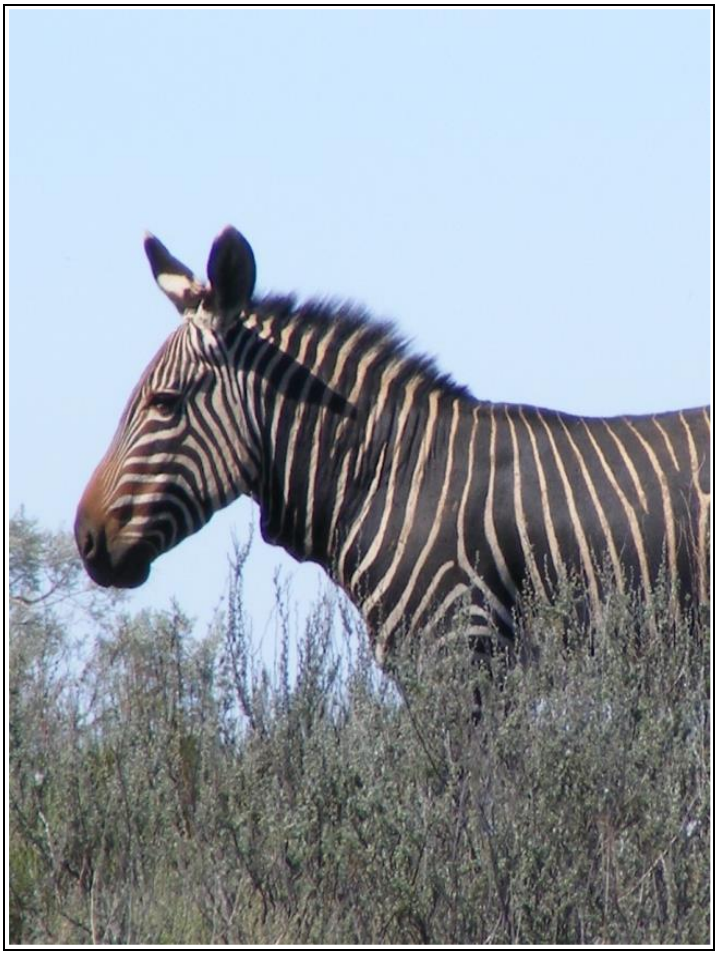
KAMMANASSIE NATURE RESERVE MANAGEMENT PLAN 2013-2018



Edited by: AnneLise Schutte-Vlok, Alan Wheeler and Gail Cleaver-Christie

Date approved:
Date of most recent update: 05 November 2012

The Kammanassie Nature Reserve is classified as a State Forest and consists of the following State properties (name and title deed details):

1. Farm 61	1982/1878
2. Portion 4 of Piets Laagte 67	T16652/19717298/1970
3. Vermaaks Rivier 125	OUQ2-3/18832650-1911
4. Kammanassieberg Forest Reserve 57	No title deed
5. Paardeberg 58	T18360/19731983/1878
6. Portion 1 of Solomons Kraal 74	T10693/19859907/1983
7. Roode Els Kloof 126	T2372/19621986/1878
8. Kleinberg 128	2649/1911
9. Paarde Kloof 127	T10663/19701851/1855
10. Elands Vlakte 7	7831/1985954/1878
11. Upper Diep Kloof 6	T27831/19853353/1878

The Kammanassie Nature Reserve will be proclaimed under the National Environmental Management: Protected Areas Act, (Act No. 57 of 2003).

AUTHORIZATION PAGE

This Management Plan for the Kammanassie Nature Reserve was drafted and recommended by the Reserve Management Committee (RMC), a multi-disciplinary team consisting of:

Reserve Management Committee:

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Mr Phillip Esau	Conservation Manager: Kammanassie Nature Reserve
Ms Susan Botha	Community Conservation Manager: Karoo
Dr AnneLise Schutte-Vlok	Regional Ecologist: Gouritz Region
Dr Alan Wheeler	Ecological Coordinator: Karoo

Supported by:

Mr Guy Palmer	Scientific Manager: Biodiversity
Dr Andrew Turner	Scientific Manager: Knowledge Management
Mr Kevin Shaw	Scientist: Ornithologist
Dr Martine Jordaan	Technician: Aquatic
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Recommended and adopted by:

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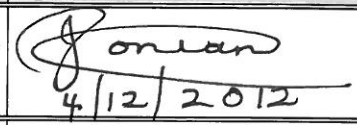
CapeNature – Kammanassie Nature Reserve Mr P. Esau CONSERVATION MANAGER	
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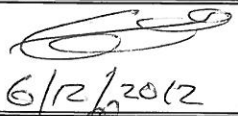
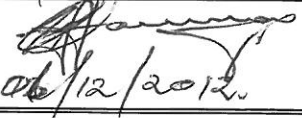
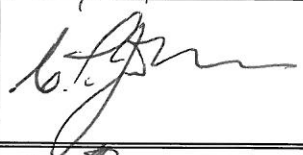
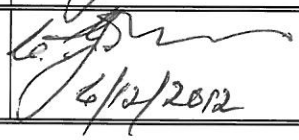
CapeNature – Directorate: Conservation Management Dr Q. Espey EXECUTIVE DIRECTOR	
CapeNature Dr K. Hamman CHIEF EXECUTIVE OFFICER (ACTING)	
Western Cape Nature Conservation Board Conservation Committee Dr C. Johnson CHAIRMAN OF THE BOARD CONSERVATION COMMITTEE	
Western Cape Nature Conservation Board Dr C. Johnson CHAIRMAN OF THE BOARD	

Approved by:

Name and Title	Signature and Date
Environmental Affairs and Development Planning Mr A. Bredell PROVINCIAL MINISTER	

PREAMBLE

The aim of the management plan is to ensure that the Kammanassie Nature Reserve has clearly defined objectives and activities to direct the protection and sustainable use of its natural, scenic and heritage resources over a five year time period. The management plan thus provides the medium-term operational framework for the prioritised allocation of resources and capacity in the management, use and development of the reserve. The management plan intends to add value and continuity by clearly stating management objectives, scheduling action and providing guidelines on the management approach.

The Kammanassie Nature Reserve falls within the Cape Floristic Kingdom (CFK). The CFK in South Africa is the smallest and richest of the six floral kingdoms in the world, and it is the only one to be found entirely within one country. Its rich biodiversity is under serious threat for a variety of reasons including conversion of natural habitat to permanent agriculture, inappropriate fire management, rapid and insensitive development, overexploitation of water resources and infestation by alien species. The region has been identified as one of the world's hottest hotspots of biodiversity (Mittermeier *et al*. 2005).

In response to this Classification, a process of extensive consultation involving various interested parties, including local government and non-governmental organisations resulted in the establishment of a strategic plan referred to as Cape Action for People and the Environment (C.A.P.E). This plan identified the key threats and root causes of biodiversity losses that need to be addressed in order to conserve the floral kingdom. This resulted in a spatial plan identifying areas which need to be conserved and a series of broad programme activities which need to be undertaken over a 20 year period. Based on the situation assessment and analysis of threats, three overarching themes that complement and reinforce one another were developed by C.A.P.E:

- Establish an effective Reserve network, enhance off-Reserve conservation, and support bioregional planning.
- Strengthen and enhance institutions, policies, laws, co-operative governance, and community participation.
- Develop methods to ensure sustainable yields, promote compliance with laws, integrate biodiversity concerns into catchment management, and promote sustainable eco-tourism.

Furthermore, the Succulent Karoo and Subtropical Thicket (Albany Thicket) biomes have also been classified as global biodiversity hotspots (Mittermeier *et al.* 2005), and have thus received international recognition and funding to develop conservation and sustainable use plans such as the Succulent Karoo Ecosystem Programme (SKEP) and the Sub-tropical Thicket Ecosystem Programme (STEP). In addition, the importance of these projects has been ratified at a Provincial and National level. It is thus our duty as South Africans to manage this special area in a sustainable manner (Lombard *et al.* 2004). Project initiatives have been instituted in all these hotspots to kick start new, innovative ways of ensuring the long term conservation and sustainable utilisation of these extremely important ecosystems, habitats and vegetation types.

The Gouritz River and associated catchments were identified as an important area requiring immediate conservation action. The river and its tributaries are an important corridor link between the Karoo and the sea. In addition, it is the only area where all three of the hotspots converge, creating a unique biological component and concentration of species and diversity. The Gouritz Initiative (GI) was developed together with the international funding agencies and the government and private stakeholders in the greater Gouritz area.

The aim was to create corridors for plants and animals to move or migrate in response to climatic change over time. This initiative is based on the voluntary participation of private landowners applying conservation principles in the way they manage their lands. There are many threatened vegetation types within this area and the only way their survival can be ensured is by engaging private landowners and creating a conservation economy that will promote strong conservation ethics amongst all landowners.

The Mission of the GI is to take ownership of the sustainable utilisation of the unique biodiversity of the area by ensuring global recognition through partnerships, continuous awareness and responsible decision making for the benefit of all people, now and in the future. The GI has evolved into the Gouritz Cluster Biosphere Reserve (GCBR) under UNESCO's Man and Biosphere Programme. The Kammanassie Nature Reserve falls entirely within the domain of the GCBR.

THE PROCESS

The objective planning session for the Kammanassie Nature Reserve management plan, facilitated by the Regional Ecologist and guided by the Conservation Manager, defined the vision and purpose of the Kammanassie Nature Reserve as an umbrella statement, indicating the direction of the management intent for the Kammanassie Nature Reserve in order to guide the formulation of the management objectives. The submitted objectives were evaluated against the definitions contained in "A Procedure for Defining Conservation Management Objectives and Goals" (Coombes & Mentis 1992) and sorted into objectives, action plans and tasks.

The final objectives were prioritised through a pairwise comparison (Coombes & Mentis 1992) and the results were used to populate the section in the management plan referred to as the Strategic Implementation Framework. Actions Plans were associated with objectives, and tasks (activities) were identified within each action plan.

Guiding principles for defining vision, purpose, objectives, action plans and tasks:

VISION: Indicates the direction of management aspiration, describes the unit, reflects uniqueness of the unit and justifies the existence of the unit.

PURPOSE: The foundation on which all future actions are based and in line with the overall management philosophy of the organisation.

OBJECTIVES: Derived from the vision and purpose, representing key areas in which achievement must be obtained to give direction to the management intention: not measurable or testable; aimed at Key Performance Areas; and prioritised through the development of action plans.

ACTION PLANS (Operational Goals): Functional Performance Areas which describe expected results which will contribute to the realisation of the objectives. Achievable within capability, measurable and attainable. Performance indicators developed in description of outputs: Tasks, responsibilities, indicators, timeframes and references to existing procedures.

APPROVAL PROCESS

The Reserve Management Committee (RMC) compiled the draft management plan for review. The Kammanassie Nature Reserve management plan was internally reviewed and recommended for stakeholder participation by all Executive Directors, Programme Managers, Catchment Managers and Senior Managers within each support service including Financial and Administration Services, Human Resource Management, Occupational Health and Safety, Risk Management and Marketing and Eco-tourism.

A review was undertaken by Scientific Services on the ecological content of the management plan. Furthermore an internal review on the scientific and technical content was undertaken respectively, using the CapeNature Scientific and Technical Protected Area Management Plan (PAMP) review template (Waller 2011). The management plan was then recommended as suitable for stakeholder participation to the Executive Director: Conservation. Stakeholder comments were considered and incorporated.

The Kammanassie Nature Reserve Management Plan was reviewed by an independent external reviewer on a voluntary basis, who commented and confirmed that the management plan met the criteria as determined in the CapeNature Scientific and Technical PAMP review template. The Executive Directors reviewed the Management Plan and the Executive Director: Conservation Management recommended the plan to the CEO. The Western Cape Nature Conservation Board (WCNCB) Conservation Committee recommended to the WCNCB that the management plan be adopted. The WCNCB adopted the Kammanassie Nature Reserve management plan and submitted to the Department of Environmental Affairs and Development Planning (DEA&DP) for submission to the Provincial Minister for approval.

ACKNOWLEDGEMENTS

The authors would like to express their gratitude to all those who contributed to this management plan, including members of the public, community forums, as well as the following individuals:

- Messrs D. Carr; W. Keiser, A. Lee, G. van Biljon, M. Isaacs, C. Venter, L. Howell, Ms K. Da Ribeira and Drs W. Roets and S. du Toit provided written feedback on the public participation draft of the management plan.
- Mr E. Matthews from Londoloza Environmental and Conservation Management Solutions cc. facilitated the public participation process.
- Mr Dick Carr kindly did a full evaluation of the final draft of the management plan as external reviewer.

EXECUTIVE SUMMARY

In compliance with the National Environmental Management: Protected Areas Act, (Act No. 57 of 2003), CapeNature is required to develop management plans for each of its nature reserves. In developing the management plan for the Kammanassie Nature Reserve, CapeNature strives to establish biodiversity conservation as a foundation of a sustainable economy creating access, benefits and opportunities for all. The Kammanassie Nature Reserve, proclaimed as a State Forest is situated between Uniondale in the east and De Rust and Dysselsdorp in the north-west and west. Uniondale, De Rust, Dysselsdorp and Oudtshoorn are the four closest towns, approximately 9 km, 12 km, 1.5 km and 23 km respectively from the reserve boundary. The office complex of the Kammanassie Nature Reserve is situated in Uniondale at 26 Van Riebeeck Street. The Kammanassie Nature Reserve falls within both the management area of the Eden District Municipality and the Oudtshoorn Local Municipality jurisdictions. The immediate surrounding economy is based on agricultural activities.

The Kammanassie Nature Reserve falls within the Cape Floristic Kingdom and the domain of the strategic Cape Action for People and the Environment (C.A.P.E.), which is focused on minimising key threats and root causes to biodiversity losses. The reserve also contains elements of three internationally recognised biodiversity hotspots, namely Fynbos, Sub-tropical thicket and Succulent Karoo. The South African vegetation map (Mucina & Rutherford 2006) classifies the majority of the northern slopes of the Kammanassie Nature Reserve as Northern Kammanassie Sandstone Fynbos. Southern Kammanassie Sandstone fynbos is the major vegetation type found on the southern slopes of the Kammanassie Nature Reserve while Central Island Shale band vegetation is found along the Cederberg Shale bands of the Kammanassie Mountain. Full descriptions of these vegetation types are available in Mucina & Rutherford (2006).

This management plan is divided into four parts.

The first part outlines the management objective framework for CapeNature and the Kammanassie Nature Reserve. The vision and purpose was developed to guide Reserve

management in its daily operations and longer term planning. The objectives for the Kammanassie Nature Reserve were developed in line with CapeNature's strategic goals, objectives and key measurable objectives. Part one also highlights the legal framework under which CapeNature and the Kammanassie Nature Reserve operates and details the reserves' history and legal status, abiotic and biotic information, cultural heritage, youth development and awareness programs.

The second part of the Kammanassie Nature Reserve management plan outlines the strengths, weaknesses, opportunities and threats (SWOT). A conservation development framework is set out which includes a sensitivity analysis and zonation. In addition to the zonation plan, an all-inclusive conservation development framework (CDF) and expansion strategy for the reserve is presented. These are in line with local municipal Integrated Development Plans to facilitate development and conservation issues.

Part three summarises the Kammanassie Nature Reserve's Strategic Implementation Framework that the reserve plans to implement to ensure that it achieves its management objectives.

Part four contains references used in the content.

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Part 1

Section 1: MANAGEMENT OBJECTIVES FRAMEWORK

1.1 VISION AND MISSION OF CAPENATURE

VISION:
A quality driven public entity conserving the unique natural heritage resources of the Western Cape for the benefit of all.

MISSION:
The establishment of biodiversity conservation as a foundation of a sustainable economy creating access, benefits and opportunities for all.

1.2 CAPENATURE STRATEGIC GOALS, OBJECTIVES AND KEY MEASURABLE OBJECTIVES

CapeNature has four strategic goals, underpinned by nine strategic objectives. Each strategic objective is further divided into key measurable objectives, as shown in Table 1.1.

Table 1.1: Summary of CapeNature Strategic Results and Programme Allocations.

STRATEGIC GOAL STATEMENT	STRATEGIC OBJECTIVE STATEMENT	KEY MEASURABLE OBJECTIVES	CURRENT PROGRAMME
1. Securing priority biodiversity and ecosystem services through integrated biodiversity planning and management enabling appropriate climate change response.	1.1 Effective knowledge management informs development and conservation priorities.	1.1.1 To provide biodiversity input into Western Cape Provincial land use planning and decision making. 1.1.2 To manage biodiversity knowledge to ensure effective conservation management.	2: Biodiversity Support
	1.2 Implementation of the Western Cape Biodiversity Plan and Protected Area Expansion Strategy secure priority biodiversity.	1.2.1 To ensure rigorous conservation planning in the Western Cape within the national legislative framework. 1.2.2 To implement measures to ensure resilience and persistence of biodiversity of the Province in the light of anticipated climate changes. 1.2.3 A network of Protected Areas with appropriate status and effectively managed by CapeNature (incorporating terrestrial, freshwater and marine).	2: Biodiversity Support 3. Conservation Management
	1.3 Sustained conservation management in priority catchments maintains ecosystem services.	1.3.1 To ensure the implementation of effective conservation management interventions in the Western Cape.	3: Conservation Management

	1.4 Legal and wildlife support services and biodiversity crime prevention result in the protection and sustainable use of biodiversity.	1.4.1 To enhance biodiversity protection and conservation in areas outside the formal CapeNature Protected Area Network.	2: Biodiversity Support 3. Conservation Management
2. Contributing to the reconstruction and development of social capital.	2.1 Facilitate youth and community development through environmental awareness and assist in developing the knowledge, skills, values and commitment necessary to achieve sustainable development.	2.1.1 To provide learners with access to a quality environmental education programme. 2.1.2 To provide experiential service learning opportunities in the conservation sector.	3: Conservation Management
3. Sustaining and growing the conservation economy.	3.1 Develop and implement strategies to facilitate equitable access to and participation in the conservation economy through a People and Parks Programme.	3.1.1 To provide access to work opportunities through implementation of conservation and tourism management services. 3.1.2 To improve access to protected areas for sustainable traditional, cultural and spiritual uses. 3.1.3 To enhance opportunities for stakeholder participation in protected area management. 3.1.4 To grow and effectively deploy volunteer capacity.	3: Conservation Management
4. Ensuring an efficient and effective institution through cutting edge leadership.	4.1 Increased sustainable revenue is attained through enhanced tourism product development and the development of a system for payment of ecosystem services.	4.1.1 Create awareness/market the tourism products within our portfolio to domestic and international visitors, and contributing positively towards sustainable tourism. 4.1.2 To establish partnerships that will improve corporate and social investment into our reserves and by so doing positively impacting on visitor expectations and the livelihoods of local communities. 4.1.3 Develop sustainable tourism products while providing access to both the domestic and international market. 4.1.4 To establish a system for payment for ecosystem services management as a sustainable basis for income in the MTEF allocation.	4: Marketing and Eco-tourism 2: Biodiversity Support
	4.2. Develop policies, systems and processes to support effective service delivery.	4.2.1 Support strategic decision making to ensure good corporate governance. 4.2.2 Ensure all CapeNature's activities are executed within a framework of sound controls and the highest standards of corporate governance. 4.2.3 To develop and implement an effective and efficient communication strategy for all internal and external stakeholders and role-players. 4.2.4 To implement Information Technology and Systems that are compliant and support the core business of the organisation.	1: Administration/ Corporate 4: Marketing and Eco-tourism
	4.3. Institution building enables a supportive working environment.	4.3.1 To provide a professional human resource management support service.	1: Administration/ Corporate

1.3 VALUES OF CAPENATURE

CapeNature strives to create a work environment that nurtures people and motivates a high level of performance in putting people first through implementing the *Batho Pele* principles. The following are our core values:

Honesty: We conduct our business with honesty, accuracy and without error.

Excellence: We espouse a deep sense of responsibility to our work and endeavour to constantly improve it, so that we may give our stakeholders the highest quality of service. We believe that work done excellently gives us dignity, fulfilment, and self-worth.

Fitness of purpose: We strive to ensure that our mission remains relevant to the local, provincial, national and international context of transformation and modernisation of the biodiversity conservation sector.

Fitness for purpose: We strive to ensure that our strategic responses and resource allocations, including staff appointments, add optimal value in implementing our mandate.

Accountability: We ensure financial, performance and political accountability in the implementation of our mandate.

Equity and access: We strive to ensure that benefits and opportunities accruing from the conservation of biodiversity are equitably shared and that our resources and services are accessible to all; ensuring redress for historically disadvantaged individuals with specific emphasis on women, youth and the disabled; and enabling cultural, traditional and spiritual uses of natural resources on a sustainable basis.

Personal responsibility: We, as the custodians of the natural resources essential for human health and well-being; and growth and development in the Western Cape, undertake this responsibility with the highest possible level of personal responsibility. We are committed to measurable targets for individual performance which we pursue through strong professional work ethics, political neutrality and selfless service.

1.4 KAMMANASSIE NATURE RESERVE VISION, PURPOSE, VALUES AND OBJECTIVES

VISION

To conserve a system of sustainable living landscapes in the Klein Karoo that is representative of the region's biodiversity and ecosystems through integrated management of formally protected areas, for the benefit of all.

PURPOSE

The purpose of the Kammanassie Nature Reserve is to manage and conserve the ecosystems and services typical of the Kammanassie Mountain Complex, and specifically the unique Cape Mountain Zebra (*Equus zebra zebra*) population present on the reserve.

PURPOSE FOR DECLARATION OF THE KAMMANASSIE NATURE RESERVE IN TERMS OF NEM: PAA (SECTION 17)

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

VALUES OF THE KAMMANASSIE NATURE RESERVE

The values of the Kammanassie Nature Reserve are:

- Cape Mountain Zebra populations and habitat, unique Cape Mountain Zebra gene pool.
- Unique biodiversity and high endemism.
- Flora of conservation concern and threatened fauna.
- Potential for connectivity.
- 27 057 hectares of protected Nature Reserve.
- World heritage site extension nomination being submitted.
- Richness in archaeological sites.
- Part of the Gouritz Cluster Biosphere Reserve.
- Strong partnerships with governmental and non-governmental stakeholders.
- Ecosystem services (water, carbon, pollination etc.).
- Important water catchment area.
- Environmental awareness raising opportunities.
- Local economic development opportunities.
- Natural and scenic beauty.
- Peace and tranquillity.
- Convergence of three globally recognised biodiversity hotspots (Fynbos, Subtropical thicket, Succulent Karoo).
- Localised alien infestation that is being managed.
- Contains wilderness attributes.
- Existing infrastructure of roads.

- Enthusiastic and passionate staff.
- Strong leadership.
- Research opportunities available.
- Staff development potential.
- Unpolluted night skies.
- Wilderness areas.
- Many knowledgeable, concerned and involved neighbours and other stakeholders

OBJECTIVES OF THE KAMMANASSIE NATURE RESERVE

From the vision a number of key objectives have been identified that further articulate the purpose of the reserve. The prioritised objectives are:

Objective 1: To conserve the natural ecosystems (life support systems) of the Kammanassie Nature Reserve.
Objective 2: To manage the conservation estate of the Kammanassie Nature Reserve effectively.
Objective 3: To secure the conservation estate.
Objective 4: To expand the conservation estate.
Objective 5: To create environmental awareness.
Objective 6: To promote the sustainable utilization of natural resources.
Objective 7: To effectively conserve our cultural heritage attributes.

1.5 GUIDING PRINCIPLES

The following guiding principles underpin the management plan for the Kammanassie Nature Reserve. It is important to note that while these principles are intended to guide reserve management in its work, the reserve is also subject to the principles and provisions of relevant international treaties and conventions, national and provincial legislation and policy, and any local contractual agreements.

Custodianship: Reserve management will seek to respect, protect and promote the Kammanassie Nature Reserve and its environmental and heritage resources, as a common heritage and a national asset for all South Africans.

Common Heritage: The management of the Kammanassie Nature Reserve must serve the public interest by safeguarding the ecological, cultural and scenic resources as a common heritage, and national asset for all South Africans.

Duty of Care: The Kammanassie Nature Reserve must ensure that all individuals, institutions and organisations act with due care and share the responsibility to conserve and avoid degradation of the ecological, cultural and scenic resources, and to use the resources of the Kammanassie Nature Reserve sustainably, equitably and efficiently.

Sustainability: Reserve management will seek to achieve a balance between ecological sustainability, social equity and economic efficiency without compromising the ecological integrity of the reserve.

Holism: The reserve and its surrounds form an indivisible system. The management of the reserve must adopt an integrated approach and recognise the interconnectedness and interdependence of social, ecological and economic components.

Intrinsic Value: All life forms and ecological systems have intrinsic value.

Cooperation and Partnerships: Reserve management will seek to work co-operatively and in partnership with public institutions, the private sector, non-governmental organisations (NGO) and local communities.

Equitable Access: Reserve management shall seek to ensure that stakeholders shall have equitable, sustainable, and managed access to the reserve and the benefits that are derived from the reserve.

Precaution: Where there may be a threat of significant negative impact but inadequate or inconclusive scientific evidence exists to prove this, action shall be taken to avoid, prevent or minimise the potential impact.

Empowerment and Transformation: The Kammanassie Nature Reserve shall strive to empower stakeholders involved in the reserve through capacity building and access to economic opportunities.

Co-operative Governance: All spheres and organs of government that are involved in management of the reserve, or in making decisions affecting the reserve, shall work together co-operatively to ensure the conservation of the reserve.

Excellence in Management and Service: The Kammanassie Nature Reserve shall strive to attain excellence in managing the reserve and servicing the visitors that use it through accountable and informed decision-making and co-ordination, co-operation and integration with relevant government agencies and stakeholders. The Kammanassie Nature Reserve shall strive for continual improvement through a creative and collaborative approach to problem solving and learning.

Capacity: Reserve management will seek to ensure that the management of the Kammanassie Nature Reserve is adequately resourced to meet its mandated and ethical responsibilities for effective management.

Alignment and Integration: Reserve management will seek to align and integrate the reserve's management activities and priorities into, and with, the relevant local and regional conservation, institutional, socio-economic and developmental context.

Culture of learning: Reserve management will aim for continual improvement through both a scientific based approach that provides the basis for informed decision making, and a creative and collaborative approach to problem solving and learning.

Accountability and transparency: Reserve management will seek to ensure that management tasks in the Kammanassie Nature Reserve are carried out efficiently and within stipulated time frames, productivity is increased, costs are controlled and impacts are managed, with integrity and in compliance with applicable laws.

In practical terms, the Management Plan needs to ensure that the following requirements for the effective management of the Kammanassie Nature Reserve are adequately addressed:

- The necessary mandate, human capacity and financial resources to implement and achieve the objectives and activities described in the management plan.
- The delivery of socio-economic benefits to local communities where possible.
- Flexibility of service delivery that encourages innovation and a wide range of government, community and non-government sector involvement.
- Performance indicators and accountability measures that provide for regular review of outcomes.

SECTION 2: LEGAL FRAMEWORK

2.1 LEGAL AND POLICY FRAMEWORK

2.1.1. Legal Framework

The legal framework that directs planning and operational management activities in the reserve are addressed in detail within the Strategic Implementation Framework section of this plan.

Constitutional and Legislative mandates

The Constitution of the Republic of South Africa Act, (Act No. 108 of 1996, Section 24) states that: '*Everyone has the right to an environment that is not detrimental to their health or well-being'*. The Constitution further states that: '*The environment must be protected for present and future generations through reasonable legislation and other measures that will prevent pollution and environmental degradation, promote conservation and will ensure ecologically sustainable development and sustainable use of natural resources while striving for justifiable economic and social development*.'

CapeNature is a public entity governed by the Western Cape Nature Conservation Board Act, (Act No. 15 of 1998) as amended by the Western Cape Nature Conservation Laws Act, (Act No. 3 of 2000). This is a public institution with the statutory responsibility for biodiversity conservation in the Western Cape Province. It is mandated to: promote and ensure nature conservation; render services and provide facilities for research and training; and generate income.

- Constitution of the Republic of South Africa Act, (Act No. 108 of 1996)
- Western Cape Nature Conservation Board Act, (Act No. 15 of 1998)
- Western Cape Nature Conservation Laws Act, (Act No. 3 of 2000)

The following are the key national and provincial statutes relevant to the implementation of the mandate of nature conservation and include all amendments to these acts and ordinances and any regulations and norms and standards promulgated there under. Note that the list below excludes all other relevant legislation to which public entities as employers, implementers of government mandate and managers of public finance are subject.

International Conventions, Protocols and Policies

- Bonn Convention on the Conservation of Migratory Species of Wild Animals (CMS)
- Convention on Biological Diversity (The) (CBD)
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (The) (CITES)

- United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol
- International Union for Conservation of Nature (The) (IUCN)
- Convention concerning the Protection of the World Cultural and Natural Heritage (WHC)
- World Tourism Organisation (WTO)
- United Nations Educational, Scientific and Cultural Organization (UNESCO) Man and Biosphere (MAB) Programme.

National Legislation

All National legislation applies to activities in the Kammanassie Nature Reserve but the following have direct reference to the reserves management activities:

- Constitution of the Republic of South Africa, (Act No. 108 of 1996)
- National Environmental Management Act, (Act No. 107 of 1998)
- National Environmental Management: Biodiversity Act, (Act No. 10 of 2004)
- National Environmental Management: Protected Areas Act, (Act No. 57 of 2003)
- Mountain Catchment Areas Act, (Act No. 63 of 1970)
- National Forests Act, (Act No. 84 of 1998)
- Conservation of Agricultural Resources Act, (Act No. 43 of 1983)
- World Heritage Convention Act, (Act No. 49 0f 1999)
- Environment Conservation Act, (Act No. 73 of 1989)
- National Water Act, (Act No. 36 of 1998)
- National Veld and Forest Fire Act, (Act No. 101 of 1998)
- National Heritage Resources Act, (Act No. 25 of 1999)
- Disaster Management Act, (Act No. 57 of 2002)
- Fencing Act, (Act No. 3 of 1963).

This Management Plan is further guided by the principles outlined in Section 2 of the National Environmental Management Act, (Act No. 107 of 1998) and Section 17 of the National Environmental Management: Protected Areas Act, (Act No. 57 of 2003). Within Section 17 the purposes of the declaration of areas as protected areas are described. These are:

- To protect ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes in a system of protected areas;
- To preserve the ecological integrity of those areas;
- To conserve biodiversity in those areas;
- To protect areas representative of all ecosystems, habitats and species naturally occurring in South Africa;
- To protect South Africa's threatened or rare species;
- To protect an area that is vulnerable or ecologically sensitive;
- To assist in ensuring the sustained supply of environmental goods and services;

- To provide for the sustainable use of natural and biological resources;
- To create or augment destinations for nature-based tourism;
- To manage the interrelationship between natural environmental biodiversity, human settlement and economic development;
- Generally, to contribute to human, social, cultural, spiritual and economic development; and
- To rehabilitate and restore degraded ecosystems and promote the recovery of endangered and vulnerable species.

Provincial Legislation

Although all provincial legislation applies to activities in the Kammanassie Nature Reserve the following have direct reference to the reserve management activities:

- Constitution of the Western Cape Act, (Act No. 1 of 1998).
- Western Cape Nature Conservation Board Act, (Act No. 15 of 1998).
- Western Cape Nature Conservation Laws Act, (Act No. 3 of 2000).
- Western Cape Planning and Development Act, (Act No. 7 of 1999).
- Land Use Planning Ordinance, (Ordinance No. 15 of 1985).
- Nature Conservation Ordinance, (Ordinance No. 19 of 1974).
- Provincial Notice 955 of 1975.

New Legislation

The following legislation is either new or pending and it is envisaged that this legalisation will impact on CapeNature.

- CITES Regulations, 2009.
- Threatened or Protected Species (ToPS) Regulations, 2007.
- Draft Alien and Invasive Species (AIS) Regulations, 2009.
- NEM:PAA, (Act No. 57 of 2003) Regulation 99: Proper administration of nature reserves (Government Gazette No. 35021 February 2012).
- Draft Norms and Standards for the management of protected areas in South Africa, 2011.
- Norms and standards for Biodiversity Management Plans for Species, 2009 (Gazette No. 214 March 2009).

2.1.2. Coordinated Policy Framework

The Kammanassie Nature Reserve management is guided by a number of internal CapeNature policies, procedures and guidelines. The policies, procedures and guidelines applicable to this management plan are referenced in the Strategic Implementation Framework (Section 7).

2.2 MANAGEMENT AGREEMENTS

CapeNature has a management agreement with Working on Fire (WoF) whereby CapeNature provides premises at the Kammanassie Nature Reserve office in Uniondale to store WoF equipment and provide standby facilities while the Working on Fire programme provides a fire fighting service to CapeNature.

In addition to the fire-fighting services carried out by WoF, alien vegetation clearing is carried out on the Kammanassie Nature Reserve through a management agreement with the Department of Environmental Affairs Working for Water project.

In terms of the National Veld and Forest Fire Act, (Act No. 101 of 1998) there are numerous agreements with neighbouring landowners with regards to fire fighting, fire prevention and fire protection. These agreements serve to regulate the placing of fire-breaks as well as other co-operative fire management activities

2.3 REGIONAL AND PROVINCIAL PLANNING

In terms of the Municipal Systems Act, (Act No. 32 of 2000), local municipalities in South Africa are required to make use of integrated development planning to plot future development in their area. An Integrated Development Plan (IDP) is a 5-year strategic plan in which the municipal strategic and budget priorities are set.

An IDP is intended to be the principal strategic instrument to inform planning and development within a municipality. It should co-ordinate the work of local and other spheres of government and must take into account the existing conditions, constraints and resources available. Amongst other objectives, the IDP should address how the environment will be managed and protected. Two of the key components of an IDP are disaster management plans and Spatial Development Framework (SDF) which are essentially the spatial reflection of a municipality's IDP.

An SDF is updated every five years and must indicate the desired patterns of land-use for the municipality and provide strategic guidance regarding the location and form of development and conservation, within the municipality. An SDF must include basic guidelines for a land-use management system for the municipality and should be used to guide changes in land-use rights and public investment in infrastructure.

The local municipalities are responsible for producing and co-ordinating IDPs and SDFs, but they must consult other stakeholders in the area who can impact on and/or be impacted on by development and other changes in the area. All government departments working in the area should refer to the IDP to ensure their work is aligned.

In essence SDFs and IDPs are tools for integrating social, economic and environmental issues and development within a municipality. As biodiversity is a fundamental component of sustainable development, SDFs and IDPs offer an opportunity to ensure that biodiversity priorities are incorporated into planning processes. In turn, the

identification of biodiversity-related projects for the IDP can support local economic development and poverty alleviation.

2.4 Institutional Framework

The Western Cape Nature Conservation Board is trading as CapeNature and the institutional framework is shown in Figure 1.

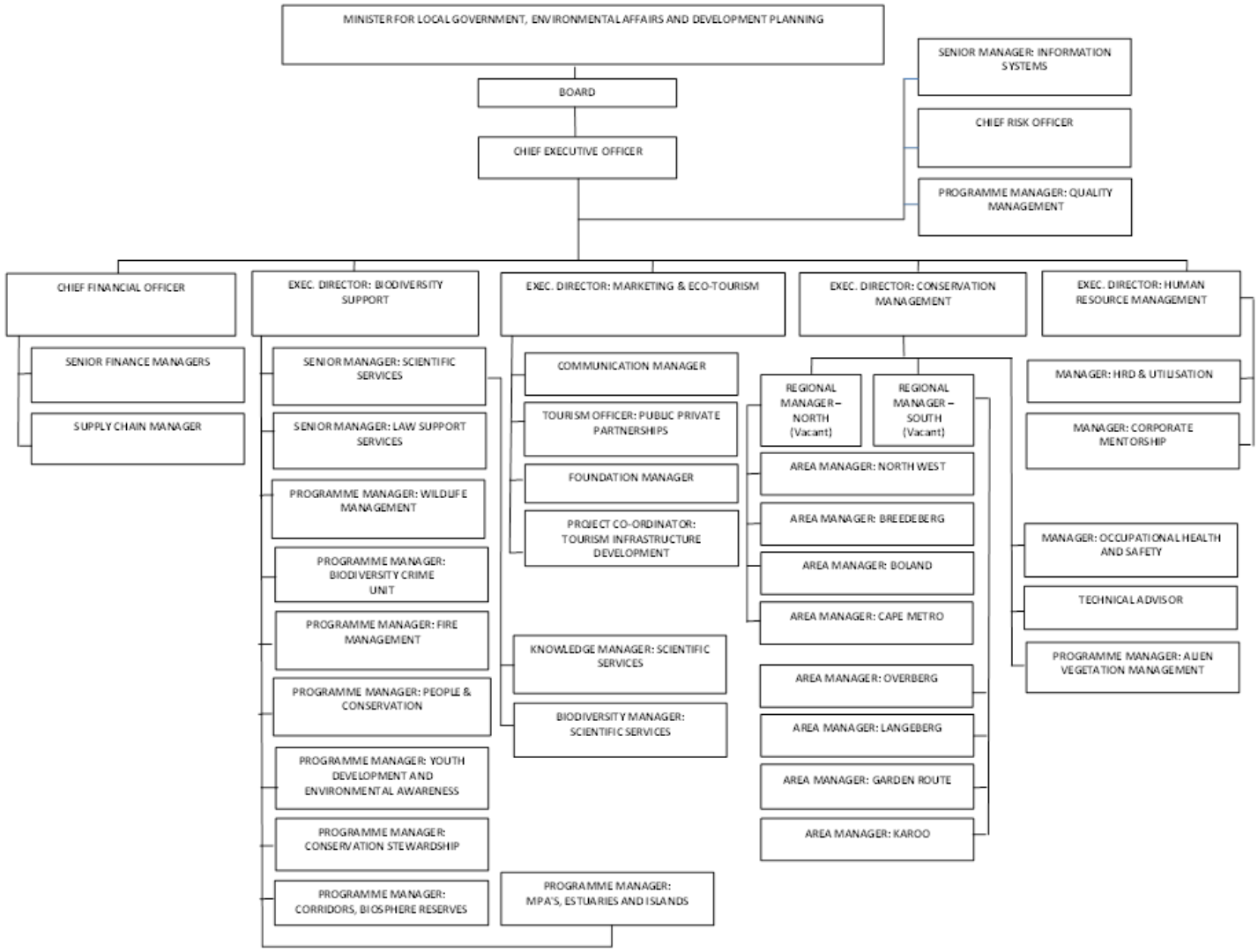

Figure 1: CapeNature Organogram (dated 18 October 2012).

2.5 STRATEGIC MANAGEMENT PLAN

2.5.1 Purpose of this Management Plan

The major elements of the reserve planning process for the Kammanassie Nature Reserve are: (i) the CapeNature corporate Strategic Plan and Annual Performance Plans (APP); (ii) detailed subsidiary plans (as required) and; iii) an Annual Plan of Operations (APO). The management plan for the Kammanassie Nature Reserve is also informed by a number of strategic plans and operational guidelines to ensure on-going implementation and review of the reserve management activities (see Figure 2).

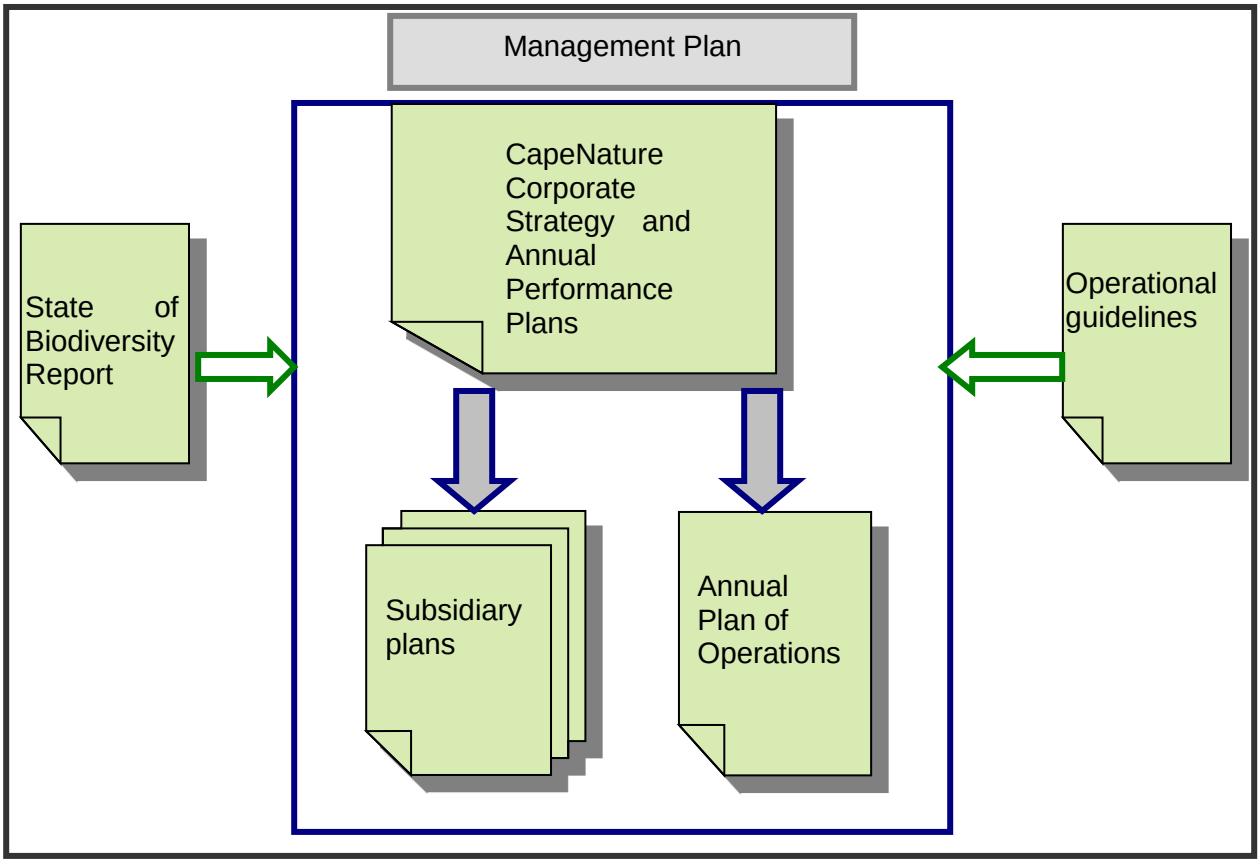

Figure 2. The elements of CapeNature management plans.

The management plan for the Kammanassie Nature Reserve is determined based on policies, legislation and related planning documents at the sectorial, institutional, agency and local levels. The organisation adopts the adaptive management cycle, see Figure 3, whereby the management plan is developed and implemented and after annual evaluation the management plan can be adapted, to ensure key objectives are being achieved.

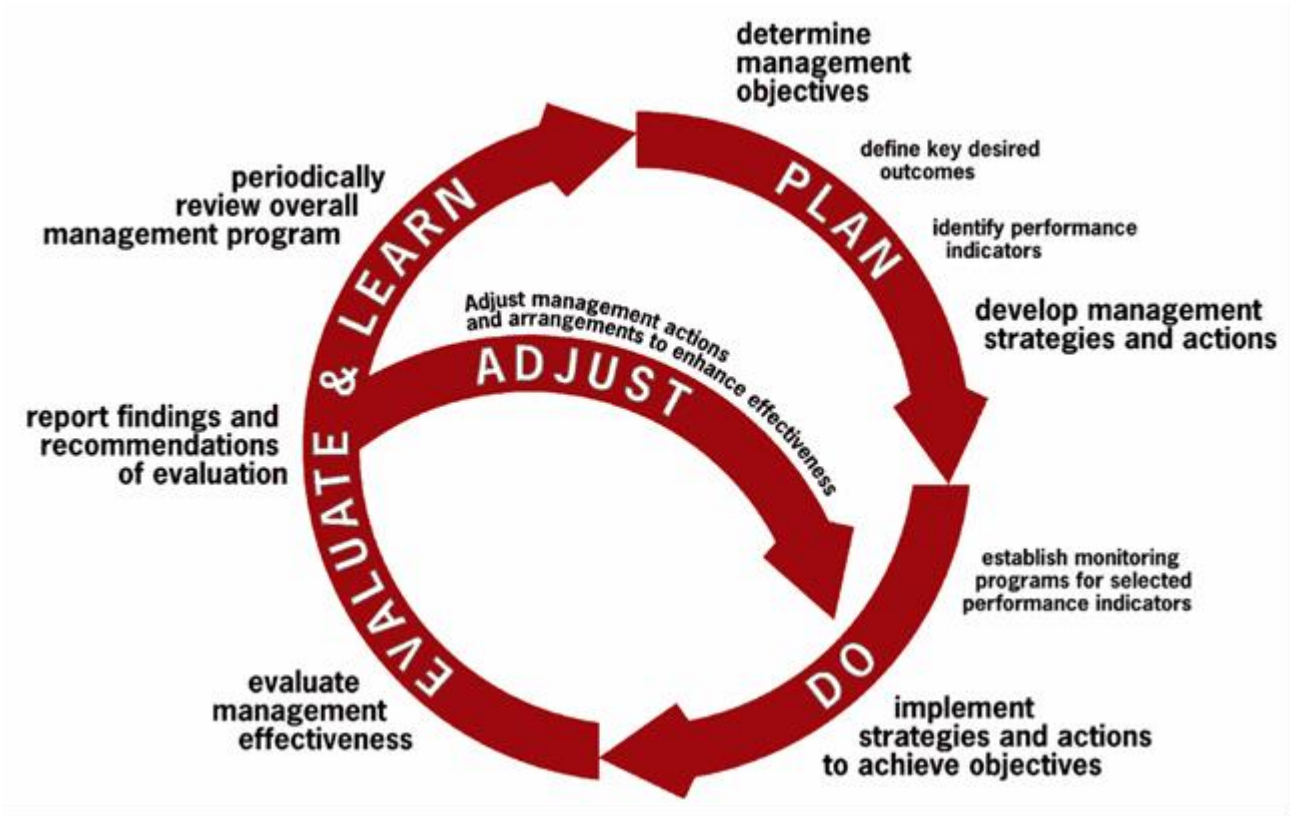

Figure 3: Adaptive management cycle (CSIRO 2012).

The approach to, and format of, this management plan is directed by the Guidelines for the development of a management plan for a protected area in terms of the National Environmental Management: Protected Area Act (Cowan & Mpongoma 2010). The drafting of this management plan has been guided by a small interdisciplinary Reserve Management Committee (RMC) comprising the Area Manager, Conservation Manager, Ecological Coordinator, Regional Ecologist, Community Conservation Manager, Conservation Services Manager and Tourism Officer. Iterative drafts of the management plan were presented to, and discussed by, the RMC before broader circulation for inputs from the public.

The purpose of this management plan is to ensure that the Kammanassie Nature Reserve has clearly defined objectives and activities to direct the protection and sustainable use of its natural, scenic and heritage resources over a five year period. The management plan indicates where Reserve management intends to focus its efforts in the next five years (2013-2018). The management plan thus provides the medium-term operational framework for the prioritised allocation of resources and capacity in the management, use and development of the reserve.

It must be noted that the management plan focuses on strategic priorities rather than detailing all operational and potential reactive courses of action in the next five years. The timeframe referenced in the Strategic Implementation Framework follows financial years (1 April to 31 March), with Year 1 commencing from signing of the Management Plan by the Provincial Minister: Environmental Affairs and Development Planning. While planning for

some emergencies is part of the Management Plan, it remains possible that unforeseen circumstances could disrupt the prioritisation established in this management plan. These should be addressed in the annual review and update of the management plan. The scope of the management plan for the Kammanassie Nature Reserve is constrained by the reserve's actual or potential performance capability - given available personnel, funding, and any other external factors - to ensure that the plan is achievable and sustainable.

The Kammanassie Nature Reserve management plan has been compiled on the basis of current available resources (funding and human capital). Legislation listed in the Strategic Implementation Framework is non-exhaustive.

2.5.2 Stakeholder Participation Process

CapeNature has adapted the South African National Parks (SANParks) Stakeholder Participation in Developing Park Management Plans (Spies & Symonds 2011) for the stakeholder participation process.

Section 39(3) of the National Environmental Management: Protected Areas Act, (Act No. 57 of 2003) states that when preparing a management plan for a protected area, the management authority concerned must consult municipalities, other organs of state, local communities and other affected parties which have an interest in the area. Section 41(2)(e) requires that the Management Plan contains procedures for public participation, including participation by the owner (if applicable), any local community or other interested party.

All stakeholders must register and a stakeholder register, as well as attendance registers for workshops and meetings, must be kept. Additional individuals, wishing to participate in the process, must register as stakeholders and should be accommodated to ensure that the process is inclusive. Figure 4 shows the stakeholder participation strategy for CapeNature management plans. Any persons having direct or indirect interests or rights in a nature Reserve may be considered to be a stakeholder.

The stakeholder process will facilitate the establishment of a comprehensive Protected Area Advisory Committee. In CapeNature's efforts to comply with the deadlines for this process, certain of these steps had to be combined for this Management Plan. Stakeholder meeting 1 and 2 shown in Figure 4, will be combined with stakeholder meeting 3. At this meeting opportunity was provided to stakeholders to comment on the desired state and objectives for the Kammanassie Nature Reserve.

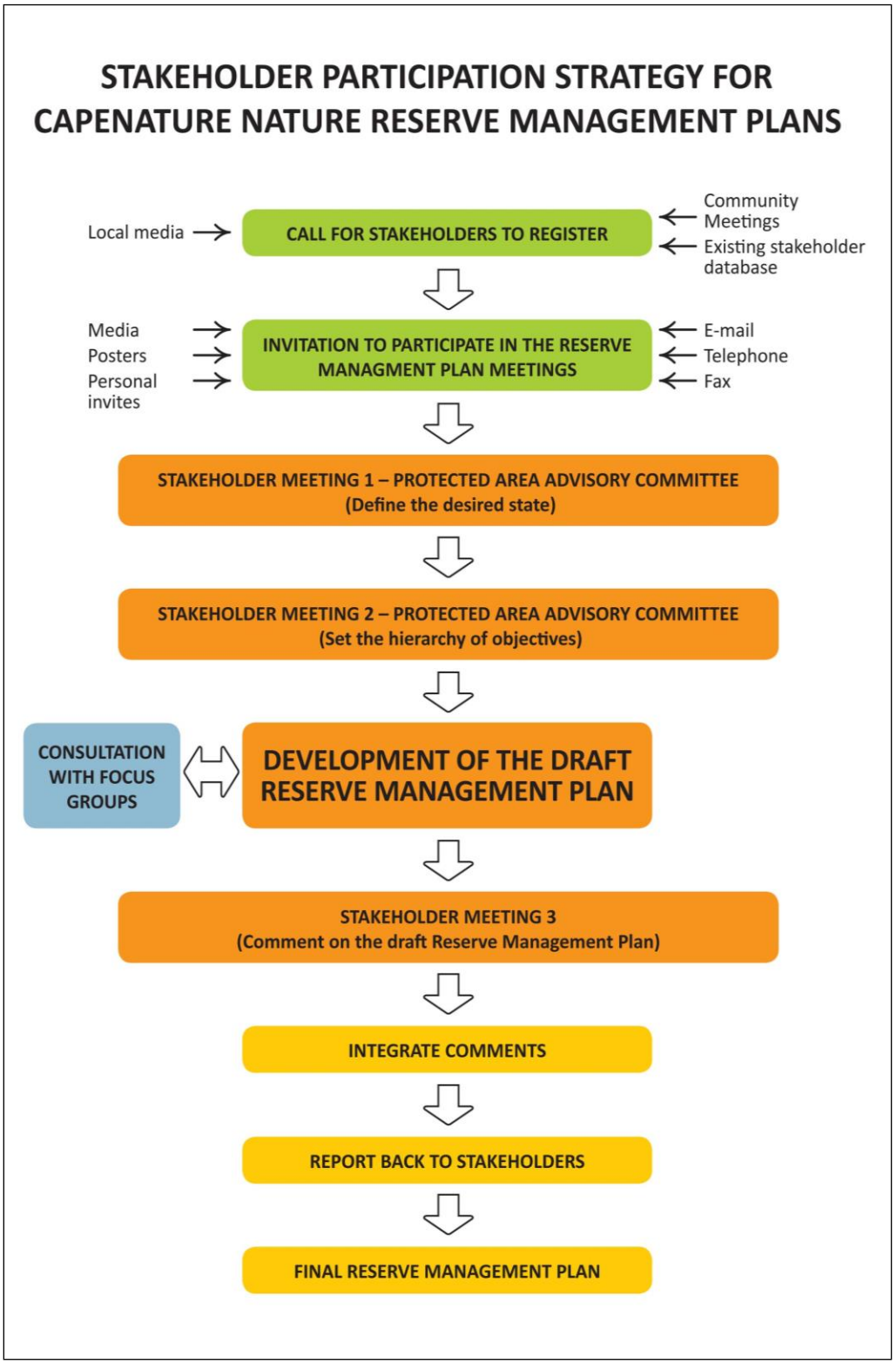

Figure 4. Stakeholder Participation Strategy for CapeNature Nature Reserve Management Plans.

2.5.3 Establishment of a CapeNature Protected Area Advisory Committee (PAAC)

In terms of the NEM:PAA, (Act No. 57 of 2003) Regulation 99: Proper administration of nature reserves (Government Gazette No. 35021 February 2012), a management authority may establish one or more advisory committees in respect of a nature reserve. These advisory committees will be called Protected Area Advisory Committee's (PAAC).

Procedure

CapeNature will invite community organisations, NGOs, residents of and neighbouring communities, through direct invitation or through advertisements in at least two local newspapers and any other agreed upon manner by the reserve planning committee in order to reach the greatest number of residents of and, neighbouring communities to the nature Reserve. The invitation will specify the method of submission and a date by which the nominations contemplated must reach CapeNature. Interested and affected parties will be required to complete the CapeNature PAAC application forms.

Minimum requirements and other criteria

Any member of the PAAC must be based on a real interest demonstrated by the member in respect of the relevant Nature Reserve. The member must be the nominated delegate from the organisation the member is representing and is expected to provide feedback to his/her organisation in terms of meetings progress.

Composition

CapeNature, after considering any nominations submitted will appoint members in writing to the PAAC. At least one employee of CapeNature, nominated by CapeNature will be an ex officio member of the PAAC.
The advisory committee should reflect the interest of the following groups:

- Municipalities.
- Local communities.
- Organs of state (National and Provincial).
- Neighbours.
- Owner/s.
- Other affected/interested parties such as:
- NGOs and Community Based Organisations (CBO).
- Tourism.
- Cultural/Natural heritage e.g. Rastafarian, traditional leaders and traditional healers.
- Botanical and/or zoological.
- Water quality/aquatic environment.
- Nature-based recreation.
- Educational institutions.
- Research institutions.
- And any other interested and affected party**.**

Term of office

- Each member is expected to serve for a fixed two year period as determined by CapeNature management but the respective organisation's rights and procedures with respect to member representation will be allowed as long as it is in the interest of conservation and good governance.
- Nominees representing organisations and formally constituted groups must be nominated by their organisation/group on official letter heads, signed by an executive authority, and be duly appointed to act in the interest of their organisation. Organisations must also nominate a second member to attend and represent the organisation when the primary nominee is not available. The nomination letters from the organisations must be accompanied by the application forms.
- Membership is voluntary and no remuneration will be provided to PAAC members.
- As part of good governance, all PAAC members will be required to adhere to the PAAC code of conduct and if any member does not adhere to the code of conduct stipulations then the organisation, that the member is representing, will be expected to deal with their member accordingly.

Terms of Reference for PAACs

The committee will be expected to:

1. Provide input into management decisions relating to protected area management.
2. Act as a forum to provide advice on Reserve issues.
3. Play a role in educating the community and various interest groups about the importance of preservation, protection and management of natural resources and the objectives of the reserve management plan that are intended to pursue these goals.
4. Monitor and evaluate progress on implementation of programmes in the reserve management plan.
5. Make recommendations on how CapeNature can improve programmes and policies.
6. Promote involvement in decision-making around the management of natural and cultural heritage resources within the scope of the reserve management plan.
7. Promote the integration of conservation activities within the Nature Reserve with those of surrounding areas.
8. Identify opportunities and constraints pertaining to the Bio-prospecting Access and Benefit Sharing, where applicable.
9. Establish and maintain links between CapeNature and other stakeholders.

Functioning of the Advisory Committee

The committee will meet a minimum of once a year. At the first meeting a Chairperson and a secretary who will be required to take minutes of all matters discussed, will be elected. The committee will be expected to submit a copy of the minutes for each meeting and a full report, to the management authority (the Area Manager for submission to the Executive Director: Conservation Management), highlighting issues and making recommendations on matters arising from the implementation of the Kammanassie Nature Reserve Management Plan. The Chairperson may at his/her discretion form working groups when required.

Minutes of all working groups meetings must be kept and submitted through the Chairperson to Reserve management.

Decision Making

The Reserve Management Committee's acceptance or rejection of advice offered will follow the process as outlined in Figure 5.

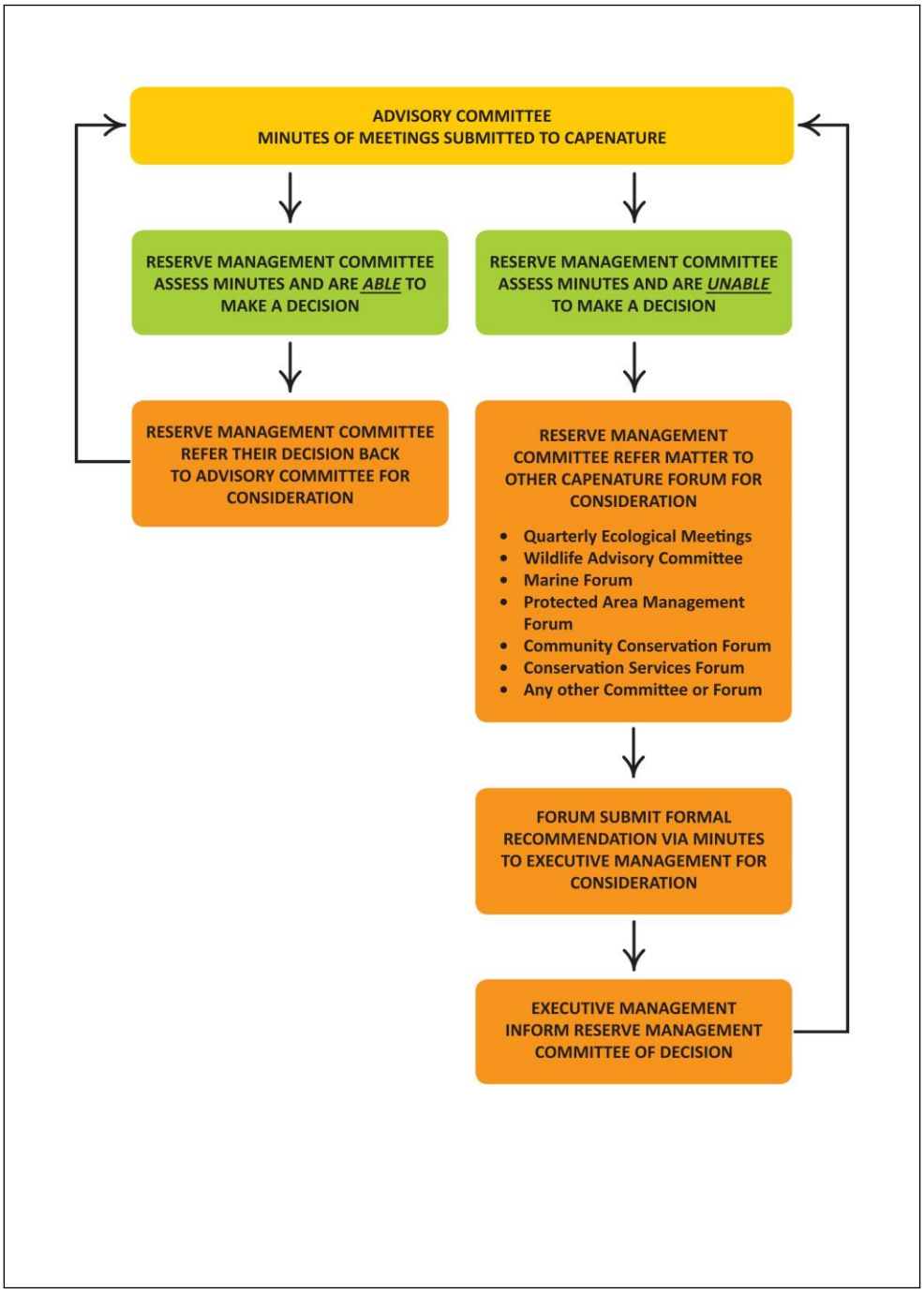

Figure 5: Decision Tree for the acceptance and rejection of advice from the PAAC.

SECTION 3: OVERVIEW AND BACKGROUND OF THE RESERVE

3.1 Location and Extent

The Kammanassie Nature Reserve forms part of the Kammanassie Mountains, an inselberg located in the eastern Klein Karoo. The reserve is situated between Uniondale in the east, De Rust in the north-west and Dysselsdorp in the west. Uniondale, De Rust, Dysselsdorp and Oudtshoorn are the four closest towns to the nature reserve. The office complex of the Kammanassie Nature Reserve is situated at 26 Van Riebeeck Street, Uniondale.

The Kammanassie Nature Reserve is approximately 53 km long and 12 km wide at its widest point, (Kleingeluk/Buffelsdrif area) and lies in an east/west orientation. The perimeter of the reserve is 131.8 km. The total area of the mountain range, managed by CapeNature is 49 430 ha, of which 22 374 ha is privately-owned declared mountain catchment area. The remaining 27 056 ha is state-owned land. The Kammanassie Nature Reserve is situated between the coordinates 33°33’50”S and 33°37’10”S and 22°27’29”E and 23°01’55”E.

The location of the Kammanassie Nature Reserve is shown in Figure 6.

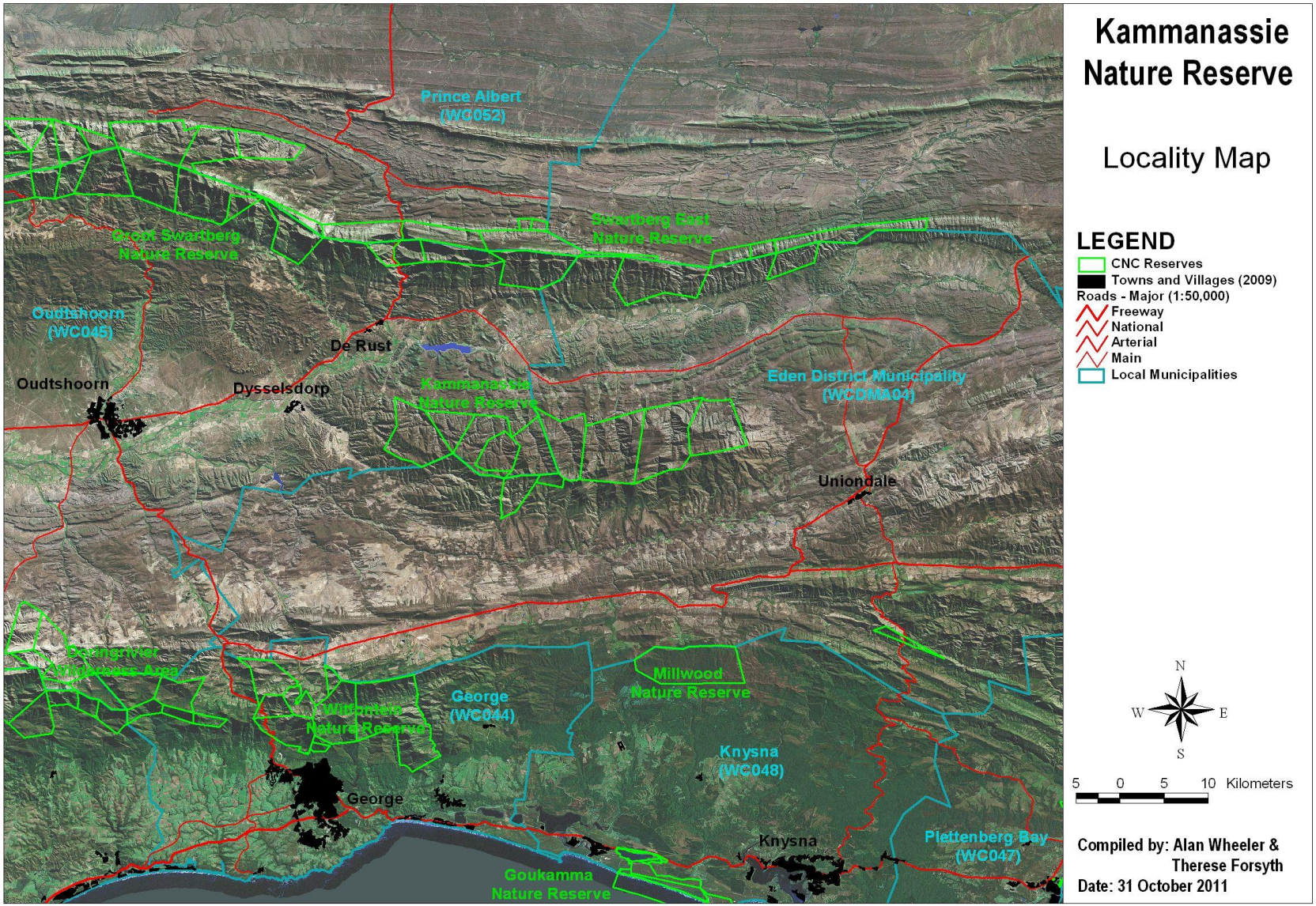

Figure 6. Location and extent of the Kammanassie Nature Reserve.

3.2 Legal Status

The Kammanassie Nature Reserve is classified as a State Forest and consists of the following properties:

Farm 61

Portion 4 of the Farm Piets Laagte 67

Farm Vermaaks Rivier 125

Farm Kammanassieberg Forest Reserve 57

Farm Paardeberg 58

Portion 1 of the Farm Solomons Kraal 74

Farm Roode Els Kloof 126

Farm Kleinberg 128

Farm Paarde Kloof 127

Farm Elands Vlakte 7

Farm Upper Diep Kloof 6

In addition, following Government Notice No. 1938 of 29 September 1978, selected private properties in the Kammanassie Mountain were declared Mountain Catchment Areas under the Mountain Catchment Areas Act No. 63 of 1970 (as amended).

The Kammanassie Nature Reserve also forms part of the serial extension nomination (December 2011) to UNESCO (United Nations Educational, Scientific and Cultural Organisation) for World Heritage Status.

3.3 History

The pre-colonial occupants of the Kammanassie Nature Reserve area were the San and Khoi, who mainly occupied the low-lying areas and consequently had little impact on the higher-lying upland vegetation types. The hunter-gathering San may have deliberately burnt the vegetation to encourage game to concentrate on new growth and to stimulate growth and reproduction of edible bulbs. While the pastoralists Khoi were reported to have habitually burnt the vegetation to provide pasture for sheep. It is believed that these Khoi herders may have pushed the San into the more marginal mountain and as a result changed the fire regime through regular patch-burning (Cleaver 2002).

By the end of the eighteenth century, European farmers occupied the lower-lying foothills and valley lands and used the mountains for grazing. These early European settlers in the area moved their sheep to low-lying areas during winter, and burnt the mountain vegetation in late winter or early spring to provide summer grazing. This practice of burning vegetation

to provide pasture was continued until the introduction of fire protection areas in the late nineteenth century (Cleaver 2002).

The registered title deeds recognising the State Forest portions of the Kammanassie date back to 1878. One hundred years later, in 1978, the importance of conserving the unique gene pool of the last six remaining Cape Mountain Zebra in the Kammanassie region became a formal conservation priority. The area was then known as the Langkloof State Forest. The management of the area was then transferred to the Cape Provincial Administration, Department of Nature and Environmental Conservation in 1992, the Department changed its name to Cape Nature Conservation and then to the Western Cape Nature Conservation Board (trading as CapeNature) in 2001. CapeNature is the current responsible authority for the management and conservation of the Kammanassie Nature Reserve as it is now known.

Biosphere Reserve

The Kammanassie Nature Reserve forms part of the core area of the Gouritz Cluster Biosphere Reserve. The Kammanassie Nature Reserve forms an important part in the maintenance of the ecological functioning of the greater conservation network.

World Heritage Site

The World Heritage Convention Act, 1999 (Act 49 of 1999) provides for the enforcement and implementation of World Heritage in South Africa. The Kammanassie Nature Reserve has been nominated as part of the serial site extension nomination of the Cape Floral Region World Heritage site.

3.4 Climate

The reserve receives rain throughout the year with an average annual rainfall of approximately 450 mm. The highest annual rainfall of 1 216 mm and lowest of 242 mm were recorded in 1981 and 1984 respectively. The hottest months on the Kammanassie Nature Reserve are December to February with maximum temperatures of 35ºC. The coldest months are June and July with minimum temperatures reaching -4ºC.

The mean maximum and minimum temperatures and average rainfall for the Kammanassie Nature Reserve from 2000 to 2011 are shown in Figure 7.

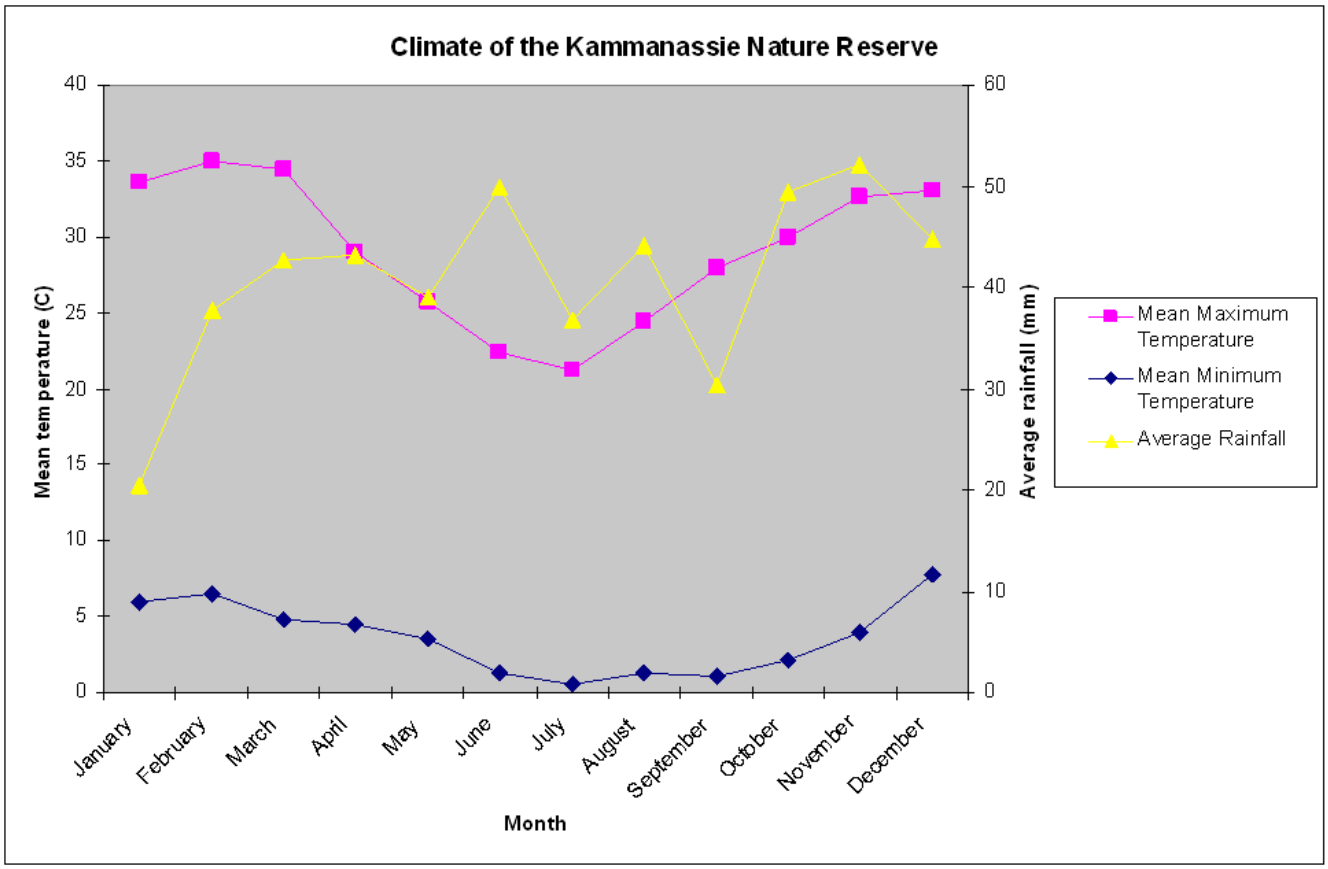

Figure 7. Climate of the Kammanassie Nature Reserve.

3.5 Topography

Mannetjiesberg is the highest peak of the Kammanassie Nature Reserve at 1955.3 m above sea level. The second highest peak is the peak west of Mannetjiesberg at 1908 m above sea level. The Kammanassieberg is 1854 m above sea level. The lowest elevations occur along the western boundary of the catchment and are approximately 350 m above sea level.

3.6 Geology

The Kammanassie Mountain is one of the prominent east-west trending ranges comprising the southern branch of the Cape Fold Belt. It was formed as a result of north-south oriented compressive stress during the Cape Orogeny 123-200 million years ago. The Kammanassie mountain range comprises almost exclusively the resistant quartz arenites of the Table Mountain Group, overlain on the lower slopes by the shale of the Bokkeveld group.

Soils generally form a thin (<1 m) veneer of silty sands/sandy silts as a result of the steep slopes of the Kammanassie Mountain and predominantly quartzitic rocks. Locally clayey soils occur in association with weathered shale horizons, and in particular the Cederberg formation. Lithosols (Mispah and Glenrosa forms) are dominant on the steep slopes. They are shallow, infertile, acidic and have minimal B-horizon development, with a low water retention capacity. The soil is deeper at the foot of the mountain in kloofs and along the southern aspects where a fairly deep red-yellow sandy to sandy loam soil occurs (Hutton, Clovely and Griffin forms), (Southwood *et.al*. 1991).

The geology of the Kammanassie Nature Reserve is shown in Figure 8.

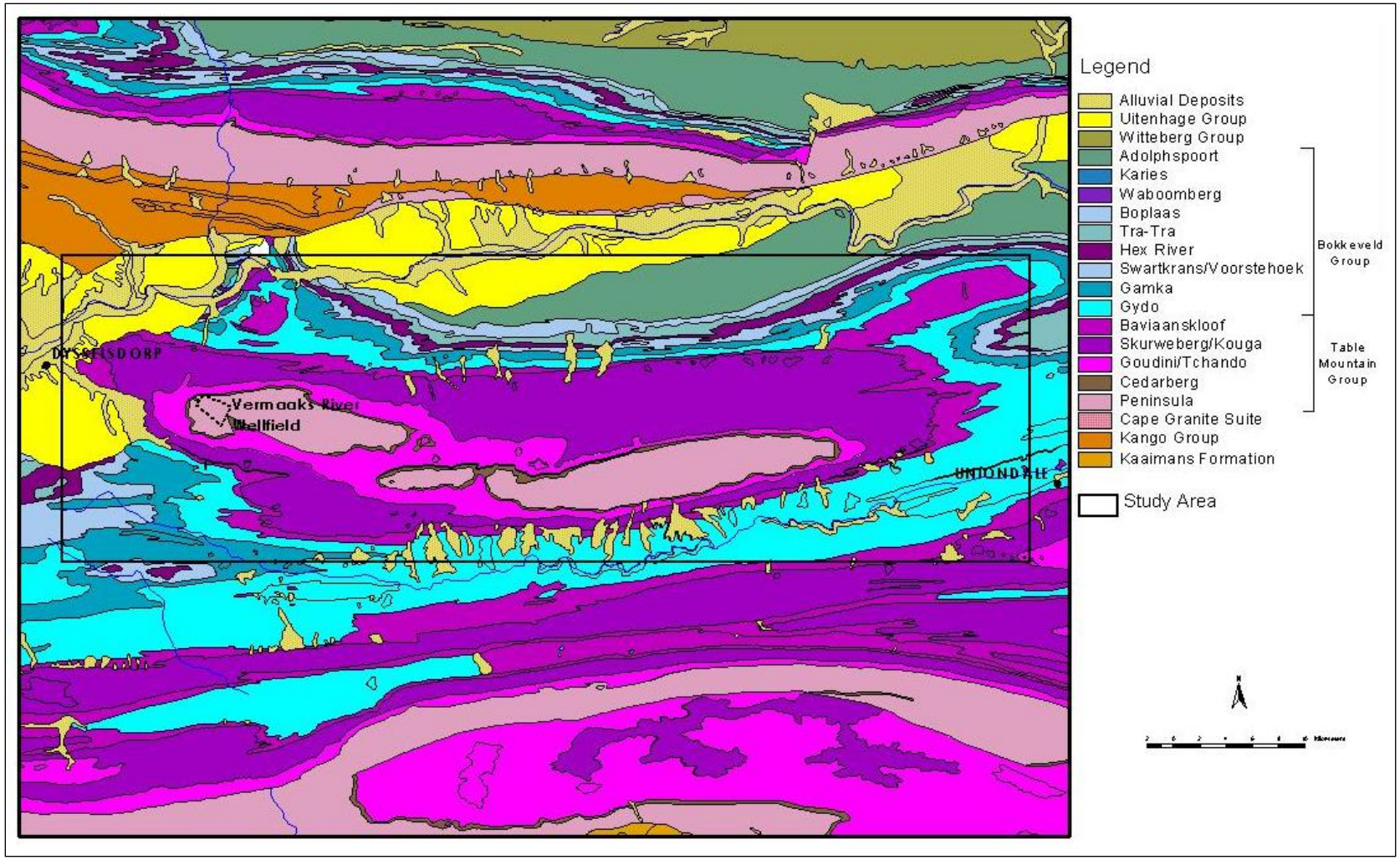

Figure 8. The geology of the Kammanassie Nature Reserve (from Cleaver *et al.* 2003).

3.7 Hydrology

3.7.1 Catchments

The Kammanassie catchment drains into the Olifants (to the north) and Kammanassie (to the south) rivers. These two east to west flowing rivers drain the eastern section of the Klein Karoo and their confluence is south-east of Oudtshoorn. The important area for agricultural irrigation is limited to the area below the Stompdrift dam which is situated in the Olifants river to the northwest of the Kammanassie Nature Reserve. The northern slopes of the Kammanassie Mountain make up only 5% of the dam's catchment but account for 28% of the annual inflow. The southern slopes make up 11% of the Kammanassie dam (situated in the Kammanassie River to the southwest of the Kammanassie Nature Reserve) catchment area, but account for 18% of the mean annual inflow into the dam (Southwood *et al.*, 1991). The mean annual run off from the southern slopes is 43.1 mm which accounts for 9,3% of the average rainfall in the area. On the northern slopes, the mean annual run off drops to 24.9 mm which accounts for 6,5% of the average rainfall (Southwood *et al.*, 1991). The Kammanassie Catchment Area is an important source of water for the agricultural activities located adjacent to the mountain and in the Olifants River valley.

3.7.2 Groundwater

Hydrogeology

The rocks of the Table Mountain Group possess essentially no primary porosity, and groundwater flow is restricted to fractures in joint and fault zones. Groundwater flow in these fractures is controlled by fracture characteristics such as connectivity, openness and geometry. Groundwater recharge, which is approximately 14% of mean annual precipitation (Kotze & Roswarne 2001), takes place predominantly in the highest topographic parts of the Kammanassie Mountain. The precipitation percolates into fractures of varying orientation and scale. Water accumulations in shallow fractures above localised aquitards resulting in the occurrence of perched springs and seeps. Migration of the groundwater under the influence of gravity into larger deeper fractures leads ultimately to the water table where it becomes part of the regional groundwater flow system and is discharged toward the foot of the mountain as springs and baseflow in river courses. Discharge in rivers occurs where there is good interconnection between fractures and the riverbed.

An understanding of the factors controlling groundwater flow, the locality of groundwater discharges as well as factors influencing the degree of interconnectivity with abstracted groundwater is required to make a judgement of the potential influence groundwater abstraction could have on groundwater near the surface and hence groundwater dependent ecosystems.

The above-mentioned is particularly of relevance to the Kammanassie Nature Reserve because of the large-scale groundwater abstraction scheme, known as the Klein Karoo Rural Water Supply Scheme (KKRWSS), which was constructed within the Vermaaks River valley of the reserve and on private and communal land adjacent to the reserve during 1990 to 1993. This scheme supplies purified domestic water to the Dysselsdorp

community and the farming communities along the Olifants River Valley westwards to the Gamka River Valley near Calitzdorp. Abstraction commenced in 1993. The scheme, which is currently managed by Oudtshoorn Municipality abstracts approximately 1.1 million m^3 groundwater per annum.

Since abstraction started there have been frequent complaints and allegations that the scheme is having detrimental environmental and socio-economic impacts. Numerous springs on the Kammanassie Nature Reserve have dried up and the vegetation in the Vermaaks River Valley started showing signs of water stress. Some farmers have also had to cease their farming activities due to their main water supply drying up or being drastically reduced.

Limits have been set by Dept of Water Affairs on the volume of water that may be abstracted by the scheme, but over-abstraction is frequently taking place. Oudtshoorn Municipality argues that they cannot stop pumping water due to a high demand from the water users. Several attempts to address this problem have been made by CapeNature - through having meetings with Oudtshoorn Municipality, Dept of Water Affairs and other stakeholders - but have had little to no effect. There is an urgent need for intervention at a very high political level to address this problem. It is also critical that the groundwater ecological reserve needs to be determined in terms of the National Water Act, (Act No. 36 of 1998) and implemented.

Wetlands and Seeps

There are a large number of seeps and springs that occur on the Kammanassie Nature Reserve. Fifty-three springs are being monitored by reserve staff twice a year – during late spring and late summer. There is also a small cluster of Freshwater Ecosystem Priority Area (FEPA) wetlands that occur downstream of the nature reserve on the Rooi River towards the north eastern side of the nature reserve.

3.7.3 Rivers

There are a total of 29 rivers originating in the Kammanassie catchment area. Amongst the rivers of the Kammanassie Nature Reserve, the Wilge River has been identified as a national FEPA. Furthermore, the Wilge River and its associated sub-catchment also provide sanctuary for some indigenous and threatened fish species. The upstream area of the Marnewicks River serves as an important support area for fish species conservation. The hydrology of the Kammanassie is shown in Figure 9.

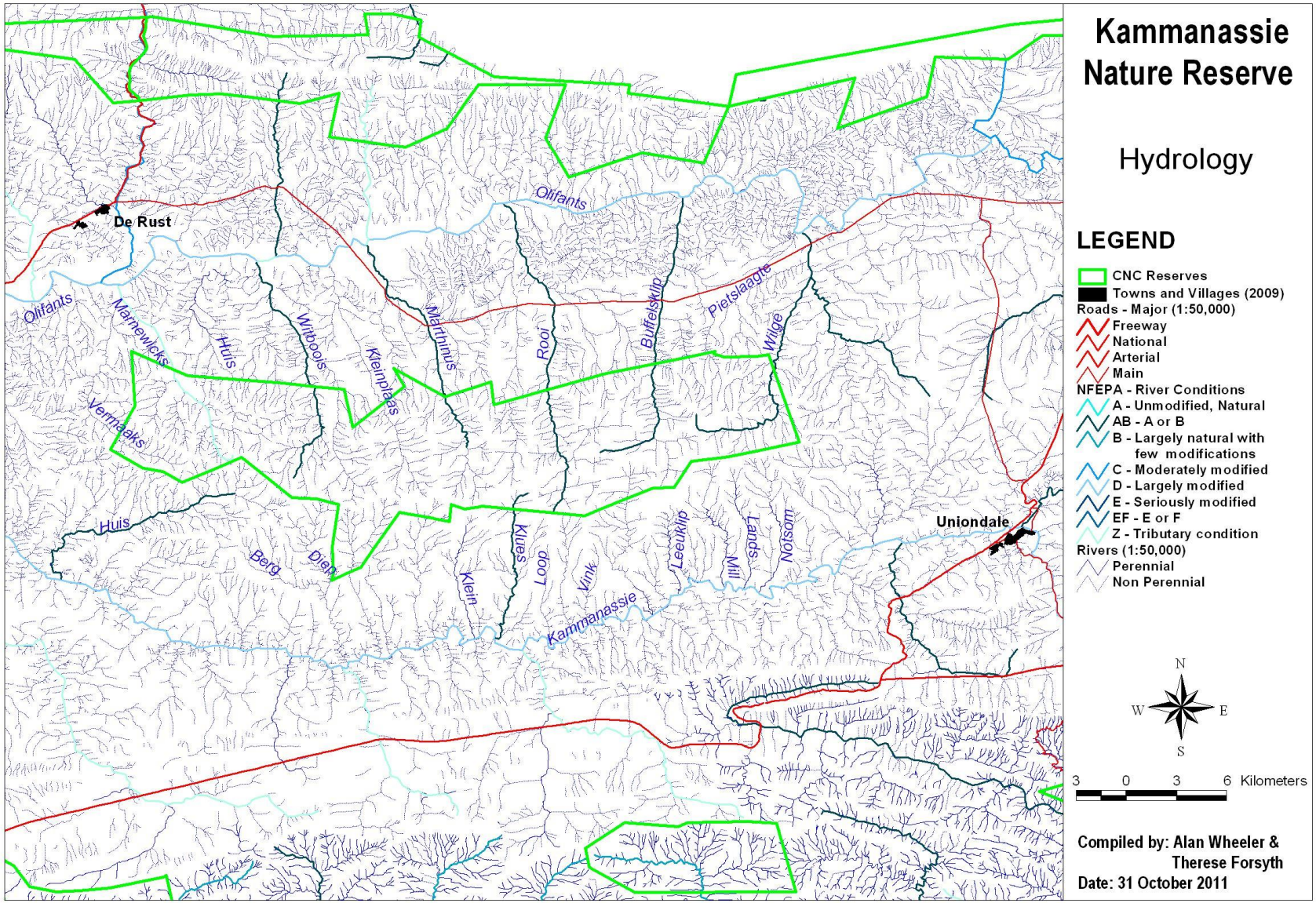

Figure 9. Hydrology of the Kammanassie Nature Reserve and hydrological status of the rivers (Nel *et al*. 2011a, 2011b).

3.8 Flora

Full species lists are not provided in the management plan. If required species lists are available on request from Scientific Services, Assegaaibosch Nature Reserve, Jonkershoek Road, Stellenbosch.

3.8.1 Terrestrial vegetation

According to the South African Vegetation Map (Mucina & Rutherford 2006), the majority of the northern slopes of the Kammanassie Nature Reserve is comprised of Northern Kammanassie Sandstone Fynbos while Southern Kammanassie Sandstone Fynbos is the dominant vegetation type found on the southern slopes of the Kammanassie. Central Island Shale Band Vegetation is found along the Cederberg shale bands of the Kammanassie Mountain. All three of these vegetation types have been classified as Least Threatened (LT). Full descriptions of vegetation types are given in Mucina & Rutherford (2006).

A more detailed, fine-scale vegetation map was compiled for the Klein Karoo by Vlok *et al.* (2005). From a management point of view this map is more practical and useful to inform management actions. According to this map, 12 vegetation units occur on the reserve, nine of which are terrestrial and three aquatic. A brief description (taken from Vlok *et al.* 2005) as well as the conservation status (Reyers & Vlok 2008, Skowno *et al.* 2010) of each is given below.

Fynbos Biome:

- Kammanassie Arid Proteoid Fynbos (LT): This unit is most similar to the Doringrivier Arid Proteoid Fynbos (from Outeniqua Mountains) in having species such as *Agathosma capensis, Agathosma ovata, Aspalathus hystrix, Erica versicolor, Erica speciosa, Ficinia deusta, Hypodiscus aristatus, Hypodiscus striatus, Ischyrolepis capensis, Leucadendron salignum, Leucospermum cuneiforme, Pentameris eriostoma, Pentameris macrocalycina, Pentaschistis malouinensis, Pentaschistis pallida, Protea lorifolia, Protea repens, Rhodocoma fruticosa, Tetraria cuspidata, Tetraria ustulata* and *Thamnochortus rigidus* prominent and abundant, but it differs in having uncommon species such as *Cliffortia dispar, Cliffortia polita, Cliffortia robusta, Lampranthus diffusus* and *Leucospermum royenifolium* present. The orange-red variant of *Leucadendron salignum* is quite abundant here, indicating that there is a shift in genetic material of this species in this unit.
- Kammanassie Arid Restioid Fynbos (LT): This unit is more arid (than similar unit on Rooiberg Mountains) as it is largely restricted to rocky, sandy soils (often underlain by silcrete) on north-facing slopes. Succulents *(e.g. Adromischus triflorus, Aloe comptonii, Bulbine frutescens, Crassula rupestris, Euphorbia heptagona, Gasteria brachyphylla, Haworthia arachnoidea, Pelargonium alternans, Pelargonium carnosum, etc.)* are often prominent on rocky sites, along with some stunted trees *(e.g. Euclea undulata, Maytenus oleoides, Osyris compressa and Searsia undulata).* Geophytes *(Boophane disticha, Drimia anomala, Haemanthus albiflos,* etc*.)* are occasionally abundant, but grasses (*e.g. Cymbopogon marginatus*) are uncommon. The only rare species known to occur in this unit is the localized endemic *Erica kammanassieae.*
- Kammanassie Grassy Fynbos (LT): It is very similar to the Rooiberg Grassy Fynbos in its structure and common species present, but it differs in having some more eastern

elements present, such as the grass-like *Protea intonsa.* No rare or endemic species are known to occur in this unit.

- Kammanassie Mesic Proteoid Fynbos (LT): This unit can be easily recognised and differs from the Kammanassie Arid Proteoid Fynbos, by its proteoid shrub component. Here *Leucadendron eucalyptifolium, Protea eximia, Protea punctata* and *Protea neriifolia* are abundant to locally dominant. It differs in having the following rare and local endemic species present: *Agathosma affinis, Amphithalea axillaris, Bobartia paniculata, Cyclopia alopecuroides, Cyclopia plicata, Disa lugens var. lugens, Erica costatisepala, Erica inordinata, Geissorhiza elsiae, Gladiolus fourcadei, Lachnaea glomerata, Leucadendron rourkei, Liparia genistoides, Oxalis fourcadei, Paranomus esterhuyseniae, Protea grandiceps* and *Romulea vlokii.*
- Kammanassie Subalpine Fynbos (LT): This unit is dominated by Restios, Ericas and short (less than 1 m) Proteas. It shares some of its rare species with the Groot Swartberg- and Kouga Subalpine Fynbos, but can be recognised by the local combination of rare and local endemic species, that includes *Alepidea delicatula, Aspalathus patens, Disa neglecta, Disa pillansii, Elegia altigena, Erica inordinata, Erica montis-hominis, Erica valida, Leucadendron singulare, Protea venusta* and *Syncarpha montana.*
- Kammanassie Waboomveld (LT): *Protea nitida* is abundant and prominent in this unit. This unit is rich in species with the following species recorded: *Agathosma capensis, Agathosma ovata, Artemisia afra, Aspalathus alpestris, Aspalathus laricifolia, Babiana sambucina, Bulbinella cauda-felis, Cannamois scirpoides, Chrysanthemoides monilifera, Cineraria alchemilloides, Cliffortia linearifolia, Cliffortia neglecta, Cliffortia ramosissima, Cliffortia ruscifolia, Clutia polifolia, Ehrharta bulbosa, Elegia filacea, Eragrostis chloromelas, Erica cerinthoides, Erica maesta, Erica melanthera, Eriocephalus africanus, Felicia filifolia, Ferraria divaricata, Ficinia nigrescens, Freylinia densiflora, Haemanthus albiflos, Helichrysum cylindriflorum, Helichrysum teretifolium, Hermannia diffusa, Hermannia multiflora, Hypodiscus striatus, Ischyrolepis capensis, Ischyrolepis hystrix, Ischyrolepis unispicata, Leucadendron salignum, Leucospermum cuneiforme, Lobostemon fruticosus, Lobostemon marlothii, Muraltia dispersa, Oedera squarrosa, Othonna auriculifolia, Othonna lobata, Oxalis obtusata, Oxalis punctata, Passerina obtusifolia, Pelargonium scabrum, Pelargonium suburbanum, Pelargonium tricolor, Pentzia dentata, Phylica paniculata, Polygala microlopha, Polygala myrtifolia, Protea neriifolia, Protea repens, Restio multiflorus, Restio triticeus, Rhodocoma fruticosa, Ruschia lineolata, Senecio cotyledonis, Senecio ilicifolius, Spiloxene trifurcillata, Struthiola macowanii, Sutera campanulata, Tephrosia capensis, Tetraria cuspidata* and *Willdenowia teres.* The combination of rare and localised endemic species differs from any other Waboomveld unit, with the following uncommon species recorded; *Acmadenia maculata, Agathosma affinis, Cliffortia arcuata, Erica passerinae, Gladiolus leptosiphon, Lachenalia haarlemensis, Lachnostylis bilocularis, Lampranthus scaber, Paranomus esterhuyseniae, Pelargonium denticulatum* and *Romulea jugicola.*

Subtropical Thicket Biome:

- Pietslaagte Asbos-Gwarrieveld (LT): In this unit *Euclea undulata* (Gwarrie) and *Searsia undulata* (Koeniebos) are the only common woody trees. Some *Portulacaria afra* (Spekboom) may be present on the north facing slopes, but there is no indication that it was abundant before. *Aloe ferox* (Bitter Aloe) is the only common succulent, with species usually abundant in other similar units *(*e.g. *Cotyledon* and *Tylecodon* species) being quite rare here. The matrix Succulent Karoo communities are dominated by

Pteronia incana (Asbos) and *Eriocephalus* species (Kapokbos), indicating that parts of this unit may be subjected to periodic fires. Geophytes are not common, but two species present *Freesia verrucosa* and *Lachenalia haarlemensis,* are uncommon species.

- Stompdrif Arid Spekboomveld (LT): The northern slopes of this unit has Spekboom (*Portulacaria afra*) and woody trees and shrubs (*Carissa haematocarpa, Euclea undulata, Gloveria integrifolia, Gymnosporia szyszylowiczii, Nymania capensis, Rhigozum obovatum* and *Searsia undulata*) abundant, but here the southern slopes differ in having *Pteronia incana* (Asbos) abundant to locally dominant. No rare or localised endemic species are known from this unit.
- Voorsorg Fynbos-Spekboomveld (LT): This unit is most similar to the Meiringspoort Spekboom Thicket structurally and in the common and uncommon species present (e.g. *Lachnostylis bilocularis* and *Senecio ficoides*), but it differs in having some other common species present (e.g. *Euclea natalensis, Euclea polyandra, Salvia africana-lutea*, etc.) and some rare species (e.g. *Cyrthanthus inaequalis*) not known from the Meiringspoort Spekboom Thicket. The latter common and uncommon species oddly seems to bridge a distribution gap for species normally better known from coastal environments.

3.8.2 Aquatic systems

A total of 244 aquatic plant species were recorded for spring flora, which represent 145 genera and 71 families. Flowering plants are represented by Monocotyledoneae with 63 species in 7 families and Eudicotyledoneae with 156 species in 43 families The Pteridophytes with 12 species in 8 families and 12 species in 12 families of Bryophytes (mosses) represent the non-flowering plants. Only one species of gymnosperm was found (Cleaver *et al.* 2003).

According to the fine-scale map for the Klein Karoo (Vlok *et al.* 2005), the aquatic systems on the Kammanassie Nature Reserve can be divided into Freshwater streams (in the mountain) and the main River system, which is a brack water system lower down in the valley. Brief descriptions of the different units are given below (taken from Vlok *et al*. 2005):

Freshwater streams

- Kammanassie Perennial Stream (LT): This unit is indicated by an abundance of *Cannamois virgata, Calopsis paniculata* and *Rhodocoma capensis,* along with *Erica caffra, Erica curviflora,* several *Psoralea* species and *Pteronia camphorata.* The broad-leaved herb *Gunnera perpensa* is another typical element and reliable indicator of this unit, as well as the tree, *Virgilia divaricata* that is often present along the mid slopes of the mountain. Small patches of forest may occur in fire-protected kloofs, often with an abundance of ferns (mostly *Blechnum* species.) A number of localized endemic species such as *Geissorhiza elsiae* and *Liparia genistoides* and some rare orchids (e.g. *Disa elegans*) occur in the upper seepage areas.
- Kammanassie Northern Perennial Stream (LT): The vegetation in this unit is most similar to those of the Kammanassie Perennial Stream unit, but it differs somewhat, as the streams drain northwards here. It is easily recognized and differs from nearby seasonal streams in having reliable indicators of wet sites such as *Cannamois virgata, Calopsis paniculata, Carpha glomerata, Cliffortia strobilifera, Erica caffra, Erica*

curviflora, Mentha longifolia, Psoralea affinis and *Rhodocoma capensis* common and abundant. It differs from all the other similar units in the uncommon species present, which include ferns such as *Asplenium platyneuron, Histiopteris incisa* and *Osmunda regalis* in cool, shady sites with the local endemic *Pelargonium pseudoglutinosum* sometimes abundant in sunny open sites. The uncommon tree *Lachnostylos bilocularis*, and *Cyrthanthus inaequalis* occur on vertical rock faces flanking this unit.

River system (brack water)

- Olifants River & Floodplain (VU): This unit differs from most of the other riverine units in that many of its upper inland streambeds are still eroding into the landscape with a great many fingers. *Acacia karroo* is the most prominent species here, often along with herbs such as *Ballota africana.* An interesting feature in this unit is the occasional abundance of *Acacia caffra.* Many perennial freshwater streams used to feed into the main drainage channel from the Kammanassie and Tsitsikamma Mountains, with periodic floods coming from the eastern Great Karoo during summer. The floodplain of this unit is somewhat different from all the other riverine units, but the shrub *Salsola aphylla* remains abundant and distinctive. Odd species noted in the floodplain include *Chrysocoma oblongifolia* and *Cyperus congestus.*

Based on specimens collected on the reserve and adjacent areas, the current plant species list for the Kammanassie Nature Reserve stands on at least 481 species. This list is by no means complete and is constantly being updated through baseline data collection.

At least 47 of these plant species are of conservation concern (Table 3.1; Raimondo *et al.* 2009). These include species listed as Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Near Threatened (NT), Least Concern (LC), Data Deficient (DDD), Rare and Critically Rare. The species are being monitored with the assistance of the Custodians of Rare and Endangered Wildflowers (CREW) groups.

Table 3.1. Plant species of special concern recorded from the Kammanassie Nature Reserve and adjacent areas.

Scientific Name	**Conservation Status (Raimondo *et al.* 2009)**
Acmadenia maculata	NT
Agathosma spinosa	Rare
Alepidea delicatula	Rare
Amphithalea axillaris	Rare
Aspalathus congesta	Rare
Aspalathus patens	Rare
Aspalathus sp. nov.	VU
Bobartia paniculata	Rare
Cyclopia alopecuroides	EN
Cyclopia plicata	EN
Disa elegans	LC
Disa lugens	EN
Disa pillansii	LC
Elegia altigena	VU
Erica annalis	Critically Rare

Erica costatisepala	Rare
Erica inordinata	Rare
Erica kammanassieae	Critically Rare
Erica montis-hominis	VU
Erica valida	Rare
Felicia esterhuyseniae	Rare
Geissorhiza elsiae	VU
Geissorhiza uliginosa	Rare
Gladiolus fourcadei	CR
Gladiolus leptosiphon	VU
Hoodia pilifera subsp*. pilifera*	NT
Hymenolepis sp. nov*.*	VU
Lachenalia haarlemensis	VU
Leucadendron rourkei	LC
Leucadendron singulare	VU
Liparia genistoides	EN
Manulea derustiana	VU
Otholobium racemosum	Rare
Oxalis fourcadei	Rare
Oxalis ioeides	DDD
Paranomus esterhuyseniae	NT
Pelargonium denticulatum	Rare
Phylica floccosa	Rare
Protea grandiceps	NT
Protea montana	VU
Protea rupicola	EN
Protea venusta	EN
Relhania decussata	Rare
Romulea jugicola	VU
Romulea vlokii	VU
Syncarpha montana	Rare
Syringodea derustensis	VU

The vegetation of the Kammanassie Nature Reserve is shown in Figure 10 (Mucina & Rutherford 2006) and Figure 11 (Vlok *et al.* 2005).

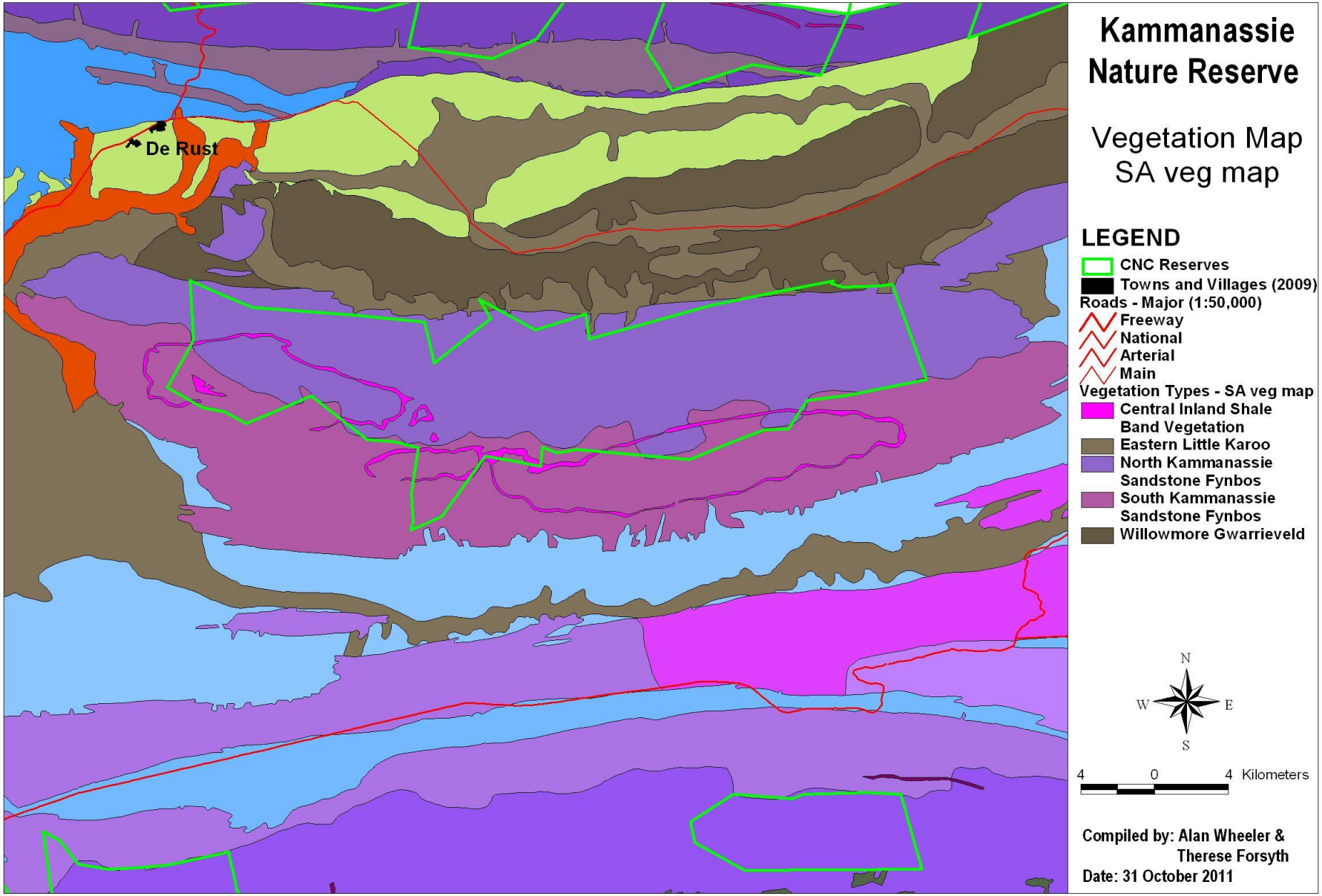

Figure 10. Map showing the vegetation types on the Kammanassie Nature Reserve according to the SA Vegetation Map (Mucina & Rutherford 2006).

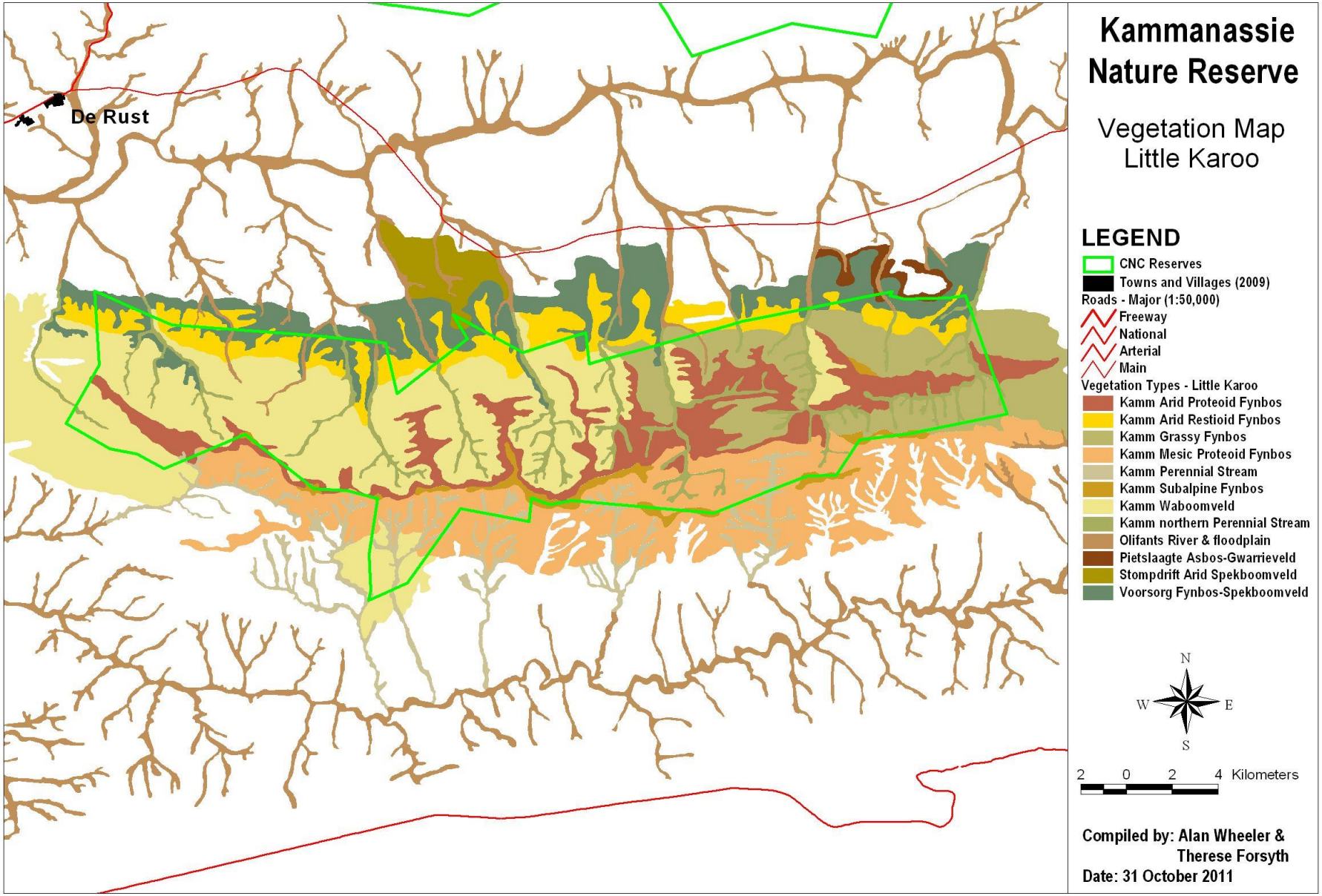

Figure 11. Map showing the vegetation of the Kammanassie Nature Reserve according to the fine-scale vegetation map compiled by Vlok *et al.* (2005).

3.8.3 Invasive Alien Plants

A number of alien plant species occur on the Kammanassie Nature Reserve and are listed in Table 3.2. *Hakea* and pine are the two dominant alien invasive plants species on the Kammanassie. Alien vegetation is eradicated by reserve management according to a management clearing unit plan. Funding is obtained through the Working for Water programme as well as the CapeNature Integrated Catchment Management project.

Table 3.2: Invasive alien plant species on the Kammanassie Nature Reserve and adjacent areas.

Scientific name	**Vernacular name**
Acacia mearnsii	Black wattle
Agave spp.	Sisal
Alhagi maurorum	Camelthorn
Arundo donax	Giant reed (Spaansriet)
Atriplex semibaccata	Creeping saltbush
Bromus catharticus	
Cereus spp.	Queen of the night
Cirsium vulgare	Scots Thistle
Cylindropuntia tunicata	Thistle Cholla
Datura stramonium	Stinkweed (Gewone stinkblaar)
Echinopsis spachiana	Torch cactus
Eucalyptus spp.	Bluegums
Hakea sericea	Silky Hakea
Harrisia martinii	Moon cactus
Melia azedarach	Sering
Nerium oleander	Oleander (Selonsroos)
Nicotiana glauca	Wild Tobacco
Opuntia spp.	Prickly pear (Turksvy)
Paraserianthes lophantha	Stinkbean (Stinkboon)
Pennisetum clandestinum	Kikuyu grass
Pinus canariensis	Kanariese den
Pinus halepensis	
Pinus pinaster	Italian Stone
Pinus radiata	
Polygonum salicifolium	
Populus canescens	Poplar (Vaalpopulier)
Prosopis glandulosa	Mesquite
Ricinus communis	Caster oil Plant
Rubus fruticosus	English Bramble

Rumex acetosella	Sheep sorrel (Boksuring)
Sesbanea punicea	Sesbanea
Solanum elaeagnifolium	Silver-leaf bitter apple
Solanum mauritianum	Bugweed
Spergularia rubra	Sand Spurrey
Tagetes minuta	Tall Khaki Weed
Tamarix ramosissima	Purple tamarisk
Urtica dioica	Stinging nettle

3.9 Fauna

Detailed species lists are not provided in the management plan. Species lists are available on request from Scientific Services, Assegaaibosch Nature Reserve, Jonkershoek Road, Stellenbosch.

3.9.1 Mammals

There are 37 mammal species recorded for the Kammanassie Nature Reserve. A number of small antelope species occur on the reserve. Various predators including the Cape leopard (*Panthera pardus*) and Caracal (*Caracal caracal*) also. The mammal species list is updated through baseline data collection.

Indigenous large mammal species known to have occurred historically in the Klein Karoo area but which are not present on the Kammanassie Nature Reserve are Buffalo (*Syncerus caffer*), Eland (*Taurotragus oryx*) and Lion (*Panthera leo*). Elephant (*Loxodonta africana*) is likely to have moved through the Klein Karoo, especially along the river courses (Olifants River), but according to Skead (2011) no firm historical records have been found.

Cape Mountain Zebra (*Equus zebra zebra;* CMZ) is the only known mammal species of special concern on the Kammanassie Nature Reserve. Cape Mountain Zebra are classified as vulnerable in the IUCN Red List and as endangered in the Nature and Environmental Conservation Ordinance (Ordinance 19 of 1974) and therefore receive more specific attention in this management plan.

Cape Mountain Zebra once had a distribution running southward across the mountainous terrain of the Roggeveld Mountains, the Cederberg Mountains and up to the Amatolas in the Eastern Cape. As a result of hunting and competition with farmers for grazing, however, they were driven to the verge of extinction such that by 1950, fewer than 100 individuals of this species survived. The only original natural populations remaining are in the Mountain Zebra National Park and in the Kammanassie and Gamkaberg Nature Reserves (Smith *et al.* 2008).

The two smallest relict populations of Cape Mountain Zebra occur in the Kammanassie and Gamka Mountains. With small populations (Gamkaberg currently estimated at 55 from a founder population of six, Kammanassie estimated at 65-70 from a founder population of

six) (Millar 1970; Lloyd 1984), severe population bottlenecks can have serious genetic consequences. This can drastically reduce genetic variation and leave populations open to the effects of inbreeding, with continuing loss of genetic diversity due to genetic drift. If left uncontrolled, inbreeding may reach levels where fitness is compromised thereby leading to extinction (Moodley 2002). The Kammanassie population is critically important for the maintenance of the genetic diversity of Cape Mountain Zebra. This population accounts for a third of the genetic variation of the meta-population.

The major water sources utilised by Cape Mountain Zebra on the Kammanassie Nature Reserve are natural springs situated on the mountain. These springs supply a constant source of clean drinking water for numerous different animal species on the Kammanassie Nature Reserve. The drying up of these springs as a result of underground water abstraction has required the use of artificial watering points. The Kammanassie Cape Mountain Zebra population is no longer able to rely on natural springs for drinking.

Cape Mountain Zebra numbers are monitored opportunistically with sightings being recorded in the State Of Biodiversity database. Camera traps have been located in areas known to be frequented by Cape Mountain Zebra and these data will be used to develop the Kammanassie Cape Mountain Zebra studbook. However, an aerial census for a total count needs to be investigated.

3.9.2 Avifauna

A total of 150 bird species have been recorded on the Kammanassie Nature Reserve (BIRP 2011). The species occurring on the reserve are typical of those associated with mountainous fynbos vegetation. Avifaunal species diversity within this type of vegetation is not high hence the low number of species. Threatened species occurring on the reserve are shown in Table 3.3 below.

Table 3.3: Species, IUCN category, and SA Red Data book status for threatened avifauna.

Species	IUCN Category (IUCN 2011)	South African Red Data Book Category (Barnes 2000)
Peregrine Falcon *Falco peregrinus*		NT
Black Harrier *Circus mauruss*	VU	NT
Blue Crane *Anthropoides paradiseus*	VU	VU
Denham's Bustard *Neotis denhamii*	NT	VU
Lesser Kestrel *Vanellus melanopterus*	VU	VU

3.9.3 Reptiles

There are 43 reptile species recorded for the Kammanassie Nature Reserve. None of these are listed as Threatened although the revised threat status for reptiles is yet to be published. The reptile species list for the Kammanassie Nature Reserve is updated through baseline data collection and input from research and data is submitted to the CapeNature State of Biodiversity database.

3.9.4 Amphibians

There are 11 amphibian species recorded for the Kammanassie Nature Reserve. None of these are listed as Threatened. The amphibian species list for the Kammanassie Nature Reserve is updated through baseline data collection and input from research and data is submitted to the CapeNature State of Biodiversity database. On-going taxonomic work will resolve the status of the Ghost Frogs (*Heleophryne* spp.) found on this Reserve.

3.9.5 Fish

The Kammanassie Nature Reserve is situated in the greater Gouritz River Water Management Area (WMA) and rivers on the reserve will therefore contain species associated with this river system. The Gouritz River WMA is home to four smaller species, namely the Smallscale redfin (*Pseudobarbus asper*), the Slender redfin (*Pseudobarbus tenuis*), the Cape galaxias (*Galaxias zebratus*) and the Cape kurper (*Sandelia capensis*), as well as one larger indigenous species, the Moggel (*Labeo umbratus*) (Skelton 2001). Historically all these species were present throughout the greater part of the Gouritz River WMA but their distribution ranges have been dramatically reduced by the presence of alien invasive fish species such as Rainbow trout (*Oncorhynchus mykiss*), Black bass (*Micropterus spp*.), Mozambique tilapia (*Oreochromis mossambicus*), Banded tilapia (*Tilapia sparrmanii*) and, more recently, Sharptooth catfish (*Clarias gariepinus*).

In the Kammanassie Nature Reserve , the smaller indigenous species are known to occur in most rivers around the Kammanassie Mountain, including the Vermaaks, Marnewicks, Buffelsklip, Mill and Wilge Rivers and these rivers are thus of critical concern for the conservation of these species. The Wilge River is highlighted as a fish sanctuary according to the National Freshwater Ecosystem Priority Areas (NFEPA) project. The presence and distribution of alien invasive fish species within the Kammanassie Nature Reserve is not certain and warrants further investigation. The fish species list is updated through baseline data collection.

The IUCN lists the conservation status of *Pseudobarbus asper* as Endangered (Tweddle *et al.* 2009) and the main threats to this species and other indigenous species are the presence of alien invasive fishes, over-abstraction of surface and groundwater and the loss of habitat through unsound land use practices. Genetic research by Swartz *et al.* (2008) has presented evidence that the species currently described as *Pseudobarbus tenuis* is two distinct lineages. The more widespread one occurs in the Kammanassie Nature Reserve and its IUCN conservation status is listed as Near Threatened. The other lineage (*Pseudobarbus sp*. "*tenuis* keurbooms") occurs exclusively in the Keurbooms River and is listed as Endangered (Tweddle *et al.* 2009). The conservation status of both *Galaxia*

zebratus and *Sandelia capensis* is presently listed by the IUCN as Data Deficient (Tweddle *et al.* 2009).

The reason for this is that the taxonomic status of both species is in the process of being reviewed as recent genetic research has presented evidence for the existence of a number of unique lineages of which the exact distribution ranges have not been confirmed (Tweddle *et al.* 2009). These unique lineages are in the process of being described as new species, many of which will likely be listed as Endangered or Critically Endangered due to the presence of invasive alien fish species, the loss of suitable habitat and the threats posed by possible genetic contamination (Tweddle *et al.* 2009; Swartz *et al.* unpublished data).

3.9.6 Invertebrates

Butterflies are abundant and 46 species have been recorded in the Kammanassie Nature Reserve. The Kammanassie Blue *(Orachrysops brinkmani)* belongs to the same genus as the Endangered Brenton Blue butterfly and Karkloof Blue butterfly. Thirty five arthropod species have been recorded on the Kammanassie Nature Reserve. The freshwater invertebrate fauna in the various river systems of the Kammanassie Nature Reserve are poorly studied. Nevertheless preliminary South African Scoring System (SASS) surveys of the 13 rivers have indicated a diverse community. Groundwater abstraction is the most serious threat to the continued existence of this macro-invertebrate community. The invertebrate species list is updated through baseline data collection.

3.9.7 Invasive/alien fauna

The following alien mammals may occur on the Kammanassie Nature Reserve:

- House rat (*Rattus rattus*);
- Brown rat (R*attus norweygicus*);
- House mouse (*Mus musculus*);
- Domestic cat (*Felis catus*); and
- Domestic dog (*Canis familiari*).

Domestic stock often roam onto the reserve as they graze on the declared private catchment areas. This is problematic as it can result in overgrazing, especially after fires in the Elandsvlakte area and feral donkeys have been removed from the reserve in the past to prevent interbreeding with Cape Mountain Zebra.

The presence and distribution of alien invasive fish species within the Kammanassie Nature Reserve is not certain and needs to be investigated further.

3.10 Cultural Heritage

A total of 37 archaeological sites have been recorded on the Kammanassie Nature Reserve. All of these sites contain rock art. Known rock art sites are monitored opportunistically to determine condition. New rock art sites are added to the archaeological site file and recorded according to the baseline data collection model. All site locality data are regarded as sensitive.

A cultural heritage resource management plan needs to be compiled for the Kammanassie Nature Reserve. Management would need to involve specialists to assist in identifying management priorities and in the development of the plan.

3.11 People and Conservation

Access to the Kammanassie Nature Reserve for spiritual, traditional and cultural groups is accommodated on request. Work opportunities are created through various projects managed by CapeNature. These include the Working for Water alien vegetation management and Integrated Catchment Management fire break maintenance projects. Although these projects only provide temporary work opportunities with CapeNature, they also contribute to contractor and skills development.

3.12 Awareness, Youth Development and Volunteers

Awareness

Environmental awareness is carried out in conjunction with the Community Conservation component of CapeNature as well as the Kammanassie Nature Reserve field rangers and focuses on specific environmental awareness calendar days such as Arbour day and Heritage day. Part of the annual Cape Pioneer Trek Cycle Race route runs though the Kammanassie Nature Reserve; this section has been labelled as the most challenging part of the race, because of its ruggedness. Several articles have appeared in newspapers and magazines regarding this race, which have raised the awareness of the general public about the reserve.

A need has been expressed that the local communities and general public should be made more aware of the Kammanassie Nature Reserve. There has been an aim to hold one open day per annum for the reserve. Attendance of these events have, however, been limited. Further suggestions are to compile information material on the Kammanassie Nature Reserve for dissemination and presentation on Environmental Awareness calendar days and at specific events (e.g. the Klein Karoo Nasionale Kunstefees (KKNK), the Uniondale Agricultural Show, Environmental Education (EE) interventions, etc.); to present talks when requested; to submit articles on the reserve to popular conservation themed magazines for publication; to make use of the electronic media and existing forums (e.g. the Gouritz Cluster Biosphere Reserve website and forum) to inform the public about the importance of the reserve.

Youth Development

Youth development on the Kammanassie Nature Reserve mostly takes place in and around Uniondale in conjunction with the Community Conservation component of CapeNature. Strong links with local NGOs and the WoF team at the Kammanassie Nature Reserve offices also contribute towards youth development. The WoF team often accompanies the field rangers on Environmental Education interventions, and UNIEP (a local poverty alleviation NGO) regularly assist with the identification of community members that can participate in specific Environmental Education interventions. Furthermore, two rural schools (Kommandantsdrift and Scheeperskraal Primary Schools) that partake in the Eco-Schools programme, utilise the reserve as an open air classroom on an *ad hoc* basis.

Volunteers

Volunteers who assist with management issues on the Kammanassie Nature Reserve include CREW (Custodians of Rare and Endangered Wildflowers) groups and the Mountain Club of South Africa.

3.13 Infrastructure

Infrastructure Maintenance

The main office complex is situated at 26 Van Riebeeck Street, Uniondale. Access roads within the Kammanassie Nature Reserve are 4x4 vehicle tracks and serve only as management roads. There are two main tracks on the reserve, Langpad (Vermaaks River to Buffelsdrift) and Mannetjiesberg (Rooiplaas to Perdevlakte).

There are two basic huts located respectively at Buffelsklip and one at Kleingeluk. Fences mainly occur on the boundary between the State owned and private land. Two artificial watering points for the Cape Mountain Zebra are situated at Kleingeluk and Wagenpadsnek.

No waste disposal sites are found on the reserve and office waste disposal is carried out at registered dumping sites in Uniondale. The two sewage tanks, one at the office and one at the Conservation Managers house, are emptied by mobile tanker by the George Municipality as needed. The septic tanks at the huts are emptied periodically.

High site repeaters, antennae's, feeders, buildings/containers and radio masts are found on the western peak of Mannetjiesberg. Users are responsible for the maintenance of this site. CapeNature monitors the high site for impacts and illegal structures annually.

Access control

The Kammanassie Nature Reserve is an island which is surrounded by private land. Although there are several access points to the reserve, each of these have to be accessed via private land, which is not open to the general public (see Figure 12). The Kleingeluk and Buffelsklip access points are for CapeNature management purposes only. The Vermaaksrivier access is for the Oudtshoorn Municipality, the Department of Water

Affairs and CapeNature. The Bergplaas, Buffelsdrift, Huisrivier and Rooiplaas access points are restricted to private landowners and CapeNature. All access points have gates which are locked.

There is no access for tourism at present due to the specific location of the reserve. CapeNature is willing to participate in a discussion with the public and the landowners should there be a definite need for the public to obtain access to the reserve.

Access to the Kammanassie Nature Reserve for research, spiritual, cultural and traditional purposes will be considered subject to permit conditions and with prior approval.

Servitudes

The Department of Water Affairs has servitude access rights to the pump houses at Vermaaksrivier. These servitudes cross private land and do not apply within the boundaries of the Kammanassie Nature Reserve.

3.14 Recreational and tourism services

The Kammanassie Nature Reserve does not offer any tourism facilities or services at present. CapeNature has however, allowed events, such as the Cape Pioneer Trek Cycle Race and the Cape Epic, to take place through the reserve as part of a bigger route.

CapeNature is willing to consider and discuss possible tourism opportunities (e.g. concessions) in conjunction with neighbouring landowners, should there be such a need. CapeNature's Marketing and Eco-tourism Unit would need to be fully involved in this process.

Compliance Management

Compliance management in the Kammanassie Nature Reserve is performed in terms of the Nature Conservation Ordinance and regulations proclaimed there under.

The location of infrastructure is shown in Figure 12.

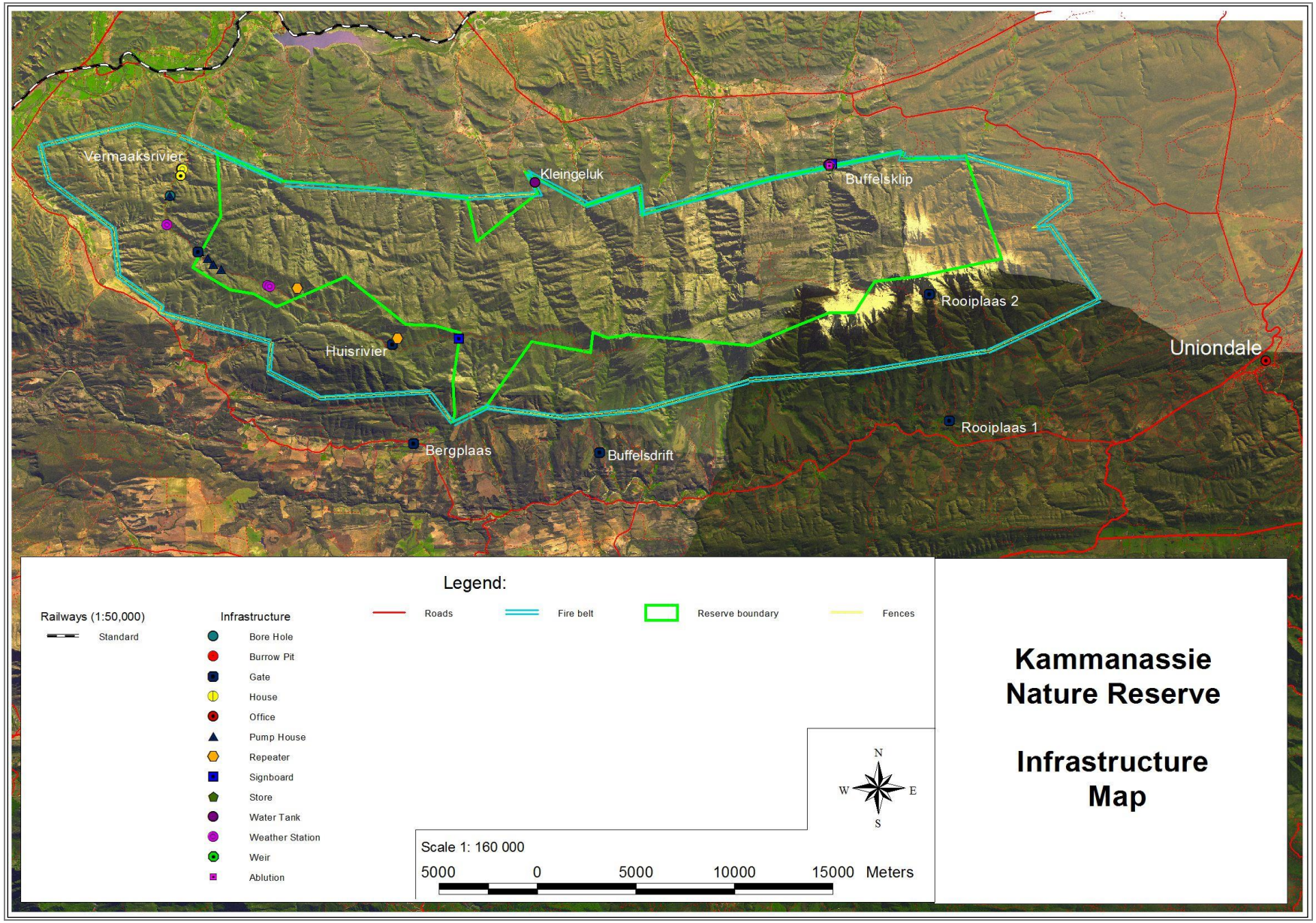

Figure 12. Kammanassie Nature Reserve infrastructure.

PART 2

SECTION 4: SWOT ANALYSIS

4.1 SWOT Analysis

A SWOT Analysis is a strategic planning method used to evaluate the Strengths, Weaknesses, Opportunities, and Threats involved. It involves specifying the objectives and identifying the internal and external factors that are favourable and unfavourable to achieving that objective.

4.1.1 Strengths, Weaknesses, Opportunities and Threats

Table 4.1 identifies the Kammanassie Nature Reserves Strengths, Weaknesses, Opportunities and Threats.

Table 4.1: SWOT analysis.

STRENGTHS (INTERNAL)	WEAKNESSESS (INTERNAL)
• To be included as a World Heritage Site • Part of Gouritz Cluster Biosphere Reserve • Global biodiversity hotspot • Management and scientific expertise • Natural environment intact • High floral and fauna diversity • High quality of river systems • Important water catchment area • Large size encompassing broad range of ecological processes • Informed landscape corridor planning • Peace and tranquillity • High visual scenic profile • Organisational stability • Dedicated staff • Integrated and coordinated planning • Research opportunities	• Lack of staff capacity • Limited suitable habitat for Endangered Cape Mountain Zebra • Illegal access difficult to control • Long boundaries increase risk of human-induced fires • Private repeaters on high sites impacting on the visual environment • Large areas of private Mountain Catchment Area which makes management difficult
OPPORTUNITIES (EXTERNAL)	**THREATS (EXTERNAL)**
• Partnerships (present and continuous) • Expansion of Protected Areas • Biosphere Reserve • Local economic development • Training and development • Environmental education • Research • Marketing and communication	• Susceptible to invasive alien plants • Uncontrolled and out-of-season fires • Floods • Over-abstraction of groundwater • Biodiversity crime • Extra-limital game species introduction • Fencing off of neighbouring properties • Climate change

	• Inappropriate agricultural activities • Limited protected habitat for Cape Mountain Zebra • Illegal grazing by neighbouring landowners' livestock

SECTION 5 CONSERVATION DEVELOPMENT FRAMEWORK

5.1 Sensitivity-Value Mapping

Sensitivity-value mapping of reserve biodiversity, heritage and physical environment provides a consistent approach, intended to be the main decision support tool guiding spatial planning in protected areas:

- for all planned and ad-hoc infrastructure development e.g. location of management and tourism buildings and precincts, roads, trails, firebreaks;
- for whole-reserve planning and formalisation of use and access as a Reserve Zonation Scheme;
- to support conservation management decisions and prioritisation.

Outputs allow direct comparison of sites both within and between reserves to support CapeNature planning at local and regional scales. The process maps:

- sites with highest regional conservation value;
- areas where human access or disturbance will have a negative impact on biodiversity or heritage, and specific environmental protection is required
- areas where physical disturbance or infrastructure development will cause higher environmental impacts, and/or higher construction and on-going maintenance costs;
- areas where there is significant environmental risk to infrastructure.

The method ensures that the location, nature and required mitigation for access, activities, and infrastructure development within protected areas can be guided by the best possible landscape-level biodiversity informants.

The process accommodates both expert-derived information and more objective scientific data. Decisions are defensible and based on a transparent process.

Biodiversity, heritage and physical features are rated on a standard scale of 1 to 5, where 1 represents no or minimal sensitivity and 5 indicates maximum sensitivity (See Figure 13). Additional features such as visual sensitivity, fire risk and transport costs can also be included. Higher scores represent areas that should be avoided for conventional access and infrastructure, or where specific mitigation would be required in order to address identified environmental sensitivity. A score of 5 typically represents areas where mitigation for conventional access or infrastructure development would be extensive, costly or impractical enough to be avoided at all costs, or features so sensitive that they represent a ‘no go’ area. For biodiversity features highest scores represent high priority sites where conservation management cannot be compromised.

Sensitivity maps cannot replace all site-scale investigation, but they are ideal for rapidly reviewing known environmental risks, and guiding whole-reserve planning to minimise overall negative environmental impact.

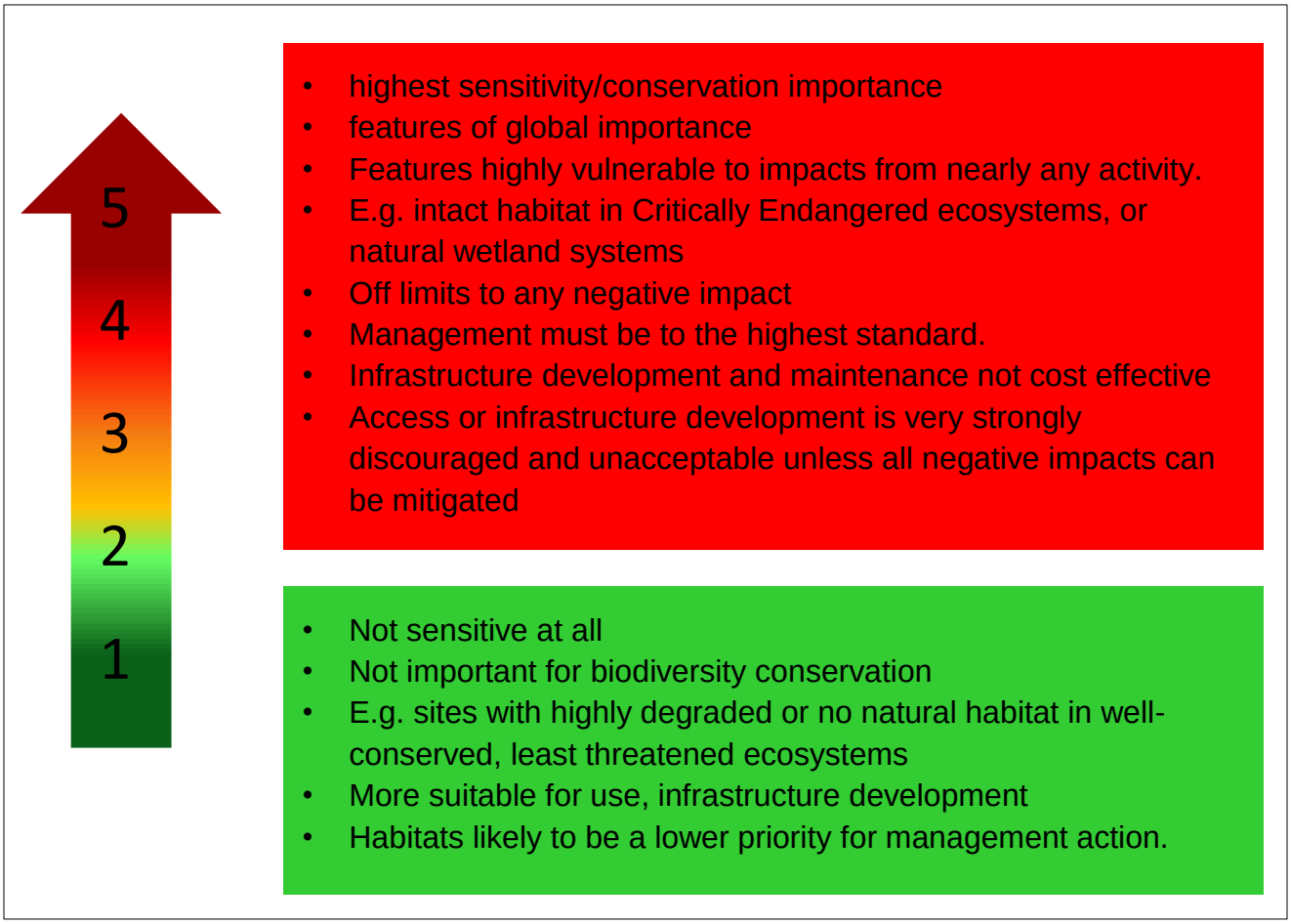

Figure 13: Sensitivity-Value mapping.

Kammanassie Nature Reserve, with a rugged landscape deeply incised by many rivers and drainage lines, represents a physically inaccessible and sensitive reserve with very little existing infrastructure. New road and path construction should be avoided, or very carefully planned, with due consideration of the likely difficult, sensitive and on-going costly nature of access. The reserve includes some areas of threatened and/or extremely under-conserved habitats, and a number of important aquatic Special Habitats. However, the Biodiversity Sensitivity, see Figure 14 and 15, is visually dominated by the areas most heavily used by Cape Mountain *Zebra Equus zebra ssp. zebra*. This subspecies is listed by the IUCN as Vulnerable, and preferred habitats should not be compromised as this population represents a critical genetic pool for the species.

Any proposed infrastructure or activity must take relevant sensitivity features into account.

Table 5.1: Sensitivity of Kammanassie Nature Reserve in terms of biodiversity and physical features.

	Class	Sensitivity layer	Description
Biophysical sensitivity: ANY infrastructure or access	**Biodiversity**	Ecosystem representivity	Vegetation map, ecosystem threat and conservation status derived from equivalent units in 2010 Little Karoo Vegetation map. Habitat condition was mapped to 1:1,000 scale on Google Earth, and spatially adjusted using 2008 SPOT5 satellite images.
		Special Habitat	All natural wetlands from NFEPA 2010
		Species	Although at least 65 records from 28 threatened or near-threatened plants are recorded from Kammanassie, only 4 records had sufficient spatial accuracy to be useful for sensitivity mapping. Only Cape Mountain Zebra were considered for Faunal Sensitivity. Consolidated data since 2005 was filtered to remove duplicates, and subjected to a simple analysis of density to identify used and preferred habitats. Data appears not to be biased toward existing road networks. Preferred areas are considered moderately sensitive due to the large areas used by these animals and low likelihood that anything except very extensive access or infrastructure development would significantly impact the conservation of this species.
	Heritage	Heritage	No heritage features were mapped.
	Physical	Slope	Slope analysis highlighting areas vulnerable to erosion and less suitable for infrastructure development was done using the Western Cape Digital Elevation Model (Anonymous 2001) with slope classes converted to generalised polygons with spurious slivers/small areas removed.
		Substrate	As no reliable data were available, substrate senstivity was not mapped, but attribute columns could be populated from habitat types if required.
		Hydrological	In the absence of any mapping of flood lines of other features that represent highly sensitive environments, the 32m and 100m buffers of classes 1-3 and >3 rivers were considered highly and moderately sensitive respectively. All natural NFEPA wetlands were also considered highest sensitivity.

No thorough analysis of viewsheds or visual sensitivity could be performed due to time constraints, but it should be noted that due to its mountainous nature, the majority of the reserve is visible from the surrounding landscape, and in turn looks onto transformed, partly non-natural landscapes and infrastructure. Approximately 40% of the reserve has only wild natural views, has been zoned as Wilderness, and should be considered highest sensitivity throughout unless specifically demonstrated otherwise by proper analysis.

For further information, see the Kammanassie 2012 Conservation Development Framework Report, which includes a detailed description of the Sensitivity Analysis components and analysis.

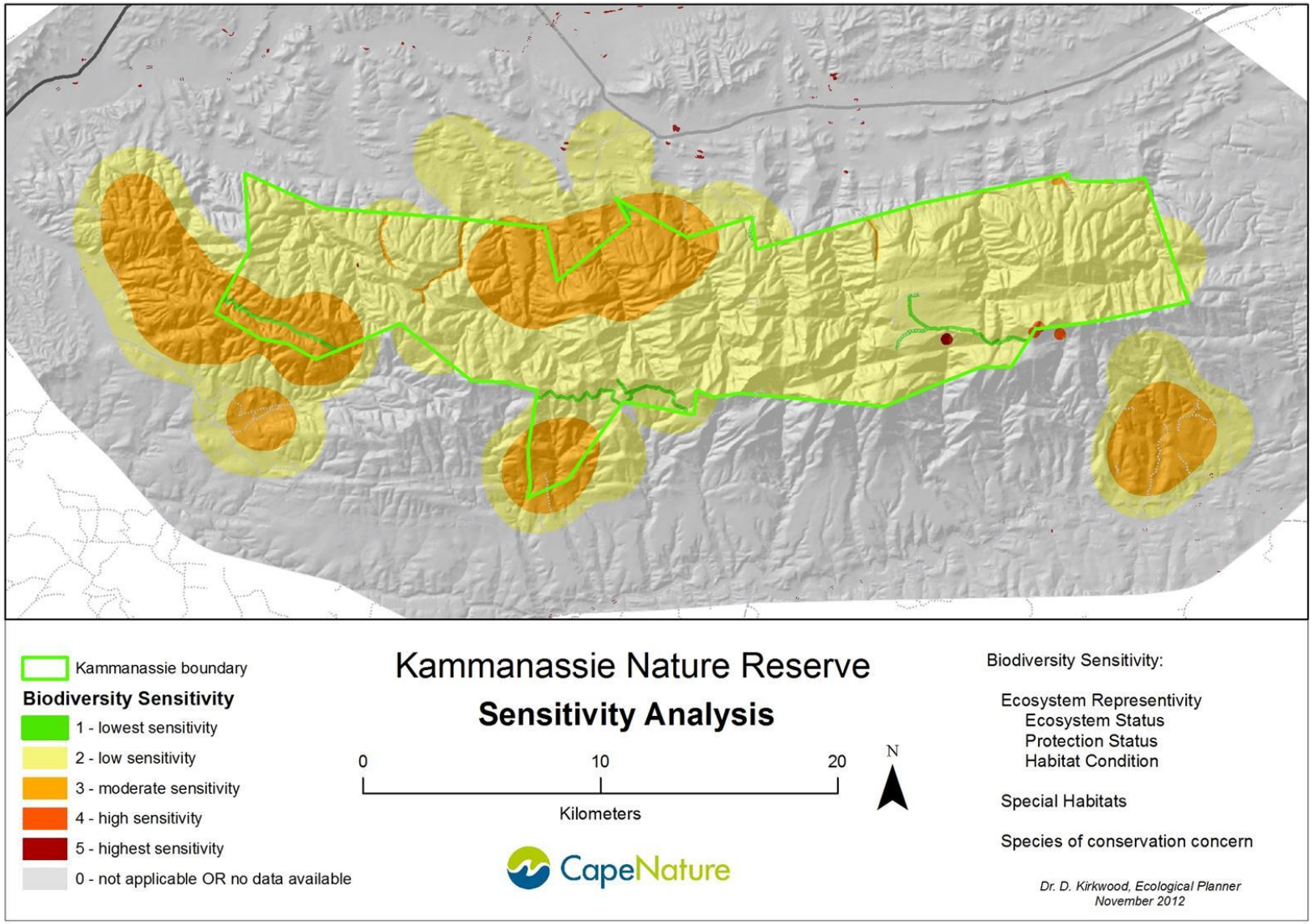

Figure 14: Biodiversity Sensitivity

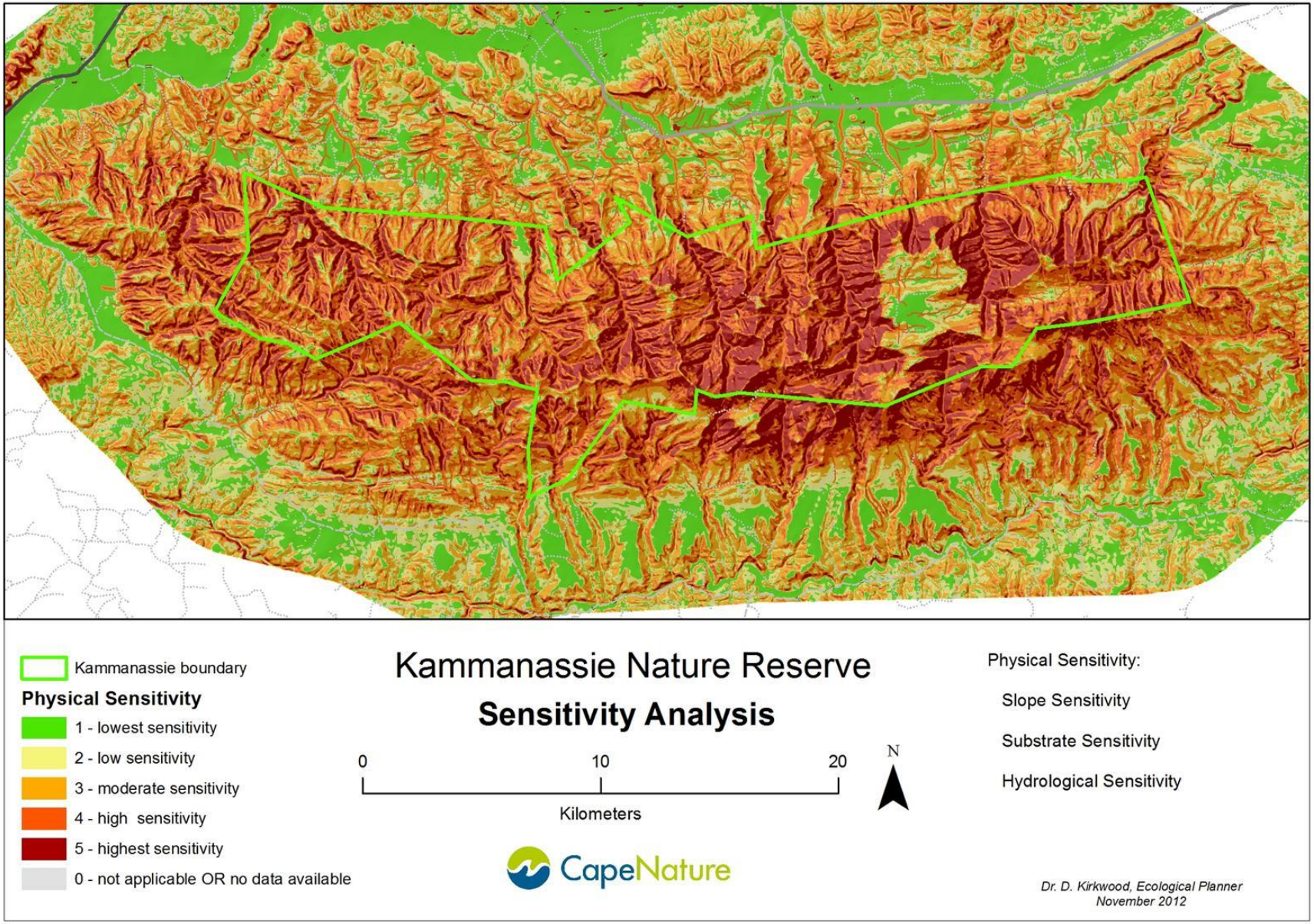

Figure 15: Physical Sensitivity

5.2 Protected Area Zonation

Protected Area Zonation provides a standard framework of formal guidelines for conservation, access and use for particular areas.

Zonation goes beyond natural resource protection and must also provide for:

- appropriate visitor experience;
- access and access control;
- environmental education;
- commercial activities.

Ideally Zonation development should be done at the same time as Infrastructure Development Planning. Good planning must aim to reduce cumulative environmental impacts and the long term operating costs of all activities. Zonation and Infrastructure Development Planning must be guided by:

- existing infrastructure and use;
- potential future infrastructure and access requirements;
- careful evaluation of overall impact, construction costs and operating costs vs. likely benefits; for alternatives for every component.

Zonation requires input from all appropriate internal CapeNature stakeholders, and is a key component to be evaluated during Public Participation evaluation of Management Plans.

5.3 Zonation Categories

CapeNature Zonation Categories were developed by an internal workshop process completed in September 2010. Existing protected area zoning schemes worldwide were examined to develop a simple and powerful scheme that provides for the required range of visitor experience, access and conservation management. Particular effort was made to maintain consistency with the best developed South African zonation schemes, in particular those of SANParks and Ezemvelo KZN Wildlife (EKZNW). CapeNature Zonation Categories have fewer tourism-access categories, but provide more detailed and explicit guidelines with regard to zone objectives and characteristics. Further, CapeNature Zonation includes additional new zones specifically required in the context of highly sensitive biodiversity sites and zoning of privately owned Contract Nature Reserves. For a guide to the zones as used by CapeNature, see Table 5.1.

Table 5.2: Guide to CapeNature Zones.

Zone	Zone Objective	Characteristics	Visitor Activities	Facilities / Infrastructure	Visitor Access	Management Guidelines
Wilderness / Wilderness (declared)	***Users:*** To provide an experience of solitude in pristine landscapes with minimal evidence of human presence or use. ***Conservation:*** To limit visitor numbers and use to minimise impact. Minimal management intervention for visitor or biodiversity management. Include sensitive or threatened habitats & species in this low use zone when contiguous sites meet the criteria for wilderness.	Completely wild and rugged landscapes (or being restored to this). Areas where users have little chance of encountering any other human presence or group. Sight or sound of human activities outside zone barely discernible and at far distance; Preferably no human impact or infrastructure inside the zone other than trails. Natural burning regimes, with no active fire management and road/firebreak infrastructure. Areas with minimal Invasive Alien Plant infestations, where IAP control can be done without vehicle access. Area must meet the definition and requirements of the National Environmental Management: Protected Areas Act 57 of 2003. If formally declared in terms of the act, zone = "Wilderness (declared)"; if not = "Wilderness".	"Leave-no-trace" activities: Overnight hiking, without any sleeping facilities, formal campsites, or with only basic, un-serviced shelters. "Carry in, Carry out" principle for all food and waste. Guided or unguided nature observation. --- No fires	No infrastructure of any type if possible. No roads or vehicle tracks. No structures except small existing buildings of cultural, historic or aesthetic value. These can be used as un-serviced sleeping shelters for hikers & provided with composting toilets. Narrow permanent walking trails. No signage except small, unobtrusive markers for closed routes, or at trail junctions. **NB** – in the mountainous, slow-growing fynbos of the Western Cape, the traditional wilderness concept of access without defined trails is unsafe and rapidly results in undesirable user-created trails and erosion.	Unguided visitor access only on foot. Visitors have freedom to use various trails. Use of donkeys, horses or other animals with an official guide only on designated historical routes and trails, or existing roads, and only where this will not cause trampling, erosion or any degradation. Limits on visitor numbers and/or control of routes and access so that zone objectives are met. Use of non-motorised canoe or flotation device on rivers can be acceptable where entry is by foot or by river from outside the zone. --- No fires No vehicle access No access without zone permit	***Visitor Management:*** Manage to conserve natural and cultural resources, ecological processes and wilderness integrity. Leave no trace ethic. Restrict numbers of visitors and allow for no-use rest periods if required. Limited management interventions. Management measures may be carried out in extreme conditions, but tread lightly principles must apply. Since visitor use cannot be intensively managed, re-route trails away from any areas with sensitive local habitats or plant and animal species. Trail layout, design and construction must reduce maintenance requirements. ***Conservation Management:*** Habitats with minimal management requirements, typically natural burning zones. Prevent or restore visible trampling or any other impact. Rehabilitate non-essential roads to natural vegetation. Re-zone essential roads out of Wilderness Zoning. ***Consumptive Use:*** Not compatible

Zone	Zone Objective	Characteristics	Visitor Activities	Facilities / Infrastructure	Visitor Access	Management Guidelines
Primitive	***Users:*** To provide an experience of solitude in natural landscapes with little nearby evidence of human presence. Can provide access to and buffer Wilderness Zones. ***Conservation:*** To limit visitor use, numbers and infrastructure to minimise impact in sensitive environments. To reduce need for management of users and visitor impacts. Allows for minimal or more intensive biodiversity management intervention. *Include extensive areas of sensitive or threatened habitats & species in this low use zone when sites do not meet the criteria for wilderness.*	Intrinsically wild appearance & character. Areas where users will seldom encounter other human groups or presence. Any visible human impact or infrastructure inside the zone is unobtrusive. Human activities outside zone may be audible or visible in places. Areas remote from management centres, or otherwise difficult or expensive to access for management. Areas that might not meet the criteria for Wilderness but can serve as undeveloped visual buffers for Wilderness. Areas that may have natural burning regimes, with no active fire management and road/firebreak infrastructure OR areas that require active fire management to stay within thresholds of concern.	Guided or unguided nature observation Primarily intended for hiking or walking access. Only allows for 4x4 routes or vehicle access if specifically considered and noted. Only allows for non-hiking accommodation node if specifically considered and noted.	Deviation from natural state to be minimised. Infrastructure should not be visible from Wilderness Zones. May provide isolated, small, unobtrusive accommodation facilities for up to 16 guests on restricted footprints, particularly for overnight hiking trails. May have defined or beaconed hiking routes, management access roads, tracks and firebreaks. All roads, tracks or trails to be located and constructed to reduce maintenance, visibility and erosion. Where un-surfaced tracks will result in erosion, use concrete strip or interlocking pavers to stabilise. Re-route unstable or erosion-prone road sections if this will lower long-term visual and environmental impact. New roads for visitor access only justified if also required for management access. Avoid wide surfaced roads or roads and tracks wider than required for a single vehicle.	Visitor access only by permit. Control of visitor numbers, frequency and group sizes to meet zone objectives. Only users of facilities/activities will access to this zone. Defined or non-defined hiking and day trail routes. On foot always. Bicycle, 2x4 or 4x4 vehicle, or horseback on designated routes only. --- No access without zone permit	***Visitor Management:*** Manage to conserve natural and cultural resources, ecological processes and wild appearance & character. Restrict numbers of visitors and allow for no-use rest periods if required. All facilities will be small, very basic, self-catering and distributed to avoid contact between users. There should be limited if any interaction between groups. Since visitor use usually cannot be intensively managed, re-route trails away from any areas with sensitive local habitats or plant and animal species. Trail layout, design and construction must reduce maintenance requirements. Visible & audible human impacts from adjacent zones should be mitigated. ***Conservation Management:*** Habitats with lower or higher management requirements. May be natural burning zones. Usually remote areas so roads and trails should be planned and constructed assuming infrequent maintenance. Prevent or restore visible trampling or any other visitor impact. Rehabilitate non-useful roads to natural vegetation. ***Consumptive Use:*** Sustainable use can be appropriate under controlled circumstances subject to a formal assessment and application in accordance with CapeNature policies.

Zone	Zone Objective	Characteristics	Visitor Activities	Facilities / Infrastructure	Visitor Access	Management Guidelines
Nature Access	***Users:*** To provide easy access to natural landscapes with low expectation of solitude at all times. Can buffer between development and wilderness or Primitive Zones. ***Conservation:*** To manage and direct visitor use, and plan infrastructure to minimise impact on sensitive environments. To actively manage users and visitor impacts. Allows for minimal or more intensive biodiversity management intervention. *Provide additional protection to localised sensitive or threatened habitats, species or other features by Special Management Overlays*	Areas with extensive lower sensitivity habitats: Areas able to accommodate higher numbers of visitors regularly, with no identified sensitive or regionally rare biodiversity. Popular view or access sites. Extensive areas able to accommodate roads, trails and tracks without high risk of erosion and degradation. Areas accessible for regular management of roads and trails. Areas where roads and trail infrastructure can be located with low visibility from the surrounding landscape, particularly from adjacent Primitive or Wilderness Zones. Usually areas that require active fire management with firebreaks to stay within thresholds of concern, but may also include natural burning regimes.	Guided or unguided nature observation. Day hiking trails and/or short trails. Bird hides, canoeing, mountain biking & rock-climbing where appropriate. Other activities if specifically considered and approved as part of specific reserve zoning scheme. Motorised 2x4 self-drive access on designated routes. No accommodation or camping. Frequent interaction with other users.	Some deviation from natural/pristine state allowed particularly on less sensitive or already disturbed/transformed sites. No accommodation; but ablution facilities may be provided. May have defined or beaconed hiking routes, tourism and management access roads, and management tracks and firebreaks. Infrastructure should be designed to reduce impacts of higher visitor numbers. Roads open to the public should be accessible by 2x4 sedan. Full width tarred or surfaced roads or roads and tracks to accommodate two vehicles are appropriate. Un-surfaced roads may be surfaced if a road planning exercise has confirmed that the location is suitable.	No special access control or permits required for this zone. Will cater for larger number of visitors than primitive zone. Vehicle access on dedicated routes, with pedestrian access from parking areas or adjacent Development Zones. On water – only non-motorised crafts allowed unless specifically noted.	***Visitor Management:*** More frequent monitoring of these areas is necessary to prevent damage or degradation. More frequent footpath maintenance must be scheduled for busy routes, with particular attention paid to use of railings or other access control to prevent damage to sensitive areas. Unless visitor access can definitely be intensively guided and managed, re-route trails away from any sensitive local habitats or plant and animal species. Trail layout, design and construction must be specified to reduce maintenance requirements under higher use. Visible & audible human impacts to adjacent Primitive or Wilderness Zones should be mitigated. ***Conservation Management:*** Habitats with lower or higher management requirements. May be natural burning zones. Prevent or restore visible trampling or any other visitor impact. Rehabilitate non-useful roads to natural vegetation. ***Consumptive Use:*** Sustainable use may be appropriate subject to a formal assessment and application in accordance with CapeNature policies.

Zone	Zone Objective	Characteristics	Visitor Activities	Facilities / Infrastructure	Visitor Access	Management Guidelines
Development – Low Intensity	***Users:*** To provide access to adjacent natural landscapes with no expectation of solitude. To provide primarily self-catering accommodation or camping. Can provide for Environmental Education accommodation and access into surrounding landscapes. ***Conservation:*** To locate the zone and infrastructure to minimise impact on sensitive environments. To actively manage users and visitor impacts on adjacent sensitive areas. *Provide additional protection to sensitive or threatened habitats, species or other features by Special Management Overlays*	Areas with existing degraded or transformed footprints. Natural or semi-natural habitats only where essential to minimise impacts over whole reserve. Areas able to accommodate high numbers of visitors regularly, with no identified sensitive or regionally rare biodiversity. Areas able to accommodate roads, trails and accommodation infrastructure without risk of erosion or degradation. Areas easily accessible from reserve management centre. Areas where risk of fire damage to infrastructure is low or can be mitigated without unacceptable impacts on surrounding environment. Areas where new infrastructure can be located with low visibility from the surrounding landscape. Areas not visible from Primitive or Wilderness Zones. Areas with available potable water, and not sensitive to disposal of treated wastewater via soak away.	Picnicking. Walking or bicycle access into adjacent areas. Self-catering accommodation and camping. Meeting, workshops or mini-conference activities for no more than the number of people that can be accommodated overnight in the zone. Can provide for Environmental Education accommodation and access into surrounding landscapes, but this must be carefully planned not to conflict with visitor use.	Reception offices. Self-catering accommodation and camping for up to 100 guests in total at any time[1] Single small lodges for up to 30 guests are permissible if all facilities are contained in a compact footprint, this represents the total accommodation for the zone, and any restaurant or catering facilities are for overnight guests only. If possible roads should be narrow with separate incoming and outgoing routes; otherwise double vehicle width roads are strongly advisable for safety and usability. Roads in this zone should be surfaced to reduce management cost and environmental impacts. Development and infrastructure may take up a significant proportion of the zone, but planning should ensure that area still provides relatively natural outdoor experience.	Motorised self-drive 2x4 sedan car access. Tour bus access. Parking areas. This zone should be used to provide parking and walk-in access for day visitors to adjacent Nature Access zone if possible.	***Visitor Management:*** Use infrastructure solutions such as railings, hard surfacing and boardwalks to manage undesirable visitor impacts. Accept negative impacts on natural habitats in this zone unless these are specifically addressed in a Special Management Overlay. Frequent footpath and road maintenance must be scheduled for high impact routes. Visible impacts to adjacent Zones should be considered and mitigated. ***Conservation Management:*** Provide access and generate revenue. Management should aim to mitigate the impacts of the high number of visitors. Largely transformed habitats with lower management requirements. Usually fire exclusion areas. Prevent or rehabilitate visible trampling or any other visitor impact. Plan for a compact overall development footprint, avoiding dispersed infrastructure that will increase fire risk and/or environmental footprint. This is most critical in fire-prone environments. ***Consumptive Use:*** Sustainable use may be appropriate subject to a formal assessment and application in accordance with CapeNature policies.

[1] Although 100 guests seem high this is in line with CapeNature sites that would fall within this zone definition, e.g. configured as 10 x 4-sleeper self-catering units and 15 campsites.

Zone	Zone Objective	Characteristics	Visitor Activities	Facilities / Infrastructure	Visitor Access	Management Guidelines
Development – High Intensity	***Users:*** To provide access to adjacent natural landscapes with no expectation of solitude. To provide low and/or higher density accommodation. May provide some conveniences such as restaurants and shops. ***Conservation:*** To locate the zone and infrastructure to minimise impact on sensitive environments. To actively manage users and visitor impacts on adjacent sensitive areas. *Provide additional protection to sensitive or threatened habitats, species or other features by Special Management Overlays*	Areas with extensive degraded or transformed footprints. Natural or semi-natural habitats only where benefits outweigh impacts. Areas able to accommodate very high numbers of visitors regularly, with no identified sensitive biodiversity. Areas able to accommodate roads, trails and accommodation infrastructure without risk. Areas easily accessible from reserve management centre. Areas where risk of fire damage to infrastructure is low or can be mitigated without unacceptable impacts on surrounding environment. Areas where new infrastructure can be located with low visibility from the surrounding landscape. Areas not visible from Primitive or Wilderness Zones. Areas with available potable water, and not sensitive to disposal of larger amounts of treated wastewater.	Restaurants and small shops. Picnicking. Walking or bicycle access into adjacent areas. Accommodation in small hotels, lodges and higher density self-catering accommodation and/or camping. Meetings, workshop or mini-conference activities for no more than the number of people that can be accommodated overnight in the zone.	High density tourism development nodes`. Modern amenities including restaurants & shops. Self-catering accommodation and camping for over 100 guests in total at any time. Lodges or small hotels. Roads in this zone must be surfaced to reduce management cost and environmental impacts. Development and infrastructure may take up a significant proportion of the zone, but planning should ensure that area still provides relatively natural outdoor experience.	Tour bus access. Motorised self-drive sedan car access. Parking areas. Air access only permitted if considered and approved as part of zoning scheme and there is no possibility of faunal disturbance.	***Visitor Management:*** Management action will focus mostly on maintenance of facilities & providing high quality experiences. Use infrastructure solutions such as railings, hard surfacing and boardwalks to manage undesirable visitor impacts. Accept substantial impact on natural habitats in this zone unless these are specifically addressed in a Special Management Overlay. Frequent landscape, footpath and road maintenance must be scheduled for high impact areas. Visible impacts to adjacent Zones should be mitigated. ***Conservation Management:*** Provide access and generate maximum revenue. Management should aim to mitigate the biodiversity impacts of the high number of visitors only in sensitive areas (if any) identified by Special Management Overlay. These are highly transformed habitats with lower management requirements. Natural fire exclusion areas. Prevent or rehabilitate visible trampling or any other visitor impact. Plan for a compact overall development footprint, avoiding dispersed infrastructure that will increase fire risk and/or environmental footprint. This is most critical in fire-prone environments. ***Consumptive Use:*** Sustainable use unlikely to be compatible.

Zone	Zone Objective	Characteristics	Visitor Activities	Facilities / Infrastructure	Visitor Access	Management Guidelines
Development - Management	Location of infrastructure and facilities for Reserve Administration & especially conservation management facilities Not compatible with tourism and tourism access.	Areas with extensive degraded or transformed footprints. Natural or semi-natural habitats only where benefits at reserve scale outweigh local impacts. Areas able to accommodate high disturbance, with no identified sensitive biodiversity. Areas providing easy access to reserve and infrastructure. Areas very close to zones requiring highest management intervention, especially Low/High Intensity Zones. Areas where risk of fire damage to infrastructure is low or can be mitigated without unacceptable impacts on surrounding environment. Areas where new infrastructure can be located with low visibility from the surrounding landscape. Areas not visible from Primitive or Wilderness Zones. Areas with available potable water, and not sensitive to disposal of treated wastewater.	n/a	Any reserve management infrastructure including offices, sheds, garages, stores, etc. Roads required to access these should be surfaced to reduce long-term maintenance costs and environmental impact. *NOTE* *Reserve administrative offices may also be located within visitor reception facilities in Development - Low/High Intensity Zones*	none	***Visitor Management:*** n/a ***Conservation Management:*** Frequent footpath and road maintenance must be scheduled for high impact routes. Accept some impact on natural habitats in this zone unless these are specifically addressed in a Special Management Overlay. Visible impacts to adjacent Zones should be mitigated. Management should aim to contain all activities within the smallest possible footprint. Largely transformed habitats with lower management requirements. Usually fire exclusion areas. Prevent or restore trampling or any other management impact. Plan for a compact overall development footprint, avoiding dispersed infrastructure that will increase fire risk and/or environmental footprint. This is most critical in fire-prone environments. ***Consumptive Use:*** Sustainable use unlikely to be possible in small zone.

Zone	Zone Objective	Characteristics	Visitor Activities	Facilities / Infrastructure	Visitor Access	Management Guidelines
Development - Production	Commercial or subsistence farming. (only applicable to privately owned & managed Contract Nature Reserves)	Areas identified for production farming. Areas with extensive degraded or transformed footprints. Natural or semi-natural habitats only when use of these areas is supported by a bioregional plan and specialist site assessment.	May allow agri-tourism	Any agricultural infrastructure.	May allow agri-tourism	Agricultural best practise to support surrounding natural areas, particularly with regard to river and wetland buffer areas.
Development – Private Areas	Private dwelling and surrounds. (only applicable to privately owned & managed Contract Nature Reserves)	Private homestead. Areas with existing degraded or transformed footprints. Natural or semi-natural habitats only when use of these areas is supported by a bioregional plan and specialist site assessment.	n/a	Dwellings and private accommodation areas. Roads to access these.	No access by the public without permission from landowner.	Should have no negative impacts on the surrounding conservation area.

Protection Zones

Zone	Zone Objective	Characteristics	Visitor Activities	Facilities / Infrastructure	Visitor Access	Management Guidelines
Species / Habitat / Cultural Protection	***Users:*** This zone's primary purpose is conservation and research. Limited tourism use only if compatible with conservation objective. ***Conservation:*** Protection of species or habitats of special conservation concern. Restrict access to prevent disturbance and/or damage.	Larger areas where uncontrolled public access is undesirable due to presence of regionally critically rare and endangered fauna, flora, habitat. Typical example would be a seabird breeding colony, particularly for threatened species.	Research. Nature observation under strictly controlled conditions only if specifically noted.	Usually none, but footpaths and tracks to allow management access may be permitted. Where visitor access is permitted, strict access control infrastructure is required to delimit access routes, and if necessary screen visitors. I.e. hides, boardwalks, screened routes, and paths with railings may be appropriate.	Public / Tourism access normally not allowed. May be permitted under very tightly controlled conditions, to be determined per site.	***Visitor Management:*** Prevent visitor access or restrict numbers of visitors and allow for no-use rest periods if required. Infrastructure layout, design and construction must be designed and maintained to highest environmental standards. ***Conservation Management:*** Feature specific – as required. Prevent any negative impacts on identified feature/s. Consider removal and/or rehabilitation of non-essential infrastructure. ***Consumptive Use:*** Not compatible.

Special Management Overlays

Special management overlays provide an indication of areas requiring special management intervention within the above zones. Overlays would typically only be applied where zoning does allow visitor or management access, but special measures are required, particularly to ensure protection of important and sensitive features or sites. Overlays should include specific indication of permitted activities, access, facilities/infrastructure and management guidelines that differ from the rest of that zone. Overlay requirements can be flexible, adapted to the requirements of the feature/s they protect.

Overlay	Overlay Objective	Characteristics	Visitor Activities	Facilities / Infrastructure	Visitor Access	Management Guidelines
Cultural	Protection of localised identified important Cultural Feature.	Can overlap any zone. Permanent, temporary or temporal zone to manage important cultural or heritage features.	Specific activities dependent on ability to manage activity and feature in question.	Usually none, but specific infrastructure dependent on feature in question.	Specific access dependent on ability to manage access and feature in question.	Feature specific – as required.
Species / Habitat	Protection of localised identified important Biodiversity Feature	Can overlap any zone. Permanent, temporary or temporal zone to manage important and sensitive species and/or habitats. Typically only applied where visitor impacts are expected.	Specific activities dependent on ability to manage activity and feature in question.	Usually none, but specific infrastructure dependent on feature in question.	Specific access dependent on ability to manage access and feature in question.	Feature specific – as required.
Visual	Protection of sensitive view sheds and particularly for Wilderness Zone view sheds.	Can overlap any zone. Sensitive view sheds and particularly for areas within Wilderness Zone view sheds.	Specific activities dependent on ability to manage activity and feature in question.	No roads, firebreaks or buildings. No visible infrastructure. Trails may be appropriate.	Walking access likely to be appropriate.	Feature specific – as required.
Natural Resource Access	Access to identified sustainable consumptive use resources as per a resource management plant.	Can overlap any zone except Wilderness and Protection zones. Areas with identified natural resources formally assessed as not sensitive to harvesting and where an approved sustainable harvesting plan is in place.	Harvesting of identified resources.	None	Specific access dependent on feature in question.	Feature specific – as required.

Research is usually permissible in all zones, except Species/Habitat protection or Cultural Protection where it may be restricted. Research that requires destructive harvesting or manipulation of more than a few square metres of habitat should not be considered in any of the Protection overlays, except where research outputs are considered essential for management of that ecosystem, research cannot be done at an equivalent site elsewhere, and research results are certain to contribute substantially to management objective.

Kammanassie Nature Reserve Zonation – Description

For a detailed description of process and outputs, including the underlying reserve Sensitivity Analysis, please refer to the report *Conservation Development Framework: Kammanassie Nature Reserve* (Kirkwood in prep.) which includes full descriptions of the Sensitivity and Opportunity Analysis, Zonation and Infrastructure Development Plan process and outputs.

Key drivers:

- Kammanassie is a medium sized 27 055.5 ha, remote and inaccessible nature reserve.
- Most vegetation types represented in the reserve are Least Threatened and well protected, except for small areas of Vulnerable Olifants River & floodplain vegetation (Vlok *et al.* 2005; Little Karoo Ecosystem Status, Reyers & Vlok 2008). The reserve and surrounding private lands provide critical habitat for Critically Endangered Cape Mountain Zebra.
- Kammanassie currently has no tourism accommodation and is not open to the general public, and no tourism development here is identified in CapeNature's Tourism Strategy.
- Kammanassie does not have an on-reserve management centre.
- Kammanassie has extensive areas with no sight of any human infrastructure that can provide a true Wilderness experience.

The reserve is therefore zoned to reflect limited tourism potential due to its relative remoteness and difficult access, and to allow for protection of the wilderness character of the reserve. Zones adhere to CapeNature's standard zonation scheme – please refer to this for full zone descriptions.

Primitive Zone: The 19 084.5 ha. zoned Primitive Zones allows for high habitat protection, and limited infrastructure development and access such as for overnight hiking in small groups. Primitive Zones allow establishment of remote small lodges for up to 16 guests, but do not allow for day visitor access.

Wilderness Zone: 7 971.0 ha. towards the west is zoned Wilderness Zone with entirely natural and wild viewsheds, and where no built infrastructure, roads or vehicular access is permitted. While the east of the reserve also contains further areas with true wilderness character, these are fragmented and cannot provide a large continuous wilderness area.

Other Zones: The reserve has lower day to day management access requirements, and no day visitor access is proposed, therefore Development – Management Zones and Development – Low Intensity Zones are not required.

Infrastructure Development Plan

- **Tourism Infrastructure - accommodation**

Due to the inaccessibility and remoteness from major centres or tourism nodes, and the absence of an on-reserve management centre, no tourism development to be run by CapeNature is proposed. Development of a small lodge for up to 16 guests within the primitive zone at existing huts at Buffelsklip (33° 34' 03.88"S, 22° 53' 22.22"E) could provide access and some income if run as a concession or public private partnership by the

neighbouring private landowner. This is appropriate within the reserve zoning, and at this site on the reserve periphery if access is provided on existing roads via private land. It is noted that the proposed site is thought to be inside the reserve boundary, but is shown as outside by available Surveys and Mapping cadastral data. The reserve boundary would have to be confirmed by a formal survey before any process could be initiated.

- **Tourism Infrastructure – access, roads and trails**

No day visitor access is contemplated, current roads network is to be maintained as is, with no new road or trail infrastructure currently proposed. Reserve zoning does allow for development of overnight hiking trails, with hiking huts only in Primitive Zones, but currently no development of such is contemplated.

- **Management Infrastructure**

The existing road and trail network provides adequate access for required management and monitoring activities.

- **Decommissioning of obsolete infrastructure and site rehabilitation**

No decommissioning of infrastructure is required.

It is noted that any infrastructure development may require environmental authorisation in terms of NEMA EIA regulations and other legislation , and no activity may proceed without written evaluation of the requirements, and if necessary, any necessary authorisations.

5.3 Access

The reserve can be accessed at several points. The Kleingeluk and Buffelsklip access points are for CapeNature management purposes only. The Vermaaksrivier access is for the Oudtshoorn Municipality, the Department of Water Affairs and CapeNature. The Bergplaas, Buffelsdrift and Rooiplaas access points are restricted to private landowners and CapeNature. All access points have gates which are locked**.** There is no access for tourism.

5.4 Concept Development Plan (CDP)

Other than the maintenance of existing infrastructure on the reserve, no new developments are planned for the period of this management planning phase.

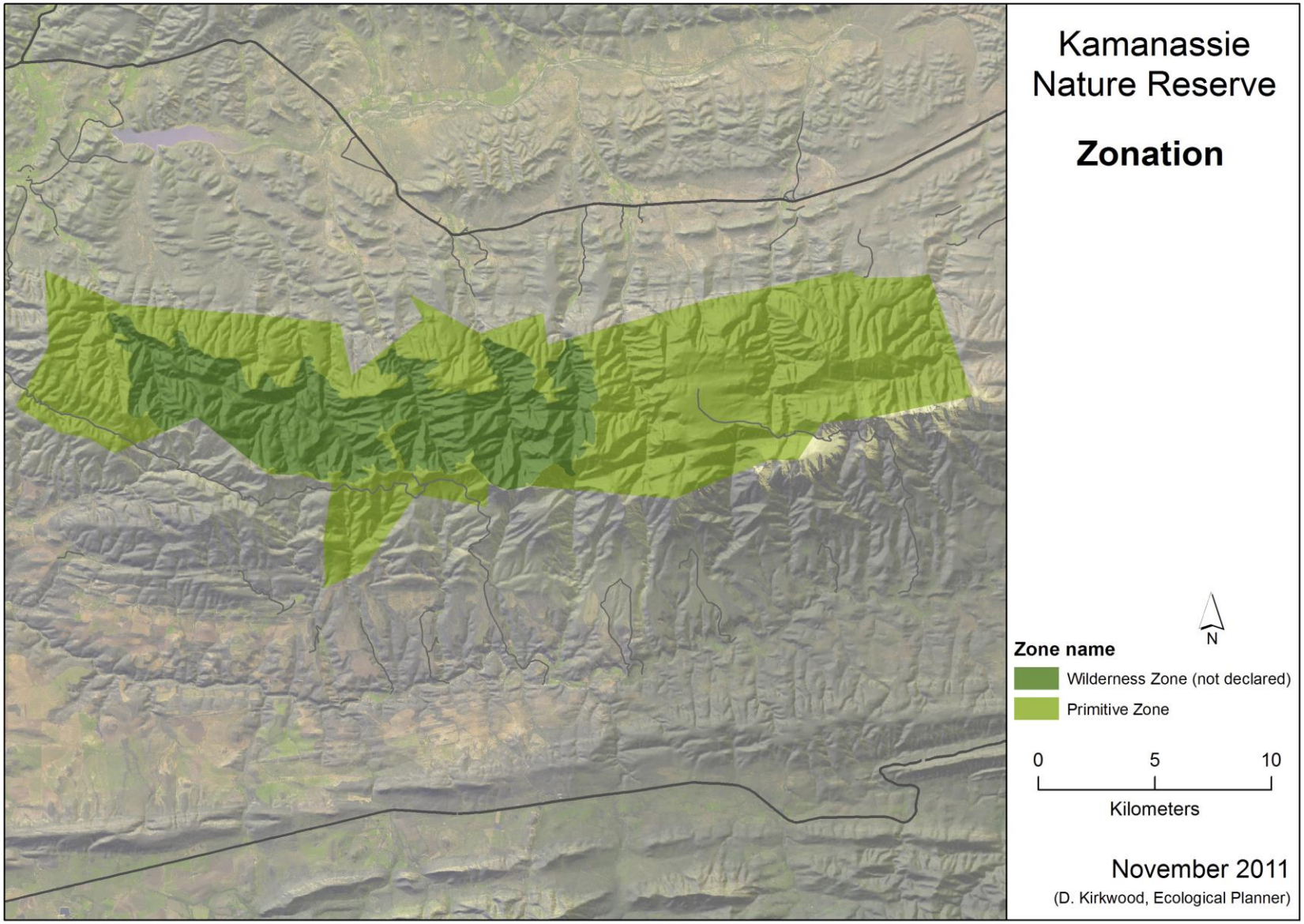

Figure 16: Zonation of the Kammanassie Nature Reserve.

SECTION 6: RESERVE EXPANSION STRATEGY

6.1 PROTECTED AREA EXPANSION

6.1.1 Introduction

The establishment and management of a provincial protected area system which is aligned with the National Protected Area Expansion Policy, is a key strategic approach to the conservation of the globally significant biodiversity of the Western Cape. Several conservation planning initiatives, have been, and will in future be used to inform a consolidated Provincial Protected Area Expansion Strategy.

The strategy aims to guide expansion priorities which contribute towards meeting national and provincial biodiversity targets [2] and national and provincial protected area targets[3].

Several mechanisms are available for the expansion of Protected Areas in order to meet both biodiversity and Protected Area targets. A further requirement in order to adequately manage these Protected Areas is the establishment and management, co-management or management guidance of buffer areas. Protected Area expansion and buffer area management, although closely linked, will be dealt with as two distinct activities.

6.1.2 Spatial Focus

The National and Provincial Protected Area network was assessed at a broad scale by the National Spatial Biodiversity Assessment (NSBA, now NBA) and the National Biodiversity Framework (NBF). The NBA (Driver *et al.* in prep.) identified crucial freshwater, estuarine and marine conservation priorities to inform the Protected Area Expansion strategy for the Western Cape.

The CapeNature Protected Area Expansion Strategy and Implementation Plan 2010-2015 (Purnell *et al.* 2010) makes use of the Conservation Action Priorities (CAP) Map to drive Protected Area expansion within the province. The CAP Map is in turn derived from the municipal Critical Biodiversity Areas (CBA) Maps of the province. These CBA Maps are based on systematic biodiversity planning and identify those areas required to meet the national and provincial biodiversity targets.

The CBA map for the Kammanassie Nature Reserve and surrounding areas is presented in Figure 16.

6.1.3 Protected Area Expansion Mechanisms

Several mechanisms (Table 6.1) are available for the expansion of Protected Areas in order to meet both biodiversity and protected area targets and are linked to land ownership and tenure.

[2] Biodiversity targets refer to how much of a biodiversity feature should be protected in order for it to persist.
[3] Protected Area targets refer to the area of land which should be represented in Protected Areas by a certain date

Table 6.1 is an extract from the National Protected Area Expansion Policy and is relevant to CapeNature (South African National Biodiversity Institute and Department of Environmental Affairs 2010)

Table 6.1: Mechanism for protected area expansion.

Mechanism	Implementation options	Land ownership and tenure
1. Declaration of public land available for conservation	i) Allocate unvested / unallocated national state land to the conservation agency	State (national)
	ii) Re-allocate national state land from a responsible national organ of state to the conservation agency	State (national)
	iii) Lease national state land under communal tenure to the conservation agency	State (national) Communal tenure
	iv) Dispose of provincial state land to the conservation agency	State (provincial)
	v) Allocate, sell, lease or contract non-state, public land to the conservation agency	Non-state public land (local authorities, public entities, government enterprises)
2. Acquisition of land	i) Land donation	Private
	ii) Land purchase	Non-state public land Private land
	iii) Property lease	State (provincial) Private land State (national) under communal tenure
	iv) S23 Contract nature reserve / protected environment with title deed restrictions	Private land
3. Negotiation of contractual arrangements with landowners	v) Contract nature reserve / protected environment	Private land State (national) under communal tenure Non-state public land
4. Regularizing the protected area status of existing conservation areas within the informal conservation area system.	vi) Statutory informal conservation areas	Private land State (national) State (provincial) Non-state public land
	vii) Non-statutory informal conservation areas	Non-state public land Private land

6.1.4 CapeNature's Strategic Approach to Protected Area Expansion in the Western Cape

6.1.4.1 Spatial Focus

The Conservation Action Plan (CAP) map is the primary informant to the expansion priorities for CapeNature. This product is informed by the Critical Biodiversity Areas (CBA) Maps. These CBA Maps are all biodiversity driven and CapeNature will unreservedly pursue priorities based on biodiversity net gain. Properties which have cultural, archaeological and paleontological features will only be evaluated in the context of a sites biodiversity importance.

6.1.4.2 Primary Mechanisms for CapeNature

The following mechanisms, dependant on landownership scenarios for properties, will be used by CapeNature in the immediate future:

i. Declaration of Provincial Nature Reserves on state owned land.
    a. CapeNature as management authority.
    b. Co-management agreement with another organ of state.
    c. Another organ of state delegated as management authority.
ii. Declaration of S23 Nature Reserves on private land as per the stewardship protocol.
iii. Biodiversity Agreements (including those with "in perpetuity" title deed restrictions usually also zoned Open Space III Nature Reserve).
iv. Declared Protected Environments (preferably with title deed restrictions in perpetuity or at least 30 years).
v. Donation of land which contributes significantly to both biodiversity and protected area targets.
vi. Purchase of land of biodiversity significance either with state or donor funds.

6.1.4.3 Implementation Phases

a. Annual Expansion plan is spatially depicted per CapeNature business area or conservation region;
b. Five Year Plan (revised at end of Medium Term Expendiiture Framework (MTEF) three year cycle); and
c. 20 Year Plan.

6.1.4.4 Planning and Implementation Review Protocol

Annual and 5-year Protected Area expansion plans at the CapeNature business area level will be reviewed by an appropriately constituted panel. This is in order to verify biodiversity and other strategic gains and to consolidate a provincial plan for CapeNature for executive approval. All sites identified for Protected Area expansion will be assessed using the appropriate site review process. These site assessments will be evaluated by the Protected Area Expansion Review Panel (appropriate management and scientific representation being a pre-requisite). A site assessment protocol will be provided (using refinements from the draft land acquisition policy and the stewardship site assessment template as well as Protected

Areas and their expansion by other agencies e.g. SANParks and DEA: Oceans and Coast and Department Agriculture Forestry and Fisheries).).

6.1.5 Financial Plan for Protected Area and Buffer zone expansion

Should CapeNature be the management authority of a stewardship site as per agreement with the private landowner then the details of this budget should be reflected in the respective management plan whether it is an extension of one of CapeNature's own reserves or a Nature Reserve in its own right which will require a management plan approved by the Provincial Minister: Environmental Affairs and Development Planning.

6.2 BUFFER ZONES

The term "buffer zone" is widely used in the context of the conservation of biodiversity, and is usually used to denote some sort of spatial protection mechanism. The configuration and extent of, and "restrictions" applied to a particular buffer zone may vary considerably depending on the attributes that require protection, and the nature of the "threat/s".

World Heritage Sites (WHS) are designed to recognise and protect areas of "Outstanding Universal Value" (OUV) to humanity, both cultural and natural. Biosphere Reserves are designed to conserve for use by mankind, the diversity and integrity of biotic communities within natural and semi-natural ecosystems and to maintain genetic diversity; to provide areas for research and facilities for research and training. Thus the difference is that WHS have to have OUV and Biosphere Reserves may not. Both however have "buffer zones".

WHS "buffer zones" are clearly delineated area) outside a World Heritage property but adjacent to its boundaries which contribute to the protection, management, integrity, authenticity and sustainability of the OUV of the WHS. Although World Heritage "buffer zones" are not regarded as part of the inscribed WHS, their boundaries and relevant management approaches are evaluated, approved and formally recorded at the time they are proposed by a state party. Where "buffer zones" are defined, they should be seen as an integral component of the state party's commitment to the protection and management of the WHS. The functions of the buffer zone should reflect the different types and levels of protection needed to protect the OUV of the WHS. Biosphere Reserve "buffer zones" are typically arranged concentrically around the core areas to which they provide protection by restricting potentially detrimental activities and promoting wise utilisation.

Due to the importance and distribution across the landscape of the biodiversity of the Cape Floral Region, several "buffering mechanisms" have been developed to ensure the long term persistence of both pattern and process, as well as to provide mitigation for global climate change. These "buffering mechanisms" are often overlapping, always mutually supportive and continuously evolving and expanding. These buffering mechanisms include but are not restricted to, declared private Mountain Catchments Areas, Biosphere Reserves, corridor initiatives and stewardship agreements. It is from these "buffer zones" that most, but not all, stewardship sites are likely to come. It is also important to bear in mind that local development plans need to take into account the buffering requirements of protected areas.

6.3 EXPANSION OPPORTUNITIES

The CapeNature Protected Area Expansion Strategy and Implementation Plan (Purnell *et al.* 2010) document describes an implementation plan and explicit spatial targets for the next 5 year period for the Biodiversity Stewardship Programme. It also describes the current approach to land acquisition, and how explicit spatial targets and a funding and implementation strategy will be developed for this mechanism. The CapeNature Protected Area Expansion Strategy and Implementation Plan therefore provide a provincial framework for an integrated and coordinated approach to:

- the expansion of Protected Areas to allow for the protection of biodiversity and persistence of ecological services; and
- the securing of landscape corridors to facilitate climate change adaptation.

No priority properties were identified for the Klein Karoo area in the CapeNature Protected Area Expansion Strategy (Purnell *et al.* 2010). Protected Area expansion for the Kammanassie Nature Reserve will be focused on securing declared private Mountain Catchment Areas adjacent to the Kammanassie Nature Reserve, and the existing stewardship sites.

Expansion of the reserve into the areas adjacent to the reserve is required in order to mitigate the shortage of suitable habitat for the Cape Mountain Zebra which is presently the case. Watson and Chadwick (2007) found that the Cape Mountain Zebra on the Kammanassie Nature Reserve require habitats with relatively high abundance of palatable grass species, such as Renosterveld, Waboomveld and Arid Restioid habitats. Of these, the Renosterveld habitat rated best for Cape Mountain Zebra. These habitats are mainly located on the lower slopes and foothills of the Kammanassie Mountain where the soils are nutrient-rich. Therefore it is essential to focus reserve expansion at increasing the size of optimal habitat for the Cape Mountain Zebra.

The CBA map compiled for the Oudtshoorn, Kannaland and Uniondale areas (Skowno *et al*. 2010) does include the declared mountain catchment land and optimal Cape Mountain Zebra habitat in and around the Kammanassie Mountains (Figure 16).

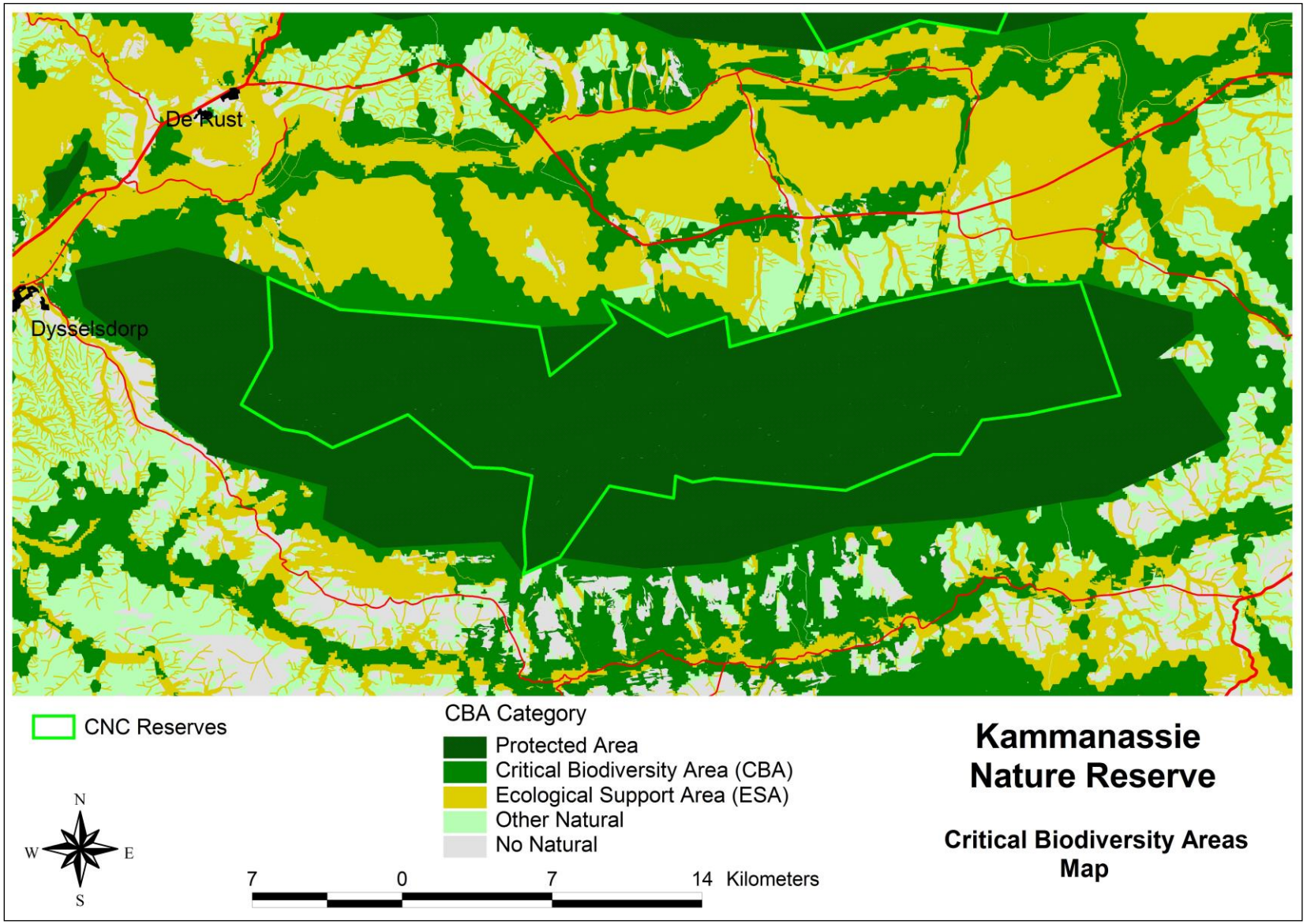

Figure 17: Map showing the Critical Biodiversity Areas adjacent to Kammanassie Nature Reserve (Skowno *et al*. 2010).

PART 3

SECTION 7: STRATEGIC IMPLEMENTATION FRAMEWORK

7.1 MANAGEMENT PROGRAMMES

7.1.1 Legal Status and Reserve expansion

The Kammanassie Nature Reserve (Kammanassie Nature Reserve) is classified as a State Forest Nature Reserve and consists of the following State properties:

1. Farm 61	1982/1878
2. Portion 4 of Piets Laagte 67	T16652/19717298/1970
3. Vermaaks Rivier 125	OUQ2-3/18832650-1911
4. Kammanassieberg Forest Reserve 57	No title deed
5. Paardeberg 58	T18360/19731983/1878
6. Portion 1 of Solomons Kraal 74	T10693/19859907/1983
7. Roode Els Kloof 126	T2372/19621986/1878
8. Kleinberg 128	2649/1911
9. Paarde Kloof 127	T10663/19701851/1855
10. Elands Vlakte 7	7831/1985954/1878
11. Upper Diep Kloof 6	T27831/19853353/1878

The Kammanassie State Forest Nature Reserve will be proclaimed as a Protected Area under the National Environmental Management: Protected Areas Act, Act No. 57 of 2003.

7.1.2 Legislation

- National Environmental Management: Protected Areas Act, (Act No. 57 of 2003) (NEM: PAA)
- National Forest Act, (Act No. 84 of 1998)
- Mountain Catchment Areas Act, (Act No. 63 of 1970)
- Nature Conservation Ordinance, (Ordinance No. 19 of 1974)

All parcels of land of the Kammanassie Nature Reserve need to be consolidated and awarded secure conservation status in terms of the NEM: PAA.

Section 9 of the NEM: PAA recognises the following kinds of protected areas:

- Special Nature Reserves, National Parks, Nature Reserves (including Wilderness Areas) and Protected Environments
- World Heritage Sites
- Specially protected Forest Areas, Forest Nature Reserves and Forest Wilderness Areas declared in terms of the National Forests Act, (Act No. 84 of 1998)

- Mountain Catchment Areas declared in terms of the Mountain Catchment Areas Act, (Act No. 63 of 1970).

Section 12 of the NEM: PAA, recognises a Protected Area which immediately before this section took effect was reserved or protected in terms of provincial legislation for any purpose for which an area could in terms of this Act be declared as a Nature Reserve or Protected Environment, must be regarded to be a Nature Reserve or Protected Environment for the purpose of this Act, including Provincial Nature Reserves (including islands) established in terms of the Nature Conservation Ordinance 19 of 1974.

7.1.3 Guiding Principles

- Reserve management will ensure the reserve is awarded secure legal status according to NEM:PAA.
- Reserve management will ensure that the reserve boundaries are clearly demarcated and known to local residents.
- Reserve management shall identify and prioritise parcels of land, public and private, to be incorporated into the reserve through an on-going systematic, defensible and socially acceptable procedure in accordance with CapeNature Protected Area Expansion Strategy and Implementation Plan 2010-2015.
- Reserve management shall strive to seek the incorporation of identified land parcels at the lowest possible financial, social and ecological net cost to the reserve.
- Reserve management shall continue to work together with private, public, and communal landowners, to enable the donation, purchase and contracting-in of conservation worthy land into the reserve in accordance with the CapeNature Protected Area Expansion Strategy.
- Reserve management shall, with the co-operation of stakeholders, strive to prevent any fragmentation of the reserve and of areas that have been identified for inclusion into the reserve.

7.1.4 Management Actions

Refer to Table 7.1

7.1	LEGAL STATUS AND RESERVE EXPANSION				
Objective 3 **Objective 4**	To secure the conservation estate. To expand the conservation estate.				
Key Deliverables	**Management/Monitoring Activities**	**Responsibility**	**Indicators**	**Timeframe**	**Reference to Existing Procedures**
1. The KNR has secure permanent legal conservation status in terms of NEM: PAA.	• Formalise legal status of State Forest Land. • Formalise legal status of all Kammanassie RSA cadastral properties by including proclamations in management plan. • The KNR is listed in the National Register as required by the Protected Areas Act.	Law Administration Support Section; Conservation Manager; Area Manager; Executive Director: Operations	The KNR is legally secure.	Year 1-5	NEM:PAA
2. The KNR boundary is known and appropriately demarcated and secure.	• Survey boundaries for inclusion in proclamations. • Investigate instances where deviations from the reserve boundary occur and implement strategies to rectify. • Compile an MOU with the landowners who have part share in the properties Paardenberg 58 (0.25%) and Paardekloof 127 (0.1%) to secure landuse protection of these portions of land.	Conservation Manager; Law Administration Support		Year 1-5	
3. A buffer zone for the KNR has been established.	• Engage with Private Mountain Catchment landowners to secure acceptable landuse management practices on the catchment.	Conservation Manager	Sound land use practices being implemented.	Year 1-5	Mountain Catchment Areas Act, (Act No. 63 of 1970).
4. To consolidate all possible land within the KNR, as well as other identified conservation-worthy areas adjacent to and contiguous with the reserve as identified.	• Identify potential stewardship agreements with the surrounding landowners in line with CNPAES. • Ensure local strategy for Kammanassie expansion is included in CNPAES. • Maintain stewardship agreements with neighbouring landowners. • Continue with the Stewardship plan to include the DMC areas into stewardship agreements. • Expand the reserve to include priority conservation areas (CBA's). • Continue with World Heritage Site serial extension nomination.	Conservation Manager; Conservation Services Manager; Scientific Services: Biodiversity Manager; Gouritz Stewardship Manager.	- Hectares added to the conservation estate. - Cape Mountain Zebra population increased to 150 animals. - Impractical Reserve boundary. configuration mitigated and improved through Stewardship and agreements.	Year 1-5	CapeNature Protected Area Expansion Strategy and Implementation Plan 2010-2015. DEA (in prep). Extension nomination for the Cape Floral Region Protected Areas World Heritage Site. Compiled for Department of Environmental Affairs, South African National Parks, Western Cape Nature Conservation Board and the Eastern Cape Parks and Tourism Agency. For submission to UNESCO.

Budget Allocation	**Development**	
	Operation (5 Year Forecast)	R252 166

7.2 REGIONAL INTEGRATED PLANNING AND COOPERATIVE GOVERNANCE

7.2.1 Legislation

The new Constitution (Constitution of the Republic of South Africa Act, (Act No. 108 of 1996), adopted in 1996, includes a South African innovation: a chapter on 'cooperative government', which aims to ensure good relations between South Africa's three spheres of government, i.e. national, provincial and local. This is encapsulated in the Intergovernmental Relations Framework Act, (Act No. 13 of 2005).

It is therefore essential that co-operative relationships are maintained and improved with all spheres of government and stakeholders and that all directly or indirectly contribute to the attainment of the vision and objectives of the Kammanassie Nature Reserve. The same applies to regional planning and initiatives within the province.

7.2.2 Guiding Principles

- Reserve Management shall co-operate with national, provincial and local government and stakeholders in strategic conservation initiatives aimed at conserving conservation-worthy areas adjacent, or related, to the reserve.
- Reserve Management, together with relevant authorities, shall strive to integrate planning and development in areas of their respective control.
- Reserve Management shall, in co-operation with the local and provincial authorities, strive to avoid further fragmentation of contiguous natural areas within and adjacent to the reserve.
- Reserve Management shall co-operate with other conservation initiatives adjacent to the reserve, especially where these are contiguous with the reserve.

7.2.3 Management Actions

Refer to Table 7.2.

7.2	REGIONAL INTEGRATED PLANNING AND COOPERATIVE GOVERNACE				
Objective 3 Objective 4	To secure the conservation estate. To expand the conservation estate.				
Key Deliverables	**Management/Monitoring Activities**	**Responsibility**	**Indicators**	**Timeframe**	**Reference to Existing Procedures**
5. The KNR is integrated into land-use planning outside of the nature reserve.	• Integrate with the SDFs and IDP's of the district and local municipalities.	Conservation Management, Regional Ecologist, Community Conservation.	The protected area is integrated into land-use planning outside of the protected area.	1-5 years.	Municipal Systems Act. GCBR technical committee
6. Water-use planning outside the KNR takes into account the objectives of the nature reserve.	• Attend regular meetings with water user's association re groundwater abstraction. • Continual monitoring of the groundwater abstraction by KKRWSS. • Attend regular meetings with Oudtshoorn Municipality re groundwater abstraction from KKRWSS. • Elevate level of interaction with authorities regarding water abstraction. • Monitoring of private water-usage from around the Kammanassie Mountain. • Monitoring of seeps and springs (see also 7.3).	Reserve Management, Community Conservation. Area Manager, Regional Ecologist.	- Stakeholders informed on and involved in issues within the reserve. - Groundwater abstraction impacts recorded and analysed – report produced. - Regulation of water abstraction formalised and implemented. - Environmental Reserve for groundwater abstraction determined and implemented.	1-5 years.	PAAC; GCBR Forum; Inter Governmental Committee
7. Establish a functioning Advisory committee for the KNR.	• Schedule and hold PAAC meetings. • Maintain open communication and trust between neighbouring communities and protected area management.	Reserve Management, Community Conservation	Advisory committee for the KNR has been established, is functioning and effective. Access to the reserve controlled and regulated through agreements and commitment of direct neighbours. Reduction in neighbour/Reserve conflict [grazing access, fires] quantifiable.	1-5 years.	Ref Section 10.1.3; Draft regulations for proper the administration of nature reserve (2009).

Budget Allocation	**Development**	
	Operation (5 Year Forecast)	R252 166

7.3 ECOSYSTEM AND BIODIVERSITY MANAGEMENT

The conservation of the biodiversity and ecosystem processes of Kammanassie Nature Reserve is the primary objective in the management of the area and is pivotal, not only in terms of its intrinsic values but because many economic activities are based on healthy and functioning natural ecosystems. Any and all use of natural resources must be sustainable and applied in accordance with the CapeNature Utilisation Policy.

7.3.1 Legislation

Although all legislation mentioned in Part 1 can be applied, the following is specific to the conservation of biodiversity:

- National Environmental Management Act, (Act No. 107 of 1998)
- National Environmental Management Biodiversity Act, (Act No. 10 of 2004)
- National Environmental Management: Protected Areas Act, (Act No. 57 of 2003)
- Conservation of Agricultural Resources Act, (Act No. 43 of 1983)
- Western Cape Nature Conservation Board Act, (Act No. 15 of 1998)
- Nature Conservation Ordinance, (Ordinance No. 19 of 1974)
- Threatened or Protected Species Regulations, 2007
- Draft Alien and Invasive Species Regulations, 2009
- CITES Regulations, 2009
- NEM:PAA, (Act No. 57 of 2003) Regulation 99: Proper administration of nature reserves (Government Gazette No. 35021 February 2012).
- Norms and Standards for the compilation of Biodiversity Management Plans for Species (BMP-s) in terms of NEM: BA
- Draft Norms and Standards for the management of protected areas in South Africa in terms of NEM: PAA

7.3.2 Guiding Principles

- Biodiversity resources must be conserved at landscape, community and species levels in the short to long term and the reduction of population levels of individual species, or the extinction of any species, as a result of human activity, must be prevented.
- Adequate management attention must be given to maintaining and improving, where relevant, the status of endemic, rare or threatened species (species of special concern).
- The unintentional introduction into the reserve of all extra-limital plants or plant materials must be controlled.
- Any extra-limital (alien) species currently present must be controlled with the aim of eradication from the reserve.
- An active adaptive management, minimum intervention approach, based on scientific evidence will be followed.
- The quantity, quality and reliability of water required to maintain the ecological functions on which humans depend shall be conserved so that the human use of water does not

individually or cumulatively compromise the long term sustainability of aquatic and associated ecosystems.

- Water quality and quantity are interdependent and shall be managed in an integrated manner, which is consistent with broader environmental management approaches.
- Water quality management options shall include the use of economic initiatives and penalties to reduce pollution; and the possibility of irretrievable environmental degradation as a result of pollution shall be prevented.
- Water resource development and supply activities shall be managed in a manner which is consistent with the broader national approaches to environmental management.
- Water management issues must be integrated into local catchment management authorities' activities.
- The knowledge base available to the reserve will be promoted and developed to support applied and other research.
- Research cooperation and collaboration partnership will be established and maintained.
- All research carried out on CapeNature reserves require permits.

7.3.3 Threats to Biodiversity and Ecosystems

- Possible over-abstraction and contamination of groundwater.
- Poaching/illegal harvesting.
- Susceptible to invasive alien flora.
- Uncontrolled and out of season fires.
- Floods.
- Biodiversity crime.
- Extra-limital game species introduction on neighbouring properties.
- Fencing off of neighbouring properties.
- Climate change.
- Inappropriate agricultural activities adjacent to the reserve.
- Limited protected habitat for Cape Mountain Zebra.
- Grazing of neighbouring landowners' livestock on reserve.

7.3.4 Management Actions

Refer to Table 7.3.

7.3	**ECOSYSTEM AND BIODIVERSITY MANAGEMENT**				
Objective 1 Objective 2	To conserve the natural ecosystems. To manage the conservation estate effectively.				
Key Deliverables	Management/Monitoring Activities	Responsibility	Indicators	Timeframe	**Reference to Existing Procedures**
8. Compile an Ecological Plan of Operation and Ecological Matrix for KNR.	• Develop and implement an approved Ecological Matrix for the KNR. • Collate all relevant monitoring and research protocols and data sheets to inform the Ecological Plan of Operations. • Compile an Ecological Plan of Operations to support the Ecological Matrix.	Conservation Manager, Ecological Coordinator, Regional Ecologist.	Ecological Matrix. Ecological Plan of Operations.	1-5 years.	Ecological Matrix format. Ecological Plan of Operations format.
9. A biodiversity resource inventory for the KNR is in place.	• Prioritisation of species for inclusion on the Ecological Plan of operation. • Collect species data and submit to Scientific Services. • Analyse data, re-assess and implement adaptive management strategies. • Hard and digital copies of all documents and publications resulting from all monitoring and research in the reserve must be catalogued and stored at the KNR office with backup copies sent to Scientific Services.	Conservation Manager, Ecological Coordinator.	SOB database updated.	1-5 years.	Baseline data collection and monitoring manual (2010)
10. A monitoring programme for the KNR is being implemented.	• Review monitoring protocols. • Identify monitoring needs of the reserve in consultation with Scientific Services. • Establish indicators for monitoring. • Implement monitoring activities as per the Ecological Matrix. • Report on monitoring activities as per the Ecological Matrix. • Analyse data, re-assess and implement adaptive management strategies. • Implement matrix and other relevant monitoring of national projects and/or programmes. • Collection of climatic data on the KNR.	Conservation Manager, Ecological Coordinator, Regional Ecologist, Manager: Scientific Services.	The KNR will annually indicate an upward trend in METT-SA score. 100% of actions identified in the integrated auditing system will be implemented.	1-5 years.	Baseline data collection and monitoring manual (2010). METT-SA scoring process. Eco-Auditing system.
11. A research programme for the KNR is being implemented.	• Identify research needs for the reserve. • Develop and implement an applied research programme for the reserve in consultation with Scientific Services.	Conservation Manager, Ecological Co-ordinator, Regional Ecologist, Senior Manager: Scientific Services		1-5 years.	CN research needs list; Fynbos Forum research strategy, CN permitting

Key Deliverables	Management/Monitoring Activities	Responsibility	Indicators	Timeframe	**Reference to Existing Procedures**
	• Results of research projects are fed back to the management of the reserve. • Results are used to adapt management of the nature reserve where relevant.				procedure.
12. The KNR contributes to the maintenance of ecosystem services.	• Design and implement appropriate fire (Refer to Table 7.5) and alien invasive management (Refer to Table 7.6) programmes. • Conduct a roads and footpath assessment. • Close and rehabilitate inappropriate roads within the reserve.	Conservation Manager, Catchment Manager, Programme Manager: AVM, Ecological Co-ordinator, Regional Ecologist, Project Manager, Area Manager.	Fire break, road, footpath, fence register and database compiled. Alien density database updated. Annual AVM APO. Annual roads and footpaths APO. Potential erosion substrates mapped. Map of erosion sites. Site specific erosion stabilisation and rehab plans compiled. Mitigation measures implemented and monitored. See Table 7.2.2	1-5 years.	ICM, AVM APO's, CapeNature Fire Policy Version 8.
13. Prevent and mitigate soil erosion on the KNR.	• Through regular monitoring identify areas that require stabilisation and remediation. • Map and ensure photo's available. • Compile an erosion maintenance plan. • Monitor the affectivity of the erosion control mitigation. • Monitor cost effectiveness of maintenance. • Monitor site recovery.	Conservation Manager, Ecological Co-ordinator, Catchment Manager.		1-5 years.	ICM APO, Ecological Plan of Operations, Eco-Matrix.
14. Mitigate the impacts of groundwater abstraction on the reserve.	• Continual monitoring of the groundwater abstraction by KKRWSS. • Attend regular meetings with Oudtshoorn Municipality re groundwater abstraction from KKRWSS. • Monitoring of private water-usage from around the Kammanassie Mountain. • All existing data regarding water extraction to be collated. • Inter-governmental interaction regarding over-abstraction of groundwater from the Kammanassie to be elevated to higher level. MOU between Oudtshoorn Municipality, DWA and CapeNature needs to be established. • Environmental reserve for groundwater abstraction to be determined and implemented. • Progress towards compiling a management plan for Vermaaks River including rehabilitation and the removal of existing waste (cement, pipes etc.). • Determine CapeNature responsible section/individuals.	Conservation Manager, Area Manager Karoo, Scientist: Aquatic.		1-5 years.	Baseline data collection and monitoring manual (2010), National Water Act; CapeNature Policy on groundwater abstraction for bulk supply purposes.

Key Deliverables	Management/Monitoring Activities	Responsibility	Indicators	Timeframe	**Reference to Existing Procedures**
	• Continue with existing spring monitoring projects.				
15. Conserve and protect rivers.	• Monitor health of rivers using SASS5. • Determine any actions necessary as a result of SASS results.	Conservation Manager, Ecological Coordinator, Aquatic Scientist.		1-5 years.	
16. Rehabilitate and conserve wetlands.	• Identify and map all wetlands and seeps. • Identify wetlands and seeps potentially impacted by groundwater abstraction. • Monitoring of seeps and springs.	Conservation Manager. Regional Ecologist. Ecological Coordinator.		1-5 years.	Working for Wetlands protocols
17. The protection of flora species of conservation concern.	• Identify species and localities of populations on the KNR. • Conduct monitoring of populations of plant species of conservation concern on the reserve. • Limit activities that may impact on plant species of conservation concern. • Vigilant patrolling and monitoring of illegal harvesting	Conservation Manager, Ecological Co-ordinator, Regional Ecologist, Scientist: Botanist		1-5 years.	Baseline data collection and monitoring manual (2010), Threatened species programme
18. Conserve the unspoilt natural landscape of the Kammanassie Mountains.	• Ensure that infrastructure development is non-obtrusive and environmentally friendly within specific identified zones • Provide comments on developments that may impact on the Kammanassie landscape.	Reserve Management; SS Landuse advice.	Infrastructural development within specified zones. No new structures are "skylined" and old structures mitigated. Environmental authorisations acquired, complied with and filed. EMP compiled and complied with. "Green" technology implemented fully. Comments submitted on developments.	1-5 years.	CDF; NEMA legislation;
19. Conservation of Threatened and Endemic Fauna	• Regular monitoring of Cape Mountain Zebra population dynamics. • Conduct census of Cape Mountain Zebra on and off reserve. • Progress with Biodiversity management plan for species (BMP-s) for Cape Mountain Zebra. • Engage with private landowners regarding cattle grazing threats to CMZ habitat and fencing issues.	Conservation Manager. Conservation Services Manager, Mammalian Ecologist, Ecological Co-ordinator, Regional Ecologist.	CMZ stud book compiled and up to date.	1-5 years.	Baseline data collection and monitoring manual (2010). Norms and Standards for the compilation of Biodiversity Management Plans for Species

Key Deliverables	Management/Monitoring Activities	Responsibility	Indicators	Timeframe	**Reference to Existing Procedures**
	• Participate in monitoring programmes focussed on the Cape Leopard including all potential nuisance causing animal issues in conjunction with Conservation Services.				(BMP-s) in terms of NEM: BA
20. Manage consumptive utilisation of biological resources.	• All applications subject to the CapeNature consumptive utilisation Policy. • Database established indicating all utilised species and the extent of their use within the reserve.	Conservation Manager, Community Conservation Manager, Ecological Co-ordinator.	All consumptive utilisation carried out in terms of the CapeNature Policy on consumptive utilisation and the EMP.	1-5 years.	CapeNature Policy on consumptive utilisation (2007).

Budget Allocation	**Development**	
	Operation (5 Year Forecast)	R1 891 248

7.4 WILDLIFE MANAGEMENT

7.4.1 Legislation

- Western Cape Nature Conservation Ordinance, (Ordinance 19 of 1974)
- Regulations proclaimed in terms of the Ordinance, Provincial Notice 955 of 1975.

7.4.2 Guiding Principles

- Biodiversity resources of the reserve must be protected from illegal harvesting and unsustainable use.
- Re-Introduction of species to the reserve is only considered if a species occurred historically and suitable habitat is still available on the reserve. Genetics of source populations is also taken into consideration to prevent 'contamination'.
- Lethal control may be used as a management tool in certain instances. Species must be selected only through extensive research and knowledge of population dynamics.
- Damage causing wildlife/nuisance fauna shall be managed in a humane manner, through recommendation from CapeNature's Wildlife Advisory Committee and authorisation from CapeNature Executive.

7.4.3 Management Actions

Refer to Table 7.4.

7.4	WILDLIFE MANAGEMENT
Objective 1 Objective 2	To conserve the natural ecosystems. To manage the conservation estate effectively.

Key Deliverables	Management/Monitoring Activities	Responsibility	Indicators	Timeframe	Reference to Existing Procedures
21. Ensure effective game management on KNR.	• Census conducted. • Recordkeeping. • Investigate Cape Mountain Zebra impact on natural vegetation and habitat needs, and area preferences. • Record mortalities. • Monitor water availability. • Provide watering points for CMZ where critical. • Progress with Biodiversity Management Plan for species, Cape Mountain Zebra. • Continue with deer cam camera project.	Conservation Manager. Mammalian Ecologist	Cape Mountain Zebra database.	1-5 years.	Baseline data collection and monitoring manual (2010), Nature and Environmental Conservation Ordinance 19 of 1974.
22. Manage damage causing/ nuisance fauna.	• Engage with landowners to remove cattle grazing illegally, causing erosion, within the KNR.	Conservation Manager.	Cattle removed from KNR.	1-5 years.	Mountain Catchment Areas Act.

Budget Allocation	**Development**	
	Operation (5 Year Forecast)	R378 249

7.5 FIRE MANAGEMENT

The overall goals of fire management in the Western Cape are as follows:

- The maintenance of the optimum levels of biodiversity in all regions managed either directly or indirectly by CapeNature.
- The conservation of all natural processes within the Fynbos Biome.
- The conservation of hydrological systems that deliver a sustained yield of stream flow in all Mountain Catchment Areas.
- The reduction of fire risk and hazard in all protected and neighbouring areas.

The aims of fire management include:

- The maintenance of fire as a vital ecological process in fynbos ecosystems.
- The integration of Fire Management into programmes aimed at the reduction and control of invasive alien plan species.
- The minimisation of the occurrence and extent of ecologically undesirable or otherwise potentially damaging wildfires.

7.5.1 Legislation

- National Veld and Forest Fire Act, (Act No. 101 of 1998)
- National Forest Act, (Act No. 84 of 1998)

7.5.2 Guiding Principles

- Fire management in CapeNature is governed by the Fire Management Policy and Guidelines Version 6 (Erasmus 2010).
- Prescribed burning will be used when and where appropriate to achieve ecological goals.
- Unplanned wildfires that occur in areas where they could have undesirable ecological effects will be suppressed or controlled where possible.
- Fires that threaten neighbouring property will also be controlled where possible.
- Unplanned wildfires that occur in areas where they will do no ecological or other harm can or may be allowed to burn, provided that safety concerns and the relevant threshold of potential concern (TPC) are not compromised.
- Fire protection measures and resources (equipment, trained personnel, fire-breaks etc.) must be maintained at optimal levels of suitability and affectivity at all times.
- Reserve Management will implement integrated fire and alien vegetation management to limit the proliferation of fire adapted alien vegetation and facilitate the alien vegetation control programmes.
- Reserve Management will establish partnerships with neighbours and other role-players through agreements and membership of Fire Protection Associations.

7.5.3 Management Actions

Refer to Table 7.5.

7.5	FIRE MANAGEMENT				
Objective 1	To conserve the natural ecosystems.				
Key Deliverables	**Management/Monitoring Activities**	**Responsibility**	**Indicators**	**Timeframe**	**Reference to Existing Procedures**
23. Reduce / avoid the spread of fires across the reserves borders and minimize accidental/deliberate fires within the reserve.	• Compile and maintain a Fire Management Plan for the reserve taking TPC's, social and economic situation into account. • Update and implement Fire Protection and Reaction Plans including risk assessments. • Construct priority firebreaks according to schedule. • Assess appropriateness of current firebreak network and re-align where appropriate. • Negotiate firebreak agreement with neighbours where relevant. • Fuel reduction around infrastructure to minimise risk. • Conduct a pre-fire season fire audit • Fire Reports completed. • Mapping of all fires and capture on GIS. • De-briefing sessions held after each fire and records kept.	Conservation Manager, Catchment Manager, Area Manager.	Reserve has a minimum pre-fire season audit score of 90% by Year 5. The distribution and range of veld age is within the limits of acceptable change (TPC). Priority firebreaks completed versus planned (%) and km Firebreaks completed. Fire report database accurately completed and up to date.	1-5 years.	Fire Management Policy and Guidelines, Fire break register, ICM APO.
24. To allow for natural fire processes to occur without negatively impacting on safety and infrastructure.	• Consider TPC's during fire fighting activities • Infrastructure Risk Assessments carried out. • Infrastructure risks mitigated.	Conservation Manager.		1-5 years.	Fire Management Policy and Guidelines.
25. Establish and maintain partnerships to improve fire management on the KNR.	• Attend and participate in Fire management Unit meetings. • Implement FMU action plan where applicable • Maintain WOF base.	Conservation Manager.		1-5 years.	Fire Management Policy and Guidelines, FPA operational rules and guidelines.
26. Determine and implement thresholds of potential concern for fire management on the KNR.	• Establish a series of fixed point photograph monitoring plots. • Conduct permanent Protea plot monitoring. • Conduct post fire regeneration monitoring. • Set and monitor TPC's.	Conservation Manager, Regional Ecologist.		1-5 years.	Fire Management Policy and Guidelines, Baseline data collection and Monitoring Manual, Ecological Matrix.
27. Wildfires as a result of human negligence are reduced.	• Create a fire awareness programme for tourists, local communities and staff.	Conservation Manager, Programme: Fire Community Conservation		1-5 years.	Fire Management Policy and Guidelines, Fire wise Implementation Guidelines.

Key Deliverables	Management/Monitoring Activities	Responsibility	Indicators	Timeframe	Reference to Existing Procedures
		manager.			

Budget Allocation	**Development**	
	Operation (5 Year Forecast)	R252 166

7.6 INVASIVE AND NON-INVASIVE ALIEN SPECIES MANAGEMENT

7.6.1 Legislation

Although most legislation mentioned in Section 2.1 can be applied, the following is specific to the eradication of alien and invasive species:

- Section 64 to 77 of the National Environmental Management: Biodiversity Act, (Act No. 10 of 2004).

It must be noted that Section 77 of the National Environmental Management: Biodiversity Act, (Act No. 10 of 2004) states the following: The management authority of a protected area must at regular intervals prepare and submit to the Minister or the Provincial Minister for Environmental Affairs in the Province a report on the status of any listed invasive species that occurs in that area.

A status report must include -

a. a detailed list and description of all listed invasive species that occur in the protected area
b. a detailed description of the parts of the area that are infested with listed invasive species;
c. an assessment of the extent of such infestation; and
d. a report on the efficacy of previous control and eradication measures.

- Conservation of Agricultural Resources Act, (Act No. 43 of 1983): Amendments published in the Government Gazette Vol. 429, No 22166 of 30 March 2001.

7.6.2 Guiding Principles

- Maintain the integrity of local species biodiversity by prohibiting and, as far as possible, preventing the introduction of alien and invasive species.
- Discourage the keeping of domestic animals within and from entering the reserve from surrounding areas.
- Alien vegetation density and distribution to be monitored and the database kept up to date.
- All alien species to be controlled with the aim of eradication through a systematic and scheduled program.
- Identify areas adjacent to the reserve as buffer area and target these areas for clearing to limit possible spread of invasive alien plants into the reserve.
- Removal of alien and invasive species must be performed in a cost and ecologically effective manner.

7.6.3 Management Actions

Refer to Table 7.6.

7.6	INVASIVE AND NON-INVASIVE ALIEN SPECIES MANEGEMEMNT				
Objective 1	To conserve the natural ecosystems (life support systems.				
Key Deliverables	**Management/Monitoring Activities**	**Responsibility**	**Indicators**	**Timeframe**	**Reference to Existing Procedures**
Invasive Alien Flora					
28. Eradicate alien and invasive species within the KNR on an on-going basis.	• Identify and map all alien and invasive flora within the KNR or threatening the reserve. • Integrated Catchment Management informs both fire and alien vegetation management. • Attend regional ICM Meetings. • Compile a Management Unit Clearing Plan. • Prioritise removal in collaboration with Working for Water (WFW).	Conservation Manager, Project Manager, Catchment Manager.	100% of hectares IAP's cleared annually versus planned. % total area cleared where IAP's have been controlled to a maintenance phase by Year 5.	1-5 years.	Working for Water (WFW). ICM procedures.
29. Monitoring of alien vegetation on the KNR informs adaptive management strategies.	• Total Clearing costs per NBAL. • Clearing norms determined and implemented. • Clearing method effectiveness and impact. • Herbicides used. • Person day/hectare.	Conservation Manager.		1-5 years.	Working for Water (WFW).
30. Implement biological control as a method of IAP management.	• Bio control sites mapped and updated. • Implement new and supplement existing biological control. • Monitor success of bio control. • Record keeping. • Site security.	Conservation Manager.		1-5 years.	PPRI guidelines.
31. Prevent the introduction of alien and invasive species from neighbouring landowners.	• Ensure surrounding landowners are aware of relevant legislation.	Conservation Manager.		1-5 years.	Working for Water and Dept. Agriculture Landcare Guidelines.
Invasive Alien Fauna					
32. Prevent the introduction of alien and invasive species.	• No domestic livestock will be permitted in the reserve and will be removed. • No introduction of alien fish species into any river systems.	Conservation Manager.	*Species specific*	Ongoing.	CNC Policy on domestic animals on nature reserves.
33. Control alien and invasive species within the KNR on an on-going basis.	• Identify alien fauna occurring on the reserve. • Monitor populations of alien fauna on the reserve. • Implement control measures where appropriate. • Measure success of control methods utilised. • External stakeholder involvement.	Conservation Manager.	Removal systems in place. No alien and invasive species in the reserve.	Ongoing.	CNC Policy on domestic animals on nature reserves, PAAC..

Budget Allocation	**Development**	
	Operation (5 Year Forecast)	R2 521 664

7.7 CULTURAL HERITAGE RESOURCE MANAGEMENT

7.7.1 Legislation

- National Heritage Resource Act, (Act No. 25 of 1999) which has repealed the National Monuments Act, (Act No. 28 of 1969)
- World Heritage Convention Act, (Act No. 49 of 1999)

7.7.2 Guiding Principles

- Reserve Management will seek to respect, protect and promote the natural and cultural heritage resources of the reserve.
- Cultural Heritage referred to in the Management Plan includes cultural, historical, archaeological and paleontological resources.

7.7.3 Management Actions

Refer to Table 7.7.

7.7	CULTURAL HERITAGE RESOURCE MANAGEMENT				
Objective 7	To effectively conserve our cultural heritage attributes.				
Key Deliverable	**Management/Monitoring Activities**	**Responsibility**	**Indicators**	**Timeframe**	**Reference to Existing Procedures**
34. To protect cultural heritage resources.	• Compile a cultural heritage resource inventory for the KNR. • Functioning database with up to date information.	Conservation Manager.	METT-SA	1-5 years.	Baseline data collection and monitoring manual (2010).
35. Cultural Heritage resources are managed to meet the protected area objectives.	• Investigate the use of specialist partners to assist with the compilation of a Cultural Heritage Resource Management Plan for the KNR and determine management priorities. • Implement the Cultural Heritage Resource Management Plan.	Conservation Manager.		1-5 years.	
36. Monitor cultural heritage resources.	• Relevant data collected. • Record keeping.	Conservation Manager.		1-5 years.	Baseline data collection and monitoring manual (2010).
37. Collaboration with external partners ensure the protection and preservation of cultural heritage resources.	• External involvement.	Conservation Manager.		1-5 years.	
38. Management interventions for cultural heritage resources.	• Actions to minimise impact. • Actions in case of impact.	Conservation Manager.		1-5 years.	

Budget Allocation	**Development**	
	Operation (5 Year Forecast)	R126 083

7.8 LAW ENFORCEMENT AND COMPLIANCE

7.8.1 Legislation

- National Environmental Management Act, (Act No. 107 of 1998)
- National Environmental Management: Protected Areas Act, (Act No. 57 of 2003)
- National Environmental Management: Biodiversity Act, (Act No. 10 of 2004)
- Threatened or Protected Species (ToPS) Regulations, 2007
- Western Cape Nature Conservation Ordinance, (Ordinance 19 of 1974)
- Regulations proclaimed in terms of the Ordinance, Provincial Notice 955 of 1975.
- Proclamation 357 of 1972, Fish and Rivers Regulations.

Also the provisions of the Bill of Rights detailed in Chapter 2 in the Constitution, No. 108 of 1996, as well as the provisions of the Criminal Procedure Act, (Act No. 51 of 1977), are also important when performing law enforcement actions.

7.8.2 Guiding Principals

- Reserve Management and personnel will ensure that all law enforcement actions are executed in a Fair, Reasonable and Objective manner, with due respect for Human Rights and in accordance with applicable Law.
- Reserve Management and personnel will identify and prioritise sensitive areas and species and prioritise law enforcement patrols accordingly, in order to ensure that resources are allocated in the most efficient and effective manner.
- Reserve Management and personnel will partner with local law enforcement role-players, such as SAPS and local authorities in order to effectively utilise resources to combat biodiversity crime within the protected area.
- Reserve Management will liaise with adjacent communities, in conjunction with relevant components, in order to identify and prioritise areas of natural and cultural heritage significance, in order to effectively manage impacts and to prevent illegal activities in these areas.

7.8.3 Management Actions

Refer to Table 7.8.

7.8	LAW ENFORCEMENT AND COMPLIANCE				
Objective 2	To manage the conservation estate effectively.				
Key Deliverables	**Management/Monitoring Activities**	**Responsibility**	**Indicators**	**Timeframe**	**Reference to Existing Procedures**
39. Law enforcement for the KNR is effective.	• All staff must have a working knowledge of all legislation applicable to their function and mandate. • The KNR staff are adequately capacitated to enforce legislation within the organisation's mandate and does so effectively. • Staff must be formally designated to enforce the relevant legislation. • Appropriate staff have been designated as environmental management inspectors. • Staff has the necessary equipment to enable them to do law enforcement effectively. • The nature reserve receives adequate law enforcement support from other sections of the organisation. • Specific relevant training has been identified and staff have received relevant training. • Local policing forum meetings are attended in priority areas in order to build partnerships with local law enforcement.	Conservation Manager, Conservation Services Manager.	Number of peace officers trained and appointed. Number of EMI's trained and appointed. BMS.	Year 1-5	Criminal Procedure Act 51 of 1977, Bill of Rights, Constitution.
40. Protection systems are in place and operating effectively.	The following management mechanisms to control both illegal and legitimate access and use: • Control legitimate access • Develop standard operating procedures to control activities within the nature reserve for relevant aspects of management. • Implement all standard operating procedures for controlling activities. • Adjacent communities are engaged in order to promote the reserve, to build relationships and to identify priority areas. • Awareness raising activities are held with adjacent communities in order to raise awareness concerning reserve and biodiversity conservation. • Areas in the nature reserve have been identified and prioritised in terms of	Conservation Manager, Community Conservation Manager.		Year 1-5	BMS.

Key Deliverables	Management/Monitoring Activities	Responsibility	Indicators	Timeframe	Reference to Existing Procedures
	conservation value or type of utilisation, etc. • Regular routine patrols are performed in all identified priority areas. • All compliance documentation is properly completed and retained as Means of verification. • All relevant cases are reported via BMS and documents submitted as verification.				

Budget Allocation	**Development**	
	Operation (5 Year Forecast)	R126 083

7.9 INFRASTRUCTURE MANAGEMENT

7.9.1 Legislation

- Occupational Health and Safety Act, (Act No 85 of 1993)
- Water Services Act, (Act No.108 of 1997)
- National Water Act, (Act No. 36 of 1998)
- Constitution of the Republic of South Africa (1996)
- According to the Constitution of the Republic of South Africa (1996), responsibility for waste management functions is to be devolved to the lowest possible level of government.
- Water Services Act, (Act No. of 1997)
- The management of sewage sludge is currently regulated by this Act.
- National Environmental Management Act, (Act No. 107 of 1998) (NEMA)
- NEMA increases the ambit of people who can be held responsible for pollution damage from not only any person, company or government department causing pollution, to any person, company or department owning, using or controlling the land on which the problem exists - even if the pollution causing activity was authorised by law.
- White Paper on Integrated Pollution and Waste Management, 1998
- White Paper on the Energy Policy of the Republic of South Africa (approved by Cabinet on 2 December 1998)
- Fencing Act, (Act No. 3 of 1963)

7.9.2 Guiding Principles

- Infrastructure management includes the planning, construction, maintenance, replacement, control and monitoring of all fixed structures, equipment and other moveable assets.
- Reserve management will strive to improve systems so as to reduce costs and negative impacts on the physical environment.
- Ensure that future developments within the reserve are socially, environmentally and economically sustainable.
- Reserve Management will strive to phase out all French drains, pit latrines and other sewerage disposal systems on the reserve.
- Environmental management includes waste, dumping sites, potable water, water systems, sewage systems and herbicide and fuel stores.

7.9.3 Infrastructure Maintenance

7.9.3.1 Roads/Jeep Tracks

Access roads within the Kammanassie Nature Reserve are mainly vehicle track roads that are usually only negotiable by means of a 4x4 vehicle, especially during the wet season. Due to the high risk of erosion of soils in the region the grading of management roads is not allowed. In many instances cement track roads were constructed at key areas and the aim is to extend these to as many frequently used management roads practically and financially possible.

7.9.3.2 Trails

There are no trails on the Kammanassie Nature Reserve open to the public. The existing trails used by management are maintained on an on-going basis.

7.9.3.3 Buildings

The Kammanassie office building complex is situated in Uniondale. Structures in the Kammanassie Nature Reserve are restricted to the two huts at Kleingeluk, two huts at Buffelsdrift and one hut at Perdevlakte. There is also a high site hut on Mannetjiesberg.

7.9.3.4 Fences

Insufficient and/or absence of proper fencing cause major difficulties in the management of the reserve. This is of particular concern in terms of the Cape Mountain Zebra population. Fence agreements with owners of private catchment land that contains habitat used by the CMZ need to be initiated. A database of fences and condition is kept on the reserve.

7.9.3.5 Environmental Management

No waste disposal sites are available within the reserve and waste disposal is carried out at registered dumping sites in Uniondale.

7.9.4 Management Actions

Refer to Table 7.9.

7.9	INFRASTRUCTURE MANAGEMENT				
Objective 2	To manage the conservation estate effectively.				
Key Deliverables	**Management/Monitoring Activities**	**Responsibility**	**Indicators**	**Timeframe**	**Reference to Existing Procedures**
41. Ensure maintenance of infrastructure and equipment.	• Map all infrastructure and compile infrastructure register. • The infrastructure necessary to manage the nature reserve effectively is in place (UAMP). • Assess if staff facilities are adequate to perform critical management activities. • Ensure that there is adequate operational equipment as required for operational management purposes. • Maintenance of Infrastructure as scheduled in registers to ensure upkeep and prevent degradation. • Equipment is maintained in good working condition. • Liaise with Public Works where required.	Conservation Manager.	Public Works Schedule.	1-5 years.	User Asset Management Plan (UAMP).
42. Align all infrastructure to the conservation development framework and zonation.	• Assess infrastructure development appropriateness to the CDF.	Conservation Manager.	CDF zonation.	1-5 years.	Infrastructure register.
43. Roads/Jeep Tracks and Trails are managed to minimise impact on the environment.	• Conduct an assessment on the KNR. • Compile maintenance plan. • Rehabilitate where necessary. • Borrow pits mapped, assessed and rehabilitated (where required). • Monitor use and impact. • Monitor cost affectivity of maintenance.	Conservation Manager.	Infrastructure maintenance schedule.	1-5 years.	Infrastructure register and Public Works schedule.
44. Buildings are effectively maintained.	• Compile and maintain a building register. • Provide Department of Public Works with works list to reflect maintenance requirements. • Maintenance or new infrastructure is appropriately planned (EMP), approved by the QEM and if required the Appropriate EIA completed. • Ensure energy saving and environmentally sound options are being implemented by Department of Public Works (Green Building principals).	Conservation Manager.	Up to date works list available.	1-5 years.	Infrastructure register, QEM, NEMA EIA process.
45. Maintain fences according to	• Conduct a fence assessment.	Conservation	Fence assessment has been	1-5 years.	Infrastructure register and

Key Deliverables	Management/Monitoring Activities	Responsibility	Indicators	Timeframe	Reference to Existing Procedures
legislative requirements.	• Compile fence management plan. • Monitor usage and impact.	Manager.	completed and report compiled. Actions listed are being implemented.		Public Works schedule.
46. Environmental Management: Energy	• Energy and water saving devices and cost effective habits.	Conservation Manager.	Energy and water saving devices in place.	1-5 years.	National Guidelines.
47. Environmental Management: Herbicide and Fuel Stores	• Manage herbicide store according to required health and safety standards.	Conservation Manager.	Complies.	1-5 years.	OHS Act, Audits
48. Management of High Sites.	• Map all High sites (with photo's). • Monitor impacts. • Access control.	Conservation Manager.	Monitoring file updated.	1-5 years.	CapeNature policy on high sites.
49. Signage is appropriate and effective to support management.	• Conduct a signage audit. • Compile a signage register with maintenance plan.	Conservation Manager.	Appropriate signage in place.	1-5 years.	Signage register.

Budget Allocation	**Development**	
	Operation (5 Year Forecast)	R4 160 746

7.10 DISASTER MANAGEMENT

7.10.1 Legislation

- Disaster Management Act, (Act No. 57 of 2002)
- Occupational Health and Safety Act, (Act No. 85 of 1993)

7.10.2 Guiding Principles

- The first priority of disaster management is the protection of the people who are most at risk. The second priority is the protection of the critical resources and systems on which communities depend.
- Disaster prevention and preparedness should be an integral part of every development policy.
- Disaster assistance must be provided in an equitable, consistent and predictable manner in association with the Local and Provincial authorities.
- Communities, with the assistance from the Local and Provincial tiers of government and Reserve Management, must know what disaster management and risk reduction stand for, what their own responsibilities are, how they can help prevent disasters, how they must react during a disaster (and why) and what they can do to support themselves and relief workers, when necessary.

7.10.3 Management Actions

Refer to Table 7.10.

7.10	DISASTER MANAGEMENT
Objectives 2	To manage the conservation estate effectively.

Key Deliverables	Management/Monitoring Activities	Responsibility	Indicators	Timeframe	Reference to Existing Procedures
50. Disaster prevention and preparedness	• Conduct a risk assessment and identify areas of potential concern. • Compile a Risk assessment and disaster management plan for KNR. • Engage and assist with disaster management units from municipalities. • Conduct an annual audit of disaster management plans and mitigation measure readiness. • Annual review and exercise of contingency and evacuation plans. • Train staff and NGOs to ensure capacity to manage and mitigate the effects of disasters. • Procure equipment for disaster response and mitigation. • Participate and assist district municipality disaster management structure. • Activate evacuation and contingency plans.	Conservation Manager, OHS Manager, Chief Risk Officer.	Membership obtained, communication links with local municipalities in place. ICS training certificate.	1-5 years.	KNR contingency plans.

Budget Allocation	**Development**	
	Operation (5 Year Forecast)	R126 083

7.11 PEOPLE AND CONSERVATION

7.11.1 Community Partnerships

The long term success of the Kammanassie Nature Reserve is dependent on developing a constructive, mutually beneficial relationship between the reserve and communities resident adjacent to the reserve.

Various projects and programmes that enhance the relationship between the reserve and the neighbouring communities are currently in progress. Expansion in partnerships with the surrounding communities of the Kammanassie Nature Reserve is essential for the success of the reserve.

7.11.2 Guiding Principles

- The Kammanassie Nature Reserve's contribution to the local and regional economy must be recognised and therefore will be seen as an important vehicle through which rural development and transformation is achieved.
- Promote the strong sense of ownership and empowerment amongst resident people and communities and ensure a strong supporting institutional base.
- The right to equality, a healthy environment and the right to information are to be guaranteed.
- Co-operative governance should take place between citizens and between different government departments.
- Benefits from biodiversity are to be fairly shared and the benefit flows to people in and around protected areas improved.
- The capacity of neighbouring communities should be developed in order to participate in protected area management.
- Equitable accessibility by all people to the reserve is to be ensured.
- Community based initiatives and partnerships shall promote and support economic and employment opportunities, particularly for local disadvantaged persons and communities.

7.11.3 Management Actions

Refer to Table 7.11.

7.11	PEOPLE AND CONSERVATION
Objective 5 **Objective 6**	To create environmental awareness. To promote the sustainable utilization of natural resources.

Key Deliverables	Management/Monitoring Activities	Responsibility	Indicators	Timeframe	Reference to Existing Procedures
51. Create access to the conservation economy through the implementation and management of appropriate initiatives and projects.	• Create jobs through a range of projects. • Alien vegetation clearing. • Administrative support. • Complete reporting on EPWP database monthly.	Conservation Manager, Community Conservation Manager.	Number of EPWP job opportunities (n). Number of EPWP full time equivalents (n).	1-5 years.	BMS.
52. The KNR provides community development opportunities through various capacity building interventions, linked to job creation opportunities.	• Training. • SMME.	Conservation Manager, Community Conservation Manager.	Number of people directly benefitting from Sustainable Livelihood Programmes (n). Number of person days employment created (n).	1-5 years.	BMS.
53. Manage consumptive utilisation of biological resources.	• Database established indicating all utilised species and the extent of their use within the reserve. • All requests to utilise resources from the KNR will be deal with in terms of the CapeNature Policy on consumptive utilisation.	Conservation Manager, Community Conservation Manager.		1-5 years.	CapeNature Policy on consumptive utilisation (2007).
54. The KNR has spiritual or religious significance.	• Access to the KNR for spiritual, cultural and traditional purposes will be allowed subject to permit conditions and with prior approval.	Conservation Manager, Community Conservation Manager.	Number of persons accessing CapeNature protected areas for cultural, traditional, spiritual, and sustainable harvesting activities (n).	1-5 years.	

Budget Allocation	**Development**	
	Operation (5 Year Forecast)	R252 166

7.12 AWARENESS, YOUTH DEVELOPMENT AND VOLUNTEERS

Environmental education should be actively encouraged especially in the context of developing knowledge in protected area management, especially for school children from the area. Where possible, partnerships should be established with role players and interested parties to ensure that this takes place.
Facilitate youth and community development through environmental awareness and assist in developing the knowledge, skills, values and commitment necessary to achieve sustainable development.

7.12.1 Guiding Principles

- The image of CapeNature to be promoted among local communities, provincial and national politicians and the public.
- Reserve Management shall develop an interpretive and educational programme, which will provide each visitor with an interpretive experience that is enjoyable and inspirational, within the context of the reserves tangible resources and the values they represent.
- Reserve Management shall provide both on- and off-site interpretive presentations and media, which facilitate a connection between the interests of the visitor and the meanings of the reserve.
- Educational Programmes must align with the National School Curriculum.
- Opportunities to participate in National Environmental Initiatives such as Arbor Day, and Water Week should be taken where appropriate.
- Reserve Management will create an enabling environment that provides youth with opportunities for learning/training, personal growth and healing.
- The Kammanassie Nature Reserve seeks to create an environment which contributes directly to the growth and development of responsible young citizens.
- Facilitate and promote the use of the natural environment for the development of youth.
- Environmental education activities will be restricted to peripheral / appropriate zones within the reserve.
- Promote the use of the Kammanassie Nature Reserve as a place of self-discovery, personal growth, emotional healing, formal learning and adventure.
- Volunteers are encouraged to contribute to projects on the reserve**.**

7.12.2 Management Actions

Refer to Table 7.12.

7.12	AWARENESS, YOUTH DEVELOPMENT AND VOLUNTEERS				
Objective 5	To create environmental awareness.				
Key Deliverables	**Management/Monitoring Activities**	**Responsibility**	**Indicators**	**Timeframe**	**Reference to Existing Procedures**
55. Ensure awareness raising initiatives elevate awareness of the KNR.	• Compile information and material on KNR for dissemination and presentation on Environmental Awareness calendar days (e.g. Heritage day and Arbour day). • Collaborate with partners to arrange events on Environmental Awareness events and scheduled school activities. • Facilitate production of media releases. • Present talks, presentations when requested. • Open day • Submit an article on the KNR for publication to a popular conservation themed magazine, annually.	Conservation Manager. Community Conservation Manager.	Number of learners provided with environmental education opportunities (n).	1-5 years.	
56. Environmental education is provided to promote an understanding of biodiversity and the use of the natural environment as a vehicle for learning and development.	• Formal and Informal EE programmes conducted on the Kammanassie Nature Reserve. • Develop and implement an education and awareness plan linked to the objectives of KNR. • Management will strive to raise the profile of World Heritage Site and Biosphere Reserve through linked awareness and education programmes.	Conservation Manager. Community Conservation Manager.		1-5 years.	

Budget Allocation	**Development**	
	Operation (5 Year Forecast)	R252 166

7.13 MANAGEMENT EFFECTIVENESS

7.13.1 Legislation

- The Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996)
- Public Finance Management Act, (Act No.1 of 1999).
- National Environmental Management: Protected Areas Act, (Act No. 57 of 2003)

- Management effectiveness is further guided by the following documents:
  - The White Paper on Transforming Public Service Delivery (Batho Pele White Paper) 1997
  - Green Paper on National Performance Management (2009)
  - Policy Framework for a Government-wide Monitoring and Evaluation System (2007)
  - National Treasury Framework for Managing Programme Performance Information (2007)

7.13.2 Guiding Principals

- As a listed provincial public entity, CapeNature must comply with all the provisions of the PFMA, with particular reference to Chapter 6 thereof which deals with the responsibilities of public entities. CapeNature is subject to, and guided by, the provincial budget and strategic planning processes. In-year reporting from CapeNature comprises quarterly expenditure and revenue, earmarked funding, non-financial performance, financial normative and other reports as requested by either the Department and/or Provincial Treasury.
- As Protected Area management in the Western Cape is a mandate of CapeNature, all activities in this regard are embedded into the organisation's planning and review mechanisms.
- To monitor and evaluate non-financial performance of the organisation. CapeNature conforms to the following protocols: a strategic five-year Plan; annual performance plan; quarterly reporting and the production of an annual report.
- In addition to the above required protocols, CapeNature also implements Performance Management System which ensures that organisational targets are embedded in individual performance contracts. This is essential as targets in the reserve management plan become specific measurable targets for individual staff members who are evaluated on them, ensuring accountability.
- All monitoring and evaluation regarding Protected Area management is imbedded in CapeNature's current systems.

7.13.3 Management Actions

Refer to Table 7.13.

7.13	MANAGEMENT EFFECTIVENESS
Objective 2	To manage the conservation estate effectively.

Key Deliverables	Management/Monitoring Activities	Responsibility	Indicators	Timeframe	Reference to Existing Procedures
57. Implement and maintain the METT-SA.	• Conduct annual METT-SA assessments. • Monitor and improve METT-SA Score through the development of action plans and implementation thereof. • Report to DEA as per requirement for national evaluation of METT-SA scores.	Conservation Manager, Regional Ecologist, Ecological Co-ordinator.	The KNR will annually indicate an upward trend in METT-SA score.	1-5 years.	METT-SA
58. Auditing systems inform management.	• Conduct CapeNature integrated auditing system. • Compile actions lists to address audit issues. • Track action list for progress. • Apply adaptive management strategies.	Conservation Manager.		1-5 years.	CapeNature integrated auditing system.
59. A detailed work plan (APO) identifying specific targets for achieving management objectives is approved by CapeNature.	• Assess and prioritise actions from audit results into APO. • Compile APO in terms of actions identified in the Management Plan.	Conservation Manager.		1-5 years.	
60. Progress reports are compiled.	• Compile quarterly BMS progress reports. • Progress reports as required.	Conservation Manager.		1-5 years.	BMS.
61. Implement and review the Management Plan for the KNR.	• Assess all PAM audit results and ensure adaptive management strategies are implemented. • Bi-annual assessment on progress of PAM actions. • Compile annual report on the status of implementation of the PAMP and submit to the Provincial Minister.	Conservation Manager.		1-5 years.	

Budget Allocation	**Development**	
	Operation (5 Year Forecast)	R504332

7.14 ADMINISTRATION

7.14.1 Finance and Administration Management

7.14.1.1 Financial Sustainability

Nature Reserves within South Africa are expected to provide a high level of internal and public accountability for the use of resources through the use of accounting systems. The reserve will have to have the support of external funding from international and local authority sources over and above support received from the provincial body and the income it generates itself.

7.14.1.2 Legislation

- Public Finance Management Act, (Act No.1 of 1999).

7.14.1.3 Guiding Principles

- Ensure that the reserve continually seeks improvements in the management of its financial resources and operations.
- Strive to develop a robust income base for the reserve from diverse sources, while conserving the integrity of its ecological, cultural, and scenic resources.
- Support initiatives aimed at increasing grant funding and donations to the reserve.
- Assess opportunities for donor funding within the reserve, evaluate appropriate donor funding organisations for projects, establish and manage contacts with such organisations and maintain relationships with potential and existing donor organisations.
- Seek, and where possible create, opportunities for economic empowerment and the involvement of Small, Medium and Micro Enterprises (SMMEs) in developing public private partnerships in commercial activities.
- Apply, and be subject to, sound and transparent financial policies and practices, and shall make available detailed information about its income, expenditure and budgets, as well as about the assumptions upon which such budgets are based.
- Financial management will be within the parameters of the PFMA, Treasury regulations and internal policies of CapeNature e.g. Supply Chain Management, delegation of powers, etc**.**

7.14.1.4 Management Actions

Refer to Table 7.14.1

7.14.1	FINANCE AND ADMINISTRATION MANAGEMENT				
Objective 2	To manage the conservation estate effectively.				
Key Deliverables	**Management/Monitoring Activities**	**Responsibility**	**Indicators**	**Timeframe**	**Reference to Existing Procedures**
62. To ensure financial accountability in terms of the PFMA and the Treasury Regulations.	• Facilitate an annual internal audit of the nature reserve financial records. Internal audit report with findings and recommendations is tabled. • External audit report with findings and recommendations communicated. • Provide relevant financial information to reserve management. • An operational budget is allocated to fund the critical management needs of the nature reserve. • Cash flow management. • Supply Chain Management. • Relevant SCM reports. • Financial management practice enables efficient and effective protected area management. • Monthly management reports submitted to reserve management. • Acknowledgement of report by Conservation Manager. • Variance report signed and returned. • Reserve Management provide input to monthly cash flow forecast. • Signed and approved budget provided by 1 April.	Finance Manager, Conservation Manager.	Percentage increase shown on revenue as a result of additional funding sourced. Annual increase in visitor numbers.	Annually.	Budgeting process; APO, SAP system, Supply Chain Management Act, Statements of GRAP.
63. Identify opportunities that are robust to create a diverse income base.	• Identify sources of potential income. • Maintain new and existing partnerships with external funders / stakeholders.	Finance Manager, Conservation Manager, Marketing and Eco-tourism.		Annually	National Treasury Regulations with regard to Donations, Sponsorships.
64. Fixed Asset Management.	• To manage the assets of the reserve in accordance with the relevant legislation. • To ensure that all reserve assets are bar coded. • To ensure that all reserve assets are verified bi-annually. • To provide input into infrastructure asset management plan annually. • Fixed Asset Register is approved by the Conservation Manager. • Verification Report is approved by the	Finance Manager, Conservation Manager, Financial Management section.		Bi-annually / monthly	SOP's and policies. Statement of GRAP, UAMP guidelines.

Key Deliverables	Management/Monitoring Activities	Responsibility	Indicators	Timeframe	Reference to Existing Procedures
	reserve management. • Disposal of assets in line with policies. • GIAMA requirement is met annually. • Trip authorisation forms in place. • To manage CapeNature and Government Motor Transport assets in accordance with policy.				
65. Capacity Building among staff.	• Provide relevant financial and Administrative training to reserve staff.	Finance Manager, Conservation Manager.		Annually	SOPs and policies, PFMA.

Budget Allocation	**Development**	
	Operation (5Year Forecast)	R252 166

7.14.2 Human Resource Management

7.14.2.1 Legislation

Cape Nature's Human Resources and Labour Relations Practices are primarily based premised on the following legislation:

- The Constitution of the RSA, (1996)
- The Western Cape Nature Conservation Board Act, (Act No.15 of 1998)
- Labour Relations Act, (Act No. 66 of 1995)
- Basic Condition of Employment Act, (Act No. 75 of 1997)
- Employment Equity Act, (Act No 55 of 1998).
- Occupational Health and Safety Act, (Act No. 85 of 1993)
- Skills Development Act, (Act No. 97 of 1998)
- The Protected Disclosures Act, (Act No. 26 of 2000)
- The Promotion of Access to Information Act, (Act No. 2 of 2000)
- The Promotion of Administrative Justice Act, (Act No. 3 of 2000)
- Our policies are further shaped by the Public Service Act, (Act No. 38 of 2008) and the Regulations thereto, the collective agreements entered into in the public service bargaining chambers as well as the Public Finance Management Act, (Act No. 1 of 1999) and Treasury Regulations issued in terms thereof.

7.14.2.2 Guiding Principles

(1) Cape Nature commits itself to the principles enshrined in the Labour Relations Act (Act No. 66 of 1995), these being:
   (a) to give effect to the right to fair labour practices and those further rights enshrined in section 23 of the Constitution of the Republic of South Africa;
   (b) to give effect to obligations incurred by the Republic as a member state of the International Labour Organisation;
   (c) to provide a framework within which employees and their trade unions, employers and employers' organisations can-
      (i) collectively bargain to determine wages, terms and conditions of employment and other matters of mutual interest; and
      (ii) formulate industrial policy.
   (d) to promote-
      (i) orderly collective bargaining;
      (ii) collective bargaining at sectorial level;
      (iii) employee participation in decision-making in the workplace; and
      (iv) the effective resolution of labour disputes.

(2) Cape Nature will interact with its employees or its representatives in a manner which fosters transparent, respectful and harmonious working relationships between management and employees and between employees and employees.

(3) Cape Nature is an equal opportunities employer that is committed to using its recruitment and selection processes to address, in a fair manner, all workplace injustices caused by Apartheid policies.
(4) We are committed to growing our human capital by providing appropriate training and development initiatives for our employees.
(5) We are further committed to maximising career-pathing to ensure that employees are constantly growing and that the workplace remains challenging and stimulating.

7.14.2.3 Management Actions

See Table 7.14.2.

7.14.2	HUMAN RESOURCE MANAGEMENT				
Objective 2	To manage the conservation estate effectively.				
Key Deliverables	**Management/Monitoring Activities**	**Responsibility**	**Indicators**	**Timeframe**	**Reference to Existing Procedures**
66. Ensure an adequately resourced staff complement on the reserve.	• Ensure current posts are filled and appointment of additional staff (subject to funding). • Ensure resourced (tools and skills) staff in line with approved budget to manage the nature reserve effectively (subject to funding). • Prioritise all critical posts for filling and develop a phased implementation plan in line with approved personnel budget. • Ensure on-going assessment of workloads (volumetric analysis) through interventions in consultation with the Organisational Development Unit of the Department of the Premier. • Employment relationship is in line with employment contract commitments. • Implement an Employment Well-being Programme.	Conservation Manager, Area Manager, Executive Director Operations and HR.	Human resource capacity is adequate to manage the protected area effectively subject to funding.	On-going	Recruitment and Selection Policy, Standard Operating Procedures for Recruitment and Selection, SA Constitution, Labour Relations Act, Basic Conditions of Employment Act, Employment Equity Act, Occupational Health & Safety Act, Overtime Policy, Equate System for Job Evaluation, Leave Policy.
67. Integrate and align organisational and employee performance.	• There is an effective Performance Management System in place. • Ensure compliance with Code of Conduct.	Conservation Manager, Area Manager, Executive Director Operations HR and CEO.	Performance agreements completed and signed for all employees. Performance appraisals completed for all employees.	Annually	Performance Management Handbook, Annual Plan of Operations, Rewards Foundation Policy, Disciplinary Code and Procedures, (Managing poor performance) Code of Conduct.
68. Skilled employees on the reserve.	• All staff are skilled to perform according to job specification in the roles they occupy in line with mandatory legislative requirements. • Develop personal development plan for all staff on the reserve. • Roll out of personal development plan for all staff on the reserve. • Reflect capacity development interventions which are supported by mentorship and coaching agreements. • Conduct annual Skills audit.	Conservation manager, Area Manager, HR and Employment Equity and Training Committees.	Develop personal development plan for all staff on the reserve. Mentorship and coaching agreements. Implement Skills Plan according to priorities and budget availability.	Annually	Individual PDPs, Mentorship strategy and toolbox, Skills Development Act, Training Policy, Bursary Policy, Internship Policy.

Budget Allocation	**Development**	
	Operation (5 Year Forecast)	R378 249

7.14.3 Occupational Health and Safety Management

7.14.3.1 Legislation

- The Occupational Health and Safety Act, (Act No. 85 of 1993), as amended, with reference to:
    - The Regulations which fall within the ambit of the Act;
    - Standards and Approved Codes of Practice under the Act.
    - Compensation for Occupational Injuries and Diseases Act (Act No. 130 of 1993)

7.14.3.2 Guiding Principles

- Reserve Management must bring about and maintain, as far as reasonably practicable, the safety of workers, contractors, volunteers, students and the public.
- Reserve Management must bring about and maintain, as far as reasonably practicable, a work environment that is safe and without risk to the health of the staff members.
- Where this is not possible, Reserve Management must inform staff of these dangers, how they may be prevented, and how to work safely, and provide other protective measures for a safe workplace.
- The staff member must also take care of his or her own health and safety, as well as that of other persons who may be affected by his or her actions or negligence to act.
- Appropriate training, awareness, education on the use of universal infection control measures so as to identify, deal with and reduce the risk of HIV transmission in the workplace will be provided.

7.14.3.3 Management Actions

Refer to Table 7.14.3.

7.14.3	OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT				
Objective 2	To manage the conservation estate effectively.				
Key Deliverables	**Management/Monitoring Activities**	**Responsibility**	**Indicators**	**Timeframe**	**Reference to Existing Procedures**
69. To implement policies, procedures and systems to ensure compliance to the Occupational Health and Safety Act. (OS4909H Act).	• Implement Occupational Health and Safety System.	Conservation Manager, OHS manager.	No disabling injuries occur.	Year 1-5	OHS Act, Internal Health and Safety System.
70. To inform the workers, contractors, volunteers, students and the public of these dangers, how exposure could be prevented, and how to work safely.	• Attend Accredited OHS Training: (HIRA). • Attend Accredited OHS Training to renew certificates (OHS Reps & First Aid Officers). • Attend in-house OHS Training Workshops. • Provide monthly Toolbox Talks.	Conservation Manager, OHS Reps, operators of equipment and machinery, First Aid Officers, Designated OHS risk specific appointments, OHS Officer, OHS Manager.		Year 1 on-going	OHS Training Needs Analysis (conducted annually and aligned with available legislative requirements and available resources).
71. Hazard Identification, Risk Assessment and Risk Management and Risk Control are implemented on the KNR.	• Conduct regular HIRA processes to determine key risks with highest impact potential. • Recommend remedial action plans to address key risks. • Follow-up to ensure effective implementation.	Reserve Management, Reserve staff, OHS Officer.		Year 1 on-going	HIRA Report, Safe Operating Procedure.
72. Monitor and review to ensure adaptive management strategies are applied to improve health and safety on the KNR.	• Assist in conducting of internal Audit Process to determine effectiveness and level of compliance of implementation of OHS Management Control System.	Reserve Management, OHS Officer, OHS Manager.		Year 1	Worksite Audit Report.

Budget Allocation	**Development**	
	Operation (5 Year Forecast)	R252 166

7.14.4 Risk Management

7.14.4.1 Specific Legislation

Risk Management is based on the requirements of the Public Finance Management Act, (Act No. 1 of 1999) which requires the Accounting Authority to implement systems of financial management, risk management and internal control.

7.14.4.2 Guiding Principles

- To promote the highest standards of corporate governance in providing assurance to stakeholders that organisational goals and objectives are achieved in an effective and efficient manner and within an ethical environment.
- Ensure the implementation of risk management systems and procedures for the identification, assessment and monitoring of risks. All risks are to be documented and controls identified to mitigate these risks.
- Ensure the development and implementation of standard operating procedures for all relevant business processes.

7.14.4.3 Management Actions

Refer to Table 7.14.4.

7.14.4	RISK MANAGEMENT				
Objective 2	To manage the conservation estate effectively.				
Key Deliverables	**Management/Monitoring Activities**	**Responsibility**	**Indicators**	**Timeframe**	**Reference to Existing Procedures**
73. Ensure effective and integrated risk management within a framework of sound corporate governance.	• Documenting of business processes. • On site risk identification and analysis. • On site identification of controls/ mitigations. • Monitoring of risks.	Conservation Manager, Chief Risk Officer.	Risks in the Risk Register mitigated in a cost effective manner and to an acceptable level.	1-5 years.	PFMA Section 38, Risk Management Policy and Strategy.

Budget Allocation	**Development**	
	Operation (5 Year Forecast)	R126 083

7.15 VISITOR MANAGEMENT AND SERVICES

7.15.1 Legislation

- Tourism Act, (Act No. 72 of 1993)

7.15.2 Guiding Principles

- Acknowledgement of the areas diverse natural heritage and a commitment to ensuring the safeguarding thereof for future generations.
- The responsible and sustainable development of tourism facilities compatible with the nature reserve's zonation policy.

7.15.3 Visitor management and services

The short to medium-term strategic focus for tourism and recreation in the Kammanassie Nature Reserve is:

- The maintenance of information on potential future visitor needs.
- There are currently no facilities open to the public on the Kammanassie Nature Reserve.

7.15.4 Concessionaires

- There are no concessions for the Kammanassie Nature Reserve.

7.15.5 Management Actions

Refer to Table 7.15.

7.15	VISITOR MANAGEMENT AND SERVICES				
Objectives 6	To promote the sustainable utilization of natural resources.				
Key Deliverables	**Management/Monitoring Activities**	**Responsibility**	**Indicators**	**Timeframe**	**Reference to Existing Procedures**
74. To promote and manage access to the reserve.	• Compile information on any potential visitor needs identified.	Reserve Management and Tourism Manager.	List of visitor needs.	1-5 years.	PAAC.

Budget Allocation	**Development**	
	Operation (5 Year Forecast)	R126 083

7.16 CONSERVATION DEVELOPMENT FRAMEWORK

7.16.1 Legislation

Key areas of legislation relevant to infrastructure use and development on Nature Reserves and conservation management. Please refer to the CapeNature guidelines.

- National Environmental Management Act, (Act No. 107 of 1998) - provides a framework for environmental governance and decision making.
- National Environmental Management: Protected Areas Act, (Act No. 57 of 2003) as amended 2009 – regulates development, use and management of all protected areas.
- National Environmental Management Act, (Act No. 107 of 1998) NEMA Environmental Impact Assessment Regulations (Government Notice No. R. 543 of June 2010 as corrected by Correction Notices 1 (Government Notice No. R. 660 of July 2010) and 2 (Government Notice R. 1159 of December 2010) - stipulates environmental authorisation process for a wide range of activities.
- National Water Act (Act 36 of 1998, as amended by Act 45 of 1999) – controls use of ground and surface water, and sets standards for wastewater quality.
- National Heritage Resources Act, (Act No. 25 of 1999) – protects and provides for authorisation relating to heritage features including buildings, archaeological and paleontological sites, and landscape character.
- The National Waste Act, (Act No. 59 of 2008) – controls disposal of waste.
- Tourism Act, (Act No. 72 of 1993) – provides a grading and classification scheme for tourism accommodation.
- Occupational Health and Safety Act, (Act No 85 of 1993) – specifies requirements for a safe and healthy working environment for all employees.

7.16.2 Guiding Principles for infrastructure planning and development

- Before any significant infrastructure development, reserves must have:
    - a zoning scheme based on a defensible environmental analysis of sensitivity and opportunities, proper internal consultation, and CapeNature regional strategy; and
    - an infrastructure development plan that specifies the type and location of all new infrastructure.
- Any infrastructure or activity, including change of use, must comply with all legislated licencing and authorisation requirements.
- Roads and tracks have the highest environmental and cost impact – planning should focus on providing efficient, lowest-impact road and trail networks.
- Layout of existing infrastructure and operations should be re-evaluated.
- Development Zones and Access Zones should be peripheral to nature reserve, and easily accessible to staff and visitors.
- Viewshed impacts of new infrastructure should be considered, especially any that might impact Wilderness Areas.
- Development Zones should be as tightly clustered as possible.
- All planning must explicitly avoid, minimise and mitigate fire risk.
- Management vs. tourism infrastructure should be close but separate.

- Tourism products should be located to balance visitor experience against environmental impact and access.
- Development Zones should utilise existing degraded or transformed habitat, although road access must be factored into the overall impact footprint.
- All new development or expansion must be informed by a financial feasibility study, reserve sensitivity analysis, and if appropriate specialist assessment of impact.
- New building infrastructure, especially in remote or sensitive locations, must consider total lifespan impact including decommissioning and removal.
- Green building techniques must be implemented to reduce carbon emissions, energy and water use, and waste contamination associated with construction and operation, although the primary consideration must be reducing local impact.

7.16.3 Management Actions

Refer to Table 7.16.

7.16	TOURISM DEVELOPMENT FRAMEWORK				
Objectives 6	To promote the sustainable utilization of natural resources.				
Key deliverables	**Management/Monitoring Activities**	**Responsibility**	**Indicators**	**Timeframe**	**Reference to Existing Procedures**
75. Tourism demand identified.	• Monitor and record tourism needs expressed by public.	Conservation Manager, Tourism Manager.	Database of tourism requests.	1 – 5 years.	PAAC.

Budget Allocation	**Development**	
	Operation (5 Year Forecast)	R126 083

PART 4

SECTION 8: REFERENCES

8.1 REFERENCES

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8.2 LIST OF ACRONYMS AND ABBREVIATIONS

AIS	Alien and Invasive Species
APO	Annual Plan of Operations
APP	Annual Performance Plan
AVM	Alien Vegetation Management
BIRP	Birds in Reserve Project
BMP-s	Biodiversity Management Plan for Species
BMS	Biodiversity Monitoring System
CAP	Conservation Action Priority
C.A.P.E.	Cape Action for People and the Environment
CBA	Critical Biodiversity Area
CBD	Convention on Biological Diversity
CBO	Community Based Organisation
CDF	Conservation Development Framework
CDP	Concept Development Plan
CEO	Chief Executive Officer

CFK	Cape Floral Kingdom
CITES	Convention on International Trade in Endangered Species
CMS	Conservation of Migratory Species of Wild Animals
CMZ	Cape Mountain Zebra
CN	CapeNature
CNC	Cape Nature Conservation (now CapeNature)
CNPAES	CapeNature Expansion of Protected Areas Strategy
CR	Critically Endangered
CREW	Custodians of Rare and Endangered Wildflowers
DAFF	Department of Agriculture, Forestry and Fisheries
DDD	Data Deficient
DEA	Department of Environmental Affairs
DEA&DP	Department of Environmental Affairs and Development Planning
DMC	Declared Mountain Catchment
DWA	Department of Water Affairs
EE	Environmental Education
EIA	Environmental Impact Assessment
EMI	Environmental Management Inspector
EMP	Environmental Management Plans/ Programme
EN	Endangered
EPWP	Expanded Public Works Project
FEPA	Freshwater Ecosystem Priority Area
FMU	Fire Management Unit
FPA	Fire Protection Association
GCBR	Gouritz Cluster Biosphere Reserve
GI	Gouritz Initiative
GIAMA	Government Immovable Asset Management Act
GIS	Geographical Information System
GRAP	Generally Recognised Accounting Practice
HIRA	Hazard Identification and Risk Assessment
HR	Human Resources
IAP	Invasive Alien Plants
IAS	Invasive Alien Species
ICM	Integrated Catchment Management
IDP	Integrated Development Plan
IS	Information Systems
IT	Information Technology
IUCN	International Union for Conservation of Nature
KKNK	Klein Karoo Nationale Kunstefees
KKRWSS	Klein Karoo Rural Water Supply Scheme
KNR	Kammanassie Nature Reserve
LC	Least Concern
LT	Least Threatened
METT-SA	Management Effectiveness Tracking Tool
MOU	Memorandum of Understanding
MTEF	Medium Term Expenditure Framework
NBA	National Biodiversity Assessment
NBAL	Natural Biological Alien

NBF	National Biodiversity Framework
NEMA	National Environmental Management Act, (Act No. 107 of 1998)
NEM:BA	National Environmental Management: Biodiversity Act, (Act No. 10 of 2004)
NEM:PAA	National Environmental Management: Protected Areas Act, (Act No. 57 of 2003)
NFEPA	National Freshwater Ecosystem Priority Area
NGO	Non-Governmental Organisation
NR	Nature Reserve
NBA	National Biodiversity Assessment
NSBA	National Spatial Biodiversity Assessment (now NBA)
NT	Near Threatened
OHS	Occupational Health and Safety
OUF	Outstanding Universal Value
PA	Protected Area
PAAC	Protected Area Advisory Committee
PAM	Protected Area Management
PAMP	Protected Area Management Plan
PDP	Personal Development Plan
PFMA	Public Finance Management Act, (Act No.1 of 1999)
QEM	Quarterly Ecological Meeting
RMC	Reserve Management Committee
SANParks	South African National Parks
SAP	System Application and Products
SAPS	South African Police Services
SASS	South African Scoring System
SCM	Supply Chain Management
SDF	Spatial Development Framework
SKEP	Succulent Karoo Ecosystem Programme
SMME	Small, Medium and Macro Enterprises
SOB	State of Biodiversity
SOP	Standard Operating Procedures
SS	Scientific Services
STEP	Succulent Thicket Ecosystem Programme
SWOT	Strengths, Weaknesses, Opportunities and Threats
ToPS	Threatened or Protected Species
TPC	Threshold of Potential Concern
UAMP	User Asset Management Plan
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNIEP	Uniondale Integrated Empowerment Project
VU	Vulnerable
WCNCB	Western Cape Nature Conservation Board
WESSA	Wildlife and Environment Society of South Africa
WfW	Working for Water
WHC	World Heritage Committee
WHS	World Heritage Site
WMA	Water Management Area
WoF	Working on Fire

8.3 LIST OF TABLES

8.4 LIST OF FIGURES