| 5. | There were many more evictions from protected areas in all regions before 1980 than are currently reported in the literature. |
| 6. | Complex nationally based environmental movements are driving recent and contemporary evictions from protected areas. |
| 7. | Large scale evictions from large protected areas are currently less prevalent than they once were. |
| 8. | Evictions will become more common if existing conservation legislation in Africa and South Asia is enforced. |
| 9. | Economic displacement and exclusion from protected areas is more significant in people's lives and complaints about protected areas than physical eviction. |

(Source: Brockington & Igoe, 2006:453)

It seems that the 1980s were the watershed period for enforced evictions if compared to the contemporary forms of evictions that are more complex and nuanced. Hypothesis 8 is particularly worrying against the background of the developmental challenges facing these regions of the world. Africa and South-East Asia are endowed with some biodiversity, geodiversity and heritage attributes that outstrip most of those to be found elsewhere on the globe. These regions are also faced with very significant socio-economic challenges that have direct and indirect consequences for PA conservation. Any form and spatial scale of PA expansion will, therefore, also be influenced by these eviction tendencies.

Larson (2011), in an attempt to deconstruct dualities between people and nature in order to provide additional lenses through which to view environmental sustainability, also warns against any overriding scientific narrative popularised by conservation organisations that can lead to peoples' marginalisation. Metaphorically, the imprint that capitalist accumulation and competitiveness have on human behaviour is often reflected in peoples' conception of and relationship with nature. Larson (2011), therefore, argues strongly in favour of more moral and compassionate ways of scientific investigations and endeavours in an attempt to harmonise and ease apparent people-environment tensions.

## 2.4 Legacies of conservation-people tensions

In a country, such as South Africa, where conservation concerns are predominantly voiced and acted upon by the privileged few in society, access to a broader spectrum of voices from society is important. Literature on the 'exclusivity' of private nature reserves, entrance fees and their membership requirements are well documented (Wells, 1996; Hansen et al., 2015; Brockington & Wilkie, 2015).

### 2.4.1 Protection: inclusive or exclusive…who/what is protected?

South Africa's protected area network requires considerable land, marine and financial resources in order to fulfil its mandate of conserving and protecting the country's vulnerable bio-, geo- and cultural-historical diversity (Wells, 1996; Stevens, 1997; Magome & Murombedzi, 2003; Kepe, 2008; Büscher & Dressler, 2012). Wells (1996) argues that it is often difficult to reconcile the quest for these requirements with the dire socio-economic conditions of many communities – often in proximity to national parks and nature reserves. The inclusivity of ecological integrity in protected area demarcation and management occurs, therefore, at the expense and exclusion of people (and their needs). Many of South Africa's current protected areas used to be the resource bases for many poor and disenfranchised people. The 'superimposition' of the PA proclamation drive left significant socio-cultural scars on the South African landscape (Reference was made earlier in this chapter to the proclamation of the Dwesa and Gwebe Nature Reserves on the Wild Coast of the former Transkei.)

Another example in this regard was the prevention of subsistence fishers from marine resource harvesting in the Tsitsikamma Section of the Garden Route National Park. Williams (2013:120), in an analysis of the plight of subsistence fishers in the Tsitsikamma, strongly argues for a "better understanding of the current context in relation to access to fisheries resources" in the area. Permission granted by the DEA towards the end of 2015 to allow subsistence marine resource harvesting in 20% of the Tsitsikamma Section was met with considerable opposition from conservation authorities and private landowners alike. The processes were subsequently halted and legally taken on review (Bigalke, 2016). Embroiled in the controversy are environmental management regulations that apparently have not been adhered to, peoples' historical rights to access marine resources, temporal restrictions on local fishers, and concerns of the scientific community regarding the protection of rare marine species.

The lenses of inclusivity and exclusivity provide, therefore, interesting philosophical dilemmas that need to be grappled with in holistic and integrated ways in order to address PA management challenges (Kepe, 2008; Ramutsindela, 2012). The 1990s were characterised by concerted efforts to try to reconcile tensions as reflected in initiatives that can be grouped under so-called Integrated Conservation-Development Projects (ICDPs) (Barrett & Arcese, 1995; Crooks & Sanjayan, 2006). The fact that PAs, over and above their core conservation mandates, can partly provide with regard to the subsistence resource needs of the poverty-stricken as well, has to be acknowledged.



The proclamation of PAs can also be associated with apartheid spatial planning and the forced removal of people from where they used to reside and from areas in which they harvested livelihood resources (Wells, 1996; Hansen et al., 2015; Brockington & Wilkie, 2015). The fact that locals often incurred livelihood costs as a result of the establishment and expansion of South Africa's conservation estate requires sustainable remedies. The advantages and disadvantages of remedies, such as co-management of parks, stewardship programmes, benefit-sharing, capacity-building initiatives, etc., are discussed in more detail in Chapter 3 of this study.

The varying definitions of the terms 'local' and 'community' are also central to these debates. South Africa's PA conservation challenges extend beyond the rural, the pristine and the far-off. It is important also to recognise the importance of challenges facing PA conservation in built-up areas. Biodiversity conservation in urban areas of the developing world in particular is facing significant

challenges if compared with biodiversity conservation in areas where anthropogenic influences are less. Dearbon and Kark (2010) are of the opinion that, from a conservation management point of view, these challenges are aggravated by motivations for urban conservation which are often not clearly articulated. (This schism is being paid more attention to in the analysis of the dynamics that influence the PA expansion of the Driftsands Nature Reserve as an urban conservation area - Chapter 5.)

### 2.4.2 Conservation, preservation and exploitation

The concepts of conservation and preservation are often used synonymously. Conservation implies, among other aspects, the sustainable use (consumptive or non-consumptive) of protected resources, whilst preservation implies the protection of resources in their original untouched condition. Whatever the definitional nuances, it is important to realise that both concepts can have inherent notions of exploitation. The theoretical perspectives provided by academic fields, such as ecological, environmental and resource economics, can provide a platform for engaging with conservation, preservation and exploitation more critically (Norton, 1986; Cutter & Renwick, 2004; Miller et al., 2014; Costanza et al., 2015). Ecological economics, with its emphasis on the multidisciplinary appreciation of how ecological goods and services can be appraised, is often proposed as the paradigm best suited to detangle conservation and preservation imbalances.



The balance between conservation and preservation is a sensitive one and needs to be maintained within the parameters of proxies, such as carrying capacities and limits of acceptable change within specific environments. The consequences of over-conservation are well documented in academic literature and are often reflected in measures/initiatives, such as the translocation of species or the setting-aside of spaces in PAs to allow for the rejuvenation of carrying capacities of physical environments in such areas. Studies in the translocation of African elephant in response to habitat considerations caused by over-conservation are a case in point is this regard (Dublin & Niskanen, 2003; Nustad, 2015)

Structural power relations, as discussed previously in this chapter, may further complicate these balances as vested interests may lead to an overemphasis of the vulnerability of species and environments instead of their resilience (Miller et al., 2014).

As these power relationships underpin decision-making regarding the nature and spatial extent of conservation estates at different geographical scales, it is important for this study also to analyse manifestations of conservation and preservation imbalances as observed in the three case-study areas.

### 2.4.3 Political ecology of conservation and protected areas

Spatial expansion is, as discussed, not necessarily a function of bona fide conservation concerns only. Other catalysts, such as vested interest, commoditisation of nature, political-strategic concerns, power relations and capitalist accumulation have been identified and extensively researched to illustrate that conservation as a philosophy and practice is not necessarily benign (Carruthers, 1989; Wolmer, 2003; Brockington & Igoe, 2006; Ramutsindela, 2007, 2012; Adams & Hutton, 2007).

Büscher and Dressler (2007, 2012), in a critique of conservation, consider the latter to be in essence the commodification of nature as defined and portrayed by vested interests fed by capitalist and neoliberal approaches. Resource utilisation and benefit-sharing emanating from conservation efforts are, therefore, often out of sync with 'community' needs (Brockington & Wilkie, 2015).

South Africa's conservation landscape carries the legacies of its colonial and apartheid past. The bona fides underpinning the country's overall conservation estate are, therefore, questionable. It is the contention of Licht et al. (2014:5) that



> "[h]istorically, parks and reserves in that country were established and managed primarily for the pleasure and benefit of the wealthy and privileged white minority."

Similar views are held by Paterson (2011), Ramutsindela (2007), and Büscher and Dressler (2012). It, therefore, needs to be acknowledged that current policies for, and management of, PAs in South Africa reflect mandates that can be related to socio-economic redress, benefit-sharing and capacitation of disadvantaged groupings. Uncritical comparisons and advocacy of best practice (as it pertains to other realities) need to be handled with care. Table 2.4 summarises the differences between PA management in SA and the USA in relation to socio-economic variables.

**Table 2.4: Comparison of PA management in South Africa and the USA**

| Issue | South Africa | United States |
|---|---|---|
| Park/reserve purpose | Conservation of wildlife, especially charismatic megafauna, for ecotourism. Many private reserves were established for commercial purposes. | Conservation of scenery and landscapes, evolved to include the conservation of wildlife and ecosystems for public benefits. |
| Conservation of small populations | More likely to reintroduce and conserve small nonviable populations. | Policies and traditions often discourage reintroduction of small nonviable populations. |
| Apex Predators | Apex predators are reintroduced into reserves as small as 5,000 ha. | Apex predators are only reintroduced to large landscapes. |
| Management Intervention | Very hands-on management, necessitated in part by the small populations and presence of apex predators. | A more hands-off approach, sometimes directed by agency policies. |
| Active metapopulation approach | Routine transfer of animals between sites for demographic and genetic augmentation, revenue generation, and other reasons. | Less frequent transfer of animals between sites, especially into existing populations. Generally done only when species is threatened with extirpation. |
| Boundary fences | Routinely used for natural areas and required by law for some species. | Generally discouraged. Used primarily for bison. |
| Water management | Trend toward removal of anthropogenic water for purposes of restoring ecosystem integrity and heterogeneity; however, many units retain anthropogenic water for wildlife viewing. | Water management generally avoided unless critical for species restoration, sometimes done for purposes of uniform range utilization and increased carrying capacity. |
| Partnerships across land ownerships | Commonly used to create and expand natural areas. Typically enforced with a legal document. Management often conferred to a single entity. | Less frequently used, rarely with a legal document, and partners maintain their own management. |
| Park/reserve expansion | Protected area boundaries regularly expand due in large part to new partnerships. | Boundary changes and expansion much less frequent. |
| Community involvement and benefits | Natural areas are often established for community benefits or have evolved to emphasize those benefits, including resource utilization by local communities. Parks/reserves actively involve local communities via regular and routine meetings. | Community involvement and benefits are more passive. Generally, public engagement is limited to more formal meetings intended to get public input on specific, proposed management actions or plans. |
| Ecotourism | Ecotourism and hunting are used to justify, create, and operate many reserves. | Ecotourism often viewed as passive benefit of natural areas, but is not typically a primary objective. |
| Park funding | National parks get about 20% of operating funds from appropriations, rest from gate receipts, wildlife sales, and other sources. Private reserves funded from ecotourism, wildlife sales, and hunting. | Almost all park funding comes from government appropriations. In the case of reserves managed by nonprofit organizations, from donations. |
| Visitor experiences | Visitation is highly restricted. Visitors, only able to enter/leave within daylight hours and must stay in vehicles in reserves with dangerous animals unless on ranger-led activities. | Visitors generally allowed to freely travel on foot, via vehicle or horseback. |
| Outreach and interpretation | Small visitor centers with rudimentary interpretive displays and information. | Larger and more state-of-the-art visitor centers utilizing modern technology. |

(Source: Licht et al., 2014:3)

It is evident from the summary that the different socio-economic realties influence to large extent the emphasis on different elements of PA management. The premium that is, for example, placed on ecotourism not only as an income generator, but also as a vehicle for development and capacitation of local communities (in South Africa), is a typical example in this regard.

Chape et al. (2005) consider the network of global protected area coverage to be a manifestation of political commitments and argue that it does not necessarily speak to the effectiveness of conservation. It is, therefore, important to address factors influencing the level of effectiveness of conservation at different geographical scales. Spatial increases in protected areas are largely facilitated by proactive conservation planning in which the assessment of biodiversity, geodiversity and cultural-historical attributes form the basis for decisions as to whether an area will be proclaimed for conservation purposes.

### 2.4.4 Conservation-development challenges of the Western Cape

South Africa enjoys important conservation status if one looks at its biodiversity, geodiversity and cultural-historical attributes. Provincially, the Western Cape Province is arguably the most diverse region in the country in terms of the aforementioned attributes. The rich biodiversity endowment of the Western Cape, if compared to the other provinces, is evident in Table 2.5.

**Table 2.5: Western Cape biodiversity attributes**

| | Number of Species | | | | | | |
|---|---|---|---|---|---|---|---|
| **Province** | **Biome** | **Veld Type** | **Plant** | **Mammal** | **Bird** | **Amphibian** | **Reptile** |
| **Eastern Cape** | 6 | 29 | 6383 | 156 | 384 | 51 | 57 |
| **Free State** | 3 | 19 | 3001 | 93 | 334 | 29 | 47 |
| **Gauteng** | 2 | 9 | 2826 | 125 | 326 | 25 | 53 |
| **KZN** | 3 | 19 | 5515 | 177 | 462 | 68 | 86 |
| **Limpopo** | 2 | 14 | 4239 | 239 | 479 | 44 | 89 |
| **Mpumalanga** | 2 | 20 | 4593 | 160 | 464 | 48 | 82 |
| **Northern Cape** | 4 | 20 | 4916 | 139 | 302 | 29 | 53 |
| **North West** | 2 | 10 | 2483 | 138 | 384 | 27 | 59 |
| **Western Cape** | 6 | 19 | 9489 | 153 | 305 | 39 | 52 |

(Adapted from South African Yearbook 2005/6)

The rich biodiversity endowment of the Western Cape Province, compared to the other provinces, makes it indeed a priority area for conservation. The province's floral endowment is unheralded and, along with its varied veld types, provides reasons for the region's floristic-kingdom status. The biodiversity and geodiversity (veld types) are assets that need protection in a province that is progressively subjected to increasing resource and land-use demands. These demands can erode the very essence of the conservation imperative. These, often conflicting, demands limit the scope for protected area expansion and the set-aside of biodiversity sensitive areas.

Pence (2014) is, therefore, of the opinion that in the near future, in order for protected area expansion targets to be reached nationally, provincially and locally, the following needs to be worked towards with urgency:

- *Exploring opportunities for PA expansion under stewardship agreements:*

  Stewardship agreements can lead to so-called 'capacity hotspots' within which vulnerable and threatened flora and fauna can be managed and protected by agencies other than local, provincial and national conservation authorities. Thus far stewardship agreements linked to the management and protection of biodiversity on private land and in conservancies proved to have had varying degrees of success in the Western Cape. Duffel-Canham, (2016) believes that alternatives to official expansion, such as off-sets, set-asides and land-banking, can go a long way in achieving conservation targets for the province.

  The legacies of colonial land appropriation and dispossession of land under apartheid laws created geographies in which generally rich landowners also 'inherited' - and largely still have access to and control of - areas with significant biodiversity attributes (Ramutsindela, 2012; Nustad, 2015). Critique of stewardship agreements stems from these legacies as the skewed access to, and unfair benefit-sharing of, conservation-related products and services are seemingly being perpetuated under such agreements (Büscher & Dressler, 2007, 2012).



- *Protecting Critical Biodiversity Areas (CBAs) through securing PAs legally:*

  There are managerial-legal disconnects between conservation areas and formally protected areas that are often reflected in imbalances between priority species conservation and ecosystem conservation (Turner, 2016). Mainstreaming CBA concerns in land-use planning and PA expansion can go a long away in protecting threatened species, such as the Cape vulture and the African penguin, which are not necessarily location-bound. Turner (2016) is of the opinion that the continuous updating of species-specific data, such as their IUCN threat statuses and related biodiversity management plans for species (BMPS), can provide further impetus for achieving conservation goals in the province.

## 2.5 Rethinking conservation and resource uses

The ever-increasing ecological footprint of humankind, largely driven by population growth and resultant increases in resource-use needs, has created significant challenges to the integrity and maintenance of ecosystems. The concept of the Tragedy of the Commons of Hardin (1968) encapsulates this and other unsustainable resource-use practices, notably those related to so-called common property resources. Critique on the Tragedy of the Commons as articulated by scholars such as Rose (2020, Anukwonke (2015) and Angus (2008) is largely rooted in the myth that the degradation and exploitation of common property sources can be solved by a change to private ownership and the belief that the individual will act rationally on behalf of the collective. The hydrosphere, atmosphere and the biosphere are most susceptible to common property resource exploitation by virtue of their components and constituting processes. Vital resources, such as water and clean air (oxygen), that are either not included in traditional accounting/monitory systems or under-valued relative to the space and time availability of such resources, need consideration in this regard.

The pressures exerted by small-scale resource users, who used to be relatively sustainable, are also increasing as "their total rate of resource use outpaces the resource's rate of replenishment" (Myers & Spoolman, 2014:40). Proponents of ideas contrary to Myers and Spoolman's (2014) view are, however, critical in their assessment of the impact that small and subsistence resource users presumably have on the replenishment of resources (Brockington & Igoe, 2006; Adams & Hutton, 2007; Ramutsindela, 2007, 2012; Brockington & Wilkie, 2015). The varied nature of resource uses in general, and how such uses are impacting on parameters, such as availability, quality and time, are summarised in Table 2.6.

**Table 2.6: Resource categorisation and utilisation**

| Resource Type | Quantity | Quality | Time | Space | Action |
|---|---|---|---|---|---|
| STOCK EXHAUSTIBLE *(e.g. minerals, fuels)* | Measurable | Measurable + Intangible | Usage constraints | Restricted | Extraction |
| FLOW & SOLAR *(e.g. Radiation)* | Measurable | Measurable | 'No' constraints | No restrictions | Interception & Storage |
| FUND *(e.g. Electrical energy)* | Measurable | Measurable | Usage constraints | Relatively restricted | Deposit, Withdrawal, Transmission |
| BIOLOGICAL / RENEWABLE *(e.g. crops)* | Measurable | Measurable | 'No' constraints | Relatively restricted | Harvesting |
| ATMOSPHERIC *(e.g. oxygen)* | Measurable | Measurable | Constraints | Non-restriction & Restricted | Economically non-consumptive |
| HYDROLOGICAL *(Water)* | Measurable | Measurable | Constraints | Restricted | Withdrawal |
| *AESTHETIC* | Measurable | Measurable | Constraints (temporal) | Constraints | Passive Consumptive |
| PEOPLE *(e.g. skills, ingenuity, and technological application)* | Measurable | Measurable | Constraints | Restricted | Applications |

(Adapted from Paterson, 1972; de Groot et al., 2002)



### 2.5.1 Revisiting resource-use impacts

According to Naughton-Treves et al. (2005), the global conservation estate grew exponentially between 1980 and 2005, largely driven by conservation efforts and PA proclamations in generally biodiversity-rich developing countries. It is recognised that PAs also have a role to play in the improvement of people's welfare. The shift from PAs as preservationist enclaves to the insight that they also need to include the use of resources for livelihood purposes is reflected in the conservation mandates of many countries. (South Africa's environmental and conservation related policies make specific provision for the inclusion of sustainable resource use where possible - see Chapter 3.) PAs have, therefore, become multi-purpose spaces within which resource uses and poverty alleviation initiatives need to be balanced with the mandates to conserve the biodiversity, geodiversity and heritage attributes of such designated spaces. This balancing act is generally complex and challenging

and requires a multidisciplinary approach to the planning, execution and management of resource uses by local people and resource-use stakeholders. One such approach, to try to create a balance, is to decentralise conservation to include co-management arrangements with local people. This approach was and still is advocated as arguably the best way of ensuring conservation and resource-use sustainability. A study by Parker et al. (2015:96) showed, however, that decentralised conservation will continue to exclude poor people in the absence of "direct policies to target marginalized groups."

This study does not only focus on resource usage for livelihood purposes but also on other indirect and non-consumptive resource uses as PAs may serve as catalysts for activities, such as tourism and adventure, teaching and research, as well as conservation agriculture. An interesting stakeholder interest (discussed in Chapter 6) associated with the WCNP, for example, relates to military activities which, although adjacent to the park, use the park's territory as a thoroughfare. There are interesting military-PA relationships in the South African conservation landscape. Lunstrum (2015) highlights these relationships in a study on the implicit legacy of South Africa's military and security activities pertaining to the Kruger National Park as a PA, as well as a stretch of (international) borderland. She argues that

> "…military activity, skills, and weapons have harmed wildlife and hence reinforced the need for its protection, and they have simultaneously been deployed in the name of such protection." (Lunstrum, 2015:356)



The country's military history and its involvement in cross-border feuds with and in other Southern African countries created a context and

> "…an arsenal of enabling factors for current poaching- and conservation-related militarised violence that ultimately proves harmful to conservation efforts." (Lunstrum, 2015:356)

PAs can, therefore, serve as a fronting role for reasons related to the furthering of political-ideological and resource exploitation.

Table 2.7 summarises traditional strategies to conservation management, recorded impacts on livelihood-resource users, and responses to the impacts that local resource uses may have on PAs, according to Claus et al. (2010).

**Table 2.7: Conservation management strategies and resource-use impacts**

| *Strategy* | *Impact on local resource users* | *Response to...* |
|---|---|---|
| Protected area | Limits entry, extraction, and use of designated area | Habitat loss and degradation, overexploitation |
| Zoning | Designates areas where local resources may be extracted | Habitat loss and degradation, overexploitation |
| Purchase of water/land rights | Transfers ownership or use rights to/from locals | Water diversions, overexploitation |
| Ecotourism | Brings outside investment to local businesses, employment in service industry | Multiple threats |
| Community-based natural resource management | Formal encoding of local monitoring and managing resource extraction | Multiple threats |
| Direct payments for ecosystem services | Payment received for successfully maintaining local resources | Overexploitation, habitat loss and degradation, pollution |
| Integrated conservation and development projects | Development of small-scale economic initiatives that incorporate sustainable resource use | Multiple threats |

(Source: Claus et al., 2010:275).



However, Claus et al. (2010) also believe that the following critical questions need to be asked in order to comprehend the complexities of conservation and resource-use relations:

> "A deeper analysis might ask questions such as; who is responsible for the degradation, overexploitation, etc.? Does the conservation strategy disproportionately affect local resource users? Are the strategies in column one responsive to the threats presented in column three?" Claus et al. (2010:275)

The rationale for this study is partly rooted in these critical questions as it interrogates the role that conservation and resource-use conflicts and/or synergies play in PA expansion or contraction in the three case-study areas.

### 2.5.2 Conclusion and synthesis of disciplinary-theoretical input

Just as it is important for different components of ecosystems to be supported (and protected) for effective conservation practices, so it is also important to understand how different systems (i.e. academic disciplines) can contribute to a better understanding of the theoretical bases for the analysis of conservation-people relations. It is the contention of Claus et al. (2010:279) that

> "[t]he study of conservation of biodiversity in functioning ecosystems has been largely pursued separately in diverse academic disciplines. Effective conservation requires an integrated understanding of how people's decisions influence ecosystems, how ecosystems produce services for people, how those services are valued by people, how those values translate into policies, and how those policies result in human actions".

This requires an integration of diverse fields, natural and social, as presented in Figure 2.5.

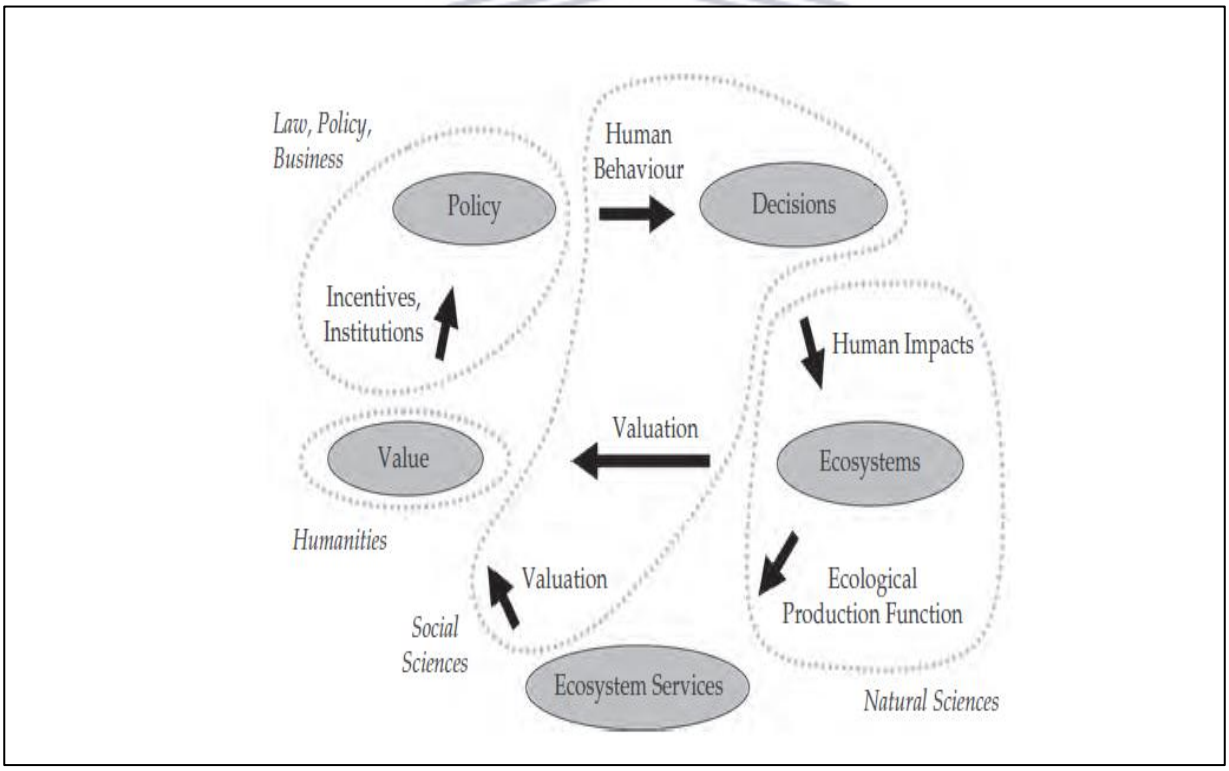



**Figure 2.5: Disciplines contributing to an integrated understanding of conservation challenges**

(Claus et al., 2010:279)

The literature reviewed and theoretical considerations revisited in this chapter provide platforms for the appraisal of general conditions that can enable - and disable - the feasibility of PA expansion. The chosen case studies display a variety of such enabling and disabling conditions which, in all three cases, need multi-perspectives on a process (expansion) that can be overtly mechanistic if (biodiversity) conservation concerns are overemphasised.

The critique of scholars (such as Cernea & Schmidt-Soltau, 2003; Adams & Hutton, 2007; Brockington & Igoe, 2006; Büscher & Fletcher, 2016; Büscher, 2017) regarding the bona fides of the existence of some PAs, specifically regarding the use of resources in such areas, serves as additional lenses for assessing expansion prospects. As spatial analysis forms the overarching theoretical approach for the study, traditional spatial analysis metrics, such space, place, size, shape and access, will be analysed in a more contextual manner employing resource-use perspectives.

# CHAPTER 3: SPATIO-LEGAL CONTEXT FOR PROTECTED AREA EXPANSION IN SOUTH AFRICA

## 3.1 Introduction

The purpose of this chapter is to analyse the spatio-legal context for the expansion feasibilities of the West Coast National Park (WCNP), Hottentots Holland Nature Reserve (HHNR) and the Driftsands Nature Reserve (DNR) which had been chosen as case-study areas. The three study areas are located in the Western Cape Province - on the West Coast, in the Boland Mountain Ranges and on the Cape Flats respectively. The reasons for these choices were discussed in Chapter 1. (Spatio-legal, for the purpose of this study, refers to the spatial and temporal manifestations or ramifications of legal instruments, i.e. acts, strategies and ordinances, that guide and influence protected area expansion decision-making). The many conservation related national and provincial laws, ordinances and strategies require careful consideration of the guidelines of NPAES and their application by different national, provincial and local conservation authorities in South Africa. Internationally there is, however, consensus that despite the influences of site-specific characteristics regarding PA expansion, the latter is vital in the world's attempts to achieve conservation estate targets (Aichi Targets, 2019; CBD, 2008, 2019; Protected Planet, 2020). PAs are the building blocks of the global conservation estate and their roles as part of this broader, integrated system need to be understood and protected. The awarding of Ramsar status to PAs in different parts of the world that play host to wetlands and waterbodies which, in turn, facilitate seasonal avifaunal migration, is arguably the best indication of the importance of this global integrated system of PAs (CBD, 2008; MPAF, 2016). The International Union for the Conservation of Nature (IUCN) attributes a number of characteristics to this system that are discussed in the following sections.



## 3.2 The IUCN and PA systems

PAs cannot be seen in isolation, but rather as part of a system in which they form important nodes and linkages (Lausche & Burhenne, 2011; Saura et al., 2019). According to Lausche and Burhenne (2011:21), the IUCN considers PA systems to have the following characteristics:

- **Representativeness, comprehensiveness and balance**: the ability to represent or sample the full variety of biodiversity and other features, such as landform types and landscapes or

seascapes of cultural value, so as to protect the highest quality examples, particularly threatened and under-protected ecosystems, and species globally threatened with extinction.

- **Adequacy**: supporting the viability of ecosystem processes, as well as species, populations and communities that make up the country's biodiversity.
- **Coherence and complementarity**: the extent to which each site makes a positive contribution to the system as a whole.
- **Consistency**: the standardised application of management objectives, policies and classifications to individual sites under comparable conditions.
- **Cost-effectiveness, efficiency and equity**: an appropriate balance between the costs of and benefits flowing from protected areas, equity in their distribution, and efficiency in terms of the minimum number and size of protected areas needed to achieve system objectives.
- **Persistence**: the ability to promote the long-term survival of biodiversity contained within a protected area by maintaining natural processes and viable populations and by excluding or overcoming threats.
- **Resilience**: the ability to adapt and sustain primary conservation objectives of the site - and the system overall - in the face of climate change and other global change factors.

The preceding characteristics stem from the CARE principles, i.e. connectivity, adequacy, representativeness and efficiency, that characterise the Marxan methodology of demarcating protected areas. Connectivity refers to the exchange of spatial and non-spatial features/materials, such as water, diseases and species, among different habitats and ecosystems. Adequacy speaks to the conditions provided by conservation areas, species and habitats to sustain themselves. Representativeness refers to the protection of the ability of all biodiversity in an area to sustain and replicate itself. Efficiency is the conservation principle that recognises and accommodates other human and economic activities that also require the use of natural resources (https://marxansolutions.org/the-care-principles/).

These requirements are primarily based on the biodiversity attributes and their threat statuses and how the management of various conservation areas can be appraised in order to assess the sustainability of PA networks/systems. Wilshusen et al. (2002) warn, though, that attempts to protect more land and sea spatially, through PA expansion, may be counterproductive if the dynamics of social and political

processes are not properly factored into expansion plans. Agrawal and Redford (2009:1) similarly argue that,

> "[i]f conservation strategies distress human populations, especially those who are less powerful, politically marginalized, and poor, little that conservationists argue on behalf of biodiversity makes sense."

(The literature on protectionist approaches versus co-management/people-centred approaches to PA management is reviewed in Chapter 2. However, it is inevitable that, depending on the peculiarities of PAs and their surroundings, the adoption of these opposing approaches is neither entirely feasible nor entirely sustainable.)

Maintaining these requirements/standards is difficult as variations exist in the effectiveness of management of PAs across the world. The standardisation of benchmarks against which management effectiveness can be measured is, therefore, inherently problematic, as discussed in Chapter 2. At the nation-state level, the fragmented system of jurisdictional authority also contributes to the challenges that face the terrestrial and marine PA system in South Africa (Crooks et al., 2011; Bush et al., 2014; DEA, 2016).

## 3.3 Challenges for conservation and PA management in South Africa



The legislative context of protected area expansion should be seen against the background of PAs as cornerstone infrastructure for the conservation and protection of vulnerable and threatened ecosystems, species, landscapes and cultures. Conservation is a highly politicised and complex component of the South African legal and geographical landscape (DEA, 2016; Govender et al., 2017). The many challenges facing conservation will, therefore, directly and/or indirectly impact on PA expansion as a tool to strengthen the country's conservation regime. The arguments for and against expansion are varied and need to be looked at collectively, as well as on a case-by-case basis, as they are inextricably linked to the challenges facing conservation at large.

Paterson (2011) argues that the legalities with respect to South Africa's conservation regime are hampered by the following broad challenges:

- *Poor conservation planning* - Prior to the year 2000, conservation planning and practices were mostly ad hoc and PAs were declared under the guise of 'conservation', but were actually driven by tourism and leisure concerns. Representative ecosystems and species conservation could not, and is therefore still not, achieved.
- *Exclusionary approaches to conservation* - PAs and conservation efforts were, and still are, largely seen as the preserve of the historically advantaged and the elite of South Africa's society. The disenfranchised occupy largely the fringes of conservation thinking, planning and management of PAs. This is a global phenomenon - but very prevalent in South Africa as a legacy of the country's apartheid ideology and planning (Ramutsindela, 2007; Büscher & Dressler, 2012; Brockington & Wilkie, 2015; Büscher, 2017).
- *Non-cooperative governance of protected areas* - The many laws that guided protected area planning and management prior to the implementation of the NEMPAA (National Environmental Management Protected Areas Act No. 57 of 2003) caused fragmentation that, in turn, caused poor cooperation among national and provincial conservation authorities. Paterson (2011:7) identifies the following acts that were relevant to PA expansion prior to the NEM:PAA: the Mountain Catchment Areas Act of 1970, the Sea Birds and Seals Protection Act of 1973, the Lake Areas Development Act of 1975 (repealed), the National Parks Act of 1976 (now repealed in part), the Forests Act of 1984, the Environment Conservation Act of 1989 (repealed), the Marine Living Resources Act of 1998, the National Forests Act of 1998, the National Heritage Resources Act of 1999, the World Heritage Convention Act of 1999 and the National Environmental Management: Biodiversity Act of 2004.

Current acts and older ordinances that have more relevance at the provincial level include the following: the Kwazulu-Natal Nature Conservation Management Act of 1997, the Mpumalanga Nature Conservation Act of 1998, the Western Cape Nature Conservation Laws Amendment Act of 2000, the Limpopo Environmental Management Act of 2003, the Provincial Parks Board Act of 2003 (Eastern Cape), the Nature Conservation Ordinance of 1969 (Orange Free State), the Nature and Environmental Conservation Ordinance of 1974 (Cape) and the Nature Conservation Ordinance of 1983 (Transvaal).

The relevant provincial acts and ordinances are important for an understanding of the historical spatiality of the South African conservation estate, and how it has expanded since 1994 when a new provincial and local authority demarcation system was introduced.

The following sections provide an overview of relevant current acts and strategies that need consideration in the appreciation of NPAES which is supposed to guide protected area expansion.

## 3.4 The South African legislative environment

### 3.4.1 Environment Conservation Act (No. 73 of 1989)

Up until the promulgation of the National Environmental Management Act/NEMA (No.107 of 1998), conservation and environmental protection in South Africa were guided by the Environment Conservation Act/ECA (No. 73 of 1989). The emphasis of this act, that is now repealed, was to provide a legislative framework within which the following could occur:

- the protection of ecological processes, natural systems and natural beauty, as well as the preservation of biotic diversity in the natural environment
- the promotion of sustainable utilisation of species and ecosystems and the effective application and re-use of natural resources
- the protection of the environment against disturbance, deterioration, defacement, poisoning, pollution or destruction as a result of man-made structures, installations, processes or products or human activities
- the establishment and maintenance of acceptable human living environments in accordance with the environmental values and environmental needs of communities
- the promotion of the effective management of cultural resources in order to ensure the protection and responsible use thereof
- the promotion of environmental education in order to establish an environmentally literate community with a sustainable way of life
- the execution and coordination of integrated environmental monitoring programmes.

These broad principles hinge mainly on the protection and monitoring of the biophysical and cultural aspects of conservation areas. However, the general critique was that, against the background of

societal and legislative reforms that were needed with the dawn of democracy in South Africa, ECA did not extend far enough to guide integrated environmental management challenges.

### 3.4.2 National Environmental Management Act (No. 107 of 1998)

NEMA, as overarching legislation, allows for specific NEMAs that can address sector-specific environmental management challenges. NEMAs that are particularly relevant to this study include the National Environmental Management Biodiversity Act/NEM:BA (No. 10 of 2004), the National Environmental Management Protected Areas Act/NEMPAA (No. 31 of 1998) and the National Protected Areas Expansion Strategy (NPAES) that provides detailed guidelines for the expansion of PAs.

The principles of NEMA apply to all organs of State that are responsible for the enactment of guidelines for projects that may have significant impacts on the natural and/or human environments for which such projects are earmarked. NEMA serves, therefore, as a general framework for the formulation of environmental management and implementation plans. NEMA (the original as well as the later amended versions thereof) further stipulates that general requirements have to be adhered to and/or striven for by developers before authorisation can be granted by a relevant organ of State, i.e. a competent authority. The following is a summary of the general requirements (NEMA, 1998:10-14):



- Environmental management must place people and their needs at the forefront of its concern and serve their physical, psychological, developmental, cultural and social interests equitably.
- Development must be socially, environmentally and economically sustainable.
- Sustainable development requires the consideration of all relevant factors, including the following:
    - that the disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied,
    - that pollution and degradation of the environment are avoided, or, where they cannot be altogether avoided, are minimised and remedied,
    - that the disturbance of landscapes and sites that constitute the nation's cultural heritage is avoided, or where it cannot be altogether avoided, is minimised and remedied,

- that waste is avoided; or, where it cannot be altogether avoided, minimised and re-used or recycled where possible and otherwise disposed of in a responsible manner,
- that the use and exploitation of non-renewable natural resources is responsible and equitable, and takes into account the consequences of the depletion of the resource,
- that the development, use and exploitation of renewable resources, and the ecosystems of which they are part, do not exceed the level beyond which their integrity is jeopardised,
- that a risk-averse and cautious approach is applied, which takes into account the limits of current knowledge regarding the consequences of decisions and actions,
- and that negative impacts on the environment and on people's environmental rights be anticipated and prevented, and where they cannot be altogether prevented, are minimised and remedied.

- Environmental management must be integrated, acknowledging that all elements of the environment are linked and interrelated, and it must take into account the effects of decisions on all aspects of the environment and all people in the environment by pursuing the selection of the best practicable environmental option.
- Environmental justice must be pursued so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons.
- Equitable access to environmental resources, benefits and services to meet basic human needs and ensure human well-being must be pursued, and special measures may be taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination.
- Responsibility for the environmental health and safety consequences of a policy, programme, project, product, process, service or activity needs to be honoured throughout its life cycle.
- The participation of all interested and affected parties in environmental governance must be promoted, and all people must have the opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation - and participation by vulnerable and disadvantaged persons must be ensured.

- Decisions must take into account the interests, needs and values of all interested and affected parties, and this includes recognising all forms of knowledge, including traditional and ordinary knowledge.
- Community wellbeing and empowerment must be promoted through environmental education, the raising of environmental awareness, the sharing of knowledge and experience, as well as other appropriate means.
- The social, economic and environmental impacts of activities, including disadvantages and benefits, must be considered, assessed and evaluated, and decisions must be appropriate in the light of such consideration and assessment.
- The right of workers to refuse work that is harmful to human health or the environment and to be informed of dangers must be respected and protected.
- Decisions must be taken in an open and transparent manner, and access to information must be provided in accordance with the law.
- There must be intergovernmental co-ordination and harmonisation of policies, legislation and actions relating to the environment.
- Actual or potential conflicts of interest between organs of State should be resolved through conflict resolution procedures.
- Global and international responsibilities relating to the environment must be discharged in the national interest.
- The environment is held in public trust for the people, the beneficial use of environmental resources must serve the public interest, and the environment must be protected as the people's common heritage.
- The costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or mitigating further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment.
- The vital role of women and youth in environmental management and development must be recognised and their full participation therein must be promoted.
- Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands and similar systems, require specific attention in management and planning

procedures, especially where they are subject to significant human resource usage and development pressure.

It is evident from the preceding summary that NEMA regulations are, just as the South African Constitution from which its cues are taken, very progressive. With the centre-staging of the needs of people in the act, it is inevitable that conservation-development schisms and contradictions will appear. The integration of basic needs, human rights, environmental justice and environmental conservation in the context of social, economic and environmental sustainability concerns is commendable from a statutory point of view. To ensure sustainable synergy among all the requirements as they may apply to specific environmental projects, is often very challenging for developers, environmental assessment practitioners (EAPs) and competent authorities. Sections 3.4.3 – 3.4.5 deal with specific NEMAs and their bearing on the feasibility of PA expansion.

### 3.4.3 National Environmental Management Biodiversity Act (No. 10 of 2004)

The purpose of the National Environment Management Biodiversity Act/NEM:BA (No. 10 of 2004) is:

> "… to provide for the management and conservation of South Africa's biodiversity within the framework of the National Environmental Management Act, 1998; the protection of species and ecosystems that warrant national protection; the sustainable use of indigenous biological resources; the fair and equitable sharing of benefits arising from bioprospecting involving indigenous biological resources; the establishment and functions of a South African National Biodiversity Institute; and for matters connected therewith." (NEM:BA, 2004:2)

The act also requires the responsible minister to see that a National Biodiversity Framework be established that would allow for the identification of priority areas for conservation, as well as

> "… to coordinate and align the efforts of the many organizations and individuals involved in conserving and managing South Africa's biodiversity in support of sustainable development. The Biodiversity Act specifies that the NBF must: provide for an integrated, co-ordinated and consistent approach to biodiversity management; identify priority areas for

conservation action, and for the establishment of protected areas; reflect regional cooperation issues concerning biodiversity management in Southern Africa". (NBF, 2018:3)

The publication of the threat statuses of ecosystems at all geographical scales is also allowed for by the act to ensure regional cooperation in the event when protection intervention is needed. Listed ecosystem threat statuses include:

- *Critically Endangered Ecosystems* which are at high risk and may face irreversible changes in the wake of extreme ecological degradation (primarily) caused by human activity.
- *Endangered Ecosystems* which are not critically endangered, but continuous ecological degradation poses serious risks to this category.
- *Vulnerable Ecosystems* which are ecosystems that face a high risk of undergoing significant ecological degradation.

  According to the South African Biodiversity Institute (SANBI), critically endangered and endangered ecosystems constitute collectively 2.7% and vulnerable systems 6.8% of the terrestrial system in South Africa. For the Western Cape Province, it is 4.1% and 8.4% respectively. Critically endangered ecosystems in the Western Cape constitute 2.9% which is the second highest in South Africa after Gauteng (Government Gazette, 2011). There are, therefore, from a species protection point of view, compelling arguments in favour of protection through expansion and/or stewardships to safeguard such systems - which include those at provincial level.

- *Protected Ecosystems* have conservation value and are subject to extinction if not protected – either formally by an organ of State or informally through various forms of stewardship agreements.

Table 3.1 summarises the ecosystems in the categories *critically endangered*, *endangered* and *vulnerable* in the Western Cape Province. Some of these systems are also present in the WCNP, HHNR and DNR.

**Table 3.1: Threat status of listed ecosystems in the Western Cape**

| Critically Endangered | Biome | Endangered | Biome | Vulnerable | Biome |
|---|---|---|---|---|---|
| Atlantis Sand Fynbos | Fynbos | Agulhas Sand Fynbos | Fynbos | Agulhas Limestone Fynbos | Fynbos |
| Cape Flats Sand Fynbos | Fynbos | Breede Alluvium Fynbos | Fynbos | Albertinia Sand Fynbos | Fynbos |
| Cape Lowland Alluvial Vegetation | Azonal | Cape Flats Dune Strandveld* (* Poorly protected in the DNR study area) | Fynbos | Bokkeveld Sandstone Fynbos | Fynbos |
| Central Ruggens Shale Renosterveld | Fynbos | Cape Vernal Pools | Azonal | Boland Granite Fynbos* (*Protected in the HHNR study area) | Fynbos |
| Eastern Ruggens Shale Renosterveld | Fynbos | Garden Route Granite Fynbos | Fynbos | Breede Alluvium Renosterveld | Fynbos |
| Elgin Shale Fynbos* (*Protected in the HHNR study area) | Fynbos | Greyton Shale Fynbos | Fynbos | Breede Sand Fynbos | Fynbos |
| Elim Ferricrete Fynbos | Fynbos | Groot Brak Dune Strandveld | Fynbos | Cape Winelands Shale Fynbos* (*Protected in the HHNR study area) | Fynbos |
| Knysna Sand Fynbos | Fynbos | Hangklip Sand Fynbos | Fynbos | Cederberg Sandstone Fynbos | Fynbos |
| Kogelberg Sandstone Fynbos*(*Protected in the HHNR study area) | Fynbos | Kouebokkeveld Alluvium Fynbos | Fynbos | Ceres Shale Renosterveld | Fynbos |
| Langkloof Shale Renosterveld | Fynbos | Mossel Bay Shale Renosterveld | Fynbos | Eastern Coastal Shale Band Vegetation | Fynbos |
| Lourensford Alluvium Fynbos | Fynbos | Peninsula Sandstone Fynbos | Fynbos | Eastern Little Karoo | Succulent Karoo |
| Muscadel Riviere | Azonal | Potberg Ferricrete Fynbos | Fynbos | Garden Route Shale Fynbos | Fynbos |
| Overberg Sandstone Fynbos | Fynbos | Saldanha Granite Strandveld* (*Adjacent to the WCNP study area) | Fynbos | Hawequas Sandstone Fynbos* (*Protected in the HHNR study area) | Fynbos |
| Peninsula Granite Fynbos | Fynbos | Western Cape Milkwood Forest | Azonal | Hopefield Sand Fynbos* (*Protected in the WCNP study area) | Fynbos |
| Peninsula Shale Renosterveld | Fynbos | | | Kango Limestone Renosterveld | Fynbos |
| Ruggens Silcrete Renosterveld | Fynbos | | | Kouebokkeveld Shale Fynbos | Fynbos |
| Swartland Alluvium Fynbos* (*Protected in the HHNR study area) | Fynbos | | | Leipoldtville Sand Fynbos | Fynbos |
| Swartland Granite Renosterveld | Fynbos | | | Montagu Shale Renosterveld | Fynbos |
| Swartland Shale Renosterveld | Fynbos | | | Piketberg Quartz Succulent Shrubland | Succulent Karoo |

| Critically Endangered | Biome | Endangered | Biome | Vulnerable | Biome |
|---|---|---|---|---|---|
| Swartland Silcrete Renosterveld | Fynbos | | | Piketberg Sandstone Fynbos | Fynbos |
| Western Ruggens Shale Renosterveld | Fynbos | | | Saldanha Flats Strandveld | Fynbos |
| | | | | Swartland Alluvium Renosterveld | Fynbos |
| | | | | Swellendam Silcrete Fynbos | Fynbos |

(Adapted from: Government Gazette No. 34809, 2011)
* Listed ecosystems prevalent in study areas

Based on the preceding discussion and the data presented in Table 3.1 regarding the threat statuses of ecosystems found in the chosen study areas, it can be argued that, based on NEM:BA regulations, stringent protection and/or possible expansion of the PAs need consideration. The act also requires that (a) a list of critically endangered, endangered, vulnerable and protected species be published, (b) South Africa complies with international regulatory agreements regarding trade in species, (c) organs of State should take responsibility for the control of all aspects related to the unauthorised introduction and spread of alien species into ecosystems, (d) permission be granted for genetically modified organisms to be stringently scrutinised, and (e) bioprospecting and the trade in biological resources be done in ethical and benefit-sharing ways.



In addition, Gubb (n.d.) believes that broader spatial aspects, i.e. habitats and ecosystems, of biodiversity conservation do not receive adequate attention in environmental impact assessments. Endangered and rare species are prioritised at the expense of the protection of the very physical conditions that shape the ecosystems and habitats on which such species depend. Other legislation that has links with listed ecosystem concerns includes: the National Environmental Management: Protected Areas Act (No. 57 of 2003), the National Forests Act (No. 84 of 1998), the National Water Act (No. 36 of 1998), the Marine Living Resources Act (No. 18 of 1998), the Integrated Coastal Management Act (No. 24 of 2008) and the National Heritage Resources Act (No. 25 of 1999).

### 3.4.4 National Heritage Resources Act (No. 25 of 1999)

The essence of this act is

> "… [t]o introduce an integrated and interactive system for the management of the national heritage resources; to promote good government at all levels, and empower civil society to nurture and conserve their heritage resources so that they may be bequeathed to future generations…." (NHRA, 1999:2)

The act makes provision for the effective management, primarily at provincial level, of all heritage resources and associated practices. Heritage resources include cultural, historical, as well as natural historical, assets. The NHRA mandates the South African Heritage Resources Agency (SAHRA) to oversee and execute and/or, in turn, mandate heritage-related activities at national, provincial and local level. The use of heritage resources and spaces in the chosen study-sites is also an important consideration in PA expansion or contraction as analysed in Chapters 5, 6 and 7.

### 3.4.5 National Environmental Management Protected Areas Act (No. 31 of 1998)

The overall purpose of the NEMPAA (National Environmental Management: Protected Areas Act, No. 57 of 2003) is:

> "…[t]o provide for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes; for the establishment of a national register of all national, provincial and local protected areas; for the management of those areas in accordance with national norms and standards; for intergovernmental co-operation and public consultation in matters concerning protected areas; and for matters in connection therewith." (NEMPAA, 2003:2)



Specific requirements of this act and its related amendments stipulate that:

- the State be the ultimate guardian of PAs in South Africa
- four types of PAs can be declared, namely:
    - special reserves - characterised by the conservation of highly sensitive ecosystems, biodiversity and geodiversity attributes for research purposes
    - national parks - to be declared to protect areas of national and/or international conservation significance, to protect representative samples of the country's natural systems, to protect the integrity of ecosystems and to provide sanctuaries for

environmentally compatible spiritual, scientific, educational, recreational and tourism opportunities

- nature reserves - to support and supplement the system of national parks
- protected environments - to buffer national parks and nature reserves against incompatible development

- monitoring and management of PAs be assigned to specific authorities who also have to oversee access to and/or restrictions on activities that may jeopardise the conservation mandates
- financial provision be made for the acquisition of additional land
- mineral rights may be acquired or cancelled by ministerial expropriation in PAs
- potential de-proclamation of PAs be considered very carefully with the input of all relevant interested and affected parties, as well as other stakeholders
- prescripts of the act always be read and applied in conjunction with other relevant environment-related legislation.

Some of the requirements of NEMPAA are jeopardised in the case-study areas, specifically in the DNR and the WCNP. For example, in the case of the DNR de-proclamation and the redrawing of the boundaries of the original reserve emanated from the severe impacts of informal settlements and land invasion (See Chapter 5). In the case of the WCNP, buffering through the establishment of protected environments in its proximity is to a certain extent compromised due to incompatible land-uses, such as mining and industries (See Chapter 6).



### 3.4.6 National Protected Areas Expansion Strategy (NPAES)

The National Protected Areas Expansion Strategy (NPAES) was approved as implementation strategy in 2009 to guide PA expansion and further the principles enshrined in NEMPAA. The goal of NPAES is

> "…to achieve cost-effective protected area expansion for ecological sustainability and increased resilience to climate change." (NPAES, 2010:1)

Protected areas cover terrestrial and marine environments that are protected by law and/or official agreements and are managed mainly for biodiversity conservation. (This does not necessarily exclude the conservation of geodiversity and heritage diversity, though).

South Africa's protected area network falls short of sustaining biodiversity and ecological processes as effectively as it potentially could (NPAES, 2010; Duffel-Canham, 2016; Gubb, n.d.). In this context, the goal of the National Protected Area Expansion Strategy is to achieve cost-effective protected area expansion for ecological sustainability and increased resilience to climate change. NPAES (2010:1), therefore,

> "...highlights ways in which we can become more efficient and effective in allocating the scarce human and financial resources available for protected area expansion. It sets targets for protected area expansion, provides maps of the most important areas for protected area expansion, and makes recommendations on mechanisms for protected area expansion. The common set of targets and spatial priorities provided by the NPAES enable co-ordination between the many role players involved in protected area expansion. The goal of the NPAES is to achieve cost-effective protected area expansion for ecological sustainability and increased resilience to climate change."



NPAES initiatives are included in management plans for the different categories of PAs. National parks are managed by SANParks, and their expansion initiatives form part of their park management plans. For the purpose of this study the management plan for the WCNP (namely, the West Coast National Park - Park Management Plan 2013 – 2023) forms the basis for discussions on expansion aspects of the park. The protected area management plans (PAMPS) form the basis for expansion-related discussions and analyses related to the DNR and the HHNR, which are both managed by Cape Nature as provincial conservation authority - although the DNR is, in practice, managed as an urban nature reserve. The PAMPS for these two reserves are entitled Driftsands Nature Reserve: Protected Area Management Plan, Version 1.0, 2015 and Hottentots-Holland Nature Reserve Complex, Protected Area Management Plan 2017 – 2021 respectively.

Figure 3.1 summarises two variables – namely, importance and urgency - as important proxies for the implementation of expansion priorities in relation to ecological sustainability and climate change.

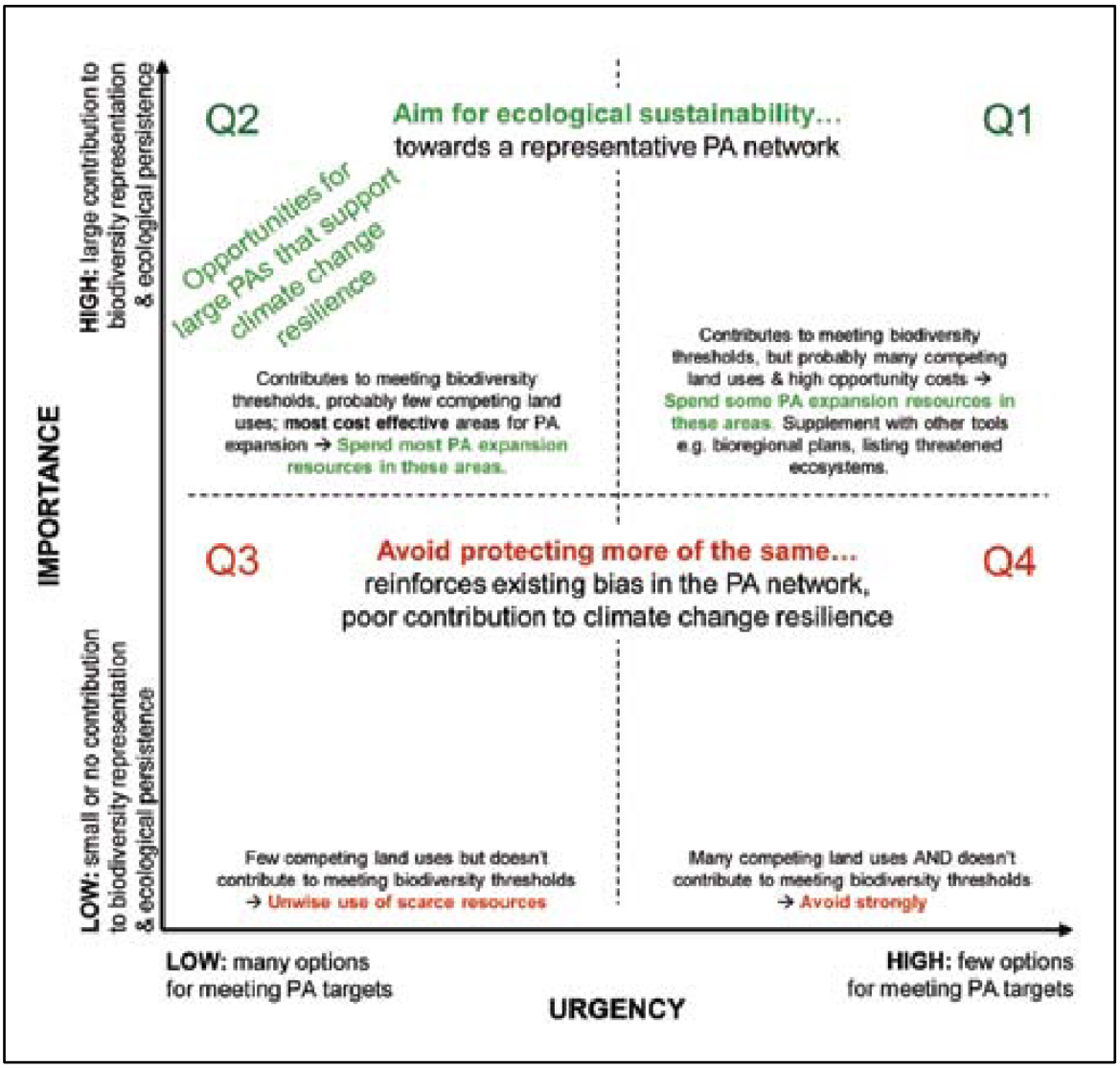



**Figure 3.1: Priority areas for PA expansion are identified based on importance and urgency**

(NPAES, 2010:4)

Inherent in NPAES is the assumption that more/larger PAs will serve the purpose of ecological sustainability, and by implication climate change resilience, more effectively. Albeit questionable whether urgency and importance will find reflection in expansion metrics, such as size and number, at local PA level, they are important from a global-systems point of view. The 2019 report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) bears testimony to how crucial the considerations of importance and urgency are in global biodiversity

conservation (IBES, 2019). According to the report, 75% of terrestrial environments and 66% of marine environments are severely altered by human actions. As ecological integrity is vital to sustaining human needs, this is indeed worrisome and, if expansion is the only intervention effective in curbing the tide of further alteration, then the importance and urgency of expansion for life-sustaining systems need to be pursued more vigorously.

## 3.5 NPAES Targets

Figure 3.2 provides an idea of the spatial distribution of areas targeted for the expansion of the conservation estate based on their levels of national conservation importance. The map displays concentrations of high-importance areas in the eastern, southern and south-western parts of the country. The spatial distributions of formal PAs in the form of national parks and provincial nature reserves are located in relative proximity to the areas classified as having high importance. Deviation from this pattern of the relative proximity of formal protected areas to areas of high expansion importance is to be found in the following regions: areas south of the Kgalagadi Transfrontier Park, areas west of the northern parts of the Kruger National Park, and some agricultural areas between the South-Western Cape Coast and the inland folding mountain ranges. The inclusion of areas with high expansion importance will change the conservation-estate map of South Africa significantly.

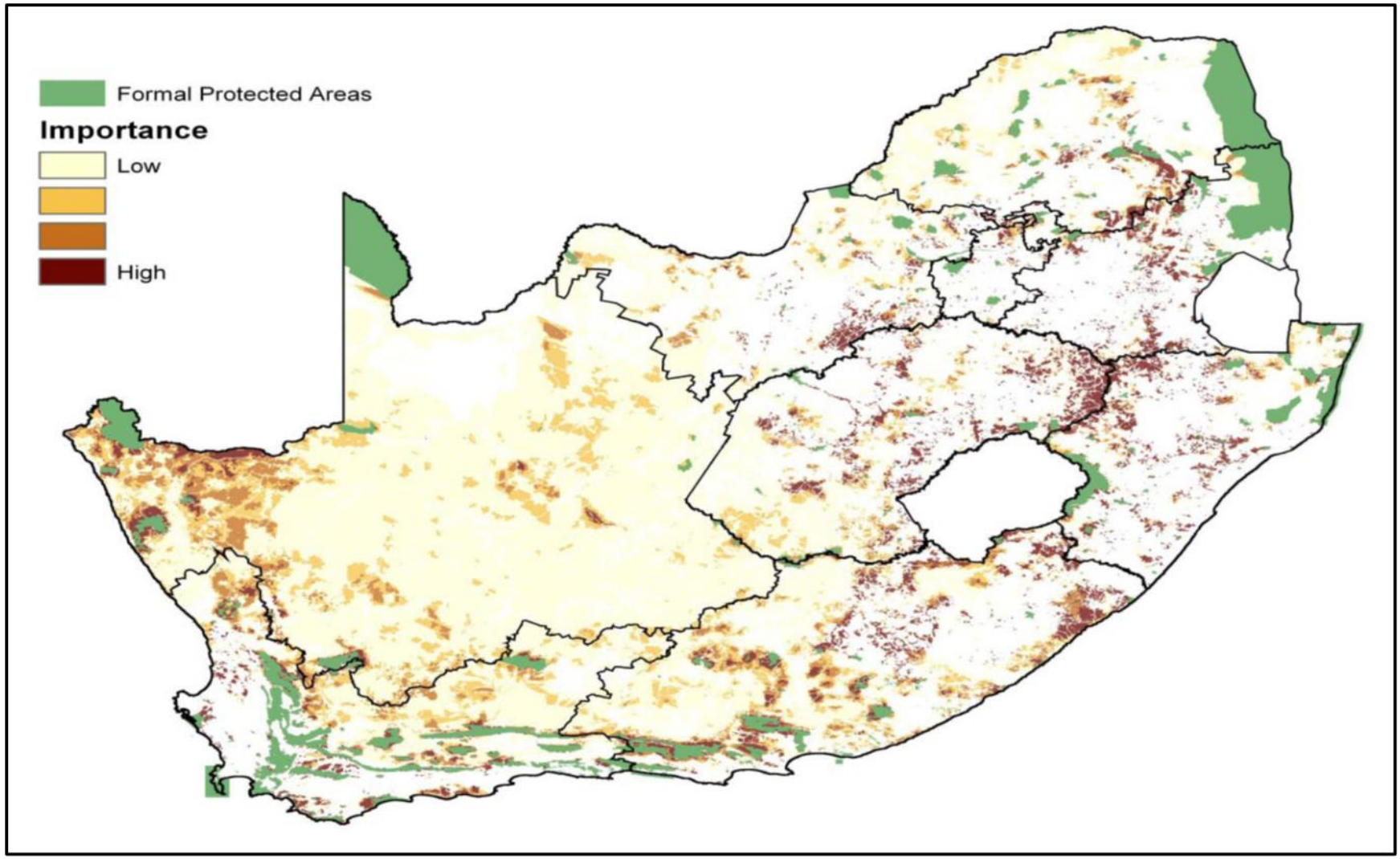



**Figure 3.2: Areas of high importance for land-based protected area expansion**

(Source: NPAES, 2009:61)

The provincial expansion targets further inform the national targeted distribution in Figure 3.2. The provincial requirements range from a 5.5% requirement for the Limpopo Province to 12.2% in the Free State. Although the requirements relate to the expansion of the protection of vegetation types in particular, they do provide benchmarks for provincial PA expansion in general.

**Table 3.2: Areas required to meet PA targets by province**

| Province | Area (000ha) | 20-year PA target (%) | Protected areas | | Required to meet 20-year vegetation type targets | |
|---|---|---|---|---|---|---|
| | | | 000ha | % | 000ha | % |
| Eastern Cape | 16 893 | 12 | 687 | 4.1 | 1 570 | 9.3 |
| Free State | 12 983 | 13 | 167 | 1.3 | 1 581 | 12.2 |
| Gauteng | 1 655 | 13 | 84 | 5.1 | 152 | 9.2 |
| KwaZulu-Natal | 9 333 | 13 | 731 | 7.8 | 842 | 9.0 |
| Limpopo | 12 575 | 11 | 1 489 | 11.8 | 687 | 5.5 |
| Mpumalanga | 7 649 | 13 | 1 168 | 15.3 | 632 | 8.3 |
| North West | 10 651 | 11 | 199 | 1.9 | 991 | 9.3 |
| Northern Cape | 37 289 | 11 | 1 582 | 4.2 | 3 333 | 8.9 |
| Western Cape | 12 945 | 13 | 1 632 | 12.6 | 1 004 | 7.8 |

(Source: NPAES, 2009:63)



Similarly, Table 3.2 summarises the targeted requirements for biomes across the provinces. Based on the urgency for expansion since the release of the first NPAES document, the most far-reaching requirements are for the expansion of Grassland, Nama Karoo, Savanna and Succulent Karoo biomes nationally. It is important to note, though, that a distinction has to be drawn between vegetation-type and biome expansion as summarised in Tables 3.1 and 3.3 respectively. Fynbos is the dominant biome that occurs in all three sites on which this study focuses. Although between 1.7% and 13.4% of all biomes nationally need to be conserved, fynbos is, relatively speaking, better off due to its (limited) natural-spatial distribution (in the Cape Provinces primarily).

**Table 3.3: Areas required to meet PA targets in each biome**

| Biome | Biome area* (000ha) | 20-year PA target (%) | Protected areas | | Required to meet 20-year veg type targets | |
|---|---|---|---|---|---|---|
| | | | 000ha | % | 000ha | % |
| Albany thicket | 2 913 | 10 | 211 | 7 | 107 | 3.7 |
| Azonal vegetation | 2 898 | 14 | 227 | 8 | 282 | 9.7 |
| Desert | 716 | 18 | 160 | 22 | 96 | 13.4 |
| Forests | 472 | 23 | 176 | 37 | 8 | 1.7 |
| Fynbos | 8 395 | 15 | 1 667 | 20 | 669 | 8.0 |
| Grasslands | 35 449 | 14 | 753 | 2 | 4 249 | 12.0 |
| Indian Ocean coastal belt | 1 428 | 14 | 97 | 7 | 110 | 7.7 |
| Nama Karoo | 24 820 | 11 | 198 | 1 | 2 600 | 10.5 |
| Savanna | 41 266 | 10 | 3 803 | 9 | 2 442 | 5.9 |
| Succulent Karoo | 8 329 | 12 | 435 | 5 | 715 | 8.6 |

(Source: NPAES, 2009:64)



## 3.6 Performance indicators for PA expansion

SANParks' legal and constitutional mandate provides a framework for its mission to

> "…develop, expand, manage and promote a system of sustainable national parks that represents biodiversity and heritage assets, through innovation and best practice for the just and equitable benefit of current and future generations." (SANParks, 2015:1)

PA expansion and its specific spatial targets form, therefore, part of the mandate of SANParks, as well as all other provincial and local conservation authorities in South Africa. (This is discussed in greater depth in Chapters 5, 6 and 7.) The following discussion provides greater detail concerning the performance indicators for PA expansion for SANParks as national conservation authority. SANParks' progress regarding PA expansion, albeit for terrestrial land only, is summarised in Table 3.4. The formal acquisition of additional land, its price, as well as partnerships with private landowners, impact on the extent to which targets are reachable within specified timeframes.

**Table 3.4: Spatial additions to SANParks conservation estate 2014/2015**

| Performance Indicator | Annual Target | Actual Performance |
|---|---|---|
| Total Area Added to National Parks (Terrestrial) | 3 715 ha | 6 125.00 ha |
| Performance Analysis | The total area added into the National Park System for the period under review was 6 125.00 ha, at a total cost of R16.034 million, which is 64,9% (equivalent of 2 410.00 ha) better performance than the planned annual target of 3 715.00 ha.<br>This performance can mainly be attributed to 3 515.16 ha of land that was acquired through the assistance of various donor funds.<br>The following is a list of properties which were added to the National Parks Systems, per national park:<br>▪ Tankwa Karoo National Park – Farm Taaibosch Plaat (Northern Cape) = 2 194.8390 ha;<br>▪ Agulhas National Park – Portion 61 of farm Paapekuil Fontein No. 281 (Western Cape) = 415.0045 ha;<br>▪ Agulhas National Park – Portion 14 of farm Paapekuil Fontein No. 281 (Western Cape) = 359.5727 ha<br>▪ Table Mountain National Park – ERF 16852 Fish Hoek (Western Cape) = 65.4722 ha;<br>▪ Table Mountain National Park - Portion 97 of Cape Farm 953 (Western Cape) = 133.9415 ha;<br>▪ Namaqua National Park – Portion 2 of the farm Niewe Plaats No. 445 (Northern Cape) = 1879.1773 ha;<br>▪ Namaqua National Park – Portion 24 of Ouss 463 (Northern Cape) = 648.4835;<br>▪ Namaqua National Park – Portion 12 of Ouss 463 (Northern Cape) = 428.5099 ha. | |
| Planned Improvement/ Corrective Actions) | Performance in this regard is satisfactory given recent economic conditions, and the difficulty of concluding earmarked land acquisition deals. | |

(Adapted from SANParks, 2015:60)



It is evident that spatial expansion was limited to primarily the so-called Cape Cluster of SANParks' PAs, despite the fact that the actual performance exceeded the annual target of 3175 ha by a significant margin. A noticeable exception to the list is the West Coast Nation Park that forms part of this study.

At provincial level, certain areas mostly located close to existing PAs are prioritised for expansion. Figure 3.3 indicates the NPAES categories as they pertain to areas in the Western Cape Province. The pattern of negotiated land awaiting formal declaration or finalisation of agreement of some sort with presumably private landowners, also displays spatial distributions that are mostly in proximity to formal PAs. Some negotiated land is more spatially isolated, though, as can be seen in areas in the Central and Little Karoo. Although land expropriation falls outside the scope of this study, it is important to acknowledge the role that of protected area declaration can play as a protection mechanism against expropriation (Xaba and Akinola, 2022).

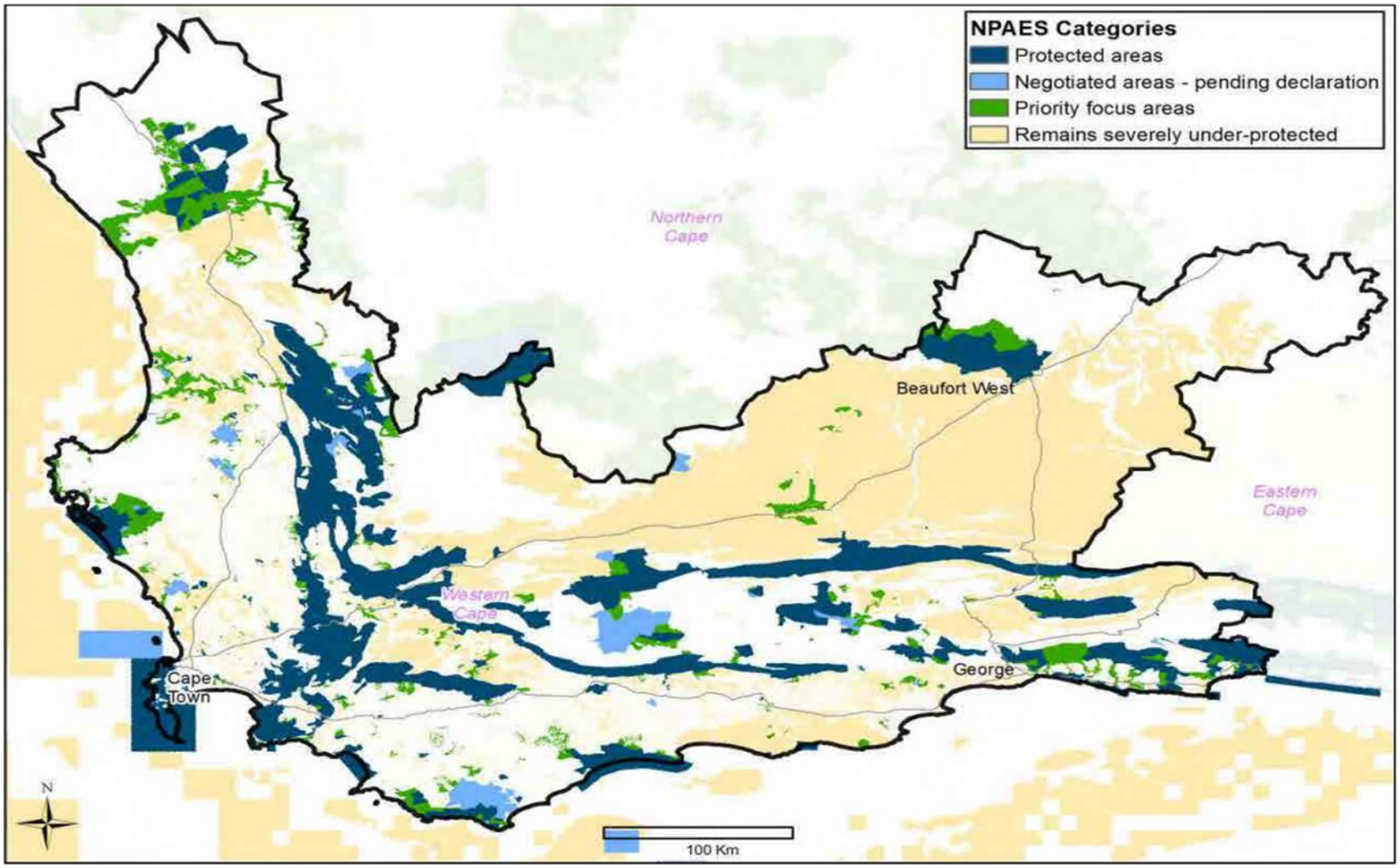



**Figure 3.3: Categories of protected area expansion in the Western Cape**

(Source: DEA, 2016:44)

Prior to the 2014/2015 period, SANParks exceeded its PA targets (as evident in Table 3.4). Since the period mentioned, the organisation's PA expansion initiatives have tapered off as captured in its 2019/2020 annual performance plan (SANParks, 2019/2020). SANParks' Strategic Objective 1 (Table 3.5) which strives to improve the organisation's "contribution to a growing national and global conservation estate" (SANParks, 2019:38) is fundamental as a context to this study. However, it is reported that only 3847 hectares (added to the Tankwa Karoo National Park) were added to SANParks' total conservation estate in the 2017/2018 reporting period.

**Table 3.5: SANParks' Strategic Objective 1**

| Strategic Objective | Objective Statement | Baseline (2017/18) | Performance indicators | Target 2023/24 |
|---|---|---|---|---|
| SO: 1. Improved contribution to a growing national and global conservation estate | To improve the national and global conservation estate through effective and efficient land inclusion mechanisms | 3 847 ha was added to the Tankwa Karoo NP | Total terrestrial area acquired for inclusion in national parks in accordance with the Land Inclusion Plan and other mechanisms in support of national and global expansion targets | 13 459 ha (cumulative)<br>(4 169 ha) |
| | | Redefined Indicator | Percentage implementation of planned activities undertaken for the 3 new MPAs managed by SANParks | 95% of planned activities implemented for the 3 new MPAs managed by SANParks |

(Adapted from SANParks, 2019:38)



The baselines and performance indicators of Strategic Objectives 2 and 3 are also very relevant to this study as captured in SANParks' Annual Performance Plan for 2018/19 and Table 3.6 (SANParks, 2019). With its Objective 2, SANParks aims to achieve "effectively and sustainably managed ecosystems, species and cultural heritage resources across biomes" (SANParks, 2019:39), and its Objective 3 aims to facilitate "sustainably utilised resources for fair and equitable sharing of benefits."

**Table 3.6: SANParks Strategic Objectives 2 and 3**

| Strategic Objective | Objective Statement | Baseline (2017/18) | Performance indicators | Target 2023/24 |
|---|---|---|---|---|
| SO: 2. Effectively and sustainably managed ecosystems, species and cultural heritage resources across biomes | To effectively and sustainably manage ecosystems, species and cultural heritage resources across biomes | New Indicator | Implementation of planned transfrontier conservation activities | 95% implementation of the planned annual activities |
| | | Existing indicator with new measure | Tracking park management effectiveness through the number of national parks achieving a METT score of ≥67% and progress against identified corrective actions | 100% of parks achieving a METT score of ≥67%<br>100% progress against identified corrective actions |
| | | 100% of activities in Rhinoceros Management Strategy were implemented | Percentage implementation of Annual Rhinoceros Plan | 95% implementation of the cumulative Rhinoceros Plan activities |
| | | 476 rhino poached | Number of rhino fatalities reduced due to poaching in KNP and the 6 rhino parks | ≤500 poached rhinos |
| | | The Elephant Management Implementation Plans approved | Percentage implementation of Annual Elephant Plan | 95% implementation of the cumulative Elephant Plan activities |
| SO: 2. Effectively and sustainably managed ecosystems, species and cultural heritage resources across biomes | To effectively and sustainably manage ecosystems, species and cultural heritage resources across biomes | Draft Cultural Heritage Strategy developed and 88% of the scheduled annual cultural heritage activities implemented | Percentage implementation of Cultural Heritage Plan | 95% implementation of cumulative activities in the Cultural Heritage Plan |
| | | New Indicator | Improved climate change preparedness | Climate change vulnerability assessed and preparedness plans developed<br>Ongoing implementation of plans |
| | | New Indicator | Percentage implementation of activities in the Annual Research Plan, informed by the Research Strategy | 95% implementation of the cumulative activities outlined in the Annual Research Plans |
| | | New Indicator | Percentage of the Air Wing Strategy developed and implemented | 95% of the Air Wing Strategy developed and implemented |
| | | Initial: 44 519 ha | Total hectares of land rehabilitated/restored | Initial: 35 000 ha |
| | | Follow-up: 199 443 ha | | Follow-up: 198 000 ha |
| | | Wetlands : 6 467 m³ | | Wetlands: 6 800 m³ |
| | | Readiness audit of 5 identified parks and baseline determined 2.22.% increase | Percentage reduction in fossil fuel generated consumption Parks and Kruger | 2% reduction on baseline of all parks |
| | | Readiness audit of 5 identified parks and baseline determined 7.34% increase in water consumption | Percentage reduction in water consumption in parks and the Kruger | 2% reduction on baseline of all parks and the Kruger |
| SO: 3 Sustainably utilised resources for fair and equitable sharing of benefits | Sharing of benefits from sustainable resource utilisation | 89.4% of planned actions implemented | Percentage implementation of the SANParks Wildlife Economy and Sustainable Use Programme | 95% implementation of the cumulative Annual Resource Utilisation Plan |

(Adapted from SANParks, 2019:39)

It is also important to acknowledge that additions to the conservation estate, albeit not via organs of State per se, can effectively be driven by partnerships and stewardships. Shumba et al. (2020) provide a map (Figure 3.4) depicting how private land conservation areas (PLCAs) are distributed nationally under the auspices of agreements rooted in NEMPAA, contractual law and informal arrangements. It is evident from the map that private land conservation areas, such as private nature reserves and biodiversity agreement areas, dominate the PLCA estate nationally with notable concentrations in Limpopo, Mpumalanga and the Western Cape provinces. Informally protected conservancies and conservation areas are far less prevalent nationally.

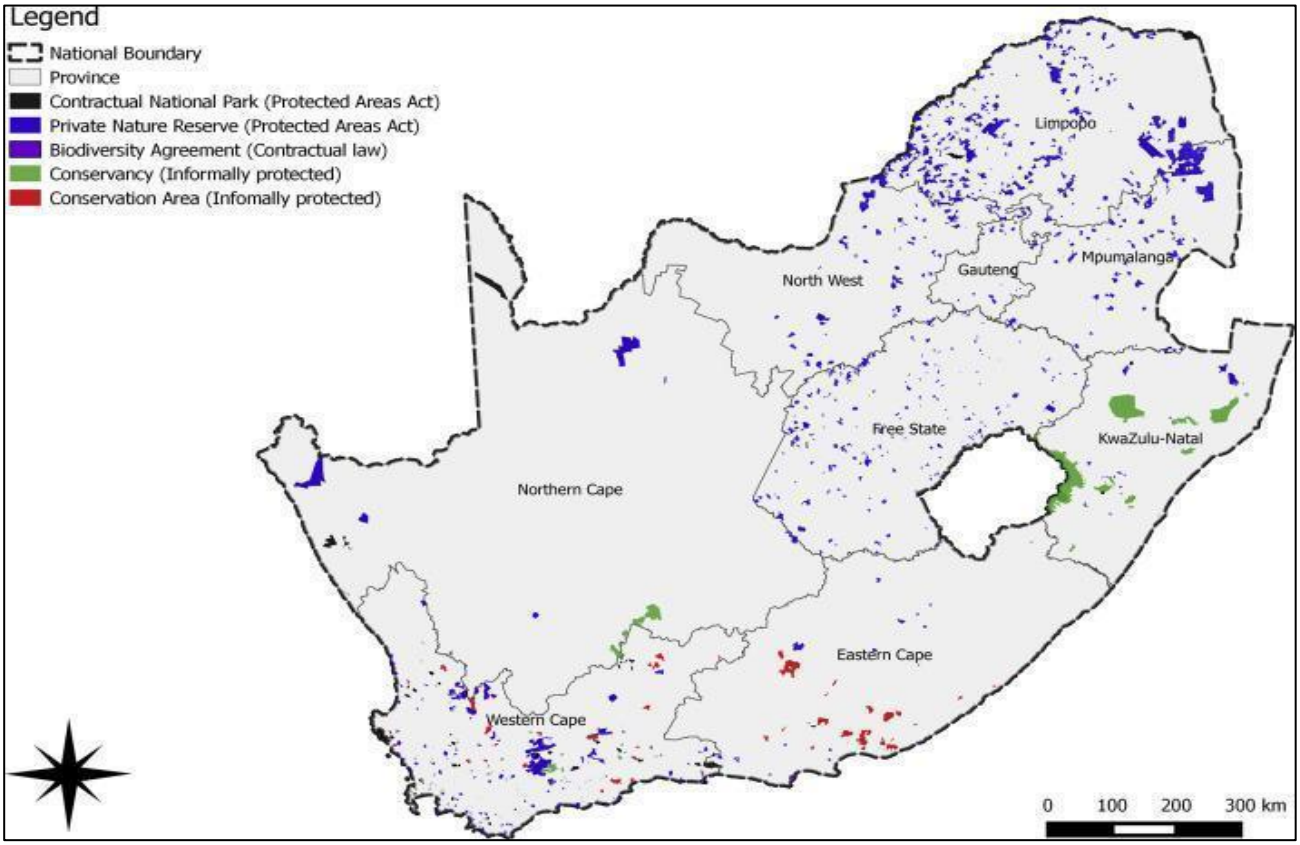



**Figure 3.4: PLCAs and their legislative management categories**

(Shumba et al., 2020)

## 3.7 Conclusions

The apparent conservation-resource use schism highlighted in Chapters 1 and 2 is inherent in the spatial-legal aspects that guide PA expansion. The discussion in this chapter has focused on the importance of understanding how legal/policy instruments and governance (can) influence and determine to what extent PA expansion is feasible. South Africa's environment-related legislation is, just as its overarching constitution, progressive and tries to strike balances between conservation and development concerns. The responsiveness of legislation (acts, policies and strategies) to changes in biophysical and human-induced realities is incumbent on government and the different structures responsible for environmental and conservation management. The evolution of environmental legislation displays a temporality that needs to be understood against the background of changes in - and challenges manifested at - local, global and national scales.

As South Africa is a signatory to international treaties and agreements, it is important that its legislation and the applications thereof are in line with and adhere to globally acceptable standards and practices. The country's 2019 Draft National Climate Change Adaptation Strategy (NCCAS) is an example of how national mandates feed into the global ones – in this case the Intergovernmental Panel on Climate Change (IPCC) (DEA, 2019).

It is also important to realise that the responsiveness of legalisation and the efficient application of the latter will always be influenced by the socio-economic and developmental mandates of the South African government. An appreciation of the complexity of this socio-ecological nexus is, therefore, always important. Virapongse et al. (2016) believe that the integration of the insights that can be derived from the natural and social sciences are vital in any attempt to address socio-ecological challenges. Socio-ecological systems approaches are, therefore, vital in any scholarly, policy and practitioner discourses when challenges facing PA expansion are involved.

# CHAPTER 4: METHODOLOGY AND DATA GATHERING

The rationale, planning and execution of the information and data gathering process are being discussed in this chapter. As this study aims to assess the impacts that conflicting and/or synergistic conservation and resource uses have on the feasibility of the expansion of selected protected areas in the Western Cape, the following objectives (as explained in Chapter 1) need to be considered:

- At the conceptual level, conservation - as a practice largely facilitated and defined by the notion of a protected area - is revisited against the background of the imperatives driving the expansion of the conservation estate at different geographical scales.
- At the policy level, conservation - as guided and facilitated by South Africa's policies and strategies, such as the National Environmental Management Act/NEMA (Act 107 of 1998), the National Environmental Management: Protected Areas Act/NEMPAA (Act 57 of 2003), the National Protected Area Expansion Strategy/NPAES (2008) and the South African Heritage Resources Agency (SAHRA) - is used as context for protected area expansion imperatives in the Western Cape.
- At the management level, against the background of the conservation value of the biodiversity, geodiversity and cultural diversity of the Western Cape, the historical and current uses of terrestrial and marine resources in, or in proximity to, protected areas are analysed through case studies of the West Coast National Park (WCNP), Hottentots Holland Nature Reserve (HHNR) and Driftsands Nature Reserve (DNR).
- Finally, a feasibility analysis of the impacts of resource-usage and conservation relationships is provided. Spatial variables, such as size, shape, temporality, association and accessibility of the chosen PAs, are analysed and their impacts on resource uses of different stakeholders assessed.

The study follows a mixed method approach in which quantitative and qualitative data and information are subjected to spatial analyses. Spatial analysis refers to the study and analysis of factors influencing locational variations of phenomena, patterns and processes in a specific area or across different areas. Interviews were conducted with reserve managers, resource users and other stakeholders involved in tourism and recreation in and around the study sites.

## 4.1 Introduction

The credibility of research is influenced by approaches, paradigms, methodologies and tools, as well as how effectively these different elements are woven into the different stages of the research process (Kinash, n.d.; Myers & Well, 2003). The different stages are preceded by an epistemological appreciation of what is reflected in reality and how it can be interpreted. Epistemology refers to

> "…the study or a theory of the nature and grounds of knowledge especially with reference to its limits and validity." (Merriam-Webster Dictionary, 2017)

It is the branch of philosophy that questions the origin, refinement and application of knowledge and is, therefore, fundamental to how phenomena can or should be interpreted. Epistemology is normally appraised in positivist or constructionist terms. Positivism refers to the belief system that attributes objective, independent and inherent value to phenomena as they exist, i.e. without the influence of social agencies. It can be defined as the

> "…assumption that all true knowledge is scientific, is grounded on facts or experience, and completely represented by observable phenomena and scientifically verified facts." (Clark, 1998:318)



The quantitative revolution in geography between 1950 and 1960 was based on positivism. Geographers, in their attempts to garner (more) scientific recognition from fraternities in the natural sciences, went to great lengths to explain social phenomena, processes and spatial theories through the application of mathematical and statistical techniques. Physical geography was enhanced by a more pronounced emphasis on the rigour associated with numerical output of data (Holt-Jensen, 2009). Constructivism and interpretivism, on the other hand, consider all phenomena to be socially constructed. It is, therefore, incumbent on researchers to search for deeper meaning in what seems to be the obvious.

Paradigms represent assemblages and mixtures of dominant interpretations as to how reality can be viewed and interpreted. Geography is characterised by dominant paradigms, such as regional, spatial and human-environment analyses (Hartshorne, 1959; Clark, 1998; Holt-Jensen, 2009).

A research approach can be considered a reflection of how methods of data/information gathering and analysis are used to give meaning to such data and information beyond what they tell us of their phenomena, patterns and processes in reality (Creswell & Plano Clark, 2017). The two broad categories of quantitative versus qualitative data are problematic, specifically if research of an integrated nature is conducted (Creswell, 2009). The gathering of information of a more subjective nature is often mistakenly equated with qualitative approaches. A quantitative approach, within which numerical data on more objective and quantifiable phenomena are collected, rearranged and ordered - and in most cases statistically analysed - may be applicable as well in the case of less quantifiable phenomena, such as perceptions and behaviour (Gomez & Jones III, 2010). Statistical manipulation and analysis of more qualitative phenomena in behavioural sciences, such as psychology and sociology, are examples of the switch from qualitative to quantitative data gathering and analysis (Creswell, 2009; Corder & Foreman, 2014). Qualitative information is categorised and aggregated to facilitate quantification of subjective phenomena. The launching of opinion poll surveys for market research purposes are also examples of such switches.

Research is fundamental to the generation of new knowledge, as well as the critical engagement with existing knowledge. The generation of and critical engagement with knowledge are, in turn, dependent on how an investigation is being looked at theoretically (paradigm), is academically rooted in an appropriate discipline(s) for such investigations (approach), and how it will be conducted (method). Academic disciplines are not necessarily only defined by the content and scope of what is being studied, but also how it is studied, i.e. referring to the defining method(s). A study of the relationship between kindergarten education and performance in primary school may be classified as a study in educational preparedness - but can also be seen as geographical if a spatial analysis (methodology) of the patterns and processes of performance in certain spaces is being investigated. The research process is further influenced by the nature and extent of the theme, phenomenon, pattern or process under investigation and requires a research design/plan to execute the investigation in order that the objectives that normally support the aim of the research can be realised. Kinash (n.d.:6) summarises the often blurry distinctions between the paradigms, methodologies and methods, which guide research approaches, as follows:

> "Paradigms are the theoretical mindsets, or collections of beliefs, that underlie our approach. Methodologies are discipline-specific approaches and processes of our research. Methods are the specific ways in which we go about collecting our research data."

General research approaches, some of them more applicable than others pending on the nature and extent of an investigation, include the following quantitative, qualitative, mixed/pragmatic methods and reflexive/advocacy research. Geographical investigations can easily draw on all of them due to the varied nature of Geography as a multi-faceted academic discipline (Gomez & Jones III, 2010). The following definition of the International Charter on Geographical Education of the International Geographical Union (IGU) encapsulates the breadth of Geography's interests, methodologies and potential very aptly:

> "Geography is the science that seeks to explain the character of places and the distribution of people, features and the events as they occur and develop over the surface of the earth. Geography is concerned with human-environment interactions in the context of specific places and locations. Its special characteristics are its breadth of study, its span of methodology, its synthesis of work from other disciplines including the physical sciences and the humanities and its interest in the future management of people-environment inter-relationships." (IGU, 1992:4)



The advantages and disadvantages of the application of different paradigms, approaches, techniques and tools need to be appreciated in the conceptualisation, data collection, analysis and synthesis stages of any investigation. Figure 4.1 illustrates the conceptual and methodological aspects of this study which draws largely on the encircled components in Figure 4.1.


**Figure 4.1: Main conceptual and methodological elements of the study**

The following sections deal with quantitative, qualitative, mixed methods and reflexive/advocacy research approaches as contexts for the methodological aspects of, and approach to, this study.

## 4.2 Quantitative Approach

A quantitative approach involves the collection, rearrangement and manipulation of data into numerical formats that can be subjected to statistical calculations and analysis. This approach carries the tags of objectivity, empiricism and positivism, i.e. the philosophy that attributes value and meaning to results that are derived from some form of mathematical verification/proof based on data collected in structured/empirical ways. It, therefore, does not really encompass the metaphysical which, in turn, accommodates the nuances in decisions, feelings, opinions, morality, etc. Statistical analysis allows for the setting of numerical benchmarks against which the reality that is investigated can be measured in order to reach conclusions (Giddings & Grant, 2007; Gomez & Jones III, 2010). Statistical applications normally take the form of summary or descriptive statistics and/or inferential statistics.

Summary statistics, which are based on measures of central tendency (i.e. calculation of means, mediums and modes), measures of dispersion (i.e. calculation of range and quartiles) and measures of the spread of data (i.e. calculation of variance and standard deviation), are fundamental to univariate and bivariate analyses (Myers & Well, 2003; Gomez & Jones III, 2010). By applying inferential statistical methods, the significance and validity of relationships/correlations and orders in data are adjudicated through the calculation of measures, such as Student's t-distribution and Spearman's correlations (Myers & Well, 2003; Corder & Foreman, 2014).

Quantitative approaches have wide application value across academic disciplines, specifically in the natural sciences. It normally leads to the formulation of a hypothesis that can be rejected or accepted as a means to answer a research question. Hypotheses, as basic predictions of the strengths between variables that may influence the issue under investigation, normally draw on tools for enumeration, such as check lists, observation schedules, replication of laboratory tests, etc. The quantification of research results in an attempt to make sense of complex realities is often seen as objective and superior to results that draw upon less quantifiable variables, such as feelings, opinions and behaviour (not that the latter cannot be enumerated, though). Geography, as a discipline, went through its own so-called Quantitative Revolution in the 1950s and 1960s. The belief of Hartshorne (1959) that Geography is an idiograhic science, i.e. a science that can explain uncertainties based on the uniqueness of individual phenomena under investigation, bears testimony to this almost 'law-giving' period in the history of the discipline (Holt-Jensen, 2009). Geography as nomothetic science, i.e. dependent on the formulation of theory and models to explain reality, often contrasts the idiographic stances in the discipline (Lyman & O'Brien, 2004).



## 4.3 Qualitative Approach

Qualitative research is based on the analysis of the social construction of reality and questions the role of variables, such as culture, beliefs, power, economy, etc. in the process of meaning-making. Qualitative approaches attempt to record and analyse the complex associations between experiences, beliefs, emotions, etc. The approach is associated with constructivism in which the concept of objectivity is a non-entity (Lyman & O'Brien, 2004; Gomez & Jones III, 2010). Researchers often use the richness of the complexities of the more subjective notions in such studies to generalise about a larger group/phenomenon/process.

Such research is also considered to be inductive rather than deductive, on which the quantitative approach is dependent. An inductive approach looks at the investigated phenomenon through a theoretical lens and allows for more flexibility in the data collection methods. The theoretical lens provides a framework for an investigation. Qualitative approaches often take the form of a survey that includes the gathering of data/information through typical tools, such as interviews, focus group discussions and participant observation. Questionnaires are often (mistakenly) included in this suite of tools. The quantification of questionnaire results from which statistical deductions can be made makes it more fitting for quantitative analyses.

It is important to emphasise, though, that the qualitative and quantitative approaches are not necessarily mutually exclusive and are often used in combination to enrich research. In doing so, the typical assertion that qualitative research is less scientific, is then addressed. As this study does not focus on the verification of the metrics and quantification of PA expansion, but rather on an understanding of the spatial variables that influence it, a greater focus will be placed on the qualitative aspects of the variables.

## 4.4 Mixed Methods Approach

Mixed-methods research (MMR) has taken up the theoretical-methodological space created by the apparent quantitative-qualitative divide and is positioned to address the challenges posed by multi-layered and more integrated investigations. MMR is often referred to as the third paradigm and is often equated with pragmatic approaches to investigations (Johnson et al., 2007; Hildebrand, 2008). It uses appropriate (and the most suitable) method(s) to collect, analyse and reflect on research data/information derived from quantitative and qualitative approaches and tools. Pragmatism is

> "…dealing with the problems that exist in a specific situation in a reasonable and logical way instead of depending on ideas and theories." (Merriam-Webster Dictionary, 2017)

MMR's relationship with pragmatism is often argued from the point of practical applications, determined by deliberate thought processes that can influence/ensure certain outcomes (Hildebrand, 2008; Terrell, 2012; Headley & Plano Clark, 2020). It, therefore, does not necessarily define manifested phenomena, patterns or processes as results or functions of the evidence gathered

(quantitative), and does not necessarily attribute them to the complexities of social construction (qualitative) either.

Pragmatism, although not excluding the importance of the more subjective and qualitative aspects of reality, contends that aspects, such as meaning, knowledge, language, science, etc., are best judged by their practicality and applicability rather than by considerations that are more abstract (Parviaz, et al., 2016). Pragmatism, as a philosophy,

> "…emphasizes the practical application of ideas by acting on them to actually test them in human experiences" (Gutek, 2014:76).

Mixed methods, therefore, provide for the strengthening of research through triangulation, i.e. drawing upon multiple resources for reliability and verification of results. The following are the traditional types of triangulation (Casey & Murphy, 2009; Bans-Akutey & Tiimub, 2021):

- Data triangulation – the use of a variety of data sources
- Investigator triangulation – the involvement of multiple research partners
- Theory triangulation – the use of different perspectives to interpret results
- Methodological triangulation – the use of multiple techniques and tools to study a research problem



An example of data triangulation in the context of this study is the use of opinions (qualitative information) obtained from livestock herders in the DNR to reflect on whether the realignment/redrawing (quantitative information) of the reserve's fence, as proposed by the conservation authorities, makes practical and environmental sense in the context of the reserve's biodiversity mandate and challenges posed by the surrounding socio-economic conditions. This sense-making can then, in turn, be considered as theoretical triangulation against the background of the preceding discussions on the spatial challenges facing fortress, neoliberal and convivial conservation.

Johnson et al. (2007:3) further consider mixed-methods research as

> "…an approach to knowledge (theory and practice) that attempts to consider multiple viewpoints, perspectives, positions, and standpoints (always including the standpoints of qualitative and quantitative research)."

MMR should not be seen as the ultimate solution to the quantitative-qualitative schism. There is valid critique of MMR that needs to be considered in the planning of research. Giddings and Grant (2007:52) consider MMR a 'trojan horse' for positivistic-quantitative preference in academic disciplines that provides impetus to the resurgence of the value attached to more 'objective' knowledge. Creswell and Plano Clark (2017:9), in a further critique of MMR, note that

> "...quantitative researchers are in the background, and their own personal biases and interpretations are seldom discussed. Qualitative research makes up for these weaknesses. On the other hand, qualitative research is seen as deficient because of the personal interpretations made by the researcher…the combination of both approaches can offset the weakness of either approach used by itself."

In a reflection on the theoretical and methodological longevity - insinuating the 'death' of MMR - Symonds and Gorard (2008:6) further argue that,

> "…[i]f all methods and evidence can be equally subjective (or objective) then a mixed methods paradigm offers us nothing further in this regard."



It is important, therefore, to acknowledge the strengths and weaknesses of any paradigm/approach and that a combination of the quantitative and the qualitative can 'offset' the weakness of either approach (Cresswell & Plano Clark, 2017). The other challenges of MMR are captured in the so-called Five Ps identified by Cameron (2011). The Five Ps include: paradigms, pragmatism, praxis, proficiency and publishing and can be related to the challenges that MMR faces in terms of

> "…its own philosophical, theoretical, methodological, analytical and practical foundations and constructs for the conduct of MMR." (Cameron, 2011:96)

For the purpose of this multi-layered study, MMR, despite its weaknesses, was used as an approach and framework for the accumulation of information and data regarding protected area expansion in the case-study areas. PA expansion is comprised of numerically quantifiable (official secondary data),

as well as more complex qualitative elements (primary data). The latter form the essence of the investigation in this study.

## 4.5 Participatory/Advocacy Research

This approach is based on researchers' beliefs that none of the qualitative, quantitative or mixed-methods approaches address the plight of certain groupings of people, especially the poor and vulnerable. It is often underpinned by strong ideological and political convictions that are driven as means to have tangible outcomes for people. Affected people are often involved in the research itself and become co-researchers and shapers of their own destinies. The researcher may also be part of the affected group, and that relationship can then, in turn, lead to additional critique of this approach for being overtly subjective. The involvement of affected people in the research allows for structured ways to include them at appropriate stages of the research. It is, therefore, a move away from rapid extraction and appraisal of information from the research subjects. The interchangeability of the roles of the researcher and the researched can cause methodological blurriness but also lends some emancipatory power - and eventually a sense of ownership - to the affected and the disenfranchised. This approach has wide application in policy formulation and the active involvement of people in social justice issues (Gilbert, 1997; Lyons, 2010; Alderman, 2017; Advocacy Research, 2018).



Section 4.6 provides a basis for the links between MMR (as methodological approach) and spatial analysis (as paradigm/theoretical framework) for this study.

## 4.6 Mixed-Methods Research and Spatial Analysis

The application value of different approaches in academia in general, and geography in particular, needs to be (re)assessed continuously. A study of this nature lends itself to a variety of possible approaches – ranging from critical, problematising approaches, such as Marxist interpretations of nature and conservation, to more pragmatic approaches in which the very locational manifestations of conservation-related phenomena are being analysed.

As spatial analysis is trying to make sense of the existence of phenomena, the patterns that they form and the processes that underpin the formation of such patterns, the assumption is that spatial heterogeneities instead of spatial homogeneities are perhaps more the rule than the exception in

geographical space (Cloke & Johnston, 2005; Simin, 2012). Against the background of the aforementioned, it can be assumed that any location will have uniqueness if compared to other locations. Each location has, therefore, inherent spatial dependency on whatever condition or set of conditions are prevalent, and the different spatial processes that will result from such dependencies.

Inherent in this understanding, and by implication a drawback of spatial analysis, is that its parameters/indicators under investigation cannot necessarily account for all the spatial dynamics at any given location. This drawback can, however, add theoretical strength to its application if it is used in combination with other frameworks and techniques (Fotheringham et al., 2000). Therefore, in this study the integration of spatial analysis and mixed-methods research was followed.

The analysis of phenomena, as they manifest in geographical space, often yields additional dimensions to discipline-specific interpretations. Spatial analysis, as a broad paradigm in geography, can contribute to such additional dimensions. The improvement in information technology, social networks, remote sensing, global positioning systems (GPS) and geographic information systems (GIS) has boosted spatial analysis options significantly in recent years.

> "Spatial analysis is a research paradigm that provides a unique set of techniques and methods for analysing events — events in a very general sense — that are located in geographical space. … Spatial analysis involves spatial modelling, which includes models of location-allocation, spatial interaction, spatial choice and search, spatial optimisation, and space-time." (Fischer, 2006:17)

Critique of spatial analysis ranges from ethical discontent concerning its historical applications in conflict and war situations to critique of its quantification of complex spatial relationships and map-dominated assertions. Paliou et al. (2014:117) categorise the critique of spatial analysis into two main arguments. The first category is premised on postmodern stances on the context of people's experiences that are often reduced to the mapping of complex place-space nuances. They believe that "…the map-like, geometric idea of space that underpins formal spatial analysis is…problematic."

The second category focuses on the phenomenology of other, more complex, sensory experiences of space and how that is visually represented. Visualisation through spatial techniques "artificially privileges the visual over other aspects of bodily engagement, notably the other senses" (Paliou et al.,

2014:117). Complex spatial behaviour can, therefore, not simply be modelled and reduced to the quantification of spatial metrics.

Protected area (PA) expansion, albeit fundamentally spatial, is in essence rooted in political decision-making and compromises that have to be reached among the biodiversity, geodiversity, heritage and developmental agendas of conservation authorities. Protected area management plans (PAMPs) provide guidelines and set the parameters within which such compromises can ideally be reached. Analyses (largely based on conservation-people considerations) of expansion and/or contraction of PAs are contained in the PAMPs of PAs.

As this study used the analysis of the relationships between resource-usage and conservation as a theoretical and practical lens to assess the feasibility of PA expansion, it did not involve spatial modelling. It focuses on the description and analysis of spatial-analysis elements, such as size, shape, place, space, accessibility, temporality and association, as they apply to PA expansion options contained in the PAMPs of the case-study areas.

Creswell (2009:224) identifies the fundamentals of MMR by focusing on how four selection criteria can influence six data collection strategies. The four selection criteria are: timing of data collection, weighting the importance of quantitative or qualitative data acquired or a balance thereof, mixing and merging of data, as well as aligning the methodology with the theoretical framework of the study.



Figure 4.2 summarises MMR data models and data collection strategies that are also influenced by the four data selection criteria in one way or the other.

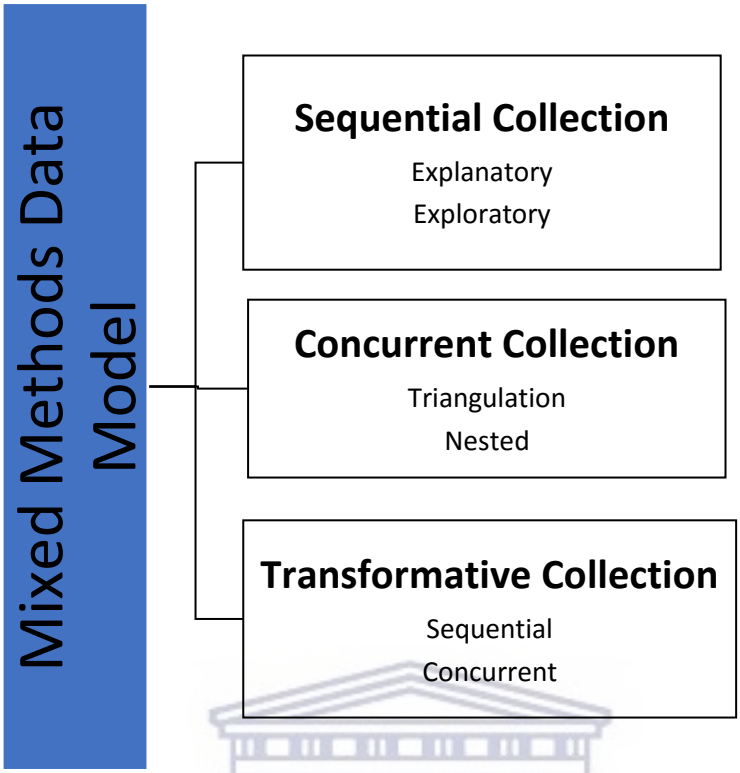



**Figure 4.2: Mixed-Methods Research Models and Data Collection Strategies**

(Adapted from Creswell, 2009:224)

The four MMR criteria apply differently across the spectrum of the three case-study areas as the conservation and management priorities for PA expansion vary between the DNR, HHNR and the WCNP. The conservation and management priorities of PA expansion are further compounded by the nuances of the place-space attributes of the PAs under scrutiny. The DNR on the Cape Flats is, for example, plagued by complex conservation-community relationships that are often manifested in contentious resource uses that are generally in conflict with the conservation mandate of the reserve (Saul et al., 2015). PA footprint and expansion challenges are, therefore, far more prioritised in the DNR compared to the HHNR, for example. In the latter, community and development challenges are not as problematic – making the spatial expansion of the reserve far less contentious (and urgent).

## 4.7 Application of the four MMR criteria to the research methods of the study

### 4.7.1 Timing of data collection (concurrent or sequential)

The study's needs for data were better served by concurrent data collection – no fixed temporal sequence in data collection was necessary. Data collection in the three case-study areas occurred simultaneously/concurrently with the secondary information on PA expansion as contained in their PAMPS. Conversations/interviews with resource-user groups that provided primary information started in 2015 and were pre-arranged - based on the availability of respondents or user-group representatives. Multiple visits for the purpose of observation and gathering photographic footage also provided the opportunity for impromptu conversations with resource users. In the case of the DNR resource users, such as livestock herders and sand dune miners, as well as residents of informal settlements (Green Park and Los Angeles) in the reserve and unemployed youth/leisure seekers of the neighbouring Mfuleni township, could be consulted more than once.

### 4.7.2 Weighting of data sources (qualitative/quantitative/combination)

In the assessment of expansion prospects, numerical data are crucial as they quantify and measure the need to protect vulnerable biodiversity, geodiversity and heritage attributes and/or to expand the conservation estates within which such attributes occur. Scientifically, quantifiable data are, therefore, a prerequisite for spatial expansion considerations. On the other hand, it is also important to acknowledge the fact that, as illustrated in Chapter 2, PAs are social constructs, often superimposed onto cultural landscapes that may also be occupied by people (Naughton-Treves, 2005; Miller, 2014). Such considerations dovetail with qualitative approaches within which opinions of people regarding the existence and/or the expansion of PAs (and CAs) can be assessed (Graham & Ernstson, 2012).

### 4.7.3 Mixing and merging of data

The mixing of various sources of data/information is important as decision-making regarding expansion of PAs is rarely a simple process. Multi-layered considerations normally take precedence, specifically if a PA 'has a community' within its perimeter or on its doorstep - as is the case in all

three case-study areas. For example, the merging of data/insights regarding the realignment of perimeter fencing of PAs to include and protect biodiversity and/or to exclude people and/or to create off-set areas if the community impacts cannot be managed sustainably, are some of the scenarios that require the merging and interpretation of data sources. It further facilitates triangulation as explained in Section 4.4.

#### 4.7.4 MMR and theoretical framework alignment

Arguments in favour of the alignment of MMR (and not a quantitative or qualitative or an advocacy approach alone) with spatial analysis are justifiable in view of the objectives of the study. Such alignment facilitates a more nuanced spatial understanding of the challenges that are facing the conservation and resource-use dilemmas in the study-areas. The alignment is reflected in Chapters 5, 6 and 7 that deal with the findings and analyses of the investigations into the DNR, WCNP and HHNR respectively.

## 4.8 Research Design

A research design is a master plan that specifies the methods and procedures for collecting and analysing the required information (Srivastava, 2004; Gomez & Jones III, 2010). The design is shaped by the nature of the problem under investigation and the appropriateness of the data gathering techniques and tools. Table 4.1 summarises the general techniques and associated tools as they apply across many academic disciplines. Except for experiments, all the techniques and associated tools were applied to a greater or lesser degree in the study.

**Table 4.1: Research techniques and tools**

| Technique | Tool and Analysis |
|---|---|
| Survey | Questionnaires, Interviews, Focus group |
| Case Study | Analysis of place-space-time specific phenomena or documented themes |
| Life Story | Tracing of narratives re the biographical and experiential |
| Historical Research | Sourcing archival/documented information |
| Grounded Theory | Review of collected data/information to generate new theory |
| Observations | Observation schedule; recording, measuring & monitoring processes, behaviour |
| Experiments | Manipulation of variables in a real situation or laboratory context |

In the preceding discussion on research approaches, the importance of the fact that different techniques and tools are not mutually exclusive is highlighted. Technique and tool combinations can enhance research whether such research is based on one or a combination of the following (geographical) paradigms: regional, systems, spatial, human-environment, political economy, political ecology, ethnography or rights-based. The nature of this study, as explained in Chapter 1, lends itself to the application of combinations of the techniques and tools referred to in Table 4.1.

As this study attempts to analyse secondary and empirical information to be able to revisit the feasibility of protected area expansion in the study-areas, a general survey method was used to collect, order, collate and analyse the information and data gathered. Figure 4.2 summarises the data gathering methods.

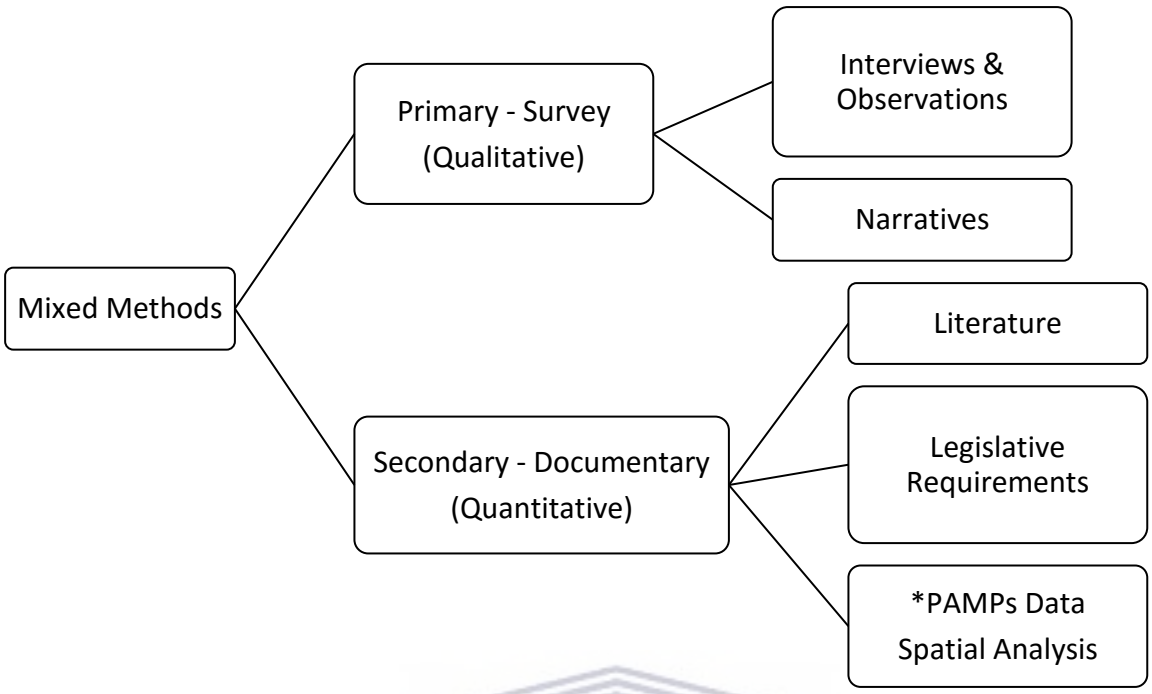



**Figure 4.3: Methods applied in the study**

(*PAMPs = Protected Area Management Plans)

The study draws on the analysis of secondary data to highlight the more numerical-quantitative aspects of the investigation. The analysis of the managerial-qualitative aspects draws on primary data that were gathered through interviews, observations and conversations. In order to make sense of the impacts of enabling and disabling factors for protected area expansion, spatial analysis was used to reflect on the geographies of the potential expansion of the chosen PAs.

The WCNP, DNR and the HHNR are all to some extent subjected to influences that impact on the following characteristics: indigenous/endemic floristic biodiversity, alien invasive species, rock art, fossils, cultural-historical sites, waterbodies, indigenous/endemic fauna diversity, land-use changes and development, infrastructural provision, marine and coastal attributes, stewardship and agreement conservation, historical leases and proclamations. The surveys that were conducted inform the understanding of how some of the mentioned characteristics are impacted upon in the different PAs.

Table 4.2 summarises the schedule that was followed for primary data collection (i.e. interviews and conversations with individual resource users and/or resource-use interest groups) for the study.

### 4.8.1 Primary data collection

Table 4.2 summarises the visits to, resource-use conversations conducted and observations done in the study-areas at various stages during the period 2015–2019. (One significant limitation of the study is that all user- and interest-groups initially envisaged for inclusion in the study could not or did not want to participate. Reasons for non-participation ranged from logistical impediments to the absence of knowledge about PA expansion.)

**Table 4.2: Resource-use/stakeholder group conversations**

| Protected Area | Resource users and stakeholders interviewed |
|---|---|
| DNR | Reserve/park managers, herdsmen, informal settlers, fuel wood collectors, livestock keepers (owners of animals), social ecologist |
| WCNP | Rangers, subsistence fishers, environmental educationist, tourism representatives, heritage representatives, environmental impact managers, harbour and marine control officials |
| HHNR | Reserve/park manager, community representatives, recreation/tourism concessionaire |

Although these resource-user and stakeholder representatives do not necessarily represent the entire spectrum of those who are affected by (potential) PA expansion, the information and perceptions gathered through conversations are, indeed, informing the questions posed by this study.



### 4.8.2 Secondary data collection

The revision of academic literature and official documents on conservation in general, and PA expansion in particular, forms the basis of the secondary data collection process for the study. South Africa's biodiversity attributes are outstanding if compared to biodiversity endowment elsewhere in the world. The species richness of the country is reflected in the fact that it plays host to almost 10% of the world's total known fish, bird and plant species and 6% of the world's mammal and reptile species (Midgely, 2010:48).

There are different classification systems for PAs - globally (IUCN), nationally (SANBI) and provincially (CapeNature). Figure 4.3 summarises the classification of PAs in the Western Cape (Turner, 2012:9).


**Figure 4.4: Classifications of PAs in the Western Cape**

(Source: Turner, 2012:9)

The vast majority of PAs in the Western Cape fall within the category WCCC1 which enjoys legal protection to some degree. The three chosen study-sites all have legal protection and some conservation agreements with PAs in the WCCC2 and WCCC3 categories.

The WCNP and HHNR are by virtue of their locations pivotal parts of WCCC3 PAs. They represent the conservation-core areas of the Cape West Coast Biosphere Reserve (CWCBR) and the Kogelberg Biosphere Reserve (KBR) respectively. Another example in this regard is the agreement that the DNR has with the landowner of an off-set area - just outside the spatial footprint of the reserve – therefore representing the DNR as a WCCC2 PA as well. The off-set area, managed by the DNR, is a relatively

undisturbed piece of Cape Flats Dune Strandveld with sensitive wetland patches towards the north of the proclaimed extent of the reserve. (This agreement is further discussed in Chapter 5).

In addition to the preceding section on the classification of PAs, Table 4.3 provides a summary of the Western Cape's PA typology and other spatial variables needed to appreciate expansion dynamics (Turner, 2012:11).

**Table 4.3: Spatial variables of PAs in the Western Cape**

(Source: Turner 2012:11)

| Category | Sub-category | 2002 ha | 2007 ha | 2012 ha | CBA ha | % of category therefore CBA |
|---|---|---|---|---|---|---|
| Western Cape Conservation Category 1 | Wilderness Area | 131 540 | 130 570 | 130 470 | 65 | 0.05% |
| | SA National Park | 156 923 | 290 631 | 303 424 | 9 590 | 3.16% |
| | Provincial Nature Reserve | 152 794 | 189 474 | 234 987 | 5 616 | 2.39% |
| | State Forest Nature Reserve | 408 597 | 408 906 | 409 033 | 664 | 0.16% |
| | Marine Protected Area | 41 784 | 68 338 | 72 092 | NA | NA |
| | Island Reserve | 296 | 296 | 302 | NA | NA |
| | World Heritage Sites | unknown | 392 710 | 392 694 | 33.12 | 0.01% |
| | Contract Nature Reserves* | NA | 17 602 | 52 824 | 12 348 | 23.38% |
| TOTAL WCCC1 | | 891 935 | 1 105 817 | 1 203 132 | 28 283 | 2.35% |
| Western Cape Conservation Category 2 | Local Authority Nature Reserve | 25 580 | 26 654 | 32 533 | 2 162 | 6.65% |
| | Mountain Catchment Area | 558 962 | 589 493 | 575 873 | 155 626 | 27.02% |
| | Private Nature Reserve | 122 824 | 139 465 | 145 789 | 80 982 | 55.55% |
| | South African Natural Heritage Sites | 31 954 | 31 551 | 0 | NA | NA |
| | Biodiversity Agreement * | NA | 960 | 14 959 | 7 083 ha | 47.35% |
| TOTAL WCCC2 | | 739 320 | 751 916 | 744 181 | 242 041 | 32.67% |
| Western Cape Conservation Category 3 | Biosphere Reserves | 320 186 | 498 330 | 820 349 | 193 787 | 23.62% |
| | Conservancies | 1 186 216 | 641 086.34 | 897 181 | 300 084 | 33.45% |
| | Voluntary Conservation Area * | NA | 19 097.04 | 22 348 | 11 185 | 50.05% |
| TOTAL WCCC3 | | 1 506 402 | 1 598 200 | 1 623 479 | 472 008 | 29.07% |

It is evident that the categories of contract nature reserves, private nature reserves, biodiversity agreements and the entire WCCC3 category sustain large portions of Critical Biodiversity Areas (CBAs) in the Western Cape.

Whether consolidated or fragmented, protected areas remain the most important building blocks of conservation, supported by governments and international bodies, such as the International Union for the Conservation of Nature (IUCN) and the Convention on Biological Diversity (CBD). They are units within which sensitive and threatened species and sensitive locations can be conserved and protected, ecosystem services enhanced, and in which cultures and community development can also be fostered (Dudley, 2008). The spatial expansion of protected areas is, therefore, assumed to be the answer to the challenges faced by vulnerable species, ecosystems and sensitive cultures and locations.

A fundamental question underpinning protected area expansion deals with the relationship between protected area management plans (PAMPs) and their effectiveness in addressing collective conservation challenges in sensitive areas. Thus, a basic question in line with the aim of this study would be: "What impacts do current protected area management challenges have on the prioritisation of PA expansion?"

Data were extracted from the PAMPs in combination with the analysis of the legislative environment (Chapter 3) to address this question in an attempt to contextualise the conservation practices in the case-study areas. PA expansion in the case-study areas is legislatively mandated by the National Protected Areas Expansion Strategy (NPAES) and guided by the principles of the Park Management Plan (for the WCNP) and the PAMPs (for the HHNR and DNR).



## 4.9 Summary and Conclusions

The chapter focused on the methodological aspects of the study and argues in favour of spatial analysis as theoretical framework for the study, supported by MMR as an approach that can inform the aim and objectives of the study.

However, the study recognises the advantages and disadvantages of different paradigms, approaches, techniques and tools and, therefore, strived to integrate the most appropriate elements in the conceptualisation, data collection, analysis and synthesis stages of the study.

The challenges and opportunities for PA expansion are perhaps best captured in the following:

> "The expansion of protected areas in South Africa is informed by the National Protected Area Expansion Strategy (NPAES)…This strategy provides a broad national framework for protected area expansion in South Africa by identifying large areas which should be targeted for formal declaration and introduces a suite of mechanisms which could aid in achieving this. In response to the NPAES which calls on provinces to develop implementation plans in support of the NPAES and in support of provincial conservation efforts and priorities, CapeNature has produced a Protected Area Expansion Strategy and Implementation Plan (Purnell et al., 2010). This CapeNature strategy addresses the formal proclamation of priority natural terrestrial habitats in the Western Cape Province as protected areas to secure biodiversity and ecosystem services for future generations. Although aligned to the concepts and goals of the NPAES, this strategy is informed by immediately available resources and therefore highlights some different spatial priorities." (Veldtman et al., 2015:59)

# CHAPTER 5: DATA PRESENTATION AND ANALYSIS - DRIFTSANDS NATURE RESERVE (DNR)

## 5.1 Introduction

This chapter provides an analysis of data and information collected regarding PA expansion and contraction of the DNR. As explained in Chapter 4, the research methodology drew primarily on a mixed-method approach that encapsulates the information gathered from conservation managers, resource users and other stakeholders. Spatial analysis is used to describe, order and analyse the information.

The DNR is arguably the most challenging PA under scrutiny in this study as it is spatially so contested that any attempt to expand or reduce its geographical footprint has implications for people who are direct and/or indirect resource users of the reserve. Compromises were reached in order to address the many challenges associated with the reserve's place-space relationships with its surrounding socio-economic environment. Büscher (2017) refers to these compromises as convivial conservation. The latter strives to address the stereotypical challenges associated with mainstream conservation (with its capitalist-dichotomous focus), new conservation (with its systems-integrated focus) and neo-protectionist conservation (with its revived fencing-separation focus). The DNR is centrally located on the Cape Flats of the metropolitan area of Cape Town and surrounded by poverty-stricken communities in general.



The reserve is largely characterised by Cape Flats Dune Strandveld which is listed as endangered and poorly protected. The wetland system, classified as Dune Strandveld Floodplain Wetlands, also has a high sensitivity status assigned to it (DNR PAMP, 2015). Over and above these site-specific threat statuses and related protection challenges, the general biodiversity challenges that the city is facing also need to be considered when analysing the results derived from the fieldwork conducted in the DNR. Section 5.2 summarises the broader impacts and externalities of the biodiversity of Cape Town and contextualises, therefore, the biodiversity-conservation part of the study.

## 5.2 Cape Town's Biodiversity Threats

The City of Cape Town identifies the following as major threats to its biodiversity attributes (CoCT, 2009):

5.2.1 **Urbanisation**: The various impacts that urbanisation has on the physical and cultural landscape, affect directly or indirectly all conservation efforts. Increased migration towards the Western Cape in general and Cape Town in particular, the resultant urban sprawl into the urban edge, and inappropriate development planning cause

> "…fragmentation of natural habitats, exposing flora and fauna to greater impacts of invasive alien species, pollution and other disturbances. In turn, these impacts lead to declines in populations and increased extinction risks. Loss of key species, such as insect pollinators, can then lead to lack of seed production in plants."
> (CoCT, 2009:17)

5.2.2 **Invasive species**: The Cape Floristic Region (CFR) plays host to species and sensitive ecosystems that are vulnerable to the invasion of tree species, such as acacia, hakea and eucalyptus (originating from Australia), as well as pines from Northern Hemisphere countries.



> "Many of these trees are considered ecosystem transformers as they out-compete the indigenous vegetation and alter ecosystem processes, such as nutrient cycling, fire and hydrological regime." (CoCT, 2009:18).

Problematic faunal invasive species include the Argentine ant (*Linepithema humile*), which disrupts the seed dispersal of fynbos, adds to mutualism with indigenous ants, and facilitates hybridisation between the alien mallard duck (*Anas platyrhynchos*) and the indigenous, yellow-billed duck (*Anas undulata*).

Another invasive species is the Indian house crow (*Corvus splendens*) that preys on small indigenous animal species and birds' eggs. Vertebrate biodiversity, such as small mammals and reptiles, are also threatened by feral and domestic cats.

5.2.3 **Agriculture**: Most productive land in Cape Town is utilised already and marginal areas are earmarked for residential development and vineyard cultivation. Agriculture is arguably the biggest contributor to habitat fragmentation (specifically in the urban fringe) and the reduction of remnants of renosterveld, one of the most threatened indigenous vegetation types in the Western Cape.

5.2.4 **Inappropriate fire**: The CFR is generally a fire-prone biome that requires fire at appropriate times to be able to be self-sustaining. Fires on a too regular basis can be detrimental to slow growing fynbos species and often create opportunities for invasive species to take root. Occasional fires can sometimes be withstood – species, such as Cape Flats Dune Strandveld, can sometimes withstand occasional fires due to their high succulent and/or thicket components. There is general lack in understanding the effects of regular fire-break burning on species composition, soil characteristics and plat diversity according to Bachinger et al. (2016) that needs to be addressed for the general purpose of ecological maintenance that is required in the fynbos biome of the Western Cape.

5.2.5 **Clearing and mowing**: Mowing of public open spaces, as well as road and rail verges, is a function of the city that has to be done regularly. (Mowing should ideally occur three times a year but is, however, achievable only in certain areas of the city.) The process often eliminates relics of indigenous vegetation and advantages the growth of grasses. It can also add to the removal of groundcovers which, in turn, contributes to wind-blown sand, specifically on the Cape Flats. In areas where seed banks of indigenous vegetation occur, it is advised that mowing should be stopped and replaced with more conservation-friendly alternatives.

5.2.6 **Overexploitation**: Most of Cape Town's vegetation is unsuitable for livestock keeping. Cattle and goats are being herded throughout the year in generally nutrient-deprived soils by urban agriculturalists. This can further reduce the carrying capacity of soils, i.e. the load/mass carrying capacity of soil, and worsens the overexploitation of available vegetation – which then creates opportunities for invasive vegetation to colonise degraded areas.

Cape Town's coastline is also under stress as marine-related resources and amenities for recreation, employment and food supply are generally overexploited. Fish stocks are under constant strain, and general marine conservation measures are hampered by a multiplicity of

factors, such as easy access to coastal waters, lack of law enforcement and a general lack of environmental duty-of-care.

5.2.7 **Pollution**: Air and land pollution, along with low nutrient soils, make it difficult for fynbos species to flourish in the urban environment. Cape Town's river and lowland wetlands experience increased nutrient enrichment due to land pollution and effluent from failing and poorly maintained waste and storm water infrastructure.

5.2.8 **Hydrology**: The general hydrology of the metropolitan area of Cape Town is significantly influenced by urbanisation. Changes in water courses, canalisation, embankments and dredging of wetlands impacted on the nature, spatial extent and composition of species in different areas. (Socio-economic and infrastructural impacts on the hydrology of the DNR play a significant role in the execution of the biodiversity conservation mandate of the reserve.)

5.2.9 **Crime and societal influences**: Cape Town is considered South Africa's most unequal city with serious inequalities in terms of the standard of living of its diverse population. The sprawling, poverty-stricken townships and low-cost housing areas are located primarily on the Cape Flats. These areas are, therefore, also the general crime havens that spill over into neighbouring areas. Furthermore, they are also the scenes of environmental crimes, such as illegal dumping, illegal harvesting of resources, poaching, arson, etc., which impact directly and/or indirectly on the city's biodiversity attributes and conservation efforts (CoCT, 2009).



## 5.3 Spatial Analysis

As explained in Chapter 1, spatial analysis as applied in this study is not based on numerical, geo-computational spatial techniques – it rather draws on narrative spatial analysis. Participants' spatial narratives and experiences of spatial variables form the essence of the analyses in this chapter. The experiences of spatial variables, such as size, shape and accessibility, are directly or indirectly reflected in peoples' life histories and livelihood struggles. Brasher (2017:180) refers to the concept 'narrative space' as the

> "…. space of the story world, or the spaces and places that make up the physical environment in which the characters of a narrative live and move."

The very existence and physical environment of the DNR shaped the narrative spaces reported on by the participants - whilst the reporting itself may assist in the contextualisation of the more nuanced expansion/contraction dynamics of the reserve. Kwan and Ding (2008) are of the opinion that the addition and analysis of qualitative geographic information can go a long way in enhancing the credibility and application value of remote sensing and GIS-based spatial analyses. The proclaimed (Figure 5.1), proposed (Figure 5.2) and priority extent (Figure 5.3) of the DNR - which resulted largely from remote sensing and GIS applications of the DNR as protected area - were further problematised by a narrative spatial analysis approach.

As illustrated in Chapter 2, PAs are socially engineered spatial entities that have been planned and proclaimed in order to facilitate officially conservation and protection mandates of conservation authorities. South Africa has a conservation authority structure that is largely in line with the different tiers of government, i.e. national, provincial and local. The national mandate, guided by NEMA and so-called Specific NEMAs (such as NEMPAA and NEMBA), is executed by SANParks; provincial mandates by provincial state departments (in the case of the Western Cape Province it is mandated to CapeNature); and local mandates by local, district and metropolitan municipalities. Significant tracts of conservation land are also managed by private owners or private ownership formations, such as conservancies (as discussed in Chapters 3 and 4).

Table 5.1 provides a typology of conservation categories and PAs as they pertain to the Western Cape Province. The province covers 129 462km$^2$ or 12 946 200 hectares (StatsSA, 2014). Roughly 42% of the Western Cape's total area is comprised of PAs and CAs if the categories of official, declared and intended PAs are calculated as a combined total percentage.

A more detailed typology of the three broad categories of PAs in the Western Cape is summarised in Table 5.1. (Turner, 2017).

**Table 5.1: Western Cape conservation categories, PA types and coverage**

| Conservation Category | Sub-Category | Hectares 2016/2017 |
|---|---|---|
| 1 | Wilderness Areas | 130 430 |
| | SA National Parks | 309 230 |
| | Provincial Nature Reserves | 269 380 |
| | State Forest Nature Reserves | 407 730 |
| | Marine Protected Areas | 164 140 |
| | Island Reserves | 300 |
| | World Heritage Sites | 804 260 |
| | Contract Nature Reserves | 142 640 |
| | Stewardship Sites | 55 400 |
| | Protected Environments | *17 080 |
| | | |
| 2 | Local Authority Nature Reserves | 37 070 |
| | Mountain Catchment Areas | 616 270 |
| | Private Nature Reserves | *231 900 |
| | Natural Heritage Sites | N/A |
| | Biodiversity Agreement Areas | 25 640 |
| | | |
| 3 | Biosphere Reserves | 3 759 700 |
| | Conservancies | 872 450 |
| | Biodiversity Partnership Areas | 43 920 |
| Total Coverage: Category 1, 2 and 3 | | 5 325 900 |



Adapted from Tuner, 2017:28

*Includes declared areas with Protected Management Plans in place, as well as those that are intended to be declared.

As the study attempts to explain how PA expansion and/or contraction can be influenced by externalities, over and above Critical Biodiversity Areas (CBA) concerns, attention needs to be paid to aspects, such as resource uses and contestations. Narrative spatial analysis of biodiversity attributes and resource-use contestations in PAs can be used to explain the expansion or contraction of a PA, such as the DNR. As spatial analysis attempts to study and analyse factors influencing locational variations of phenomena, patterns and processes in a specific area or across different areas, fundamental concepts, such as size, shape, place, space, accessibility, temporality and association are used to reflect on, and analyse primary and secondary data and information.

The three PA case-studies yielded significant similarities and differences, specifically regarding priority objectives for the effective management of the PAs.

This chapter focuses on the analysis of results of fieldwork that was done in the DNR. The reserve, albeit managed by CapeNature as provincial conservation authority, represents the local authority component of the three-tiered comparison of this study. The DNR is then, according to the typology in Table 5.1 both a Category 1 and 2 protected area. The DNR, for the purpose of this study, should therefore be seen as a local PA in the spatial jurisdiction of a metropolitan authority, i.e. the City of Cape Town. It is, therefore, important to emphasise again the rationale for urban biodiversity conservation. Dearborn and Kark (2010) maintain that, with increased urbanisation throughout the world, emphasis on urban biodiversity conservation also became more controversial. Within the context of existential urban development challenges, quests for land and finances to extend and/or sustain pockets of biodiversity in urban areas, are just one of many competing demands. Dearbon and Kark (2010) argue that the effective articulation of biodiversity goals in relation to other crucial needs in urban areas is important if the role that urban conservation should play in furthering urban-ecological balances, has to be given priority. From Section 5.3.1 through to Section 5.11, official data, opinions of conservation management, observations, and livelihood/resource-use histories and practices of participants are woven together and triangulated in mixed-method ways to inform some of the DNR's expansion/contraction dynamics.



### 5.3.1 Spatial Analysis: Size

Size is a fundamental concept in spatial analysis as it defines the metrics of the phenomena in question. It refers to the measurable "physical dimensions, proportions, magnitude, or extent" of a phenomenon (www.thefreedictionary.com/size). Size is determined by parameters, such as width, length, depth and diameter. The size of PAs is an important consideration if processes and resultant patterns of conservation management and resource-use in such areas are being analysed. Larger PAs, with arguably more conservation attributes, could theoretically pose more challenges regarding the recording, monitoring and management of resource-uses. By the same token, arguments in favour of more compact and smaller PAs could be furthered as premise for more effective management. Such arguments are problematic as there is much more to the PA-size nexus when it comes to conservation management (Adam & Hutton, 2007; Ramutsindela, 2007; Büscher & Dressler, 2012; Duffel-

Canham, 2016). The Protected Area Expansion Strategies (PAES) of the different conservation authorities have led and will lead to changes in the sizes of PAs (WCNP MP 2013 – 2023; Saul et al., 2015; Veldtman et al., 2015).

### 5.3.2 Changes in the size of the DNR

**Proclaimed Extent**: The proclaimed size (Figure 5.1) of the DNR is 638 hectares and is characterised by critical biodiversity attributes (such as endemic Cape Flats Dune Strandveld), alien vegetation (Port Jackson, Black Wattle and Kikuyu grass), informal settlements (Green Park, Driftsands and Los Angeles), conflicting and illegal land-uses (urban agriculture, livestock herding, illegal solid waste dumping), infrastructure (bulk-water supply, sewer, electricity, road infrastructure), and a research facility of the Medical Research Council (MCR).

The proclaimed extent of the reserve is compact and the conservation spaces are contiguous. Such a compact layout, from a management and control point-of-view, would have been ideal for any reserve other than the DNR (which is significantly impacted upon by its socio-economic surroundings).

The reserve is, however, practically open and not entirely perimeter-fenced. The arguments furthered in Chapter 2 regarding the fortress nature of enclosure and access control that characterise most PAs find reflection in the protection of a non-existing boundary. The northern side of the reserve, adjoining the precinct of the MRC facility, is barrier-fenced with strict access control, primarily precipitated by the sensitivity of the activities at the MRC complex. The complex, including Driftsands' administration facilities that are housed in a hired section of the complex, is further protected by an electric fence. These security measures stand in sharp contrast to the open boundaries of the reserve - which is supposed to protect the critical biodiversity attributes of the area – and create a fortressed exclave in a reserve that is, in itself, an exclave in a socio-economic landscape in which livelihood concerns override conservation imperatives.


**Figure 5.1: Proclaimed Extent of DNR**

(Adapted from the DNR-PAMP, 2015:28)

**Proposed Extent**: Changes in the size of the DNR, from the proclaimed to the proposed extent, were precipitated by the continuous socio-economic impacts of the surroundings on the reserve. The proposed extent is reflected in the erection of a barrier fence that will, if eventually completed, bar the communities of Green Park, Los Angeles and Driftsand from the central part of the reserve and will add further protection to the MRC facility. Figure 5.2 illustrates this new realignment of a barrier fence that is currently (2020) still under construction. It is evident that this realignment is creating a less compact area with significant geometric indentations and, consequently, a longer boundary that needs to be managed and protected. The perimeter of the proposed extent is roughly 11.3 km. This will arguably result in a new set of challenges for fence protection. (Reference to a lack of funding and capacity for an eventual fence management and protection plan was made by the former and current reserve managers during initial, as well as follow-up, conversations in 2016 and 2018/9.) The fence, as a protection measure, will therefore need protection itself. The protection of a structure, in this case a fence that is supposed to protect sensitive biodiversity assets, epitomises the extreme challenges faced by urban conservation authorities.

Another fence-related challenge is a stalemate that has existed since 2017 between the community on the one hand and CapeNature and the City of Cape Town on the other. In conversation with the reserve manager in 2019, it was confirmed that no agreement regarding employment opportunities related to the erection of the perimeter fence could be reached between the 'community' and authorities thus far. The community is comprised of people residing in Green Park, Los Angeles, Driftsands, as well as Mfuleni. Due to the high unemployment rate in the area, the community demands a bigger share of employment intake for locals by the contractors responsible for erecting the fence. The material for the completion of the fence is stockpiled on-site and due to the above-mentioned demands, the completion of the (re)alignment of the perimeter fence to coincide with the proposed extent of the reserve is, therefore, in limbo. Until agreements regarding fence-erection employment have been reached, the effective execution of the conservation mandate of the reserve will play second fiddle to the socio-economic demands that are being placed on it. Recent (2020), and ongoing, land invasions by homeless people, primarily in the southern part of the reserve, have added another blow to the completion of the realignment of the fence according to its proposed spatial extent (Figure 5.2).

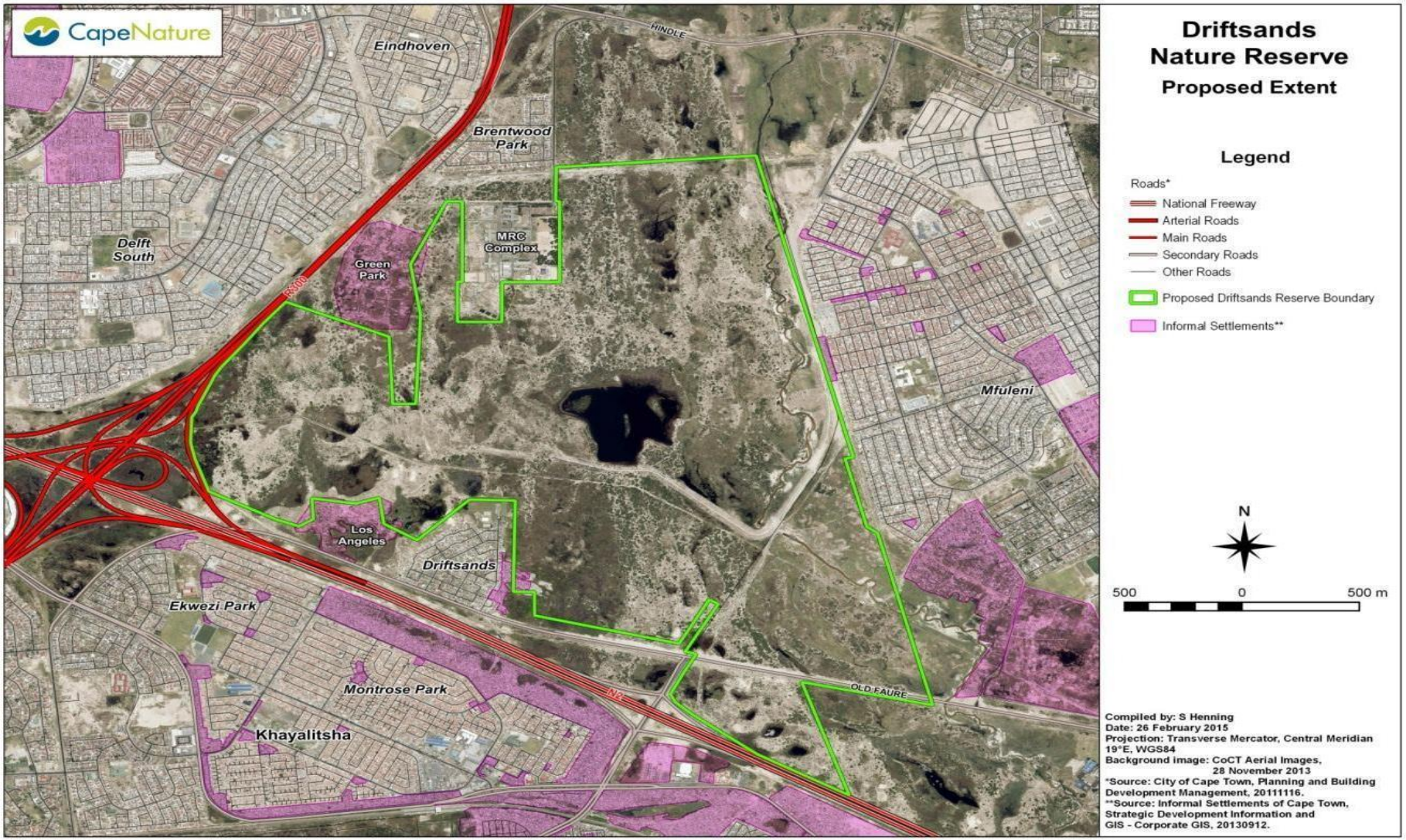



**Figure 5.2: The Proposed Extent of DNR**

(Source: DNR-PAMP, 2015:29)

**Priority Extent**: 'Spatial compensation' for the contraction in the spatial extent of the reserve due to the realignment of its boundaries is taking the form of two identified off-set areas. These areas are earmarked primarily for their biodiversity status and support of their wetland functions. Status CBA 1b is allocated to these land parcels. It is important to understand the challenges of, and mitigation options for, critical biodiversity areas nationally, provincially and locally. Locally, such challenges are acknowledged by the City of Cape Town's Biodiversity Network (BioNet) and mitigation options are proposed accordingly. The position of areas with CBA1b status relative to other conservation requirements is explained in the following:

> "Just over half (53.1%) of the BioNet is conserved, although some of these areas currently have no statutory protection. A process currently is underway to proclaim City-run nature reserves under the National Environmental Management: Protected Areas Act (NEMPAA 57 of 2003). The 100% irreplaceable, high-medium condition remnants comprise the next highest category of the BioNet (CBA1b: 14.2%) followed by areas selected for ecological process targets (CBA1e: 10.6%). A significant portion (9.3%) of the BioNet is in low condition (i.e. CBA1d and CBA2) and requires ecological restoration in order to promote the long-term conservation of biodiversity." (Holmes et al., 2012:23)

The first priority-extent portion is the area east of the Brentwood Settlement (towards the north of the reserve), and the second one is a narrow northwest-south-east running corridor towards the south-east of the Driftsands Settlement (Figure 5.2). The first portion is private land and is characterised by well-established, relatively undisturbed Cape Flats Dune Strandveld with sensitive wetland patches. The area is managed by the DNR on behalf of the landowner. Figure 5.3 shows a hilly part of Off-set Area 1 with wetland patches in the foreground.

**Figure 5.3: Part of priority Off-set Area 1 on a vegetated dune towards the north of DNR.**



The second portion is state-owned land under the jurisdiction of the Department of Public Works. It forms part of the planning of spatial corridors within which biodiversity processes can be accommodated. The grand idea is to facilitate connectivity, along a south-easterly stretching corridor and anchored by the Kuils River, between the DNR and the Macassar Dunes Nature Reserve (Holmes, et al., 2012; personal communication with Respondent A, 2016).

It can be argued that, in combination, the boundaries of the proposed extent (Figure 5.2), as well as the inclusion of the off-set areas (Figure 5.4), will pose even greater challenges for the effective management and protection of new fences (personal communication with reserve managers, 2015 & 2018).

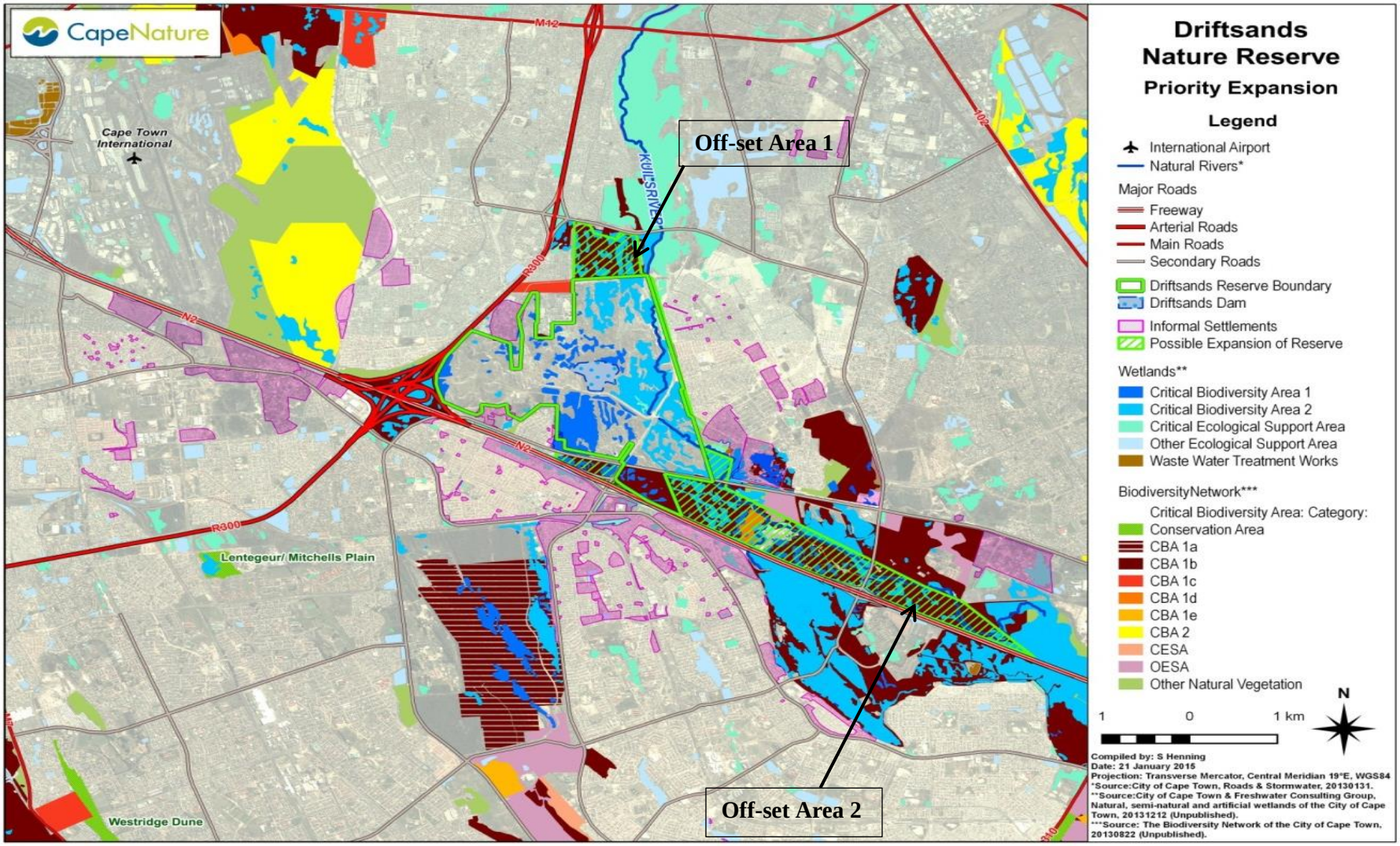



**Figure 5.4: Priority biodiversity areas and planned expansion of DNR and surrounds (Adapted from DNR-PAMP, 2015: 75)**

The effective management of the size of the reserve is also influenced by the existence of infrastructure and servitudes in the area that precede the proclamation of the reserve in 1983. The reserve "was established as a Provincial Nature Reserve in terms of Section 6(1) of the Nature and Environmental Conservation Ordinance, 1974, (Ordinance 19 of 1974)" (http://www.capenature.co.za/wp-content/uploads/2014/05/DRFS-PAMPS_merged-1.pdf).

Figure 5.6 depicts the location of roads, electricity supply lines, bulk-water supply piping and sewers in the reserve. The reserve can, therefore, be seen as a servitude and conduit that facilitates the use of, and disposal of, utility-related resources such as electricity, water and sewage. A burst in the bulk-water supply pipe that crosses the reserve and connects the Steenbras Dam and the Newlands Reservoir caused management dilemmas that rendered reserve management procedures almost irrelevant (personal communication with reserve manager, 2016).

**Figure 5.5: Fluid waste disposed in the Kuils River on the eastern boundary of DNR**

The Kuils River (Figure 5.5) is a temporary disposal site for treated effluent piped from further afield, as well as from the surrounding residential areas of Mfuleni (towards the east of the reserve), Delft and Brentwood (and presumably the MRC Complex) towards the northwest and west of the reserve.

Figure 5.7 depicts access characteristics of the DNR relative to infrastructure related to servitudes. (An analysis of access as a spatial variable is discussed in Section 5.7).

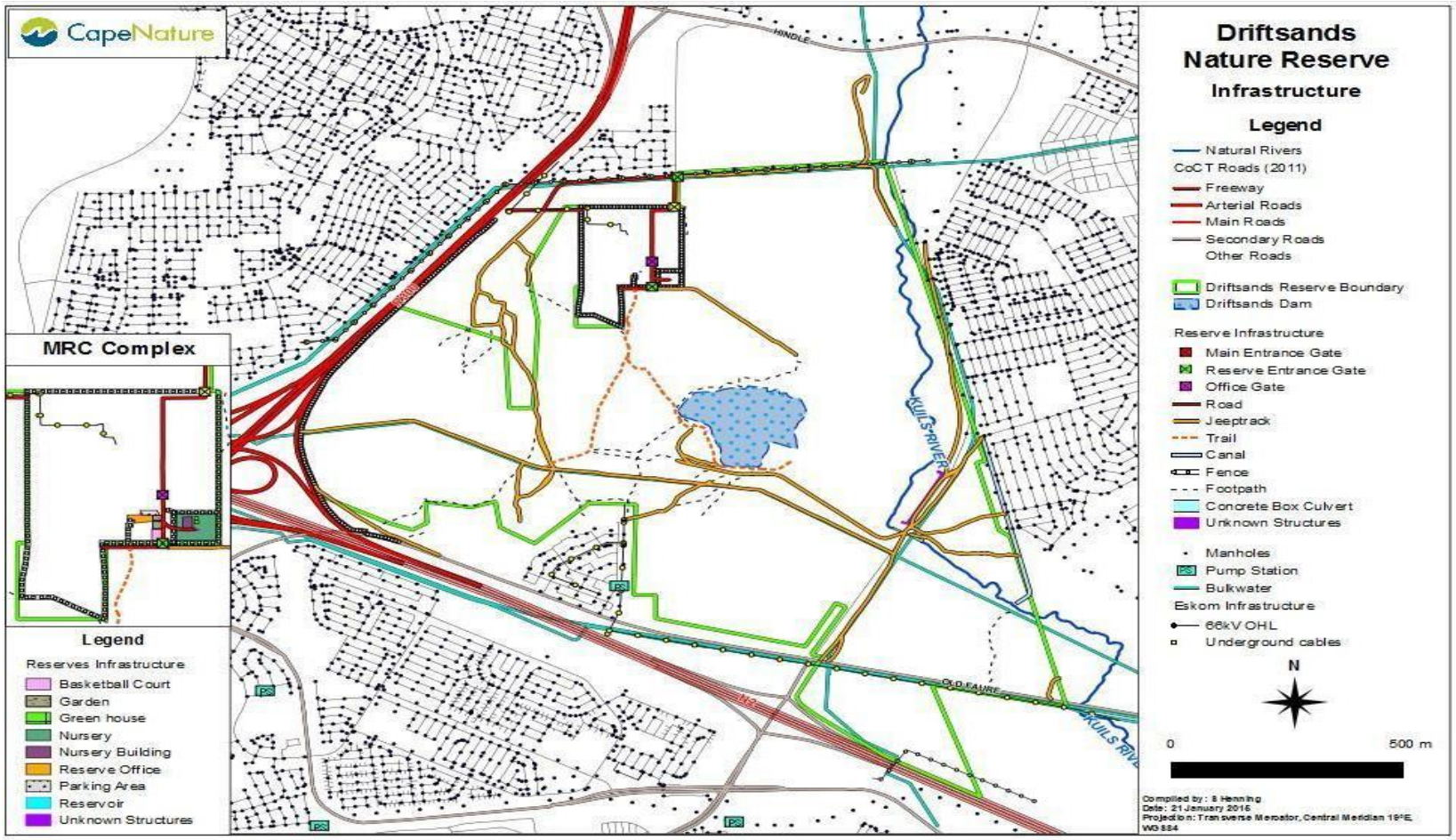



**Figure 5.6: Infrastructure map of DNR**

(DNR – PAMP, 2015:69)

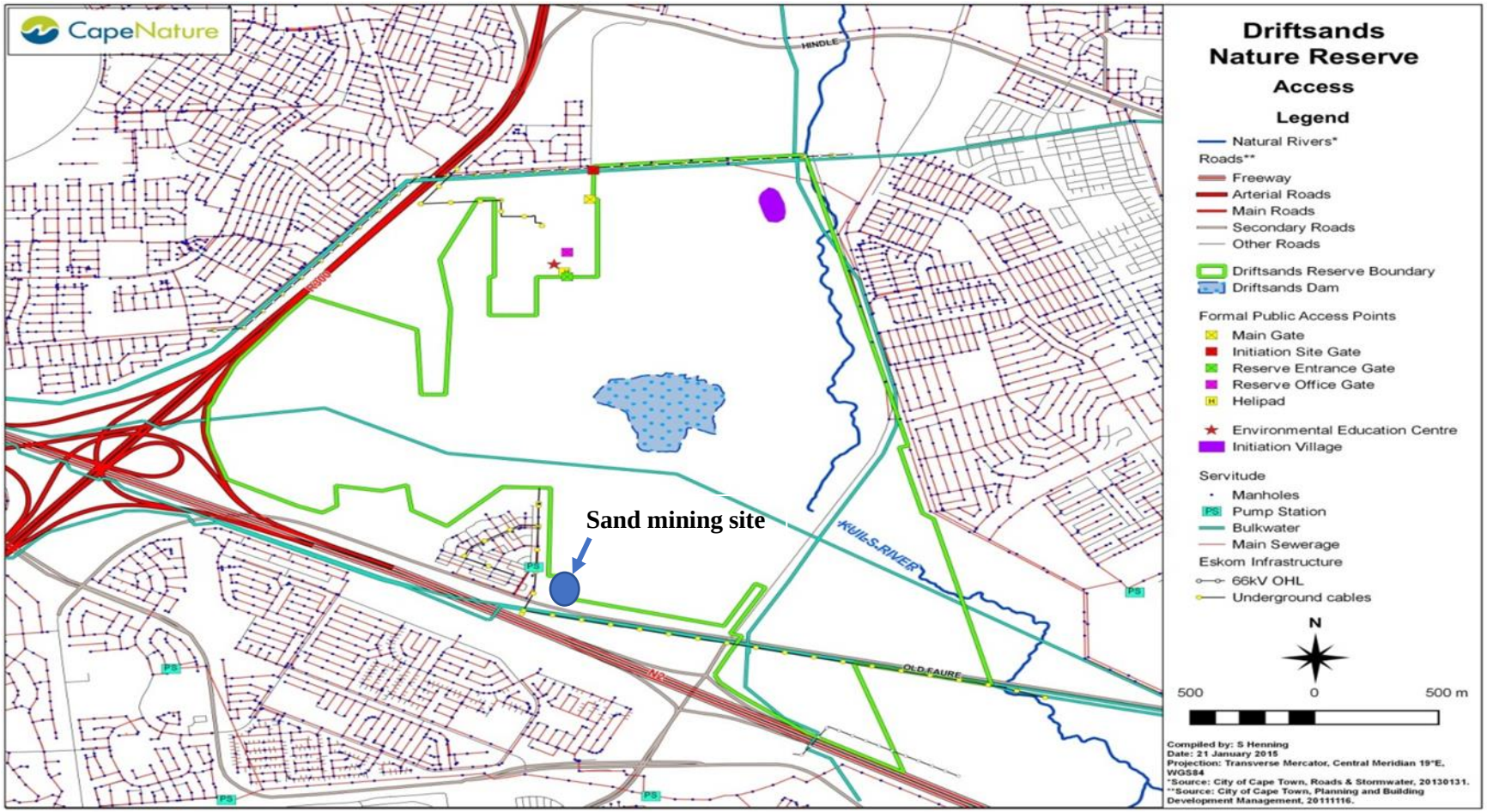



**Figure 5.7: Access and servitude map of DNR**

(Adapted from: DNR-PAMP, 2015:94)

## 5.4 Resource-use analysis

The analysis in this section is based on feedback from respondents who participated in the study. The content of the conversations was analysed (i.e. content analysis) in order to inform the study's concerns about the spatiality of resource uses in the DNR. Effective size-management is also influenced by resource uses in the reserve. The communities residing in the informal settlements of Green Park, Los Angeles and Driftsands practise resource uses that are generally in conflict with the conservation mandate of the DNR. For the purpose of this part of the study the resource uses recorded in the reserve can broadly be classified as direct-consumptive or indirect-consumptive. Direct consumption refers to the harnessing and application of a (natural) resource by the very user(s) thereof. Indirect consumption, on the other hand, refers to the indirect benefits derived from the use of resources in which the very user is not necessarily an actor (Axinn et al., 2010; York et al., 2003).

The resource uses highlighted under the headings **Respondents/Respondent Groups A-H** on the following pages, are indicative of different resource-use groupings and their impacts. This is combined with information gathered from interviews with the reserve managers, the community conservator for the DNR, as well as 13 respondents who were involved in the use of natural resources in the reserve. This information is used collectively and concurrent as per the mixed-method approach followed in this study to reflect on how resource uses impact on the (biodiversity) integrity of the reserve and how they contribute to the shaping of the spatial variables of the reserve.



The resource uses highlighted under the headings **Respondents/Respondent Groups A-H** on the following pages, are analysed based on the integration of observations done in the reserve and information gathered through interviews with the mentioned respondents between 2016 and 2019. Content analysis is used to make sense of the ideas expressed by the respondents in order to inform the inquiry into the variables that underpin the spatial analysis on which the study is based. As respondents were reluctant to give consent to audio recordings of the interviews with the researcher, the following are summaries of interviews/conversations that were conducted. (Although all respondents face similar livelihood challenges, the 13 interviews conducted have been reduced to 7 respondent categories of users who depend, in various direct or indirect ways, on the resources and, therefore, the very existence of the DNR.) Based on anonymity agreements with the respondents and

the ethical considerations to which the study is subjected, the letters (A - H) are being used as pseudonyms for individual respondents and resource-use groupings.

It needs to be kept in mind that, although the interview questions (see Appendices A - C) were structured in such a way as to gather more information regarding people's understanding of PA expansion and its (potential) impacts, some respondents did not comprehend the relevant concepts - even after the context had been explained to them. As random sampling was impossible under the circumstances, snowball and convenience sampling were used to obtain information from the respondents, i.e. those who were willing to participate in the study.

**Respondent A** (Livelihood challenges - parent)

This female has been living in the Los Angeles informal settlement in the south-western part of the reserve for more than six years, and she has seen how the settlement grew from a few structures to more than 50 in her estimation. As a mother of three young children, she and her partner eke out a living by doing casual work in other areas, or as livelihood comes their way. The locational advantages for her of living in Los Angeles include easy access to taxis that use the routes R300, Hindle Road and the N2 highway. This, in turn, enhances her mobility and access to areas, such as Kuils River, Bellville and Somerset West, where there are casual work prospects. With respect to the question as to why she prefers to live in Los Angeles, she believes that, despite the porous boundaries of the reserve, it nevertheless provides some safety if compared to other informal settlements on the Cape Flats. She understands the conservation challenges of the DNR and the reason for a perimeter fence around it but believes that access for some residents to fuel wood for space heating and cooking is important and that they should not be excluded from the reserve.

**Respondent Group B (**Unemployment challenges - youth)

In conversation with three young unemployed men, the impact of the stereotypical socio-economic conditions in informal settlements was evident in how they responded to questions posed to them.

One young man is staying with relatives in Los Angeles and left school after the death of his mother with whom he lived in Site C, Khayelitsha. He is conscious of the biodiversity importance of the reserve and knows that the impact that communities have on the environment is generally negative.

He reported that he tries to sustain himself financially by selling wood to people in the adjacent Driftsands settlement, as well as commuters who are using the Old Faure and Swartklip Roads. He and his friends are also sometimes paid for assisting truck and bakkie drivers, who harvest sand from the dunes along the Old Faure Road (see Figure 5.8), with the loading and off-loading of their vehicles. Fuel wood and sand harvesting are arguably the most damaging – and illegal - extractive resource uses in the DNR. There is almost no control over these practices.

**Figure 5.8: Dune destruction caused by illegal sand harvesting in the south-eastern part of DNR**

**Respondent C** (Historical 'refugee' - middle-aged man)

This man, in his late fifties, used to live in the Driftsands settlement after he had fled from the Crossroads township in the early 1980s when factional fighting among different politically affiliated groupings created war zones on the Cape Flats. The political conflict that ravaged the townships in the eighties inadvertently helped in the shaping of the DNR and its affiliated communities (Daraghma, 2009). Feuds between the 'Wit Doeke', a militant grouping that was apparently supported by the apartheid government, and the 'Comrades' saw the killing of more than 60 people (Cronje, 2014).

During that volatile period people abandoned their abodes and fled across the N2 Highway to find safety in the dense vegetation of the DNR. He still remembered how they could hide in vegetation that, based on his recollection, must have been acacia and hakea species. After calm had returned, he did not return to Crossroads. He moved with his family from the Driftsands settlement to Los Angeles due to the fact that the latter is less congested and has bigger stands on which they could erect structures to live in.

**Respondent D** (Casual work and husbandry - family)

This woman and her family live in Green Park, and weekdays she commutes to Kuils River where she is employed as a domestic worker. Her husband is unemployed and started with some livestock keeping that includes poultry and three pigs. The latter survive primarily on the vegetation in and around the plot of land that they occupy, as well as food waste. Food waste is apparently dropped off by retailers who have businesses in Kuils River and Somerset West. Piglets in the recent litters have been sold to livestock owners in nearby Khayelitsha and Mfuleni.

The DNR can, therefore, be seen as a direct and indirect resource base for livestock keepers who reside in Green Park and who are contributing to a seemingly thriving livestock-keeping business in Cape Town's townships and informal settlements.

**Respondent E** (Larger-scale livestock keeping - herdsman)

This young man came from the Eastern Cape and stays with family in Green Park. He is looking after cattle and goats that belong to livestock owners who use the reserve as a grazing resource (Figure 5.9).

**Figure 5.9: A herder in DNR.**

**Figure 5.10: Goats as part of the livestock mix in the reserve**



Herders in and around DNR find it difficult to restrict cattle to areas outside the reserve as a result of broken and open boundaries of the reserve (Figure 5.11).

**Figure 5.11: Cattle grazing unattended**



Fig 5.11 depicts the township of Mfuleni visible in the distant background, cattle grazing on vegetation (largely short invasive kikuyu grass) and illegally dumped waste in the foreground, a disturbed dune ridge with some Cape Flats Dune Strandveld intact in the midground, and a wetland patch in the foreground.

The reserve is not the only grazing site, though. It was reported that other herdsmen also allow cattle to graze further upstream along the Kuils River on the northern side of Hindle Road. North of the reserve, cattle enclosures are erected and animals are allowed to graze in those areas and further north of Hindle Road. The open floodplain of the Kuils River facilitates the movement of animals (Figure 5.12).




**Figure 5.12: Paths followed by livestock**

(Adapted from http://maps.capetown.gov.za/isisiv/)

The paths visible in Figure 5.12 lead from the floodplain of the Kuils River and are funnelled by the bridge over the river into the DNR south of Hindle Road. In situ observations done in the study area confirm the patterns caused by the paths that livestock follow. Figure 5.13 shows the different paths of livestock from the area north of DNR funnelled by the gap under the Hindle Road Bridge and spreading out in a braided pattern south of the bridge into the reserve.

**Figure 5.13: Braided footpath patterns caused by livestock in the northern part of DNR**



Herds of cattle observed during site visits to the reserve were mostly comprised of younger animals. During conversations and walkabouts with herders in 2016, 2017 and 2018, it was mentioned that the young, playful ones are more difficult to contain and are responsible for the spatial dispersion of sub-groups in the herd. Young, unemployed men look after the cattle on behalf of cattle owners who are very often absent.

The limited remnants of fynbos in that part of the Kuils River floodplain that forms part of the DNR are heavily infested by invasive kikuyu grass. The latter is preferred by the cattle and, according to the herdsman, it is difficult to veer them away from the river in the reserve. Cattle-grazing is, therefore, a major problem and hinders the restoration of indigenous vegetation in the reserve.

**Respondent F** (Livestock owner)

This man lives in Wesbank and has inherited cattle from a late relative of his. His herd has grown to such an extent that he can sell to subsistence livestock keepers in other townships on the Cape Flats. He is employed and is, therefore, not entirely dependent on livestock keeping. Arrangements apparently exist between him and other livestock owners regarding herding responsibilities. Such responsibilities are allocated to unemployed men who are willing to see to the animals.

The agreement that livestock owners have with the reserve manager to prevent cattle from entering the core conservation area and wetlands of the DNR is often not adhered to as herders apparently do not abide by this agreement. This problem was also mentioned by the reserve managers during the interviews. (Although livestock owners are ultimately responsible for adhering to the arrangement and for overseeing the herdsmen working for them, they often blame the latter for cattle invasion into no-go areas.)

During the night, livestock is kept in makeshift 'kraals' located towards the northwest of the reserve (Figure 5.14). It is also becoming increasingly difficult for livestock owners to protect their animals due to crime in the reserve, as well as in the surrounding areas.

**Figure 5.14: Cattle 'kraals' on the northern boundary of DNR**



**Respondents G** (Crime & recreation - unemployed youths)

Another two young men and a female who live in the adjacent Mfuleni township on the eastern edge of the DNR were also interviewed. The impact that Mfuleni has on the reserve is clearly visible in the vandalised perimeter fence, illegal waste dumping (Figure 5.16), and wood collection. Over the years, fuel wood collection has left vast tracts of land in the riparian zone of the Kuils River, as well as the surrounding dune systems, almost devoid of vegetation. This is a major cause of the encroachment of alien vegetation, such as kikuyu grass and Port Jackson trees.

It was reported by the respondents that the reserve has also become a haven for other illegal and criminal activities, such as drug and alcohol abuse. Figure 5.15 indicates the restrictions applicable to the use of the DNR and its resources. Restrictions with regard to swimming, waste dumping and the presence of unsupervised children are regularly transgressed, according to the respondents. (Such

transgressions were observed on three occasions during visits to the reserve. Safety and ethical concerns prevented the researcher from capturing such activities on camera. Children playing in the reserve and swimming unsupervised in the polluted Kuils River, that drains the eastern part of the reserve, was particularly concerning.)


**Figure 5.15: City of Cape Town restrictions on recreational activities**

Figure 5.15 further displays very little indication of an urban park with integrated and community-friendly attributes - if the restrictions on the information board are anything to go by. The DNR ought to be, by virtue of its location within poverty-stricken communities on the Cape Flats, an urban park that fosters community-conservation integration. A sentiment expressed by the youth is that the apparent managerial schism, i.e. that the DNR should have been managed by the City of Cape Town as local conservation authority and not by CapeNature as provincial conservation authority, can be considered one of the root causes for the on-going challenges faced by the reserve. One of these challenges is illegal waste dumping in areas in and around the reserve where the monitoring of

conservation- impeding activities is non-existent. The youth, although they realise the severity of the impact that surrounding communities have on the reserve, believed that more can be done to at least 'face-lift' the reserve and make it more appealing for visits by locals and other conservation-minded people from elsewhere. Figure 5.16 is indicative of the illegal waste dumping problem faced by the DNR – in contrast with the advertisement of the environmental education centre.


**Figure 5.16: Illegal waste dumping on the eastern boundary (Mfuleni-side) of DNR**

**<u>Respondent Group H</u>** (Land invaders and dune destabilisation)

The DNR was not spared from the most recent spate of land-grabs on the Cape Flats in the latter part of 2020. The volatility of the situation, safety considerations and lockdown restrictions prevented the researcher from visiting the areas in the reserve where people grabbed land during the peak of the invasions in August and September 2020. However, walkabouts in the reserve in December of 2020

revealed the extent to which land invasions have eradicated conservation land. Observations from the N2 National Road and Old Faure Road also indicate where land invasions have occurred. The fact that housing structures were erected on dunes (Fig. 5.17), which are vital parts of ecological infrastructure, is a serious concern.

**Figure 5.17: Dune destruction caused by land invasions in the south-eastern part of DNR**

As the eviction of people from land that they illegally occupy was prohibited during Covid19 lockdown, land-grabs in PAs, such as the DNR and the Wolfgat Nature Reserve, pose arguably the most serious threat to the spatial integrity of such reserves. The legality of the possible eradication or

upgrading of spaces occupied illegally during lockdown remains a bone of contention and may eventually determine to what extent the environmental-spatial bona fides per se of PAs will/can be protected legally. Allegations that the land invasions in the Western Cape, and in the Cape Town Metropole in particular, are politically orchestrated complicate the targeting of vacant land (or so-called idle land) and PAs by land invaders even more (PMG, 2020).

## 5.5 Spatial Analysis: Shape

Shape refers to the surface configurations or the form of things and is crucial in understanding the nature and extent of boundaries (www.thefreedictionary.com/shape). The boundaries of the PAs under investigation in this study are essential as they can be linked directly to expansion and/or contraction plans of the responsible conservation authorities.

The changes proposed and effected by the spatial plans that speak to the proclaimed, proposed and priority extent of the DNR, as analysed in Section 5.3, inevitably changed and/or will change the shape of the DNR. In turn, changes in the shape of the reserve pose challenges to the 'protection' of its boundary. The 'new shape', with its various indentations as presented by the priority extent of the DNR, increased the total length of the boundary to more than 11 kilometres. The erection of a perimeter fence, over and above its cost and its protection function, also needs protection against vandalism itself. (This concern was also expressed by the reserve managers.)

## 5.6 Spatial Analysis: Sense of place and space

The concept of 'place' is often associated with location which, in turn, may have absolute or relative meaning. The term 'absolute location' refers to a position on the surface of the earth that can be located through referencing systems, such as the traditional geo-referencing system and Cartesian geometry. Lines of latitude and longitude are the bases of conventional geographical referencing systems that allow for universality in communicating absolute location.

'Relative location' refers to the position of a place relative to another place or reference point. It is per definition, therefore, less exact than absolute location. It is often expressed in descriptions, such as 'towards the northeast of the city' or 'just west of the biggest dam'. An appreciation of the meaning

of relative location also allows for a critical look at the more objective appreciation of absolute location. As geo-referencing systems are social conventions, absolute location is theoretically, therefore, also relative. With ever-improving locational accuracy due to more sophisticated remote sensing and orbital-based observation technology, absolute location is also changing. The past and present meanings of 'location' are, therefore, intertwined with the development and advances in human endeavour.

***Sense of Place***

On a more philosophical level, the term 'location' takes on different meanings for different constituencies and people. Sense-of-place is often used to describe the notions of place-meaning and place-attachment. The absolute, relative, past and present nature of the meaning of location is, therefore, important in order to understand locational disconnects, synergies and contestations. The latter have, through history, manifested themselves in land and resource contestations and dislocations. In this regard Massey (1995:183) argues that

> "[i]n daily life, in politics, in battles over development and conservation, we often operate in ways which mobilise this kind of view of place."

The sense of place is, therefore, linked to what characterises a location relative to how it is being perceived and used by its inhabitants and managed in order to support its people. The continuous reshaping of natural and cultural environments, and by implication changes in the meaning of place for different interest groups, provides various lenses through which to gain an understanding of sense-of-place nuances when it comes to absolute and relative places of protected areas. Protected areas have been, and still are, places of struggle for the disempowered and are at the same time powerful pivots for vested interest (Escobar,1998; Fabricius & de Wet, 2002). Protected areas can, therefore, be seen as podiums for class, space, place and resource contestations. The Diftsands Nature Reserve exemplifies such a podium, and the scepticism of Harvey (1989) of local/place trends in past and present class and resource struggles can, therefore, be applied in this case study. Massey (1995:184) uses the concepts of 'place-bound' and 'place-based' to elaborate on Harvey's class-resource critique.

Past experiences continuously shape relationships and the imprint that human agency has on its current environment (Bowers, 2012). Kudryavtsev et al. (2012), in a study on urban youth and

environmental education, argue that place-meaning and place-attachment are often disconnected despite interventionist measures, such as environmental education, skills development and stewardship initiatives. The results of this study show that such disconnects indeed exist in the DNR in which place-attachment is significantly influenced by livelihood struggles, mixtures of urban and rural land uses, and counter-conservation practices.

The analyses of conversations with resource users in Section 5.4 all allude to livelihood struggles and housing challenges faced by the different participants. The communities associated with DNR can, therefore, be considered as 'residential resource-users' with specific place and space affinities to the reserve and how the latter is used to satisfy community needs. The activities in the informal settlements of Green Park, Los Angeles and Driftsands bear testimony to these attempts. As the DNR plays host to informal settlements, it therefore also serves as a resource space in which extractive and active consumptive resource-uses are at play – mostly to the detriment of the conservation mandates of the reserve as indicated in the analyses in Section 5.4.

The Green Park community, situated on the western side of the DNR, is located within the proclaimed boundary of the reserve and represents one of the residential resource-users. (The other communities, Los Angeles and Driftsands, are located in the south-western and southern parts of the reserve.) Certain sections in Green Park are not serviced for the provision of electricity and water-borne sanitation to individual dwellings. Portable toilets and communal (water) standpipes are provided though.

Attempts to eke out a living in these areas are reflected in how spaces around informal structures are used. Some people living in this informal settlement do have work 'outside' while others have resorted to gardening, poultry and livestock keeping (conversations and observations in Green Park, 2016-2018). Figure 5.18 is indicative of husbandry activities that include the rearing of cattle, sheep, goats, pigs and chickens on bigger plots in Green Park.

**Figure 5.18: Cattle grazing in Green Park**



It is evident, though, that attempts to protect the biodiversity (i.e. the remaining Cape Flats Dune Strandveld) and the ecosystem services provided by the wetland patches in the reserve are seriously compromised by the settlements and the activities of the inhabitants. The regulatory ecosystem services of wetlands, such as groundwater augmentation and discharge, surface and groundwater quality, as well as flood regulation and attenuation, are impeded (conversations with reserve managers, 2016, 2018, 2019).

In response to the continued pressure exerted on the reserve's management by the socio-economic challenges of the resident communities, a relook at the boundaries of the reserve was undertaken. A new and less compact boundary compared to the proclaimed one is proposed with significant spatial indentations in order to 'cut' out communities, as can be seen in Figure 5.2.

This new boundary alignment will keep out people while simultaneously continuing to provide more protection to the reserve - and indeed will further garrison the complex of the Medical Research Council which is landmarked by the incinerator chimney of the facility visible in the background in Figure 5.19.

**Figure 5.19: A new re-aligned boundary under construction in 2018 with concrete palisade fencing**

The fencing-off of the core areas of the reserve, in line with the priority spatial extent of the reserve (to reduce and prevent the impact of people), may yield further ecological advantages for dune (re)vegetation and stabilisation. Figure 5.20 indicates the position of the incomplete fence at the base of a dune rage near the Green Park settlement.

**Figure 5.20: The incomplete fence between sparsely vegetated dunes and the area west of the Green Park informal settlement**



***Sense of space***

The concepts of 'space' and 'spatiality' are closely linked to the concept of relative location. As spaces are created, and sometimes recreated due to land-use changes and zonation, their meaning is often associated with resource uses in other spaces that are in proximity to them.

The location of the DNR is inextricably linked to other spaces that surround it. The place of the reserve on the Cape Flats with its peculiar environmental and socio-economic challenges makes it a space that is characterised by some of those challenges. Conservation and protected areas associated with, or in proximity to, communities also face challenges that stem spatially from far beyond those that are represented by the very communities themselves. The DNR, just like other PAs, is therefore facing complex pressures from inside and outside its perimeters that have effectively blurred simple sense-

of-space interpretations. Roux et al. (2019:3) believe that the complexity of PA management can be best appreciated if integrated and embedded research into PAs

> "…can generate useful insights into natural processes and social-ecological feedbacks to support the management of these areas and their surrounds."

Therefore, as proven in the conversations with the different resource users in the DNR, it is important to manage the reserve in the context of its surroundings, i.e. including space appreciation and not only place appreciation.

It can be argued that the place-space attachment of the DNR with the precinct of the facility of the Medical Research Council (MRC), and its high safety and security requirements, is providing additional 'protection' to the reserve. The sensitive nature of the research being conducted at the MRC facility, as well as the services rendered, requires a safe and secure environment. Figure 5.21 indicates the specialised services, such as medical waste treatment and animal cremation, located in the same precinct as the administration and environmental education sections of the DNR. This spatial association is nowhere else to be found in any PA in the Western Cape.


**Figure 5.21: Information board reflecting the co-existence of the DNR office and facilities in the MRC Complex**



Figure 5.22 is indicative of the security concerns with regard to the precinct that is being shared by the facility of the MRC and the administrative and environmental education sections of the DNR. Electrified fences separate the precinct from the reserve proper (on the far side of the fence).

**Figure 5.22: Electrified gate and fence**



The safety of visitors to the reserve is a priority and they are supposed to report to the reception in order to be guarded and guided through the reserve. The management does not take responsibility for visitors who enter the reserve unannounced, and the latter do so at their own peril. Attacks and muggings by criminals, who apparently reside in proximity to the reserve, have occurred and are still occurring frequently according to the reserve managers. This is an intra-reserve contradiction that can be associated with the disconnects between the space and place attributes of the DNR. The external influences defeat the very aim of the DNR that strives to be "a haven, relevant to local communities whilst maintaining its biological integrity" as per the reserve's mandate.

The strength of place-space affinities can also be 'judged' by the degree to which the objectives of the DNR are achieved - or not. The objectives of the DNR are:

- to implement effective management systems through corporate governance, legislative compliance, and the implementation of policies, plans, strategies, procedures and agreements
- to provide access to communities for sustainable activities
- to provide and facilitate capacity building
- to provide opportunities for economic development
- to maintain and improve the biological integrity the DNR

The objectives can be seen as (too) ambitious in the wake of the many social challenges that the reserve is trying to address.

## 5.7 Spatial Analysis: Accessibility

It is important to distinguish between the physical accessibility of the reserve as a demarcated location or place relative to its surroundings, and access to the reserve for user groups and other stakeholders. Generally, access to a PA may be security-controlled, financially controlled (through admission and conservation fees) and privilege-controlled (through membership and loyalty incentives).

The DNR's absolute and relative accessibilities are intertwined with the place-space dynamics discussed in Section 5.6. Absolute accessibility can be linked to the extent to which the reserve is accessible, in terms of its location, to the users thereof. The location of the reserve at the intersection of two of Cape Town's most important highways - the N2 National Road and the R300 Route - that traverse large parts of the Cape Flats makes it fairly accessible. Direct access to the reserve is facilitated via Hindle Road that ramps off from the R300, and the Old Faure Road that, in turn, ramps off via Mew Way from the N2. Unauthorised access to the reserve by surrounding communities, facilitated by vandalised stretches of perimeter fencing, is arguably the biggest accessibility threat to the DNR.

Intra-reserve accessibility is facilitated by the road system in the reserve, as well as jeep tracks and foot paths as depicted in Figures 5.6 and 5.7. The fact that servitude infrastructure, such as manholes, sewage conduits, electricity transmission infrastructure, bulk water conduits and pump stations, are located in, or on the fringe of, the reserve further enhances accessibility beyond the control of the

conservation authorities. Servitude infrastructure maintenance and repairs supersede conservation concerns in the wake of crisis situations. (This has been confirmed by the reserve manager during conversations in 2016 and 2017.) Figure 5.23 indicates the presence of important servitude infrastructure, such as high voltage power lines in the background and storm and wastewater outlets (that feed the Kuils River) on the western side of the image.

**Figure 5.23: Servitude infrastructure - high voltage lines and wastewater outlets**

The Kuils River that drains the eastern edge of the reserve also adds to intra-reserve accessibility, albeit for livestock primarily. The almost uncontrolled access that livestock has to various parts of the reserve also needs to be considered from a safety perspective, seeing that people use the reserve as a thoroughfare, and cattle and goats use it as grazing space. Partly covered and/or open sewers and stormwater manholes were observed in various parts of the reserve during numerous visits (See Figure

5.24). The danger of animals falling into these open manholes and/or hurting themselves has been attested to by the herdsmen, as well as the reserve manager. The respondents reported that casualties among young animals have occurred in the past. Livestock owners are urged to take responsibility for the overall well-being of their animals and the role that herdsmen employed by them should play.

**Figure 5.24: Open sewer and an open and damaged manhole**



Relative accessibility is associated with the place dynamics of a location. Despite the DNR's good absolute accessibility, it is relatively inaccessible largely as a result of its poverty-stricken immediate hinterland and the latter's association with crime and unsafe conditions. The reserve's importance for the maintenance and expansion of the collective fynbos estate in the Western Cape is, therefore, severely hampered by anti-conservation activities that take place in, and in proximity to, the reserve. The fact that would-be visitors are deterred by safety concerns can indirectly add to the relegation of the reserve as a non-preferred conservation area. (This has been confirmed by the reserve managers during conversations in 2016, 2017 and 2018.)

Accessibility to the reserve for constituencies other than the surrounding communities can also be looked at from active-consumptive, as well as passive-consumptive, perspectives if the use of the demarcated initiation space is considered. It was reported that the reserve offers spatially what is

required by initiation practices. Young initiates do have physical protection provided by the bushy and shrubby vegetation in proximity to the initiation village on the eastern side of the reserve. That part of the reserve is also close to surrounding communities and significant others that can intervene in circumstances where initiation practices go wrong. Initiates in the urban reality cannot 'go to the mountain' as is practice in Xhosa tradition (Bullock, 2015).

This easy access can also bedevil the initiation process as minimum contact with the 'outside world', as required by this rite of passage to manhood, cannot be controlled. The fact that the DNR is an urban park, and that it has for all practical purposes no perimeter fencing - or, at best, only porous fencing - impacts therefore negatively on the important cultural practice of ulwaluko for young Xhosa men who are collectively referred to as abakwetha. Figure 5.25 depicts a part of the cultural space close to the eastern boundary of the reserve.

**Figure 5.25: A part of the former cultural space with Mfuleni in the background**

During a follow-up visit to the reserve in the earlier part of 2020, and after extensive land invasions in the Cape Town metropolitan area, it was observed that this cultural space has disappeared due to invasions and the subsequent establishment of dense clusters of informal housing structures in the eastern and southern parts of the reserve.

## 5.8 Spatial Analysis: Temporality

Temporalities associated with the DNR include resource use and service considerations. As explained in Section 5.4 (Resources Analysis), the use of the reserve for various purposes indeed displays time dimensions. Examples in this regard include the periods of initiation and cattle grazing. Flooding in the reserve is a potential problem in winter as the water table in the wetland sections of the reserve poses serious consequences for people and the informal structures that they occupy in the Green Park and Driftsands settlements.

Visits by (outside) user-groups, such as tourists and environmentally minded visitors, to the reserve are/can also be influenced by safety concerns. Reserve managers and the social ecologist have identified criminality in the areas surrounding the reserve as a real issue which they have to deal with as they cannot guarantee the safety of visitors. This, in turn, influences the environmental education programmes offered by the reserve.



The winter and summer initiation periods for young Xhosa men in the reserve also reflect a temporality that is closely associated with cultural practices in spaces that are conducive for rites-of-passage to be practised as explained in Section 5.7.

## 5.9 Spatial Analysis: Association

The DNR's conservation assets and its association with an immediate hinterland that poses a variety of socio-economic challenges make the reserve arguably one of the most difficult ones to manage in the Western Cape - if not in South Africa at large (according to the former reserve manager). A protected area that plays host to poor communities that are located in and/or adjacent to its boundaries make the execution of core conservation functions very difficult. This sentiment was also expressed by the former and current reserve managers, as well as the social ecologist (conversations with reserve managers, 2016, 2018, 2019).

The fact that the reserve is part of the conservation estate of Cape Town makes its association with other reserves in the metropolitan area, that are in terms of their location and managerial support 'far more privileged', very prejudicial from a visitation point of view. As the potential dangers associated with visits to the reserve have to be considered, it is being disadvantaged from the good that can come from more visitors to the reserve.

The association that the DNR has, by virtue of its location and the servitude infrastructure that it plays host to, with the areas outside the reserve can also be illustrated through wastewater and solid waste disposal. The Kuils River, as intermediate wastewater disposal site, carries effluent waste that originates from land-uses in the upper and middle course of the river. It drains areas characterised by agricultural, residential and commercial land-uses from its origins in the high-lying areas of Durbanville all the way to its confluence with the Eerste River.

Other forms of solid waste disposal are also evident in the reserve. Figures 5.26 and 5.28 show locations where used vehicle tyres and inert and organic waste respectively are illegally dumped.

**Figure 5.26: Illegal dumping of waste tyres**

**Figure 5.27: Illegal dumping of inert and organic waste**



Other associations that are worthwhile mentioning relate to the general Extended Public Works Programme (EPWP) that is implemented by CapeNature at various nature reserves in the province, supported by the Western Cape Provincial Treasury and the Department of Environmental Affairs and Development Planning (DEADP). The EPWP at the DNR includes integrated catchment management and operation services. Conservation spaces are, therefore, used as platforms to provide work opportunities for local people.

## 5.10 Conservation and resource-use synergies

In spite of evidence of significant conservation and resource-use conflict as recorded and analysed in the preceding sections, there are positive aspects that characterise the DNR and that can be enhanced to strengthen the conservation mandate of the reserve. The generally gloomy picture presented by the analysis provides, on the contrary, opportunities for such strengthening. Similar problems, albeit not that intense, have plagued the reserve since its proclamation but did not, however, incapacitate the management of the reserve over the years (conversations with reserve managers, 2016, 2018, 2019).

The objectives of the reserve highlighted in Section 5.6 need to be considered against the background of the benchmarks set in the PAMP of the DNR. The reserve managers believe that environmental education and capacity-building are the mandates of the DNR that will probably best support longer term sustainability of the reserve (and its management).

## 5.11 Linking resource-use information, spatial variables and expansion feasibility concerns

This section brings together resource-use information obtained from participants and the revisiting of spatial variables that influence - or are being influenced by - such uses in order to reflect on the PA expansion feasibility of the DNR. A feasibility analysis is typically comprised of the following categories: economic feasibility (which involves considerations such as finances, costing concerns and cost-benefit analysis), technical feasibility (which deals with risk assessment, mitigation and solutions), legal feasibility (which considers legal/constitutional requirements and mandates), operational feasibility (which focuses on control, efficiency and services), resource feasibility (which has additional staffing and material at heart), and schedule feasibility (which involves resource optimisation and project timeline estimations) (Feasibility Study, 2020).

Based on the analyses of different spatial variables in the preceding sections, the following sections summarise the relationships between the different spatial variables, on the one hand, and the chosen feasibility parameters for expansion (Table 5.2) and the conservation attributes of the DNR (Table 5.3), on the other hand.

Adapted from the Practitioner's Field Guide for Marine Conservation Agreements (The Nature Conservancy and Conservation International, 2012) the envisaged feasibility indicators, as discussed in Chapter 1, for investigation include: critical conservation concerns (in the case of the DNR it would be the threatened species and associated ecological infrastructure - the CBAs), the competency of conservation entities/authorities, relationships with right-holders (such as owners, managers and users of land, resources and ecosystem services), abatement of threats to expansion agreements, and the creation of conducive and site-specific conditions.

**Table 5.2: Linking spatial variables and feasibility indicators for expansion of the DNR**

| | Spatial variables | | | | | | |
|---|---|---|---|---|---|---|---|
| **Feasibility Indicators** | **Size** | **Shape** | **Place** | **Space** | **Access** | **Temporality** | **Association** |
| **Critical conservation concerns (CBAs)** | Smaller PA footprint to protect critical areas better | Less compact; perimeter protection lacking | Major problem of informal housing in the DNR | Conservation hampered by lack of fencing; DNR thoroughfare | Grazing, wood fuel and sand harvesting hamper conservation | Seasonality of resource-uses often hampers conservation | Reputational damage due to association with poverty and crime |
| **Competency of conservation entities/authorities** | Subject to externalities and resources to manage effectively | Subject to externalities and resources to manage effectively | Subject to externalities and resources to manage effectively | Subject to externalities and resources to manage effectively | Subject to externalities and resources to manage effectively | Subject to externalities and resources to manage effectively | Subject to externalities and resources to manage effectively |
| **Relationships with right-holders (such as owners, managers and users of land, resources and ecosystem services)** | Co-management initiatives; community involvement crucial | Co-management initiatives; community involvement crucial | Advantages of positive place-space affinities to be enhanced | Advantages of positive place-space affinities to be enhanced | Uncontrolled access difficult, if not impossible, to manage; community involvement | Strengthening of right-holders' participation crucial | Role of CapeNature and City of Cape Town crucial; partnership enhancement |
| **Abatement of threats to expansion or contraction agreements** | Realignment of boundary fence; de-proclamation of sections; inclusion of off-set areas | Perimeter fencing; de-proclamation; off-set areas | Environmental education; bird watching; fynbos and wetland protection to be enhanced | Advantages of positive place-space affinities to be enhanced | Fencing and fortressing-off of the DNR not feasible; community involvement crucial | Temporalities and sustainability of resource-uses to be 'negotiated' | Subject to externalities and resources to manage effectively |
| **Creation of conducive, site-specific conditions** | Perimeter fencing protection needed; partnerships | Perimeter fencing protection needed; partnerships | Advantages of positive place-space affinities to be enhanced | Advantages of positive place-space affinities to be enhanced | Access cannot be controlled; community involvement crucial | Community involvement crucial | Community involvement crucial |

Externalities and resource-uses related to: Conservation, Grazing, Housing, Fuel-wood, Sand harvesting, Pollution, Criminality, Cultural practices

**Table 5.3: Linking spatial variables, conservation attributes and feasibility indicators**

| Spatial Variable | Spatiality of Conservation Attributes | Feasibility Categories (Economic, Technical, Legal, Operational, Resource or Schedule) |
|---|---|---|
| Size | The proclaimed, proposed and priority extents of the reserve are to be considered relative to conservation mandates. | The priority extent may enhance operational feasibility. Economic feasibility is jeopardised as fence realignment and associated problems carry material/financial and reputational costs. |
| Shape | The priority extent is less compact. | Shape indentations pose challenges to technical and operational feasibility. |
| Place | Off-set areas spatially separated from the reserve towards the north; off-set area towards the southeast of the reserve; de-proclaimed area around the Green Park settlement. | Legal and operational feasibilities are influenced by both off-set areas - particularly the off-set area in the southeast of the reserve. |
| Space | DNR as a birdlife haven; dunes, wetlands, Driftsands Dam and the Kuils River as important ecological infrastructure; Fostering of good conservation and community relations to underpin DNR as integrated urban park. | Conservation attributes contribute to resource feasibility. Stronger community support can enhance resource and operation feasibility. |
| Accessibility | Kuils River floodplain as a green corridor that is linked to the middle and upper courses of the river; 'free' access based on the reserve's urban/community status. | Porous fence/lack of fencing, safety and crime concerns pose challenges to all categories of feasibility. |
| Temporality | Wetland inundation, flooding; resource harvesting. | Flood management influenced by run-off in the upper and middle courses of the Kuils River, as well as resource harvesting, impact on schedule feasibility. |
| Association | Association with the surrounding communities and other PAs on the Cape Flats that experience similar conservation challenges. | Association poses challenges to all categories of feasibility. |

## 5.12 Conclusions

The evidence presented in this chapter illustrates how the revisiting of different spatial variables, such as size, shape, place, space, access, temporality and association, can inform the feasibility of the expansion and/or contraction of the DNR as a protected area. In combination with the principles of South Africa's National Protected Areas Expansion Strategy (NPAES), as well as the chosen

feasibility indicators, it can be deduced, based on the evidence presented, that the changes in the proclaimed, proposed and the priority extents of the DNR were results of the threats to locational/place aspects of the reserve.

As the analysis reveals, most of the threats to biodiversity in Cape Town (as discussed in Chapters 2 and 3) are also prevalent in and around the DNR and include the following: urbanisation and related informal settlements, invasive species, urban livestock keeping and overexploitation of grazing stocks, water and land pollution, impacts on hydrological features (i.e. the Kuils River and the wetlands) and crime.

Theoretically, sense-making of the evidence presented in this chapter points in the direction of the environmental conflict thesis as a particular political-ecology thesis. It tries to explain how class, race and gender issues influence environmental conflicts and vice versa and frames questions regarding environmental access to resources. The spatial variables of place, space and accessibility related to the DNR largely support the application of this conflict theory to the case study.

The identified off-set areas towards the north and south-east of the reserve, as per the priority extent map of the DNR, can also be considered an example of reactive conservation, i.e. conservation precipitated by developments to off-set some of the impacts of such developments and further site-specific conservation imperatives.



The analysis brought together the results of primary data (derived from resource-use and PA expansion conversations and observations), as well as secondary data (derived from quantitative data derived from PAMPs and other literature), in a concurrent, triangulated manner rooted in MMR. The evidence suggests that the spatial expansion or reduction of the DNR encompasses far more than just the demarcation of sizes and boundaries, and that a critical understanding of how the impact of spatial variables is reflected directly or indirectly in conservation, resource/livelihood and management practices in the study area.

# CHAPTER 6: DATA PRESENTATION AND ANALYSIS - WEST COAST NATIONAL PARK (WCNP)

## 6.1 Introduction

This chapter presents and analyses the primary and secondary data and information collected for the WCNP case study. The analysis is done similarly to the analysis of the data for the DNR in Chapter 5. Over and above observations and seven site visits to the WCNP since 2016 and the revisiting of secondary data, primary data were derived from interviews with stakeholders and users of the park's resources. The following stakeholder and resource-use groupings were consulted at various stages in the period 2016 to early 2020 (prior to Covid-19 restrictions): rangers, small scale and subsistence fishers, an environmental educationist, a social ecologist, tourists and visitors, heritage representatives, environmental impact managers, as well as harbour and marine control officials.

Formal meetings were arranged with rangers and small-scale and subsistence fishers whilst participant observation was used as a platform for exchanges with the other participants. A group of small-scale fishers allowed an audio recording of discussions with them whilst other participants were reluctant to agree to any audio and/or video recording and preferred in situ participant observation. Adherence to these ethical principles left the researcher with few choices other than the capturing of mental and field notes. As was the case in the DNR, the discussions diverted in almost all cases away from PA expansion per se to management and livelihood challenges.



## 6.2 The spatial context and locational characteristics of the WCNP in relation to the Cape West Coast Biosphere Reserve (CWCBR)

The west coast of the Western Cape Province is generally drier than the south-western and southern parts of the province's coastal areas. Compared to Cape Town's average annual rainfall of 520mm the coastal strip north of the city is relatively dry. The stretch from Cape Town through to the towns of Langebaan, Saldanha Bay, Vredenburg and St. Helena Bay receives an annual average rainfall of 268mm (https://en.climate-data.org/africa/south-africa/western-cape/langebaan-23473/). The natural vegetation in the area is largely shrubby fynbos and, except for the towns mentioned, the area is not as developed as the other coastal areas of the Western Cape.

### 6.2.1 Site characteristics of the WCNP

An appreciation of the locational characteristics is important in understanding the resource contestations that will be analysed in this chapter. The WCNP is adjacent to the town of Langebaan and includes the world-renowned Langebaan Lagoon for which it was declared a Ramsar site (Figure 6.1). It also includes the adjoining coastal zones of Sixteen Mile Beach and Postberg Nature Reserve, as well as the nearshore islands named Jutten (43 ha in size), Schaapen (29 ha), Malgas (18 ha), Marcus (17 ha) and Vondeling (21 ha). (https://www.birdlife.org.za/iba-directory/west-coast-national-park-and-saldanha-bay-islands/)

Meeuw Island (with a size of 7 ha) falls outside the jurisdiction of the WCNP and is controlled by the South African National Defence Force (SANDF). The Langebaan Lagoon, core of the WCNP, is roughly 15km long, on average 3km wide, relatively shallow, and with the deepest areas having an approximate depth of 6m. The lagoon is sheltered from the wave action of the Atlantic Ocean, and saline water enters the lagoon via Saldanha Bay in the north (See Figure 6.1). The little freshwater received by the lagoon comes primarily from the Elandsfontein aquifer towards the east of the WCNP. (https://www.birdlife.org.za/iba-directory/west-coast-national-park-and-saldanha-bay-islands/)


**Figure 6.1: Land use and potential park expansion**

(Adapted from https://www.sanparks.org/assets/docs/conservation/maps-26Feb10.pdf)

The lagoon and its salt marshes towards the south of the body of water provide habitats to significant populations of molluscs, crustacean marine algae, salt-marsh succulents, reeds and freshwater vegetation. The lagoon is also a spawning and nursery ground for various fish species, as well as small sharks. The combination of salt-marsh succulent vegetation and palustrine freshwater wetland vegetation, i.e. vegetation with underwater root systems, in the southern part of the lagoon is a crucial biodiversity asset that is under constant threat as a result of externalities, such as sediment deposition, water level variation and trampling by visitors, which impact on the lagoon.

Another locational characteristic that has to be considered in the conservation-resource use nexus on which this study focuses, is the connection of Marcus Island with the mainland at Hoedjiespunt via the construction of a causeway. The latter was completed in 1976 as a protection measure for the iron ore export harbour, as well as the crude oil import activities in Saldanha Bay (Weeks et al., 1991).

The causeway impacts on water circulation in the bay itself which accelerates the erosion of Langebaan's beaches and contributes to sediment deposition in the mouth of, and further to the south of, the lagoon. Deposition dynamics are further complicated by the locations of the Meeuw and Schaapen Islands in the mouth of the lagoon (Shannon & Stander, 1977; Weeks et al., 1991). The islands seem to be responsible for the channels in the sand deposits in the northern part of the lagoon (See Figure 6.2).



The military activities at Donkergat on the almost triangularly shaped peninsula (which is connected with a narrow strip of land to the Postberg Nature Reserve area) is bordered by the Atlantic Ocean in the west, Saldanha Bay in the north and the Langebaan Lagoon in the south. The SANDF controls Donkergat - and by implication its spatial (in)accessibility which is only terrestrially possible through the WCNP. The analysis of the 'militarisation' of a part of the WCNP is presented in Section 6.9.2.

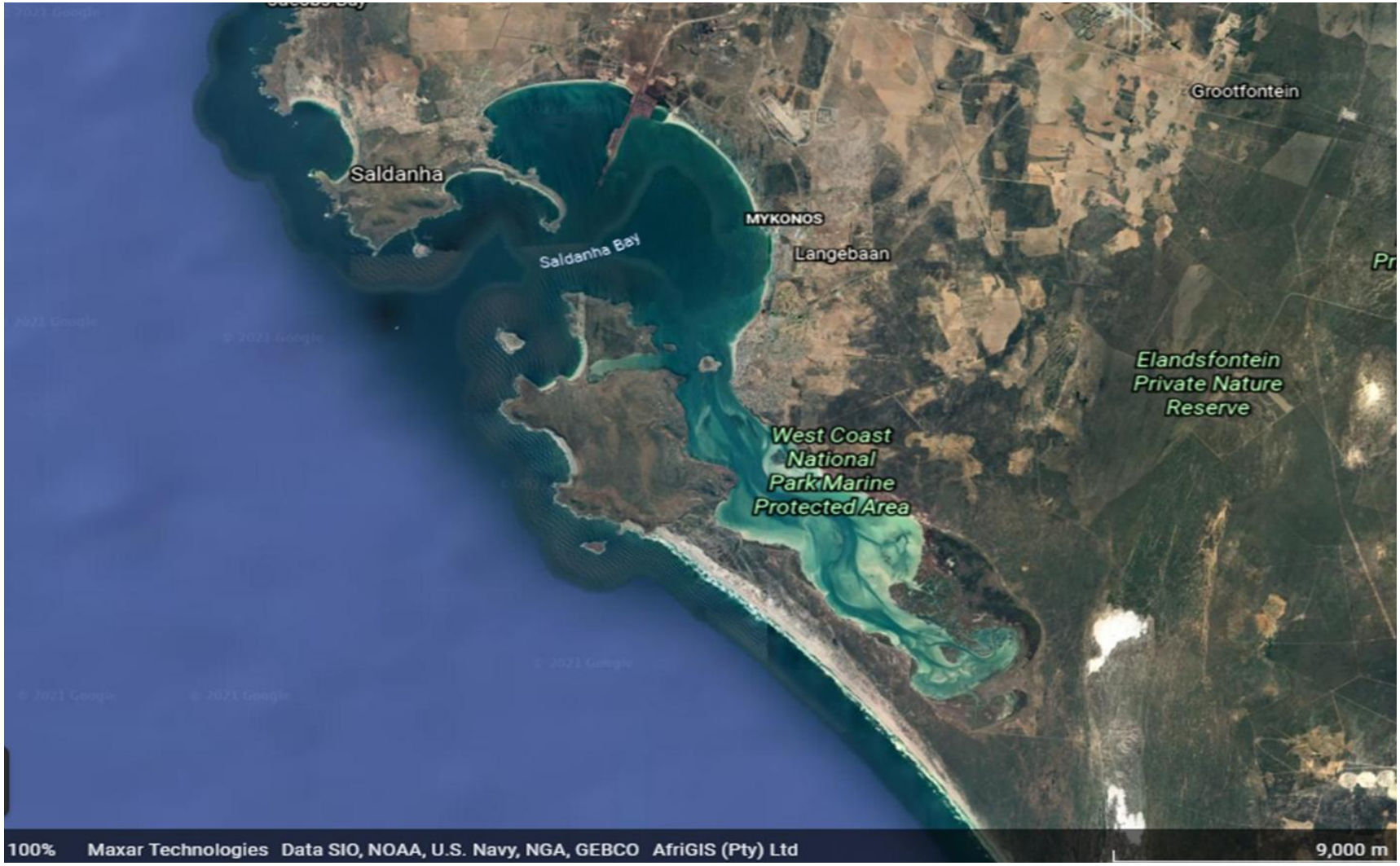



**Figure 6.2: West Coast National Park and Langebaan Lagoon (Source: Google Earth)**

### 6.2.2 Cape West Coast Biosphere Reserve (CWCBR)

Despite its relatively 'lower' biodiversity endowment, the West Coast has significant conservation value. This is reflected in the fact that the area forms part of the Cape West Coast Biosphere Reserve (CWCBR). The CWCBR is one of ten UNESCO-declared biosphere reserves in South Africa and one of five in the Western Cape Province (UNESCO MAB programme, 2019:14).

The other biosphere reserves in the province are Kogelberg, the Cape Winelands, the Gouritz Cluster and the Garden Route. Biosphere reserves form the backbone of the demarcated biodiversity-rich areas of the province which simultaneously, through their very existence, acknowledge the fact that conservation areas and other land-uses are integrated. Figure 6.3 indicates the distribution of South Africa's Biosphere Reserves, and by implication the Western Cape Province's biodiversity endowment. The WCNP, in turn, forms the conservation heart of CWCBR.

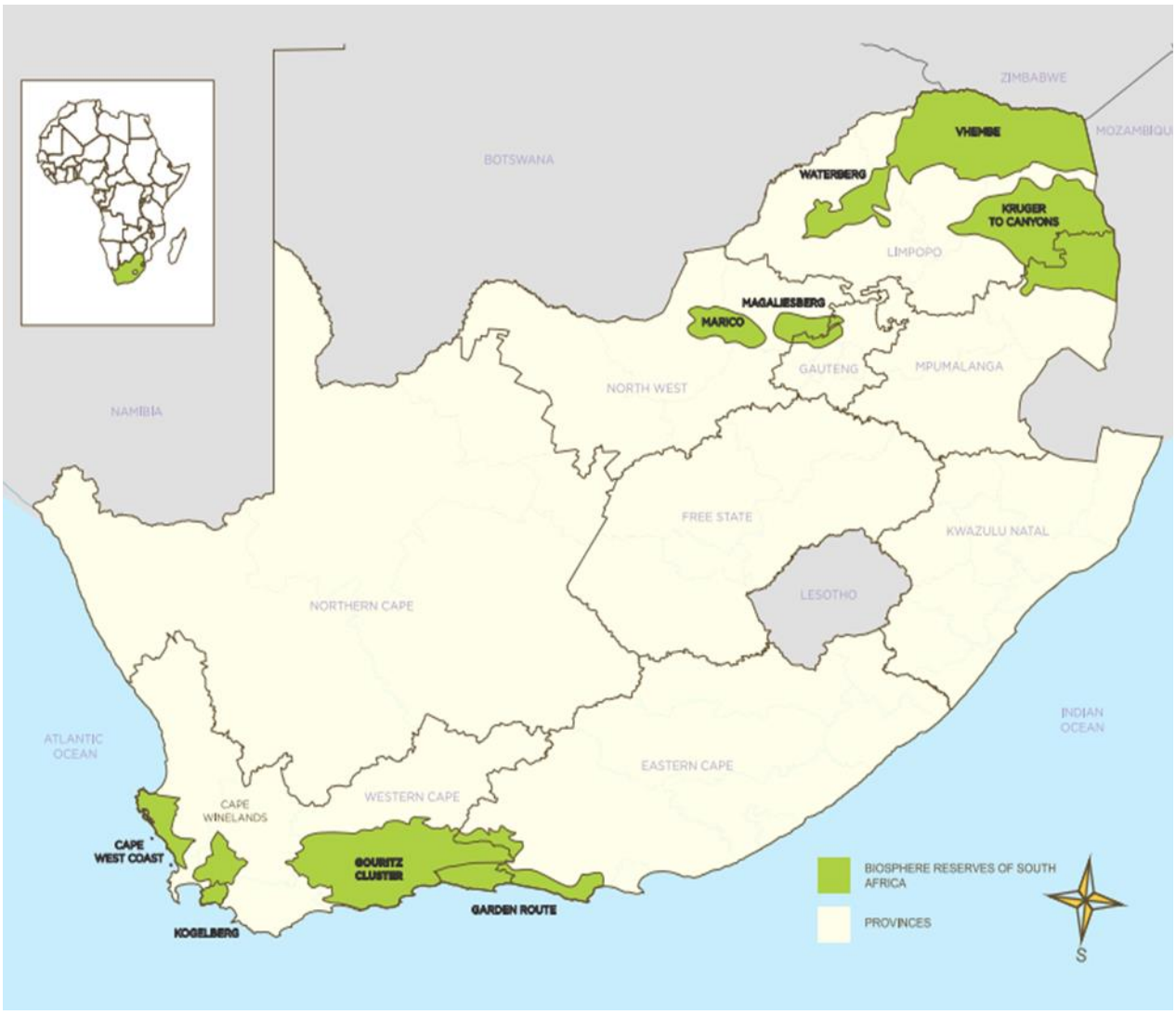



**Figure 6.3: South African Biosphere Reserves**

(UNESCO MAB Programme, 2019:14)

The most serious threat to biodiversity conservation along the coast from Cape Town all the way north into Saldanha Bay, was (and still is) industrial development. The development of the iron-ore export harbour and its associated infrastructure in the 1970s was a typical example of the development of so-called growth-pole initiatives, driven by the development of industrial nodes under grand apartheid. Saldanha Bay was earmark as such a flagship growth-pole (Todes & Watson, 1984; Kleynhans et al., 2003). In democratic South Africa, the essence of growth-pole development to diversify and deconcentrate the South African space economy continues, and Saldanha Bay features

again as a pivot for further development on the West Coast. The purpose of the current initiatives that have given rise to the establishment of the Saldanha Bay Industrial Development Zone (SBIDZ) are to revive the area economically (Brand & Drewes, 2020).

The location of the WCNP in the spatial context of the Cape West Coast Biosphere Reserve (CWCBR) is important to consider before the spatial dynamics, that influence PA expansion, can be analysed (Figure 6.4). The CWCBR is one of five biosphere reserves in the Western Cape Province. Biosphere reserves are

> "…territories with beautiful landscapes, a considerable abundance of fauna and flora, its [*sic*] own and unique culture, where harmony between development and the natural surrounding is promoted. They are like specific areas where models of sustainable development, that seek better living conditions based on environmental principles, are tried and proven." (https://www.capebiosphere.co.za/)

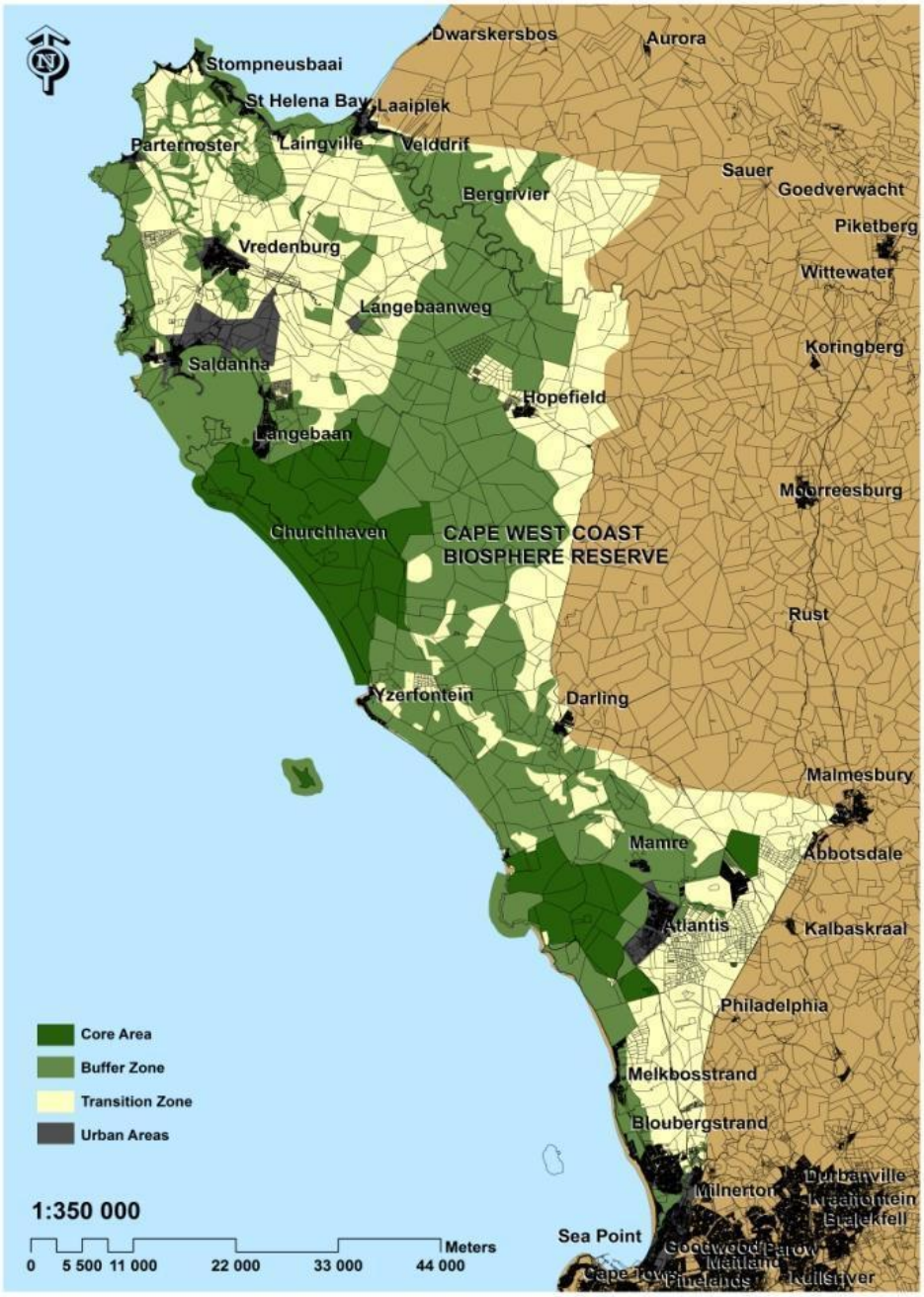



**Figure 6.4: Cape West Coast Biosphere Reserve**

(UNESCO MAB Programme, 2019:21)

The United Nations Educational Scientific and Cultural Organisation (UNESCO) considers biospheres, as part of its Man and Biosphere Programme (MAB), to be "learning sites for sustainable development." UNESCO bestows international status, based on the advice of a sovereign country, on biosphere reserves. South Africa plays host to ten of the 70 biosphere reserves on the African continent and the 669 biospheres worldwide. Depending on their location, they normally consist of terrestrial, marine and coastal ecosystems, and each biosphere reserve strives to strike a balance between biodiversity conservation and sustainable uses of resources in such areas. UNESCO further considers biosphere reserves as

> "…Science for Sustainability support sites – special places for testing interdisciplinary approaches to understanding and managing changes and interactions between social and ecological systems, including conflict prevention and management of biodiversity." (http://www.unesco.org/new/en/natural-sciences/environment/ecological-sciences/biosphere-reserves/)

A biosphere reserve is typically comprised of three interconnected zones that complement each other. The multiple spatial and functional levels of declared biosphere reserves regarding their core conservation spaces, buffer zones and transition zones are illustrated in Figure 6.5.

The first zone is the so-called core area in which strict conservation measures are in place to protect sensitive species and genetic variations, ecosystems and habitats, as well as natural and cultural landscapes. As the Langebaan Lagoon is the core conservation area of the WCNP which is, in turn, the core area of the CWCBR, it can be considered the central conservation core.

The second zone, which normally surrounds the core, is considered to be the buffer area in which human activities, characterised by compatible ecological practices, occur. In the area being studied, the buffers that protect the core include the proclaimed PA space surrounding the lagoon, the adjacent Marine Protected Areas (the MPAs), as well as ecological buffering support provided by CAs further afield, largely in the form of private and local nature reserves, such as the Elandsfontein Private Nature Reserve towards the north-eastern part of the park and the Yzerfontein Nature Reserve in the south.

The third zone is the transition area in which most economic activities are allowed within the context of socio-cultural and ecological sustainability. The towns mentioned previously, as well as industrial,

port and other extractive resource-use activities, such as fishing, agriculture and mining, can be considered part of the transition zone.

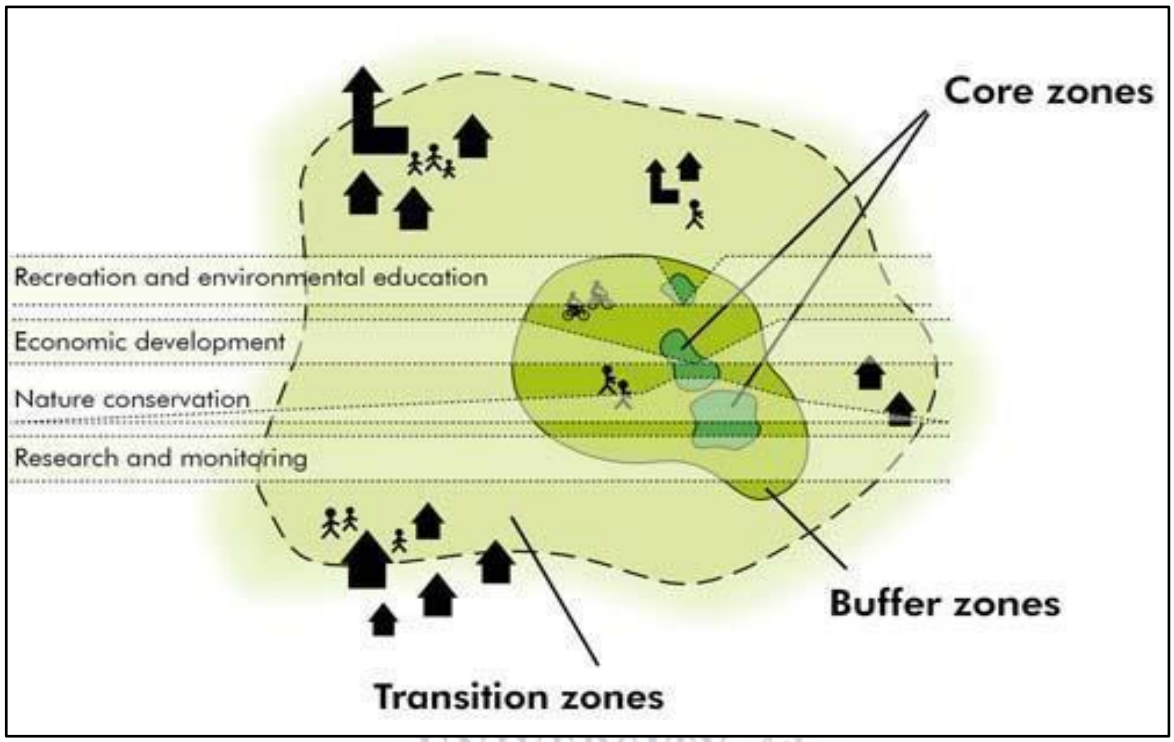





**Figure 6.5: Components of a biosphere reserve**

(Source: www.credits-for-sustainability.com)

## 6.3 Biodiversity characteristics and challenges of the WCNP

As discussed in Section 6.2, the heart of the WCNP, as one of South Africa's smaller but very diverse national parks, is the Langebaan Lagoon, the surrounding MPA areas, as well as the nearshore islands. The biodiversity characteristics of the park, and their association with challenges, need to be seen against the background of the natural-physical conditions that accommodate the biodiversity endowment, as well as the conservation mandate of the park. The lagoon's international Ramsar status is arguably the most important driver for maintaining the ecological integrity in a PA, such as the

WCNP, which is comprised of very diverse historical land-uses, as well as an immediate hinterland that poses significant challenges to the management of the park (WCNP MP, 2013).

### 6.3.1 Avifauna

The lagoon and the largely strandveld and costal fynbos vegetation in the park play host to more than 250 migratory, as well as a great number of residential, bird species. The lagoon is South Africa's most important wetland for coastal wader birds and is home to approximately 10% of the country's wader population. In summer, it also supports, on average, more than 20 000 migratory birds, including waders and species from the Palearctic region (WCNP MP, 2013). The Palearctic is the largest biogeographic region on earth and stretches all across Eurasia and North Africa. During the winter period, the lagoon hosts, on average, more than 6 500 birds largely comprised of Greater and Lesser Flamingo, as well as waders. (https://www.birdlife.org.za/iba-directory/west-coast-national-park-and-saldanha-bay-islands/)

The nearshore islands provide habitats for more than 80 000 birds. The islands are breeding sites for the highly threatened Cape Gannet and the African Penguin. Malgas Island is, for example, home to 25% of the world's Cape Gannet population. There are concerns, though, regarding the significant decrease of more than 50% of this bird's population on the island.



### 6.3.2 Fauna

Animal species in the park include the following: the Cape golden mole, black-footed cat, Cape mole rat, the endemic sand toad, Cape sand frog, Cape dwarf chameleon, the highly localised southern adder, and a host of other highly localised and threatened reptiles, such as skinks, lizards, gecko and tortoises.

Mammals in the park include: the bat-eared fox, honey badger, small grey mongoose, caracal, Cape grysbok, mountain zebra, grey rhebok, common duiker, steenbok, bontebok, springbok, red hartebeest and eland.

### 6.3.3 Flora

Terrestrial areas around the lagoon are vital in the conservation of strandveld in the WCNP, namely areas on the western side of the lagoon and coastal fynbos to the east. Annuals normally flower around the lagoon in spring, making the WCNP a premier flower tourism destination in the period from July to September. The lagoon and its salt marshes towards the south of the waterbody are a habitat to significant populations of molluscs, crustacean marine algae, salt-marsh succulents, reeds and freshwater vegetation. The lagoon is also a spawning and nursery ground for various fish species, as well as small sharks. The combination of salt-marsh succulent vegetation and palustrine freshwater wetland vegetation, i.e. vegetation with underwater root systems, in the southern part of the lagoon, is a crucial biodiversity asset that is under constant threat as a result of externalities impacting on the lagoon.

Figure 6.6 illustrates the colourful salt marshes on the southern edge of the lagoon. One of the most visited bird-hides in the park is also visible in the background, as well as plumes of an extensive vegetation fire that occurred in September 2016 on farms east of the WCNP.

**Figure 6.6: Colourful salt marshes on the southern edge of the Langebaan Lagoon**

### 6.3.4 Conservation challenges and threats

The town of Saldanha Bay with its iron-ore exporting harbour and its associated activities, as well as the current and planned industrial activities, represents arguably the biggest threats to conservation and the management of the WCNP. Saldanha Bay and the completion of the iron-ore port in 1972 were part of the then apartheid government's growth-pole development strategy that attempted to deconcentrate and diversify the space economy of the old South Africa. Historically, through growth-pole development, economically deprived areas could obtain government support for the establishment of industries and businesses in areas, such as the former homelands, where cheap labour was in abundance (Todes & Watson, 1984; Kleynhans et al., 2003). Currently, activities associated with the Saldanha Bay Industrial Development Zone (SBIDZ) add to the revival and extension of the economy of the West Coast (Brand & Drewes, 2020).

Saldanha Bay and the Langebaan Lagoon are spatially inseparable – whatever happens in the bay will inevitably have an impact on the lagoon. The building of the port changed the hydrodynamics and water circulation in the bay, as well as in the lagoon. The interconnectedness of water circulation in the bay, the harbour activities and the bay-lagoon ecosystem require, therefore, bay-wide approaches to address and manage conservation challenges in the WCNP (Clark et al., 2012; Birdlife South Africa, 2015). Biodiversity is, therefore, directly and/or indirectly impacted upon by human influences and what happens ecologically elsewhere in the bay-lagoon system.



It is also important to protect groundwater resources around the WCNP. The potential use of groundwater from the Elandsfontein and Langebaanweg aquifers east of the park needs to be considered carefully as abstraction may have a direct and indirect impact on the ecological (water) balances in the lagoon. (This sentiment was also strongly emphasised in personal communication with rangers in 2018 and 2019.) The Elandsfontein aquifer feeds groundwater into the lagoon. It underlies the phosphate rich Elandsfontein dune field and surroundings and is threatened by the Elandsfontein Phosphate Mine that was granted environmental authorisation in 2016.

## 6.4 Natural Heritage

The natural heritage of the West Coast is arguably best captured in the fascinating paleontological history of the area - specifically in a radius of approximately 30km from the mouth of the Berg River, one of the most important perennial rivers of the Western Cape Province. An abundance of fossil records of animal and plant species provides evidence of the fact that some 5 million years ago the lower course and estuary of the current Berg River must have run more or less where the military complex, Langebaanweg, in proximity to the West Coast Fossil Park (WCFP), is located (Figure 6.1). The area that stretches from the WCFP towards an ancient coast, more or less where the current location of the Langebaan Lagoon is, must have been an extensive swampy area (Haarhof, 2015). The WCFP came into being after fossils had been discovered (uncovered) in a phosphate mine located in the Laangebaanweg area, off the road, between the towns of Vredenburg and Hopefield. (In accordance with South Africa's heritage regulations, mining operations at the site subsequently had to cease in 1993.) Roughly 5 million years ago this mining area was under water. The deposition, solidification and ultimate fossilisation of plant and animal material created phosphate beds that could be mined. Phosphate is a compound containing predominantly the element phosphorus (Compton, 2001). The latter is used in various industries and agriculture and can be mined from phosphate minerals.



Humid conditions and mangrove forests facilitated habitats for terrestrial, riverine and marine species. The uncovered wealth of fossils, layered in different strata, shows that extinct species of hippopotami, elephant, rhinos, bears, short-necked giraffes, sabre-toothed cats, three-toed horses, birds, frogs, seal whales and small mammals must have occupied the swampy region. (http://www.fossilpark.org.za/pages/background.html). Many of the current species of elephant, hyena and the big cats are recognisable in the reconstructed ancestor species that used to occupy the marshland of the then West Coast. The rich varieties of ancient species and their impact need to be understood in the context of the geo-biophysical conditions that prevailed then. Haarhoff (2015:46) believes that

> "[y]ou would have found elephants although they had four tusks. There were also hyenas, hominids, seals, sabre-tooth cats, dolphins, turtles and frogs…No one expected to find a bear

in Africa. At 750 kilograms, it was the largest predator of the time and had the most devastating jaw pressure of any animal."

The origin of the landscape of the Langebaan area, over and above its predominantly igneous geological underbelly, can be attributed to sea level variation that, in turn, was caused by the melting of ice surfaces (Compton, 2001; Umvoto Africa, 2011; Khan et al., 2015). Figure 6.7 illustrates and explains to visitors the impact of sea-level changes and how the South African costal environments, and the West Coast in particular, were influenced in recent geological times.

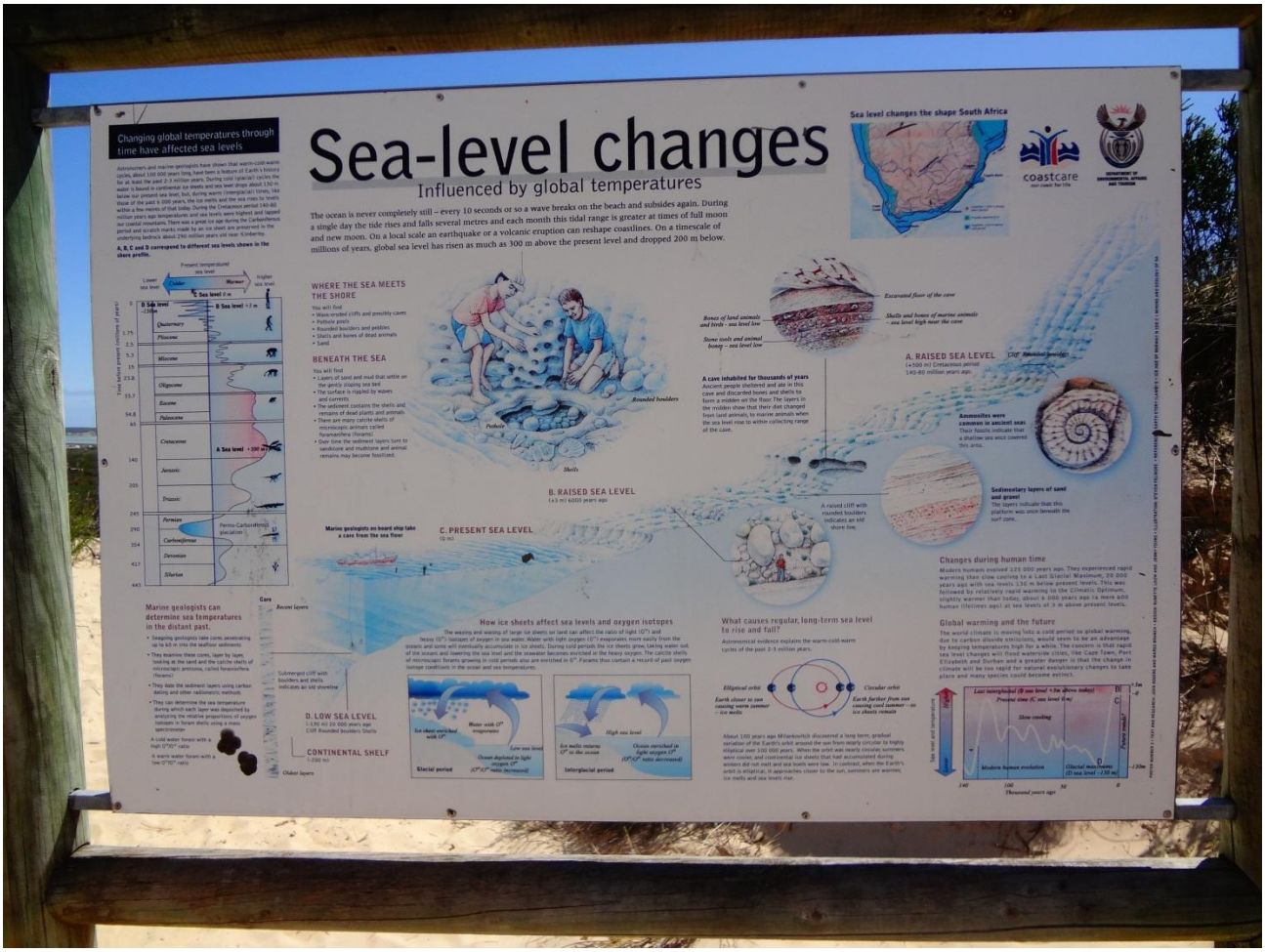



**Figure 6.7: Sea-level change information board at Geelbek Dunes**

## 6.5 Cultural Heritage

Just as fascinating as the natural history of the West Coast is its cultural history which can be traced back to the First Nations that roamed the area, namely the Khoi and San people. Excavated archaeological artefacts and the analysis of other physical remains provide proof of the fact that the pre-historical period on the West Coast must have been vastly different for the Khoi and San who eked out a living in a harsh environment populated by species which are currently not native to the area any longer (WCNP MP, 2013).

The archaeological history of the WCNP cannot be separated from that of the greater Saldanha region. For the purpose of this study the focus will be on the archaeological riches of the WCNP. Excavations at places, such as Leentjiesklip, Geelbek, Postberg, Kreefbaai, Preekstoel, Kraalbaai and Stofbergfontein revealed interesting resource-use temporalities. Available evidence that can be linked to the Holocene period (3000-5000 years ago) suggests that Late Stone Age people must have timed their visits to the lagoon and the coast in such a way that they could optimise the collection of shellfish, such as perlemoen and limpets, during low tide on the eastern and western shores of the lagoon. Evidence of interaction between Dutch soldiers and Khoi pastoralists during the 17th century was found at Oudepost.

> "The reason for the abundance of fossil archaeological and palaeontological remains in the Langebaan area is largely due to the fact that bones and implements are readily preserved by the rapid carbonate cementation of the strata in which they become entombed."
> (DEMF - Greater Saldanha, 2021:48)

Figure 6.8 illustrates the relationship that First Nation groupings had with the natural environment and resource-use characteristics that emanated from it.




**Figure 6.8: First Nation interaction - information board at Kraalbaai on the Langebaan Lagoon**

The geo-biophysical and cultural-historical elements discussed in the preceding sections provide more context for the following sections on the managerial challenges of the WCNP.

## 6.6 WCNP – Operational structure and management

The park is home to marine and terrestrial diversity that requires differentiated conservation management areas. The first management area covers the marine section of the park: the Langebaan Lagoon, the four islands (Marcus Island - 17ha in size; Malgas Island - 18ha; Jutten Island - 43ha; Schaapen Island - 29ha), as well as Sixteen Mile Beach that separates the Atlantic Ocean from the lagoon. The second management area is the terrestrial section that stretches from the town of Langebaan to the Geelbek Environmental Education Centre and park administrative facility. The third

management area is the terrestrial section that stretches all the way from Geelbek to Postberg and includes the beach areas of Preekstoel, Kraalbaai and Tsaarsbank (WCNP MP, 2013).

Other operational requirements of the park are managed through the Tourism, People and Conservation, and Technical components of the management structure. Essential duties related to visitor management, law enforcement, alien vegetation clearing and biodiversity are executed by designated teams which, collectively, make the park a well-managed entity by rangers and monitors under the auspices of the park manager. Expanded Public Work Programmes (EPWP), such as Working for Water, Working on Land and Working for the Coast, are also taking place in the WCNP.

The WCNP is also characterised by co-management agreements that include arrangements with private landowners in the Postberg and Stofbergsfontein areas of the park. SANParks manages the Postberg area in terms of a 99-year agreement (WCNP MP, 2013). Agreements also exist with respect to the inclusion of properties purchased by the National Parks Trust of South Africa (NPTSA) and the WorldWide Fund for Nature (WWF) into the WCNP. The NPTSA is a statutory body that enhances and expands, through the buying of land, SA's network of national protected areas and is, therefore, an important contributor towards the spatial expansion targets of NEMPAA (WCNP MP, 2013; https://www.sanparks.org/parks/west_coast/about/operational_structure.php). SANParks further co-manages the MPAs - including the Langebaan Lagoon, Sixteen Mile Beach and Malgas, Jutten and Marcus Islands of the WCNP - with the Oceans and Coast Directorate of the then Department of Environmental Affairs (DEA), which is now included in the newly named Department of Forestry, Fisheries and the Environment (DFFE).

It can be argued that the spatial integrity of the WCNP is jeopardised by spatial anomalies stemming from lease and management agreements and the fact that the park serves as thoroughfare for the militarised area of Donkergat over which park management has no control. The fact that the Postberg area is open to park visitors only during the annual flower season from July to September is evidence of such anomalies.

Section 6.7 introduces and analyses the information derived from stakeholder and resource-use participants as explained in Chapter 4 (Methodology and data gathering).

## 6.7 Narrative summaries and content analysis of conversations with stakeholder and resource-use groups

As mentioned in Chapter 1, stakeholder and resource-use groups are not representative of all interest groups. However, conversations were conducted, based on willingness and availability, with representatives of the following interest groups: rangers, subsistence fishers, environmental educationists, a social ecologist, tourists and visitors, heritage representatives, environmental impact managers, as well as harbour and marine control officials.

The following sections capture the essence of the conversations with the interest groups, as well as observations during field visits. The merging of primary and secondary, as well as qualitative and quantitative, data in MMR - which underpins this study - is important. This merging is done in a concurrent manner, i.e. the capturing of primary information, identification of themes and the reflection on spatial narratives emanating from the responses, are intertwined and linked with secondary data in a concurrent analysis, as explained in Chapter 4.

### 6.7.1 Rangers and honorary rangers

Rangers and honorary rangers form integral parts of the management and core conservation functions in South Africa's national parks. Honorary rangers, who are often retired professionals and former professional rangers, play important roles in the promotion of parks, launching of specific programmes and fundraising. Their roles in the WCNP park also include well established environmental education and community outreach programmes. During the extensive fieldwork periods of 2015 - 2019, interviews were planned and conducted with rangers and honorary rangers regarding the spatial expansion of the WCNP (See interview questions included in Appendix A). The respondents were familiar with the broad expansion plan that earmarked the inclusion of land parcels east of Route 27 (see Figure 6.1), as well as land purchased by the NTPSA and the WWF as explained in Section 6.6. Strong sentiments were expressed, though, that the current footprint of the park needs to be conserved as best possible and that pockets of expansion, notwithstanding their conservation attributes, need to be phased in via co-management agreements (personal communication with rangers, 2018 & 2019). The sentiments expressed by the rangers are in line with suggestions contained in the park management plan (WCNP MP 2013 – 2023).

Interviews were often done with rangers who accompanied the researcher (and fieldtrip groups) on guided tours through the park – often to the Postberg section in the northern part of the park and the Geelbek Dunes in the southern part of the park. The guided tour, from a research methodology point of view, provided for more in-depth conversations and fewer interview formalities en route in a vehicle or on a hiking trail.

### 6.7.2 Small scale/subsistence fishers

The subsistence fishers, albeit aware of SANParks' expansion plans, were - as expected - more concerned about discrepancies in the allocation of fishing quotas for commercial and small scale fishers, and associated implications for their livelihoods. Conversations took place on two occasions in 2017 and 2018. One conversation session was facilitated by an honorary ranger who also happened to be a subsistence fisher and one of the last few whalers on the West Coast. The whaling station, located at the current Donkergat Military Training area, was closed in 1967 (Marx & Liebenberg, 2019).

Some fishers had experience of fishing in the lagoon since childhood. Some of the older fishers explained that, prior to the demarcation of the activity zones in the lagoon, catches all along the shores of the lagoon could augment harvests of subsistence fishers, specifically if they had had poor catches offshore. They argued a strong case for the appreciation by management of the intergenerational knowledge that they have of the conditions in the lagoon. Conversations were subsequently steered in the direction of the impact that the activity zones in the lagoon have on the livelihoods of those who are almost solely dependent on fishing (personal communication with small-scale fishers, 2017 & 2018).

As illustrated in Figure 6.1, the lagoon is divided into three so-called activity zones A, B and C. Zone A is considered the multi-purpose recreational section of the lagoon, Zone B a restricted area, and Zone C the sanctuary and restricted area in which no activity is allowed. Zone C includes the most sensitive parts of the lagoon towards the south where the salt marshes, wetlands and bird habitats are situated. Fishing is allowed only in Zone A, closest to Saldanha Bay. Zone B was, and still is, the contentious one in which fishing is also not allowed but, according to an appeal by small-scale fishers of Langebaan, some commercial fishermen have been allowed to fish in this zone (Breytenbach,

2016). Since 2011 the small-scale fishers had found it increasingly difficult to make a living as they had to compete with other users in Zone A where fishing is allowed. However, whilst DAFF restricted small-scale fisher activities in Zone B, three commercial net-fishers, all being landowners in the WCNP, were allowed to operate in Zone B. This lingering contradiction and associated frustration was also voiced in conversations with representatives of small-scale fishers in 2017. Their commitment to the sustainable harvesting of fish stocks of harder and stumpnose in the lagoon was emphasised and they felt that their demands to have their resource base extended should not be seen as anti-conservationist but rather as an expression of their frustration with the spatial restrictions to which they were being subjected (personal communication with small-scale fishers, 2017 & 2018). The fact that subsistence fishers continued to fish in the lagoon despite it contravening apartheid legislation which had forced them legally out of the area, bears testimony to their continued struggle to oppose also the conservation restrictions imposed by the zones in the lagoon.

With the assistance of the human rights organisation, Legal Resources Centre, and the community organisation, Coastal Links, small-scale fishers requested the Western Cape High Court in 2013 to rule in favour of their application to fish in the lagoon, and in Zone B in particular, based on their ancestral (fishing) rights and attempts to sustain their livelihoods. In October 2016 the Western Cape High Court ruled in favour of Langebaan's small-scale net fishers who had made a living from the lagoon and the ocean prior to the proclamation of the WCNP. The court adjudicated that subsistence fishers' rights to make a living had been infringed upon and there was not enough scientific evidence presented by the then Department of Agriculture, Forestry and Fishing (DAFF) to suggest that the practices of small-scale fishers would necessarily be detrimental to the conservation mandate of the WCNP (Hendricks, 2016).

The granting of fishing rights to small-scale fishers in a protected area of the lagoon can, against the background of the PA expansion-reduction debates, be seen as an intra-PA reduction from a conservation point of view, but an aerial expansion of a resource-use base. It is, therefore, important to understand the juxtaposition of the commercial and small fishers' resource rights and demands, on the one hand, with attempts to manage the conservation integrity of the lagoon, on the other hand.

The small-scale fishers are also of the opinion that the activities in the Port of Saldanha and the resultant sedimentation further south in the lagoon may have impacted negatively on the spawning

habitats of fish in Zones B and C of the lagoon (personal communication with small-scale fishers, 2017 & 2018).

### 6.7.3 Environmental educationist

The environmental educationist is responsible for conducting environmental education programmes for school and tertiary education groups - mainly at the Geelbek Environmental Education Centre if so required. Sentiments, similar to those of the rangers regarding spatial expansion, were expressed by the environmental educationist. One of the essential aims of the programmes offered at the centre is to contribute to pro-conservation behaviour. A spatially bigger park may not necessarily contribute to such behavioural change, though. The Geelbek Environmental Education Centre is well equipped to handle groups in excess of 30 participants, and accommodation on the premises for such groups can also be arranged.

Concerns were also expressed regarding the general lack of educational visits by local, less-privileged schools compared to educational groups from elsewhere. Reasons provided for why this situation persists included lack of funds for fieldtrips, group sizes and time constraints due to full syllabi. It can, therefore, be argued that the use of the WCNP as an education resource-base is underutilised - at least by local schools (personal communication with the environmental educationist, 2017 & 2018).



The fact that the Geelbek Environmental Education Centre is on the southern edge of the lagoon, some 25 kilometres from the town of Langebaan and by implication from local schools, exacerbates the underutilisation. Other important attractions, such as the dune field further to the south, and attractions on the Atlantic side of the park, such the Church Haven settlement, Kraalbaai, Postberg, Plankiesbaai and Tsaarsbank, are even further away - making such resources still more inaccessible, relatively speaking (See Figure 6.1). The environmental educationist was in agreement with the argument that any extension of the protected area of the WCNP could, therefore, be considered as insignificant for purposes of environmental education for poorly resourced schools as a stakeholder group.

### 6.7.4 Social Ecologist

The inseparability of the ecological and the social components, and how to foster stronger synergies between the two, is the essential message of the social ecologist. The fact that the current WCNP used to be a site on which interaction between that environment and the Late Stone Age People, as well as the Khoi and San groupings, created synergies over thousands of years, needs to be appreciated. This is a crucial message conveyed by the social ecologist on visits to certain archaeologically important sites, such as the Pulpit Rock at Kraalbaai. The archaeological richness of the park is, therefore, an important basis for understanding historical and current social-ecological relationships. The diversity - and sometimes the imbalanced uses of resources stemming from the ecological endowment of the park and its surroundings - is, therefore, a constant social-ecological challenge. The demands of resource-use groups in the fishing, mining, tourism, real estate, military and industrial fraternities do have direct and indirect consequences for the ecological integrity of the park and its management.

The social ecologist shared the sentiments of the environmental educationist in relation to park expansion, i.e. that the latter may not necessarily enhance the integrity of the most sensitive parts (the lagoon, mudflats and salt marshes) of the park against the background of resource-use group demands. Arguments in favour of increased investment in human capacity and supporting material resources to enhance socio-ecological relations were furthered during the conversations (personal communication with social ecologist, 2017 & 2018). Size as a spatial variable for PA expansion is, therefore, relative and the social ecologist's opinion is that the relevant authorities should strive to achieve sustainable balances among the resource-use groups in order to enhance ecological integrity.

### 6.7.5 Tourists/visitors

During various site visits to the WCNP between 2016 and 2020, numerous impromptu conversations with visitors to the beaches of Langebaan, as well as with visitors to the various attractions in the park, were conducted. As participant observation underpins data gathering among tourists/visitors as a specific resource-use group, popular tourist places in the park, such as Postberg (during flower season in particular), Kraalbaai, Plankiesbaai, Geelbek Visitor Centre, bird hides and Geelbek Dunes were visited (Figure 6.9). As the activities that visitors to these attractions engage in can largely be

considered active and passive non-consumptive, it was assumed that some visitors would have some knowledge of the park's expansion initiatives.


**Figure 6.9: Zoning areas and visitor attractions in/around Langebaan Lagoon.**

(Source: Hendricks, 2016)

Based on research ethics considerations, tourists were not 'surveyed' for their opinions. Rather, the approach was to engage in in situ conversations while joining a tourist activity itself where it was

possible for the researcher to do so. Approaching possible respondents, explaining what the research entailed, and obtaining permission from visitors who would, for example, be walking the dunes, queuing at the Atlantic Viewpoint, day-visiting and picnicking at Kraalbaai - and those admiring the wildflower display in August/September at Postberg - was relatively easy. Kraalbaai is a popular site for day-visitors as it allows for a variety of recreational, non-consumptive activities as displayed in Figure 6.10. The nearby Pulpit Rock (Figure 6.11), at which the Footprints of Eve were discovered on the shore of the lagoon in 1995, adds to Kraalbaai's popularity (Roberts, 2002). The fossilised footprints, estimated to be approximately 117 000 years old, of a female hominid subsequently named Eve were discovered in a sandstone ledge on the edge of the lagoon. The original footprints were subsequently removed from the site and are kept in the Iziko Museum in Cape Town. However, a concrete replica of the prints is to be seen close to the popular rock.


**Figure 6.10: Prohibited and permitted activities in Kraalbaai, the WCNP's most popular day-visiting site along the Langebaan Lagoon**

**Figure 6.11: The popular Pulpit Rock near which the Footprints of Eve were discovered in 1995**



It was more challenging to garner information from visitors who participated in active non-consumptive activities, such as surfing and kite-surfing, as the researcher could not participate in these activities along with the surfers. The opinions of nine regular, local surfers and visiting surfers regarding park expansion could be captured, though. The three visiting surfers who granted interviews to the researcher, were not aware of the specific expansion plans for the WCNP. Local, regular surfers knew of the park expansion plans and appreciated the importance of a balanced approach to addressing the needs of different resource-use groups (personal communication with surfers, 2016 - 2019). As they understood the rationale for the demarcation of the different activity zones (A, B, C) into which the lagoon had been divided, sentiments in favour of access to Zone B for surfing purposes were expressed. It can, therefore, be argued that, from the point of view of surfers as a specific water

sport stakeholder group, intra-expansion of the scope of activities within the existing resource area, is promoted.

### 6.7.6 Heritage representatives

Honorary rangers of the WCNP, as well as representatives of the West Coast Fossil Park (WCFP), provided input in the form of very strong heritage voices. All three honorary rangers who were interviewed felt that, over and above the cultural heritage associated with the First Nations who occupied and extracted resources from certain areas of the current park, the more recent history of the park and its formation - which is based on the amalgamation of formerly contested land-uses - needed to be given greater emphasis if the conservation mandate of the park was to be fulfilled. Former contested land-uses and activities around the lagoon included agriculture, livestock rearing, whaling and guano harvesting. These are some of the historical activities that provide for an understanding of the current environmental and socio-economic challenges associated with the park. The former Geelbek farmstead is arguably the most popular cultural heritage site in the park. The honorary rangers also highlighted the direct and indirect consequences which the proclamation of the park had on the prior livestock keeping in the area. The ruins of a former abattoir near Geelbek is a reflection of the erstwhile importance of meat for the surrounding communities, as well as the town of Langebaan (Figure 6.12).



**Figure 6.12: Ruins of the old abattoir that used to serve the farming communities that existed near Geelbek before the proclamation of the WCNP.**

Mention was also made that rangers, honorary rangers and older folk who used to live on farms as part of the labourer corps reported sightings in 2015 - 2017 of wild pigs that genetically stemmed from pigs that were on the loose after the cessation of the former abattoir activities and the amalgamation of privately owned farms into the current WCNP (personal communication with rangers, 2017 & 2018). It could not be confirmed whether these sightings of feral pigs perhaps included alien pigs/boars imported as biological control of the pine emperor moth (Skead, 2011). The feral and wild pig numbers in protected areas of the Western Cape have decreased significantly over

the past four decades and the management (and eradication) of these animals is as important as maintaining indigenous/endemic biodiversity integrity (Skead, 2011).

Other adaptations by wildlife in the park relate to the marine rabbits on the nearshore islands of Saldanha Bay. These rabbit populations have also, despite their adaptability, decreased significantly since colonial times (Skead, 2011). Small-scale fishers reported on the adaptation and regular sightings of rabbits on Schaapen Island drinking saline water and foraging while swimming near the island (personal communication with small-scale fishers and rangers, 2017 & 2018).

Conversations with representatives of the WCFP revealed concerns about the apparent disconnect between the WCNP and the WCFP. WCFP representatives argue that the two parks cannot, from an archaeological point of view, be separated as the most recent geological processes and changes that had occurred further inland during the Pleistocene era had shaped some parts of the current coastal landscape of the West Coast (personal communication with WCFP representatives, 2017 & 2018). The mouth of the current Berg River that now flows into the Atlantic Ocean near the town of Velddrif, had done so further south in the geological past. Evidence suggests, for example, that fossils discovered in the WCFP park are similar to those buried under the Geelbek dunes and which are exposed by the wind ever so often (Figure 6.13).



**Figure 6.13: Exposed fossilised vegetation stump in the WCNP's Geelbek Dune Field**

Thus, according to the heritage representatives interviewed, the spatial-geological connections between the two parks provide an ideal opportunity for rethinking the original conservation-related objectives of the two parks and connecting them in order to conserve their biodiversity, geodiversity and cultural diversity – which, by implication, would mean park expansion.

The acknowledgment of the contribution that rangers made, and are still making, in the WCNP is perhaps best exemplified by the cultural recognition bestowed on the late Dawid Bester, a former ranger in the park. Bester was a master tracker and was world-renowned (https://thenaturecollege.com/team/ ; https://www.sanparks.org/conservation/people/all.php) for his knowledge and expertise in the field of medicinal indigenous plants of the West Coast, as well as his

ability to identify and track animals. The latter skill was acquired during his younger years in the Kalahari. Figure 6.14 depicts the plaque at the start of The Dawid Bester Trail named in honour of him. The trail starts near the Duinepos Chalets and winds all the way up to the dune field in the southern part of the park.

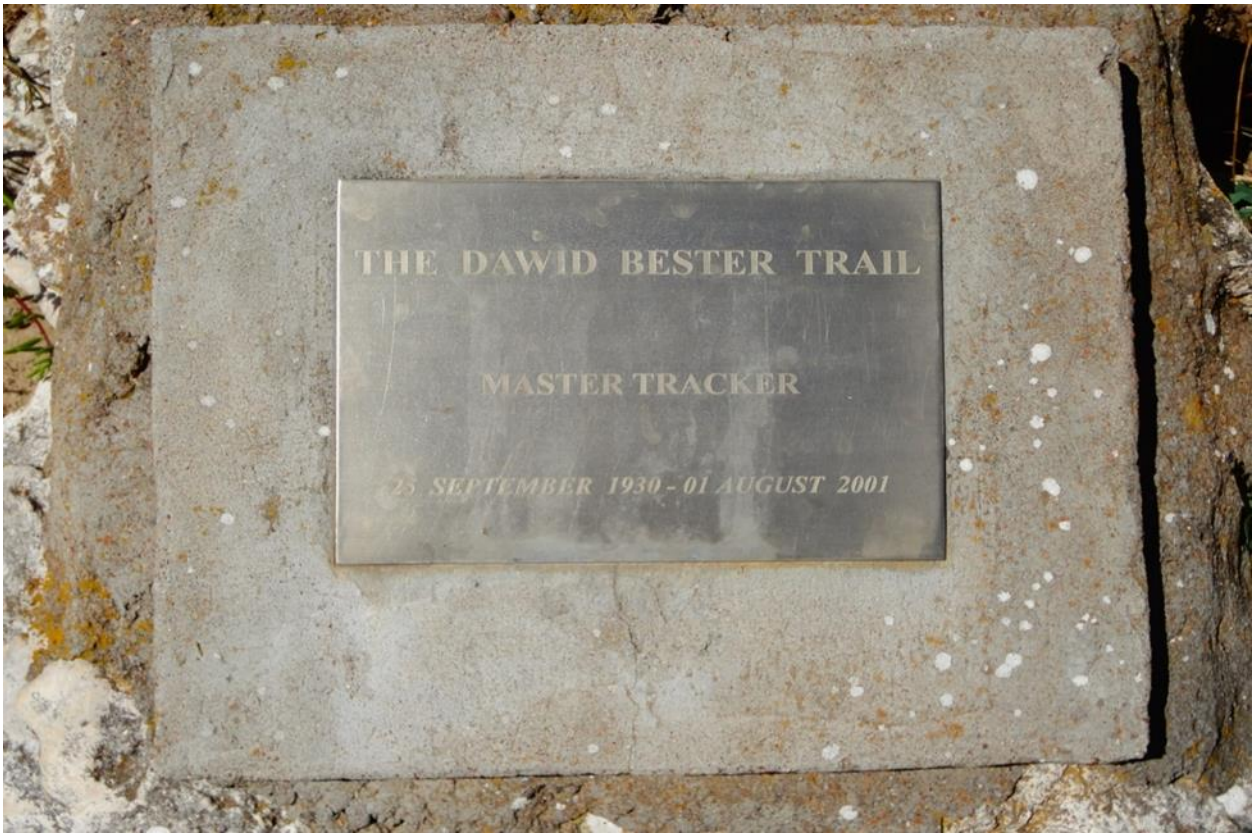



**Figure 6.14: The plaque at the start of the The Dawid Bester Trail**

The short 1.2 km trail is well signposted with information on indigenous vegetation to be found along the path. If the trail is undertaken as part of a guided tour, it becomes a living testimony to how the transfer of knowledge by the late Dawid Bester and its legacy capacitated and inspired the trail guides. Figure 6.15 provides information about the trail, and other hiking routes in the southern part of the park, as well as the achievements of the late Dawid Bester.

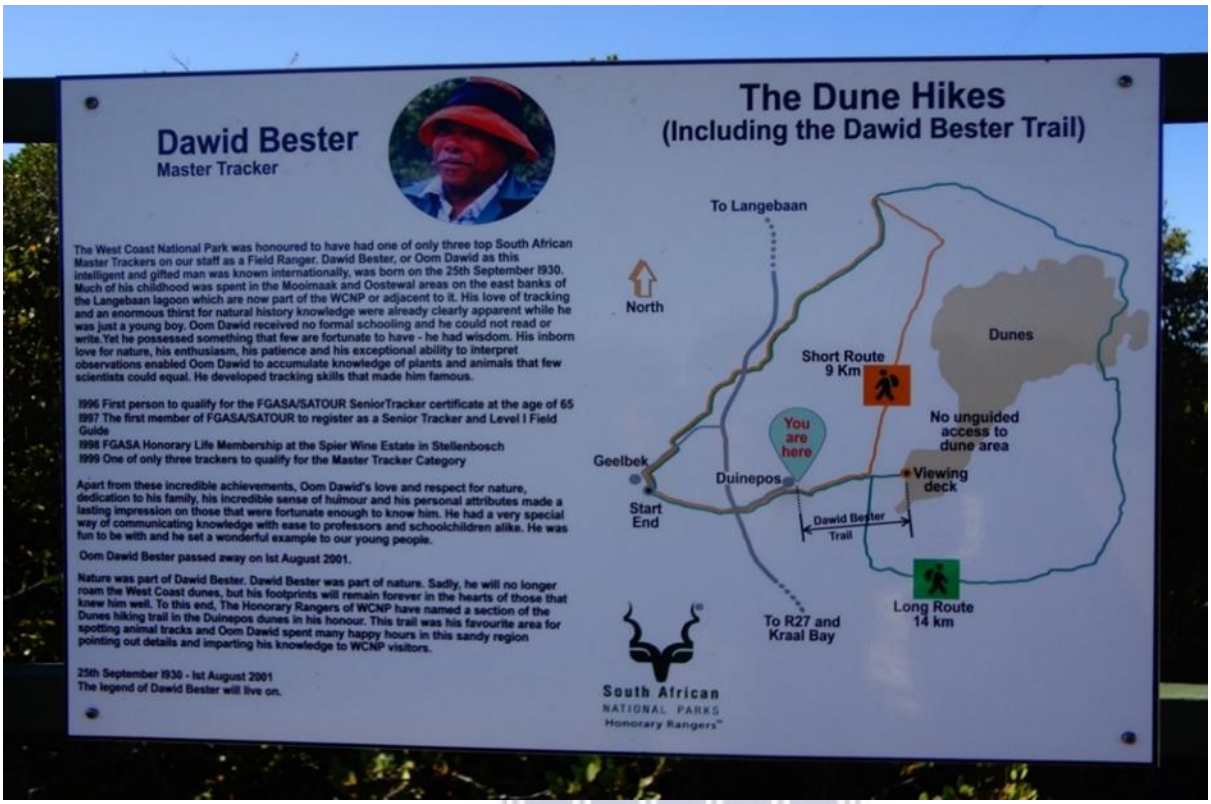



**Figure 6.15: Information on the Dawid Bester Trail and other Dune Hikes**

Figure 6.16 displays some of the indigenous vegetation to which the late Dawid Bester introduced some of the now honorary guides. The scientific names, the common names, as well as their (potential) uses and disadvantages for humans and wildlife, are signposted along the route.


**Figure 6.16: The survival and medical value, as well as dangers of some indigenous vegetation.**

Honorary rangers, who normally undertake the guided tours on the Dune Hikes, mentioned that walking the Dawid Bester Trail with groups is one of the most rewarding activities from an environmental education and heritage point of view. Educational, as well as public-interest, groups are normally very attentive and responsive on such walks. The researcher experienced this personally during participant observation which he undertook twice as part of the methodology for this study. (Mention was made, in conversation with one of the longest serving honorary rangers, that the toxic witmelkbos, although not scientifically proven, could have been the cause of death of some eland in 2018.)

### 6.7.7 Environmental assessment managers

Perspectives from other stakeholders, outside the spatial footprint of the WCNP, were deemed important for the purpose of this study as well. Interviews were conducted with the environmental manager in the Port of Saldanha in 2018, as well as with an environmental control officer (ECO) responsible for overseeing the infilling of a part of Small Saldanha Bay in 2019. Infilling was done to provide additional space for the stockpiling of iron-ore in the harbour. Iron-ore is transported by rail from distant Sishen in the Northern Cape and stockpiled in the harbour precinct before it is exported to overseas destinations – mainly China.



Despite adherence to the environmental management programmes for port expansion activities, the environmental manager and ECO acknowledged that the activities which they are overseeing in the Port of Saldanha may have direct and/or indirect impacts on the Langebaan Lagoon. The latter is inseparable from Saldanha Bay through which water circulation into the lagoon occurs. This is in line with the bay-wide approach that considers Saldanha Bay and the Langebaan Lagoon as inseparable from an ecological point of view. Standard concerns, such as the erosion of Langebaan's beaches, increased sedimentation in the lagoon due to changes in circulation patterns in the bay caused by the causeway built in the bay, and the ever-present visibility of (red) dust due to the iron-ore handling activities in the port, were also acknowledged by the environmental manager and ECO (personal communication with the environmental manager and ECO, 2017 & 2018). The spatialities of these impacts are largely visible in Zone A. It is their opinion that the intangible and longer-term (potential) influences of the aforementioned impacts on Zones B and C of the lagoon require additional investigations.

### 6.7.8 Harbour and marine control officials

In a similar vein, interviews were conducted with the manager of the Port of Saldanha, as well as an official of the fishing harbour on the opposite side of the bay. From a protected-area expansion point of view, the respondents appreciated the importance of the consolidation of different parcels of land towards the east of the WCNP, as well as private property in the park. Issues pertaining to the international economic impact of the Port of Saldanha as a very important iron-ore export harbour, as well as the role of the port as a multi-purpose terminal, were emphasised by the port manager as well. Ecological concerns were expressed, based on international protocols, regarding the management of ballast water. The multi-functionality of the port with respect to iron-ore export, importation of crude oil for on-shore storage in a facility east of the bay (see location of the SFF facility in Figure 6.1), and the servicing and maintenance of international off-shore oil platforms all contribute to the possibility of introducing alien marine species with the release and intake of ballast water into the ballast hull of vessels (personal communication with the port manager, 2017 & 2018). Imported crude oil is piped from the port to the onshore facility which is administered by South Africa's Strategic Fuel Fund (SFF).

The official at the fishing harbour expressed concerns about waste management challenges associated with the fishing industry in the harbour. Without divulging details, reference was made to the operations of Sea Harvest as anchor industry in the harbour. The company's fresh-fish and factory-freezer trawling activities offshore are beyond the spatial jurisdiction of harbour control, but the official is acutely aware of supply chain concerns, including marine source areas, transportation and eventual factory activities onshore (personal communication with the fishing harbour official, 2017 & 2018).

### 6.7.9 Accommodation services

SANParks offers accommodation to visitors in refurbished horse stables (for big groups) at Geelbek. The Steytler and Van Breda Cottages in the precinct of the stables are also available to the public. Other accommodation is available at Jo-Anne's Beach Cottage near Churchhaven on the western shore of the lagoon, Abrahamskraal in the south of the park and Duinepos Chalets west of the Geelbek

Dunes (Figure 6.9). As the WCNP also provides economic opportunities to, and capacity building for, local people, a conversation with the manager of the Duinepos Chalets was conducted as well.

The chalets, located in the south of the WCNP, are unique as the facility is eco-friendly – comprised of units built from sandbags and locally sourced rocks, and electricity supply is based on capturing solar energy. Over and above its eco status, the Duinepos Chalets are popular from a locational point of view as well. The manager is of the opinion that the facility's popularity can also be attributed to its proximity to the southern gate of the WCNP (primarily used by visitors from Cape Town), facilities at Geelbek (the restaurant, accommodation, shop and the environmental education centre), the Geelbek Dunes, the bird hides, and the southern salt marshes that attract and play host to the rich avifaunal endowment of the park (personal communication with Duinepos official, 2017, 2018, 2019).

Accommodation is also provided by owners of private houseboats in Kraalbaai. The houseboats are a long-standing cause of controversy as they, as private enterprises, are moored in the lagoon which is a world-renowned Ramsar site. Prior to the proclamation of the WCNP in 1984, houseboat operations were lucrative and not necessarily subjected to stringent environmental regulations, specifically in relation to waste management (personal communication with small-scale fishers and rangers, 2017 & 2018).



The place-space characteristics of accommodation establishments in the park seem to be a reflection of how best to capitalise on the conservation attributes and attractions in the park as reflected in the preceding discussions.

## 6.8 Spatial-temporal Analysis: place and space affinities

The fact that, before its proclamation as a PA, the spatial footprint of the current WCNP was historically comprised of a variety of terrestrial and marine productive areas that supported livelihoods in the Langebaan and Saldanha region, is crucial to understanding conservation and resource-use activities in the park. Place and space concerns are, therefore, important for consumptive and non-consumptive resource users who have developed relationships with specific locations in the park, such as historic fishing grounds, privately owned settlements, unique accommodation, such as on houseboats in the Kraalbaai area, and recreational spaces for boating and surfing.

### 6.8.1 Historical fishing grounds

Historic extractive consumptive activities include fishing activities, which used to range from whale hunting off the coast to small-scale net fishing, as well as commercial agricultural activities in the Geelbek and Postberg areas. It is, therefore, understandable that a stakeholder group, such as the subsistence fishers, still takes an ambivalent stance with regard to total adherence to where they can - or cannot - harvest, as explained in Section 6.7.2. Figure 6.17 summarises, based on intergenerational oral histories of local folk as well as archival material, the locations of historical resource-use and/or resource exchange locations in and around the Langebaan Lagoon. As alluded to in Section 6.7.2, the older fishermen believe that the current zonation of the lagoon into Zones A, B and C does not necessarily further the conservation aims of the park (personal communication with small-scale fishers, 2017 & 2018). Further arguments in favour of their stance were expressed and explained within the context of their experiential and indigenous knowledge of the sustainable harvesting of fish in the current prohibited areas.

Figure 6.17 illustrates the historic fishing locations prior to the zonation of the lagoon. It is evident that, based on the distribution of such spots, the entire lagoon used to be a resource base for small-scale fishers.


**Figure 6.17: Historic fishing locations on the Langebaan Lagoon**

(Source: SANParks and the Peace Park Foundation, n.d.)

The emphasis on effective and collaborative management of marine resources is noble, but in many instances also the basis from which a variety of marine resource-use challenges stem. These challenges are often manifested in the polemics associated with the nexus formed by the socio-economic plight of subsistence fishing communities and the conservation of fishing resources, the dominance of the commercial fishing industry, and the political economy of the setting of challengeable marine resource quotas by government. Isaacs and Hara (2008, 2015) argue in favour of more fundamental pro-poor transformation in fishing rights and quota allocations for local fishing communities. It is their contention that, despite the formal recognition afforded to the subsistence and small-scale fisheries sectors in terms of the Marine Living Resources Act (MLRA), informal fishers as a group have continued to be marginalised. Isaacs and Hara (2015), as well as Isaacs and Witbooi (2019), are also of the opinion that local elites within communities, who have the necessary social and political capital, tend to 'ensure' that their access to fishing rights and quotas are maximised. Young (2013) concurs that non-commercial fishing groups continue to be excluded from the fishing rights allocation processes established in terms of the MLRA. The sentiments expressed by representatives of Langebaan's small-scale fishers in Section 6.8.1 provide some 'corroboration' regarding the challenges associated with of the nexus alluded to above.

### 6.8.2 Militarised zone of the WCNP



WCNP should be seen as part of a bay-wide system that is comprised of Saldanha Bay (and all its industrial and marine resource extraction activities) and the ecologically sensitive Langebaan Lagoon which constitutes a very important Ramsar site on the South African coastline. The northern part of the park is also characterised by a military training area called Donkergat, managed and controlled by the South African National Defence Force (SANDF). Donkergat provides highly specialised and diverse seaborne training and warfare facilities for the South African Special Forces (SASF) of the SANDF (Marx & Liebenberg, 2019). The facility is bordered by the Atlantic Ocean, Saldanha Bay and the Langebaan Lagoon (Figure 6.1).

As explained previously in this chapter, terrestrial access to the Donkergat is, however, possible only via the WCNP. The co-existence of a highly specialised military facility and a highly sensitive Ramsar site makes the management of the park very challenging. As security and the country's safety

supersede all other concerns, environmental considerations, as represented by and in the WCNP, play second fiddle. Marx and Liebenberg (2019) are of the opinion, though, that this inherent dilemma can and should be exploited to further the conservation mandate of the WCNP. They believe that Donkergat's place and space characteristics can in reality be used as a benchmark for furthering the ecological integrity of the bay-system and, in particular, the Langebaan Lagoon. As the military can contribute positively, albeit in a fortress-conservation style, to the lagoon and the wetland system further south, it can buffer the WCNP better. Marx and Liebenberg (2019) thus argue in favour of the inclusion of Meeuw Island, Donkergat Bay, Riet Bay and Salmander Bay into the existing Ramsar area of the lagoon. In doing so, an additional 278ha would be added to the WCNP.

### 6.8.3 Buffering

Following on the ideas of Marx and Liebenberg (2019), place-space consideration can also be looked at from a non-quantitative perspective in which narratives around buffering can add to the quantification thereof. Buffering provides a 'protection layer' in proximity to, or around, PAs and their core conservation functions. Just as the areas around the lagoon protect it, as the heart of the WCNP, so can and should areas around the park protect its entire integrity.

As national parks are often exclaves in areas that exert pressure on the effective functioning of such PAs, some form of buffer protection is needed. Govender et al. (2017:3) consider such buffers as zones that "provide an additional layer of some degree of protection (or awareness about the park) to a park as well as to increase the dynamics and conservation productivity." Although buffer zones do not have any legal status, they help to facilitate the core conservation functions of a park's management.

Such areas, as depicted in Figure 6.18, include categories, such as other PAs, informal PAs, contractual agreement areas, shareholder areas and National Parks Trust (NPT) areas. The buffer zone around the WCNP includes well-established private nature reserves and other conservation areas, such as Thali Thali Private Game Reserve, Buffelsfontein Game and Nature Reserve, iKwa TTu Private San Cultural Village, Rondeberg PNR, Grotto Bay PNR, the Ganzekraal Conservation Area and the Elandsfontein PNR. (The latter has subsequently closed down). The PNRs mentioned fall

within the buffer zone of the WCNP and, therefore, also fulfil a protection function along with other conservation areas that are located further away from the boundaries of the park.

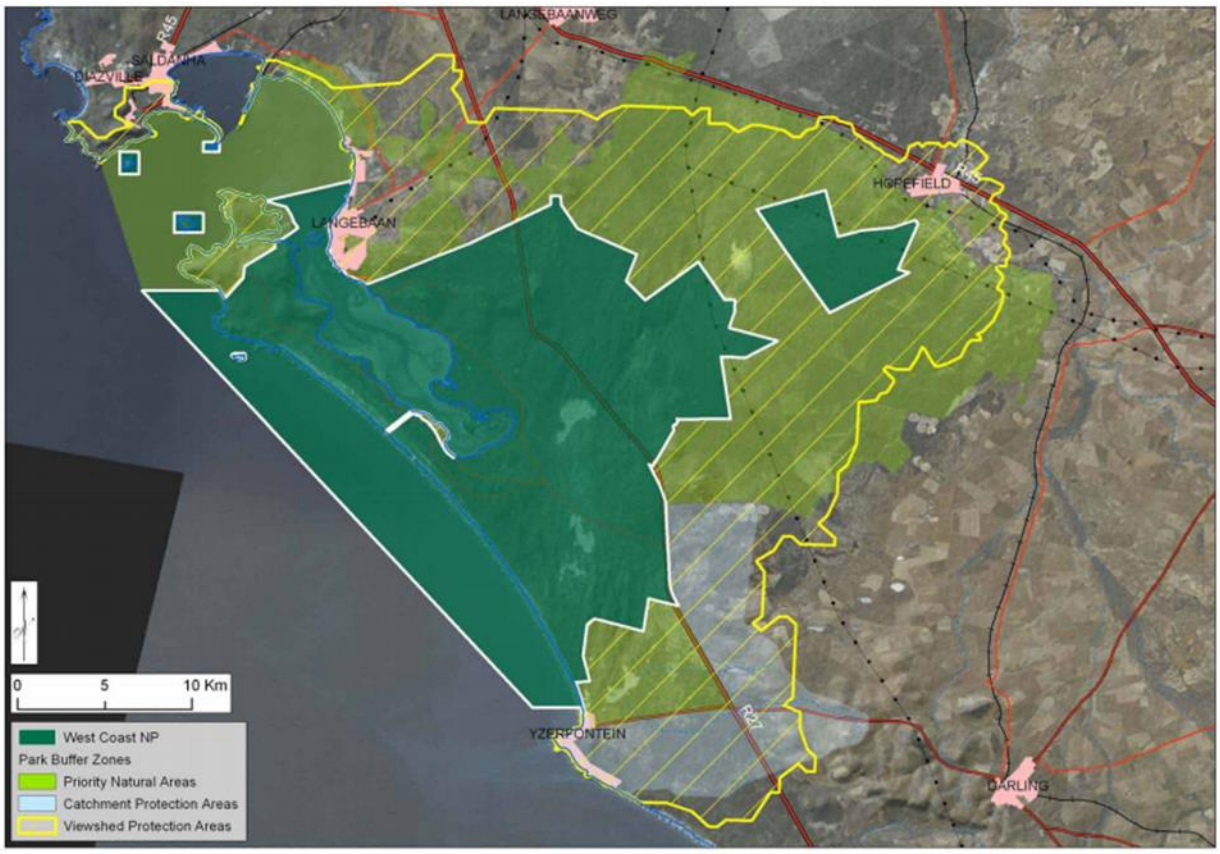


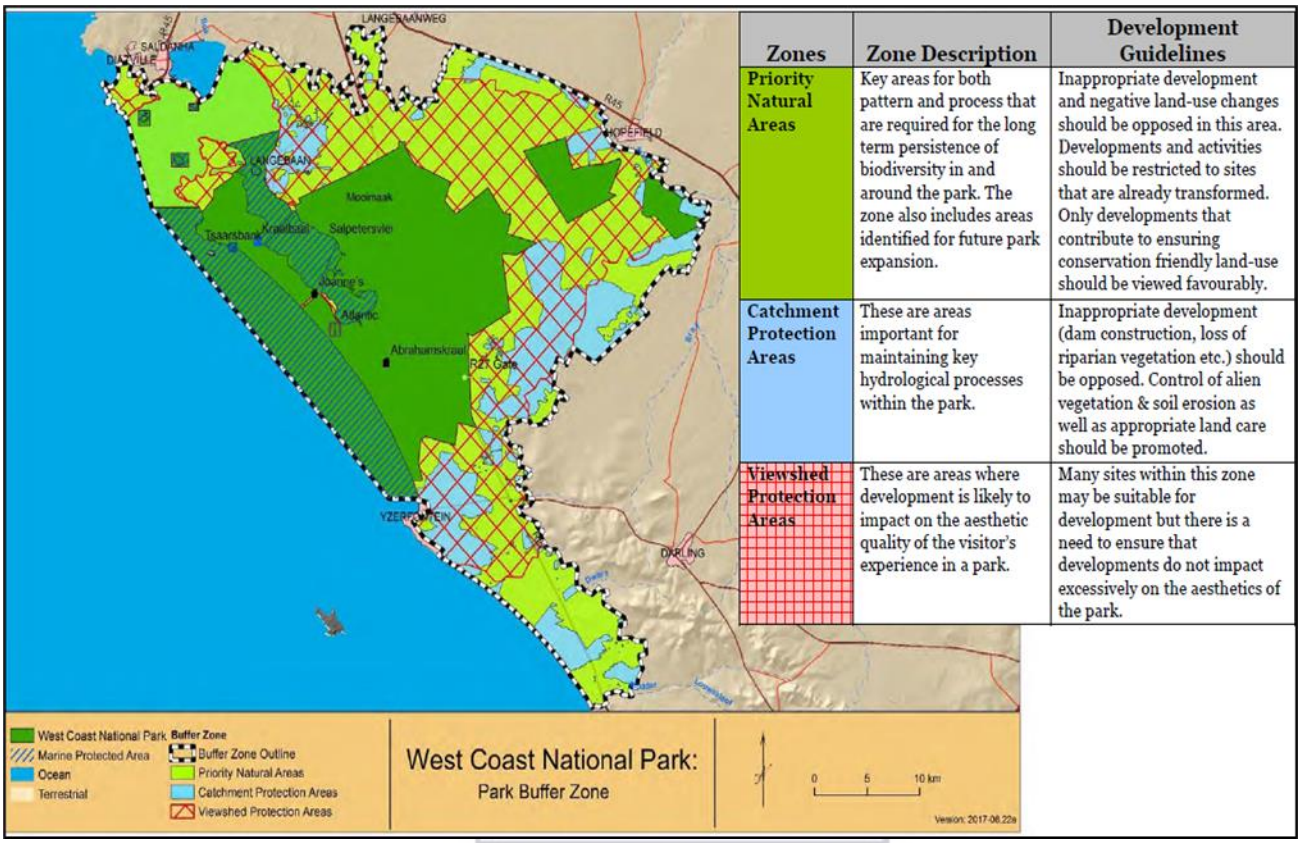



**Figure 6.18: WCNP Buffer Zones**

(Source: https://www.sanparks.org/assets/docs/conservation/maps-26Feb10.pdf)

The existence of private nature reserves, in particular, and other conservation areas (administered by CapeNature) seem to have been stimulated by the WCNP and the extensive tourism market of the Langebaan area. This has been confirmed in conversations with WCNP rangers who often advise tourists to visit the PAs in the buffer zone as well (personal communication with rangers, 2018 & 2019).

Figure 6.19 summarises the different buffer zone categories as they apply to the WCNP and illustrates which categories of development can be allowed or disallowed in certain locations.




| Zones | Zone Description | Development Guidelines |
|---|---|---|
| Priority Natural Areas | Key areas for both pattern and process that are required for the long term persistence of biodiversity in and around the park. The zone also includes areas identified for future park expansion. | Inappropriate development and negative land-use changes should be opposed in this area. Developments and activities should be restricted to sites that are already transformed. Only developments that contribute to ensuring conservation friendly land-use should be viewed favourably. |
| Catchment Protection Areas | These are areas important for maintaining key hydrological processes within the park. | Inappropriate development (dam construction, loss of riparian vegetation etc.) should be opposed. Control of alien vegetation & soil erosion as well as appropriate land care should be promoted. |
| Viewshed Protection Areas | These are areas where development is likely to impact on the aesthetic quality of the visitor's experience in a park. | Many sites within this zone may be suitable for development but there is a need to ensure that developments do not impact excessively on the aesthetics of the park. |

**Figure 6.19: Different buffer zone categories**

(Source: Govender et al., 2017)



The fact that there are significant spatial overlaps between catchment protection areas and viewshed protection areas, in which future development is likely to occur, may potentially pose challenges to a spatially more consolidated buffer zone into which the WCNP may potentially expand.

The following section elaborates on the characteristics of some of the PNRs as a way of contextualising their buffering and place-space relations relative to the WCNP.

- Thali Thali Private Game Reserve:
  This 14.6km$^2$ (1460ha) establishment is located towards the northeast of the WCNP off Route R27. It boasts abundant fynbos, a rich bird life and wildlife attractions, such as black wildebeest, eland, kudu, oryx, giraffe, red hartebeest, springbok, steenbok, zebra, bontebok

and duiker. There are predators in the park and visitors on game drives are, therefore, guaranteed to see these animals, albeit in ex situ habitats. Over and above amenities and services related to conferencing, various categories of accommodation, wining and dining, weddings, and general recreational options, the ancient sport of archery can also be practised here. (https://www.westcoastway.co.za/thali-thali/)

- Buffelsfontein Game and Nature Reserve:
  This PNR covers an area of 16km$^2$ (1600ha) and is located southeast of the WCNP off Route R27 . It is home to some of the 'Big Five' (lion, white rhino, buffalo), as well as other wildlife, such as giraffe. Just as the other PNRs in the area, it also offers a suite of amenities and services ranging from the basic to the luxurious in terms of rating and pricing. (https://buffelsfontein.co.za/)

- iKwa TTu Private San Cultural Village:
  This 800ha establishment is located off Route R27 towards the south-east of the coastal town of Yzerfontein which borders the WCNP in the south. It plays host to a staging of the life of the San, one of the First Nations who roamed Southern Africa. The San are descendants of ancient hunter-gatherer groupings who also eked out a living on the West Coast. The facility should not be seen as a monument to remind visitors of the dispossession of the territories of the San and discrimination against them, but rather as a living reminder and celebration of the San's past and present culture.
  https://www.sa-venues.com/visit/khwattu/

As explained and reflected in the sentiments expressed by park officials and visitors to the PNRs, certain symbiotic relationships have developed between some of these PNRs and the WCNP. Other than the kind of agreements that exist between big game reserves, such as the Kruger National Park (KNP), and neighbouring private reserves, such as Timbavati and Umbabat, few formal agreements exist between the WCNP and its adjacent neighbours in terms of co-management and benefit, and sharing of resources. The two private reserves mentioned above responded positively to parliamentary recommendations for the fostering of more inclusive benefit-sharing between them and surrounding communities within the open system of the as exemplified by the Greater KNP

(https://africageographic.com/blog/private-reserves-respond-parliaments-revise-agreement-between-kruger-private-reserves/).

It is, therefore, important to consider the spatial context of PAs relative to their biophysical endowment and what benefits can be accrued from them. In the case of the WCNP, with its strong seasonal/temporal base of attractions, i.e. flowers and migratory birds, it is, therefore, understandable that the existence of 'community demands' and what these exert on PAs would be far less challenging than in wildlife reserves, for example.

### 6.8.4 Marine Protected Areas

The World Wildlife Fund's (WWF) marine protected area forum summarises the importance of MPAs as follows:

> "Marine protected areas aim to conserve marine life and promote the conservation and effective management of biodiverse marine areas. They are an example of successful collaboration between civil society, communities and government to take care of our natural resources, particularly our marine resources." (http://mpaforum.org.za)

The logic of Marx and Liebenberg (2019) who argue in favour of the inclusion of marine areas, such as Meeuw Island, Donkergat Bay, Riet Bay and Salmander Bay, into the existing Ramsar area of the lagoon, provides some context for a proposed expansion of the WCNP's marine environment – and, by implication, its MPA. An additional 278ha would be added to the WCNP if this could be realised and it would, in turn, add to the consolidation and arguably better spatial management of the park.

Against this broad definition, the specific objectives of the WCNP MPA, according to the forum, are to:

- "…maintain physical and ecological integrity of the marine environment,
- manage Zones A and B of the lagoon effectively with regard to ecological integrity and use,
- manage the use of the lagoon effectively so that the experiences of different visitor user groups are enhanced, and
- ensure effective compliance." (http://mpaforum.org.za/portfolio/west-coast-national-park/)

Other locational aspects that add complexity to the shape and size variables of the WCNP are the areas in, and adjacent to, it that form part of the park's marine protected area. The WCNP Marine Protected Area (WCNNP MPA) consists of three nearshore islands (Malgas, Jutten and Marcus Islands), as well as Sixteen Mile Beach that lies astride the West Coast Peninsula, and the largely cut off Langebaan Lagoon. The lagoon protects more about 32% of South Africa's salt marshes and is a non-breeding site in summer for thousands of migrant wader birds from the Palaearctic regions in the Northern Hemisphere. The lagoon is also South Africa's only non-estuarine tidal lagoon (http://www.photodestination.co.za/marine-protected-areas-of-the-west-coast-national-park.html).

The islands are very important breeding sites for seabirds, specifically Malgas, Jutten, Schaapen and Marcus Islands. The following statistics illustrate the biodiversity and conservation importance of the islands:

**Table 6.1: Islands as breeding sites**

| Island | Conservation importance |
|---|---|
| Malgas | One of only 3 breeding sites for the endangered Cape Gannet in South Africa; endangered Black Oystercatcher breeding site; endangered Bank Cormorant breeding site |
| Jutten | endangered Black Oystercatcher breeding site; endangered Bank Cormorant breeding site |
| Schaapen | largest known colony of Kelp Gulls in Southern Africa; endangered Black Oystercatcher breeding site; endangered Bank Cormorant breeding site |
| Marcus | endangered Black Oystercatcher breeding site; endangered Bank Cormorant breeding site |

Source: http://www.photodestination.co.za/marine-protected-areas-of-the-west-coast-national-park.html

It can be argued that the locations of Malgas, Jutten and Marcus Islands in Saldanha Bay, which is subjected to a variety of port and shipping activities, make these islands, as breeding sites, particularly vulnerable. Although Schaapen Island has a more 'protected' location in the mouth of the lagoon, it is subjected to all the recreational activities off Langebaan Beach, as well as the multifunctional uses of Zone A of the lagoon. The fact that the population of the endangered Bank Cormorant plummeted from roughly 8700 breeding pairs in 1980 to less than 5000 pairs in the early 2000s is of great concern (Anchor Environmental Consultants, 2012; http://www.photodestination.co.za/marine-protected-areas-of-the-west-coast-national-park.html).

**Table 6.2: Summary of the composition of the WCNP MPA, year of MPA declaration and core conservation and/or tourism functions**

| MPA component | Declaration Year | Core Function |
|---|---|---|
| Malgas Island | 1985 | The Island MPAs provide important protected habitats for seabirds, such as the Cape gannet, kelp gulls and Cape Cormorant. They also allow these bird species protected areas to breed, gather food for their young and, once successfully raised, integrate the adolescent birds into the colony. |
| Jutten Island | 2000 | |
| Marcus Island | 2000 | |
| Langebaan Lagoon | 1985 | Haven for migratory birds |
| Sixteen Mile Beach | 1985 | Its dune structure and rocky headlands are natural erosion protection measures, habitat for molluscs (Franceschini & Compton, 2006) |

Adapted from: http://mpaforum.org.za

Marcus Island, compared to the other islands, is peculiar due to its physical connection with the mainland via a breakwater/causeway that was built in the early seventies. Under apartheid's space economy, Saldanha Bay was earmarked as a growth-pole along the drier west coast north of Cape Town. The major impetus for industrial development in the area stemmed from the building of harbour facilities for the export of iron-ore that was being mined near Sishen in the Northern Cape. Saldanha Bay is South Africa's deepest harbour (naturally) and it made good sense at the time to use that attribute, in combination with the then government's growth-pole strategy, to construct an iron jetty in the bay (https://africaports.co.za/saldanha-bay/). Of paramount importance, though, was the protection of the facilities against extreme wind and water circulation from the Atlantic Ocean into the bay. A causeway that links the mainland (at Hoedjiespunt) to Marcus Island in the centre of the bay was engineered to withstand the wind, circulation and sea level extremes.

**Aquaculture Controversy**:

Saldanha Bay had a long history of mussel farming on a manageable scale. Since 2016 an experimental industrial-scale aquaculture zone (ADZ) initiative, more than 800ha in size, was initiated in the bay by the then Department of Agriculture, Forestry and Fisheries (DAFF) which is, in essence, the current Department of Environment, Forestry and Fisheries (DEFF) – since 2021 renamed as the Department of Forestry and Fisheries and the Environment (DFFE). The DEFF authorised and supported two companies, Molapong Aquaculture and Southern Cross Salmon Farming to drive the initiative that is comprised of areas set aside for fish, mussel and oyster farming in the bay. The initiative was opposed in court by the organisation Save Langebaan Lagoon (SLL) and the local fishers of Langebaan. The fishers consulted believe that the ADZ will jeopardise their livelihoods and will change the ecology of the bay irreversibly as salmon and trout breeding cages will be brought in. The seal population is apparently also increasing in the bay (Knight & Tobias, 2019; Mammoth battle against 'aquaculture disaster' near Langebaan Lagoon to be heard in Cape High Court, 2019).

Table 6.3 summarises the main points of controversy between the opposing parties, namely Save Langebaan Lagoon (SSL) and the then Department of Agriculture, Forestry and Fisheries (DAFF), as well as companies associated with it. It is evident that the controversies span ecological and livelihood concerns in an absolute encompassing space that is utilised directly and/or indirectly by a variety of stakeholders, namely the Port of Saldanha, the ADZ and tourism and recreation users.

**Table 6.3: Controversies between SSL and DAFF**

| Save Langebaan Lagoon (SSL) | DAFF & Companies |
|---|---|
| Algal blooms, oxygen depletion and diseases may be caused by accumulated food and faecal waste. | Mitigation will be facilitated by the phase-in approach of the companies, but if the problems persist operations may be stopped. |
| Non-native fish species may escape breeding cages, colonise the bay and may pose threats to native species. | Escaped fish never have to hunt, were sheltered from predators and would not know how to colonise the bay. |
| The ADZ may introduce invasive species or fouling pests. | The risk is minimal and can be mitigated by regular surveillance, antifouling coatings and cleaning of the breeding cages. |
| Seal numbers will increase as they are attracted to the caged fish. As predation nets prevent them from accessing cages, they will predate more on local species. | Naturally, finfish such as salmon and trout will attract predators more that shellfish. Only 29% of the ADZ is suitable for and allocated to finfish. |
| Local fishers' traditional lifestyles and livelihoods will be disrupted. | Re-employment of local fishers will mitigate livelihood disruption. Local labour will also be used to maintain the ADZ. |
| Water sport and tourism will be impacted negatively as parts of the bay will not be accessible. | The ADZ activities will be far from the shoreline and located in approved earmarked sections of the bay and the lagoon. |

Source: Adapted from 'Mammoth battle against 'aquaculture disaster' near Langebaan Lagoon to be heard in Cape High Court', 2019.

Table 6.3 displays fundamental livelihoods, resource-use and spatial relations that are at play in the study area and problematise aquaculture as a presumably benign and ecologically sound practice. Intra set-aside spaces of the ADZ can, therefore, be seen in essence as a contraction rather than an expansion of the protected area of the Saldanha Bay-West Coast National Park system.

Figure 6.20 illustrates the alleged increase in the number of seals visiting Saldanha Bay and their concentration around the cages of the ADZ.

**Figure 6.20: Seal concentrations around the salmon and rainbow trout cages**

(Source: Mammoth battle against 'aquaculture disaster' near Langebaan Lagoon to be heard in Cape High Court, 2019)

> "The seal population in the Saldanha Bay area has allegedly already tripled since the first aquaculture cages for alien salmon and rainbow trout were installed despite strong public objections and a pending court case." (Mammoth battle against 'aquaculture disaster' near Langebaan Lagoon to be heard in Cape High Court, 2019)

The court's decision on the aquaculture controversy in Saldanha Bay will provide "a watershed ruling to determine the future of huge sea-based aquaculture operations along South Africa's coastline" (ibid.).

**Houseboat Controversy**:

In Section 6.7.9, that focuses on accommodation in the WCNP, reference is made to the controversy between the WCNP management and private houseboat owners and their quest for their boats to be moored in MPA areas of the WCNP, specifically in Kraalbaai. Although accommodation can be considered a non-extractive and passive non-consumptive activity, its association with the exclusivity of houseboat accommodation in a MPA and Ramsar site, such as the Langebaan Lagoon, has been a persistent point of conflict since the proclamation of the WCNP.

The controversy paved the way, however, for the expansion of the WCNP's own houseboat business in Kraalbaai. In 2017, a tender was awarded to a concessionaire to continue the business on behalf of SANParks (Jordan, 2017). Objections to the concession were voiced by various role players in the private yacht industry, but the management of the WCNP considered its decision financially and ecologically sound. Place-space concerns related to the provision of accommodation as a user-group activity in the WCNP is, therefore, also intertwined with MPA concerns.



**Figure 6.21: The popular, as well as controversial, Kraalbaai houseboats**

## 6.9 Accessibility-association analysis: the WCNP as thoroughfare

As discussed previously in this chapter, Saldanha Bay and the WCNP (specifically the Langebaan Lagoon), are inextricably linked from a bio-geophysical point of view. The spatial ecology of the bay-lagoon system and the integrity of conservation efforts are largely influenced by activities in and around the system. Linkages are important spatial analysis variables that need to be looked at if PA expansion or contraction is examined. The following sections analyse the location of the WCNP relative to its links with other non-conservation activities and resource uses.

### 6.9.1 The WCNP as crude oil distribution thoroughfare

South Africa's Strategic Fuel Fund (SSF) Association has its main storage facility in Saldanha Bay. The SSF installation is the largest of its kind in the world and has six sunken concrete storage tanks that can collectively hold 45 million barrels (7 155 000 000 litres) of crude oil. (http://fred.csir.co.za/www/sff/oil.htm). The SFF facility is a very important key point and is linked via a pipeline with the oil terminal at the Port of Saldanha where tankers discharge or backload crude oil.

The facility is also linked via a 107km pipeline with the Astron Energy Refinery, previously known as the Caltex Refinery, in Milnerton, Cape Town. The refinery is dependent on the SFF facility for more than 80% of its oil supply. The pipeline runs for more than 15km through the eastern side of the WCNP in a southerly direction towards Milnerton. The WCNP is, therefore, a crucial thoroughfare for piped oil between two very important strategic (energy) key points in South Africa, i.e. the SFF Terminal and the Astron Energy Refinery. Thus, it can be argued that the WCNP as a PA, by implication, also protects an oil pipeline on which the City of Cape Town, and the Western Cape Province at large, are very dependent. The WCNP, therefore, facilitates strategic linkages beyond its core conservation mandate. Although the pipeline is protected and monitored, largely via remote sensing techniques, to the strictest standards, future spatial expansion and effective management of the park can also add to the protection of this very strategic pipeline. By association, the strict protection and monitoring of the pipeline, in turn, carries advantages for the safety of the park as well. The mast in Figure 6.22 is one of the locations in the southern part of the WCNP at which the integrity of the bulk crude oil pipeline between the SFF bunker facility and the refinery in Milnerton in Cape Town is monitored.




**Figure 6.22: Location of the underground oil pipeline in the WCNP – indicated by the high mast**

### 6.9.2 The WCNP as a military doorstep

In Section 6.8.2 the militarised nature of Donkergat, the area that borders the northern section of the WCNP, is discussed. The fact that Donkergat is terrestrially accessible only via the park, makes the latter an important thoroughfare for military-related movement. Furthermore, Donkergat is managed by the Department of Defence and Military Veterans, with a national security mandate that supersedes the sustainable conservation mandate of the DFFE. This makes an appreciation of the spatial variables, namely accessibility and association, even more important. The practicalities of the suggestions made by Marx and Liebenberg (2019), i.e. to include Meeuw Island, Donkergat Bay, Riet

Bay and Salmander Bay into the existing Ramsar area of the lagoon, are questioned by the social ecologist and rangers (personal communication with social ecologist and rangers, 2019).

### 6.9.3 The WCNP as safe haven for residents

The WCNP also serves as a thoroughfare for residents of private properties in the old fishermen village at Churchhaven and Postberg. Access to these properties is restricted for the general public and owners, therefore, have the double protection of restricted access in a national park that has its own access control measures. Consequently, the safety benefits for private landowners in the park need to be appreciated against the background of restricted accessibility. The fact that the Postberg Nature Reserve, although located in the WCNP, can be accessed during the flower season only is a bone of contention for visitors and park officials (personal communication with rangers and day visitors to Kraalbaai's picnic facilities, 2017-2019).

Apart from the impressive annual wildflower display in the Postberg area, the latter is also home to the highest concentration of wildlife in the WCNP and offers some of the most beautiful vistas of Saldanha Bay and the Langebaan Lagoon. These are passive non-consumptive touristic assets that can, and should perhaps, be opened to the public on a regular basis. Antelope, such as gemsbok, bontebok, eland, steenbok and red hartebeest, as well as the Cape Mountain zebra and the common duiker, are often observed on the plains of Postberg.



### 6.9.4 The WCNP as a detour

Personal conversations with rangers (2017 - 2020) revealed that the West Coast Gate Road that can be accessed via the southern gate to the park, is often used by local people and visitors as a quicker detour, compared to using the main Route R27 to the town of Langebaan. Entrance fees are paid by such 'detourers' who will then exit the park via the northern gate south of Langebaan. Speeding through the park is a problem. It was reported that tortoises and snakes are often the casualties caused by such speeding. However, apparently no verifiable data are available regarding the place, time and context of such casualties.

As no one who pays entrance fees within the official business hours can be denied access to the park, the management and control of the detour problem is rendered very complex. Just as accessibility for

residents who live permanently in the park (Section 6.9.3) is important, so is the accessibility for those visitors who enter the park in the south and exit it via the Langebaan gate in the north. Accessibility is, therefore, an import spatial variable that needs to be recognised and critically assessed (within the context of this study).

### 6.9.5 WCNP as a driver for residential development

There is ample academic literature and grey information on the advantages of biophysical attractions for residential development in proximity to them (Aliyu et al., 2016; BusinessTech, 2020; The Valuator Group, 2021). New residential development is taking place close to the northern gate of the WCNP. The development's selling points include place, space and accessibility indicators. The area nestles on the western slope of a hill that separates the town of Langebaan from the lagoon. It overlooks the lagoon, i.e. the place/locational attribute combines with the space attribute of being on the doorstep of a national park along with the advantage of scenic vistas.

The Shark Bay development (Figure 6.23) is an example of an upmarket residential bordering the lagoon. In the wording on the advertisement board, association as a significant spatial variable, is effectively captured in the links that this development assumes with the internationally renowned Langebaan Lagoon. It invites prospective owners and developers to seize the "[l]ast opportunity to claim this pristine land overlooking the Azure lagoon" and "[b]e part of this idyllic lifestyle – claim your piece of the West Coast" (Figure 6.23). Promotional wording such as 'claim' and 'your piece' reflects almost a free for all scenario if it was not for the restrictive pricing range of available properties.

As indicated in Section 6.3, further developments, inclusive of residential extension, around the lagoon pose potential threats to its conservation. The exclusivity of the development - should it eventually be completed - may well contribute towards the 'protection' of the lagoon, but subsistence fishers are concerned about the development's possible contribution to the widening socio-economic gap between the 'us and them' and associated challenges in Langebaan (personal communication with subsistence fishers, 2019).



**Figure 6.23: Property advertisements piggybacking on the attributes of the lagoon**

The attractive attributes of the lagoon with its bluish-turquois comforting tranquillity, idyllic conditions and beautiful vistas are being used to market the properties for sale by one of South Africa's most powerful and successful real estate agencies. This development exemplifies arguably the best place-space relations that stem from the lagoon as an indirect resource base for the real estate industry as a specific resource-use grouping in this study.

## 6.10 Linking resource-use information, spatial variables and expansion feasibility concerns



This section brings together resource-use information obtained from participants in the WCNP case study of the thesis and the revisiting of spatial variables that influence, or are being influenced by, such uses in order to reflect on the PA expansion feasibility of the WCNP. A feasibility analysis is typically comprised of the following categories: economic feasibility (involving considerations such as finances, costing concerns and cost-benefit analysis), technical feasibility (dealing with risk assessment, mitigation and solutions), legal feasibility (which considers legal/constitutional requirements and mandates), operational feasibility (which focuses on control, efficiency and services), resource feasibility (which concerns additional staffing and material), and schedule feasibility (involving resource optimisation and project timeline estimations) (Feasibility Study, 2020).

Based on the analyses of different spatial variables in the preceding sections, the following sections summarise the relationships between the different spatial variables, on the one hand, and the chosen feasibility parameters for expansion (Table 6.4) and the conservation attributes of the WCNP, on the other hand.

Adapted from the *Practitioner's Field Guide for Marine Conservation Agreements* (The Nature Conservancy and Conservation International, 2012) the envisaged feasibility indicators (as discussed in Chapter 1) for investigation include: critical conservation concerns, in the case of the WCNP it would be the threatened terrestrial fauna and flora species; marine protected area challenges associated with the Langebaan Lagoon and Saldanha Bay; the efficiency of park management/authorities; relationships with right-holders (such as owners, managers and users of land, marine resources and ecosystem services); abatement of threats to expansion; and the creation of conservation-conducive, site-specific conditions.

**Table 6.4: Linking spatial variables and feasibility indicators for expansion of the WCNP**

| | Spatial variable | | | | | | |
|---|---|---|---|---|---|---|---|
| **Feasibility Indicators** | **Size** | **Shape** | **Place** | **Space** | **Access** | **Temporality** | **Association** |
| **Critical conservation areas/concerns (CBAs)** | Larger PA footprint to better conserve non- protected areas | Compact; coastal boundaries and protected perimeter | Determined by the bay-lagoon system and conservation attributes | Influenced by various contested land-uses and resource users | Challenges associated with lagoon's activity zones restrictions | Seasonality of resource uses can hamper conservation | Shaped by surrounding non-conservation activities |
| **Competency of conservation entities/authorities** | Efficient area management by SANParks | Will remain largely compact with envisaged expansions | Subject to externalities and resources to manage effectively | Subject to externalities and resources to manage effectively | Subject to externalities and resources to manage effectively | Subject to externalities and resources to manage effectively | Subject to externalities and resources to manage effectively |
| **Relationships with right-holders (such as owners, managers and users of land, marine resources, ecosystem services)** | Co-management initiatives; multi-sectoral involvement crucial | Co-management initiatives; multi-sectoral involvement crucial | Advantages of positive place-space affinities to be enhanced | Advantages of positive place-space affinities to be enhanced | Physical access well controlled; access to the military unresolved | Strengthening of right-holders' participation important | Role of SANParks crucial in partnership enhancement |
| **Abatement of threats to expansion or contraction agreements** | Good surrounding buffering land-use infrastructure and Private NRs | WCNP's buffer plan facilitates a spatially more compact park | Deal constructively with concerns of resource users, such as the small-scale fishers | Advantages of positive place-space affinities to be enhanced | Access to the lagoon via Saldanha Bay will remain problematic | Managing temporalities of marine and terrestrial resource uses important | Subject to externalities and resources to manage effectively |
| **Creation of conducive, site-specific conditions** | Enhancement of intra-park contractual partnerships | Enhancement of intra-park contractual partnerships | Advantages of positive place-space affinities to be enhanced | Advantages of positive place-space affinities to be enhanced | Terrestrial access to the park is well controlled. | 'All-stakeholder' involvement crucial | 'All-stakeholder' involvement crucial |

Externalities and resource uses relate to: conservation, industrial development, fishing, real estate, aquaculture, mining, port activities

## 6.11 Conclusions

The evidence presented in this chapter illustrates how the revisiting of different spatial variables, such as size, shape, place, space, access, temporality and association, can inform the feasibility of the expansion of the WCNP as a protected area. In combination with the principles of South Africa's National Protected Areas Expansion Strategy (NPAES), as well as the chosen feasibility indicators, it can be deduced, based on the evidence presented, that respondents are generally indifferent to changes in the spatial footprint of the WCNP. Concerns expressed with regard to the impact of challenges on the integrity of the conservation mandate of the park, as identified in this analysis, were far more prevalent than concerns about park expansion.

Over and above the importance of the conservation of the bio-geophysical attributes of the lagoon, concerns about how the lagoon, as core conservation area of the WCNP, is being utilised directly and/or indirectly is of great concern. The contentious restrictions related to activity Zones A, B and C bear testimony to these concerns.

Theoretically, sense-making of the evidence presented in this chapter points to conservation and control as a particular political ecology debate (See Chapter 1, Section 1.8). This angle on political ecology assumes that conservation is intrinsically benign and directs attention to the political and economic context within which conservation is embedded. Although it is not entirely the case in the WCNP, some of the evidence presented in this chapter highlights aspects of control, e.g. access to certain areas in the park and activities around the lagoon. The spatial variables of place, space and accessibility related to the WCNP largely support the application of this 'control' theory in the case study.

The identified expansion areas towards the east of the park can be considered an example of consistent and preparatory biodiversity planning, i.e. extension of the park's conservation footprint through a conservation-driven buffering structure, largely presented by the many private nature reserves surrounding the WCNP.

The analysis brought together the results of primary data (derived from resource-use and PA expansion conversations and observations), as well as secondary data (derived from quantitative data gleaned from the park's management plan and other literature) in a concurrent, triangulated manner

rooted in MMR. The evidence and opinions suggest that the expansion of the park, albeit not highly prioritised, can solidify and protect the conservation assets of the park, as visualised in the buffering structure, amidst the many conflicting land-uses around the park.

# CHAPTER 7: DATA PRESENTATION AND ANALYSIS - HOTTENTOTS HOLLAND NATURE RESERVE (HHNR)

## 7.1 Introduction

The HHNR is one of the various provincial nature reserves managed by CapeNature, is located in the Hottentots Holland Mountains, some 90km south-east of Cape Town, and forms part of the Hottentots Holland Nature Reserve Complex (HHNRC) which, in turn, forms part of the Boland Mountain Complex. The Hottentots Holland Mountains form the backbone of the bigger Hottentots-Holland Catchment Area that covers 84 936 ha. The reserve itself covers approximately 70 000ha and stretches from the towns of Grabouw and Elgin in the south to beyond Villiersdorp in the north, and from the Stellenbosch Mountains in the west, eastwards to the Groenland Mountains. (The analyses in this chapter will largely draw on information derived from the HHNRC Protected Area Management Plan (PAMP) of which the HHNR is part.)

The Boland Mountain Complex forms part of the Cape Floral Region (CFR) which includes a number of formally protected areas and proclaimed heritage sites. The reserve was proclaimed in 1979 as a forest nature reserve and has, by virtue of the fact that it is located in the CFR, World Heritage Status. (CapeNature, 2019; http://www.capenature.co.za/wp-content/uploads/2017/03/Hottentots-Holland-Protected-Area-Management-Plan.pdf; PAR, 2021).

Some 7 000ha of land, comprised of private and state property, abuts the HHNR and is co-managed by the Theewaterskloof and Groenlandberg Conservancies in conjunction with CapeNature and other landowners. Although the core area of the reserve is compact, its other parts are non-contiguous and are bisected/and or bordered by important main routes, such as the R45, that runs over the impressive Franschhoek Pass between the towns of Franschhoek and Villiersdorp (towards the north-north-eastern part of the reserve). The R321, which runs over the scenic Viljoen's Pass and along the Theewaterskloof Dam between the towns of Grabouw and Villiersdorp, is found on the south-eastern edge of the reserve. The main entrance to the reserve is also located on Route 321 at the (former) Nuweberg forest station.

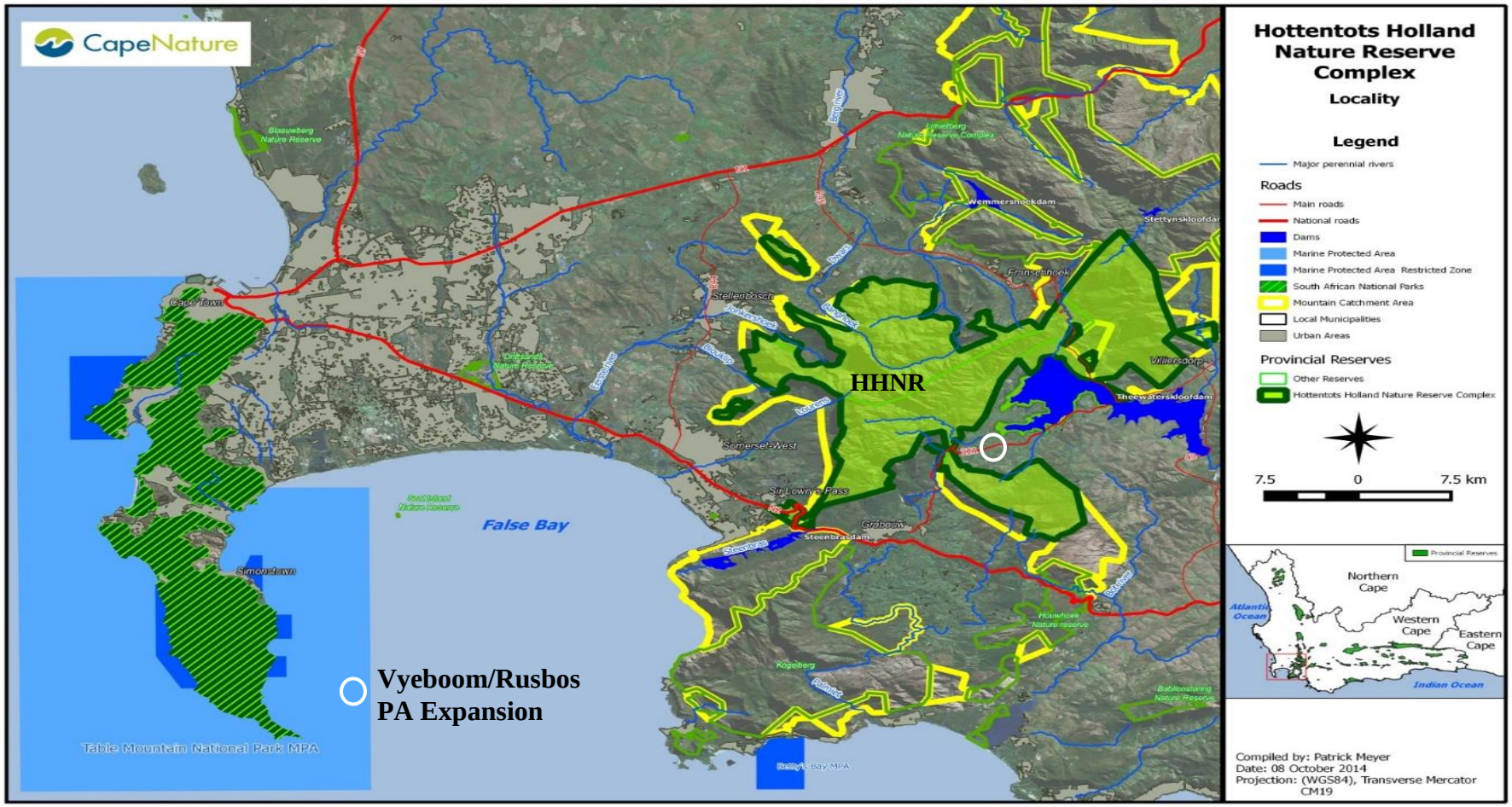



**Figure 7.1: The HHNRC- inclusive of the HHNR and abutting conservancies**

(Adapted from Veldtman et al., 201

## 7.2 Biophysical characteristics and conservation challenges

The reserve is mountainous and rugged with the highest altitude at 1590m and the lowest at 500m. It forms part of the Cape Folding Mountain ranges and is largely comprised of Table Mountain sandstone and quartz. It is drained by the Riviersonderend and Palmiet Rivers which originate in the high-lying central-western part of the reserve and their tributaries, such as the Wesselgat and Klipdrif Rivers (HHNR, CapeNature, n.d.). These rivers have weathered and eroded the landscape to spectacular sceneries of towering mountain outcrops, such as Victoria Peak (1589m) and Somerset-Sneeukop (1590m), and steeply incised valley, such as Suicide Gorge and Sonderend Kloof in the central-eastern part of the reserve, and Assegaaiboskloof caused by the small Berg River stream in the north (HHNR, n.d.; Veldtman et al., 2015). The natural landscape allowed for an understanding of diversity of resource usage and consumption categories prevalent in the HHNR, as analysed in Section 7.4.

The annual rainfall can be as high as 3300mm in the Dwarsberg area in the central part of the HHNR. The Mediterranean climate of the area allows for generally dry and mild summer conditions whilst the winter periods are characterised by strong winds, an abundance of rain and treacherous and unpredictable conditions. Snow can occur on the higher peaks if winter weather conditions deteriorate. With more than 1300 endemic and rare fynbos species growing in the reserve, the HHNR is one of the most important (mountain) fynbos conservation sites in the Western Cape Province. The reserve is home to the following vegetation types: Kogelberg Sandstone Fynbos (critically endangered), Hawequas Sandstone Fynbos (least threatened), Boland Granite Fynbos (vulnerable), Elgin Shale Fynbos (critically endangered), Western Coastal Shale Band Vegetation (least threatened), Southern Afrotemperate Forest (least threatened), and Cape Winelands Shale Fynbos (vulnerable) (Mucina & Rutherford, 2006). Low-lying fynbos and renosterveld are also to be found in the north-eastern part of the reserve – in the Rusbos area.

Four of the eight identified types of vegetation are labelled with ‘threat’ statuses, such as ‘critically endangered’ and ‘vulnerable’ and, therefore, bear testimony to the important role that the HHNR should play in the broader Fynbos-Boland Mountain Complex nexus. The reserve also boasts with the highest concentrations of erica, restio and protea species in the CFR (Oliver et al., 1983).

Indigenous trees in the valleys and shadier areas of the reserve include red alder, Cape holly, wild olive, Cape beech and wild peach.

Cowling and Richardson (1995) suggested that plant diversity in the region can be attributed to species variation in the same habitat type across different geographical locations and along environmental gradients as caused by the natural conditions.

Vegetation-related challenges of the reserve include the removal and eradication of invasive species. According to van Wilgen and Forsyth (2008), and based on the spatial extent of the invasion as well as impacts on water resources, two invasive species were earmark for priority eradication: pines (*Pinus spp*.) and the black wattle (*Acacia mearnsii*). Although hakea is also widespread in the reserve it receives less attention as biological controls for removal and eradication are available (van Wilgen & Forsyth, 2008). The cost associated with alien invasive clearing is of great concern to CapeNature (Veldtman et al., 2015).

The faunal endowment of the HHNR includes 110 bird species, as well as a variety of raptors. Grey rhebok, klipspringer, common duiker and grysbok occur widely in the reserve. Leopards, although seldom seen, also frequent the mountains in the reserve. Cape Mountain zebra, eland, bontebok and red hartebeest have also been re-introduced into the reserve. Furthermore, the reserve plays host to forty reptile species of which four are endemic to the Western Cape and one, the dwarf crag lizard (also threatened) is at home only in this reserve. Twelve frog species occur in the HHNR of which two are endemic to the Hottentots Holland Mountains, namely the Landdros moss frog and a species of mountain toad. As water from the mountains in the HHNR feed the tributaries of the main Berg, Breede and Riviersonderend Rivers, fish indigenous to these catchments are, therefore, likely to be found in the reserve. These include species, such as the Berg-Breede River whitefish (*Cheilobarbus capensis*), the Cape galaxias (*Galaxias zebratus*) and the Cape Kurper (*Sandelia capensis*). The Berg River redfin (*Pseudobarbus burgi*) and the Breede River redfin (*Pseudobarbus sp. burchelli*) are endemic to the Berg and Breede River systems respectively (Chakona et al., 2013).

Threatening invasive fish species in the reserve include the rainbow trout, black bass, bluegill sunfish, common carp and the sharptooth catfish. The invasive estuarine round herring is to be

found in Theewaterskloof Dam. These species were likely introduced by anglers and further aided by broader habitat degradation and destruction, over-abstraction of water and pollution (Darwall et al., 2009).

## 7.3 Social, cultural-historical and tourism characteristics

Apart from the conservation value of the HHNR's biophysical attributes reviewed in Section 7.2, the reserve and the surrounding conservation complex, comprised of the abutting contractual PAs referred to in the previous section, also have social, cultural-historical and ecotourism value.

*Social value*: The entire conservation complex is important for its aesthetic and spiritual value and connectedness, for employment opportunities in support of the local economy, as a research and science hotspot, and for environmental awareness programmes (Veldtman et al., 2015).

*Cultural-historical value*: This value is largely manifested in historical buildings and infrastructure, such as Assegaaibosch Manor House on the Stellenbosch side of the reserve, the Old Trout Hatchery (the first hatchery in South Africa), the old Gantouw Pass (characterised by ox wagon tracks and old cannon and running more or less parallel to the current N2 National Road over the Sir Lowry's Pass), the Jan Joubert's Gat bridge (the first bridge built in South Africa and still in use on the Franschhoek side of the reserve), the Fort-se-nek (a block house), the Old Toll Gate and Kat-se-Pad (Veldtman et al., 2015).



*Ecotourism value*: The reserve is central to the Cape Winelands and Kogelberg Biosphere reserves. It is a World Heritage Site and offers recreation opportunity and activities, such as trail running, mountain biking, hiking and 'kloofing' (Veldtman et al., 2015). Although not managed by CapeNature, the ziplining operation (Cape Canopy Tours), run by an external concessionaire, can also be included in the ecotourism attributes of the reserve.

## 7.4 Narrative summaries and content analysis of conversations with stakeholder and resource-use groups

In line with the analysis of the DNR and the WCNP, this section deals with the perspectives of stakeholders and user-groups associated with the HHNR. Compared to the other two PAs, the

HHNR, by virtue of its location and conservation attributes and mandates, is a far less contentious space. The identified biophysical challenges are arguably the most serious concerns for the management of the reserve. Discussions on the protected area expansion of the HHNR, just as in the case of the other two areas, were reduced to the sharing of resource-use challenges. Conversations with the following stakeholders and resource-use groups were conducted in the period 2017 – 2019: the reserve manager, the operational manager of the Cape Canopy Tour Zip Line initiative, disgruntled members of the Nuweberg settlement, hiking groups and adrenalin seekers engaging in active non-consumptive activities, such as 'kloofing', ziplining and mountain biking. As participant observation forms part of the methodology applied in the three case-study areas, conversations with hikers and some adrenalin seekers took place in situ and during such activities - or after completion thereof as the researcher participated in some of these activities. Respondents preferred not to be audio-visually recorded but were generally accommodating. The analysis is, therefore, based on field notes kept by the researcher. Interviews with the reserve manager, zipline operator and representatives of the Nuweberg community were arranged in advance, followed by walk-abouts to facilitate observation. The interviews with the outdoors user-groups were impromptu, based on convenience sampling and the willingness of people to participate in the study.

Albeit impromptu, participants were informed about the nature of the study and extent thereof, in line with the ethical considerations of the study.



### 7.4.1 Conversation with the reserve manager

Based on the spectrum of questions included in the interview schedule, it was the manager's opinion that protected area expansion is not necessarily a priority, as the surrounding/abutting conservation and protected areas are managed well by contractual agreements between conservancies, private landowners and CapeNature. In line with NPAES CapeNature has produced a provincial Protected Area Expansion Strategy and Implementation Plan. CapeNature's strategy aims to have priority natural terrestrial habitats in the Western Cape Province formally proclaimed as protected areas "to secure biodiversity and ecosystem services for future generations" (Veldtman et al., 2015). Planned expansion of the HHNRC is based on the identification of critical biodiversity areas and on systematic conservation planning. An extra 1 844ha will eventually be

added to the complex. This will include seven identified sites of which Klipfontein, a stretch of state-owned land east of the Vyeboom wetland and close to the Theewaterskloof Dam, will receive attention for inclusion (Veldtman et al., 2015).

Spatial variables, such as size, shape, access and association, are therefore less concerning as they do not necessarily have an impact on management efficiencies (personal conversation with reserve manager, 2018). Details of the impact of the spatial variables feature more prominently in the following section, though. The most crucial continuing challenge for the reserve's management relates to the Nuweberg community.

### 7.4.2 Conversation with members of Nuweberg Village

***The Nuweberg Problem***

The Nuweberg Village is located close to the main entrance of the HHNR off Route R321 (Figure 7.2). The former Department of Water Affairs and Forestry (DWAF) established the village in the 1970s as a place of residence for workers employed by the said department to work in the pine plantations in the area, such as Nuweberg and Lebanon State Forests, as well as forested areas in the HHNR. The settlement used to be comprised of 45 housing units made of treated logs and was earmarked to accommodate approximately 250 people (Yeni, 2014). In conversation with four representatives of the Nuweberg Residents Association (NRA) in 2019, it was mentioned that the number of residents had, however, increased to more than 300 people.

**Figure 7.2: The Nuweberg Village close to the entrance of the HHNR**



In Figure 7.2, remnants of older and younger pine plantations in the background and which formed part of the former forestry activities, as well as fynbos shrubs in the foreground, are visible. Although the Nuweberg Forest Station is still operational, the gradual decline of forestry as a primary activity operated by the State led to the privatisation of the industry in the 1990s which, in turn, led to the retrenchment of most former DWAF workers and subsequent rise in unemployment. This caused significant hardship for people who had to find alternatives to sustain their livelihoods. The alternatives on which residents embarked include seasonal/casual wage labour in the HHNR and on the neighbouring apple and pear farms of Grabouw and Elgin, as well as employment at fruit-packing facilities in the areas (personal conversation with members of the NRA, 2019). Other unemployed residents are engaging in subsistence activities, such as domestic gardening and livestock keeping (mainly chickens and pigs). Figure 7.3 illustrates a part of the

village with mature pine plantations on the lower slopes of the Groenland Mountains in the background and invasive vegetation in the foreground.

**Figure 7.3: Nuweberg Village and invasive vegetation**



In response to the researcher's question as to the (in)compatibility of such activities with the conservation mandate of the HHNR in whose precinct these activities occur, respondents were adamant that a compromise be reached between conservation and small agro-livelihood activities (personal conversation with members of the NRA, 2019). It is their opinion that CapeNature needs to facilitate the transfer of the village to the people, as well as access to additional land in the reserve for land-based livelihood purposes. Strong sentiments were expressed and it was alleged that CapeNature pushes conservation and tourism mandates at the expense of the plight of people. The community is receiving support from local NGOs, such as Surplus People Project and the Food Sovereignty Campaign (Yeni, 2014; personal conversation with members of the NRA, 2019). It, therefore, places the increasing need for agro-ecological initiatives in, or close to, PAs on the table again as such initiatives, if managed sustainably, can enhance access to food and food security in the midst of dire socio-economic conditions. Agro-ecological activities can also

enhance biodiversity if practiced sustainably and in line with ecological processes (Agro-ecology Report, 2015).

The continuing polemics associated with the community's demands and the responsibilities of State entities are causing the protected area-community schisms that conservation can ill afford. In response to a protest by the community the former Department of Agriculture, Forestry and Fisheries (DAFF) issued a statement in 2012 in which mentioned was made that CapeNature "is still responsible for the delivery of services and for the maintenance of the village, including that of the residential and management buildings." (Available: https://www.gov.za/response-today%E2%80%99s-nuweberg-residents%E2%80%99-association-march-national-legislature.) Thus, the challenging needs of this community in the HHNR place an additional, cross-government tiered burden on the manager.

Other former forestry communities in the Western Cape, such as Meerlust, La Motte, Wemmershoek, Waterval, Hawequa, Lebanon and Jonkershoek, are facing similar problems stemming from the privatisation of forestry, associated retrenchments, unemployment and the resultant socio-economic problems. (Available: http://viacampesinaafrica.blogspot.com/2012/07/south-africa-seven-forestry-communities.html).



***Resource-use aspects***

The participants living in the Nuweberg Village consider themselves to be conservation-abiding residents and do not see any conflict between the village and the livelihood practices that they are involved in, as the latter do not impact on the core conservation function of the reserve. As water provision to the village is in place, the only other resource needed is access to more land for agro-based and eco-friendly practices that they will (and can) abide by. Although fuel wood collection can be considered an active consumptive activity, the participants did not consider the harvesting of fuel wood to be detrimental as invasives, such as pine and black wattle, are being targeted. As older folk in the village used to be former DWAF workers, it was reported that they provided guidance to others as to the sustainable harvesting of wood in general. Fuel wood harvesting has potential benefits that includes the eradication of invasive species, the improvement of biodiversity and hydrological systems, as well as energy security.

***Spatial-analysis aspects***

Size: Participants were indifferent regarding the expansion and size of the conservation-based footprint of the HHNR and the bigger HHNRC as a whole. Although they were aware of the importance of PAs and their expansion to accommodate and protect CBAs, the fact that their immediate needs centred around access to land from which to make a living, rendered such awareness a secondary concern. Only one of the participants was aware of the planned inclusion of the piece of State-owned land east of the Vyeboom wetland as part of the HHNR.

Shape: The participants expressed appreciation for the challenges that the reserve's management experiences in protecting a very large, diverse and rugged landscape that is not very compact in terms of it shape. They understood and appreciated the challenges of the HHNR in the context of the bigger HHNRC, and the latter's abutting co-managed conservancies referred to in Section 7.1.

Place and Space: The concepts of place and space appreciation were explained to the participants prior to engaging with them in conversation about the manifestation of such an appreciation among the people in the community. As the participants were second-generation relatives of former DWAF workers, and although they had grown up in the village, they admitted that they might lack a 'deeper' sense of place and space appreciation.



They mentioned, though, that their parents and other relatives 'vowed to go nowhere' as Nuweberg had been the backdrop to their formative years and the work skills that they had accumulated during better days, prior to being retrenched. The fact that the village also shaped the participants' life experiences, albeit differently, provided them with a sense of belonging as they saw the village as home.

Accessibility, temporality, association: As explained in the previous section, the participants' sense of belonging is rooted in their child- and adulthood experiences. It can, therefore, be assumed that their association with the HHNR embraces far more than just their living in a pristine World Heritage site in the centre of the world's richest floristic kingdom. They mentioned that, although the importance of the conservation status of the HHNR was not a determinant, it added to their quest to continue residing there under more sustainable conditions.

As discussed in Section 7.1, the HHNR and the bigger HHNRC are externally very accessible via Route R45 and Route R321. The fact that the Nuweberg Village is located at the main entrance to the HHNR (off Route R321) makes the settlement also more accessible. In our conversations, participants reminisced about the time when forestry overshadowed conservation as the dominant land-use in the area and, as a result, made the HHNR relatively more accessible. Their understanding of temporality is shaped by the number of visitors to the reserve for research/educational purposes, hiking, mountain biking, 'kloofing' and ziplining. These numbers are, in turn, influenced by weather conditions that can be very unpredictable, making the reserve and its offerings temporarily less accessible during the winter period. The reserve is internally also very accessible via hiking trails and jeep tracks.

### 7.4.3 Conversation with the Cape Canopy Zipline concessionaire

An interview with the concessionaire was arranged in 2018 and included a description of the business, as well as a walk-about. CapeNature has an arrangement with the business venture, Cape Canopy Tour, to open the wilderness and previously inaccessible parts of the HHNR to visitors. It is a high-altitude zipline tour running over deep ravines and inter-connecting 13 platforms high up in the Hottentots Holland Mountains. The experience also includes 11 slides, of which some exceed lengths of 300m, as well as a suspension bridge. The adventure takes roughly 4 hours and can be experienced at a cost of R895. The initiative received two very important international awards so far; namely, Second Best New Attraction in the World (by Lonely Planet) in 2015 and Second Best Attraction in Africa (by TripAdvisor) in 2019 (https://www.canopytour.co.za/locations/cape/).

The operator was well-versed with the rationale for PA expansion but steered away from expressing an opinion on resource-uses by other stakeholders as it might have impacted on the contractual agreement with CapeNature and the extension of the concession. The spatial elements that shape and influence the opinions of the resource-use group (outdoor lovers and adrenalin seekers) in Section 7.4.4 were also reflected upon by the concessionaire.

The spatial variable of verticality and height, and how the Cape Canopy Tour operations tapped into it, were discussed. It adds another element to the spatial variables discussed thus far and provides an additional experience to nature lovers who can afford it financially.

### 7.4.4 Conversations with outdoor lovers and adrenalin seekers

As participant observation underpinned some data gathering aspects of the study, the researcher participated in hikes and 'kloofing' with different groups on three occasions - twice in 2018 and once in 2019. As was the practice during the gathering of data in the DNR and the WCNP, hikers were informed about the study and the purpose and nature of the questioning. Conversations took place en route or at the overnight huts at Boesmankloof or Landdroskop, depending on the hiking route(s) taken (Figure 7.4) There are more than 40km of hiking trails in the reserve, linking the Nuweberg CapeNature office with the mentioned overnight huts along different routes, such as the Orchard, Sphinx, Boesmanskloof and Palmiet routes, as well as the Landdroskop Jeep Track. Then there are also the Riviersonderend and Suicide 'kloofing' routes. Route distances and levels of difficulty differ, and hikers can, therefore, tailor their own itineraries for overnight or one-day trail options.

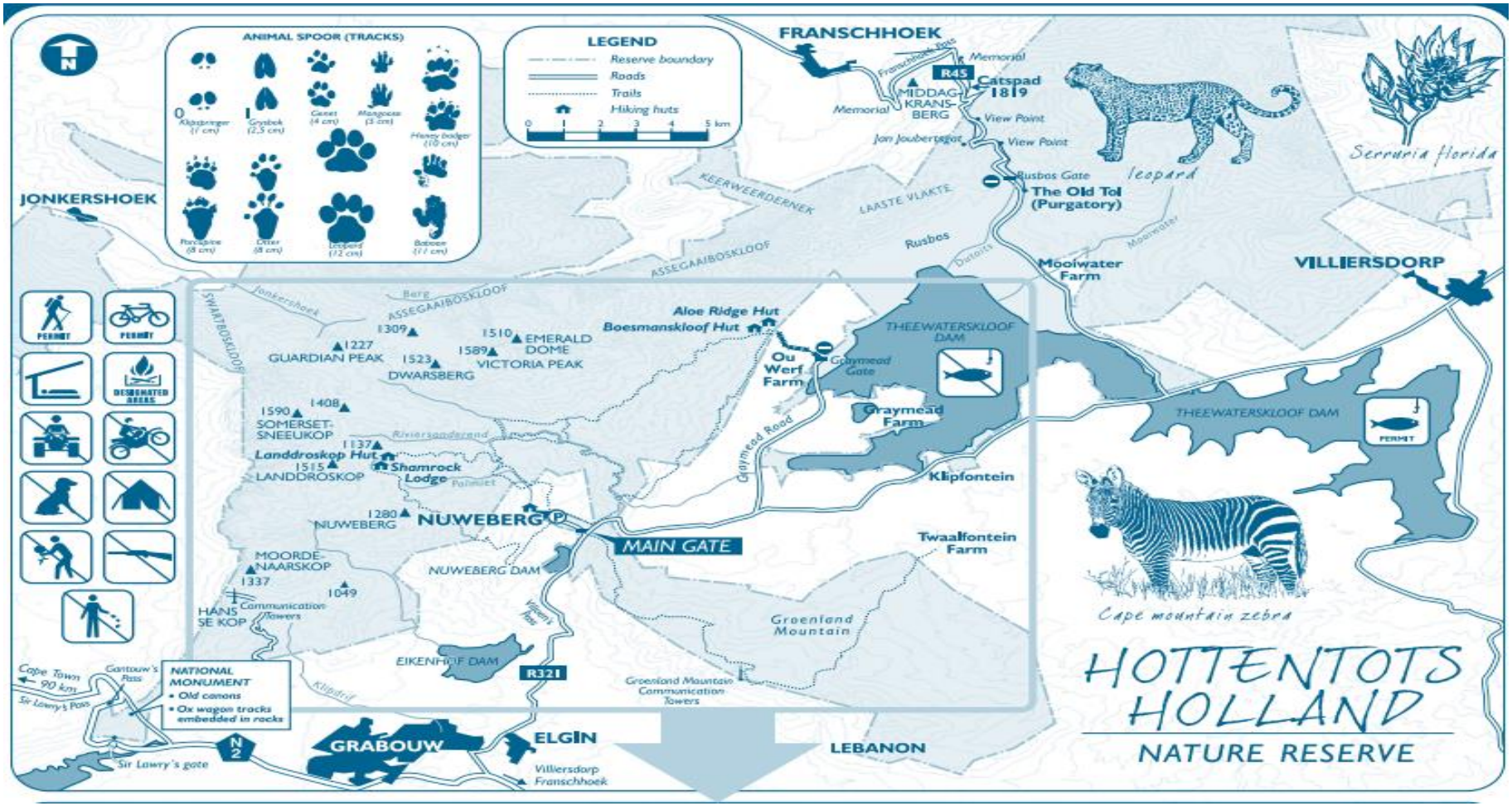



**Figure 7.4: Hiking routes and attractions in the HHNR**

(Adapted from Hottentots Holland Nature Reserve brochure, n.d.)

Conversations were conducted with 13 hikers on the three participant-observation hikes that were undertaken. The respondents could not be handpicked for sample representivity, but nine of the interviewees were older and more experienced hikers who had done more than one hike in the reserve. Three high school learners and their accompanying teacher were also willing to participate in a conversation. As mentioned previously, knowledge about PA expansion of the HHNR was limited or non-existent. Only seven of the thirteen respondents knew about the rationale for PA expansion in general, but no one had knowledge of expansion plans and land earmarked for inclusion in the HHNR. However, there was a general feeling that, if the spatial expansion of the reserve could support its conservation mandate and enhance the integrity of its ecosystem services, then the reserve should be enlarged in areas were needed. Discussions, therefore, centred more on resource uses and spatial aspects as recorded in the following sections.

***Resource-use aspects***

Hikers and outdoor lovers can be considered active non-consumptive resource users as per the categorisation applicable in this study. The fact that this group of users engage in physical activity in a PA without any (significant) harm to the environment makes resource-use and conservation relations non-conflicting. (Typical anti-conservation behaviour and transgression were observed, though, as some individuals would take shortcuts, drop litter and damage vegetation that obstructed pathways.) The fact that the trails in the HHNR are some of the most popular ones in the province and booked out long in advance, according to CapeNature, speaks to stronger resource-use and conservation synergies.

***Spatial-analysis aspects***

Size and shape: Opinions regarding the size of the reserve were largely reflected in how the length and level of difficulty of a route impacted on the physical and mental state of hikers after a long day. Most respondents felt that options to hike in the Theewaterskloof and Groenlandberg Reserves should be facilitated via the Nuweberg office as well. Respondents demonstrated a good understanding of the fact that the shape of the HHNR is largely determined by its conservation and eco-service attributes, some of which need to be legally protected.

Place and Space: Ten of the 13 respondents had their first hiking, 'kloofing' and overnight hut experiences in the HHNR. Therefore, the latter has become - for the more experienced hikers - more than just a PA that facilitates conservation activities. Space and place affinities with the HHNR are thus intricately linked with some respondents' initial experiences of nature. Some, specifically those from Cape Town, bemoaned the fact that the route that used to start on the Sir Lowry's Pass has been closed officially, preventing them from 're-experiencing' the imposing mountain peaks of Hans-se-Kop and Moordenaarskop.

Accessibility, temporality, association: The proximity of the HHNR to the Cape Town Metropole makes the reserve and the bigger HHNRC locationally quite accessible. Hiking costs and conservation fees did not present access limitation to the respondents. Internal accessibility via hiking routes, jeep tracks and service roads that provide access to servitudes and infrastructure, such as electricity transmission lines, pipe systems and telecommunication towers in the HHNR, were appreciated by the respondents.

Inclement weather conditions, as explained in previous sections, may impact on the concept of relative accessibility to the reserve - something that was acknowledged by the respondents as well. Opinions voiced regarding the concept of association dovetail with the place-and-space sentiments expressed by respondents.



## 7.5 Linking resource-use information, spatial variables and expansion feasibility concerns

This section brings together resource-use information obtained from participants in the HHNR case study of the thesis and the revisiting of spatial variables that influence (or are being influenced by) such uses in order to reflect on the PA expansion feasibility of the HHNR. A feasibility analysis is typically comprised of the following categories: economic feasibility (which involves considerations such as finances, costing concerns and cost-benefit analysis); technical feasibility (which deals with risk assessment, mitigation and solutions), legal feasibility (which considers legal/constitutional requirements and mandates), operational feasibility (focusing on control, efficiency and services), resource feasibility (concerned with additional staffing and material),

and schedule feasibility (which involves resource optimisation and project timeline estimations). (Feasibility Study, 2020).

Based on the analyses of different spatial variables in the preceding sections, the following sections summarise the relationships between the different spatial variables on the one hand, and the chosen feasibility parameters for expansion (Table 7.1) and the conservation attributes of the HHNR on the other hand.

Adapted from the *Practitioner's Field Guide for Marine Conservation Agreements* (The Nature Conservancy and Conservation International, 2012) the envisaged feasibility indicators (as discussed in Chapter 1) for investigation include: critical conservation concerns (in the case of the HHNR it would be the threatened terrestrial fauna and flora species), the Nuweberg Village problem, the efficiency of park management/authorities, relationships with right-holders (such as owners, managers and users of land, ecosystem services), abatement of threats to expansion and/ or spatial reduction, and the creation of conservation-conducive, site-specific conditions.

**Table 7.1: Linking spatial variables and feasibility indicators for expansion of the HHNR**

| | Spatial variable | | | | | | |
|---|---|---|---|---|---|---|---|
| **Feasibility Indicators** | **Size** | **Shape** | **Place** | **Space** | **Access** | **Temporality** | **Association** |
| Critical conservation areas/concerns (CBAs) | Larger PA footprint to conserve HHNR & HHNNRC more effectively | Central HHNR compact; abutting CAs make it less compact | Determined by CFR Kingdom attributes & catchment role | Influenced largely by agricultural activities | Controlled, general access to reserve, relative access weather determined | Activities influenced by seasons and weather | Shaped by surrounding non-conservation activities |
| Competency of conservation entities/authorities | Efficient area management by CapeNature | Will remain largely compact with envisaged expansions | Place attributes well managed | Subject to externalities and resources in order to be managed effectively | Subject to externalities and resources in order to be managed effectively | Subject to externalities and resources in order to be managed effectively | Subject to externalities and resources in order to be managed effectively |
| Relationships with right-holders (such as owners, managers and users of land, resources, ecosystem services) | Co-management initiatives; multi-sectoral involvement crucial | Co-management initiatives; multi-sectoral involvement crucial | Advantages of positive place-space affinities of conservation attributes to be enhanced | Advantages of positive place-space affinities of conservation attributes to be enhanced | Physical access well controlled; some parts of reserve not fenced off | Strengthening of right-holders' participation crucial | Role of Cape Nature crucial in partnership enhancement |
| Abatement of threats to expansion or contraction agreements | Good abutting conservation land use, infrastructure and conservancies | Threats fairly limited except for Nuweberg Village challenges | Determined by CFR Kingdom attributes & catchment role | Advantages of positive place-space affinities to be enhanced | Controlled, general access to reserve; relative access weather determined | Temporalities and sustainability of resource uses managed by CapeNature | Subject to externalities and resources in order to be managed effectively |
| Creation of conservation-conducive, site-specific conditions | Contractual partnerships for expansion | Central HHNR compact; abutting CAs make it less compact | Advantages of positive place-space affinities for users | Advantages of positive place-space affinities for users | Access controllable | Diversification of activities may enhance HHNR's status | Diversification of activities may enhance HHNR's status |

Externalities and resource-uses related to conservation, agriculture, housing, outdoors activities

## 7.6 Conclusions

The evidence presented in this chapter illustrates how the revisiting of different spatial variables, such as size, shape, place, space, access, temporality and association, can inform the feasibility of an expansion of the HHNR as a protected area. In combination with the principles of South Africa's National Protected Areas Expansion Strategy (NPAES), as well as the chosen feasibility indicators, it can be deduced, based on the evidence presented, that respondents, specifically representatives of the Nuweberg Village, are generally indifferent to changes in the spatial footprint of the HHNR.

Theoretically, sense-making of the evidence presented in this chapter points to conservation and control as a particular political ecology thesis (See Chapter 1, Section 1.8). This angle on political ecology assumes that conservation is intrinsically benign and focuses less attention on the political and economic context within which conservation is embedded. The location, biophysical attributes, and the important mountain catchment role which the reserve fulfils render it very different to the DNR and the WCNP. The application of the 'control' theory to this case study is justifiable as the mountains in the reserve are the origins of some of the most important rivers and/or their tributaries in the Western Cape. Its 'water-supply footprint' stretches, therefore, beyond the official boundaries of the reserve.



The analysis brought together the results of primary data (derived from resource-use and PA expansion conversations and observations), as well secondary data (derived from quantitative data gathered from the park's management plan and other literature), in a concurrent, triangulated manner rooted in MMR. The evidence/opinions suggest that the expansion of the park, albeit not highly prioritised, can solidify and protect its conservation assets.

# CHAPTER 8: SUMMARY AND CONCLUSIONS

## 8.1 Introduction

Although the study is not representative of all categories on PAs in the Western Cape, conclusions drawn are case-study specific. The case-study method used in this research provided the opportunity, though, to interrogate in greater depth the different dynamics, specifically related to resource uses in relation to conservation activities, in the investigated areas. The 'incubator' role that the case-study analyses can play in making sense of (theoretical and practical) similarities and differences in conservation-resource-expansion relations is evident in the analyses of Chapters 5, 6 and 7. As explained in Chapter 1, the three study areas are significantly different in terms of their spatialities, conservation mandates, use of their various resources and expansion prospects. The study provided evidence of a multitude of direct and indirect resource consumption activities by different users in and close to the PAs, and how this, in turn, may have had an influence - and may continue to do so – on expansion initiatives. Evidence that speaks to the need to reduce the spatial footprint of PAs, as is the case with the DNR, rather than the desire to expand, is proof of the continuing schism between conservation and resource consumption demands.

The apparent polemic of people and conservation activities that share common space is an important theme emanating from the research. In this regard the (middle class) communities living in the WCNP (i.e. the lease agreement allowing occupants of Postberg to live there, as well as the permanency of the Churchhaven settlement) elicit significantly different temporal, spatial and management responses from conservation authorities. The problems associated with the poverty-stricken Green Park, Los Angeles and Driftsands settlements in the DNR were addressed by CapeNature's plan of de-proclamation of spaces occupied by these settlements. As indicated in Chapter 5, approximately 131 hectares were excluded to create the priority extent of the DNR. The sustainability of such plans is questionable as the reserve forms a resource-base for certain stakeholders, notably for the urban livestock herders and cultural practitioners.

The WCNP displays a direct juxtaposition regarding the management of problems associated with its resident communities. Historical agreements, dating back to pre-proclamation periods, hamper any quick solution to these challenges. The 99-year lease agreement with occupants of the Postberg

section of the park created problems the solution to which is handled in an almost stewardship fashion as the traditional roles are reversed, i.e. SANParks manages the area on behalf of the occupants instead of vice versa, as explained in Chapter 6.

## 8.2 Comparative Reflections

In this section, a brief synopsis of, as well as reflections on, the results is presented as a prelude to the conclusion. Table 8.1 summarises the relationships among conservation, broad resource-use categories and prospects for PA expansion.

**Table 8.1: Resource consumption and spatial responses at the DNR, WCNP and HHNR**

| **Resource-use Categories** | **Nature of relationships** | | | **PA Spatial Response** | | | |
|---|---|---|---|---|---|---|---|
| | Positive | Complementary | Negative | Expansion | Reduction | Stable | Off-sets |
| Marine | WCNP | WCNP | WCNP | WCNP | | WCNP | |
| Agriculture | | | | | | | |
| Industrial | | | WCNP | | | | |
| Mining | | | WCNP | | | WCNP | |
| Bio harvesting | | | DNR | | | | |
| Forestry | | | | | HHNR | | |
| Military | | WCNP | WCNP | | | | |
| Heritage | WCNP | WCNP, HHNR | | WCNP | DNR | | |
| Tourism | | | | | | WCNP | |
| Residential | | HHNR | DNR | | DNR | WCNP | DNR |
| Sport | WCNP | WCNP | | | | | |
| Adventure | HHNR | WCNP | | | | | |



Albeit arbitrary in some instances, it is evident from Table 8.1 that the prevalence of certain direct and indirect resource uses can be linked to planned PA expansion responses, e.g. land invasions and counter-conservation land-uses in the DNR led to the de-proclamation of sections of the reserve, to be substituted by conservation-valued off-set areas, as discussed in Chapter 5. In a similar vein, attempts to expand the MPA, as well as the terrestrial footprint of the WCNP, can be considered as positive in response to the protection of marine resources and buffering against counter-conservation land-uses.

The following sections provide conclusionary thoughts on the management aspects that were investigated.

### 8.2.1. The roles of reserve managers/conservators

As reflected in the three case studies, the roles of the above-mentioned officials are much broader than their core job descriptions. Their discretion is of vital importance if reserves have intricate community issues that cannot be separated from the very existence of such areas. All three study areas are, albeit differently, challenged by housing and service delivery issues. Managers, therefore, have to execute, directly and/or indirectly, corporate social investment (CSI) responsibilities associated with conservation. The fact that the DNR is an urban-community park in the metropolitan area of Cape Town, but not managed by the city, places undue pressure on CapeNature as the provincial conservation authority responsible for the DNR.

A PA in the broader socio-political context needs critical attention. During an interview with the reserve manager, he mentioned that, in the past and by virtue of his position, he had been requested to help diffuse two volatile situations in the larger Grabouw area as community protests spilled over into the reserve and protesters set fires to a section of the reserve. It can, therefore, be argued that PAs are becoming (soft) targets for such service delivery protests in order to make political-ideological statements. The demand for housing by many poverty-stricken people also spilled over into land invasions that were particularly troublesome for the management of the DNR in 2019 and 2020. The situation is, to all intents and purposes, out of control as some core and peripheral areas are currently densely occupied by informal structures, specifically on the reserve's eastern border with the Mfuleni township. Compliance with any agreement or arrangement is non-existent, according to the current reserve manager at the DNR – even the cultural-religious site on the bank of the Kuils River in the eastern part of the reserve is occupied by land invaders. The purpose of the DNR as an urban-community park with significant conservation value has been rendered almost unachievable.



### 8.2.2. Spatial changes due to expansion or contraction

Although this study did not focus on the quantification of expansion or contraction per se, Table 8.2 summarises how the sizes of the WCNP, HHNRC and DNR will change if expansion or contraction plans come to fruition (WCNP MP 2013 – 2023; Saul et al., 2015; Veldtman et al., 2015; Marais et al., 2021).

**Table 8.2: Potential expansion and contraction changes**

| | Size (ha) | | |
|---|---|---|---|
| **Protected Area** | **Current** | **Expansion/Contraction** | **Total** |
| WCNP | 36 300 | 6 382 | 42 682 |
| *HHNR | 70 000 | 25 | 7 025 |
| DNR | 638 | 131 (contraction) | 507 |
| | | 180 (off-set areas/relative expansion) | 687 |

(Adapted from: WCNP MP 2013 – 2023; Saul et al., 2015; Veldtman et al., 2015; Marais et al., 2021)

*The HHNR is part of the HHNRC which also includes the following nature reserves: Assegaaibos, Jonkershoek, Simonsberg, Helderberg, Groenlandberg and Theewaterskloof. The HHNR, Theewaterskloof and Groenlandberg are managed together as a sub-unit in the larger HHNRC. These PAs are essential in the management of the larger 85 000-hectare Hottentots-Holland Mountain Catchment Area. Any expansion plans will, therefore, have to take into consideration conservation needs of the HHNRC.

Longer term expansion plans seem to be not that urgent at this stage as "the HHNRC design (shape and size) are adequate to achieve the conservation objectives in the Management Plan" (Veldtman et al., 2015:74). A piece of state land east of the Vyeboom wetlands close to the Theewaterskloof Dam is however, earmarked for inclusion into the complex's expansion plans due its biodiversity attributes and corridor-linkage functionality (Veldtman et al. 2015:59).



(It needs to be mentioned that DNR faces de-proclamation at this moment in time as a nature reserve due to uncontrolled and violent land invasions that have continued unabated since 2019).

### 8.2.3. Attractions/activities in study areas

It is important to acknowledge that, despite the identification and analysis of the impacts of the conflicting and/or complementary conservation-resource use relations in the study areas, they have fundamental visitation value. Over and above the importance of the conservation attributes of the study sites, their attractions and leisure offerings are equally important. Table 8.3 summarises the most important offerings by the WCNP, HHNR and DNR.

**Table 8.3: Attractions/Activity Matrix for PAs**

| | Protected Area | | |
|---|---|---|---|
| **Activity/Attributes** | **WCNP** | **HHNR(C)** | **DNR** |
| Accommodation | √ | √ | |
| Camping | | | |
| Bird watching | √ | √ | √ |
| Whale watching | √ | | |
| Wildlife | √ | √ | √ |
| Rock art | | | |
| Fossils | √ | | |
| Rock climbing | | √ | |
| 'Kloofing' | | √ | |
| Ziplining | | √ | |
| Multi-day hike | √ | √ | |
| Day walks | √ | √ | √ |
| Mountain biking | √ | √ | |
| Swimming | √ | √ | |
| Angling | √ | | |
| Canoeing | √ | | |
| Water sport | √ | | |
| Picnic area | √ | √ | |
| Braai facilities | √ | √ | |
| Ocean | √ | | |
| Lake/Wetland area | √ | √ | √ |
| Mountains | | √ | |
| Indigenous forest | | √ | |
| Rivers | | √ | √ |
| Fynbos | √ | √ | √ |
| Environmental education | √ | √ | √ |

(Adapted from CapeNature – Guide to Accommodation and Activities, n.d.; https://www.sanparks.org/)

The multiplicity of offerings varies across the case studies – largely as a result of their locational and conservation attributes. The coastal location of the WCNP added to its offerings, but also caused

additional challenges to its conservation mandate, as discussed in Chapter 6. Water-based attractions/activities and marine resource usage will continue to be a challenge as the (open) Saldanha Bay-Langebaan Lagoon system is subjected to the impact of externalities of which some are beyond the control of the park's management.

The nature-based offerings associated with the remoteness of the HHNR/HHNRC make the reserve far less prone to the impacts experienced by the WCNP and the DNR. The marine environment of the WCNP and the variations in its biodiversity, geodiversity, as well as natural and cultural heritage, add significantly more to the park's attractions. On the other hand, the documented problems associated with the DNR had a direct impact on what attractions and activities can be promoted by its management.

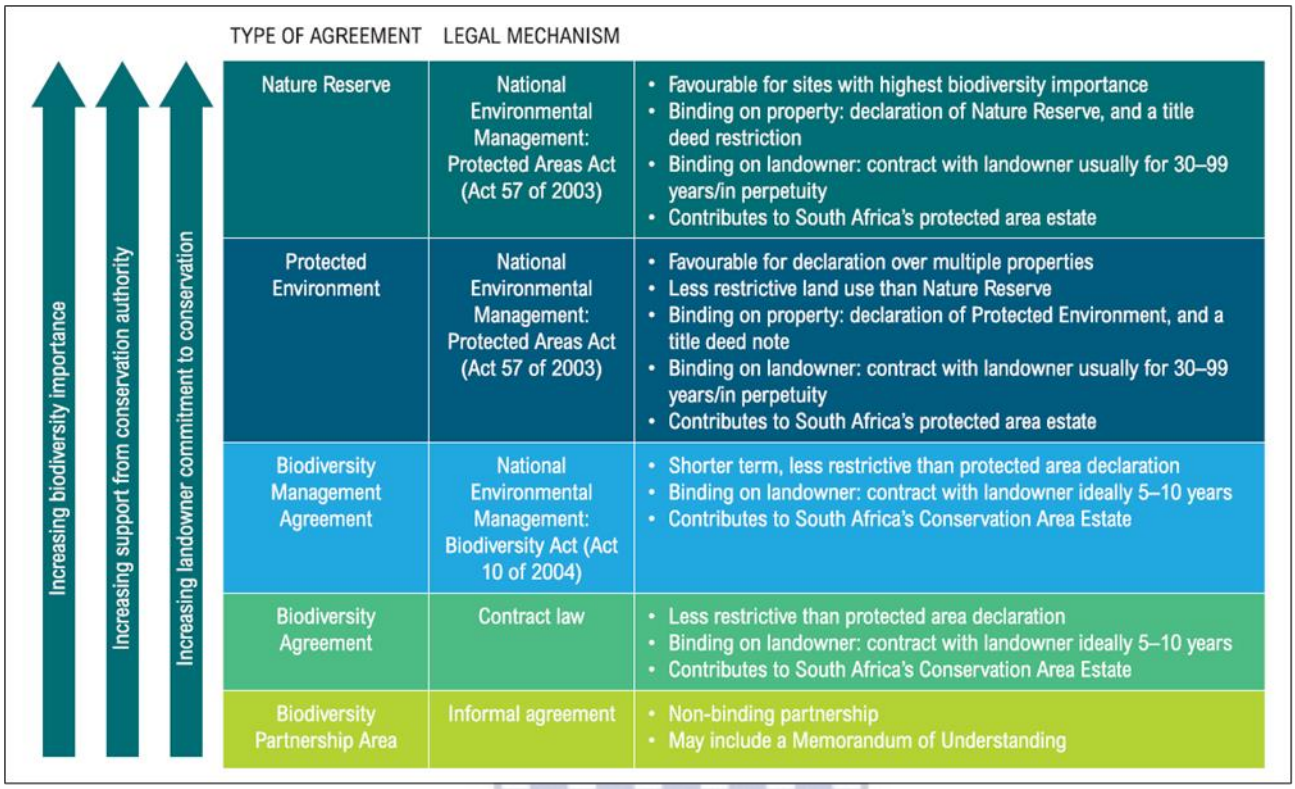
### 8.2.4 PA expansion in the context of contested spaces and priorities

Direct and indirect contestations that influence formal expansion prospects through mechanisms, such as stewardships and de-proclamation, have been revealed by the study. The DNR case study is the most problematic PA in terms of expansion prospects if compared to the WCNP and HHNR.

***Revisiting frameworks for the spatial expansion of PAs: contraction, de-proclamation, stewardships, co-management options, adaptive management:***



As formal expansion is not as feasible as it may seem from bona fide biodiversity and ecological points of view, alternative mechanisms need to be considered. Most of these alternatives are related to stewardship agreements among State entities and PAs and private or communal landowners. Figure 8.1 summarises the stewardship agreements relative to landownership.




| TYPE OF AGREEMENT | LEGAL MECHANISM | |
|---|---|---|
| Nature Reserve | National Environmental Management: Protected Areas Act (Act 57 of 2003) | • Favourable for sites with highest biodiversity importance<br>• Binding on property: declaration of Nature Reserve, and a title deed restriction<br>• Binding on landowner: contract with landowner usually for 30–99 years/in perpetuity<br>• Contributes to South Africa's protected area estate |
| Protected Environment | National Environmental Management: Protected Areas Act (Act 57 of 2003) | • Favourable for declaration over multiple properties<br>• Less restrictive land use than Nature Reserve<br>• Binding on property: declaration of Protected Environment, and a title deed note<br>• Binding on landowner: contract with landowner usually for 30–99 years/in perpetuity<br>• Contributes to South Africa's protected area estate |
| Biodiversity Management Agreement | National Environmental Management: Biodiversity Act (Act 10 of 2004) | • Shorter term, less restrictive than protected area declaration<br>• Binding on landowner: contract with landowner ideally 5–10 years<br>• Contributes to South Africa's Conservation Area Estate |
| Biodiversity Agreement | Contract law | • Less restrictive than protected area declaration<br>• Binding on landowner: contract with landowner ideally 5–10 years<br>• Contributes to South Africa's Conservation Area Estate |
| Biodiversity Partnership Area | Informal agreement | • Non-binding partnership<br>• May include a Memorandum of Understanding |

**Figure 8.1: Stewardship options for landowners**

(Source: Duffell-Canham et al., 2017:29)



As landownership and land-uses regarding the DNR are varied, it poses very specific challenges for the implementation of one or some of the agreements. For example, Off-set Area 1 (which plays host to generally intact and undisturbed fynbos) in Figure 5.4 is privately-owned and has a Biodiversity Partnership Agreement with the reserve. (It is the parcel of land opposite the Brentwood Park residential area.) The owner of the land is apparently not ready to sell off the land as yet (conversation with the reserve manager, 2019).

The other parcel of land (Erf 534) in question is located south of the Hindle Road Bridge and the first access road into the Mfuleni township. It belongs to the Medical Research Council and is unused, disturbed and has low conservation value. It plays host to the cattle kraals discussed in Chapter 5, serves as grazing for cattle that often veer into the reserve and is drained by the Kuils River. Despite its low conservation status, its type of resource uses impact on the ecological integrity of the DNR further south.

## 8.3 Is the assessment of conservation and resource-use relations an adequate way of framing PA expansion in SA/Western Cape differently?

The study used political ecology and socio-ecological systems as lenses to frame the study theoretically. Descriptive/narrative spatial analysis, instead of traditional quantitative spatial analysis, was used to record and analyse the more nuanced impacts of spatial variables on the chosen reserves and vice versa. The direct and indirect impacts were assessed by using different mixed research methods that allowed for a more nuanced understanding of the impacts of these variables.

The variables were also linked to prevalent resource consumption in, and in proximity to, the study areas in order to inform the feasibility of PA extension where there were (apparent) conflicting conservation and resource-use needs. Although PA expansion mandates are in place, actively pursuing them seems to be less important than executing the existing conservation mandates associated with the study areas. The problems associated with the DNR precipitated official de-proclamation of certain areas in the reserve in order to have a priority spatial extent within which conservation is feasible.

### 8.3.1 Effectiveness and efficiency

In the final analysis, revisiting the feasibility of expansion (or not) of PAs would probably have to be assessed against the background of indicators of the effectiveness and efficiency of decisions taken at reserve level. 'Effective' refers to being "adequate to accomplish a purpose; producing the intended or expected result", whilst 'efficient' refers to "performing or functioning in the best possible manner with the least waste of time and effort" (Goh, 2013).

The generic differences between efficiency and effectiveness, as summarised in Figure 8.2, provide a perspective on expansion feasibilities as reflected in this study.

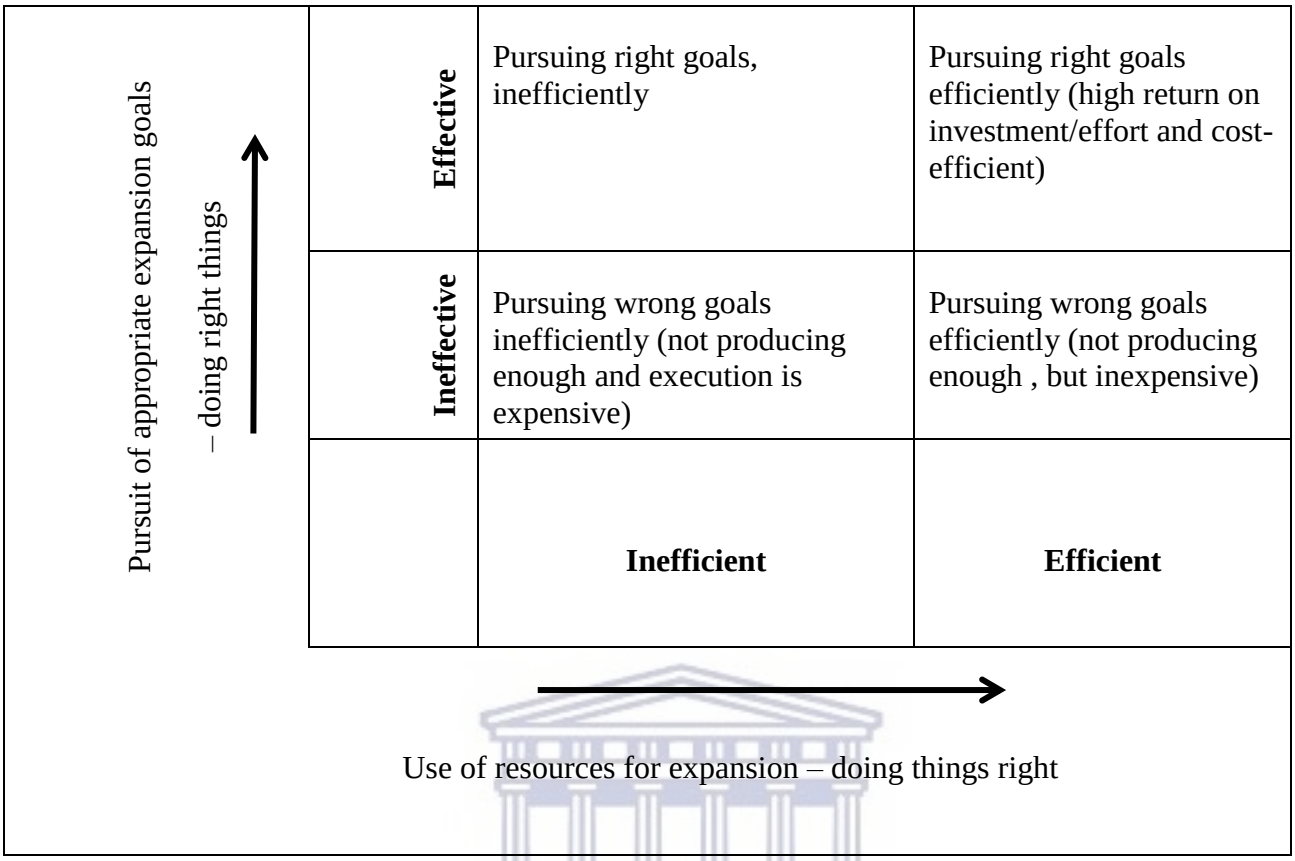



**Figure 8.2: Effective and Efficiency variables influencing expansion**

(Adapted from Goh, 2013)



In all three case studies, the intended physical expansion of and/or reduction in the size of the PAs go hand in hand with a number of practical considerations. In the case of the DNR, after conservation assessments have been done and authorisation granted, it is a 'defendable perimeter fence' that, in turn, requires a budget, as well as a management plan for the protection of the fence (conversation with reserve managers, 2018, 2019, 2020). Budget concerns and a fence protection management plan are, therefore, examples of pursuing the right expansion goal, i.e. trying to do the right thing. The specific concerns regarding the effectiveness and efficiency in pursuing the right goal(s) for expansion are complex in the case of the DNR. Expansion and/or reduction assessment, therefore, has to consider additional layers of concern other than mere biodiversity, geodiversity, heritage and livelihoods. As the DNR is subjected to much greater 'urban influences', compared to the WCNP and HHNR, it is important to situate the evidence emanating from it within the broader urban sustainability discourses. PA areas in urban settings are/can be, in combination with other green initiatives, one of the roots of

urban sustainability. Groak (2016) believes that a balance in the combinations of the elements "density, liveability and convenience" are crucial in the people-centred debate in urban sustainability. For Cape Town's urban poor, who are largely relegated to the spatial-economic margins of the city, balancing these elements requires far more purposeful thinking and planning. As discussed in Chapter 5, the historical origins and establishment of the DNR and surrounding communities (i.e. Mfuleni, Delft, Khayelisha), as well as its intra-reserve communities (i.e. Green Park, Los Angeles and Driftsands) did not consider density, liveability and convenience as priorities. It, therefore, stands to reason that the effectiveness and efficiency of the reduction, expansion and (spatial) off-set initiatives at the reserve, will always be problematic.

In the case of the WCNP, pursuing expansion effectively would require the transfer of land in the buffering structure around the park. The spatial buffer, consisting of private nature reserves located around the park, provides indirect protection. Intra-park expansion will probably be more challenging for as long as private landownership areas (e.g. Postberg and Churchhaven) and State-owned land, such as at Donkergat, exist in the park.

The expansion of the HHNR, as part of the broader HHNRC, seems far less troublesome as synergies between private (agricultural) landowners and conservancies exist that will make the potential inclusion of additional pockets of CBAs effective.



### 8.3.2 Resource uses and consumers

For the purpose of this study, the variety of resource uses, as illustrated in Chapters 5, 6 and 7, can be divided into the two broad categories of active and passive consumptive on the one hand, and active and passive non-consumptive on the other. Other categories, such as extractive and non-extractive, can also be used in the monitoring of resource usage in PAs (Vermeulen et al., 2019). Active consumptive uses refer to the complete or partial physical removal by users of natural resources from their original locations. Table 8.4 summarises the non-conservation resource uses and activities across the study areas for livelihood, as well as recreational and tourism purposes.

**Table 8.4: Resource usage in study areas**

| | Resource Use Categories | | | |
|---|---|---|---|---|
| **Protected Area** | **Active Consumptive** | **Passive Consumptive** | **Active Non-consumptive** | **Passive Non-Consumptive** |
| **DNR** | Wood harvesting<br>Sand harvesting<br>Vegetation removal<br>Land invasion<br>Hunting<br>Livestock grazing | Gardening | | Bird watching |
| **WCNP** | Commercial subsistence fishing | Aquaculture<br>Beach walking and combing<br>Fossil appreciation | Swimming<br>Hiking<br>Surfing<br>Water sport | Bird watching<br>Sightseeing |
| **HHNR** | Wood harvesting | Gardening (Nuweberg) | Swimming<br>Hiking<br>Kloofing<br>Zip lining | Bird watching<br>Sightseeing |

It is evident that active extractive consumptive resource uses underpin the livelihood struggles of people residing in, and in proximity to, the DNR. Resource dependency on and usage of indigenous fynbos vegetation is causing havoc with regard to the conservation of the very fynbos endowment of the reserve. Similarly, the destruction of dunes in the DNR is responsible for a plethora of direct and indirect impacts on fynbos conservation, wetland services, and the ecosystem services provided by the dunes.



### 8.3.3 Swot Analysis

In this section, an attempt is made to make sense of the relationships between resource uses and feasibility indicators for possible PA extension. Table 8.5 provides a summarised SWOT analysis of some of the relationships between those indicators and consumptive and non-consumptive resource uses in the study areas.

**Table 8.5: SWOT analysis**

| | SWOT Analysis for Resource Uses | | | |
|---|---|---|---|---|
| **Feasibility Indicator** | **Strengths** | **Weaknesses** | **Opportunities** | **Threats** |
| **Critical conservation areas/concerns (CBAs)** | The core/central conservation areas in all three sites are generally healthy and can be improved, even in the DNR | Decimation of threatened plant species in the DNR due to land invasion; limited perimeter fencing | Official intervention & multi-level stakeholder involvement needed and the possibility to stop invasions in order to protect what is left of indigenous vegetation, and the wetlands in the DNR | Decimation of threatened plant species in the DNR due to land invasion; limited perimeter fencing; dune destruction |
| **Competency of conservation entities/authorities** | Good, committed and sensitive reserve officials at all three sites supported by SANParks and Cape Nature (and City of Cape Town regarding the DNR). | Staff shortages (can) hamper conservation initiatives at all three sites. | Additional staff and general support from SANParks, CapeNature and City of Cape Town need to be explored further. | Continuing conflicting resource uses beyond the control of competent officials, specifically in the DNR. |
| **Relationships with right-holders (such as owners, managers and users of land, resources, ecosystem services)** | Reserve managers (can) facilitate dialogue among different right-holders . | Conservation and changing resource usage demands can be in conflict as in the case of the DNR and WCNP. | Multi-level stakeholder engagement can solve impasses. | Animosity between management and (illegal) resource users can, and indeed has, hampered initiatives in the past at the DNR and WCNP; safety to DNR visitors. |
| **Abatement of threats to expansion agreements** | Good, multi-stakeholder input, specifically in the WCNP. | Continuing consumptive and non-consumptive resource demands for subsistence, as well as financial gain, occur to various extents in study areas. | Opportunity exists to realign the physical boundaries of the DNR to exclude invaded areas; fostering of duty-of-care behaviour. | Disregard for environmental regulations where resources are of an active-consumptive nature. |
| **Creation of conservation-conducive, site-specific conditions** | Good, multi-stakeholder input, specifically in the WCNP. | Changing demands of different resource consumers remain a significant variable. | Ongoing dialogue to emphasise the importance of the DNR's conservation value; WCNP and HHNR have much better pro-conservation site-specific conditions. | Hampered by real and perceived disparity of land invaders who plunder resources. |

## 8.4 Conclusion

Despite the limitations of the study in terms of representative PAs and representative resource consumption patterns over space and time, the case studies, indeed, provide insight into the resource-PA expansion debates in a more nuanced way. Similar and different relations may be prevalent in other local, provincial and national PAs. As the NPAES is fairly vague regarding the more subjective concerns associated with spatial variables, such as size, shape, place (absolute location), space (relative location), temporality, accessibility and association, of PAs relative to their expansion and/or contraction plans, this study provided some insight to fill that knowledge gap.

Future research is needed regarding the quantification of the impacts which these spatial variables have on the expansion or contraction of PAs - and the impact which expansion or contraction would have on these variables themselves, as they inform conservation prospects and mandates as well.

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**APPENDICES**

Appendix A – Interview schedule/conversation with officials

Appendix B – Gespreks/onderhoudskedule vir amptenare

Appendix C – Interview schedule/ Conversation with resource users

Appendix D – Gespreks/onderhoudskedule vir hulpbronverbruikers

Appendix E – Convention on Biological Diversity - South Africa Country Profile



Appendix F – Aichi Biodiversity Goals and Targets

## **APPENDIX A:** INTERVIEW SCHEDULE/CONVERSATION WITH OFFICIALS


**UNIVERSITY OF THE WESTERN CAPE**

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**Department of Geography, Environmental Studies and Tourism**


Dear Respondent

The following interview schedule forms part of research undertaken by Michael Dyssel of the abovementioned department. The purpose of the study is to revisit direct and indirect resource uses in, and around protected areas in order to assess circumstances that may impact on the feasibility of protected area expansion. (It is assumed that expanding the size and/or number of protected areas can contribute to more effective conservation, ecosystem services and environmental protection).

The researcher (and supervisor), commit to the following to protect the autonomy of participants:

to clarify any uncertainty re the nature of the research and information gathering process; emphasise the voluntary nature of the participation and the fact that respondents can withdraw (without any consequences) at any stage during the interview; treat all responses in a confidential manner as required by respondents; ensure anonymity (through coded names); abide by the choice of the participant as to how (written or audio) responses should be recorded; and ensure academic integrity in using the information gathered.

Your responses on the following questions will be appreciated.

Name of Protected Area: ……

Please indicate (√) your interest(s):

| | |
|---|---|
| Conservation authority/manager | |
| Stakeholder/Resource-use interest<br>Marine<br>Agricultural (livestock & crops)<br>Conservation/Ecological<br>Industrial<br>Mining<br>Heritage (Cultural)<br>Heritage (Natural)<br>Tourism/Leisure<br>Research/Education<br>Other……. | |
| Civil society interest<br>…….. | |



**Please reflect on/answer the following**:

1. Is there in your opinion (or the group that you represent), a need for the spatial consolidation and/or expansion of the particular protected area?

2. Explain why you are in favour of spatial consolidation and expansion.

3. Explain why you are in favour of maintaining or reducing the spatial extent.

4. Alternatively, explain if you believe that both spatial expansion and reduction are needed.

5. What temporal-situational aspects influenced, are influencing and may influence consolidation and expansion or reduction?

6. What functional and managerial aspects influenced, are influencing and may influence consolidation and expansion?

7. Explain how direct/consumptive resource uses in the protected area impacted, are impacting, or may impact on the potential spatial expansion or reduction of the area.

8. Explain how the usage of resources that are indirectly linked to the protected area impacted, are impacting or may impact on the potential spatial expansion or reduction of the area.

9. What are the prospects for an optimal expansion framework within which social and economic variables can feature more sustainably?

10. Provide your opinions on the following spatial variables of the reserve/park: size, shape, place, space, accessibility, temporality, association.

11. What are the prospects for more constructive partnerships with other conservation authorities, other protected areas, local communities and private landowners?



*Any additional comments are welcome.*

*Thanks for your cooperation!*

## **APPENDIX B:** GESPREKS/ONDERHOUDSKEDULE VIR AMPTENARE


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**Department of Geography, Environmental Studies and Tourism**


Geagte Respondent

Die volgende onderhoudskedule vorm deel van navorsing wat deur Michael Dyssel, verbonde aan bogenoemde department, gedoen word. Die doel van die studie is om direkte en indirekte hulpbrongebruike in, en naby beskermde/bewaringsgebiede te herbesin ten einde die uitvoerbaarheid van die uitbreiding van beskermde gebiede te belig. (Dit word algemeen aanvaar dat die grootte van en/of die aantal beskermde gebiede ekstra bydraes kan maak tot meer effektiewe bewaring, ekosisteem dienste en omgewingsbeskerming).



Die navorser (en supervisor) onderneem die volgende om die outonomiteit en anonimiteit van respondente te beskerm deur:
enige onsekerheid rakende die aard van die navorsing en informasie insameling te verduidelik; die vrywillige aard van die deelname aan die respondente te verduidelik asook hul reg on ter enige tyd, sonder enige gevolge, te kan onttrek uit die onderhoud; alle response konfidensieël te hanteer soos versoek deur respondent; anonimiteit te verseker (en kodifisering te gebruik waar toepaslik); respondente se keuse te eerbiedig rakende geskrewe of audio-visuele opnames van hul response; akademiese integriteit in die gebruik van data/informasie te beklemtoon.

U reaksie op die volgende vrae sal waardeer word:

Naam van die beskermde gebied: …….……

Dui u belang(e) met (√) aan asseblief:

| | |
|---|---|
| Bewarings-outoriteit/bestuurder | |
| Belangegroep/Hulpbrongebruik<br>Mariene<br>Landbou (veeteelt & gewasse)<br>Bewaring/Ekologies<br>Industrieël<br>Mynbou<br>Erfenis (Kultureel)<br>Erfenis (Natuurlik)<br>Toerisme/Ontspanning<br>Navorsing/Opvoeding<br>Ander……. | |
| Burgelike samelewing belang<br>…….. | |



**Reflekteer op/beantwoord die volgende asseblief**:

1. Is daar in u opinie (of die belangegroep wat u verteenwoordig), ‘n behoefte aan ruimtelike konsolidasie en/of uitbreiding van die spesifieke beskermde gebied?

2. Verduidelik waarom u ten guste van die ruimtelike konsolidasie en uitbreiding van die reservaat/park is.

3. Verduidelik waarom u ten guste is van die verkleining van die ruimtelike omvang van die reservaat/park is.

4. Alternatiewelik, verduidelik waarom u glo dat beide uitbreiding en verkleing nodig is.

5. Watter tyd-ruimtelike aspekte beïnvloed, het beïnvloed of mag konsolidasie en uitbreiding of verkleinig beïnvloed?

6. Watter funsionele en bestuurs aspekte beïnvloed, het beïnvloed of mag konsolidasie en uitbreiding of verkleinig beïnvloed?

7. Verduidelik hoe dat direkte hulpbronverbruike in die reservaat/park ruimtelike uitbreiding of verkleining beïnvloed, beïnvloed het, of mag beïnvloed.

8. Verduidelik hoe dat hulpbronverbruik of eksploitasie van hulpbronne wat indirek gekoppel word aan die reservaat/park potensiële ruimtelike uitbreiding of verkleining beïnvloed, beïnvloed het, of mag beïnvloed.

9. Wat is die vooruitsig van ‘n optimale uitbreidingsraamwerk waarbinne sosiale en eknomiese veranderlikes meer volhoubaar geïnkorporeer kan word?

10. Verskaf jou opinie rakende die volgende ruimtelike veranderlikes van die reservaat/park: grootte, vorm, plek, ruimte, toegang, temporaliteit, assosiasie.

11. Wat is die vooruitsigte van meer konstruktiewe vennootskappe tussen bewaringsoutoriteite, ander bewaringsgebiede, plaaslike gemeenskappe en privaat grondeienaars?

*Enige addisionele kommentaar is welkom.*

*Dankie vir u samewerking!*

## **APPENDIX C:** INTERVIEW SCHEDULE/CONVERSATION WITH RESOURCE USERS


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**Department of Geography, Environmental Studies and Tourism**

Dear Respondent

The following interview schedule forms part of research undertaken by Michael Dyssel of the abovementioned department. The purpose of the study is to revisit direct and indirect resource uses in, and around protected areas in order to assess circumstances that may impact on the feasibility of protected area expansion. (It is assumed that expanding the size and/or number of protected areas can contribute to more effective conservation, ecosystem services and environmental protection).

The researcher (and supervisor), commit to the following to protect the autonomy of participants:

to clarify any uncertainty re the nature of the research and information gathering process; emphasise the voluntary nature of the participation and the fact that respondents can withdraw (without any consequences) at any stage during the interview; treat all responses in a confidential manner as required by respondents; ensure anonymity (through coded names); abide by the choice of the participant as to how (written or audio) responses should be recorded; and ensure academic integrity in using the information gathered.

**Your responses on the following questions will be appreciated**.

1. Name of Protected Area: ……..……..……
2. Name the resources in/close to the reserve that you are using.
3. What are your reasons for using the resources?
4. Where specifically (location) do you get the resources?

5. When do you normally collect the resources.

6. How often do you collect the resources?

7. Do you think that the resources are easy to collect/available/accessible? Please explain.

8. Were you given permission by the management of the reserve/park to use the resources?

9. In your opinion, what are the impacts of your resource usage, if any?

*Any additional comments are welcome.*

*Thanks for your cooperation!*

## **APPENDIX D:** GESPREKS/ONDERHOUDSKEDULE VIR HULPBRONVERBRUIKERS


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**Department of Geography, Environmental Studies and Tourism**


Geagte Respondent

Die volgende onderhoudskedule vorm deel van navorsing wat deur Michael Dyssel, verbonde aan bogenoemde department, gedoen word. Die doel van die studie is om direkte en indirekte hulpbrongebruike in, en naby beskermde/bewaringsgebiede te herbesin ten einde die uitvoerbaarheid van die uitbreiding van beskermde gebiede te belig. (Dit word algemeen aanvaar dat die grootte van en/of die aantal beskermde gebiede ekstra bydraes kan maak tot meer effektiewe bewaring, ekosisteem dienste en omgewingsbeskerming).



Die navorser (en supervisor) onderneem die volgende om die outonomiteit en anonimiteit van respondente te beskerm deur:
enige onsekerheid rakende die aard van die navorsing en informasie insameling te verduidelik; die vrywillige aard van die deelname aan die respondente te verduidelik asook hul reg on ter enige tyd, sonder enige gevolge, te kan onttrek uit die onderhoud; alle response konfidensieël te hanteer soos versoek deur respondent; anonimiteit te verseker (en kodifisering te gebruik waar toepaslik); respondente se keuse te eerbiedig rakende geskrewe of audio-visuele opnames van hul response; akademiese integriteit in die gebruik van data/informasie te beklemtoon.

**U response op die volgende vrae sal waardeer word**:

1. Naam van die beskermde gebied: …….……

2. Noem die hulpbronne in/naby die park/reservaat wat u gebruik.

3. Waarom gebruik u die genoemde hulpbronne?

4. Waar spesifiek (ligging) kry u die hulpbronne?

5. Wanneer versamel u gewoonlik die genoemde hulpbronne?

6. Hoe gereeld versamel u die genoemde hulpbronne?

7. Dink u dat die hulpbronne maklik beskikbaar/versamelbaar is? Verduidelik asseblief.

8. Het u toestemming van die park/reservaat bestuur gekry om die hulpbronne te gebruik?

9. In u opinie, wat is die impak van u hulpbronverbruik, indien enige?

*Enige addisionele kommentaar is welkom.*

*Dankie vir u samewerking!*

## **APPENDIX E:** CONVENTION ON BIOLOGICAL DIVERSITY - SOUTH AFRICA COUNTRY PROFILE

Source: https://www.cbd.int/countries/profile/default.shtml?country=za#facts

"South Africa - Country Profile

Biodiversity Facts:

Status and trends of biodiversity, including benefits from biodiversity and ecosystem services

The content of this biodiversity profile is still a draft. The text below has been prepared by SCBD and remains subject to final approval by the Party concerned.

The diversity of topography, climate, geology and people in South Africa presents a wide variety of natural and cultural resources. It is notably considered one of the most biologically diverse countries in the world due to its species diversity, rate of endemism and diverse ecosystems. Terrestrial biodiversity can be divided into nine biomes, rivers into 31 different river ecoregions, and estuaries and coastal marine habitats into three biogeographical zones around the coast (subtropical, warm temperate, cool temperate). In addition, numerous structural types of vegetation, rivers, wetlands, estuaries and marine habitats add considerably to the biodiversity within these environments. While it occupies only 2% of the world's land surface area, South Africa is home to 10% of the world's plant species and 7% of its reptile, bird and mammal species. Furthermore, it harbors around 15% of the world's marine species. Endemism rates reach 56% for amphibians, 65% for plants and up to 70% for invertebrates.

However, South African biodiversity is at present greatly endangered. National Red List assessments indicate that 10% of South Africa's birds and frogs, 20% of its mammals and 13% of its plants are threatened. In terms of natural ecosystems, the National Spatial Biodiversity Assessment (NSBA) (2004) revealed that 82% of the main river ecosystems are threatened, with 44% critically endangered, 27% endangered, and 11% vulnerable. Of the country's 440 vegetation types, 5% are critically endangered, 12% are endangered and 16% are vulnerable; 3 of the 13 estuary groups are critically endangered, a further 5 are endangered and 2 are vulnerable; 65% of

the 34 marine biozones are threatened, with 12% critically endangered, 15% endangered and 38% vulnerable. In regard to freshwater ecosystems, the assessment revealed that only 29% of the country's main rivers were unmodified, or largely unmodified, and an estimated 50% of South Africa's wetlands have been destroyed. An example is taken from the Cape Floral Kingdom, a particularly rich area in terms of flora. Home to 38% of South Africa's plant species, this region is also the smallest and most threatened of the world's six floral kingdoms, with 1,850 of its plant species (over 20%) now threatened with extinction.

The loss and degradation of South Africa's biodiversity has serious implications for society and the economy. Natural ecosystems provide many essential services, such as the provision of clean water and air, prevention of soil erosion, pollination of crops, provision of medicinal plants, nutrient cycling, provision of food and shelter, as well as meeting spiritual, cultural, aesthetic and recreational needs. Large portions of the country's economy are heavily dependent on biodiversity (e.g. fishing industry, game and livestock ranching, horticulture and agriculture based on indigenous species, commercial and subsistence use of medicinal plants, ecotourism). A recent estimate placed the total value added to the economy by all provisioning, regulating and cultural ecosystem services in South Africa, excluding the marine environment and the value generated by the extraction of water resources, in the order of R73 billion per annum (which is approximately 7% of the country's annual GDP). In addition, intact ecosystems (i.e. ecosystems which are in a natural or near- natural state) are likely to play an important role in providing cost- effective resilience to the impacts of climate change, including buffering human settlements and activities from the impacts of extreme climate events. Finally, the majority of South Africans are highly dependent on natural resources for their livelihoods, well-being and health care (it is estimated that over 70% of South Africans use traditional medicinal plants as their primary source of health care).

Main pressures on and drivers of change to biodiversity (direct and indirect):

One of the major threats to biodiversity is habitat loss and degradation, resulting from alternative land uses for urban, industrial and mining development, agriculture, biofuel production, canalization (aquatic) and trawling (marine). Other threats include alien invasive species and their hybridization with local species (8% of the land area in South Africa is currently infested by about 200 species of

invasive alien plants across all biomes and ecosystems), over-harvesting of resources (especially marine), discharge of industrial effluents into the water systems, and climate change. Finally, South Africa emits many greenhouse gases due to its reliance on coal for energy, which could result in a decrease of up to 55% in the area covered by current biomes in the next 50 years.

Measures to Enhance Implementation of the Convention:

Implementation of the NBSAP

South Africa published its National Biodiversity Strategy and Action Plan (NBSAP) in 2005 and intends to complete a revised and updated NBSAP by 2014. National targets, aligned with the Aichi Biodiversity Targets, have already been developed and incorporate outcomes contained in the existing NBSAP (2005). Along with the National Biodiversity Assessment (2011), these documents serve as the basis for the National Biodiversity Framework (NBF) which is updated every five years, as required by the Biodiversity Act. The NBF identifies 33 priority actions to guide the work of the biodiversity sector to 2013.

Actions taken to achieve the 2020 Aichi Biodiversity Targets



South Africa is currently behind target in regard to protected areas coverage and representativity of ecosystems and habitats. Protected areas now comprise 6.5% of the terrestrial surface area, however are targeted to increase to 8.8% by 2013 and to 12% in the next twenty years. Among them, the country counts 100 important bird sites, 8 World Heritage sites, 5 biosphere reserves and 19 RAMSAR sites. Ten percent of South Africa’s wetlands are fully protected, and a further 8% are partially protected. While 21.5% of the coastline is in Marine Protected Areas (MPAs), only 9% is fully protected as no-take zones. Of South Africa's Exclusive Economic Zone, 0.4% lies within MPAs, with less than 0.2% in no-take zones. The same holds for aquatic ecosystems, with only 7% of main river ecosystems adequately protected. Similarly, while 59% of the 259 estuaries in South Africa are in good or excellent condition, only 5.4% have a high level of protection.

South Africa has however made noteworthy efforts in various policy fields, including: alien invasive species regulation (several programmes, such as the “Working for Water” programme, have been

developed to deal with the threat of invasive alien species); protection of indigenous knowledge and involvement of communities (Indigenous Knowledge Systems Policy is in place to provide fair and equitable compensation to indigenous people for their contribution to the protection and conservation of biodiversity; local communities are involved in the implementation of the CBD to a certain extent, through programs such as "People and Parks"); and biosafety (South Africa is implementing the Cartagena Protocol).

Support mechanisms for national implementation (legislation, funding, capacity-building, coordination, mainstreaming, etc.)

South Africa has a well-developed and progressive policy framework for biodiversity management. Policies are given effect through various pieces of legislation, with the basis laid in the White Paper on the Conservation and Sustainable Use of South Africa's Biological Diversity (1997). The National Environmental Management Act (1998) establishes overarching principles for environmental legislation, with separate acts passed to further define and support its objectives in relevant functional areas such as protected areas, coastal management, air pollution and waste management. The National Environmental Management: Biodiversity Act (2004) is of particular importance with respect to South Africa's commitments under the CBD. This Act sought to resolve the fragmented nature of biodiversity-related legislation at national and provincial levels by consolidating different laws and giving effect to the principle of cooperative governance. Responsibility for biodiversity management being allocated among various government departments and agencies at the national, provincial and local levels, the Department of Environmental Affairs and Tourism (DEAT) performs the role of lead agent in environmental governance. Biodiversity programs include, for instance, the Succulent Karoo Ecosystem Program (SKEP), Eastern Cape Co-ordination Unit for Bioregional Programs, Grasslands Program, Marine Program, Freshwater Programs.

The South African government is the primary source of funding for biodiversity management and, while donor funds are an important source of funding, amounts available from donors tend to decrease. Within the constraints of limited resources available to the sector, South Africa has nevertheless made substantial progress with mainstreaming biodiversity. It has embraced the

Ecosystem Approach, applying it in planning activities and in implementing many programs. In particular, substantial progress has been made in developing a framework for incorporating biodiversity considerations into decision-making and land use planning, with various tools under development to achieve this (e.g. list of threatened ecosystems in relation to the Biodiversity Act; provincial spatial biodiversity plans and bioregional plans which identify critical biodiversity areas based on systematic biodiversity planning techniques). Furthermore, South Africa's National Climate Change Response Strategy and National Action Programme to combat land degradation both incorporate biodiversity- related matters, while both the recently-published National Framework for Sustainable Development and Discussion Document Towards an Anti- Poverty Strategy for South Africa are cognizant of the important role that healthy ecosystems play in sustainable development.

Finally, the biodiversity sector has established business and biodiversity initiatives with a number of production sectors aimed at enhancing sustainable production. For example, the Biodiversity and Wine Initiative (BWI) in 2004 produced biodiversity guidelines for the wine industry (South Africa is the world's eighth largest wine producer). Such initiatives are complemented by amendments to tax legislation and fiscal incentives that encourage biodiversity- friendly management.

Mechanisms for monitoring and reviewing implementation



The recently completed National Biodiversity Assessment (NBA) (2011) provides an assessment of South Africa's biodiversity and ecosystems, including headline indicators and national maps for the terrestrial, freshwater, estuarine and marine environments. The NBA (2011) was led by the South African National Biodiversity Institute (SANBI), in partnership with a range of organizations, including the Department of Environmental Affairs, Council for Scientific and Industrial Research (CSIR) and South African National Parks. It follows from the National Spatial Biodiversity Assessment (2004), however is broader in scope, including key thematic issues as well as a spatial assessment. The NBA (2011) includes a summary of spatial biodiversity priority areas that have been identified through systematic biodiversity plans at national, provincial and local levels. Finally, progress has been made with data collection and calculation for certain indicators, including the amount of natural habitat lost, number of invasive species, extent and degree of infestation by invasive

species and the extent to which terrestrial ecosystems are intact. To date, South Africa is the only country in the region to have established national targets in line with the Aichi Targets, while having also incorporated the outcomes in their existing NBSAP (2005) in these targets."

# **APPENDIX F:** AICHI BIODIVERSITY GOALS AND TARGETS

## The Aichi Biodiversity Targets

***Strategic Goal A:*** *Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society*

1. By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.
2. By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.
3. By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio economic conditions.
4. By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.

***Strategic Goal B:*** *Reduce the direct pressures on biodiversity and promote sustainable use*

5. By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.
6. By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.
7. By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.
8. By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.
9. By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.
10. By 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning.

***Strategic Goal C:*** *Improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity*

11. By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscape and seascapes.
12. By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.
13. By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.

***Strategic Goal D:*** *Enhance the benefits to all from biodiversity and ecosystem services.*

14. By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.
15. By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification.
16. By 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation.

***Strategic Goal E:*** *Enhance implementation through participatory planning, knowledge management and capacity building*

17. By 2015 each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan.
18. By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.
19. By 2020, knowledge, the science base and technologies relating to biodiversity, its values functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.
20. By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan 2011-2020 from all sources and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization should increase substantially from the current levels. This target will be subject to changes contingent to resources needs assessments to be developed and reported by Parties.

**Please feel free to use the Aichi Biodiversity Targets icons in your own materials. More details at www.cbd.int/sp**

https://marinespecies.org/introduced/wiki/Convention_on_Biological_Diversity