KEURBOOMS RIVER NATURE RESERVE COMPLEX MANAGEMENT PLAN 2013-2018

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The Keurbooms River Nature Reserve Complex (KRNRC) comprises the following:

The Keurbooms River Nature Reserve is established as a Provincial Nature Reserve in terms of Section 6 of the Nature and Environmental Conservation Ordinance, 1974, on 18 December 1979 and proclaimed in the Provincial Gazette of 4 January 1980 by Proclamation No. 1/1980.

The Seagull Breeding Colony is a moving sand spit between the Look-out Rocks and the Strandmeer Residential Development and includes the area above the high–water mark.

View of Keurbooms River Nature Reserve showing the river gorge with Fynbos vegetation in the foreground and Forest vegetation on the steep slopes.

[Cover page photograph: View of the Keurbooms River looking south.]

AUTHORIZATION PAGE

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PREAMBLE

The Keurbooms River Nature Reserve Complex (KRNRC) falls within the Cape Floristic Region (CFR). The CFR is one of the world's most biologically interesting ecosystems and is an epicentre of diversity and endemism. It 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. At least 70% of the plant species and nearly 20% of the genera that make up this region are found nowhere else on earth. This rich biodiversity is, however, 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, marine resources, and infestation by alien species. The region has thus been identified as one of the world's "hottest" hotspots of biodiversity.

In response to this, 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 the Cape Action Plan for the Environment (CAPE) (Cowling *et al.* 1999). It 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, a strategic programme was developed, which is known as Cape Action Plan for People and the Environment (C.A.P.E). Three overarching themes that complement and reinforce each other were developed:

- 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; and
- develop methods to ensure sustainable yields, promote compliance with laws, integrate biodiversity concerns into catchment management, and promote sustainable eco-tourism.

The Garden Route area was identified as an important area requiring focussed conservation action (Cowling *et al*. 1999). This resulted in the establishment of the Garden Route Initiative (GRI), a project aimed at using the above-mentioned three broad strategies (themes) at a regional level to conserve the biodiversity of the area. An important long-term goal is to create a network of corridors for plants and animals to move/migrate in response to climatic change over time, as well as to ensure the conservation and sustainable utilisation of the extremely important ecosystems, habitats and vegetation types in the area. This would contribute to the overall Catchment to Coast philosophy adopted by CapeNature. The GRI is dependent upon the participation and collaboration of private landowners, municipalities, government institutions, conservation organisations, non-governmental organisations (NGO) and Community Based Organisations (CBO), *etc*.

The KRNRC is located in the GRI area. CapeNature is therefore a key role player in achieving the goals of this initiative. Furthermore, Keurbooms River Nature Reserve has been included in the application for Extension Nomination for the Cape Floral Region Protected Areas World

Heritage Site which will be submitted to UNESCO (N.G. Palmer 2011, CapeNature. pers. comm.).

THE PROCESS

The planning session, facilitated by the Regional Ecologist and guided by the Conservation Manager, defined the vision and purpose of all the nature reserves and marine protected areas in the Garden Route Area (which include the **KRNRC**) as an umbrella statement, indicating the direction of the management intent for the nature reserves and marine protected areas in the Garden Route Area to guide the formulation of the management objectives. The submitted objectives were evaluated against the definitions in "A Procedure for Defining Conservation Management Objectives and Goals" (Coombes & Mentis 1992) and sorted into three categories: 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 is 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 with Action Plans developed.

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 RMC compiled the draft management plan for review. The KRNRC management plan was internally reviewed and recommended for stakeholder participation by all Executive Directors, Programme Managers, Catchment Managers, 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 review template (Waller 2011). The management plan was then

recommended for stakeholder participation to the Executive Director: Conservation Management. Stakeholder comments were considered and incorporated. The KRNRC management plan was reviewed by an independent external reviewer on a voluntary basis, who commented and recommended 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 KRNRC management plan and submitted to the Department of Environmental Affairs and Development Planning (DEA&DP) for submission to the Provincial Minister for approval.

ACKNOWLEDGEMENTS

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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 KRNRC, CapeNature strives to establish biodiversity conservation as a foundation of a sustainable economy providing ecosystem services, access and opportunities for all.

The KRNRC, proclaimed in 1980, is situated just north east of Plettenberg Bay and falls within the Bitou Municipality. The Nature Reserve Complex (NRC) is surrounded by both private and state landowners and surrounding land use includes farming (grazing) and conservation practices (marine and estuary use and water use). Southwards towards the Seagull Breeding Colony the adjacent land use is upmarket coastal and urban development.

The Bitou Municipality is home to three of South Africa's seven biomes. Those present within the municipality are fynbos, subtropical thicket and forest. The KRNRC falls within the Cape Floristic Region (CFR), a global biodiversity hotspot, and under the strategic Cape Action for People and the Environment (C.A.P.E.) programme, which is focused on minimising key threats and root causes to biodiversity loss.

An unspoilt riverine gorge, patches of Afro-temperate floodplain forest along the river embankments, coastal fynbos on the upper plateau, as well as a large part of the estuary and the littoral dune fields at the Seagull Breeding Colony are included in the KRNRC.

The KRNRC also falls within the Garden Route Initiative (GRI) area, part of the C.A.P.E. programme, which is attempting to soften the boundaries between formal protected area conservation, and initiatives on private and communal land to establish a sustainable conservation economy and promote the protection of ecological infrastructure.

The management plan is divided into four parts. The first part outlines the management objective framework of CapeNature and the KRNRC. The NRC's vision and purpose was developed to guide reserve management in its daily operations and longer term planning. The objectives for the KRNRC 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 KRNRC operates and details the history and legal status of the NRC, and presents details on abiotic and biotic information, cultural heritage, tourism, and youth development and awareness programmes.

The second part of the management plan outlines the strengths, weaknesses, opportunities and threats (SWOT) of the NRC. A conservation development framework is set out for the NRC, which includes a sensitivity analysis and zonation. In addition to the NRC's zonation plan, an all-inclusive Conservation Development Framework (CDF) and expansion strategy for the NRC is presented. These are in line with local Integrated Development Plans (IDPs) to align and facilitate integrated conservation and development.

Part 3 summarises the KRNRC's Strategic Implementation Framework that the NRC plans to implement to ensure that it achieves its management objectives.

Part 4 comprises the references, acronyms and abbreviations.

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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 a 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 Reserve Vision, Purpose, Values and Objectives

VISION

To conserve a system of sustainable living land- and seascapes in the Garden Route that are representative of the region's biodiversity and ecosystem services through integrated management, for the benefit of all.

PURPOSE

The main purpose of the KRNRC is to conserve examples of an unspoilt riverine gorge, patches of Afro-temperate floodplain forest along the river embankments, coastal fynbos on the plateau, as well as the estuarine littoral dune fields at the Seagull Breeding Colony. A

second purpose is to provide visitor facilities and to manage the visitor and illegal activities within the nature reserve complex through zoning and compliance enforcement.

PURPOSE FOR DECLARATION OF KRNRC IN TERMS OF NEM: PAA (SECTION 17)

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

VALUES

The values of the KRNRC are:

- the scenic beauty of the area;
- the seascapes;
- being a prime tourism and recreation destination;
- the temperate climate of the area;
- the bird breeding colony;
- the Bitou wetland;
- the Keurbooms Estuary system;
- the environmentally conscious and proactive community;
- intact mountain to ocean systems;
- high spiritual value of the river (*e.g*. for baptising);
- altitudinal gradients;
- the high local economic value;
- good infrastructure and accessibility; and
- the reserve's location in the Garden Route Initiative area.

OBJECTIVES

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 and manage biodiversity and natural processes representative of southern Cape terrestrial and marine ecological systems.
Objective 2: To improve the reach and quality of biodiversity management.
Objective 3: To provide appropriate opportunities and facilities for recreation.
Objective 4: To expand and secure the conservation estate.
Objective 5: To create environmental awareness.
Objective 6: To promote social and economic opportunities and sustainable utilisation**.**
Objective 7: To effectively conserve our cultural heritage attributes.

1.5 Guiding Principles

The following guiding principles underpin the Strategic Management Plan for the KRNRC. It is important to note that while these principles are intended to guide the 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 KRNRC, and its environmental and heritage resources, as a common heritage and a national asset for all South Africans

Common Heritage - The management of the KRNRC 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 KRNRC 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 KRNRC 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, NGOs and local communities.

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

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 KRNRC 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 KRNRC 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 KRNRC 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 KRNRC is adequately resourced to meet its mandated and ethical responsibilities in the effective management of the respective reserves.

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 KRNRC 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 KRNRC are adequately addressed, namely:

- 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; and

- 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.

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 economical and social development.'*

CapeNature is a public entity established in terms of and governed by the Western Cape Nature Conservation Board Act, (Act No. 15 of 1998) and 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. 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 which public entities as employers, implementers of government mandate and managers of public finance are subject to.

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)

- Convention on Wetlands of International Importance especially as Waterfowl Habitat (The) (RAMSAR)
- United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol
- United Nations Convention on the Law of the Sea (UNCLOS)
- International Union for Conservation of Nature (The) (IUCN)
- Convention concerning the Protection of the World Cultural and Natural Heritage (WHC)
- World Tourism Organisation (WTO)
- Intergovernmental Oceanographic Commission
- International Whaling Commission (The) (IWC)
- United Nations Educational, Scientific and Cultural Organization (UNESCO) Man and Biosphere (MAB) Programme

National Legislation

All National legislation applies to activities in the KRNRC, but the following have direct reference to the reserve's 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)
- Marine Living Resources Act, (Act No. 18 of 1998)
- Environment Conservation Act, (Act No. 73 of 1989)
- National Water Act, (Act No. 36 of 1998)
- Sea-shore Act, (Act No. 21 of 1935)
- National Veld and Forest Fire Act, (Act No. 101 of 1998)
- National Heritage Resources Act, (Act No. 25 of 1999)
- Sea Birds and Seals Protection Act, (Act No. 46 of 1973)
- Disaster Management Act, (Act No. 57 of 2002)
- Occupational Health and Safety Act, (Act No. 85 of 1993)
- Labour Relations Act, (Act No. 66 of 1995)
- Public Finance Management Act, (Act No. 1 of 1999)
- Disaster Management Act, (Act No. 57 of 2002)
- Consumer Protection Act, (Act No. 68 of 2008)

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, which 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 KRNRC, 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 and Environmental 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
- National Environmental Management: Integrated Coastal Management Act, (Act No. 24 of 2008)
- 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 KRNRC 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.

2.2 Management Agreements

The Keurbooms River Nature Reserve has formal partnerships with and a signed contract/MOU with the following institutions:

- Department of Water Affairs,
- Department of Environmental Affairs: Oceans & Coasts, and
- Working on Fire (WoF).

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 use integrated development planning to plan and map future development in their areas. 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. Among other things, the IDP should address how the environment will be managed and protected. Among the key components of an IDP are disaster management plans and a Spatial Development Framework (SDF). SDFs are essentially the spatial reflection of a municipality's IDP.

A 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, as well as conservation, within the municipality. A 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-coordinating IDP 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.

As an important management authority in the area, CapeNature needs to ensure that the nature reserves, estuary zonation plan, biodiversity sectoral plans and management guidelines are included in these documents and processes.

2.4 Institutional Framework

The Western Cape Nature Conservation Board is trading as CapeNature and the organisational structure is provided in Figure 1.

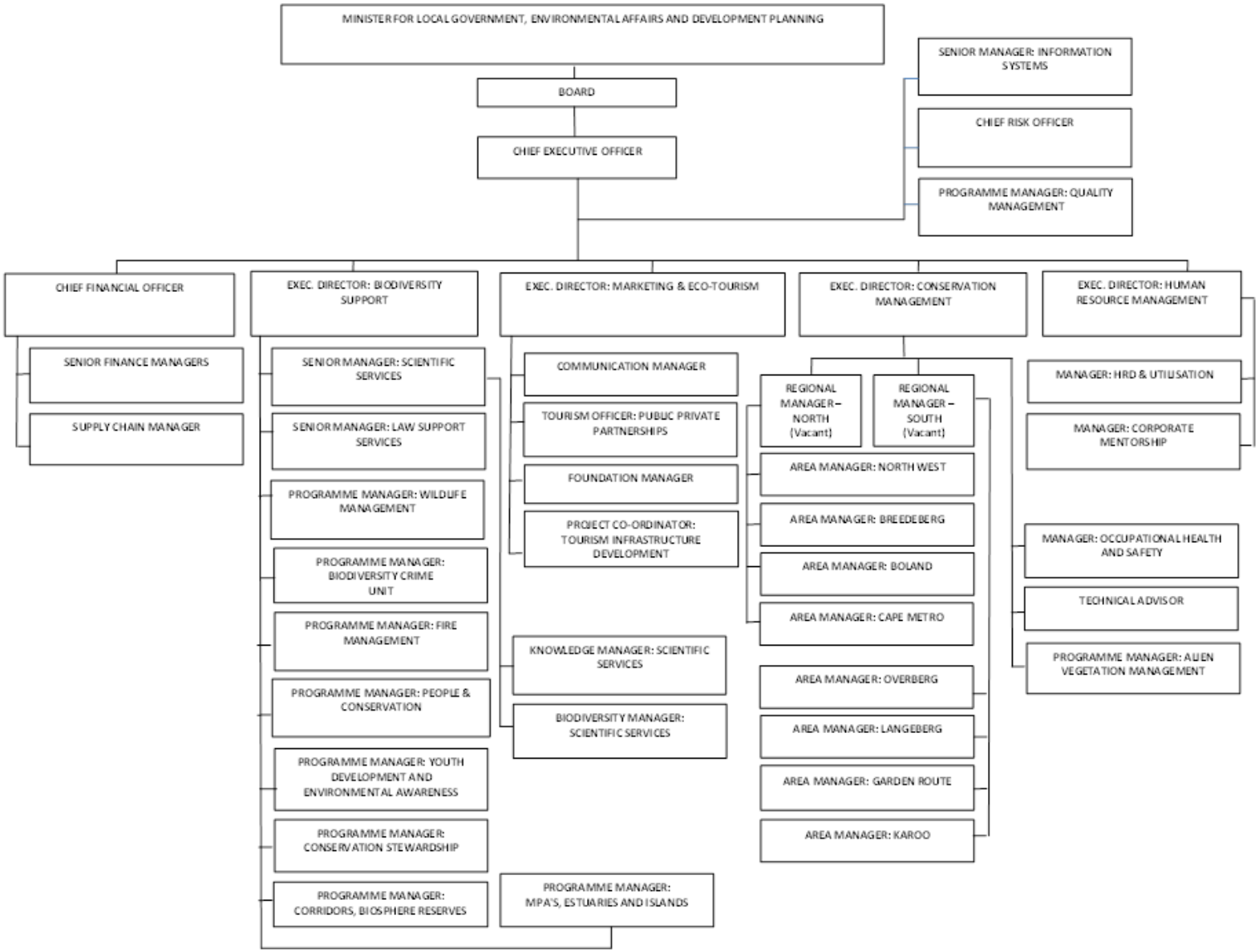

Figure 1: CapeNature Organogram (dated 18 October 2012).

2.5 Strategic Management Plan

2.5.1 Purpose of this management plan

The major elements of the reserve planning process for the KRNRC 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 KRNRC 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).

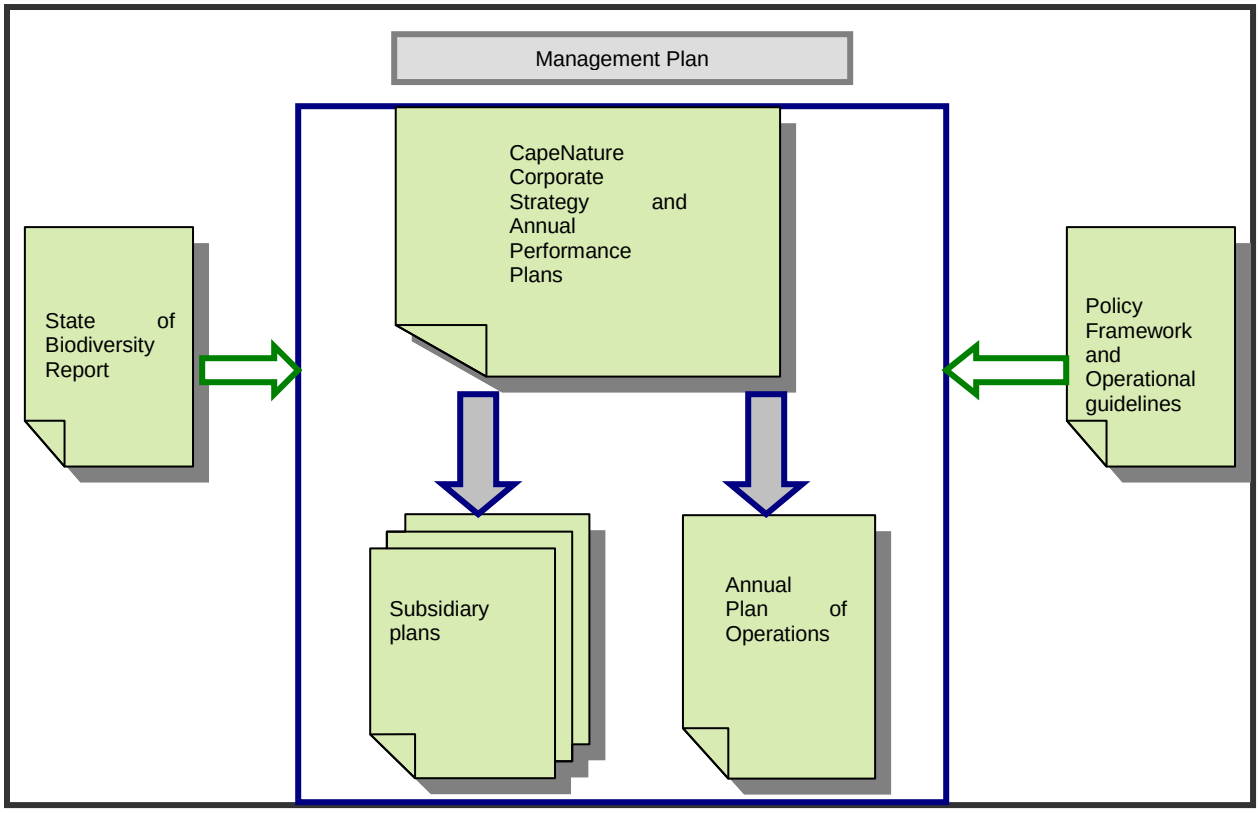

Figure 2: The elements of CapeNature management plans.

The management plan for the KRNRC 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 KRNRC 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 KRNRC 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 KRNRC 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 were combined with stakeholder meeting 3. At this meeting opportunity was provided to stakeholders to comment on the desired state and objectives for the Keurbooms River Nature Reserve Complex.

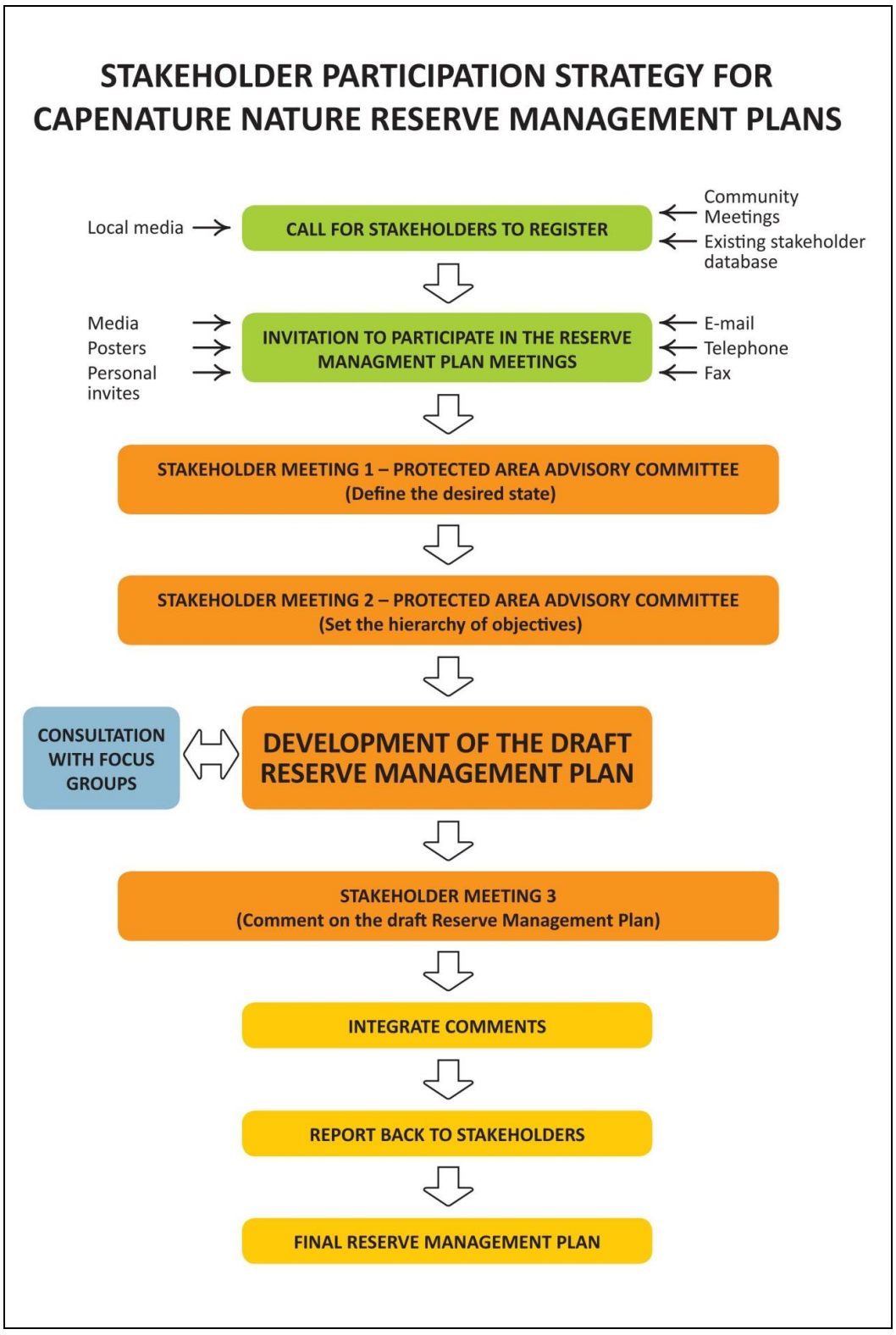

Figure 4: Stakeholder Participation Strategy for CapeNature Nature Reserve management plans.

2.5.3 Establishment of a CapeNature Protected Area Advisory Committee

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.

Procedure

CapeNature will invite representatives of community organisations, NGOs, residents of the neighbouring community, 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 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 letterheads, 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 in case of any member not adhering to the code of conduct stipulations, 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; and
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 KRNRC 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 and rejection of advice offered will follow the process as outlined below (Figure 5):

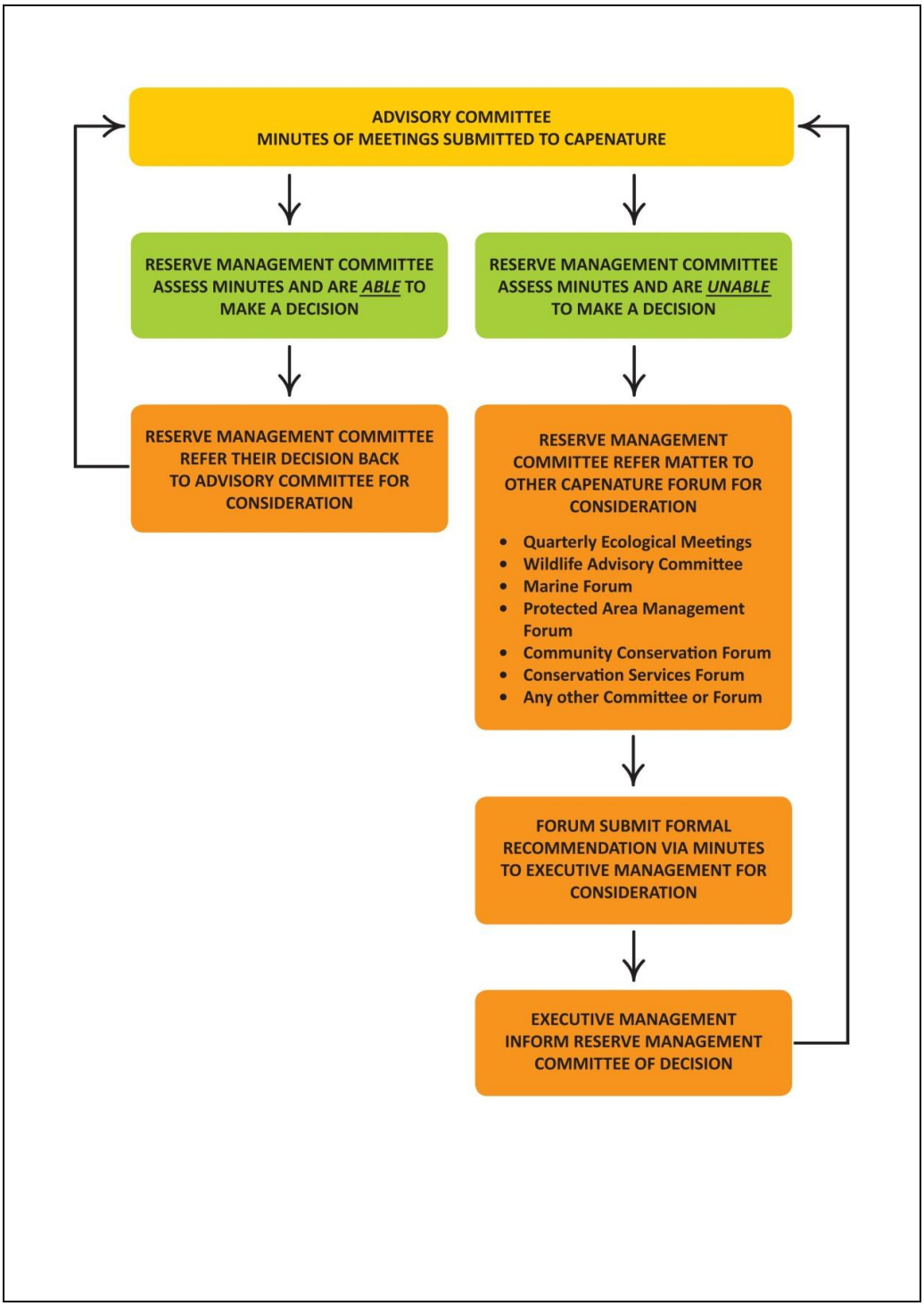

Figure 5: Decision Tree for the acceptance and rejection of advice from the PAAC.

SECTION 3: **OVERVIEW AND BACKGROUND OF THE RESERVE**

3.1 Location and Extent

The KRNRC is situated about 6 km north east of Plettenberg Bay on the N2 national road towards Port Elizabeth (see Figure 6). It falls within the following quarter degree grid squares: 3323 CD and 3423 AB.

The reserve complex consists of three sections:

- the Keurbooms River Nature Reserve, which includes the section of the Keurbooms River and adjacent land from the N2-bridge northwards up the gorge for about 7 km;
- the Seagull Breeding Colony, which is the sand-spit situated at the mouth of the Keurbooms River; and
- the reserve office situated on Erf 542 in Plettenberg Bay (see Figure 6).

Keurbooms River Nature Reserve and the Seagull Breeding Colony are 897.8 ha and 114.3 ha in extent, respectively.

The Keurbooms River Nature Reserve is situated between the following coordinates:

Northernmost limit of reserve:	33° 57’ 01.4”S
Southernmost limit of reserve:	34° 03’ 06.7”S
Westernmost limit of reserve:	23° 22’ 30.1”E
Easternmost limit of reserve:	23° 24’ 42.6”E.

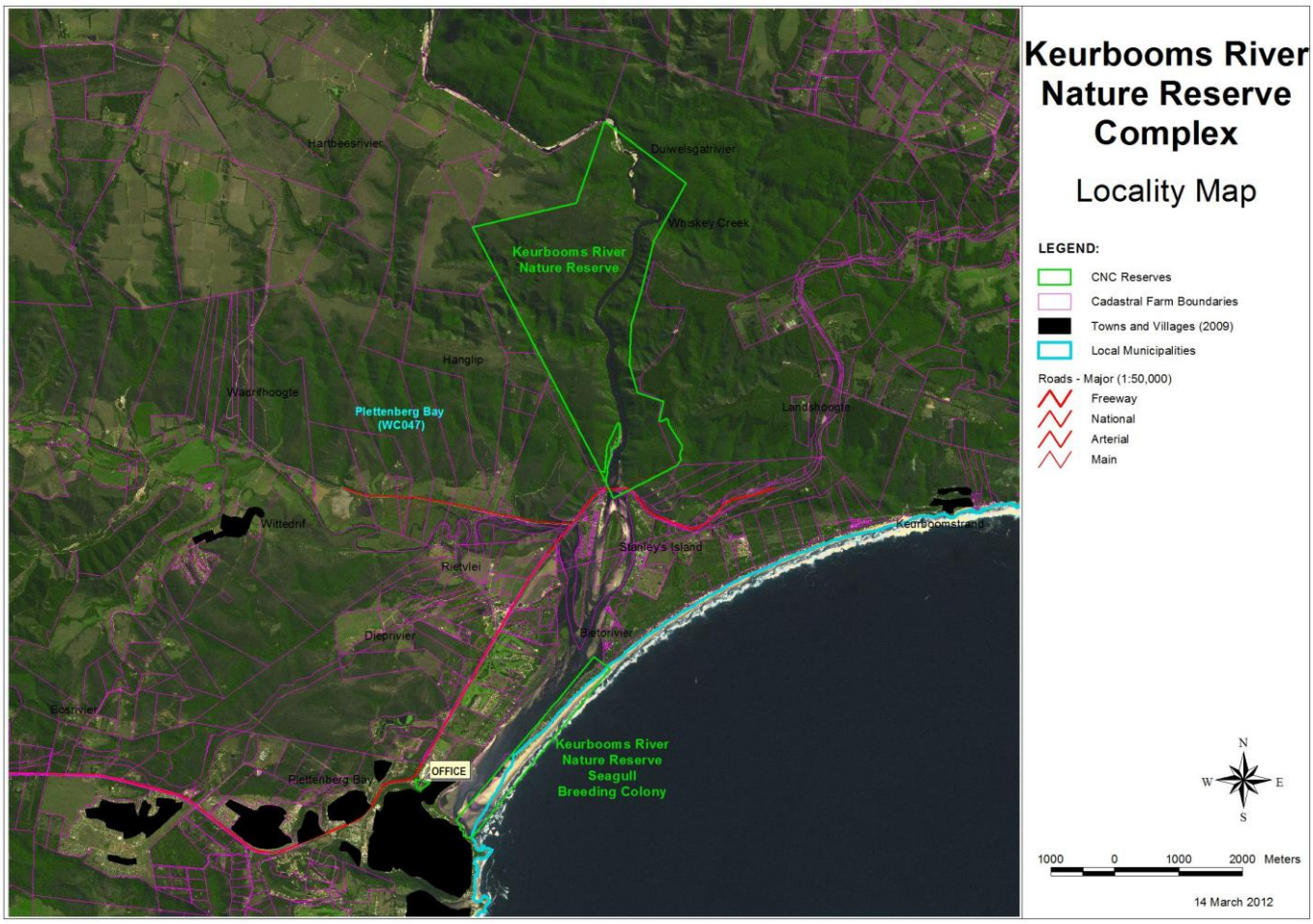

Figure 6: Location and extent of the Keurbooms River Nature Reserve Complex.

3.2 Legal Status

The Keurbooms River Nature Reserve was part of the Keurbooms River Forest Reserve managed previously by Department Water Affairs and Forestry. The proclaimed reserve was established in 1980, and was handed over to the Cape Provincial conservation authorities for management, together with the state land on which the resort is located which is presently managed by Forever Resorts.

The Keurbooms River Nature Reserve is established as a Provincial Nature Reserve in terms of Section 6 of the Nature and Environmental Conservation Ordinance, 1974, on 18 December 1979 and proclaimed in the Provincial Gazette of 4 January 1980 by Proclamation No. 1/1980.

The Seagull Breeding Colony is a moving sand spit between the Look-out Rocks and the Strandmeer Residential Development and includes the area above the high–water mark.

3.3 History

The Keurbooms River Nature Reserve used to be managed as part of the Keurbooms River Forest Reserve prior to 1980. All the indigenous forests, plantations, as well as Forest Reserves were managed by the Department of Water Affairs and Forestry during that period.

With the development and zoning of the resort (now known as Forever Resorts) the current reserve was cut off from the Keurbooms River Forest and handed over to the Cape Provincial Administration (CPA) of the Western Cape to manage, as the management of public resorts was not part of their mandate. The CPA at that stage used to manage two resorts in the Western Cape, namely Sonesta near Hermanus and Keurbooms at Plettenberg Bay. As part of the transfer, the Keurbooms River Nature Reserve was established as a Provincial Nature Reserve. This transfer also included the Seagull Breeding Colony at the Keurbooms River mouth.

The Keurbooms River Nature Reserve is that section of the Keurbooms River and adjacent land and water body situated in the lower reaches of the catchment area and the Keurbooms / Bitou estuary. The reserve was proclaimed a nature reserve to conserve Afromontane floodplain forest not formally conserved in any other protected area. The sand-spit on the eastern side of the Keurbooms River mouth is also proclaimed as a nature reserve for the purpose of protecting the kelp gull (southern black-backed gull) (*Larus dominicanus*) breeding area.

3.4 Climate

Rainfall, and minimum and maximum temperatures have been recorded on the reserve since 1995. Since measurements started, Keurbooms River Nature Reserve has recorded a minimum annual rainfall in 2005 (387 mm) and the highest annual rainfall was recorded in 2007 (783 mm). The inland valleys generally receive less rain because of the rain shadow effect from the mountain ranges, which lie parallel to the coast. From Figure 7 it is clear that rainfall in this region is spread throughout the year with a peak in September - November. The mean total rainfall per year was 592 mm.

Warmest temperatures are normally experienced between November and March and ranges between the high twenties and low thirties, the hottest month being February (Figure 7). Lowest temperatures are normally experienced between April and September, with the coldest temperatures recorded during July. The mean difference between minimum and maximum temperatures is 18.5 ^{0}C

The dominant winds throughout the year are south-westerly, normally as a result of an anticyclonic low-pressure system, which originates from the circumpolar westerlies. These interact with two subtropical high-pressure anticyclones, which fluctuate over the South Atlantic and South Indian Oceans (Hellström 1990).

During summer the winds are predominantly south-westerly alternating with weaker south-easterly wiinds. During autumn and winter the alternation is most frequent between south-

westerlies and north-westerlies. This is a result of the anticyclonic low-pressure system with its associated coastal low being displaced by inland cyclonic high-pressure systems. This allows for a moderate to strong katabatic land breeze component from the north-west, and influenced by the Outeniqua Mountain Range. These are the typical berg wind conditions experienced in May and August, which result in hot and dry conditions with high evapotranspirative conditions (Hellström 1990).

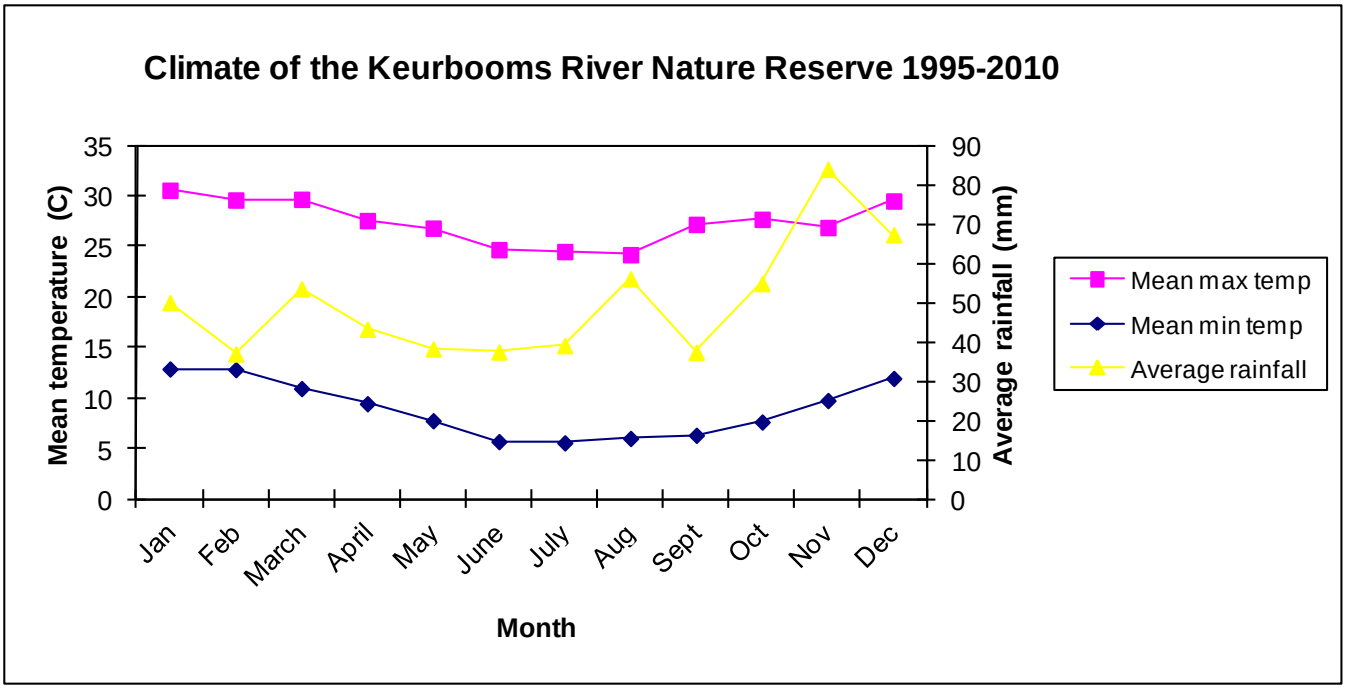

Figure 7: Climate for the Keurbooms River Nature Reserve Complex.

3.5 Topography

The Keurbooms River flows through a steep gorge situated mainly in the eastern part of the reserve. The reserve ranges from sea level, to a plateau with the highest point 240m.

3.6 Geology

Keurbooms River Nature Reserve has a classic sequence of late Jurassic age that includes deposits from a variety of terrestrial, beach and near-shore environments that were deposited in the intertidal and subtidal environment. These beds are tilted between 10° to 20°. Exposed palaeosurfaces occur along the outcrops facing the Indian Ocean (Reddering & Rust 1997).

The dominant lithological classes that are indicated on a 1:250 000 scale geological series map are shale, sandstone, siltstone and clay (Figure 8). Another lithological series that is

identified on the reserve is that of whitish-weathering quartz sandstone, which is medium to coarse grained, quartzitic and massive (Reddering 1993).

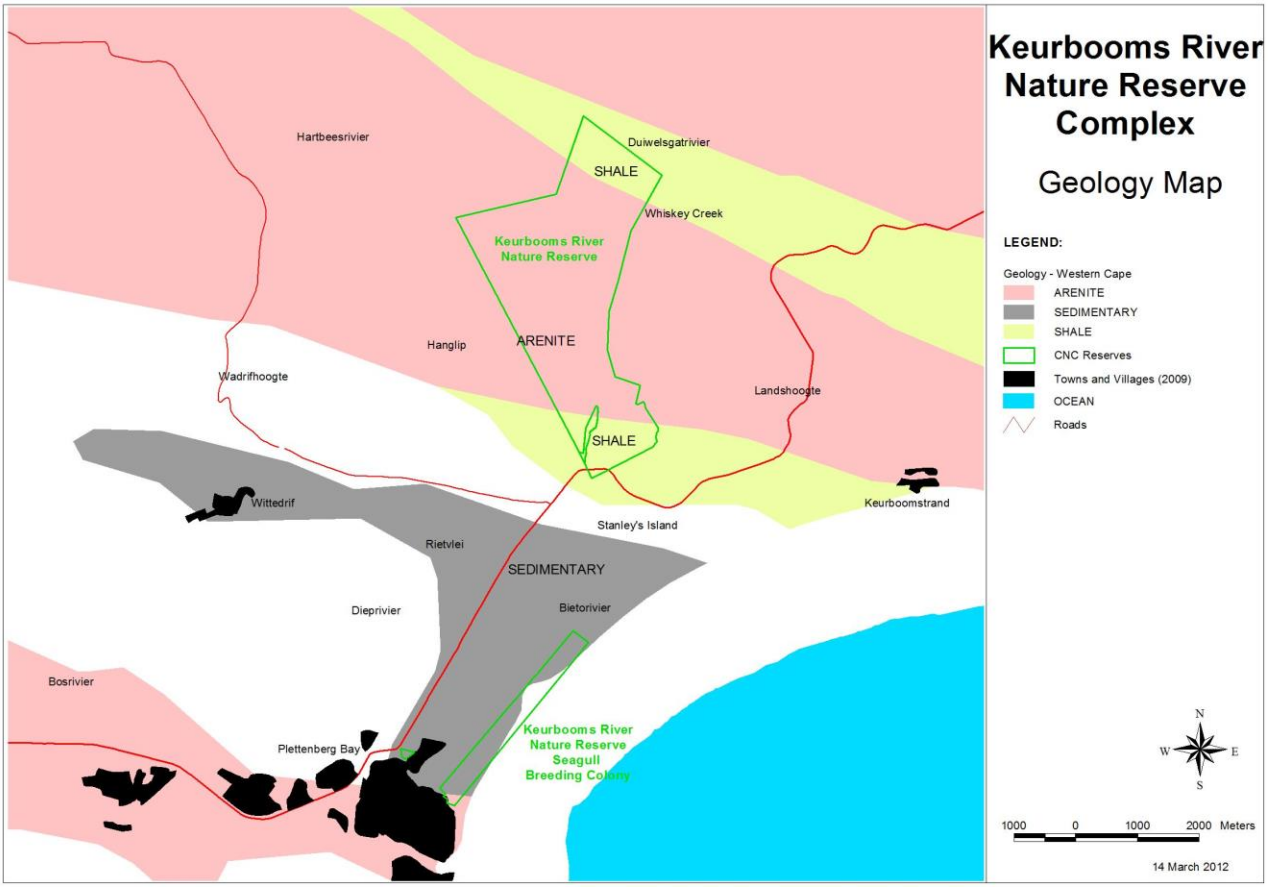

Figure 8: Geology of the Keurbooms River Nature Reserve Complex (Council for Geoscience 2001).

3.7 Hydrology

The section of the Keurbooms River that falls within the Keurbooms River Nature Reserve lies at the seaward end of major inland catchments. This obviously has impacts on factors such as water flow, water quality, sedimentation, alien invasions, *etc*.

According to the Department of Water Affairs (DWA), the geographical boundaries of an estuary are defined as follows: *"the seaward boundary is the estuary mouth and the upper boundary the full extent of tidal influence or saline intrusion, whichever is furthest upstream, with the five meter above mean sea level (MSL) contour defined as the lateral boundaries."* The extent of the tidal influence on the Keurbooms Estuary has historically been suggested a few hundred meters beyond Whiskey Creek, according to Enviro-fish Africa (2011). It, however, appears to extend at least 1.5 km upstream from Whiskey Creek and is therefore currently used as the cut-off point, until the exact extent of the River-Estuarine Interface,

where fresh and saltwater mix, can be determined (Enviro-fish Africa 2011). The upper extent of the Bitou Estuary is taken at the causeway on the Wittedrift road.

There are three main rivers flowing into the Keurbooms Estuary. They are the Duiwelsgatkloof-, Whiskey Creek- and Hartebees Rivers. The Bitou River joins the Keurbooms River in the lower estuary (Figure 9).

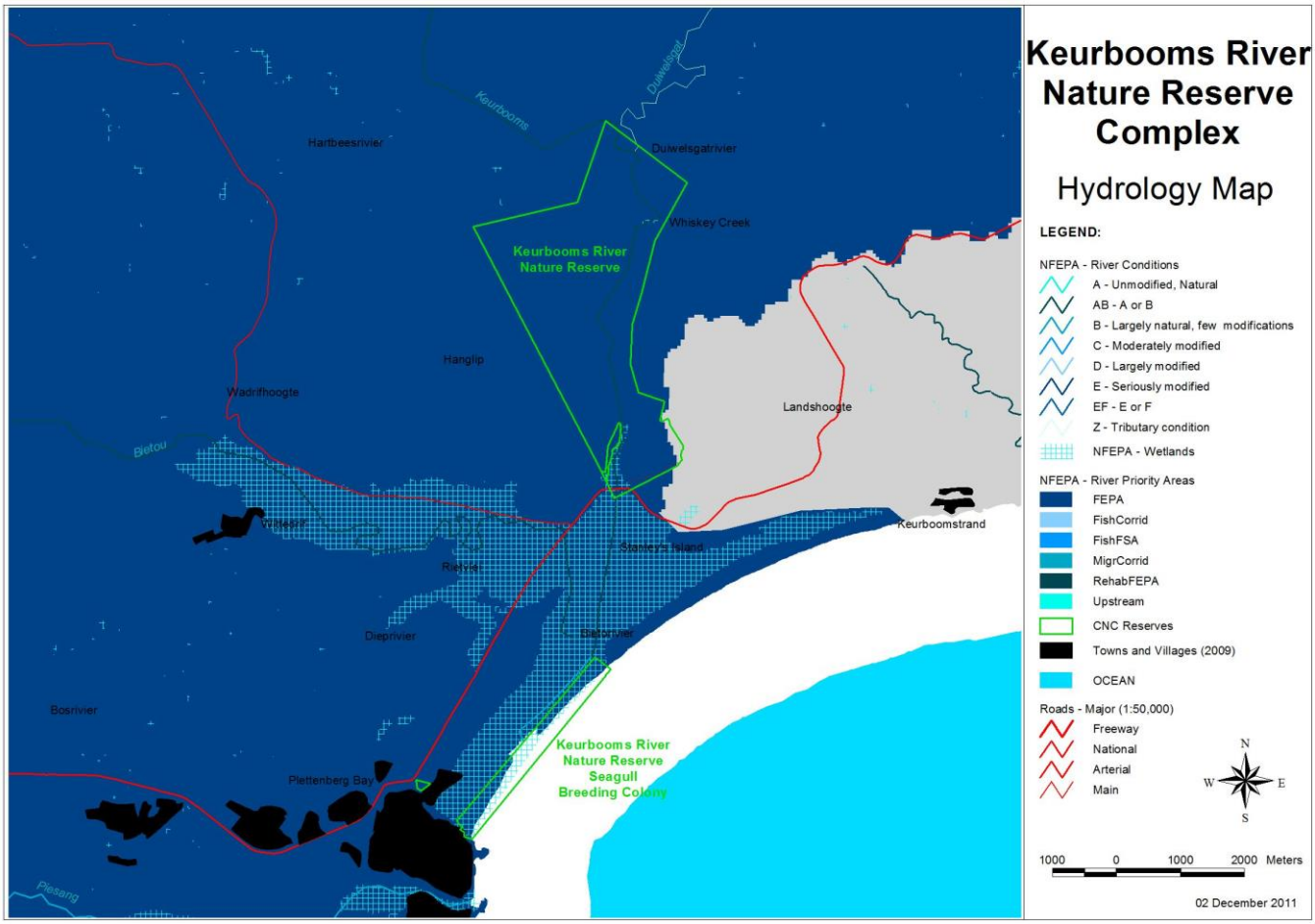

Figure 9: Hydrology of the Keurbooms River Nature Reserve Complex (Nel *et al.* 2011a, 2011b).

3.7.1 Catchments

The water in the Keurbooms River Nature Reserve has its source in the Outeniqua Mountains through the Keurbooms River, as well as the Palmiet River from the Tsitsikamma Mountains.

3.7.2 Rivers

The major part of the Keurbooms River Nature Reserve falls within river Freshwater Ecosystem Priority Areas (FEPAs) and their sub catchments as identified by the National Freshwater Ecosystem Priority Area (NFEPA) project (Nel *et al.* 2011a, 2011b). The Bitou River, although outside the boundaries of the Keurbooms Nature Reserve, is also a river FEPA. Both the Keurbooms and the Bitou Rivers are of importance to threatened indigenous

fish species and both these catchments are zoned as fish sanctuaries areas according to the NFEPA project (Figure 9). The management of both these systems is included in the estuary management plan for the Keurbooms/Bitou Estuary (Enviro-Fish Africa 2011).

To supplement the water supply to Plettenberg Bay, the DWA approved the increase in abstraction from the Keurbooms River from 8.46 to 14.8 Mega litres per day. Of great concern is the fact that this approval was granted based on a desk-top determination of the ecological reserve for the estuary. One of the conditions stipulated in the approval was that pumping must be ceased when the flow at the weir is less than 300 l/s. This condition is however not adhered to, especially during peak season. This abstraction affects both the water flow and quality of the estuary. Furthermore, the Bitou Municipality is currently in the process of applying to build an off-channel dam to store the abstracted water. The Keurbooms-Bitou Estuarine Management Committee has therefore indicated that a comprehensive ecological reserve study needs to be undertaken before any further proposals are considered.

3.7.3 Other freshwater aquatic systems (Wetland, springs, pans)

The Bitou wetland joins the Keurbooms Estuary 5 km upstream from the Keurbooms River mouth. It has a unique mixture of plant and animal species and no alien fish species (River Health Programme 2009).

A small cluster of wetlands is found in association with a tributary of the Keurbooms River downstream of the Duiwelsgat River and these form a FEPA together with a small section of the river itself. These are all located within the nature reserve (Figure 9).

3.7.4 Estuaries

The large Keurbooms River Estuary is separated from the sea by a coastal barrier, which has a tidal inlet linking it to the sea. Due to its size and topography the estuary always remains open to the sea with only the river mouth migrating between Lookout Rocks and Strandmeer (Gyer's Corner).

The confluence of the Bitou River and Keurbooms River is approximately 3.5 km from the mouth. The Bitou River is 23 km long, with its source at Buffelsnek, and is tidal for 7.2 km from the confluence to the causeway at Wittedrift. The Keurbooms River is approximately 85 km long, with its source at Spitskop in the Outeniqua Mountains, and is tidal for approximately 8.5 km from the confluence to about 1.5 km upstream of Whiskey Creek (Enviro-Fish Africa 2011).

The estuary is an important nursery area for marine fish, it is one of only three estuaries where the Red Data Book Knysna seahorse (*Hippocampus capensis*) is found, and is rated the 16th most important estuary along the South African coastline due to its functioning and condition (River Health Programme 2009, Turpie & Clarke 2007, Enviro-Fish Africa 2011).

The river and estuary are home to several IUCN Red-listed bird species, for example the Blue Crane (*Anthropooedes paradisea*), and the Half Collared Kingfisher (*Alcedo semitorquata*). The Keurbooms Estuary has also been identified as a national priority for conservation (FEPA estuary) (Nel 2011a, 2011b).

A large variety of estuarine habitats occurs within the system, including large salt marshes in the Bitou wetland with mud flats where organisms like the mud crab (*Scylla serrata*) occur. Large Zostera beds (*Zostera capensis*) can be found at the confluence of the Keurbooms and Bitou Rivers. This high density aquatic vegetation serves as a refuge for juvenile fish, including the Knysna seahorse (*Hippocampus capensis*).

The sand spit within which the river mouth migrates also serves as a breeding colony for a variety of sea birds including the kelp gull (*Larus dominicanus*), African black oystercatcher (*Haematopus moquini*), sacred ibis (*Threskiornis aethiopicus*) and African spoonbill (*Platalea alba*).

A Rapid (Desktop) Ecological Reserve Assessment of the Keurbooms Estuarine system rated the present ecological state as Category A/B, the Ecological Importance and Sensitivity as High, and the Recommended Ecological Category as A/B (Bitou Municipality 2008). Category A/B indicates a system that is between A (unmodified; natural) and B (largely natural with few modifications; small change to habitat and biota, but ecosystem functioning remains essentially unchanged) (Enviro-Fish Africa 2011). This rating is quite surprising given the continuous growth in developments surrounding the estuary and the water abstraction of 8,4 million liters per day for municipal use (see discussion under 3.7.2 above).

Little is known about the impacts of *existing* abstractions, let alone the impacts of recently approved and proposed future abstractions and stream flow reduction activities on the long-term health and functioning of the estuary. A system as ecologically valuable as the Keurbooms should have a near natural flow of fresh water. It is therefore critical that: (1) the amount of water currently abstracted from the Keurbooms system (through direct abstraction – farm and domestic use, invasive alien plants, agriculture and plantations) is accurately determined, and (2) the impacts of existing abstractions on the ecology of the river and estuary are quantified and, where unacceptably high, addressed in the management plan.

3.8 Flora

3.8.1 Terrestrial vegetation

Keurbooms River Nature Reserve has an altitudinal range from sea level to 241 m above sea level, which has a substantial influence on its vegetation.

The deep protected valleys and kloofs are covered in Afrotemperate forest with the plateau being vegetated with typical grassy fynbos. On the north-westerly slopes adjacent to the Afrotemperate forest an Aloe-dominated thicket is prevalent with an isolated colony of *Aloe pluridens* occurring within the Keurbooms River Nature Reserve.

According to the South African vegetation map (Mucina & Rutherford 2006), six vegetation types occur within the reserve, namely: Cape Coastal Lagoons, Cape Estuarine Salt Marshes (LT), Cape Seashore Vegetation (LT), Garden Route Shale Fynbos (EN), South Outeniqua Sandstone Fynbos (VU), and Southern Afrotemperate Forest (LT) (Figure 10).

For detailed descriptions of these vegetation types, see Mucina and Rutherford (2006).

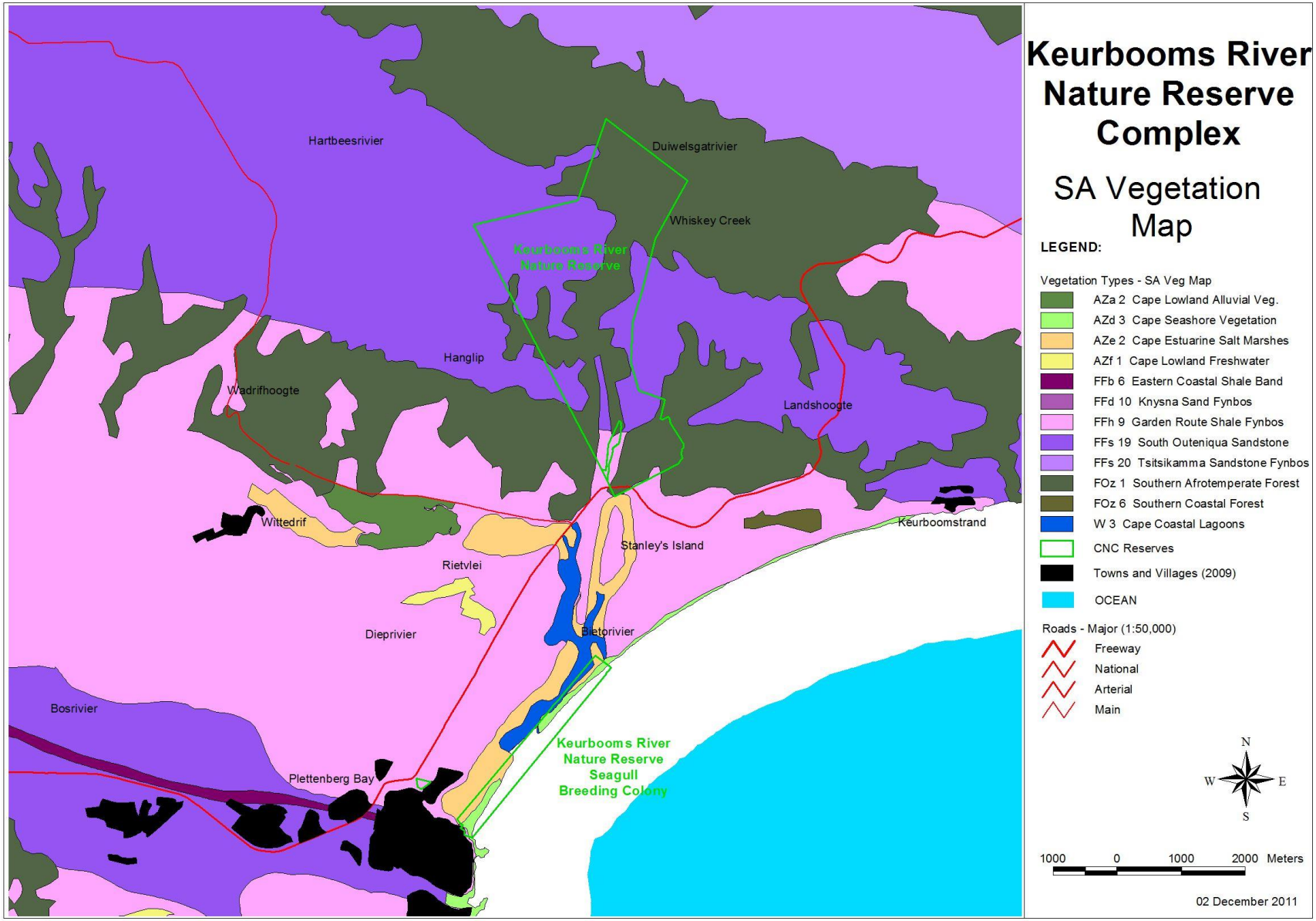

Figure 10: Vegetation of the Keurbooms River Nature Reserve Complex based on the SA Vegetation Map (Mucina & Rutherford 2006).

Based on the fine-scale vegetation map developed for the Garden Route Initiative by Vlok *et al.* (2008), the reserve contains eight non-aquatic vegetation units from three biomes (Figure 11). From a management point of view this map is more practical and useful to inform management actions. A brief description of each unit (based on Vlok *et al*. (2008)) is given below as well as the conservation status according to Holness *et al*. (2010) and Vromans *et al*. (2010):

Forest biome:

- Tsitsikamma Plateau Forest (LT) - This habitat occurs from Plettenberg Bay to the eastern extent of the Tsitsikamma National Park. It contains moisture loving ferns such as *Cyathea capensis* which tend to be more abundant in the understorey of this unit, but that may be an artifact of the large number of rivulets that originate and intersect the Tsitsikamma Plateau Forest unit.
- Piesang River Fynbos-Forest (LT) – This unit is limited to a small area near Plettenberg Bay. It is easily recognized in having *Strelitzia alba* present in the forest component. These forests also tend to have *Lachnostylis hirta* often super abundant, which may be an artifact of regular fires that enter these forests. The associated Grassy Fynbos has one uncommon species present, *Muraltia knysnaensis*.
- Keurbooms Thicket-Forest (VU) – This unit, which is entirely limited to the Keurbooms River, occurs on steep slopes where the vegetation of the southern and northern slopes differs much. In being centrally located it assimilated an enormous range of non-fire adapted species typical from both the western and eastern sectors. Even succulents such as *Aloe arborescens* and *A. pluridens* are present in arid sites.
- Tsitsikamma Riverine Forest (LT) - This forest unit occurs in patches along rivers from Pletterberg Bay to Oyster Bay and varies much in height depending on the local conditions. It includes some of the tallest forest in the Southern Cape. *Afrocarpus falcatus* can grow into giant trees that tower over the forest canopy. The canopy is often tangled with a variety of creeping and climbing plants, often dominated by *Rhoicissus tomentosa*. In disturbed examples *Pittosporum viridiflorum* and *Tarchonanthus littoralis* are usually very abundant and seem to act as pioneer species, seemingly more so than *Virgilia divaricata*. This habitat may be confused with the Coastal Dune Milkwood and *Ekebergia* Forests, but *Sideroxylon inerme* is less prevalent and it is easily recognized by the presence of the localized endemic *Strelitzia alba*. Some uncommon understorey species, such as *Liparis remota* reach their southernmost distribution here.

Subtropical Thicket biome:

- Wilderness Forest-Thicket (VU) – This habitat, which occurs from Wilderness to Plettenberg Bay, is restricted to the secondary dune systems, just inland of the mobile dune systems. The matrix vegetation consists of Dune Thicket with typical species such *Azima tetracantha*, *Carissa bispinosa*, *Cassine peragua, Euclea racemosa, Lycium cinereum*, *Searsia crenata, Searsia pterota*, *Mystroxylon aethiopicum, Muraltia spinosa, Putterlickia pyracantha* often forming impenetrable stands as these shrubs are usually woven together with creepers such as *Asparagus aethiopicus, Cynanchum ellipticum, Rhoicissus digitata, Sarcostemma viminale* and *Solanum africanum*. A forest-like community of trees such as *Olinia ventosa, Pterocelastrus tricuspidatus, Sideroxylon inerme* and *Tarchonanthus littoralis* occur in the protected dune slack

areas. Where these dune slack areas are deep these trees form a dense and closed canopy that is well lifted above ground level, thus qualifying to be called a “Milkwood forest”.

Fynbos biome:

- Tsitsikamma Forest Fynbos (LT) - This habitat is of a very limited extent – occurring from Plettenberg Bay to the eastern boundary of the Tsitsikamma National Park. It has a natural mix of Forest and Fynbos vegetation. The broken topography in which it occurs may result in fires burning here less frequently here and this allows many different forest species to establish and persist in the tall Fynbos vegetation. It is this mix and the dominance of Fynbos that distinguishes it from Tsitsikamma Fynbos Forest. Useful indicator species are: *Erica sparsa, Erica diaphana, Passerina falcifolia, Protea mundii, Rhodocoma gigantea* and *Widdringtonia nodiflora*.
- Uplands Grassy Fynbos (EN) – This unit, which generally lacks specific features is limited to the area just north of Plettenberg Bay. Some *Protea neriifolia* is sometimes present on moist south-facing slopes, but they are never abundant. It contains few restios and several grasses are abundant, as well as several small wetlands (also indicated by an abundance of *Cliffortia linearifolia*). In this unit the small wetlands look suspiciously much like old elephant wallows, which probably harbored the now threatened fern *Marsilea schelpeana*. When not burned this unit is often overgrown by *Euryops virgineus*. Some interesting eastern species such as *Thunbergia alata* are present in dry rocky areas, including the very rare *Brachystelma comptum*.
- Knysna Enon Fynbos (LT) – This habitat is limited to the Knysna and Plettenberg Bay area. The base geology of this habitat, the Enon Conglomerate, often erodes in such a way that the hills have steep slopes with many small ravines, which afford protection against fires. Patches of Dune Thicket usually occur in these ravines, often along with a few odd individuals of coastal forest tree species such as *Calodendrum capense* and *Celtis africana*. Fynbos occurs on moist south-facing slopes, often with an overstorey of proteoid shrubs such as *Leucadendron eucalyptifolium* and *Protea neriifolia* and an abundance of ericoid shrubs (such as *Agathosma ovata, Erica versicolor, Phylica axillaris*, etc.). The north-facing slopes support mostly Grassy Fynbos, in which grasses such as *Brachiaria serrata, Cynodon dactylon, Digitaria eriantha, Eragrostis capensis, Eragrostis curvula, Eragrostis obtusa, Eustachys paspaloides, Harpochloa falx, Heteropogon contortus, Pentaschistis pallida, Themeda triandra* and *Tribolium uniolae* are usually abundant, with only a few overstorey proteoid shrubs such as *Leucadendron salignum* present. Many succulents, such as *Aloe arborescens, Bulbine alooides* and several *Crassula* species, are present on bare rocky outcrops. The broken topography thus results in three different vegetation units, Thicket, Proteoid Fynbos and Grassy Fynbos to occur in close proximity. Threatened species present include *Acmadenia alternifolia, Satyrium muticum* and *Satyrium princeps*. It is suspected that two long-lost and probably highly threatened orchid species, *Disa newdigateae* and *Disa forcipata*, occur (or occurred) in this unit.

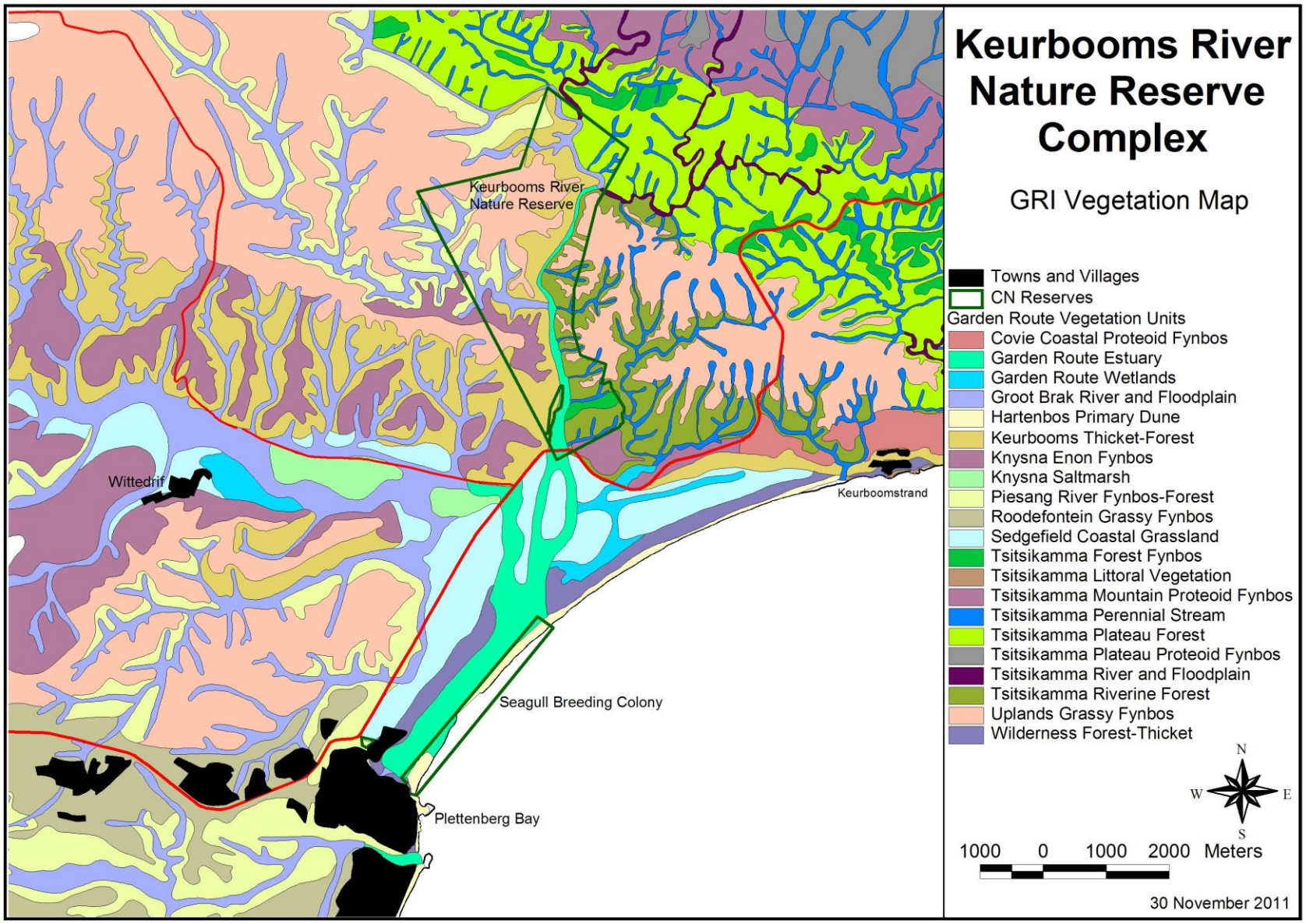

Figure 11: Fine-scale vegetation map of Keurbooms River Nature Reserve Complex according to Vlok *et al.* (2008).

3.8.2 Aquatic (Freshwater and marine)

With regards to the aquatic vegetation, four units occur within the Keurbooms River Nature Reserve according to the fine-scale vegetation map compiled by Vlok *et al*. (2008) (Figure 11):

- Garden Route Estuary – Occurs from Wilderness to Plettenberg Bay. The boundary of this unit changes depending on the freshwater input from inland in relation to the saltwater penetration from the sea. Useful indicators to determine this boundary is the presences of submerged aquatic species (*e.g*. *Potamogeton pectinatus*, *Ruppia maritima*, *Zostera capensis*) and plant species such as *Cotula coronopifolia*, *Juncus kraussii, Limonium scabrum, Scirpus maritimus*, *Suaeda caespitosa* and *Thinopyrum distichum* along the outer edge.
- Groot Brak River and Floodplain (EN) - In this unit, which occurs along rivers from Groot Brak River to Plettenberg Bay, *Prionium serratum* is present in the mainstream. Along the upper tributaries *Cliffortia odorata* tends to form very dense mats, allowing only a few other shrubs and trees (e.g. *Psoralea affinis* and *Salix mucronata*) to persist. Perhaps most distinctive about this unit is the presence of riverine forest within much of the floodplain zone, often with tall *Afrocarpus falcatus* trees present. In the more exposed areas the vegetation of these tributaries has a well-developed grass and sedge component and *Acacia karroo* present.
- Tsitsikamma Perennial Stream (CR) – This units is associated with the freshwater streams originating from the Tsitiskamma Mountains. Typical of this habitat is the dark, fresh and acidic water where *Laurophyllus capensis* tends to be abundant.
- Hartenbos Primary Dune (EN) – This marine unit occurs in patches as a very narrow coastal strip all the way from Witsand eastwards to Nature's Valley. It has few species present. *Ammophila arenaria* (alien), *Arctotheca populifolia*, *Gazania rigens*, *Hebenstretia cordata*, *Ipomoea pes-caprae*, *Senecio elegans*, *Scaevola plumieri*, *Tetragonia decumbens* and *Thinopyrum distichum* are mostly present. Plants tend to be sparse, but just inland the vegetation rapidly becomes more dense and taller, with shrubs such as *Metalasia muricata*, *Morella cordifolia*, *Passerina rigida*, *Searsia crenata* and often somewhat stunted *Sideroxylon inerme* present. The latter constitute the transition to Dune Thicket vegetation and the cut-off point between these two units is often difficult to determine. The absence of species such as *Scaevola plumieri*, *Tetragonia decumbens* and *Thinopyrum distichum* can be used as indicators of the transition from Primary Dune to Dune Thicket units. The Primary Dune units act as a precursor to the Dune Thicket units. Wherever they are absent, often due to stabilization of the supporting Drift Sands habitat, wave action starts eating into the secondary dunes, undermining the sands of the Dune Thicket. *Gladiolus gueinzii* is the only uncommon plant species present in this unit.

Plant species lists for the reserve are being compiled by reserve personnel during monthly focal point surveys, supplemented by opportunistic collections and observations. To date, 173 plant species have been recorded from the reserve and included in CapeNature's State of Biodiversity (SOB) database housed at Jonkershoek in Stellenbosch. There are many more species known from the reserve, but these have not been captured in the database – an aspect that needs to be addressed.

Three forest species that are of conservation concern occur on the reserve, namely: *Curtisia dentata* (NT), *Ilex mites* (Declining) and *Rapanea melanophloeos* (Declining) (Raimondo *et al*. 2009). It is however not impossible that *Acmadenia alternifolia* (EN) or *Erica onusta* (CR) may also occur here. Reserve staff and plant enthusiasts are also encouraged to be on the lookout for the long lost *Disa newdigateae* (PE) and *Disa forcipata* (Extinct), especially after fires.

Species lists are available on request from Scientific Services, Assegaaibosch Nature Reserve, Jonkershoek Road, Stellenbosch.

3.8.3 Invasive Alien Plants

The threat posed to the reserve by invasive alien plants is mainly due to the upstream infestations of *Acacia mearnsii* (Blackwattle), *Arundo donax* (Giant reed), *Solanum mauritianum* (Bugweed), *Ricinus communis* (Castor-oil plant) and *Rubus cuneifolius* (American bramble). *Hakea sericea* (Silky hakea) and *Pinus pinaster* (Cluster pine) occur on the plateau area.

3.8.4 Plantations

To the east of the reserve are large plantations of *Pinus elliotii* (Slash pine) managed by Mountains to Ocean (MTO).

3.9 Fauna

Species lists are available on request from Scientific Services, Assegaaibosch Nature Reserve, Jonkershoek Road, Stellenbosch.

3.9.1 Mammals

Twenty six species of mammals have been recorded in the Keurbooms River Nature Reserve. Of these, only Blue duiker (*Celphalophus monticola*) is considered a threatened species. The other threatened species listed below (Table 3.1) are likely to occur in the reserve and confirmatory records are required.

Bushbuck, Vervet monkeys, mongooses and baboons are frequently sighted on the reserve. Bushpigs wallow in the mud in the seasonal pans and judging by the footprints these temporary open waters are also utilised by a variety of other animals including bushbuck, Cape grysbok and mongooses.

Table 3.1: List of Threatened species of mammals that occur or are likely to occur on the reserve.

Species	Common name	South African Red Data Book Category (Friedman and Daly 2004)
Mysorex longicaudatus	Long-tailed Forest Shrew	
Graphiurus ocularis	Spectacled Dormouse	LC
Dasymus incomtus	Water rat	NT
Mystromys albicaudatus	White-tailed Mouse	EN
Panthera pardus	Leopard	
Mellivora capensis	Honey badger	NT
Celphalophus monticola	Blue duiker	

3.9.2 Avifauna

The reserve supports terrestrial-, shore- and seabirds. The latter two groups are predominantly found on the two coastal portions of the reserve complex. According to the Birds in Reserves Project, a total of 177 species of birds have been recorded for the KRNRC (BIRP 2011). Sixty-three of these species are known to breed within the reserve boundaries.

Threatened bird species recorded for the reserve complex are listed in Table 3.2.

Table 3.2: List of threatened bird species recorded from the Keurbooms River Nature Reserve Complex.

Species	IUCN Category (IUCN 2011)	South African Red Data Book Category (Barnes 2000)
Cape Gannet *Morus capensis*	VU	VU
Cape Cormorant *Phalacrocorax capensis*	NT	NT
White-backed Night-heron *Gorsachius leuconotus*		VU
Maccoa Duck *Oxyura maccoa*	NT	
Perigrine Falcon *Falco peregrinus*		NT
Martial Eagle *Polemaetus bellicosus*		VU
African Marsh-harrier *Circus ranivorus*		VU
Blue Crane	VU	VU

Anthropoides paradiseus		
African Finfoot *Podica senegalensis*		VU
African Black Oystercatcher *Haematopus moquini*	NT	NT
Black-winged Lapwing *Vanellus melanopterus*		NT
Caspian Tern *Sterna caspia*		NT
Half-collared Kingfisher *Alcedo semitorquata*		NT
Knysna Woodpecker *Campthera notata*		NT

Apart from more than 1000 breeding pairs of Kelp Gull, a number of bird species breed in the Seagull Breeding Colony including African Black Oystercatcher, Spoonbill, Caspian Tern, Little Egret, Sacred Ibis, Egyptian Goose and Water Dikkop. Furthermore, Swift Terns, Sandwich Terns and Common Tern roost near the river mouth.

3.9.3 Reptiles

A total of 19 reptile species have been recorded from the reserve. None of them are listed in the outdated South African Red Data List for Reptiles and Amphibians (Branch 1988).

3.9.4 Amphibians

Seasonal pans occur in the fynbos on the plateau and a variety of associated amphibians rely on these temporary pools for their survival. Eleven species have been recorded from the reserve, none of which are listed as Threatened (IUCN 2011). However, the Endangered Knysna leaf-folding frog (*Afrixalus knysnae*) has been recorded from Knysna to just east of Plettenberg Bay (Burger *et al*. 2004; Du Preez & Carruthers 2009) and should be actively sought within the reserve.

3.9.5 Fish

The Keurbooms and Bitou Rivers are home to four indigenous freshwater fish species namely the Slender redfin (*Pseudobarbus tenuis*), the Eastern Cape redfin (*Pseudobarbus afer*), the Cape galaxias (*Galaxias zebratus*) and the Cape kurper (*Sandelia capensis*). There are no large indigenous freshwater fish in the Keurbooms River, but the occurrence of catadromous species such as eels (*Anguilla* spp.) and Mullets (*e.g*. *Mugil cephalus* and *Myxus capensis*) is expected. The lower sections of these rivers fall within a fish sanctuary within the Keurbooms River Nature Reserve, and are therefore of critical importance for indigenous fish conservation. Both redfin species and the Cape kurper are present in both these rivers, but records for Cape galaxias only exist for the Bitou River.

Tributaries of special conservation concern in the Bitou include the Kransbos River and in the Keurbooms River, the Palmiet- and Kwaai River are important as they do not have any

invasive alien fish species. The results of a River Health Programme (River Health Programme 2009) survey from 2007 indicated that the fish community of the upper Keurbooms River was considered to be in a poor condition with the loss of indigenous species and the presence of invasive alien species, while the fish community of the middle and lower Keurbooms was considered to be in a better condition. The fish assemblage of the upper Bitou River was reported to be in a reference condition with the lower Bitou reported to be in good condition with regard to the indigenous fish community. The main threats to the indigenous fish of the Keurbooms River system are the presence of alien invasive fish species and habitat destruction (Tweddle *et al*. 2009).

As a major section of the Keurbooms River flowing through the reserve is tidal, and it also contains an extensive list of estuarine fish typical to the Southern Cape. The Knysna sea horse (*Hippocampus capensis*) is also found within this system and is endemic to the Southern Cape – occurring only in the Swartvlei, Knysna and Keurbooms River Estuaries (Bell *et al.* 2003).

The Keurbooms River Estuary also sustains a large variety of marine species and is known for its high concentration of Cape grunter (*Pomadasys commersonii*), Flat-headed mullet (*Mugil cephalus*) and Cob (*Argyrosomus japonicus*). Thirty-two estuarine fish species have been recorded for the Keurbooms River Nature Reserve, none of which are listed as Threatened.

Conservation status of fish species of the Keurbooms River Nature Reserve

Genetic research by Swartz *et al*. (2009) has presented evidence that the species currently described as *P. tenuis* comprises two distinct lineages, one of which occurs in and above the Keurbooms River Reserve. The most recent IUCN conservation status of this lineage is Endangered (Tweddle *et al.*, 2009). Similarly the currently described *P. afer* consists of three lineages, one of which is associated with the Keurbooms River catchment and whose conservation status is Near Threatened (Tweddle *et al*. 2009). Each of these lineages has been described as a new species (Swartz *et al*. 2009). The conservation status of both *G. zebratus* and *S. 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). As with the redfins, 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 a number of threats, including the presence of invasive alien fish species and a loss of suitable habitat (E. Swartz, personal communication).

3.9.6 Invertebrates

Ten lepidopterans have been recorded for Keurbooms River Nature reserve. None of these are listed as Threatened (IUCN 2011).

3.9.7 Invasive/alien fauna

Largemouth Bass (*Micropterus salmoides*) has been found in the Hartebees tributary and from previous reports other alien invasive species have been recorded upstream from the

nature reserve. These also include Brown- (*Salmo trutta*) and Rainbow Trout (*Onchorynchus mykiss*), Black Bass (*Micropterus spp.*) and Bluegill Sunfish (*Lepomis macrochirus*) (Hamman & Scott 1988).

3.10 Cultural Heritage Resources

Several Stone Age artefacts have been found scattered on the reserve, but no evidence of any settlement has been located to date. A section of the Old Cape Road runs through the reserve, which is now being used as access to the slipway and stores. This road used to be part of the main road between Knysna and Port Elizabeth before the N2 National Road was built.

3.11 People and Conservation

Access to the Keurbooms River Nature Reserve for spiritual, traditional and cultural groups is accommodated on request. These activities are confined to the picnic area at the Keurbooms River bridge, which is easily accessible from the N2 highway. Access to the rest of the reserve requires the use of a boat and is therefore not accessible unless these groups make use of the ferry concessionaires. The site next to the Keurbooms River bridge is very popular, especially for mass baptisms in the river.

Work opportunities have been created through different means. Currently various functions previously performed by permanent CapeNature staff, have been outsourced and these all contribute to generating work opportunities. These functions include gate guards, garden and cleaning services.

Further work opportunities are also created through externally funded projects managed by CapeNature. These include alien vegetation removal as well as fire break maintenance projects through the CapeNature Integrated Catchment Management (ICM) project. Although these projects only provide temporary work opportunities with CapeNature, it also contributes to contractor and skills development.

Giant Reed (*Arundo donax*) was previously harvested by local people under supervision of reserve staff, mainly for the local building trade. This is no longer viable and stands are being eradicated as part of the routine reserve management activities.

Another contributor to creating work opportunities on CapeNature land is to allow private concessionaires to operate on the reserve. This does not only create additional work opportunities, but also generate additional income to CapeNature. At Keurbooms River Nature Reserve this is mainly achieved through the ferry concessionaires who also provide an important service to the public.

3.12 Youth Development, Awareness and Volunteers

Facilities consisting of rustic benches and an outdoor board exist for an Outdoor Classroom Project focussed on local schools.

The Bitou Ten Foundation was established by Cadburys to improve the quality of teaching in state schools in the Plettenberg Bay area, using the Keurbooms facility.

Currently the only volunteers assisting from time to time at Keurbooms River Nature Reserve are those from the ORCA Foundation (Oceans Research Conservation Africa). These volunteers are mainly from Europe and the Americas, but all their activities are managed by the ORCA co-ordinators, who themselves are South African conservation students. These coordinators use the reserve monthly plan to co-ordinate their monthly activities in such a way that it can be a learning experience for the volunteers and also assistance to CapeNature.

3.13 Infrastructure

The reserve's main office is located in the town of Plettenberg Bay (Erf 542, Plettenberg Bay). This 2.1 ha property in extent, is located on the corner of Beacon Drive and Zenon Street. The reserve manager's official house is also located on the same property (Figure 12).

The facilities at the Keurbooms River bridge consist of a gate kiosk, public slipway and jetty, canoe hire facility, outdoor classroom, picnic sites and toilets.

A store room, workshop, boathouse, slipway for official use and a fuel storage facility are located 400m north of the above-mentioned area and is accessed by a gravel service road from the picnic site.

Upstream from the Keurbooms River bridge there are three separate picnic sites with toilet and braai facilities which are located on the river banks.

An overnight hut is located at the northern boundary of the reserve and serves as an overnight hut for the Whiskey Creek Canoe trail. This facility can accommodate up to 10 people.

3.14 Recreational and tourism services

The KRNRC contributes to the recreational needs of local and other communities. The nature reserve is zoned to accommodate a wide variety of recreational activities. A broad spectrum of outdoor recreation opportunities associated with natural areas exists, such as boating, fishing, canoeing, water-skiing, accommodation (Whiskey Creek canoe trail), observation of nature, bird-watching, photography *etc.* Opportunities for ferry-boat concessions are provided on the river.

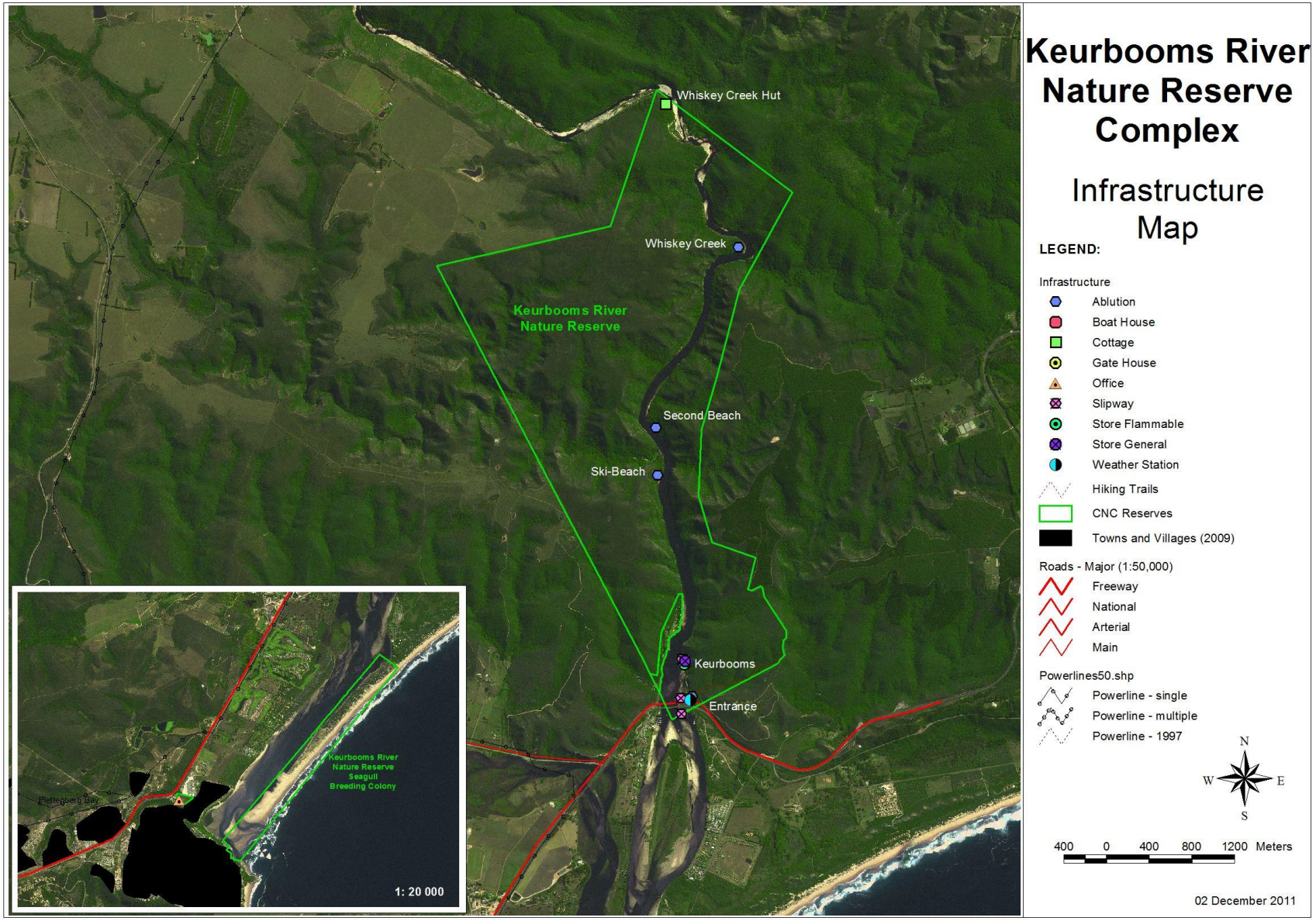

Figure 12: Infrastructure on the Keurbooms River Nature Reserve Complex.

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PART 2

SECTION 4: **SWOT ANALYSIS**

4.1 SWOT Analysis

4.1.1 Strengths, Weaknesses, Opportunities and Threats

Strengths	**Weaknesses**
• Dedicated staff • Close proximity of reserves to communities • Strong support systems (*e.g*. Regional Ecological Support Team) • Experienced staff • Integrated management style • Reserve is funded • Good infrastructure available • Good communication • Rehabilitation of disturbed sites • Variety of ecosystems • Easily accessible • High level of knowledge (diversity of ecological, biological) • Important water catchment areas • Corridor linkages • Altitudinal gradients • Tourism development opportunities • Estuary management plan and forum exist	• The implementation of the Keurbooms/Bitou estuarine management plan as the lead agent with no financial or any other support from the other partners (Bitou Municipality). • Lack of sufficient staff • Limited access control • Reserve configuration (edge effects) • Quality of contractors • Procurement procedures • Availability of affordable facilities for staff • Difficulty to control private boat access into the reserve south of the N2 • Inappropriate development in the reserve • On the eastern boundary the fire break between SANParks and Cape Pine is used as common boundary due to practical implications. The actual boundary consists of beacons with no clear boundary where only some are known
Threats	**Opportunities**
• Alien infestation from upstream properties • Water abstraction (municipal and upstream private landowners) • Inter-basin transfer scheme from Keurbooms River to Piesang River (Record of Decision issued) • Potential dam in Keurbooms River • Alien invasive organisms (plants and fish) • Upstream mismanagement of river and adjacent areas • Buffer areas are vulnerable to land use changes • Large numbers of seasonal users problematic • Flood events threat to infrastructure • Habitat destruction and fragmentation due to the small size of the reserve, proper system functioning have to include neighbouring properties and due to a variety of interferences, commercial activities, agricultural practices and residential developments the natural landscape surrounding the protected area has been either	• Research opportunities • Partnerships with government institutions, NGOs and CBOs • Expansion opportunities: Due to high commercial value and current residential developments the only expansion can include the water surface up to the high water mark on the southern boundary of the estuary and possibly include a section of flood plain opposite Goose Valley golfing estate which is currently owned by Eden District Council • Concessionaire opportunities • Harvesting of alien products • External funding for projects • Expand opportunities for youth development on the reserve. • Increase job opportunities

changed or fragmented. • Close proximity of reserves to urban area • Illegal harvesting (*e.g.* bait collecting) • High potential for hazardous spills (N2) • Limited options for expansion of nature reserve: On the eastern boundary the landscape have been altered to pine plantations and the N2 high way. On the southern and western boundaries the extremely high property value makes it almost impossible to buy and most of these properties have already been developed to it's capacity. The only option of expansion is to the north, but this property (Whiskey Creek Forest Reserve) has already been incorporated in the Garden Route National Park which also include the contractual Soetkraal Wilderness Area. • Pollution (from boats and upstream users; stormwater into estuary, *etc*.) • Climate change: Due to climate change the rain fall season has become irregular with drought periods followed by frequent flooding events. In 2007 a record high flood followed by a drought in 2009 and then the second highest flood again in 2012. This does not only cause infrastructural damage but also landslides and erosion.	

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 nature reserves 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 transparent process.

Biodiversity, heritage and physical features are all rated on a standard scale of 1 to 5, where 1 represents no or minimal sensitivity and 5 indicates maximum sensitivity (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 extensive 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.

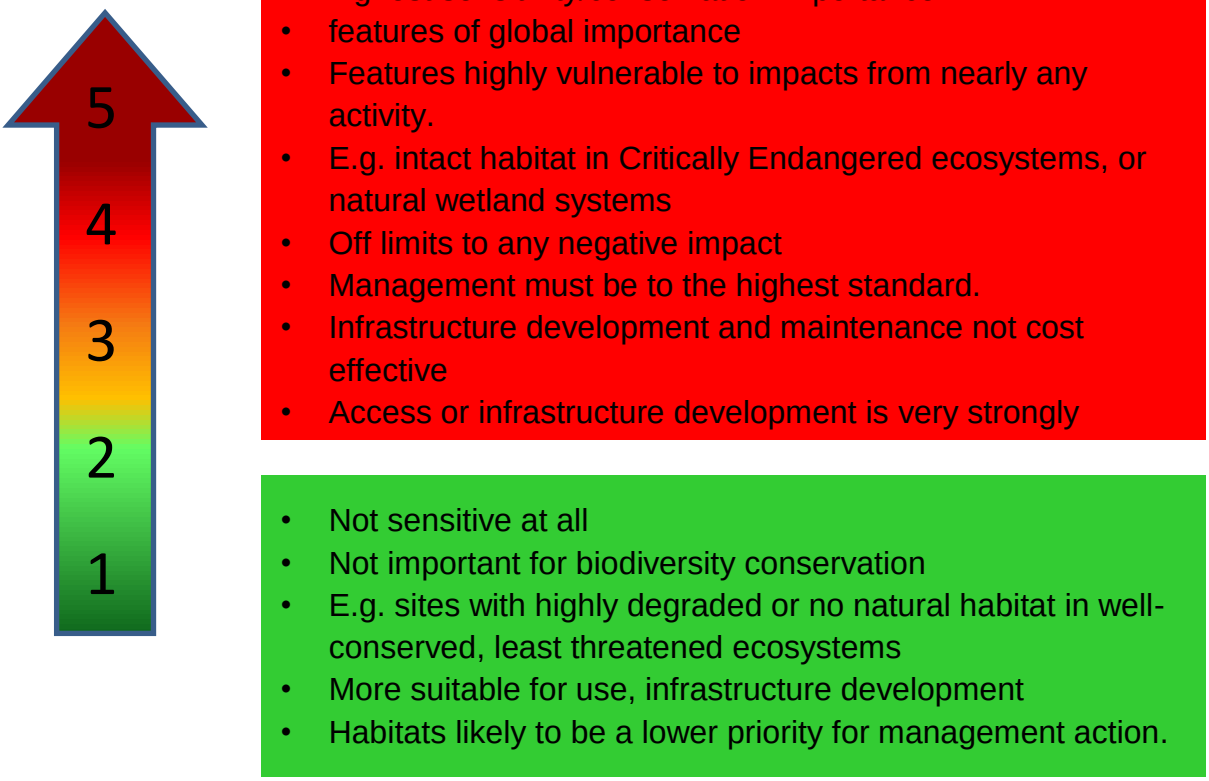

Figure 13: Sensitivity-Value Mapping

Sensitivity Analysis of the Keurbooms River Nature Reserve Complex

Due to the presence of regionally endangered and under-conserved habitat, plus the physically rugged landscape incised by numerous drainage channels, the majority of Keurbooms River Nature Reserve interior should be considered high to highest sensitivity and unsuitable for new road access or large infrastructure development (Table 5.1).

Low sensitivity areas corresponding to existing transformed footprints at the current reserve entrance may however be suitable for appropriate tourism and management infrastructure development and to provide easy access to the reserve (Table 5.1).

Table 5.1: Sensitivity of the Keurbooms River Nature Reserve Complex based on the sensitivity of biodiversity, heritage and physical features (see Figures 15 and 16).

	Class	Sensitivity layer	Description
Biophysical sensitivity: ANY infrastructure or access	**Biodiversity (Figure 15)**	Ecosystem representivity	Habitat map and conservation and protection status are provided by the 2010 Garden Route Vegetation (Vlok *et al.* 2008) and Garden Route transformation data (Bradshaw 2008). The only modification included was very fine-scale mapping of the main river channel, addition of beach habitats not mapped, and spatial adjustment of the map layer to better correspond to actual location of the units.
		Special Habitat	No special habitats were recognised or mapped.
		Species	No species of regional conservation concern is known from the reserve (SANBI and CapeNature databases, and reserve records).
	Heritage	Heritage	No heritage features are known from the reserve.
	Physical (Figure 16)	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, and manually edited to rationalise modelled outputs to known features, especially the main river channel and the area around the existing office complex.
		Substrate	Substrate sensitivity was estimated as generally lowest to low using the Garden Route Vegetation (Vlok *et al* 2008) unit descriptions. Specific highly erodible areas associated with the main river channel such as mudbanks were mapped at fine scale as highest sensitivity features.
		Hydrological	The 1:50,000 Rivers GIS data were used as the primary data source, with some manual edits to add and correct river channels. Given the rugged landscape 32m buffers for both class 1-4 tributaries and the main river channel and estuary were considered appropriate and correspond to areas controlled by the 2010 NEMA EIA legislation. At the existing development footprints, the reserve manager mapped locations subject to seasonal flooding.

No analysis of viewsheds or visual sensitivity could be performed due to time constraints, except to confirm that no extensive area exists that could be considered true Wilderness. The

visual impact of any proposed new infrastructure should be carefully considered and preferably subjected to formal viewshed impact analysis before authorisation.

For further information, please see the Keurbooms River Nature Reserve Complex 2012 Conservation Development Framework Report (Kirkwood in prep.), which includes a detailed description of the Sensitivity Analysis components and analysis.

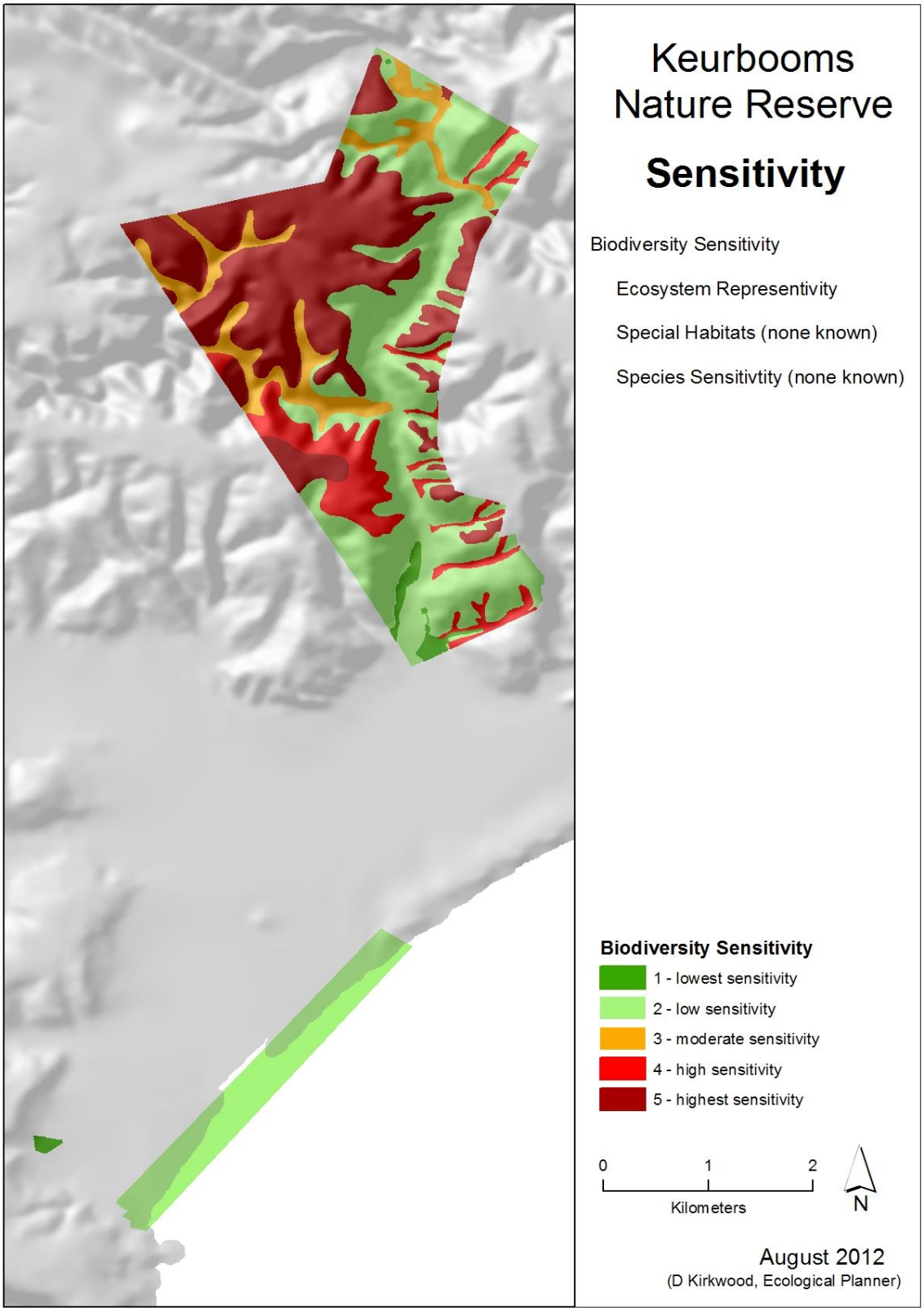

Figure 14: Sensitivity of the Keurbooms River Nature Reserve Complex based on ecosystem representivity, special habitats and sensitive species.

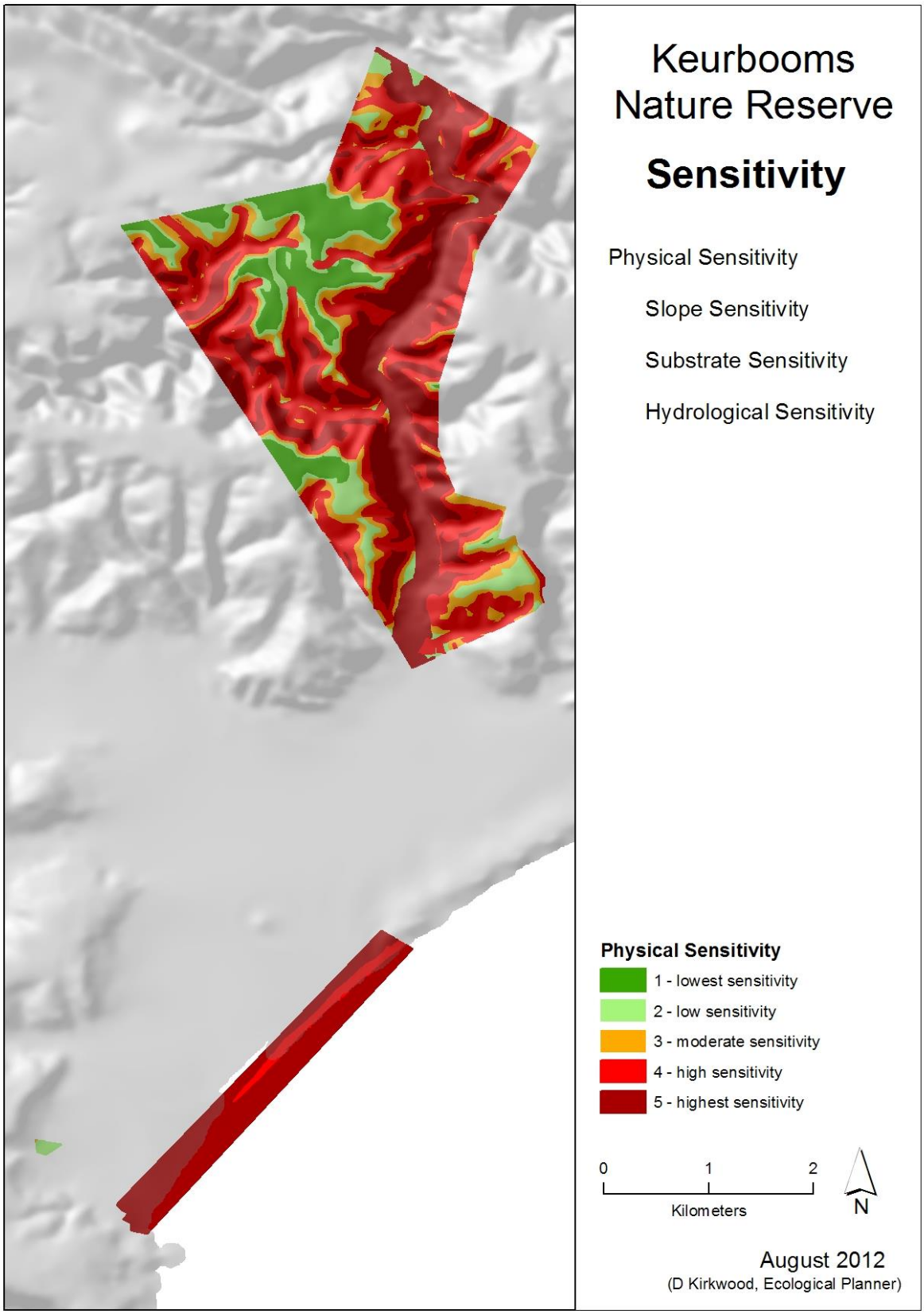

Figure 15: Sensitivity of the Keurbooms River Nature Reserve Complex based on sensitive slopes, substrates and hydrology.

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 KwaZulu Natal 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 (Table 5.2).

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.

Keurbooms River Nature Reserve Complex Zonation – Description

For a detailed description of process and outputs, including the underlying reserve Sensitivity Analysis, please refer to the report *Conservation Development Framework: Keurbooms 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:

- Keurbooms Nature Reserve is a small 1 012.2 ha nature reserve with two separate portions. The 897.8 ha immediately north of the N2 includes the Keurbooms River and forest and fynbos environments. A further 114.3 ha approximately 2.6 km south comprises the large coastal sandbar and associated beach and estuarine habitat at the estuarine mouth.
- All terrestrial habitats occurring within the reserve are Least Threatened and adequately conserved according to the SA vegetation map (Mucina & Rutherford 2006) and no threatened plant or animal species are known to occur within the reserve. However, according to the fine-scale vegetation map compiled for the Garden Route Initiative (Vlok *et al.* 2008), the reserve contains Uplands Grassy Fynbos (EN), Keurbooms Thicket-Forest (VU), Hartenbos Primary Dune (EN), Groot Brak River and Floodplain (EN) and Tsitsikamma Perennial Stream (CR), which are all classified as threatened vegetation units (Holness *et al.* 2010).
- However, river and estuarine environments are important, sensitive and potentially flood-prone environments, and any further expansion of development into natural or semi-natural riparian habitat is inappropriate.
- The coastal sandbar portion of the reserve has unrestricted access from the adjacent public beach, but also provides an important breeding habitat for seabird species.
- The river provides an extremely popular boating recreational resource for the nearby town of Plettenberg Bay, with current controls providing for three types of access: (1) high speed powerboat access including waterskiing from the Keurbooms River bridge to a marker buoy at 33° 58’ 53.76”S 23° 23’ 57.07” E, including the first 2.3 km within the nature reserve; (2) low speed engine idling access from that point 2.8 km up-river to the marker buoy at 33° 57’ 44.28”S, 23° 24’ 15.17”E; and (3) canoe access only further upstream where the river becomes too shallow for larger boats. This status quo is considered acceptable.
- The current development footprint at the southern end of the reserve, on the eastern side of the Keurbooms River is appropriately located at the reserve periphery and adjacent to easy access off of the N2 highway.
- There is no road access into the interior of the reserve from the public entrance, and the forest and fynbos habitats could provide relatively wild and private hiking experiences.
- Keurbooms River Nature Reserve currently provides accommodation only at the Whiskey Creek cabin in the remote northern area of the reserve, and accessed only as part of the Whiskey Creek Canoe Trail by up to 10 guests.
- The riverside picnic area at the entrance from the N2 is a popular day visitor amenity, but generates little income.
- Plettenberg Bay and surrounds is an extremely popular holiday destination and receives high visitor numbers, particularly in peak summer season. An independent tourism Market Feasibility Study for Keurbooms (Seaton Thomas 2011) suggests that

additional camping and self-catering or lodge accommodation would be viable and would represent an important additional income stream for CapeNature.

These factors require that the zonation for the reserve allows for potential expanded camping and self-catering/lodge development, while accommodating current high day visitor numbers along the accessible portion of the river. The interior of the reserve provides for more restricted access, with no additional development permitted except potential hiking routes. Zones adhere to CapeNature's standard zonation scheme – please refer to this for full zone descriptions.

Development – Low Intensity Zone: The entrance, existing recreation and picnic area and surrounds has be Zoned as Development – Low Intensity Zone to provide for accommodation development and to reflect the management requirement associated with day visitor use and accommodation for up to 100 guests in total. This zone has been tightly mapped to existing developed footprints, but with the addition of degraded habitats associated with previous building footprints and associated areas (see Figure 16 below). The footprint is appropriately located at the reserve boundary, on transformed and degraded habitats of low conservation concern, with easy access directly off a major tourism route. Potential scenic and well-vegetated self-catering/lodge and camping areas are available, and screened from the N2 highway by topography.

It is noted that any development layout and construction must take account of potential flood zone of the Keurbooms River, and water flow associated with the valley and slopes.

Figure 16: Proposed Low Intensity Development Zone near the Keurbooms River bridge.

Nature Access Zone: The portion of the river accessible by motor boat has been zoned Nature Access to reflect current use and low expectation of solitude, with provision for a high speed southern section and a low/idling speed northern section (Figure 16, 17).

The following conditions apply to the Nature Access Zone of the river area within the Keurbooms River Nature Reserve:

- Boating: Hydrocarbon-propelled craft are permitted on the river. Due to potential congestion and pollution, no houseboats will be allowed. No jet skis or hovercrafts will be allowed, due to the increased risk of accidents on this linear waterway. The number of river ferries operating in the reserve will be limited to three. Future applications may be considered subject to a thorough investigation.
- Fishing is permitted in the estuary, subject to a DEA: Oceans and Coast permit and may be subject to temporal zoning for certain species. Regulations may be introduced to prohibit catching certain species if this is deemed necessary. This will be done in collaboration with DEA: Oceans and Coast and involve a public participation process.

Nature Access Zonation of the sandbar also reflects current use providing for unrestricted access from the adjacent public beach. A Species / Habitat Special Management Overlay indicates the areas utilised by seabird species, but as there are no known threatened or near threatened species in this area, management should provide for simple interventions such as signage to prevent unnecessary disturbance, rather than intensive access control.

Primitive Zone: This zone covers the remainder of the reserve, and allows for extensive habitat protection and limited access and accommodation only for hiking or canoe trails.

Development Management Zones: The main Development - Management Zone is located outside the reserve in a developed municipal area (Figure 18). It is close enough to provide a convenient joint management centre for Keurbooms River and Robberg Nature Reserves, without any impact on natural environments or visitor experience. This property is owned and managed by the Department of Public Works and does not form part of the proclaimed nature reserve. A small additional Development – Management Zone provides for the existing boathouse and access road adjacent to the Keurbooms Development – Low Intensity Zone. This zone provides boat storage and launching for official use only. Careful management of management traffic volume and speed through the tourism oriented Development – Low Intensity Zone is required when accessing this zone.

Other Zones: The reserve does not provide for a Wilderness Zone as there is no extensive area that meets the criteria for wilderness, and the reserve viewshed encompasses extensive nearby farmlands, roads and plantations.

Plettenberg Forever Resorts (Aventura Resort) – uncertain status.

The status of this property (areas outlined in blue in Figure 17 below) is currently uncertain. The property may be state land included in the reserve proclamation and historically provided as a long-term lease or similar arrangement. Alternatively, it may be private land. Proposed zoning of the developed portion as Development – High Intensity Leisure and the remainder as Primitive Zone should be applied if the property is in fact part of the Keurbooms River Nature Reserve Complex. In addition, no major changes or development would be permitted without the permission of CapeNature as the custodian of the property. If the property is privately owned, this portion must be excluded from the Keurbooms River Nature Reserve zoning scheme.

The status and ownership of this property must be urgently resolved.

Figure 17: Map indicating the location of the property managed by Forever Resorts.

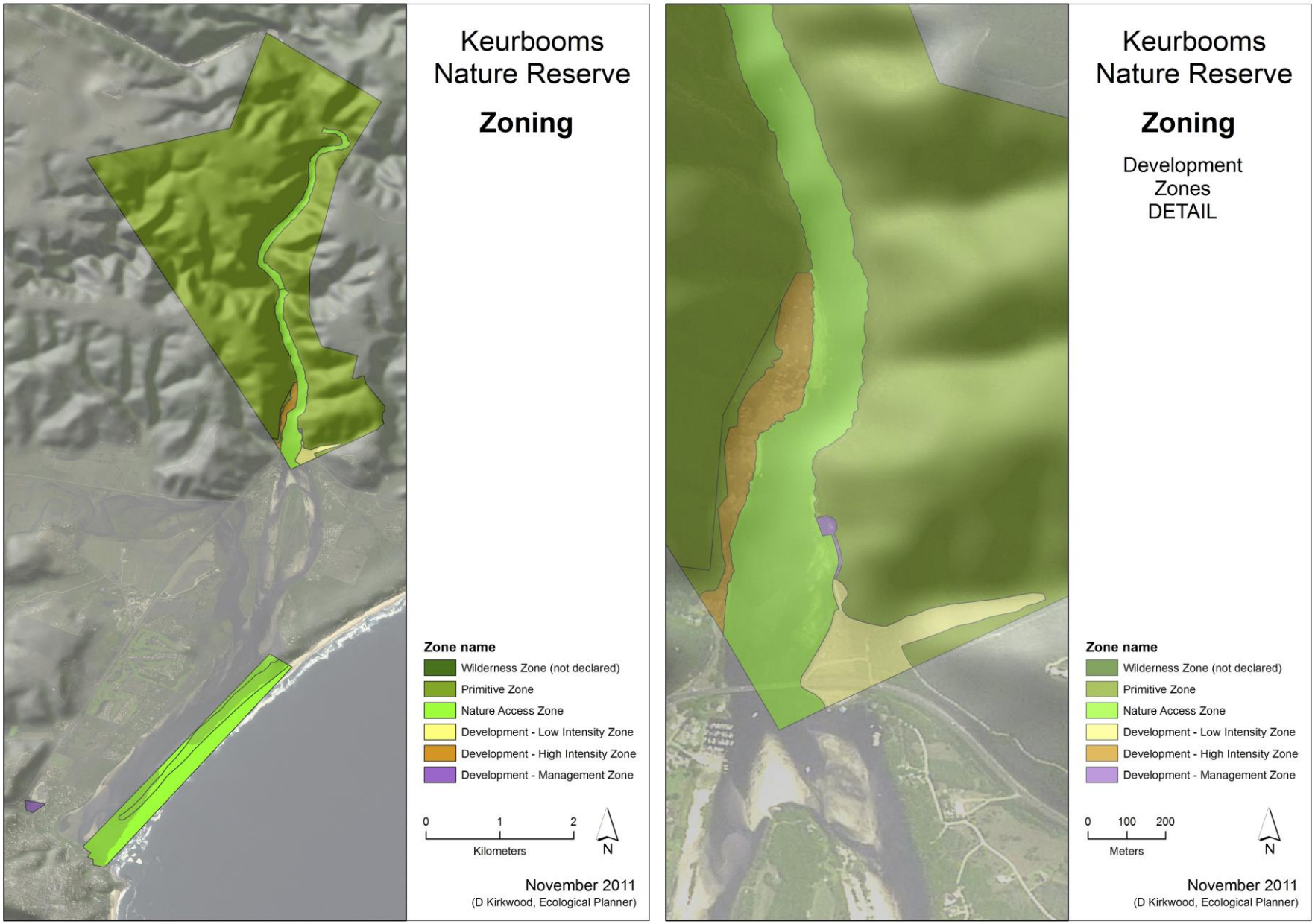

Figure 18: Zonation of the Keurbooms River Nature Reserve Complex.

5.4 Infrastructure Development Plan

5.4.1 Tourism Infrastructure – accommodation and restaurant

Due to the high tourism potential and availability of appropriate low impact and high potential development areas, the following options for development are proposed, to be completed within the next five year period (see Figure 19):

- Development of new accommodation, either up to 8 self-catering units or a small, maximum 32 bed fully-catered lodge within the more private valley of the Development – Low Intensity Zone.
- Development of a new campsite area of up to 18 sites, using part of the existing day visitor area (indicated as a yellow outline in Figure 19).
- Development of a new restaurant or convenient store in the existing quarry footprint.

Final size, capacity, layout and designs must still be determined by financial feasibility analysis, and detailed environmental planning. It is noted that new tourism accommodation and any infrastructure within 32-100 m of the Keurbooms River is likely to trigger a requirement for a NEMA EIA Basic Assessment process and authorisation.

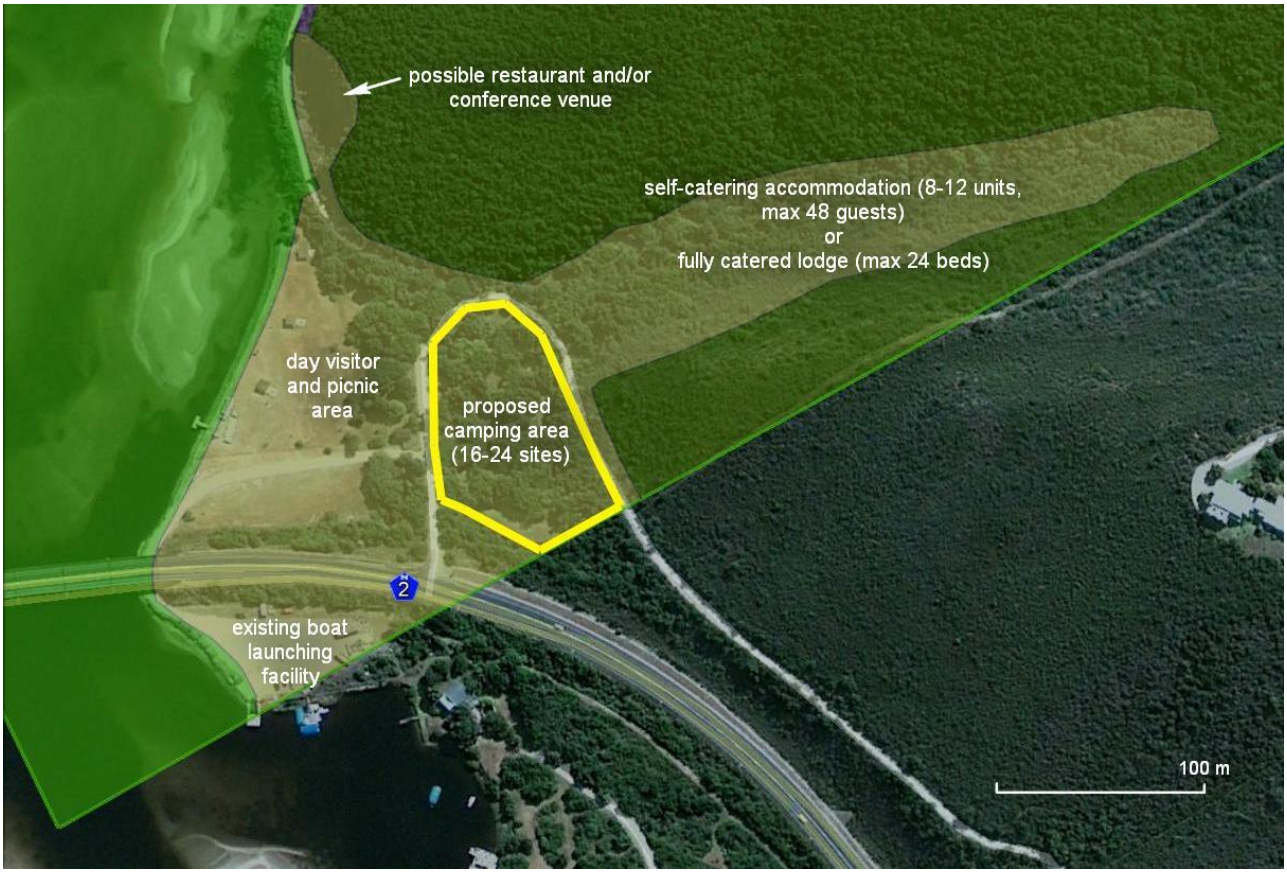

Figure 19: Map indicating the area where the accommodation units, camping sites, restaurant or convenient store and picnic sites are proposed.

5.4.2 Tourism Infrastructure – access, roads and trails

No expansion of roads to provide public vehicle access is proposed.

Associated with proposed tourism development, new overnight hiking routes and huts may be developed within the Primitive Zone to take advantage of the scenic but relatively low sensitivity terrestrial environments. Again, final layout and design requires detailed financial and environmental assessments, and would be dependent on internal CapeNature consultation and approval and any required environmental authorisation process.

5.4.3 Management Infrastructure

Keurbooms Nature Reserve is adequately serviced from the CapeNature management centre in Plettenberg Bay and currently no development of offices or management buildings on the reserve is proposed.

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

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.

5.5 Access

Keurbooms River Nature Reserve is largely an unfenced reserve, except for the Uplands section which is game-fenced due to the game farm on the adjacent property. The main entrance to the reserve is at the picnic site near the Keurbooms River bridge (see Figure 20). The southern section of the reserve is unfenced and unmanned, and therefore easily accessible. The only control is at the seven slipways along the embankments, where signage indicates that boat owners should have a boat permit, which is obtainable either from the gate kiosk at the Keurbooms River bridge or the CapeNature office in Plettenberg Bay. There are no public roads leading into the Uplands part of the reserve.

Commercial activities include ferry operators and boat hiring facilities. Agreements with these operators are through contracts between the parties and CapeNature and are regularly reassessed.

Mass baptisms are allowed at the picnic site next to the Keurbooms River bridge as part of community use. This access is free-of charge and allowed on request.

Integrated Catchment Management (ICM) contractors access the reserve with assistance from CapeNature staff, as boats are required to perform alien clearing upstream. The contractor responsible for cleaning of the overnight facility has his own boat and is therefore able to reach the facility.

Access is controlled at the Seagull Breeding Colony through appropriate signage and regular compliance patrols.

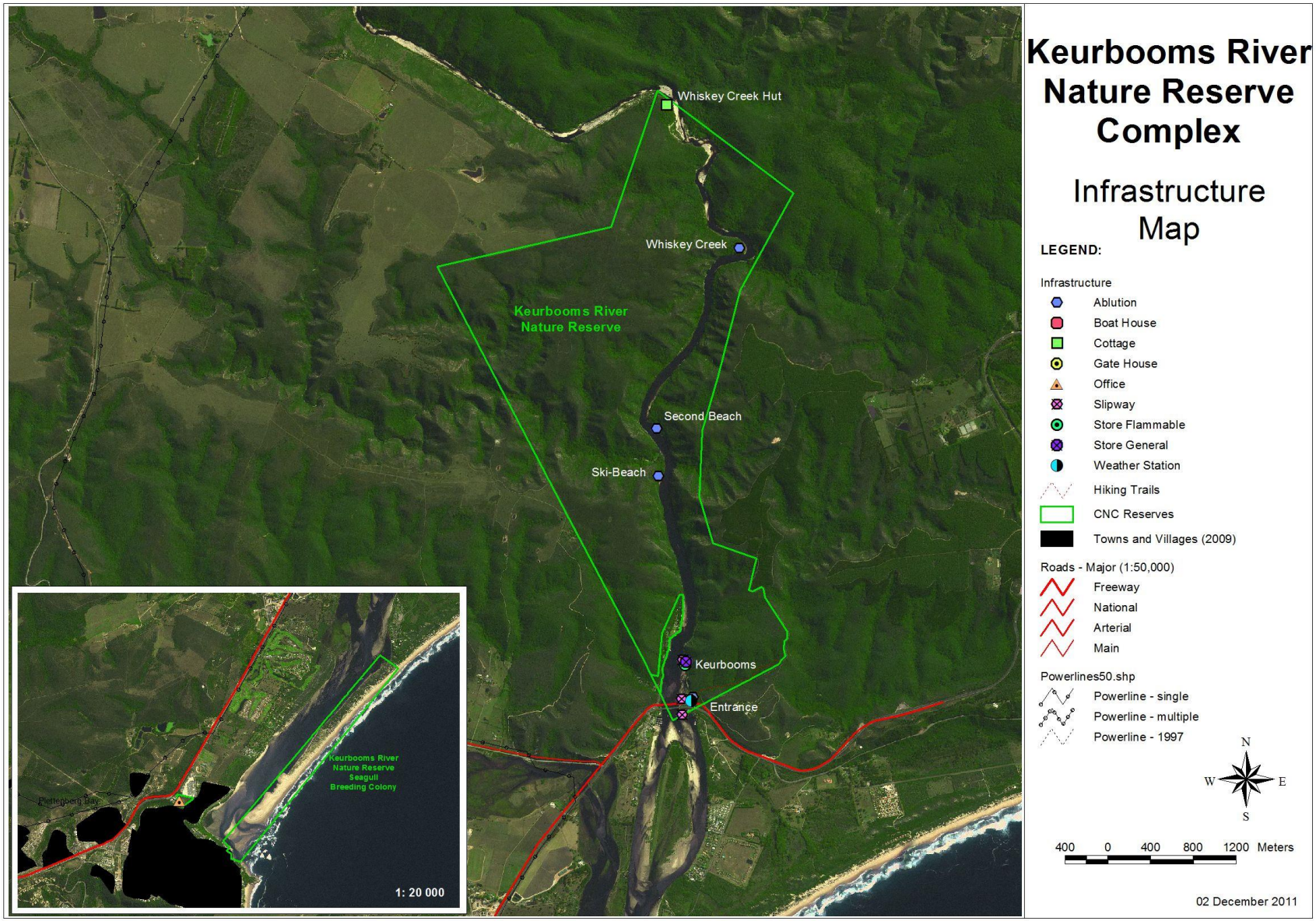

Figure 20: Access and facilities on the Keurbooms River Nature Reserve Complex.

5.6 Concept Development Plan

A feasibility study looking at development proposals for the picnic area at the Keurbooms River bridge has been undertaken by Seaton Thomson and Associates (2011). As part of the study a detailed assessment of current market trends originating from both domestic and international markets was done, as well as an assessment of existing operations between Knysna and Tsitsikamma, and current operations at Forever Resorts.

Based on the above, the following has been proposed (Figure 21):

- a campsite with 18 sites,
- eight tented self-catering chalets on stilts,
- a restaurant or convenient store; and
- an upgrade of the existing entrance gate and security complex.

This proposed development will be limited to the existing disturbed picnic area at the Keurbooms River bridge, and therefore within the Low Intensity Development Zone.

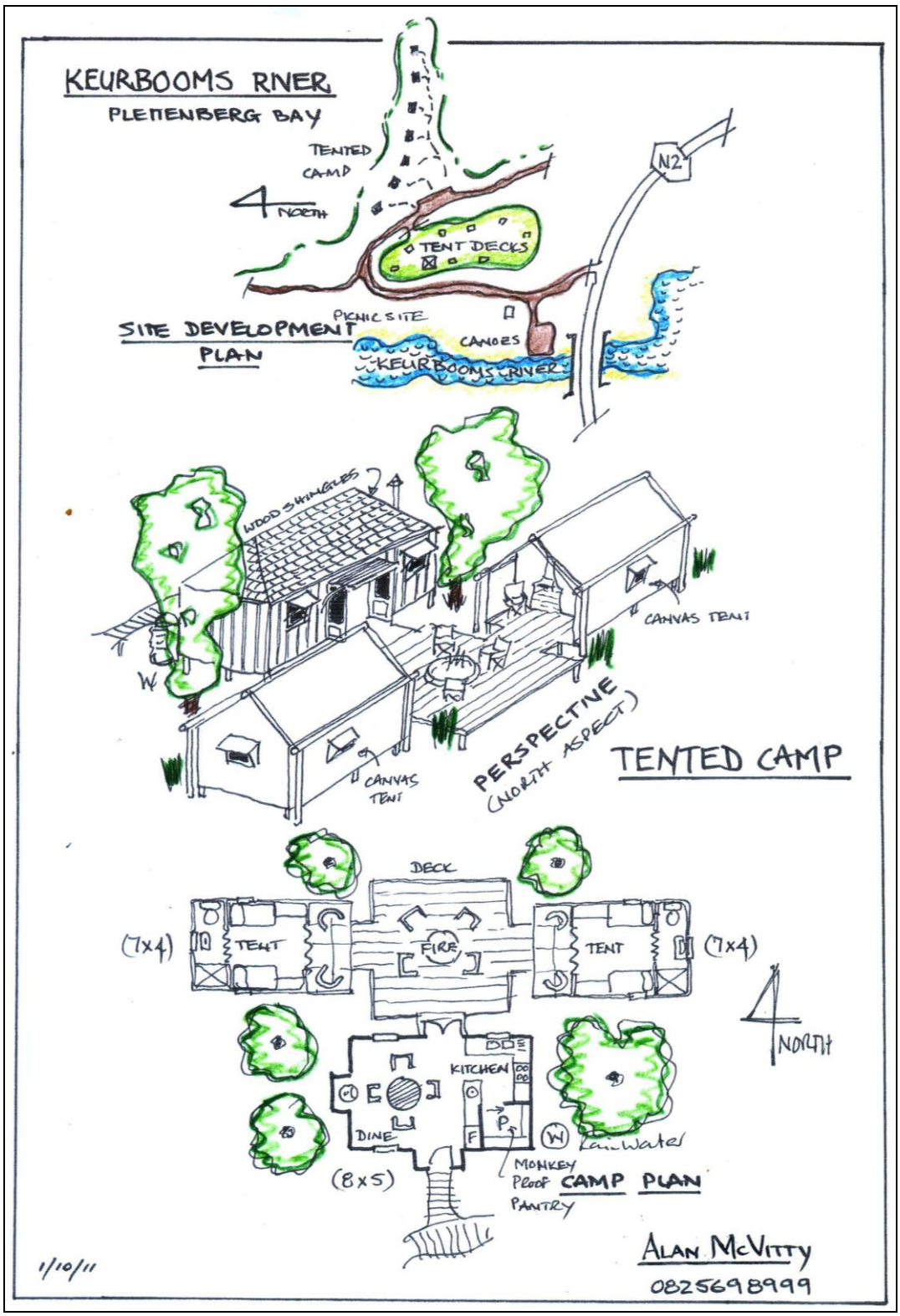

Figure 21: Concept Development Plan for the Keurbooms River Nature Reserve Complex (Seaton Thomson & Associates 2011).

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 (South African National Biodiversity Institute and Department of Environmental Affairs 2010), 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 both national and provincial biodiversity targets [2], as well as 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 areas, 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, currently being drafted by the South African National Biodiversity Institute (A. Driver, personal communication) identified crucial freshwater, estuarine and marine conservation priorities to inform the Protected Area Expansion strategy for the Western Cape.

CapeNature employs several conservation planning products which may inform the CapeNature Protected Area Expansion Strategy and Implementation Plan 2010-2015 (Purnell *et al.* 2010) in order to meet national and provincial biodiversity targets as well as protected area targets. These include the Conservation Action Priority (CAP) map, Important Biodiversity Layers (IBL) and the various regional Fine-scale Plans (*e.g.* Matzikama, Saldanha Peninsula).

[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

6.1.3 Protected Area Expansion Mechanisms

Several mechanisms 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.

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

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	i) 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	i) Statutory informal conservation areas	Private land State (national) State (provincial) Non-state public land

conservation area system.	ii) 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 Priority (CAP) map is the primary informant to the expansion priorities for CapeNature. This product is supported by the IBL and the Fine-scale Plans (see above). These plans are all biodiversity-driven and CapeNature will unreservedly pursue priorities based on biodiversity net gain. Marine priorities which are adjacent to existing terrestrial areas or protected islands will be prioritised accordingly. Other marine / terrestrial interfaces *e.g*. estuaries will be considered in the priority evaluation process as informed by relevant biodiversity conservation plans not listed above.

Properties which have cultural, archaeological and paleontological features will also be evaluated in the context of biodiversity first.

6.1.4.2 Primary Mechanisms for CapeNature

The following mechanisms which address the various landownership scenarios for properties which are identified will be used by CapeNature for the immediate future:

i. Declaration of Provincial Nature Reserves on state owned land / sea or island.
    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 into 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 spatially depicted per Area or conservation region;
b. Five Year Plan (revised at end of MTEF three-year cycle); and
c. 20 Year Plan.

6.1.4.4 Planning and Implementation Review Protocol

Annual and five-year Protected Area Expansion plans at 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 & 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(s) 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 property. Although World Heritage "buffer zones" are not regarded as part of the inscribed World Heritage property, 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 World Heritage property. The functions of the buffer zone should reflect the different types and levels of protection needed to protect the outstanding universal value of the World Heritage property. 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 CFR several "buffering mechanisms" have been developed to ensure the long term persistence of both pattern and process, as well 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, stewardship agreements and critical biodiversity areas (both terrestrial and aquatic). 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 document (Purnell *et al*. 2010) describes an implementation plan and explicit spatial targets for the next five-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 in the Garden Route area in the CapeNature Protected Area Expansion Strategy (Purnell *et al.* 2010). With specific regard to estuarine and marine ecosystems, expansion priorities identified by other National and Provincial Departments will be considered.

However, in the conservation plan framework study compiled for the Plettenberg Bay (Bitou) Municipality by Lombard *et al.* (2004), a number of potential corridors for the expansion of the existing protected area system within the Municipal area were identified (Figure 22).

Three potential expansion corridors were identified adjacent to the Keurbooms River Nature Reserve (Figure 22):

- **Bitou Corridor** – This corridor begins at the Seagull Breeding Colony of the Keurbooms River Nature Reserve managed by the CapeNature and continues along the estuary of the Bitou and Keurbooms Rivers, to incorporate important wetlands. These wetlands are critical because the estuary depends on them for clean water and flood control, and they are also the most threatened natural habitats in South Africa, are of the highest conservation status, and are protected by national legislation (Environment Conservation Act, (Act No. 73 of 1989)).
  The corridor needs to buffer the Bitou River and the wetlands up to the 1:100 year flood line (this is approximately 2 m above the current water level).
  This corridor continues along the course of the Bitou River, and some of its perennial tributaries bisect the last remaining patches of Uplands Grassy Fynbos, which is an Endangered habitat.
  The corridor also needs to capture important strips of lowland Coastal Forest, which differs from Knysna Afromontane Forest in the presence of *Ekebergia capensis* (Essenhout) and the prominence of *Calodendrum capense* (Cape Chestnut) and

Sideroxylon inerme (Milkwood). *Cassine peragua* (Saffron) and Candlewood (*Pterocelastrus tricuspidatus*) are also present. This forest type has not been well studied and is severely threatened by coastal developments.
The corridor continues to the western edge of the Petrus Brand Nature Reserve (part of the Garden Route National Park), providing an East-West gradient across the municipality (from the mountains to the sea).
This corridor must be linked to the Keurbooms Corridor through the private land (Hanglip) at the confluence of the two rivers. Natural vegetation must be maintained here, with no activities that would threaten the adjacent wetlands or estuary. These private properties are a priority for an alien removal programme.

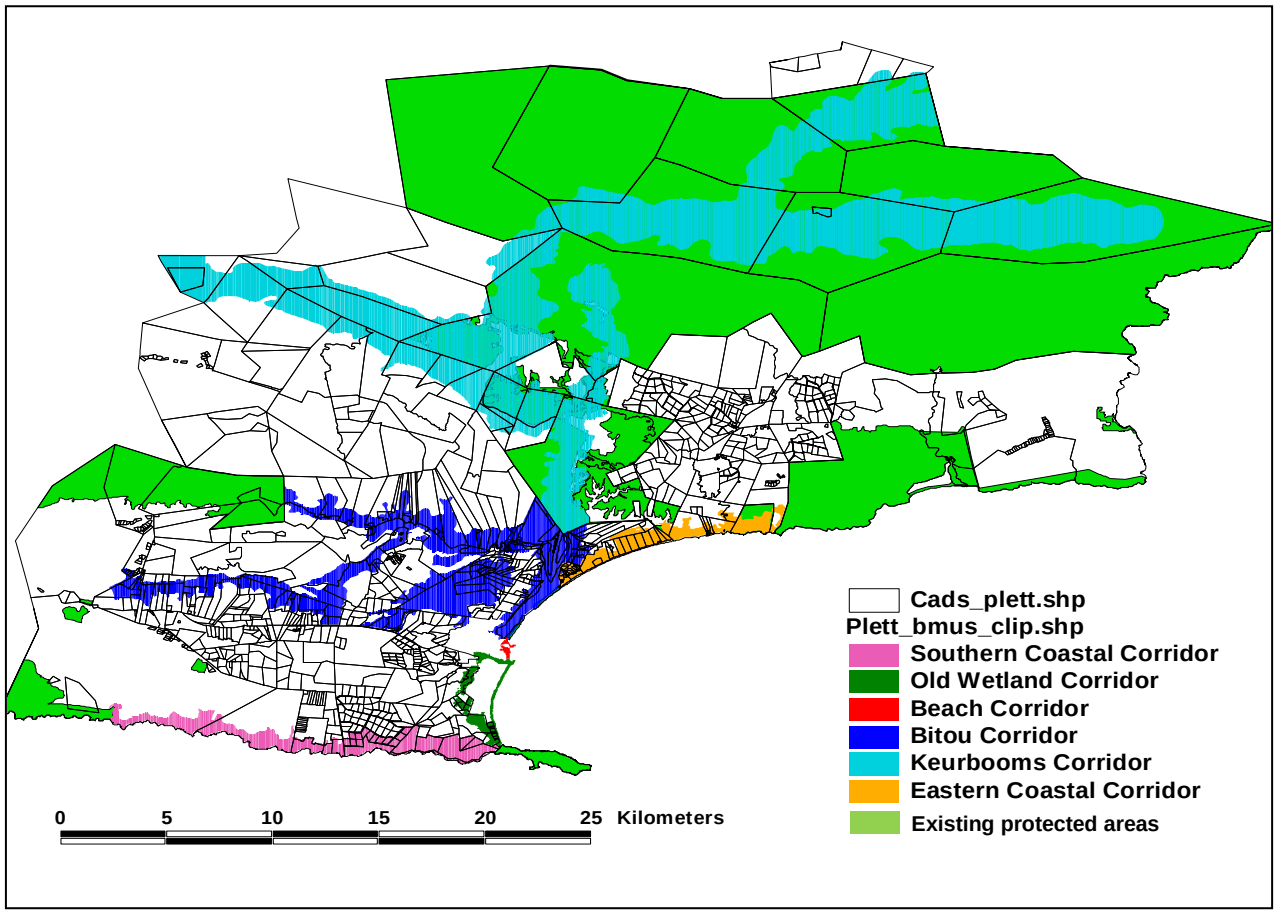

Figure 22: Map indicating the priority conservation corridors in the Plettenberg Bay area (Lombard *et al*. 2004).

- **Keurbooms Corridor** – This corridor begins in the South at the border of the Bitou corridor, and provides a North-South upland-lowland gradient along the catchments of the Keurbooms- and Palmiet Rivers. It thus provides a linkage between the mountains and the sea, and the coast and the inland.
  It is an important link between existing protected areas: Keurbooms River Nature Reserve (CapeNature) and the Garden Route National Park (Whiskey Creek Nature Reserve, and the Soetkraal properties) managed by SANParks.

The corridor is important for the movement of some of the remaining large predators (e.g. Crowned Eagles, Black Eagles, leopards), as well as herbivores such as bushbuck (the largest antelope found in coastal bush).
The corridor would also protect the water catchments of the Keurbooms- and Palmiet Rivers, which would help to maintain a healthy estuary as well as water security for the Plettenberg Bay area.

- **Eastern Coastal Corridor** - This corridor is required to link the estuary complex to the Tsitsikamma National Park, through the Arch Rock Private Nature Reserve.
  There are important dunes and associated dune vegetation and forest along this coastal strip. These dunes are severely threatened by development. Any development along here should be set behind the secondary dunes, and any remaining natural vegetation (which includes the Tsitsikamma Plateau Fynbos) should not be disturbed.
  This corridor will provide an East-West gradient and will link existing protected areas along the coast, all the way from the Sinclair Reserve in the West, to the Tsitsikamma National Park in the East, across the entire municipality.

In the Biodiversity Sector Plan for the Garden Route Initiative area, these basic corridors were also identified as important for conservation in the Critical Biodiversity Area maps (Holness *et al*. 2010; Vromans *et al*. 2010; see Figure 23).

A study on marine protected area expansion opportunities was done by Kingwill & Robinson (2009). WWF-SA requested this study which identified an opportunity to link the Tsitsikamma Marine Protected Area and Robberg Marine Protected Area towards the Keurbooms River Estuary for incorporation into the proposed Plettenberg Bay Marine Park. With this proposal current Marine Protected Areas will be linked with each other as well as to terrestrial nature reserves and national parks. It will also contribute towards a continuous conservation area from the mountain catchment area at Soetkraal, via the Keurbooms River and estuary to (and including) the sea.

For CapeNature, the highest priority is to secure the section between the Seagull Breeding Colony and the rest of the reserve, north of the N2-bridge. This section belongs primarily to the Bitou Municipality, with the Goose Marsh section (on the western side) belonging to the Eden District Municipality. Furthermore, the status of the stateland on which Forever Resorts is located, needs to be clarified.

The other corridors need to be secured in conjunction with other stakeholder, *viz*.: SANParks as the managing authority of the Garden Route National Park, Cape Pine (managing authority of the plantations towards the east), landowners, developers, NGOs (e.g. Eden-2-Addo, WESSA) and CBOs (e.g. Plettenberg Bay Environmental Forum). Building these corridors have already proven to be challenging and is likely to remain so due to the immense development pressure in the Plettenberg Bay area.

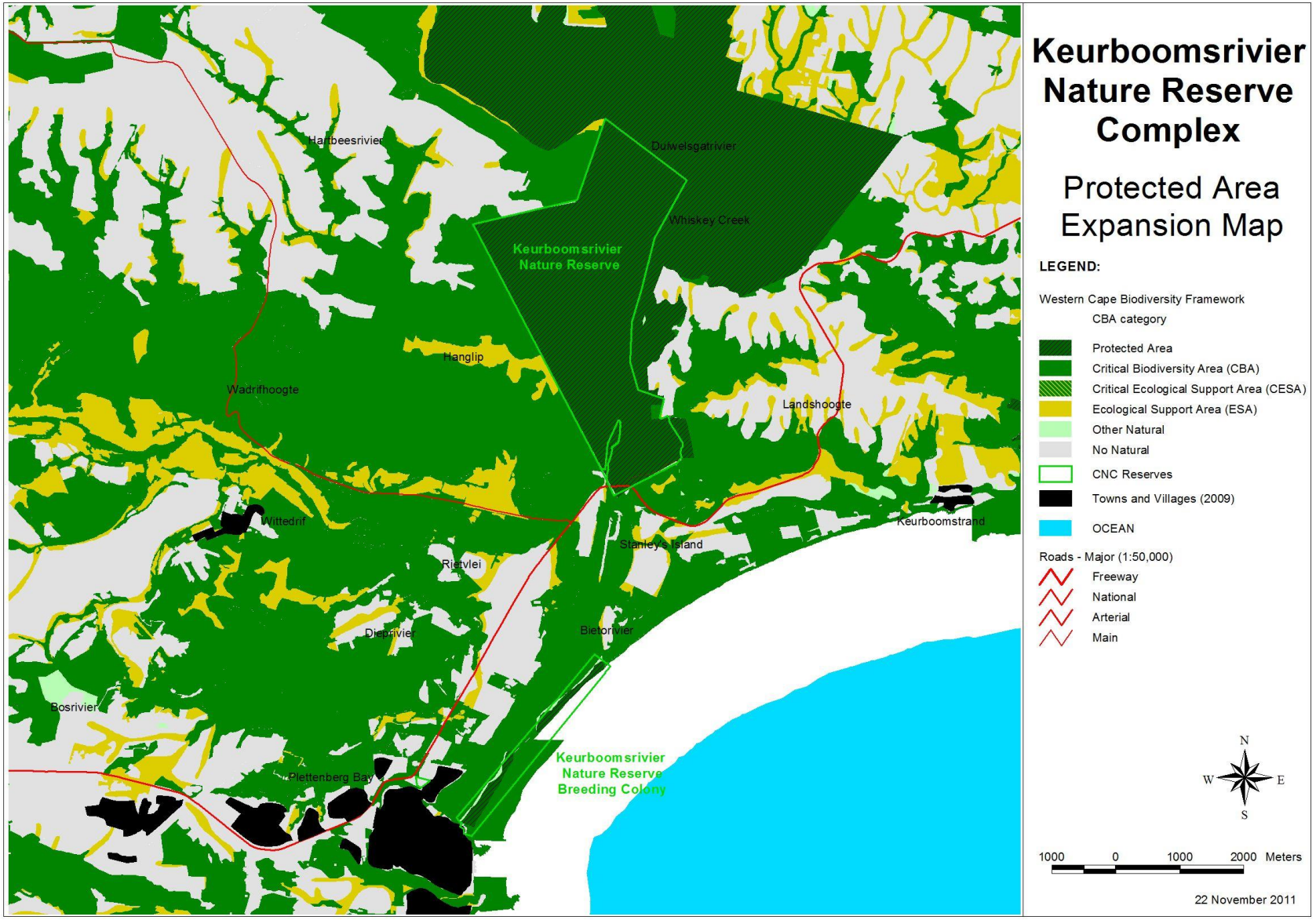

Figure 23: Map showing the Critical Biodiversity Areas adjacent to Keurbooms River Nature Reserve, which support the priority corridors identified by Lombard *et al*. (2004) (see Figure 22).

PART 3

SECTION 7: **STRATEGIC IMPLEMENTATION FRAMEWORK**

7.1 Management Programmes

7.1.1 Legal Status and Reserve expansion

The KRNRC comprises the following:

The Keurbooms River Nature Reserve is established as a Provincial Nature Reserve in terms of Section 6 of the Nature and Environmental Conservation Ordinance, 1974, on 18 December 1979 and proclaimed in the Provincial Gazette of 4 January 1980 by Proclamation No. 1/1980.

The Seagull Breeding Colony is a moving sand spit between the Look-out Rocks and the Strandmeer Residential Development and includes the area above the high–water mark.

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)
- Marine Living Resources Act, (Act No. 18 of 1998)
- Nature and Environmental Conservation Ordinance, (Ordinance No. 19 of 1974)

All parcels of land of the KRNRC 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 and Environmental Conservation Ordinance, 1974; and

Section 38(4) of the NEM: PAA requires marine and terrestrial protected areas with common boundaries to be managed as an integrated protected area by a single management authority including:

- Any Marine Protected Areas declared in terms of the Marine Living Resources Act, (Act No. 18 of 1998) sharing a common boundary with the terrestrial protected area.

7.1.3 Guiding Principles

- Reserve Management will ensure the reserve is awarded secure legal status according to the Protected Areas Act.
- 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 the 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 4	**To expand and secure the conservation estate.**				
Key Deliverables	**Management/Monitoring Activities**	**Responsibility**	**Indicators**	**Timeframe**	**Reference to Existing Procedures**
1. The KRNRC has secure permanent legal conservation status in terms of NEM: PAA.	• Consolidate and formalise legal status of provincial nature reserve. • The protected area is listed in the National Register as required by the Act.	Executive Director: Cons Mngt, DEA, DEADP, Law Admin Manager, Programme Manager: Stewardship	The KRNRC is legally secure.	Year 1-2	NEM:PAA
2. The KRNRC boundary is known and appropriately demarcated and secure.	• Resurvey boundaries of Seagull Breeding Colony for inclusion in proclamations. • Confirm the boundaries of the Forever Resorts land.	Conservation Manager, Land-surveyor		Year 1-2	NEM:PAA
3. The KRNRC design (size and shape) are adequate to achieve the conservation objectives in the SMP.	• Formalise management agreement with the Bitou Municipality and Eden District Municipality for the section of the river between the bridge and the Seagull Breeding Colony and the Goose Marsh section.	Programme Manager: MPA, Islands & Estuaries, Conservation Manager, Programme Manager: Stewardship		Year 1-2	CapeNature Protected Area Expansion Strategy and Implementation Plan 2010-2015.
4. To consolidate all possible land within the KRNRC, as well as other identified conservation-worthy areas adjacent to and contiguous with the reserve as identified.	• Declaration of reserve as WHS as per the WHS nomination process. • Investigate the option of linking Robberg MPA with the Tsitsikamma MPA, as per The Bay Management Proposal compiled by Blue Pebble Consultants (Jan 2009). • Participate and support the Garden Route Initiative's proposal to apply for Biosphere Reserve status for the GRI area.	Conservation Manager; Conservation Services Manager, Relevant Programme managers; Scientific Manager: Biodiversity	Number of Hectares added to the conservation estate.	Year 1-5	CapeNature Protected Area Expansion Strategy and Implementation Plan 2010-2015; Extension nomination for the Cape Floral Region Protected Areas World Heritage Site.

Budget Allocation	**Development**	
	Operation (5 Year Forecast)	R 490,308

7.2 Regional Integrated Planning and cooperative Governance

7.2.1 Legislation

When South Africa implemented the new Constitution [Constitution of the Republic of South Africa Act, (Act No. 108 of 1996)], adopted in 1996, they included a South African innovation: a chapter on 'cooperative government', which aims to ensure good relations between South Africa's three spheres of government. This is captured 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 KRNRC. 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 2 **Objective 1** **Objective 4**	**To improve the reach and quality of biodiversity management.** **To conserve and manage biodiversity and natural processes representative of the southern Cape terrestrial and marine ecological systems.** **To expand and secure the conservation estate.**				
Key Deliverables	**Management/Monitoring Activities**	**Responsibility**	**Indicators**	**Timeframe**	**Reference to Existing Procedures**
5. The KRNRC is integrated into land-use planning outside of the nature reserve.	• Integrate with the SDFs and IDPs of the district and local municipalities.	Biodiversity Mainstreamer, Conservation Manager, Scientist: Landuse Advice	The protected area is integrated into land-use planning outside of the protected area	Ongoing	SDF and IDP planning processes, NEMA regulations
6. Water-use planning outside the KRNRC takes into account the objectives of the nature reserve.	• Attend and participate in Bitou water catchment forum. • Attend estuary management forum meetings.	Conservation Manager, Scientist: Aquatic, Programme Manager: MPA, Islands & Estuaries	Ecological reserve of river maintained.	Ongoing	National Water Act
7. Establish a functioning Advisory committee for the KRNRC.	• Identify relevant local and regional stakeholders, develop and apply criteria and processes for their involvement in strategic decision-making. • Attend estuary management forum meetings.	Conservation Manager, Scientist: Aquatic, Programme Manager: MPA, Islands & Estuaries, Community Conservation Manager	Advisory committee for the KRNRC has been established, is functioning and effective.	Ongoing	Ref Section 10.1.3; Draft regulations for proper the administration of nature reserve (2009).

Budget Allocation	**Development**	
	Operation (5 Year Forecast)	R980,617

7.3 Ecosystem and biodiversity management

Conserving biodiversity is vital, not only in terms of its intrinsic values but because continued human existence is based on healthy and functioning natural ecosystems. Any use of natural resources must be sustainable and the conservation and management of biodiversity is essential for the maintenance of natural ecosystems.

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)
- Sea Birds and Seals Protection Act, (Act No. 46 of 1973)
- Western Cape Nature Conservation Board Act, (Act No. 15 of 1998)
- Nature and Environmental 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 community and species levels in the long term and the reduction of population levels of indigenous 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 conservation concern).
- The introduction into the reserve of any alien species must be controlled.
- 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 reserved 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.
- No domestic animals will be permitted in the reserve due to the potential threat or impact on wildlife or other visitors.

Guidelines for Research

- Research can only be initiated after a proper project proposal has been evaluated by the Scientific Services and approval obtained from the reserve manager.
- Research will be permitted via formal agreements and projects will need to be registered. Research projects which contribute to the overall objectives of the reserve should be encouraged, but essentially "pure" research will not be discouraged, providing it is judged to be of sufficient merit and is not in conflict with the objectives of the reserve. Partnerships with local academic institutions should be strengthened.
- CapeNature research will be aimed at providing baseline information for monitoring and other purposes, advising on management problems, and providing general biological advice.
- Research by external researchers will be actively encouraged and will be managed as follows:
  1. Where necessary research projects can be commissioned by CapeNature. This will be done under contract, funding and facilities will be provided. Research by persons external to CapeNature must be according to standards and specific permit conditions set by CapeNature. Feedback of results to CapeNature is vital.
  2. Projects initiated by outside bodies, that are considered of importance to Keurbooms River Nature Reserve and CapeNature will be supported.
  3. Projects initiated by outside bodies that are not considered to be of a priority nature for Keurbooms River Nature Reserve and CapeNature, in general will not be provided with support in terms of the use of facilities or funds.
- Non-destructive research can be undertaken anywhere in the Keurbooms River Nature Reserve, with conditions.
- Consumptive or destructive research will be subject to the following conditions:

1. Destructive research will not be encouraged, but can be undertaken if the overall effect will not have long-term detrimental consequences.
2. Destructive research of any kind will only be allowed under prescription.
3. Where destructive research is necessary it must be conducted in delimited areas and where necessary, must be explained to the public.
4. The research must have approval of the relevant institutional Ethics Committee, and comply with all permit conditions set by CapeNature.

- All publications and research reports pertaining to Keurbooms River Nature Reserve must be filed and kept at the reserve office, with back-up copies stored at Scientific Services.
- Copies of documents and publications resulting from the research, will be made available to reserve management.

7.3.3 Threats to Biodiversity and Ecosystems

- Over-abstraction of water
- Unsustainable water demand and inter-basin transfer
- Large numbers of users
- Climate change
- Unseasonal, large and too frequent wildfires
- Invasive Alien species
- Uncontrolled access and unsustainable utilisation
- Surrounding land use pressures and bad management practices
- Illegal harvesting (poaching)
- Loss of habitat and increased competition due to invasive alien fauna and flora
- Escalation in development pressure
- Flood events

7.3.4 Management Actions

Refer to Table 7.3.

7.3	ECOSYSTEM AND BIODIVERSITY MANAGEMENT				
Objective 1 **Objective 2**	**To conserve and manage biodiversity and natural processes representative of the southern Cape terrestrial and marine ecological systems.** **To improve the reach and quality of biodiversity management.**				
Key Deliverables	**Management/Monitoring Activities**	**Responsibility**	**Indicators**	**Timeframe**	**Reference to Existing Procedures**
8. Compile and Ecological Plan of Operation and Ecological Matrix (i.e. the ecological projects planned for the reserve for the year) for KRNRC.	• Compile an Ecological Plan of Operations to support the Ecological Matrix. • Collate all relevant monitoring and research protocols and data sheets to inform the Ecological Plan of Operations. • Develop and implement an approved Ecological Matrix for the KRNRC.	Conservation Manager, Ecological Co-ordinator, Regional Ecologist, GIS Technician, Area Manager	Ecological Plan of Operations compiled. Ecological Matrix compiled, approved and implemented. 100% of actions identified in the integrated auditing system will be implemented. Research projects undertaken to address management needs and inform management actions.	Ongoing	Ecological Plan of Operations, Ecological Matrix
9. A biodiversity resource inventory for the KRNRC is in place.	• Prioritisation of species for inclusion on the Ecological Matrix. • Compile and implement the Ecological Matrix • Collect specimens (where relevant) and submit to Scientific Services. • Analyse data, re-assess and implement adaptive management strategies.	Conservation Manager, Ecological Co-ordinator, Regional Ecologist; Scientific Manager: Biodiversity, Scientific Manager: Knowledge Management		Ongoing	Baseline data collection and monitoring manual (2010)
10. A monitoring programme for the KRNRC 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 SABAP2 and CWAC and other relevant monitoring national projects/programmes. • Collection of climatic data on the KRNRC.	Conservation Manager, Ecological Co-ordinator, Regional Ecologist; Senior Manager: Scientific Services		Ongoing	Baseline data collection and monitoring manual (2010)
11. A research programme for the KRNRC is being implemented.	• Identify research needs for the reserve. • Develop and implement an applied research programme for the reserve in consultation with Scientific Services. • 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.	Conservation Manager, Ecological Co-ordinator, Regional Ecologist, Senior Manager: Scientific Services, Programme Manager: MPA, Islands & Estuaries		Ongoing	CN research needs list; Fynbos Forum research strategy, CN permitting procedure

Key Deliverables	Management/Monitoring Activities	Responsibility	Indicators	Timeframe	Reference to Existing Procedures
12. The KRNRC 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 (e.g. Uplands roads, footpaths). • Close and rehabilitate inappropriate roads within the reserve and re-design road networks.	Conservation Manager, Catchment Manager, Programme Manager: AVM, Ecological Co-ordinator, Regional Ecologist, Project Manager, Area Manager		Ongoing	ICM, AVM APO's, CapeNature Fire Policy Version 8.
13. Prevent and mitigate soil erosion on the KRNRC.	• Conduct a soil erosion assessment of stabilisation walls at picnic sites. • Map and ensure photos are available. • Compile an erosion maintenance plan. • Monitor the effectivity of the erosion control mitigation. • Monitor cost effectiveness of maintenance. • Monitor site recovery.	Conservation Manager, Ecological Co-ordinator, Catchment Manager		Ongoing	ICM APO, Ecological Plan of Operations, Eco-Matrix.
14. Conserve and protect rivers.	• Prevent future permanent infrastructure within the determined 1: 100 year flood line (where it is not known it must be determined by a qualified person). • Provide input into future applications for additional water abstraction. • Refer and address problems with pollution to relevant authorities. • Control natural resource use (e.g. fishing). • Water samples are taken by Field Rangers on a quarterly basis and sent to the Bitou Municipality water laboratory for analysis and reporting. • Get records of abstraction from Bitou Mun. • Create database indicating the abstraction.	Conservation Manager, Scientist: Landuse Advice, Scientist: Aquatic, Programme Manager: MPA, Islands & Estuaries		Ongoing	National Water Act; CapeNature Policy on developments below the 1 in 50 year floodline
15. Rehabilitate and conserve wetlands.	• To prevent future permanent infrastructure within the determined 1: 100 year flood line (where it is not known it must be determined by a qualified person). • Identify and map all wetlands and seeps. • Identify and prioritise wetlands that require future rehabilitation (use	Conservation Manager, Scientist: Landuse Advice, Scientist: Aquatic, Ecological Co-ordinator, Regional Ecologist		Ongoing	Working for Wetlands protocols, National Water Act, NEMA regulations.

Key Deliverables	Management/Monitoring Activities	Responsibility	Indicators	Timeframe	Reference to Existing Procedures
	appropriate norms and standards to rehabilitate). • Close, rehabilitate roads within wetland areas and re-design road networks.				
16. Ensure effective management of estuaries.	• Implement the Keurbooms River Estuary Management Plan. • Initiate process to get comprehensive ecological reserve determined for the Keurbooms Estuary. • No future permanent infrastructure within the determined 1: 100 year flood line (where it is not known it must be determined by a qualified person). In the absence of the determined 1:100 year flood line the 5 m contour line will act as a surrogate.	Conservation Manager, Scientist: Landuse Advice, Scientist: Aquatic, Programme Manager: MPA, Islands & Estuaries, Ecological Co-ordinator.		Ongoing	Working for Wetlands protocols, Ecological Plan of Operations and Ecological Matrix, NEMA regulations, National Water Act.
17. The protection of flora species of conservation concern.	• Identify plant species of conservation concern. • Implement monitoring of species of conservation concern.	Conservation Manager, Ecological Co-ordinator, Regional Ecologist, Scientist: Botanist		Ongoing	Priority species list, Threatened Species Programme, SOB, Ecological Matrix
18. Conservation of Threatened and Endemic Fauna	• Map the location and distribution of these species in the Keurbooms River Nature Reserve and data to be captured in the SOB database. • Ensure that visitor and management actions and activities do not impact negatively on these species and areas of occurrence through appropriate zonation	Conservation Manager, Scientist: Aquatic, Ecological Co-ordinator, Regional Ecologist, Executive Director: Marketing and Eco-tourism			Ecological Plan of Operations and Ecological Matrix, NEMA regulations, National Water Act.
19. Manage consumptive utilisation of biological resources.	• Database established indicating all utilised species (mainly through fishing) and the extent of their use within the reserve. • Maintain a presence on the reserve, conducting foot and boat patrols as needed and possible. Take law enforcement action where necessary. • Control natural resource use (e.g. fishing).	Conservation Manager, Community Conservation Manager, Ecological Co-ordinator			CapeNature Policy on consumptive utilisation (2007).

Budget Allocation	**Development**	
	Operation (5 Year Forecast)	R1,225,771

7.4 Wildlife Management

7.4.1 Legislation

- Western Cape Nature and Environmental 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. This should be professionally done through a tender process. 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 2	**To improve the reach and quality of biodiversity management.**				
Key Deliverables	**Management/Monitoring Activities**	**Responsibility**	**Indicators**	**Timeframe**	**Reference to Existing Procedures**
20. Manage escaped game from neighbouring properties (historical occurrences, extra-limital and alien species).	• Remove escaped game species from neighbouring properties.	Conservation Manager, Conservation Services Manager, Programme Manager: Wildlife.	No extra-limital game species occurring on reserve.	Ongoing	Nature and Environmental Conservation Ordinance 19 of 1974
21. Manage damage causing/ nuisance fauna.	• Remove dogs and other pets entering the reserve.	Conservation Manager	No dogs or other pets occurring on the reserve.	Ongoing	CN Pets on the reserve Policy

Budget Allocation	**Development**	
	Operation (5 Year Forecast)	R245,154

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 plant 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 2008).
- The Adaptive Interference Fire Management System will be applied where a stochastic fire regime, utilising natural ignitions, is supplemented with intentional burns if necessary.
- Prescribed burning will be used when and where appropriate to achieve ecological goals.
- When executing prescribed burns optimal fire weather conditions should prevail to ensure hot, high intensity fires.
- Any burn (ecological, exotic plant control or fuel reduction) must take the relevant “Thresholds of Potential Concern” (TPCs) into account.
- 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.
- Prescribed burning will be used when and where appropriate to achieve ecological goals.
- 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.
- Fire Management plans (Contingency, Response) must be up-dated annually to account for differing local circumstances.
- Reserve Management will establish partnerships with neighbours and other role-players through agreements and membership of Fire Protection Associations.

Ecological Thresholds

The overwhelming majority of fires must burn within the ecological thresholds of plant/fire adaptation with regard to frequency, season and intensity:

Season

- Prescribed burns will only be considered in veld that is older than 12 years, with the proviso that there are no exotic plants which are likely to be favoured by fire in the area and that the TPCs for that area will not be compromised.
- Prescribed burns will only preferably, be undertaken from December to March, unless circumstances dictate otherwise and authority has been obtained from the Quarterly Ecological Management Meeting.

Frequency

- In the Keurbooms River Nature Reserve, veld fires, irrespective of their origin, that occur in veld younger than 12 years, will be confined to as small an area as possible.
- The minimum rotation for prescribed burns will be sufficiently long to allow adequate regeneration of the slow-maturing species, and should therefore not be shorter than 12 years.
- Senility pre-emption burns will be considered (based on flower production levels), if the veld remains unburnt for 20 years. This refers to areas that have been artificially isolated from natural fires through human activities.

Intensity

- When executing prescribed burns, normal fire weather conditions should prevail, implying that hot, dry periods will not be avoided at all costs.

7.5.3 Management Actions

Refer to Table 7.5.

7.5	FIRE MANAGEMENT				
Objective 1 **Objective 2**	**To conserve and manage biodiversity and natural processes representative of the southern Cape terrestrial and marine ecological systems.** **To improve the reach and quality of biodiversity management.**				
Key Deliverables	**Management/Monitoring Activities**	**Responsibility**	**Indicators**	**Timeframe**	**Reference to Existing Procedures**
22. Reduce / avoid the spread of fires across the reserves borders and minimize accidental/deliberate fires within the reserve.	• 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. • Conduct a pre-fire season fire audit.	Conservation Manager, Catchment 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 (TBD).	Years 1-5	Fire Management Policy and Guidelines; Fire break register; ICM APO
23. To allow for natural fire processes to occur without negatively impacting on safety and infrastructure.	• Fire Reports completed. • Mapping of all fires and capture on GIS. • De-briefing sessions held after each fire and records kept.	Conservation Manager, Ecological Co-ordinator, Catchment Manager		Years 1-5	Fire Management Policy and Guidelines.
24. Establish and maintain partnerships to improve fire management on the KRNRC.	• Attend FPA meetings.	Conservation Manager		Years 1-5	Fire Management Policy and Guidelines ; FPA operational rules and guidelines.
25. Determine and implement thresholds of potential concern for fire management on the KRNRC.	• Compile and maintain a Fire management plan for the reserve taking TPCs, social and economic situation into account. • Conduct permanent Protea plot monitoring. • Set and monitor TPCs. • Conduct burns with necessary preparation and post fire procedures. • Conduct post-fire monitoring.	Conservation Manager, Ecological Co-ordinator, Regional Ecologist, Catchment Manager		Years 1-5	Fire Management Policy and Guidelines; Baseline data collection and Monitoring Manual; Ecological Matrix.
26. Wildfires as a result of human negligence are reduced.	• Create a fire awareness programme for tourists, local communities and staff.	Conservation Manager, Communications Manager, Working on Fire, FPA		Years 1-5	Fire Management Policy and Guidelines; Fire wise Implementation Guidelines

Budget Allocation	**Development**	
	Operation (5 Year Forecast)	R858,039

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.
- Removal of alien and invasive species must be performed in a cost-effective manner.
- Methods of invasive alien species removal must be based on current best practice based on guidelines established by Working for Water (including or example: Biological Control).
- It is recognised that invasive alien vegetation and alien freshwater fish in particular pose a significant threat to the key biodiversity objectives of the reserve. All efforts will be made to control invasive alien species.
- The active control and eradication of alien taxa will continue to be carried out according to the reserve's long-term strategic plans. Priority should be given to controlling those species that impact most significantly on the key conservation objectives of the reserve.
- If alien and non-local indigenous taxa outside of the reserve are identified as potential threats to the reserve's conservation objectives, then steps should be taken to implement control measures through partnerships with other departments and stakeholders. It is recognised that due to the continuous re-infestation of invasive alien

plants into the reserve from neighbouring properties upstream, neighbouring landowners should be encouraged to initiate invasive alien plant removal programmes.
- Only indigenous local plant species will be permitted for landscaping purposes for developments within the reserve.
- Eradication must proceed logically from the uppermost source of infestation downstream (or down wind) to the boundary of the mountain catchment area.
- Groups of, or individual alien plants growing on difficult-to-reach sites, or dangerous working areas (such as cliff faces) will be removed using specialised techniques and equipment.
- Control efforts must not just focus on the symptom of the problem (*i.e*., the colonising plants) but also the cause.

7.6.3 Management Actions

Refer to Table 7.6.

7.6	INVASIVE AND NON-INVASIVE ALIEN SPECIES MANAGEMENT				
Objective 1 **Objective 2**	**To conserve and manage biodiversity and natural processes representative of the southern Cape terrestrial and marine ecological systems.** **To improve the reach and quality of biodiversity management.**				
Key Deliverables	**Management/Monitoring Activities**	**Responsibility**	**Indicators**	**Timeframe**	**Reference to Existing Procedures**
Invasive Alien Flora					
27. Eradicate alien and invasive species within the KRNRC on an on-going basis.	• Identify and map all alien and invasive flora within the KRNRC or threatening the reserve. • Integrated Catchment Management informs both fire and alien vegetation management. • Attend regional ICM Meetings. • Prioritise removal according to Working for Water (WfW) protocol.	Conservation Manager, Catchment Manager, Ecological Co-ordinator, Regional Ecologist, Project Manager	100% of hectares IAPs cleared annually versus planned. 100 % of reserve cleared of IAPs to a maintenance phase by Year 5.	Years 1-5	Ecological Plan of Operations, Ecological Matrix planning, ICM APO
28. Monitoring of alien vegetation on the KRNRC informs adaptive management strategies.	• Total Clearing costs per NBAL. • Person day/hectare.	Conservation Manager, Catchment Manager, Project Manager		Years 1-5	AVM & ICM APOs
29. 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, Ecological Co-ordinator		Ongoing	Working for Water Guidelines
30. Prevent the introduction of alien and invasive species from neighbouring landowners.	• Ensure surrounding landowners are aware of relevant legislation.	Conservation Manager, Community Conservation Manager, Conservation Services Manager		Ongoing	Working for Water and Dept Agriculture Landcare Guidelines
Invasive Alien Fauna					
31. Prevent the introduction of alien and invasive species	• No introduction of alien fish species into all river systems. • Remove dogs and other non-indigenous animals from reserve.	Conservation Manager, Community Conservation Manager, Conservation Services Manager, Scientist Aquatic	No permits issued for release of alien invasive fish species into the river. Awareness raising campaign regarding the threats posed by invasive alien fish. No alien animal species on the reserve.	Ongoing	CN Permitting procedure. GRI and GCBR Forums, Indigenous fish conservation and utilisation policy, Nature and Environmental Conservation Ordinance 19 of 1974, CNC Policy on domestic animals on nature reserves
32. Control alien and invasive species within the KRNRC 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.	Conservation Manager, Scientist Aquatic, Ecological Co-ordinator	Alien fish database. SASS survey results	Ongoing	CNC Policy on domestic animals on nature reserves, Ecological Plan of Operations, Eco-matrix, SOB database, Indigenous fish conservation and

Key Deliverables	Management/Monitoring Activities	Responsibility	Indicators	Timeframe	Reference to Existing Procedures
	• Measure success of control methods utilised. • External stakeholder involvement.				utilisation policy

Budget Allocation	**Development**	
	Operation (5 Year Forecast)	R612,885

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 and historical heritage attributes.**				
Key Deliverable	**Management/Monitoring Activities**	**Responsibility**	**Indicators**	**Timeframe**	**Reference to Existing Procedures**
33. To protect cultural heritage resources.	• Compile a cultural heritage resource inventory for the KRNRC. • Functioning database with up to date information.	Conservation Manager, Ecological Coordinator	Resource inventory compiled and maintained.	Year 1-2	Ecological Plan of Operations, Ecological Matrix

Budget Allocation	**Development**	
	Operation (5 Year Forecast)	R245,154

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
- Marine Living Resources Act, (Act No. 18 of 1998)
- Government Notice R1111 of 1998 - Marine Living Resource Regulations
- National Environmental Management: Integrated Coastal Management Act, (Act No 24 of 2008)
- Seashore Act, (Act No 21 of 1935)
- Western Cape Nature and Environmental 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, local authorities and Oceans & Coasts, 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**
34. Law enforcement for the KRNRC is effective.	• All staff must have a working knowledge of all legislation applicable to their function and mandate. • The KRNRC 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 have 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. • Initiate regular meetings with all relevant parties in order to agree on and implement a strategic approach to eradicating illegal harvesting and ensuring law enforcement. • Enlist the support of local CBOs and NGOs where possible and highlight the issue through press releases as required.	Conservation Manager	Number of peace officers trained and appointed Number of EMI's trained and appointed. Number of sea fisheries officers trained and appointed.	Year 1-5	Criminal Procedure Act 51 of 1977; Bill of Rights; Constitution
35. Protection systems are in place and operating effectively.	• The following management mechanisms to control both illegal and legitimate access and use: • 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.	Conservation Manager		Ongoing	BMS

Key Deliverables	Management/Monitoring Activities	Responsibility	Indicators	Timeframe	Reference to Existing Procedures
	• 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 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)	R1,225,771

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)

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.
- Environmental management includes waste, dumping sites, potable water, water systems, sewage systems and herbicide and fuel stores.
- Reserve Management will strive to phase out all French drains, pit latrines and other non-environmentally friendly sewerage disposal systems on the reserve.
- 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.

7.9.3 Infrastructure Maintenance

7.9.3.1 Roads/Jeep Tracks

The only major road is the existing entrance road from the N2, leading to the public slipway, store room, boat house and the Keurbooms River bridge.

There are tracks on the firebreaks along the boundary fences and a contour track at Uplands and Hanglip.

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Actions:

- Identify those roads which require cement tracks as an urgent priority and include in budgeting requirements.
- Survey and map all roads in the reserve, identify those needed for management access, and close and rehabilitate the remaining networks.

7.9.3.2 Trails

There are no official trails on the reserve at present.

7.9.3.3 Buildings

At the picnic sites near the Keurbooms River bridge there are a gate kiosk, picnic facilities, a slipway, a public jetty, toilet facilities and a car park. The boathouse, fuel store, workshop and official slipway are located 400 m from the gate next to the river.

There are picnic facilities with toilets on three different sites on the embankments of the river with the canoe trail hut (Whiskey Creek Hut) at the top end of the reserve.

7.9.3.4 Fences

Ordinary 1.2 m high fences only exist where the neighbouring property is farmed extensively. This includes only the Uplands and Hanglip boundaries.

Actions:

- Maintain fences, especially after prescribed burns have been executed.

7.9.3.5 Signage

- Signage consists of health and safety signage, information signage and interpretive signage. These information boards are placed at strategic places as required. Signage is regularly updated according to the needs of the reserve.

7.9.3.6 Environmental Management

No waste disposal sites are available within the reserve and waste disposal is done at the registered dumping sites of Plettenberg Bay. It is policy to use primate proof dustbins at all development or other sites to prevent pollution. There is a refuse cubicle at the public slipway where waste from the reserve is temporarily stored and removed weekly by Bitou Municipality (Refer to Waste Management Programme).

Water on the reserve is provided by the Bitou Municipality. In general, available water quantity is mostly sufficient to support current infrastructure at different sites where domestic water is required. Infrastructure will have to be improved should the planned future tourism development take place.

The toilet facilities at the picnic sites near the Keurbooms River bridge are not connected to the municipal sewerage system and have a conservancy tank. The toilets at the picnic sites up the river have septic tanks. Alternative, more environmentally friendly sewerage treatment systems need to be investigated for these sites.

At the moment there is one fuel store at Keurbooms River Nature Reserve which also serves as an herbicide store as there is no herbicide store for the reserves.

7.9.4 Management Actions

Refer to Table 7.9.

7.9	INFRASTRUCTURE MANAGEMENT				
Objective 2	**To improve the reach and quality of biodiversity management.**				
Key Deliverables	**Management/Monitoring Activities**	**Responsibility**	**Indicators**	**Timeframe**	**Reference to Existing Procedures**
36. 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, Area Manager, Technical Advisor.	Maintenance of infrastructure and equipment is adequate. Means of verifications: Infrastructure database Maintenance schedules	Ongoing	Infrastructure registers and Public Works Schedules
37. Align all infrastructure to the conservation development framework and zonation.	• Assess infrastructure development appropriateness to the CDF. • Compile a re-alignment plan. • Implement the re-alignment plan.	Executive Director: Marketing and Eco-tourism, Area Manager, Conservation Manager.	Infrastructure located in appropriate zones.	Ongoing	CDF; Infrastructure registers
38. Roads/Jeep Tracks and Trails are managed to minimise impact on the environment.	• Conduct an assessment on the KRNRC. • Compile maintenance plan. • Re-align road network and align with the CDF. • Rehabilitate where necessary. • Borrow pits mapped, assessed and rehabilitated (where required). • Monitor use and impact • Monitor cost affectivity of maintenance.	Conservation Manager, Public Works.	Updated infrastructure register. Maintenance of scheduled infrastructure works.	Ongoing	Infrastructure register and Public Works schedule
39. 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	Conservation Manager, Public Works, Area Manager.	Building register compiled and maintained.	Ongoing	Infrastructure register and Public Works schedule

Key Deliverables	Management/Monitoring Activities	Responsibility	Indicators	Timeframe	Reference to Existing Procedures
	principles).				
40. Maintain fences according to legislative requirements.	• Conduct a fence assessment • Maintain fences as scheduled in registers to ensure upkeep and prevent degradation. • Conduct boundary patrols on a regular basis and monitor impact.	Conservation Manager, Public Works, Area Manager.	Maintenance of fences according to register.	Ongoing	Infrastructure register and Public Works schedule
41. Environmental Management: Waste Disposal	• Maintenance of storage bins as scheduled in registers to ensure upkeep and prevent pollution. • Educate visitors and staff (and local communities) on recycling and effective waste management. • Ensure that concessionaires comply with the reserve's waste management policy.	Conservation Manager, Tourism Officer.	Updated Infrastructure Registers Maintenance of scheduled infrastructure works Awareness campaign implemented. Compliance with policy.	Ongoing	Infrastructure registers and Public Works Schedules
42. Environmental Management: Water	• Maintenance of water supply as scheduled in registers to ensure upkeep and prevent degradation. • Schedule regular inspections. • Educate visitors and staff (and local communities) on appropriate and possible water conservation measures.	Conservation Manager, Public Works, Area Manager, Tourism Officer, Communications Manager.	Water supply maintained according to schedule. Awareness campaign implemented.	Ongoing	Infrastructure registers and Public Works Schedules
43. Environmental Management: Sewage	• Ensure maintenance of existing septic tanks through ensuring micro-enzymes are added quarterly into the systems. • Monitor if there is contamination of water resources and aquatic systems in the reserve by human-induced means. Any discharge to the environment must comply with the National Water Act, 1998. • Investigate alternative sewerage treatment options for picnic sites and replace existing septic tanks with improved system.	Conservation Manager, Public Works, Area Manager, Tourism Manager	Sewerage system is effective and not resulting in pollution. Monitoring data collected at picnic sites and captured in datasheet.	Ongoing Quarterly monitoring Year 1-5	OHS Act, National Water Act
44. Environmental Management: Energy	• Where feasible, introduce appropriate technologies on the use of renewable energy sources in existing developments and incorporate into any new designs and developments.	Conservation Manager, Tourism Manager	Appropriate technologies introduced in all new developments and where feasible in existing developments with reduced energy consumption resulting.	Ongoing	National Guidelines
45. Environmental Management: Herbicide and Fuel Stores	• Ensure that herbicide and fuel stores are managed and maintained in accordance with national environmental standards.	Conservation Manager, OHS Manager	Stores maintained according to schedule and managed appropriately.	Ongoing	OHS Act, Audits
46. Signage is appropriate and effective to support management.	• Conduct a signage audit. • Compile a signage register with	Conservation Manager	Audit report and signage register.	Years 1, 3 & 5	

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

Budget Allocation	**Development**	
	Operation (5 Year Forecast)	R858,039

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)
- Seabirds and Seals Protection Act, (Act No. 46 of 1973)
- South African Maritime Safety Act, (Act No. 5 of 1998)

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 understand disaster management and risk reduction stand for, what their own responsibilities are, how they can help prevent disasters, how and why they must react during a disaster 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				
Objective 2	**To improve the reach and quality of biodiversity management.**				
Key Deliverables	**Management/Monitoring Activities**	**Responsibility**	**Indicators**	**Timeframe**	**Reference to Existing Procedures**
47. Disaster prevention and preparedness	• Conduct a risk assessment and identify areas of potential concern • Compile and implement disaster management plan for KRNRC. • 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.	Conservation Manager, Tourism Officer, Community Conservation Manager, Eden Disaster Management Unit.	Communities, tourists and staff are aware and prepared for any likely disaster. Appropriate signage in place. Membership obtained, communication links with local municipalities in place. ICS training certificate.	Annually	Risk Management Policy; Fire management programme; Health and safety Act, Forest, Veld and Forest Fire Act; OHS Act; Bitou Search and Rescue; Mountain Rescue; ICS systems; NSRI
48. Disaster response.	• 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		Ongoing	Bitou Search and Rescue; Mountain Rescue; ICS systems; NSRI

Budget Allocation	**Development**	
	Operation (5 Year Forecast)	R490,308

7.11 People and Conservation

7.11.1 Community Partnerships

The long term success of the KRNRC 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 KRNRC is essential for the success of the reserve.

7.11.2 Guiding Principles

- The KRNRC's contribution to the local and regional economy must be recognised and therefore will be seen as a vehicle through which rural development and transformation may be achieved.
- Promote a 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 access 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 6	**To promote social and economic opportunities and sustainable utilisation.**				
Key Deliverables	**Management/Monitoring Activities**	**Responsibility**	**Indicators**	**Timeframe**	**Reference to Existing Procedures**
49. Create access to the conservation economy through the implementation and management of appropriate initiatives and projects.	• Create jobs through a range of projects, such as: • Clearing of Invasive Alien Plants; maintenance of fire breaks; security guards at gate entrances; cleaning services and garden services. • Complete reporting on EPWP database monthly.	Conservation Manager, Catchment Manager.	Number of EPWP job opportunities (n). Number of EPWP full time equivalents (n). Number of people directly benefitting from Sustainable Livelihood Programmes (n) Number of person days employment created (n). Law enforcement register (capture compliance checks of fishing licences and quotas). Catch cards submitted by anglers.	Ongoing	Trade World; Procurement Procedures; Supply Chain Management Policy; WCNCB Outsourcing Policy 2004
50. The KRNRC provides community development opportunities through various capacity building interventions, linked to job creation opportunities.	• Training (ICM, Health and Safety, Services training for security guards, etc.).	Conservation Manager, Community Conservation Manager.		Ongoing	Training and Development Policy
51. Manage consumptive utilisation of biological resources.	• Capture catch card information provided by anglers on database and submit to Oceanographic Research Institute (ORI).	Conservation Manager.		Ongoing	MLRA
52. The KRNRC has spiritual or religious significance.	• Access to the KRNRC for spiritual, cultural and traditional purposes will be allowed subject to permit conditions and with prior approval.	Community Conservation Manager, Conservation Manager.	Number of persons accessing CapeNature protected areas for cultural, traditional, spiritual, and sustainable harvesting activities (n).	Ongoing	Biodiversity Monitoring System

Budget Allocation	**Development**	
	Operation (5 Year Forecast)	R367,731

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

- Focus awareness on the purpose of protected areas, the protection of the natural environment and sustainable use of natural resources.
- 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 reserve's 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 Arbour Day, and Marine Week should be utilised where appropriate.
- Reserve Management will create an enabling environment that provides youth with opportunities for learning/training, personal growth and healing.
- The KRNRC 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 appropriate zones within the reserve.
- Promote the use of the KRNRC 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**
53. Ensure awareness raising initiatives elevate awareness of the KRNRC.	• Compile information and material on KRNRC for dissemination and presentation on Environmental Awareness calendar days (e.g. Heritage day, National Marine Week and Marine Protected Area Awareness, 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. • Submit an article on the KRNRC for publication to a popular conservation themed magazine, annually.	Community Conservation Manager, Conservation Manager, Eco-coordinator, Conservation Services Manager.	Number of learners provided with environmental education opportunities (n).	Ongoing	People and Conservation Action Plan, CapeNature Communication Policy Development of Educational Resources (Corporate Strategic Plan) Youth Development & Environmental Education Programme Strategic Plan
54. Environmental education is provided to promote an understanding of biodiversity and the use of the natural environment as a vehicle for learning and development.	• Develop and implement an education and awareness plan linked to the objectives of KRNRC. • Management will strive to raise the profile of World Heritage Site through linked awareness and education programmes.	Community Conservation Manager, Conservation Manager, Eco-coordinator, Conservation Services Manager.		Ongoing	People and Conservation Action Plan, CapeNature Communication Policy
55. Volunteers actively assist in the management of the KRNRC.	• Involve volunteers from ORCA in reserve activities where appropriate.	Conservation Manager, Community Conservation Manager.	Number of volunteer hours worked (n).	Ongoing	People and Conservation Action Plan

Budget Allocation	**Development**	
	Operation (5 Year Forecast)	R245,154

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 a 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 improve the reach and quality of biodiversity management**				
Key Deliverables	**Management/Monitoring Activities**	**Responsibility**	**Indicators**	**Timeframe**	**Reference to Existing Procedures**
56. 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.	Regional Ecologist, Ecological Co-ordinator, Conservation Manager, Area Manager, Programme Manager: Quality Management.	The KRNRC will annually indicate an upward trend in METT-SA score.	Annually	METT-SA
57. Auditing systems inform management.	• Conduct CapeNature integrated auditing system. • Compile action lists to address audit issues. • Track action lists for progress. • Apply adaptive management strategies.	Regional Ecologist, Ecological Co-ordinator, Conservation Manager, Area Manager, Programme Manager: Quality Management.		Every 2nd year	Eco-audit process
58. 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. •	Regional Ecologist, Ecological Co-ordinator, Conservation Manager, Area Manager, Programme Manager: Quality Management.		Every 2nd year	APO, PAMP
59. Progress reports are compiled.	• Compile quarterly BMS progress reports. • Progress reports as required.	Conservation Manager, Area Manager, Programme Manager: Quality Management.		Quarterly	BMS
60. Implement and review the management plan for the KRNRC.	• 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, Area Manager, Programme Manager: Quality Management.		Bi-annually	Eco-audit, PAMP

Budget Allocation	**Development**	
	Operation (5 Year Forecast)	R490,308

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.
- Charge appropriate fees for access to those areas/zones of the reserve where tourists and operators would normally have access to.

7.14.1.4 Management Actions

Refer to Table 7.14.1.

7.14.1	FINANCE AND ADMINISTRATION MANAGEMENT				
Objective 2	**To improve the reach and quality of biodiversity management.**				
Key Deliverables	**Management/Monitoring Activities**	**Responsibility**	**Indicators**	**Timeframe**	**Reference to Existing Procedures**
61. 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.	Financial Management section Reserve Management	Percentage increase shown on revenue as a result of additional funding sourced. Annual increase in visitor numbers.		Budgeting process; APO. SAP system; Supply Chain Management Act. Statements of GRAP.
62. 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.	Reserve Management, Planning & Financial sections, Marketing and Eco-tourism Foundation Management		Annually	National Treasury Regulations with regard to Donations, Sponsorships.
63. 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.	Reserve Management Financial Management section		Bi-anually / monthly	SOPs and policies. Statement of GRAP, UAMP guidelines.

Key Deliverables	Management/Monitoring Activities	Responsibility	Indicators	Timeframe	Reference to Existing Procedures
	• Verification Report is approved by the 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.				
64. Capacity Building among staff.	• Provide relevant financial and Administrative training to reserve staff.	Reserve Management Financial Management section		Annually	SOPs and policies PFMA

Budget Allocation	**Development**	
	Operation (5Year Forecast)	R980,617

7.14.2 Human Resource Management

7.14.2.1 Legislation

CapeNature'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 Principals

(1) CapeNature 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) CapeNature 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) CapeNature 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 improve the reach and quality of biodiversity management.**				
Key Deliverables	**Management/Monitoring Activities**	**Responsibility**	**Indicators**	**Timeframe**	**Reference to Existing Procedures**
65. Ensure an adequately resourced staff complement on the reserve.	• Ensure current posts are filled and appointment of additional staff (subject to funding). • Ensure resourced (equipment 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: Conservation Management 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
66. Integrate and align organisational and employee performance.	• There is an effective Performance Management System in place. • Ensure compliance with Code of Conduct.	Line Manager; Conservation Manager; Area Manager; Executive Director: Conservation Management, 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
67. 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)	R612,885

7.15 Occupational Health and Safety Management

7.15.1 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)

7.15.2 Guiding Principals

- 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.

7.15.3 Management Actions

Refer to Table 7.15.

7.15	OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT				
Objective 2	**To improve the reach and quality of biodiversity management.**				
Key Deliverables	**Management/Monitoring Activities**	**Responsibility**	**Indicators**	**Timeframe**	**Reference to Existing Procedures**
68. 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
69. 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. • Conduct 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)
70. Hazard Identification, Risk Assessment and Risk Management and Risk Control are implemented on the KRNRC. 71.	• 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.	Conservation Manager, 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 KRNRC.	• Assist in conducting of internal Audit Process to determine effectiveness and level of compliance of implementation of OHS Management Control System.	Conservation Manager, OHS Officer, OHS Manager		Year 1	Worksite Audit Report

Budget Allocation	**Development**	
	Operation (5 Year Forecast)	R367,731

7.16 Risk Management

7.16.1 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.

7.16.2 Guiding Principals

- 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.

7.16.3 Management Actions

Refer to Table 7.16.

7.16	RISK MANAGEMENT				
Objective 2	**To improve the reach and quality of biodiversity management.**				
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.	Year 1-5	PFMA Section 38. Risk Management Policy and Strategy.

Budget Allocation	**Development**	
	Operation (5 Year Forecast)	R490,308

7.17 Visitor Management and Services

7.17.1 Legislation

- Tourism Act, (Act No. 72 of 1993)
- Consumer Protection Act, (Act No. 68 of 2008)

7.17.2 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.
- CapeNature will provide and maintain facilities to meet visitor demand, provided sufficient funds are available. All visitor facilities must be located within the relevant zones and must comply with EIA requirements.
- Most of the reserve is inaccessible and only accessible by boat. Easy access from the N2 provides a good opportunity to develop tourism for access and profit generation. It is noted that the area is flood prone and any development needs to take this into account.
- Tourism development will only be guided by full and proper business feasibility analysis.
- Visitor activities may need to be regulated to ensure that negative impacts on the natural environment and on the experience of other users are minimised.
- Visitor use should be managed within respective zones to ensure that environmental impact is kept within acceptable limits and that visitor experience is not compromised. Monitoring of visitor impact will be undertaken to assess visitor carrying capacity and to adapt management if and when necessary in order to mitigate any impacts.
- To accommodate the various user groups, outdoor recreation activities will be promoted according to the zonation of the reserve. Any activities that are not explicitly covered in the zonation must be addressed by special application.
- To convey to the public in the best possible way, all information that will facilitate their enjoyment and appreciation of visits to the Keurbooms River Nature Reserve
- To provide relevant background information to the public about the natural resources and ecological processes, management objectives and activities, and outdoor recreation opportunities in the Keurbooms River Nature Reserve.
- To provide facilities and opportunities for controlled outdoor recreation in areas zoned for varying intensities and forms of visitor usage.
- No fires are allowed, except in designated areas.
- Disturbing, destroying, or damaging any biotic and abiotic feature, or collecting of any specimens without a permit, are not permissible.
- The public are not permitted to bring pets and/or fire arms into the Keurbooms River Nature Reserve.
- Bathing (swimming) will be permitted in the Keurbooms River, but no washing of utensils, clothing, *etc.*, with non-biodegradable soap will be permitted in or within 20 m of any stream, pool or other water source in the reserve.

7.17.3 Visitor management and services

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

- The development of a middle-market visitor accommodation facilities;
- The maintenance of a range of low impact recreational adventure activities;
- Access control at entry points; and
- The maintenance of key information on visitor profiles and their needs.

Existing tourism products and facilities

- **Whiskey Creek Canoe Trail**
  - Whiskey Creek Canoe Trail is a unique product in CapeNature in that the client rows upstream for 7 km's to an isolated wood cabin on stilts on the edge of the Keurbooms River.
  - The cabin sleeps 10 in one room, dormitory style.
  - Hot water, lighting and a 40 l fridge/freezer functioning with solar power and a wind turbine.
  - Gas is provided for cooking on a two plate stove.
  - A lifejacket and helmet are issued to each client.
  - This product lends itself to a guiding canoe and a portage service opportunity – should be investigated.
  - CapeNature staff maintains the terrain.

- **Picnic Areas (see Upgrade or change of products)**
  Close to where one enters the reserve:
  - Is a shaded picnic area with ablutions, braai areas and water points.
  - A wooden outdoor classroom with benches and a blackboard – this venue has been used for a wedding ceremony.
  - Garden services are outsourced to maintain the picnic area.
- **Canoeing**
  - Ten double canoes are hired to day visitors by the security staff. Canoes are issued with lifejackets and oars and charged at a daily rate.
- **Boating**
  - Boat users must be in possession of a launch and boat permit.
- **Boat ski and tubing**
  - Boat users are only allowed in the relevant zone from 10:00 – 16:00.
- **Swimming**
  - Is allowed in the river at any place.
- **Fishing**
  - Is allowed, but an angling license is required, which is obtainable from any post office.

Upgrade or change of products

- A feasibility study was undertaken by consultants Seaton Thomas and Associates (2011) and recommended changes to the picnic area to:
  - a campsite with 18 sites,

- eight tented self-catering chalets on stilts, and
- the entrance gate and security complex to be upgraded.

7.17.4 Concessionaires

- Ferry concessions are allowed and currently there are three in operation.

7.17.5 Management Actions

Refer to Table 7.17.

7.17	VISITOR MANAGEMENT AND SERVICES				
Objective 3	**To provide appropriate opportunities and facilities for recreation.**				
Key Deliverables	**Management/Monitoring Activities**	**Responsibility**	**Indicators**	**Timeframe**	**Reference to Existing Procedures**
74. To plan for and manage visitor facilities.	• Design and implement a visitor management plan that ensures the environmental impact on the reserve is limited and mitigated to the greatest extent possible – especially the well-used and highly valued estuary picnic areas. • Monitor and manage visitor numbers and their environmental impact. • Plan for and develop visitor facilities within CDF and local area plans. • Monitor visitor numbers. • Survey visitor opinions.	Tourism Manager, Conservation Manager	Annual increase in visitor numbers. Annual increase in tourism income.	Year 1 ongoing	Tourism plan
75. To strive to ensure visitor safety.	• Ensure that routes are clearly marked and that warning signs are in place in areas that may be risky to visitors. Should any routes be dangerous due to weather conditions or other factors, these should be closed to visitors for the necessary period. • Outsource security management if more effective and cost-efficient. • Appoint and train volunteers. • Establish a collaborative relationship with the policing authorities, local authorities and stakeholders, and work together towards a crime-free reserve. • Gate entrances to be protected against armed robberies and hijackings.	Conservation Manager, Tourism Manager, OHSA Officer	Reduction in number of reports on safety and crime incidents.	Ongoing	Tourism plan, OHSA
76. To promote and manage access to the reserve.	• Produce and distribute marketing information promoting the various visitor facilities and activities available on the reserve. • Set management guidelines for different use zones. • Provide season ticket and special user discounted rates to enable equitable access including the Wild Card system. • Monitor pay access points and control access where required. • Identify areas requiring special management strategies and protection from visitor use. • Facilitate access for disadvantaged groups on request.	Tourism Officer, Conservation Manager	Marketing material produced. Profile of discount opportunities. Visitor numbers.	Years 1-5	Tourism plan
77. To enhance visitor	• Provide interpretive boards covering	Tourism Officer,	Interpretive signage in place.	Year 1-2	Tourism plan

experience through the use of well-designed and placed interpretive aids.	ecological aspects of the reserve at suitable points. • A simple booklet/pamphlet providing pictures of plant and animal species and additional interpretive material should also be available, together with a clear map of the reserve.	Conservation Manager, Ecological Co-ordinator	Booklet/pamphlet available.		

Budget Allocation	**Development**	
	Operation (5 Year Forecast)	R980,617

7.18 Conservation Development Framework

7.18.1 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.

7.18.2 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.

7.18.3 Management Actions

Refer to Table 7.18.

7.18	TOURISM DEVELOPMENT FRAMEWORK				
Objective 3	**To provide appropriate opportunities and facilities for recreation.**				
Action plans	**Management/Monitoring Activities**	**Responsibility**	**Indicators**	**Timeframe**	**Reference to Existing Procedures**
78. To provide nature and cultural tourism and recreational opportunities within the reserve without affecting the ecological processes negatively.	• Establish and implement concessionaire process. • Prioritise different types of tourism development within the reserve. • Monitor concessionaire compliance with national and international standards.	Conservation Manager and Standards Committee Conservation Manager and Concessionaires	Concession of selected tourism opportunities Standards are set in specified and approved schedules (including hospitality standards based on those by the South African Grading Council). Standards Committee established for monitoring tourist facilities within the reserve Development priorities in place and implemented in the correct Zones within the reserve Recommendations within these plans implemented Concessionaire compliance audited	Year 1 on-going	Reserve Zonation
79. Promote Community-Based Tourism and SMME initiatives in and around the reserve	• Facilitate private / community sector involvement in the planning, design, financing and / or running of tourist facilities.	Conservation Manager and Private/Community Sector	Successful operation (stable tourist flow and financial success) of SMMEs and community-based tourist facilities		
80. Ensure tourism contributes to conservation through the reserve	• Monitor Tourist use and interest within the reserve, including negative impacts, adapt where necessary. • Establish a Financial Management System for the reserve. • Ensure proper control of the reserve's assets. • Identify the potential for negative consequences and their adverse effects on tourism (Risk assessment).	Conservation Manager	Tourist Use Monitoring Programme in place Management systems (financial, risk and asset register) are in place and implemented	By year 3	

Budget Allocation	**Development**	
	Operation (5 Year Forecast)	R490,308

PART 4

SECTION 8: **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
CAPE	Cape Action Plan for the Environment
C.A.P.E.	Cape Action for People and the Environment
CBOs	Community Based Organisations
CEO	Chief Executive Officer
CDF	Conservation Development Framework
CFR	Cape Floristic Region
CITES	Convention on International Trade in Endangered Species
CN	CapeNature
CNC	Cape Nature Conservation (now CapeNature)
CPA	Cape Provincial Administration
CR	Critically Endangered

CWAC	Coordinated Waterbird Counts
DAFF	Department of Agriculture, Forestry and Fisheries
DEA	Department of Environmental Affairs
DEA&DP	Department of Environmental Affairs and Development Planning
DWA	Department of Water Affairs
EIA	Environmental Impact Assessment
EPWP	Expanded Public Works Project
EMI	Environmental Management Inspector
EMP	Environmental Management Plans/ Programme
EN	Endangered
EX	Extinct
FEPA	Freshwater Ecosystem Priority Area
FPA	Fire Protection Association
FSP	Fine-scale Plan
GCBR	Gouritz Cluster Biosphere Reserve
GIAMA	Government Immovable Asset Management Act
GIS	Geographical Information System
GRAP	Generally Recognised Accounting Practice
GRI	Garden Route Initiative
HIRA	Hazard Identification and Risk Assessment
HR	Human Resources
IAP	Invasive Alien Plants
IAS	Invasive Alien Species
ICM	Integrated Catchment Management
ICS	Incident Command System
IDP	Integrated Development Plan
IUCN	International Union for Conservation of Nature
KRNRC	Keurbooms River Nature Reserve Complex
LC	Least Concern
LT	Least Threatened
METT-SA	Management Effectiveness Tracking Tool
MOU	Memorandum of Understanding
MPA	Marine Protected Area
MSL	Mean Sea Level
MTEF	Medium Term Expenditure Framework
MTO	Mountains to Oceans
NBAL	Natural Biological Alien
NBF	National Biodiversity Framework
NEMA	National Environmental Management Act
NEM:BA	National Environmental Management Biodiversity Act
NEM:PAA	National Environmental Management: Protected Areas Act, 57 of 2003
NFEPA	National Freshwater Ecosystem Priority Area
NGO	Non-Governmental Organisation
NR	Nature Reserve
NRC	Nature Reserve Complex
NBA	National Biodiversity Assessment
NSBA	National Spatial Biodiversity Assessment (now NBA)
NSRI	National Sea Rescue Institute

NT	Near Threatened
OHS	Occupational Health and Safety
OHSA	Occupational Health and Safety Act
ORCA	Oceans Research Conservation Africa
ORI	Oceanographic Research Institute
OUF	Outstanding Universal Value
PA	Protected Area
PAAC	Protected Area Advisory Committee
PAM	Protected Area Management
PAMP	Protected Area Management Plan
PE	Presumably Extinct
PFMA	Public Finance Management Act
QDS	Quarter Degree Squares
QEM	Quarterly Ecological Meeting
RHP	River Health Programme/Project
RMC	Reserve Management Committee
SABAP	South African Bird Atlas Project
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
SOB	State of Biodiversity
SOP	Standard Operating Procedures
SMME	Small, Medium and Macro Enterprises
SWOT	Strengths, Weaknesses, Opportunities and Threats
ToPS	Threatened or Protected Species
ToR	Terms of Reference
TPC	Threshold of Potential Concern
UAMP	User Asset Management Plan
UNESCO	United Nations Educational, Scientific and Cultural Organisation
VU	Vulnerable
WCNCB	Western Cape Nature Conservation Board
WESSA	Wildlife and Environment Society of South Africa
WfW	Working for Water
WHS	World Heritage Site
WoF	Working on Fire
WWF	World Wildlife Fund

8.3 List of Tables

8.4 List of Figures