INTEGRATED RESERVE MANAGEMENT PLAN

BOTTERBLOM NATURE RESERVE

June 2011

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AUTHORIZATION PAGE

This Integrated Management Plan for the Botterblom Nature Reserve was drafted by the Area Manager and recommended by the Reserve Planning Team, a multi-disciplinary team consisting of:

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DOCUMENTED

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INTEGRATED RESERVE MANAGEMENT PLAN

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City of Cape Town

Botterblom Nature Reserve

June 2011

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List of abbreviations used

APO **annual plan of operations**

C.A.P.E	**Cape Action for People and the Environment**
CDF	**Conservation Development Framework**
CFR	**Cape Floristic Region**
EIA	**environmental impact assessment**
GIS	**geographic information system**
IDP	**Integrated Development Plan**
IMEP	**Integrated Metropolitan Environmental Policy**
IRMP	**Integrated Reserve Management Plan**
LBSAP	**Local Biodiversity Strategy and Action Plan**
METT-SA	**Management Effectiveness Tracking Tool South Africa**
MOU	**memorandum of understanding**
NEMPA	**National Environmental Management Protected Areas Act**
PAR	**protected-area review**
RPC	**Reserve Planning Committee**
SANBI	**South African National Biodiversity Institute**
SWOT	**strengths, weaknesses, opportunities, threats**

PART 1

DESCRIPTION

1. INTRODUCTION

Botterblom Nature Reserve conserves the Critically Endangered Swartland Silcrete Renosterveld. The vegetation is in an excellent condition. Numerous threatened plant species occur on this 3,2 ha site, including *Aspalathus aculeata, Pauridia minuta, Phylica strigulosa* and *Xiphotheca reflexa.*

The strategic management planning process (which resulted in the development of an Integrated Reserve Management Plan, or IRMP) for Botterblom Nature Reserve began with the definition of the vision followed by the purpose for the reserve. This purpose is then supported by desired states for the reserve. The reserve objectives contribute to realising the purpose and desired states. For each desired state, a number of management objectives are identified. These management objectives are then implemented through the identification of outputs. Objectives for each Desired State are prioritised for the five-year time horizon of the plan. Time frames, deliverables, performance indicators and targets are then allocated to each objective, or a group of linked outputs contributing to the desired state.

1.1 Aim of the Integrated Reserve Management Plan

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

The planning process for Botterblom Nature Reserve takes place against the backdrop of (i) the City of Cape Town's Integrated Development Plan (IDP) (Anon 2010); (ii) the City of Cape Town's Integrated Metropolitan Environmental Policy (IMEP) (Anon 2003[1]); (iii) the biodiversity strategy (Anon 2003[2]) and Local Biodiversity Strategy and Action Plan (LBSAP) (Anon 2009[1]), and (iv) the bioregion (Cape Action for People and the Environment, or C.A.P.E). The major elements of the IRMP are this document (overall strategy, vision and context), the detailed subsidiary plans (as required), and an annual plan of operations (APO). The IRMP for Botterblom Nature Reserve is supported by a State of Biodiversity report (Holmes *et al*, 2008), operational guidelines, and a monitoring and evaluation framework to ensure ongoing implementation and review of protected-area management activities (figure 1).

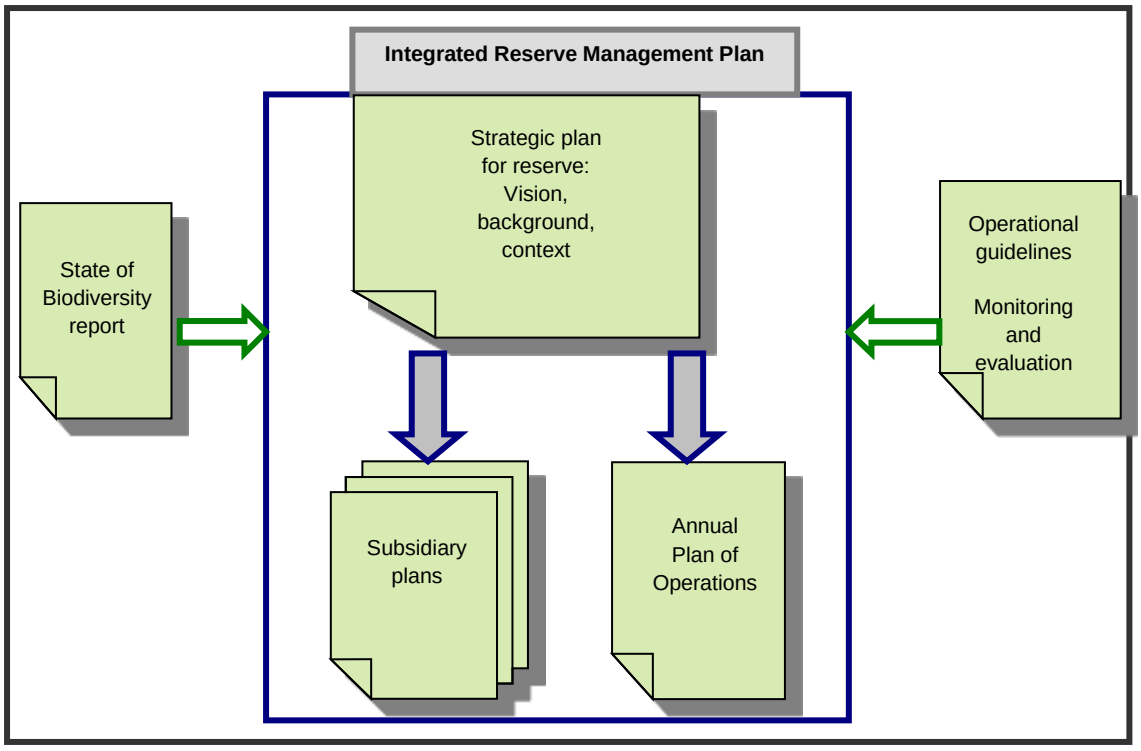


Figure 1: Elements of the IRMP

The IRMP for Botterblom Nature Reserve forms part of a tiered series of policies, legislation and related planning documents at the sector, institutional, agency and local levels (figure 2).

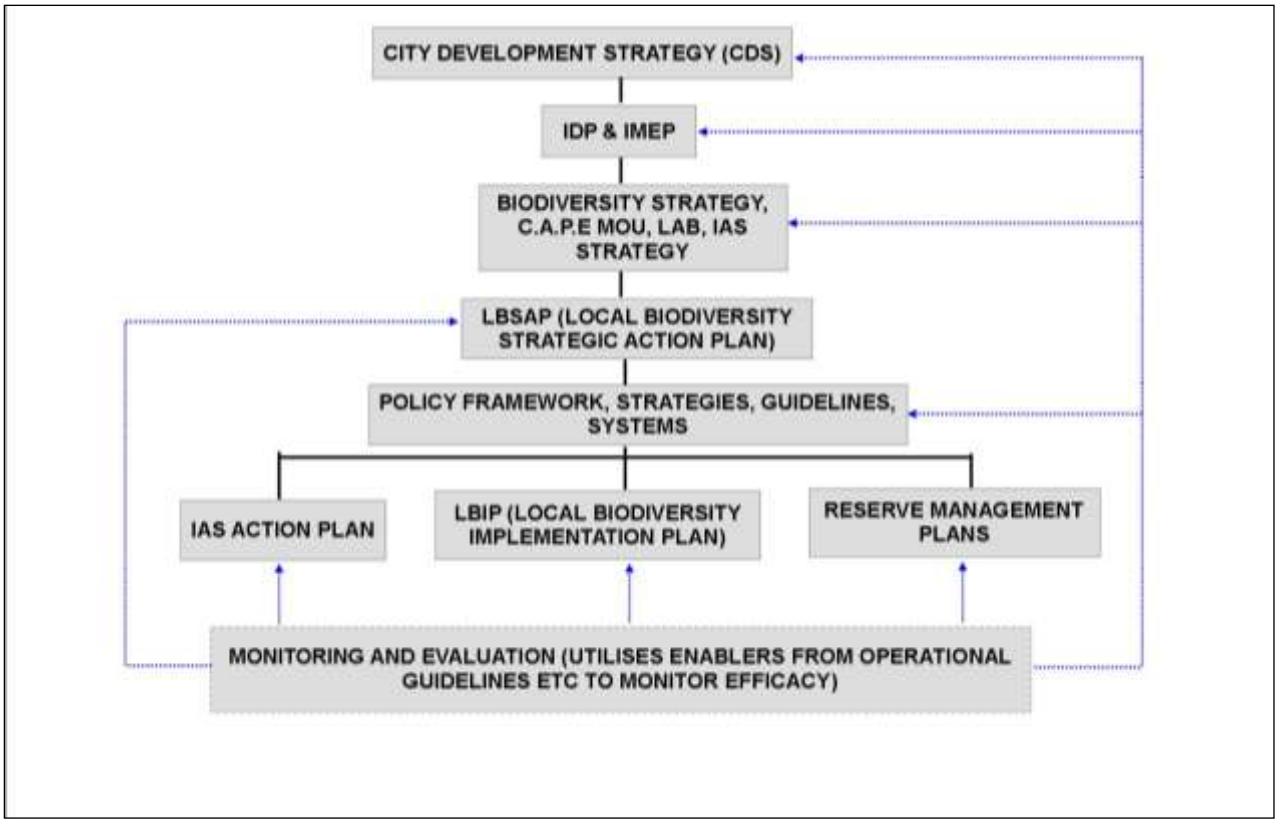


Figure 2: Legal and planning framework for the IRMP

Where possible, emphasis has been placed on the following:

- Assigning responsibility for management interventions
- Scheduling said management interventions
- Quantifying management costs

This approach is specifically intended to create a mechanism whereby management intervention can be monitored and audited on an annual basis.

In context, this IRMP is a dynamic document, and the detailed subsidiary plans should be updated on an annual basis or as soon as new information comes to light that may better inform decisions on responsible land management. The IRMP should be updated every five years.

The drafting of this IRMP has been guided by a small interdisciplinary Reserve Planning Committee (RPC) comprising the branch manager, the regional manager, the area manager, various specialists, and other interested and affected persons. Repeated drafts of the IRMP were presented to, and discussed by, the RPC before broader circulation for public participation.

Pre-engagement workshops were held with community partners from March to May 2010. This afforded key community partners an opportunity to provide their input at an early stage. Where practical, the ideas and outputs from the workshops have been incorporated into the IRMP.

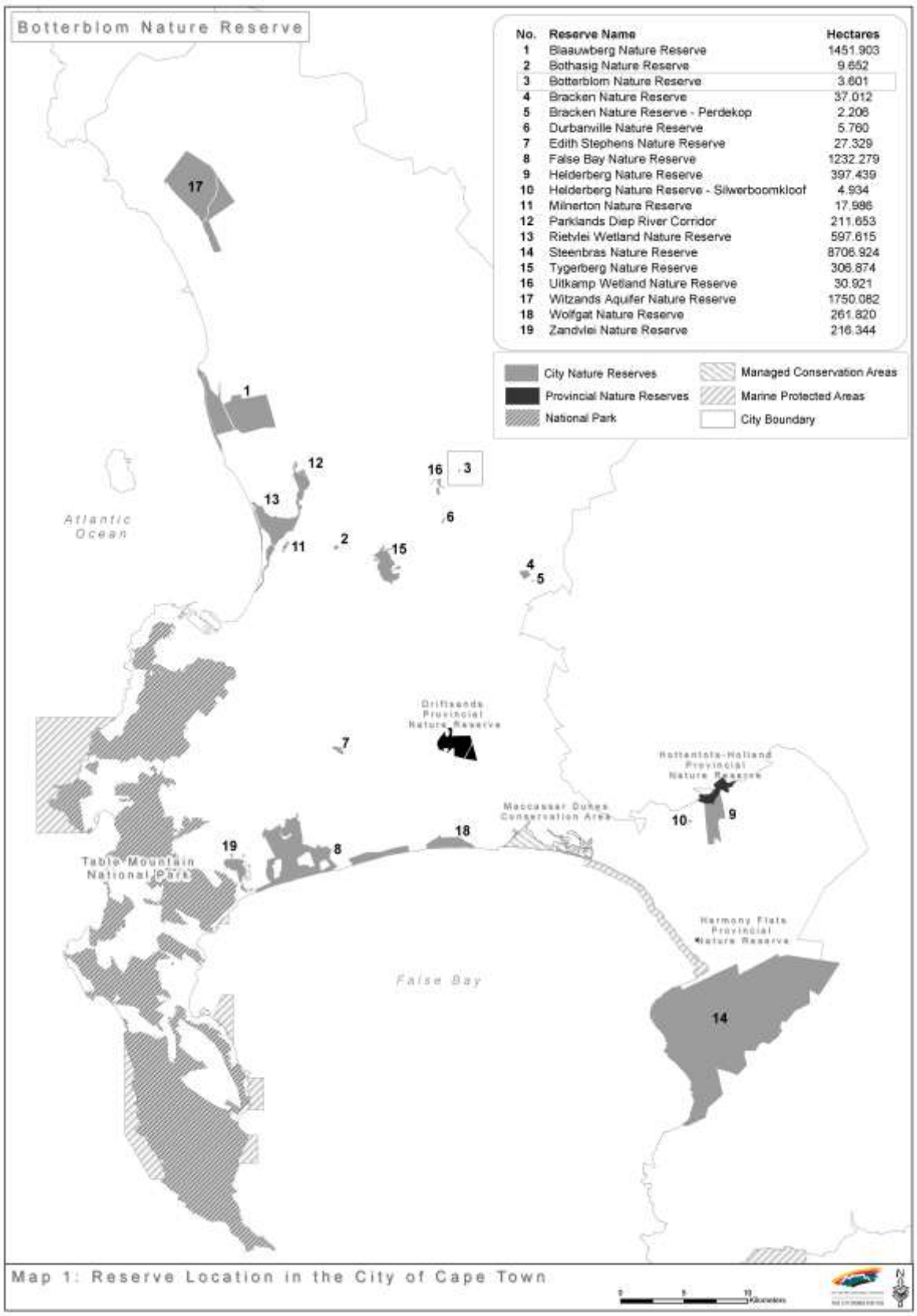
1.2 Location and extent

Botterblom Nature Reserve is situated in the suburb of Durbanville, Cape Town. It is located in the central region of the City of Cape Town's Biodiversity Management Branch. Botterblom Nature Reserve is made up of two erven divided by Botterblom Street. The majority of the reserve is bounded by residential houses, apart from a small section on the south-eastern boundary that is bounded by Boland Way, and a section of the north-eastern boundary that neighbours agricultural land (map 1 and 2).

The reserve is still in the developmental stages and in a process of being formally proclaimed. It is managed by the City of Cape Town's Biodiversity Management Branch.

Botterblom Nature Reserve is 3,6 ha in size, and is located at the following grid references:

33˚48'21.255"S and 18˚39'27.035"E



Map 1: Reserve location in Cape Town

Map 2: Reserve boundaries

2. DESCRIPTION OF LANDHOLDINGS AND OWNERSHIP

2.1 Property details and title deed information

- Erven 64-9176, Durbanville, situated in the City of Cape Town municipality, Western Cape province
  In extent 0,695 ha; held by title deed no. T97000/2005

- Erven 64-9244, Durbanville, situated in the City of Cape Town municipality, Western Cape province
  In extent 2,905 ha; held by title deed no. T97001/2005

  Nature Reserve refers to the area declared as such on the properties in terms of the National Environmental Management Protected Areas Act (NEMPA) as depicted on map 3.

  Refer to Appendix 2 for copies of Surveyor-General diagrams.

Map 3: Reserve erven

2.2 Landscape perspective

The reserve falls within the Cape Floristic Region (CFR). The CFR is the smallest yet richest of the world's six floral kingdoms, and the only one to be found entirely within one country. This rich biodiversity is under serious threat for a variety of reasons, including conversion of natural habitat to permanent agricultural area, inappropriate fire management, rapid and insensitive development, overexploitation of water resources, and infestation by alien species. The region has been identified as one of the world's 'hottest' biodiversity hot spots (Myers *et al*. 2000).

In response to this challenge, a process of extensive consultation involving various interested parties, including local government and non-governmental organisations, resulted in the establishment of a strategic plan (C.A.P.E Project Team 2000) referred to as Cape Action Plan for People and the Environment, which 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 that need to be conserved and a series of broad programme activities that need to take place over a 20-year period. Based on the situation assessment and analysis of threats, three overarching, mutually complementing and reinforcing themes were developed:

- To establish an effective reserve network, enhance off-reserve conservation, and support bioregional planning
- To strengthen and enhance institutions, policies, laws, cooperative governance and community participation
- To develop methods to ensure sustainable yields, promote compliance with laws, integrate biodiversity concerns with catchment management, and promote sustainable eco-tourism

The C.A.P.E partnership was formed and works together to implement the C.A.P.E vision and plan by strengthening institutions, supporting conservation efforts, enhancing education, developing tourism benefits, and involving people in conservation. The City of Cape Town was one of the 19 founding signatories of the C.A.P.E memorandum of understanding (MOU).

Botterblom Nature Reserve forms an important platform and integral link in the City of Cape Town biodiversity network (Anon 2009[2]). This network ensures that parcels of land worthy of conservation are included in a protective network, connected to other parcels of conservation-worthy land.

This reserve is of extreme importance for the conservation of the Critically Endangered veld type, Swartland Silcrete Renosterveld. Only 1% (100 ha) of the

original extent is protected. The national target for conservation of this vegetation type is 26%. This is unfortunately unattainable, which makes the conservation of every last remnant, irrespective of size, critical.

Botterblom Nature Reserve constitutes the only conserved portion of Swartland Silcrete Renosterveld within the City of Cape Town's reserve network, and is indicated as a critical biodiversity area on the biodiversity network, which strives to conserve remnant vegetation required for national conservation targets (see map 4).

2.3 Physical environment

2.3.1 Climate

The climate of Botterblom Nature Reserve and surrounding areas is typically Mediterranean, with rain falling predominantly in winter (April–September) at an annual average of 774,38 mm. June to July constitutes the wettest period, with an average rainfall of 133,26 mm. January is the driest month, with an average rainfall of 13,9 mm. Recent rainfall figures have been recorded at Uitkamp Wetland Nature Reserve in the Durbanville area since 2003. Appendix 1 contains a summarised table of mean rainfall per month.

The summers are hot, with the maximum temperatures ranging from 20,8 ºC to 38,4 ºC, while the average minimum temperatures in June (mid-winter) are between 1,3 ºC and 13,2 ºC. Botterblom Nature Reserve is influenced by fog and sea breezes. The strongest and most frequent winds blow predominantly in summer from the south to south-east. During the winter months, the winds blow mostly from the north-west.

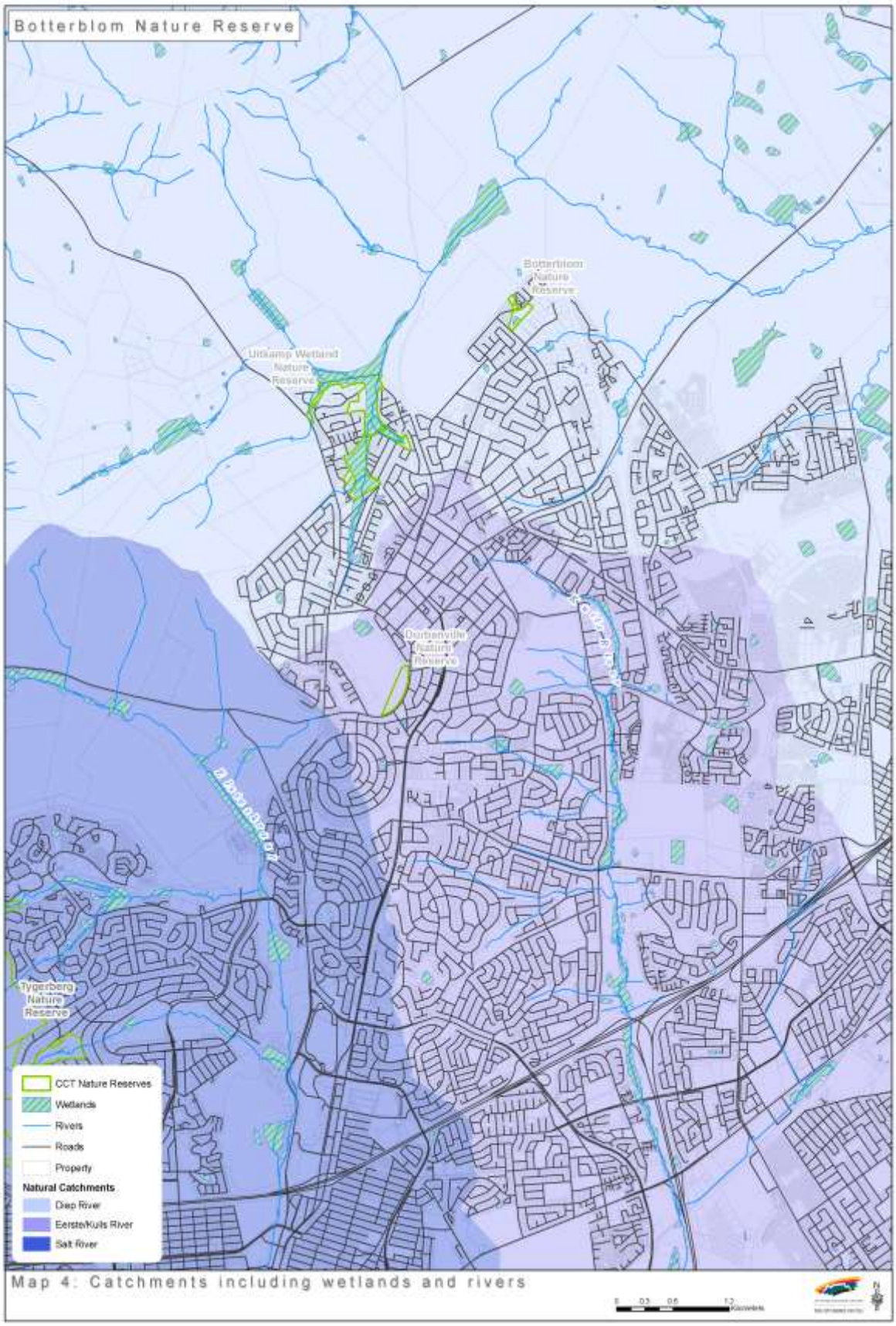
2.3.2 Geology, geomorphology, soils and land types

Botterblom Nature Reserve is largely flat, with a large number of silcrete outcrops. The geology of the reserve is silcrete layers over Malmesbury shale and Cape granite. Soils with prismacutanic and/or pedocutanic diagnostic horizons or plinthic catena are dominant. (Rebelo *et al*. 2006).

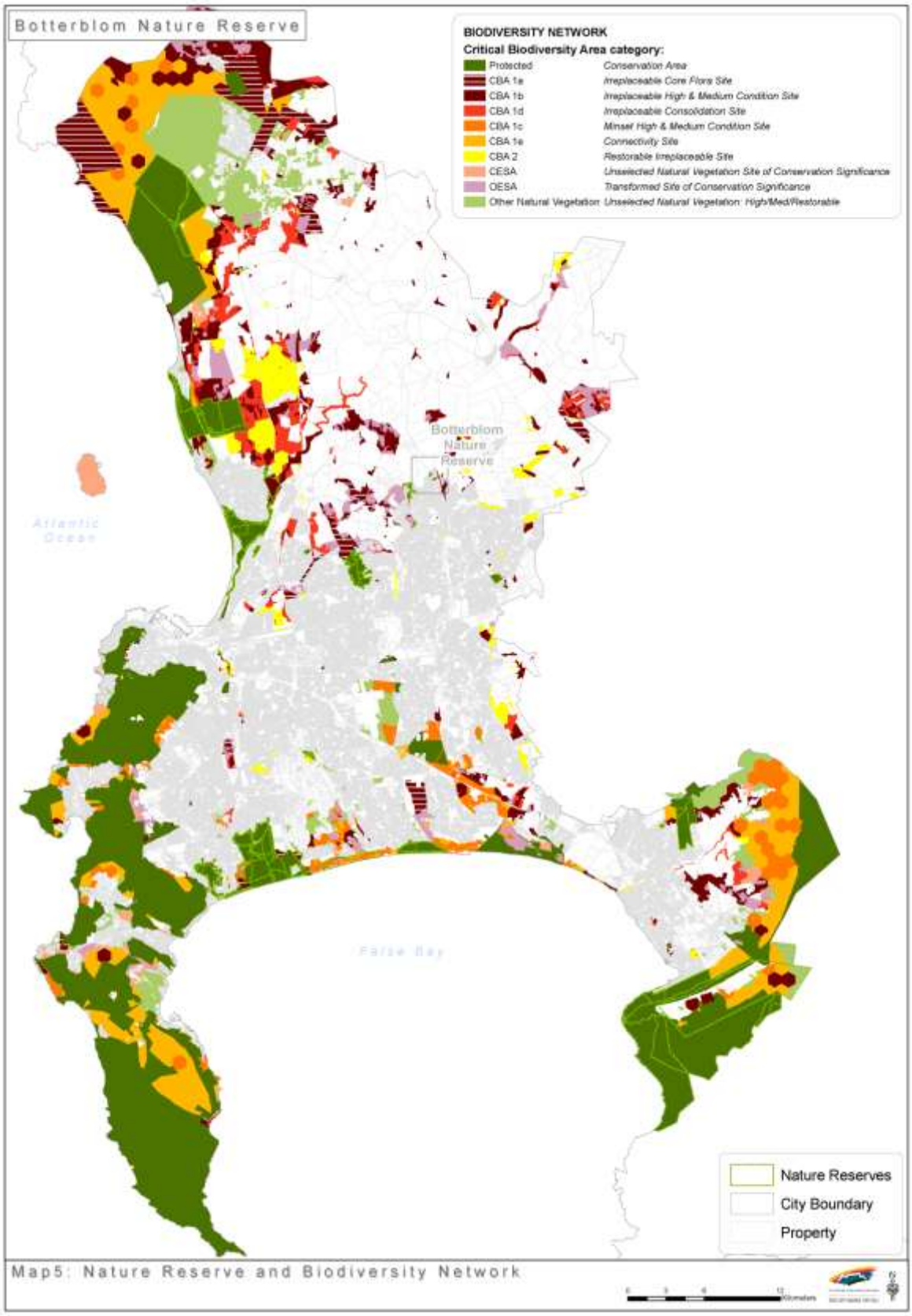
2.3.3 Hydrology and aquatic systems

Botterblom falls within the Diep river catchment. Map 5 illustrates the hydrological features of the Durbanville area.

Historically, the site would have been very wet in winter, but there were never any natural watercourses or wetlands. However, due to the urban development surrounding Botterblom Nature Reserve, there is a stormwater channel and pond that have created an artificial wetland habitat for a range of fauna species. The management of this system, particularly the effects of eutrophication, is a management priority.



Map 4: Catchments including wetlands and rivers



Map 5: Nature Reserve and Biodiversity Network

2.4 Biological environment

2.4.1 Vegetation

The vegetation at Botterblom Nature Reserve is classified as Swartland Silcrete Renosterveld (Rebelo *et al*. 2006). The last National Spatial Biodiversity Assessment of 2004 stated that only 8% of Swartland Silcrete Renosterveld remains (Driver *et al.* 2004). Most of the remnants are very small and isolated. Only 100 ha (about 1%) is protected. The minimum national conservation target for this vegetation type is 26%. This is unfortunately unattainable, which makes the conservation of every last remnant, irrespective of size, critical.

The vegetation is characterised by an open, low, cupressoid-leaved and small-leaved, low to moderately tall shrubland with many succulents, dominated by renosterbos.

Soils with prismacutanic and/or pedocutanic diagnostic horizons or plinthic catena are dominant (Rebelo *et al*. 2006).

Fire has been excluded from the site for some time, and this has resulted in the vegetation becoming senescent (old). The use of fire is therefore a critical component of the management of Botterblom Nature Reserve.

While the reserve is small, the vegetation is in very good condition and extremely species-rich. No detailed botanical assessments have been conducted, but preliminary surveys have identified 106 species, with 14 being listed as threatened or near-threatened (Appendix 3).

2.4.2 Mammals

A baseline study of the area's mammal fauna still needs to be conducted, but due to the small size of the area and the relative ecological isolation, it is expected that only smaller mammal species will persist on site. *Hystrix africaeaustralis* (Porcupine) has been recorded .

2.4.3 Birds

An avifaunal study still needs to be conducted for the reserve. However, a total of 38 bird species for the area has been recorded historically by the Tygerberg Bird Club through bird ringing (see Appendix 4).

2.4.4 Reptiles

While no detailed survey has been done to date, a few reptile species have been recorded on the site. These include *Homopus areolatus* (Parrotbeaked Tortoise) and *Duberria lutrix* (Common Slug-eater) (Appendix 5).

2.4.5 Amphibians

A baseline study of the amphibian fauna still needs to be conducted for the reserve.

2.4.6 Fish

A baseline study of the fish fauna still needs to be conducted for the reserve.

2.4.7 Invertebrates

An invertebrate study still needs to be conducted for the reserve.

2.5 Socio-political context

2.5.1 History

Botterblom Nature Reserve was set aside as public open space during the development of the suburb Vierlanden in Durbanville. The reserve was previously managed by the City of Cape Town's Parks Department. In October 2010, the management of the reserve was however taken over by the City of Cape Town's Biodiversity Management Branch, and the site is currently managed as a satellite site from Durbanville Nature Reserve.

2.5.2 Socio-economic context

Botterblom Nature Reserve falls under the jurisdiction of Ward 105, Subcouncil 7.

The socio-economic profile of the area surrounding Botterblom Nature Reserve ranges from affluent, large households to the north-eastern side, to more dense developments on the southern side.

There is an active community in the area, who is also serious about service delivery. Several neighbourhood watches operate in close cooperation with the City of Cape Town's Metro Police and the South African Police Service. Various small venues in the Durbanville area are used for theatre productions. The area also has various non-profit organisations, such as Durbanville Garden Club, Kenridge Women's Club and the Tygerberg Rotary Club, to mention a few.

The subcouncil is the interface between the City of Cape Town and its communities, and plays an important role in promoting public participation in Council's plans and policies. The subcouncil does its utmost to be a medium between the community and the City of Cape Town, and to function as efficiently as possible within its delegated powers. The upliftment of local communities and the continuous assessment of service delivery, community needs and budget priorities are ongoing activities.

The subcouncil is sensitive to community aspirations, needs and participation, and supports all activities aimed at preserving the area's rich natural environment, while fulfilling its role as

a facilitator of meaningful and systematic socio-economic development and good governance.

Economic attributes of the reserve include the following:

- Ecosystem services – water retention, wetlands, green lung, scenic landscape, positive impact on property values, etc.
- Job creation and poverty relief (alien-clearing projects, etc.)
- Local recreation and specialist botanical tours
- Future plans for environmental education programmes and opportunities

2.6 Protected-area expansion

Botterblom Nature Reserve is still connected to open agricultural areas to the north.

3. PURPOSE, VISION/MISSION, SIGNIFICANCE/VALUE

3.1 Purpose of the protected area

Botterblom Nature Reserve is located in the CFR, an area of global biodiversity significance. The reserve conserves a unique combination of habitats, ecosystems and species, many of which are either rare or endemic to the area.

The primary purpose of Botterblom Nature Reserve is the **conservation of this unique biodiversity and associated ecosystem features and functions.**

In conserving this unique biodiversity, secondary objectives will include the following:

- Facilitating the low-impact use of the area by local residents and visitors for nature appreciation activities
- Conserving critically endangered Swartland Silcrete Renosterveld
- Promoting sound environmental education principles

3.2 Vision and mission

3.2.1 Vision

Integrated Development Plan vision

The vision of the City of Cape Town remains as follows:

- To be a prosperous city that creates an enabling environment for shared growth and economic development
- To achieve effective and equitable service delivery
- To serve the citizens of Cape Town as a well-governed and effectively run administration

To achieve this vision, the City recognises that it must:

- actively contribute to the development of its environmental, human and social capital;
- offer high-quality services to all who live in, do business in, or visit the city as tourists; and
- be known for its efficient, effective and caring government.

C.A.P.E vision

We, the people of South Africa, are proud to be the custodians of our unique Cape Floral Kingdom, and share its full ecological, social and economic benefits now and in the future.

Environmental Resource Management Department vision

To ensure that sustainable and equitable development is combined with sound environmental practice for a healthy local environment, which sustains people and nature, provides protection for our unique resources, and results in an enhanced quality of life for all.

Biodiversity Management Branch vision

To be a City that leads by example in the protection and enhancement of biodiversity; a City within which biodiversity plays an important role, and where the right of present and future generations to healthy, complete and vibrant biodiversity is entrenched; a City that actively protects its biological wealth, and prioritises long-term responsibility over short-term gains.

Botterblom Nature Reserve vision

To manage and restore the natural assets of Botterblom Nature Reserve by partnering with people to ensure the area's survival for present and future generations.

3.2.2 Mission

Biodiversity Management Branch mission

- To manage biodiversity proactively and effectively
- To ensure an integrated approach to biodiversity between City of Cape Town line functions and departments, and actively pursue external partnerships
- To adopt a long-term approach to biodiversity
- To ensure sustainability of our rich biodiversity
- To adopt a holistic and multifaceted approach to biodiversity
- To continue to measure and monitor the City of Cape Town's performance in the protection and enhancement of biodiversity
- To continue to measure and monitor the state of biodiversity in Cape Town

Botterblom Nature Reserve mission

To restore and maintain the natural environment and its associated ecological processes and services through the implementation of the management objectives of Botterblom Nature Reserve.

3.3 Significance of property (biodiversity, heritage and social)

Botterblom Nature Reserve contains a Critically Endangered vegetation type, and is therefore essential to help achieve national conservation targets. It forms an integral part of the fine-scale conservation plan for the region, namely the City of Cape Town's biodiversity network.

Summary of qualifying site assessment criteria

- The reserve conserves Critically Endangered Swartland Silcrete Renosterveld.
- The reserve is home to 14 threatened or near-threatened species.
- Through natural open space, the reserve is well connected to extensive natural areas to the north and east.
- The reserve provides opportunities for recreation.

PART 2

MANAGEMENT POLICY FRAMEWORK

4. ADMINISTRATIVE AND LEGAL FRAMEWORK FOR THE MANAGEMENT AUTHORITY

4.1 Legal framework

Table 1: Legal Framework

The following is a list of legislation applicable to the management of the City of Cape Town's Biodiversity Management Branch. Repealed legislation has been included as greyed-out text for information purposes only.

Legislation: **Acts, ordinances, bylaws**	**Relevance:** **Description**	**Amendment:** **Latest amendment date**	**Comment:** **Other notes**
Constitution of the Republic of South Africa, Act 108 of 1996	Lists South African citizens' environmental rights	N/A	Chapter 2: Bill of Rights assigns citizens with particular rights
ENVIRONMENTAL LEGISLATION			
National legislation			
National Environmental Management Act (NEMA), Act 107 of 1998	One of the most important environmental laws relating to most aspects of the environment, including environmental impact assessments (EIAs), environmental information and legal standing, etc.	• Amendment Act 56 of 2002 • Amended by GN 26018, Vol 464 of 13 February 2004	Provides for cooperative environmental governance
National Environmental Management: Biodiversity Act, Act 10 of 2004	The objectives of the Act are to provide for: • the management and conservation of South Africa's biodiversity within the framework of the National Environmental Management Act, 1998; • the protection of species and ecosystems that warrant national protection; • the sustainable use of indigenous biological resources; • the fair and equitable sharing of benefits arising from bio-prospecting involving indigenous biological resources; and • the establishment and functions of a South African National Biodiversity Institute. In essence, the Act was put in place to safeguard the important	N/A	The development of the IRMP will assist in ensuring that the objectives of this Act are achieved in the reserve.

	biodiversity attributes in the country, while allowing people to benefit equally from the natural resources. In order to achieve these goals, the Act made provision for the South African National Biodiversity Institute (SANBI), which has been designated certain functions and afforded powers and duties in respect of this Act.		
National Environmental Management: Protected Areas Act, Act 57 of 2003	To provide for: • the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and natural landscapes and seascapes; • the establishment of a national register of all national, provincial and local protected areas; • the management of those areas in accordance with national norms and standards; • intergovernmental cooperation and public consultation on matters concerning protected areas; and • matters in connection therewith.	• Amendment Act 62 of 2008 • Amendment Act 15 of 2009	Regulations Notice 1029 of 2009 lists specific regulations for reserves proclaimed by the Member of the Executive Council (MEC) (draft August 2009).
Conservation of Agricultural Resources Act (CARA), Act 43 of 1983	The CARA regulations contain a list of alien invasive vegetation categorised according to their legal status. The Act regulates the sale, position and use of listed species.	• Amended by GN R 2687 of 6 December 1985 and GN R 280 of 30 March 2001	Alien invasive plant legislation to be included under the Biodiversity Act in future
National Veld and Forest Fire Act, Act 101 of 1998	Relates to veld fire prevention, fire protection associations, fire danger indexing, enforcement of fire legislation, and the fighting of fires	N/A	A detailed fire management plan will be developed.
Marine Living Resources Act, Act 18 of 1998	Regulates conservation of the marine ecosystem and the long term sustainable utilisation of marine living resources		
Environment Conservation Act, Act 73 of 1989	The Environment Conservation Act is the other law that relates specifically to the environment. Although most of this Act has been replaced by NEMA, some important sections still remain in operation. These sections relate to: • protected natural environments; • littering; • special nature reserves; • waste management; • limited-development areas; • regulations on noise, vibration and shock; and • EIAs.	• Environment Conservation Amendment Act 98 of 1991 • Environment Conservation Amendment Act 79 of 1992 • Environment Conservation Second Amendment Act 115 of 1992 • Environment Conservation Amendment Act 94 of 1993 • Environment Conservation Second Amendment Act 52 of	

		1994 • Proclamation R27 of 1995 • Proclamation R43 of 1996 • National Environment Management Act 107 of 1998	
National Water Act, Act 36 of 1998	Relates to all use of water and the management of all water resources in South Africa	•	
National Environmental Management: Air Quality Act, Act 39 of 2004	To provide for enhancing the quality of ambient air for the sake of securing an environment that is not harmful to the health and well-being of the people		Promulgated to give effect to section 24(b) of the Constitution. The South African Air Quality Information System is a web-based system that provides information on the quality of ambient air across the country.
Animal Protection Act, Act 71 of 1962	To consolidate and amend the laws relating to the prevention of cruelty to animals	Animal Matters Amendment Act, Act 42 of 1993	
Animal Diseases Act, Act 35 of 1985	Provides for control measures relating to animal diseases		
Animal Health Act, Act 7 of 2002	Regulates animal health		
Game Theft Act, Act 105 of 1991	Regulates the ownership and protection of game		
Mountain Catchment Areas Act, Act 63 of 1970	Provides for catchment conservation		Administered under the Western Cape Nature Conservation Board Act, Act 15 of 1998
National Heritage Resources Act 25 of 1999	Provides for the protection of heritage resources		N/A
World Heritage Conservation Act 49 of 1999	Incorporates the World Heritage Convention into South African law		N/A
Problem Animal Control Ordinance, Ordinance 26 of 1957	Regulates problem animals		Administered under the Western Cape Nature Conservation Board Act, Act 15 of 1998
Mineral and Petroleum Resources Development Act, Act 28 of 2002	Provides for equitable access to, and sustainable development of, mineral and petroleum resources		
Atmospheric Pollution Prevention Act, Act 45 of 1965		Entire Act repealed on 1 April 2010 in favour of the National Environmental Management: Air Quality Act, Act 39 of 2004	
Provincial legislation			
Land Use Planning Ordinance, Ordinance 15	The purpose of the Ordinance is to regulate land use and to provide for	• Assented to on 22 November	Although it might not have a direct

of 1985	incidental matters related to land use.	1985 • Western Cape Land Use Planning Ordinance, 1985, Amendment Act, 2004	application in the management of nature reserves, it does affect the surrounding properties, and could possibly be used to control activities/developments around the reserves to minimise negative effects, for example in applying zoning restrictions.
Cape Nature and Environmental Conservation Ordinance, Ordinance 19 of 1974	The purpose of this Ordinance is to regulate wild animals and plants, and the establishment of nature reserves.	Publication date 1 September 1975	Administered under the Western Cape Nature Conservation Board Act, Act 15 of 1998
Western Cape Nature Conservation Board Act, Act 15 of 1998	The purpose of this Act is to promote and ensure nature conservation, render services and provide facilities for research and training and to generate income		Biodiversity agreements are signed under this Act.
Municipal legislation			
Integrated Metropolitan Environmental Policy (IMEP), 2001	Envisages a set of Citywide aligned strategies dealing with all aspects of the environment.		Influenced the Biodiversity Strategy, 2003
Biodiversity Strategy, 2003	To be a city that leads by example in the protection and enhancement of biodiversity	• Draft amendment for 2009–2019	Influenced the development of the IRMP
City of Cape Town Bylaw relating to Stormwater Management, LA 31420	To provide for the regulation of stormwater management in the area of the City of Cape Town, and to regulate activities that may have a detrimental effect on the development, operation or maintenance of the stormwater system	• Publication date 23 September 2005	Communication strategy and action plan will take effect to address the issues with the relevant departments
City of Cape Town Air Pollution Control Bylaw, LA 12649	The purpose of this bylaw is to give effect to the right contained in section 24 of the Constitution of the Republic of South Africa Act (Act 108 of 1996) by controlling air pollution within the area of the Council's jurisdiction; to ensure that air pollution is avoided, or, where it cannot be altogether avoided, is minimised and remedied.	• Publication date 4 February 2003	
Bylaw relating to Community Fire Safety, Province of the Western Cape, LA 11257	The purpose and scope of the bylaw is to promote the achievement of a fire-safe environment for the benefit of all persons within the municipality's area of jurisdiction, and to provide for procedures, methods and practices to regulate fire safety within the municipal area.	• Publication date 28 February 2002	A fire management plan to be designed

City of Cape Town Draft Animal Bylaw, 2009	The purpose of the Bylaw is to formulate a new single bylaw, including ten different municipal dog bylaws and the Animal Protection Act of 1962. The Bylaw includes chapters on dogs, cats, poultry and working equines.	• Draft, 2009	
HUMAN RESOURCES/ADMINISTRATION LEGISLATION			
National legislation			
Occupational Health and Safety Act, 1993	To provide for the health and safety of persons at work, and for the health and safety of persons in connection with the use of plant and machinery; the protection of persons other than persons at work against hazards to health and safety arising out of or in connection with the activities of persons at work; to establish an advisory council for occupational health and safety, and to provide for matters connected therewith.	Occupational Health and Safety Amendment Act, No 181 of 1993	
Basic Conditions of Employment Act, Act 3 of 1997	Provides for control measures pertaining to employment	• Amendment Act 11 of 2002	
Labour Relations Amendment Act, Act 66 of 1995	The Act aims to promote economic development, social justice, labour peace and democracy in the workplace.	• Labour Relations Amendment Act, 42 of 1996 • Afrikaans Labour Relations Amendment Act, 1998 • Labour Relations Amendment Act, 127 of 1998 • Labour Relations Amendment Act, 2000 • Amendment Act 12 of 2002	
Local Government Municipal Systems Act, Act 32 of 2000	Establishes core principles, processes and mechanisms relating to local government		
Promotion of Equality/Prevention of Unfair Discrimination Act, Act 4 of 2000	Provides for the prevention of discrimination and other related matters		
Criminal Procedure Act, Act 51 of 1977	Makes provision for procedures and related matters in criminal proceedings	• Criminal Procedure Amendment Act, Act 65 of 2008	
Firearms Control Act, Act 60 of 2000	To establish a comprehensive and an effective system of firearms control and, to provide for matters connected therewith		

Civil Aviation Act, Act 13 of 2009			
Fencing Act, Act 31 of 1963	Regulates all matters relating to fencing		
Hazardous Substances Act, Act 15 of 1973	Controls substances that may cause injury or ill health to, or death of, human beings by reason of their toxic nature		
Land Survey Act, Act 8 of 1997	Regulates land surveying, beacons and other related matters		
Promotion of Access to Information Act, Act 2 of 2000	Promotes access to information		
Promotion of Administrative Justice Act, Act 3 of 2000	Provides for the promotion of administrative justice	• Amendment Act 53 of 2002	
Regional Services Council Act, Act 109 of 1985	Regulates and controls land, land use and other related matters		
Skills Development Act, Act 97 of 1998	Promotes the development of skills		
State Land Disposal Act, Act 48 of 1961	Regulates the disposal of state-owned land		
Subdivision of Agricultural Land Act, Act 70 of 1970	Regulates the subdivision of agricultural land		
Tourism Act, Act 72 of 1993	Provides for the promotion of tourism, and regulates the tourism industry		A tourism strategy is envisaged.
Public Resorts Ordinance, Ordinance 20 of 1971	Regulates nuisance and pollution control		
Municipal Ordinance, Ordinance 20 of 1974	Regulates pollution and waste management		
South African National Road Agency Limited and National Roads Act, Act 7 of 1998			
Aviation Act, Act 74 of 1962	Provides for the control, regulation and encouragement of aviation activities in the Republic of South Africa	• Repealed in favour of the Civil Aviation Act, Act 13 of 2009	
Provincial legislation			
Western Cape Land Administration Act, Act 6 of 1998	Regulates land and land use		
Western Cape Planning and Development Act, Act 7 of 1999	Regulates planning and development within the province		
Municipal legislation			
City of Cape Town Bylaw relating to Filming, LA30441	The purpose of the Bylaw is to regulate and facilitate filming in Cape Town.	• Provincial Gazette 6277, 24 June 2005	
City of Cape Town Bylaw relating to Streets, Public Places and the Prevention of Noise	The purpose of the Bylaw is to regulate activities in streets and public places, and to prevent excessive noise nuisance	• Promulgated 28 September 2007, PG 6469; LA 44559	

Nuisances, 2007			
City of Cape Town Bylaw relating to signage		•	

4.2 Administrative framework

Botterblom Nature Reserve is managed by the City of Cape Town's Biodiversity Management Branch in the Environmental Resource Management Department of the Strategy and Planning Directorate. The reserve is located in the central region, and falls under the oversight of the central regional manager. It is the management responsibility of an area manager, who is assisted by the central-region revolving team. The operational management of Botterblom Nature Reserve is supported by various other City of Cape Town departments, including, but not limited to, Law Enforcement, Roads & Stormwater, City Parks, Human Resources, and Finance.

5. PROTECTED-AREA POLICY FRAMEWORK & GUIDING MANAGEMENT PRINCIPLES

5.1 Management objectives

5.1.1 Biodiversity and heritage objectives

Table 2: Biodiversity and Heritage Objectives for Botterblom Nature Reserve

High-level objective	*Objective*	*Sub-objective*	*Initiative*	*Low-level plan*
CONSERVATION OF REPRESENTATIVE, FUNCTIONAL ECOSYSTEMS To conserve a representative sample of the region's ecosystems in a linked landscape, and maintain or restore environmental processes to enable natural spatial and temporal variation in structural, functional and compositional components of biodiversity	**Representative ecosystems** To incorporate a spectrum of viable aquatic and terrestrial ecosystems characteristic of Botterblom Nature Reserve, and to re-introduce missing elements where possible	**Consolidation and expansion of land areas** Consolidate protected areas, focusing on underrepresented ecosystems, functional linkages and processes	(1) Identify underrepresented habitats/ecosystems (2) Consolidate reserve boundaries (3) Establish corridors linking Botterblom Nature Reserve with other natural areas	Reserve expansion plan (to be compiled)
		Re-introduction of biota Where possible, re-establish locally extinct or depleted biodiversity components and populations in accordance with International Union for Conservation of Nature principles and guidelines	(1) Re-establish indigenous herbivore complement within constraints of reserve size and urban setting	Faunal management plan (to be compiled)
		Fire management Apply appropriate fire regime in fynbos areas (frequency, season, intensity, size)	(1) Implement a fire management plan in accordance with objectives of conserving biodiversity and threatened biota (2) Monitor impact of fire management regime	Fire management plan (to be compiled)
		Threatened biota Maintain viable populations of threatened species in order to meet obligations in terms of international agreements and conventions	(1) Maintain viable populations of rare/threatened plant and animal species (identify, locate and monitor populations of priority species)	Branch-wide threatened-biota Plan (to be compiled)

		Monitoring plan Implement and maintain an approved monitoring plan for the reserve	(1) Implement and maintain a biological monitoring programme for the reserve	(1) Branch-wide monitoring plan (to be compiled) (2) Erosion plan (to be compiled)
	Rehabilitation Rehabilitate degraded areas, including the re-establishment of natural biodiversity patterns, and the restoration of key processes that support the long-term persistence of biodiversity	**Vegetation** Re-establish physical, chemical and biological processes in degraded vegetation areas	(1) Rehabilitate all old, degraded sites	Flora management plan (to be compiled)
		Alien plants and other alien biota Control and, where possible, eliminate alien biota to facilitate re-establishment of natural biodiversity patterns and process in invaded areas	(1) Establish the distribution and density of invasive species (2) Prioritise areas for alien removal, focusing on biodiversity restoration (3) Implement removal programmes for priority species and areas	(1) Invasive-plant management plan (draft) (2) Invasive-animal management plan (draft)
MITIGATE INTERNAL and EXTERNAL PRESSURES To reduce threats and pressures and limit environmental impacts resulting from non-biodiversity management aspects and operations on surrounding land and resource use	**Reconciling biodiversity with other reserve objectives** To ensure that non-biodiversity management aspects of reserve operations are informed and constrained by biodiversity conservation objectives, and that the impacts of these activities on biodiversity are minimised	**Internal developments** Minimise the impacts associated with the development of visitor and reserve management infrastructure, and ensure that such developments do not compromise biodiversity objectives **Internal activities** Minimise the impacts associated with visitor and reserve management activities, and ensure that such activities do not compromise biodiversity objectives	(1) Reserve zoning (2) Develop and implement Conservation Development Framework (CDF) (3) Develop in accordance with environmental impact assessment (EIA) process (NEMA) and corporate policies (4) Establish visitor carrying capacities (5) Implement green standards and environmental best practice based on corporate policy	

	Reconciling biodiversity with external threats To reduce external threats and pressures, and limit impacts of surrounding land and resource use on biodiversity conservation within the reserve	**External developments** Minimise the impacts associated with inappropriate developments outside the reserve	(1) Engage regional land management authorities, including IDPs and spatial development frameworks at local and regional level (2) Align with bioregional planning, including explicitly identified areas for the maintenance of important biodiversity patterns and processes with appropriate land use guidelines (3) Provide input into planning and decision-making processes for external development that may compromise reserve and biodiversity network objectives (4) Negotiate to ensure that external developments are not visually obtrusive or out of character with the park	Branch-wide communications strategy (in draft)

		External activities Negotiate to ensure that external resource and land use does not detrimentally affect ecological processes within the reserve	(1) Negotiate to mitigate or improve the management of external, potentially detrimental impacts (2) Encourage eco-friendly resource use and land management practices on adjacent properties (3) Mitigate the impacts of oil and other pollution events through appropriate contingency planning	Risk management plan (to be compiled)
		Illegal harvesting of resources Prevent the illegal collection, removal and destruction of physical and biological resources	(1) Public liaison (2) Law enforcement	(1) Branch-wide security operational manual (to be compiled)
WILDNESS/REMOTENESS To maintain and restore wildness/remoteness in Botterblom Nature Reserve so that the spiritual and experiential qualities of wildness are maintained, enhanced or, where necessary, restored	**Range of experiences** Provide a range of visitor experiences		(1) Reserve zoning (2) Develop CDF and sensitivity-value analysis	(1) CDF (to be compiled) (2) Reserve expansion plan
	Sense of place Maintain or restore appropriate sense of place		(1) Implement and update CDF (2) Establish and apply appropriate visitor carrying capacity (3) Negotiate to ensure that external developments are not visually obtrusive or out of character with the reserve	

5.1.2 Socio-economic objectives

Table 3: Socio-economic objectives for Botterblom Nature Reserve

High-level objective	*Objective*	*Sub-objective (where required)*	*Initiative*	*Low-level plan*
Nurture productive and mutually beneficial partnerships that result in gains in economic and/or biodiversity equity	Enhance socio-economic benefits to local communities	N/A	(1) Contribute to local community development by supporting the Expanded Public Works Programme/poverty relief project (2) Contribute to local skills development by supporting the skills and learnership programmes (3) Identify and facilitate the creation of business opportunities in association with the reserve (4) Support community-based social development initiatives	Branch-wide local socio-economic development plan (to be compiled)
	Increase environmental awareness and encourage participation in conservation initiatives	Inspire visitors and communities to consider the environment as an interrelated and interdependent system, of which they are an integral part	(1) Develop and implement an interpretation plan that feeds into both the education and zoning plans (2) Implement environmental education and youth development programmes suited to the needs of each focus group (i.e. tailor-made programmes for each focus group)	(1) Branch-wide education strategy an action plan (to be compiled) (2) Regional environmental education and community involvement strategy (to be compiled)
		Educate learners, educators and other community focus groups to be able to take environmental action.		
		Support educators and community leaders with resource and information materials	(1) Establish and market an environmental resource centre and outdoor classrooms, with a range of interpretive and information resources	
Support cooperative governance that will	Maintain good reserve/community/	N/A	(1) Identify and involve all relevant stakeholders in the reserve advisory	(1) Branch-wide communications strategy (in draft)

build custodianship	stakeholder relations		forum (2) Develop effective communication mechanisms and responsibilities for representatives	(2) Branch-wide stakeholder relationship plan (to be compiled)
	Effective cooperative governance	Minimise degrading impact and consequences of inappropriate development in and around the reserve	(1) Establish and maintain good working relationships with relevant government departments as well as internal City of Cape Town departments	
		Ensure support/buy-in for management decisions through participatory decision-making processes	(1) Define roles and responsibilities with stakeholder groups, partnerships and government through written agreements/terms of reference and MOUs	
Enhance the City's reputation	Enhance the reserve's reputation	N/A	(1) Develop and implement a communication plan to promote reserve activities	
Advance strategic human resource management	Ensure good human resource management	N/A	(1) Implement and support learnerships and volunteer programmes (2) Ensure that all staff have access to training initiatives as per the Workplace Skills Plan (3) Ensure that all corporate human resource policies are adhered to	Regional standard operation procedures manual (to be updated)
Financial management	Ensure that sound financial management practices are applied to and underpin the reserve	N/A	Manage cost spending appropriately	Branch-wide business plan (to be compiled)

5.2 SWOT (strengths, weaknesses, opportunities, threats) analysis

Strengths

- Community development, environmental education and awareness opportunities
- Biodiversity attributes (vegetation type)
- Adds value to neighbouring community

Weaknesses

- Invasive alien species
- Small size
- Inadequate capacity (staff)
- No site-specific budget
- Law enforcement
- Inappropriate use of road verges adjacent to the reserve

Opportunities

- Recreational facilities – footpaths, picnic benches
- Only a few conservation sites proclaimed in the northern suburbs
- Educational opportunities
- Stewardship potential of small areas of high-quality vegetation on neighbouring properties

Threats

- Size and isolation of nature reserve
- Questionable ecological viability of site
- Human carrying capacity limited, therefore limited visitor activities can be provided

5.3 Protected-area management policy framework and guiding principles

5.3.1 Community participation

Botterblom Nature Reserve will strive to nurture productive and mutually beneficial partnerships, which, in turn, will result in economic and/or diversity equity. This will be achieved through the creation of job opportunities in support of Expanded Public Works Programme and poverty relief projects. Through participating in skills development and learnership programmes, local skills can be advanced, and through the support of

community-based social development initiatives, the reserve can also enhance socio-economic benefits of local communities.

Through the development of an education plan, Botterblom Nature Reserve will contribute to raising environmental awareness and encourage participation in conservation initiatives.

The main aims of the reserve education plan will be as follows:

- To inspire visitors and communities to consider the environment as an interrelated and interdependent system, of which they are an integral part
- To educate learners, educators and community focus groups to take environmental action, by supporting such groups with resource and information materials
- To develop and implement environmental education programmes suited to the needs of various focus groups
- To develop and implement an interpretation plan that complements the education plan

In order to develop and maintain good reserve/community/stakeholder relations, all relevant stakeholders need to be identified. An effective communication system needs to be developed in order to liaise with interested and affected parties. Where necessary, task teams and working groups may be established in order to assist the reserve with key issues.

The central region has an advisory board, which includes Botterblom Nature Reserve. This board was established in terms of the Nature Conservation Ordinance (No 19 of 1975). The National Environmental Management Protected Areas Act does not legally require the establishment of advisory forums. However, the City of Cape Town wishes to follow best practice, and will thus establish terms of reference for new advisory forums.

5.3.2 Safety and security

A safety and security audit aimed at completing a rapid and verifiable analysis of the current security situation, security services, infrastructure, staffing and social context has not been carried out to date.

5.3.3 Tourism development and management

The main visitor activities allowed in Botterblom Nature Reserve include hiking, running, sightseeing, picnicking, photography, nature appreciation and bird-watching. The reserve has only recently been established. Therefore, environmental education and other annual events will be developed over the next five years.

5.3.4 Infrastructure management

In the conservation area, infrastructure is essential for the effective management and use by visitors. It is essential to manage the infrastructure in such a manner that it has a minimal negative impact on the environment or on the visitor experience through regular maintenance of roads, routes and parking areas as well as any other relevant infrastructure.

5.3.5 Biodiversity conservation management

5.3.5.1 Community-based natural resource management

The harvesting of natural resources in Botterblom Nature Reserve is currently not permitted. Research on the amount of harvesting and the species harvested across the city is currently under way. Some investigations as to the types and extent of harvesting in the reserve have started, but, to date, no detailed or conclusive data have come to light to determine where current harvesting is sustainable and/or what potential threats are foreseen should these activities persist. However, the small size of Botterblom Nature Reserve will probably exclude the possibility of natural resource harvesting.

5.3.5.2 Fire management

Fire plays an essential ecological role in the life cycle of fynbos and renosterveld. Fire is crucial to the long-term conservation of species in Botterblom Nature Reserve, and is therefore considered an important component of reserve management. Fire management involves varying the season, frequency and intensity of fires, and reconciling ecological and practical requirements. Too frequent fires, or fires that burn out of phase with the natural burning regime, present a threat to slower-growing species, which may be entirely eliminated. If fire is excluded from the area, thicket species invade, resulting in the renosterveld species being lost. Conversely, if vegetation is allowed to burn too frequently, the area becomes degraded, and alien species, especially grasses, invade the site. Grasses maintain a shorter fire cycle, and permanently change the vegetation structure and biodiversity value.

The fire management programme for Botterblom Nature Reserve involves the monitoring of wildfires to ensure that there is no threat to life or property. In cases where human-induced fires occur that would simulate a natural fire, the same management responses would apply. Natural fires are limited in spread within the constraints of ecological, project and public safety requirements. All possible actions are taken to prevent the spread of fire onto adjacent properties. All unnatural fires that threaten the reserve ecologically, or pose a threat to infrastructure and/or public safety, are controlled.

The fire frequency for this vegetation type is five to seven years. Prescribed burning of vegetation is a management option in areas where vegetation becomes senescent and there is a risk of species loss. The use of prescribed burning practices would assist in maintaining a vegetation mosaic that promotes plant and animal diversity. Accurate fire records and post-fire monitoring data will facilitate the initiation of prescribed burns in the core area of the reserve. The decision to administer prescribed burns is considered on annually and, if required, planned and implemented accordingly.

Firebreaks and other fire control measures required by law will be implemented where necessary and feasible. Due to the small size of the reserve, firebreaks should not exceed 1 m from the fence line inwards.

Reasonable pre-fire protection measures are necessary, as well as a plan of action in the event of wildfire. Interaction with various City of Cape Town departments and independent stakeholders, and continuous public and private landowner involvement, are essential. The development of fire protection and response plans is an important component of the reserve's fire management.

Fire management implementation in Botterblom Nature Reserve involves the following:

- Application of guidelines on seasonal burning intervals and species requirements acquired from relevant documentation and biophysical specialists
- Accurate record keeping of all fires, including details and maps
- Use of fire data and geographic information system (GIS) for recording and mapping
- Application of post-fire monitoring programmes
- Application of fire data to determine prescribed burning needs
- Development and implementation of a fire protection and response plan, including affected stakeholders, such as additional City of Cape Town departments and private landowners neighbouring the reserve

5.3.5.3 Soil erosion and control

Within Botterblom Nature Reserve, natural erosion processes are allowed to take their course without interference, except where necessary. In the case of human-induced and natural areas that are aggravated, appropriate management action will take place.

Potential human impacts should be avoided through correct planning and maintenance of infrastructure. Areas that had been previously degraded by human activities and are no longer in use will be restored as close as possible to their natural state. Disturbed areas and areas affected by unnatural accelerated erosion will be controlled by means of appropriate methods. The cause and management of problem erosion sites will also be considered.

Soil management implementation in Botterblom Nature Reserve includes the following:

- Identification and recording of all soil erosion sighted, including the assessment and development of restoration plans where required
- Use of soil erosion data and GIS for recording and mapping
- Application of fixed-point monitoring programmes at identified soil erosion sites
- Accurate documentation of management actions applied to restoration sites, including results from areas responding to these actions

5.3.5.4 Invasive-species management

The management of invasive and alien species is a priority in Botterblom Nature Reserve. The control and, where possible, elimination of alien biota is needed in order to facilitate the re-establishment of natural biodiversity and processes in invaded areas.

Invasive and alien-species management in the reserve is applied in accordance with the City of Cape Town's invasive alien species strategy and in coordination with various government-funded initiatives, including Working for Water and Working for Wetlands. Invasive plant species could spread rapidly should management fail to continue to implement a properly planned and coordinated programme. No alien invasive plant species have been cleared to date.

In order to protect indigenous species from invasive aliens, the following is required:

- Prioritisation of areas for alien removal, focusing on biodiversity restoration
- The implementation of removal programmes for priority species and areas

- The development and implementation of an invasive and alien management plan as well as a management plan for alien biota

Formal plans outlining the monitoring and removal of identified invasive species are required.

5.3.5.5 Species introductions

Species that were historically indigenous to Botterblom Nature Reserve, and for which suitable habitat and eco-niches are available, may be re-introduced.

Prior to the re-introduction of any species, a full proposal is required. Investigation into the availability of suitable habitat for the species with reference to public utilisation of the areas is required, as is a full investigation into the historical occurrence and status of the species. The effect of re-introducing species to the area must also be researched. Re-introduction of potentially dangerous and problematic species may also require a public participation process. An investigation of suitable source populations is also necessary.

All proposed re-introductions need to be recommended and approved by the Biodiversity Management Branch's faunal and floral management committees as well as provincial authorities before implementation. The implementation of any re-introduction programmes must also be specified in the plan of action, and documented accurately.

5.3.5.6 Strategic research

Research subjects beneficial to the management of Botterblom Nature Reserve require identification. These subjects can then be prioritised and further pursued. No research is currently conducted in the reserve.

5.4 Sensitivity analysis of Botterblom Nature Reserve

Botterblom Nature Reserve is a considerable asset to the City of Cape Town, and significantly contributes to national vegetation targets of threatened vegetation types, as listed in the National Spatial Biodiversity Assessment (Driver *et al*. 2005). It also provides a service and facilities to local residents and schools.

The development of the sensitivity and zoning plan is one of the steps required in compiling a CDF for the reserve. CDFs are tools to reconcile the various land use needs, and to delineate visitor user zones and the positioning and nature of new infrastructure, access points, roads and facilities.

The CDF process has grown in response to the requirements of the National Environmental Management Biodiversity Act (2004), and seeks to comply with the spatial planning requirements of the Act. The CDFs will ensure that best practice and sustainable development principles are integrated with spatial planning in protected areas.

The sensitivity-value analysis is the landscape analysis portion of the broader CDF. It is a multi-criteria decision-support tool for spatial planning, designed to present the best available information in a format that enables defensible and transparent decision making. The sensitivity-value process is based on the principle that the acceptability of a development (or placement of a structure) at a site is based on that site's value (arising from the site's biodiversity, heritage, aesthetic or other values) and its sensitivity or vulnerability to a variety of disturbances (Holness 2005).

The sensitivity-value analysis, the CDF and the associated zoning plan should form part of an adaptive management system. They will grow and change over time as the understanding of the landscapes and ecosystems improves. However, they will never replace the need for detailed site and precinct planning and EIA compliance at site level.
The small size of Botterblom Nature Reserve did not warrant an extensive analysis, and resulted in a fairly straightforward subsequent zoning process. The methodology used for both the sensitivity-value analysis and the zoning process was adapted from Holness and Skowno (2008) and SRK Consulting (2008[1]; 2008[2]).

All geographic information work was carried out in ESRI's ArcMap, version 9.3.1, using the ArcInfo licence level, with Spatial Analyst and 3D Analyst extensions. See Appendix 6 for the complete sensitivity-value analysis and zoning process.

5.5 Zoning plan of Botterblom Nature Reserve

5.5.1 Zoning informants

This section briefly outlines the values underlying the identification of broad tourism use zones. It is important to remember that the landscape/biodiversity analysis is just one of the informants in the zoning process. Although the biodiversity analysis is intrinsically a relatively objective scientific process, other informants to the zoning process are not.

Although every attempt is made to place high sensitivity-value sites into more protected zones where possible, the zoning process is essentially a compromise between environment and development. In particular, the identified high-value sites are often the

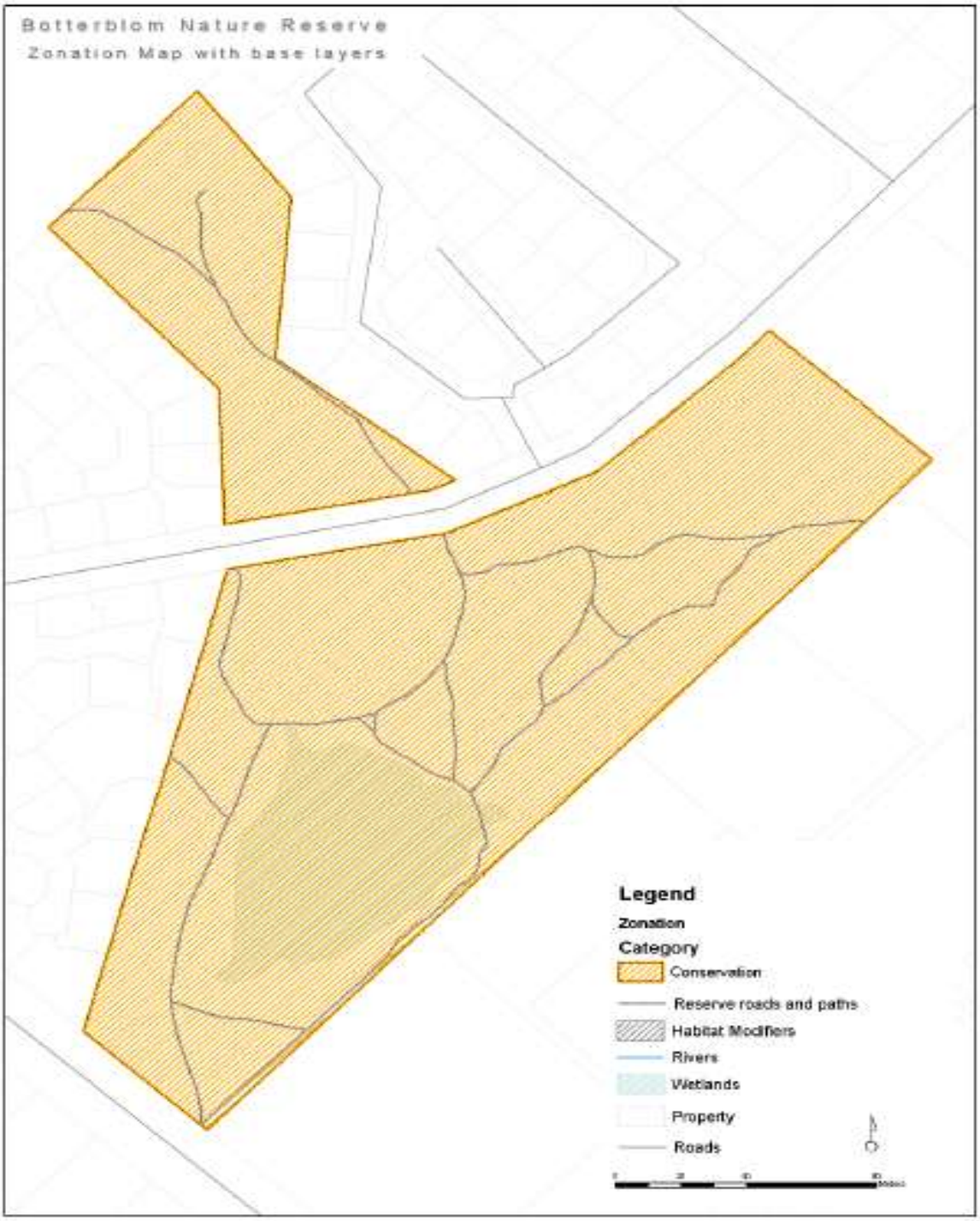
key biodiversity assets that need to be made available to the eco-tourism market in an appropriate manner. The biodiversity layers and the spatial management of the reserve are directly linked during the identification of special management areas (where applicable). Even within broad high-tourist use zones, some areas are likely to be subject to very tight conservation controls (potentially involving complete exclusion of human impacts from an area).

Underlying decision-making rules used in the zoning process

- The zoning process is aimed at striking a balance between environmental protection and the development required to meet the broader economic and social objectives of the reserve.
- The zoning process takes into account existing development footprints and tourism access routes.
- This is based on the underlying principle that, all else being equal, an existing transformed site is preferable to a greenfield site, from a biodiversity perspective.
- Infrastructure costs are dramatically increased when developments take place away from existing infrastructure.
- Existing tourism nodes and access routes are a reality of the economic landscape, and it would not be possible to shut down existing tourism sites that compromise the development objectives of the reserve.
- Where existing development nodes, tourist sites and access routes occur in areas with high sensitivity-value, the broad-use zoning aims to keep the development footprint as small as is realistically possible, preferably within the existing transformed site.
- Where possible, sites with high biodiversity sensitivity-value are put into stronger protection zones.
- Peripheral development is favoured and should, where possible, be located outside the conservation area.
- Two key points need to be emphasised:
    - The designation of a broad-use zone does not imply that all sites within that zone would be suitable for all the development types anticipated. Detailed site-level planning is still required, and many sites may prove to be unsuitable at a site/precinct/EIA level of planning.
    - Special management areas/overlays need to be formalised and linked to the management plans.

5.5.2 Zoning definitions and descriptions

The zoning definitions and descriptions were workshopped with reserve and regional managers. Four categories were decided on, namely primary conservation zone, conservation zone, low-intensity leisure zone and high-intensity leisure zone (see map 6). The process is still linked to the zoning used for the CapeNature reserves (Holness & Skowno 2008), as there should be general alignment of the broader use zones to enable comparison and integration if provincial documents so require (see Appendix 6).



Map 6: Botterblom Nature Reserve zoning map

6. DEVELOPMENT PLAN

Botterblom Nature Reserve is a developing reserve, and, as such, a development plan still needs to be compiled. It is anticipated that infrastructure development will be limited to low-impact developments, such as trails.

7. COSTING PLAN

A budget is allocated for the Durbanville area, which includes three reserves, namely Botterblom, Uitkamp Wetland and Durbanville nature reserves.

Table 4: Costing plan

Management Action: Uitkamp	Funding Source	Approximate Costs 2011-2012	Approximate Costs 2012-2013	Approximate Costs 2013-2014	Approximate Costs 2014-2015	Approximate Costs 2015-2016
1. Invasive Alien Plant Program • Clearing of NBal's	IAS Funding	R30,000.00	R31,500.00	R33,075.00	R34,811.00	R36,551.57
2. Repairs and Maintenance	Operating	R18,631.26	R19562.82	R20540.96	R35,946.69	R37,744.02
3. Fencing	CAPEX	-	-	-	-	-
4. Infrastructure Development	Capital Reserve Fund	-	-	-	-	-
5. Human Resources • Salaries, wages • Employee related costs • Employee costs	Operating	R577,854.47 R129,989.15 R707,843.62	R624,082.10 R140,388.28 R764,471.10	R674,008.66 R151,619.34 R825,628.78	R727,929.35 R163,748.88 R891,679.08	R786,163.69 R176,848.79 R968,720.15
6. General Expenses • General Operating Costs • Other materials • Contracted services	Operating	R128,009.90 R12,416.77 R3,944.92	R138,250.69 R13,410.11 R4,260.51	R149,310.7 R14,482.92 R4,601.35	R161,255.59 R15,641.55 R4,969.46	R174,156.03 R16,892.87 R5,367.02
7. Special Projects	CAPEX	-		-	-	-

Note:
HR costs are escalated at 8% per annum
Operating Expenditure is escalated at 5% per annum

PART 3

MONITORING & AUDITING

8. MONITORING & AUDITING

8.1 Annual audit procedure

8.1.1 Management Effectiveness Tracking Tool South Africa (METT-SA)

The METT-SA is a rapid, site-level assessment tool adapted from the World Bank and Worldwide Fund for Nature (WWF) system (second edition, 2007). The system is based on the idea that good protected-area management follows a process comprising six distinct stages or elements:

It begins with understanding the **context** of existing values and threats (where are we now?), then progress through **planning** (where do we want to be?), followed by allocation of resources (**inputs**) (what do we need?). As a result of management actions (**processes**) (how do we go about it?), it eventually produces products and services (**outputs**) (what were the results?), which result in impacts or **outcomes** (what did we achieve?).

This version has been compiled so that it can be applied to the full range of protected areas managed by all C.A.P.E partners. It also applies to protected areas in other regions, and, with minor adaptations, could be applied outside of South Africa as well. It may also be used for marine protected areas (MPAs) and islands, but, in the long run, it may become necessary to amend the system to be more specific to these areas. In addition, a system for off-reserve conservation areas, such as conservancies or stewardships, may need to be developed.

When applying METT-SA, it is important for the following to be kept in mind:

- The METT-SA is intended to report on the reserve's progress. Thus, the score is the baseline against which future assessments are made to see if there has been an improvement.
- It is site-specific and must therefore not be used to compare scores between different protected areas.
- It is a useful tool to give indications of management trends. In this version, the six elements of the management process, as defined in the original version, are scored as subsets of the total. This gives an indication of where management should strive for improvement.
- It is not intended to replace more detailed assessments as part of adaptive management systems.
- The METT-SA has limitations in the quantitative measurement of outcomes, and these should be measured by more objective and quantitative systems.

- This version adjusts the total score where questions are irrelevant.
- Often, low scores on some questions could be a reflection on the organisation as a whole, and do not necessarily point to issues over which the protected-area manager has control. **The performance of managers should therefore under no circumstances be measured against the METT-SA results.**

Tracking the trends of management effectiveness is a long-term process, and instant improvements are unlikely. Generally, the METT-SA is applied at three-year intervals, but an annual application is acceptable if it is understood that changes may only be slight. To date, a METT-SA assessment has not been conducted for Botterblom Nature Reserve. The Biodiversity Management Branch has only recently taken over the site. It is anticipated that the next METT-SA assessment will be conducted in September, 2011.

8.1.2 Protected-area review (PAR)

The PAR is an internal review conducted annually to assist managers in reviewing their sites, and to allow for adaptive management actions to be taken where required (and within managers' control). A PAR will be conducted for Botterblom Nature Reserve in June of this year.

8.2 Management plan review

Every five years, this IRMP should be reviewed, and adjusted where necessary. To achieve this, the following questions (and others as needed) should be addressed:

- Did this IRMP make a meaningful contribution to management of Botterblom Nature Reserve?
- Were individual management 'prescripts' realistic and achievable? Were they written unambiguously or was there room for misunderstanding?
- Were budgets for each management activity realistic? Were the allocated budgets too much or too little?
- Were sufficient staff members with the right qualifications allocated to each management activity?

There will be some overlap between the review and the audit, and they should therefore be done on the same day.

8.3 Biodiversity monitoring

Table 5: The Reserve's monitoring requirements.

Action	Responsible party	Means of verification	Frequency
Vegetation monitoring	Reserve staff	Weekly inspections	Weekly
Invasive alien plants Aspects to be monitored include the effectiveness of the operation, the effectiveness of the follow-up, methods used, compliance with the alien-clearing schedule, and environmental damage such as herbicide spillage	Area manager, students and interns	Final inspections Field verification sheets Veld age map, fire map	Once-off – completion of contract Annually – to determine management unit clearing plan
Fire mapping All veld fires must be accurately mapped and recorded to build up a useful record that will assist with veld interpretation. These records will take the guesswork out of the effects of fire when it occurs on the property. A simple map indicating the extent and date of the burn is the minimum requirement.	Reserve staff Area manager, students and interns	Stratified sampling plots Fixed-point photography Presence, abundance, density	Post-fire
Post-fire recruitment	Reserve staff Area manager, students and interns	Field observation sheet	Post-fire Six months 12 months Annually for three years Annually
Abundance, density and structure	Reserve staff Area manager, students and interns		Seasonally
Threatened species	Reserve staff Area manager, students and interns		
Faunal monitoring	Reserve staff Area manager, students and interns	Field observations	Weekly
Bird diversity	Tygerberg Bird Club	Bird ringing	Monthly
Bird distribution	Reserve staff	Stratified random	Seasonally
Small mammals	Area manager, students, interns and field staff	Sherman trap array	
Water monitoring	Reserve staff	Field collection equipment	Daily

Rainfall	Area manager, students, interns		
South African Biodiversity Database Capturing of all monitoring data on the database	Area manager Students Public members	Acceptance of data by the administrator	Monthly

PART 4

REFERENCES

9. REFERENCES

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PART 5

10. APPENDICES

Appendix 1: Summarised Average monthly rainfall

Month	Mean rainfall in mm
January	13.69
February	14.29
March	21.46
April	67.07
May	96.18
June	133.26
July	122.07
August	114.51
September	73.86
October	51.29
November	48.43
December	18.71

Appendix 2: SG diagrams

Appendix 3: Plant list

Species Name	Common Name	Red Book Status
Antimima aristulata		
Arctopus dregei		
Arctopus echinatus		
Aspalathus aculeata		
Aspalathus cordata		
Asparagus asparagoides		
Asparagus capensis		
Asparagus rubicundus		
Asparagus undulatus		
Athanasia trifurcata		
Berkheya armata		
Berkheya rigida		
Bolboschoenus maritimus		
Carpanthea pomeridiana		
Chlorophytum undulatum		
Chrysanthemoides monilifera	Bitoubos	
Chrysocoma ciliata		
Cissampelos capensis		
Cotula turbinata		
Crassula dejecta		
Cyanella hyacinthoides		
Dimorphotheca pluvialis		
Disa bracteata		
Ehrharta calycina		
Eleocharis limosa		
Empodium plicatum		
Eragrostis curvula		
Eriospermum lanceifolium		
Euphorbia arceuthobioides		
Euphorbia genistoides		
Euphorbia silenifolia		
Euphorbia tuberosa		
Ficinia indica		
Ficinia nigrescens		
Gazania rigida		
Geissorhiza aspera		
Geissorhiza ovata		
Gethyllis afra		
Gladiolus alatus		
Gladiolus watsonius		
Gnidia laxa		
Gymnosporia buxifolia		
Haemanthus sanguineus		
Helichrysum patulum		
Helichrysum revolutum		
Hermannia alnifolia		
Hermannia althaeifolia		
Hyparrhenia hirta		
Ischyrolepis capensis		

Ischyrolepis sieberi		
Lampranthus spiniformis		
Leysera gnaphalodes		
Lobostemon fruticosus		
Micranthus tubulosus		
Microloma sagittatum		
Mohria caffrorum		
Monoculus monstrosus		
Monsonia speciosa		
Moraea collina		
Moraea galaxia		
Moraea gawleri		
Moraea inconspicua		
Moraea miniata		
Muraltia ononidifolia		
Muraltia trinervia		
Nenax hirta		
Ornithogalum multifolium		
Otholobium hirtum		
Otholobium virgatum		
Oxalis glabra		
Oxalis obtusa		
Oxalis purpurea		
Oxalis tenuifolia		
Oxalis tomentosa		
Passerina corymbosa		
Pauridia minuta		
Pelargonium asarifolium		
Pelargonium ternifolium		
Pelargonium triste		
Phylica strigulosa		
Podalyria microphylla		
Podalyria sericea		
Polygala refracta		
Pterygodium catholicum		
Salvia chamelaeagnea		
Searsia glauca	Blou Taaibos	
Senecio pubigerus		
Serruria brownii		
Solanum guineense		
Sparaxis bulbifera		
Spiloxene aquatica		
Spiloxene capensis		
Spiloxene serrata		
Themeda triandra		
Tritonia undulata		
Tulbaghia alliacea		
Typha capensis	Bulrush, Papkuil	
Viscum capense		
Zantedeschia aethiopica		

Appendix 4: Bird list

Species Name	Common Name
Acrocephalus baeticatus	African Reed-Warbler
Acrocephalus gracilirostris	Lesser Swamp-Warbler
Alopochen aegyptiacus	Egyptian Goose, Kolgans
Anas platyrhynchos	Mallard
Anhinga rufa	African Darter
Ardea melanocephala	Black-headed Heron
Ardea purpurea	Purple Heron
Centropus burchellii	Burchell's Coucal
Cinnyris chalybeus	Southern Double-collared Sunbird
Cisticola pipiens	Chirping Cisticola
Cisticola tinniens	Levaillant's Cisticola
Colius colius	White-backed Mousebird
Colius striatus	Speckled Mousebird
Cossypha caffra	Cape Robin-Chat
Estrilda astrild	Common Waxbill
Euplectes capensis	Yellow Bishop
Euplectes orix	Southern Red Bishop
Fulica cristata	Red-knobbed Coot
Gallinula angulata	Lesser Moorhen
Gallinula chloropus	Common Moorhen
Indicator minor	Lesser Honeyguide
Lanius collaris	Common Fiscal, Fiscal Shrike
Motacilla capensis	Cape Wagtail
Nectarinia famosa	Malachite Sunbird
Numida meleagris	Helmeted Guineafowl
Nycticorax nycticorax	Black-crowned Night-Heron
Passer melanurus	Cape Sparrow
Phalacrocorax africanus	Reed Cormorant
Ploceus capensis	Cape Weaver
Ploceus velatus	Southern Masked-Weaver
Prinia maculosa	Karoo Prinia
Pycnonotus capensis	Cape Bulbul
Serinus canicollis	Cape Canary
Streptopelia semitorquata	Red-eyed Dove
Sturnus vulgaris	Common Starling, European Starling
Tricholaema leucomelas	Acacia Pied Barbet
Vanellus armatus	Blacksmith Lapwing, Blacksmith Plover
Zosterops virens	Cape White-eye

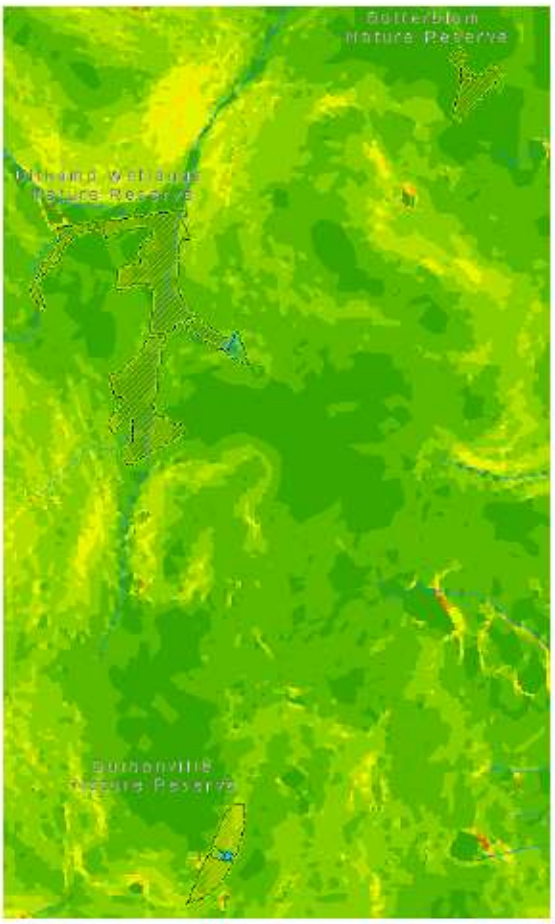
Appendix 5: Reptile list

Species Name	Common Name	Red Book Status
Acontias meleagris	Cape Legless Skink	
Afrogecko porphyreus	Marbled Leaf-toed Gecko, Marbled Leaftoed Gecko	
Chersina angulata	Angulate Tortoise	
Crotaphopeltis hotamboeia	Herald Snake	
Dasypeltis scabra	Common Eggeater	
Duberria lutrix	Common Slug Eater	
Homopus areolatus	Parrot-beaked Tortoise, Parrotbeaked Tortoise	
Pachydactylus geitje	Ocellated Thick-toed Gecko, Ocellated Thicktoed Gecko	
Psammophis notostictus	Karoo Sand Snake	
Pseudaspis cana	Mole Snake	
Trachylepis capensis	Cape Skink	

Appendix 6: Sensitivity value analysis and zonation process

ZONATION Summary REPORT for:

Botterblom Nature Reserve,Durbanville Nature Reserve & Uitkamp Wetlands Nature Reserve



Prepared for the Biodiversity Branch and Environmental Management Systems Branch

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Contents

1. Introduction and Scope of Report

Durbanville, Botterblom and Uitkamp Wetlands Nature Reserves are three small reserves that occur in the Central management district in the suburb of Durbanville. They are small, isolated reserves, surrounded by urban development. They all contain critically endangered vegetation types and several rare and endemic plant species.

The vegetation types that occur are, Cape Sand Plain Fynbos and Swartland Shale Renosterveld (see Figure 1). These vegetation types are all critically endangered and are poorly represented (2 - 3% of target) within currently proclaimed protected areas.

These vegetation types are all listed as threatened ecosystems under National Environmental Management: Biodiversity Act (Act 10 of 2004), DEAT (in press).

The small size of the reserves did not necessitate a full sensitivity analysis. For all the reserves the entire area was considered highly sensitive for the purpose of this zonation exercise.

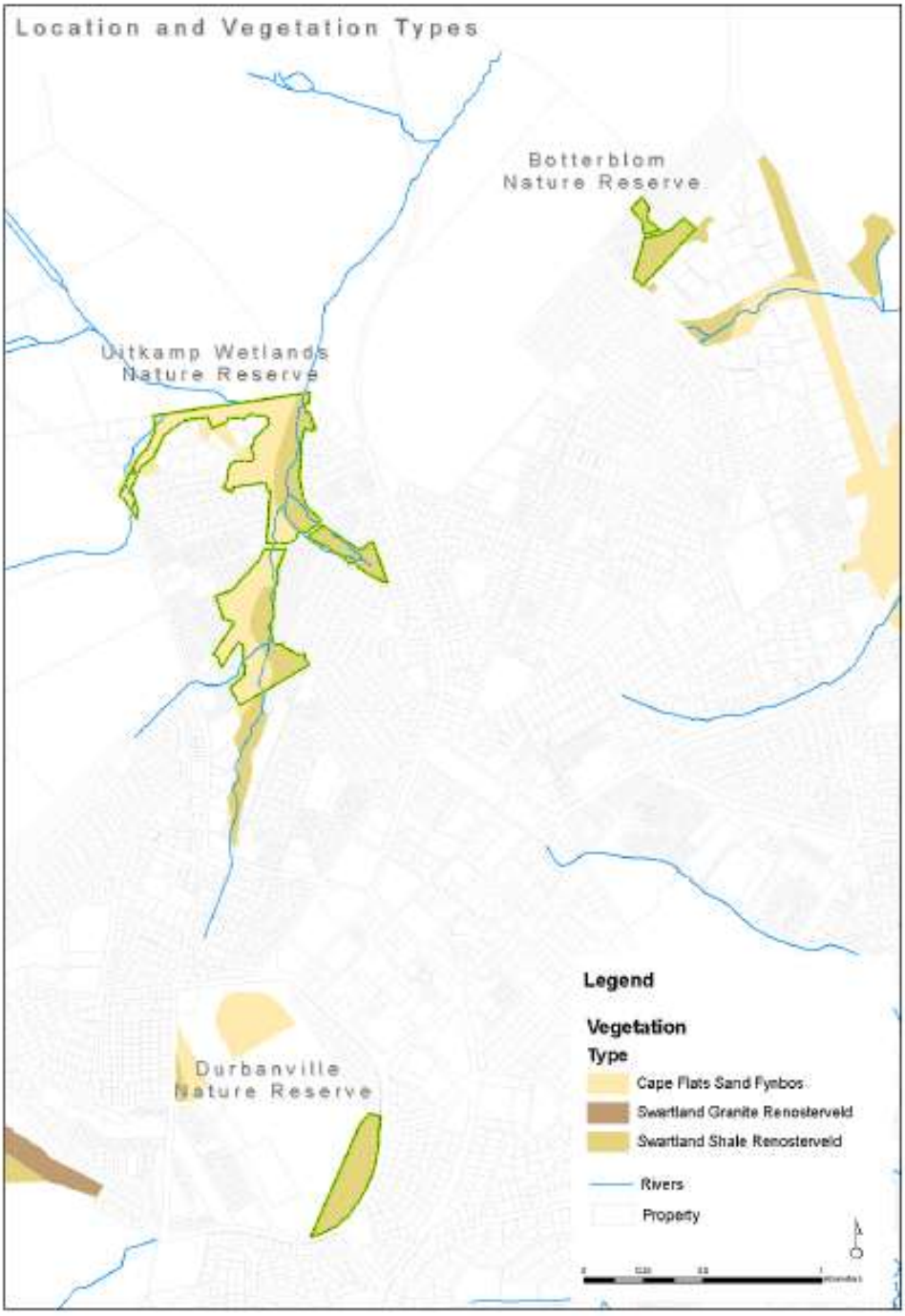

Figure 1: Location and vegetation types

1.2 Context

The development of the Sensitivity and Zonation plan is one of the steps required in compiling a Conservation Development Framework (CDF) for the reserve. CDFs are tools to reconcile the various land-use needs and to delineate visitor user zones and the positioning and nature of new infrastructure, access points, roads and facilities.

The CDF process has grown in response to the requirements of the NEMBA (2004) and is a strategy to comply with the spatial planning requirements of these acts. The CDFs will ensure that best practice and sustainable development principles are integrated into spatial planning within protected areas.

The Sensitivity-Value analysis is the landscape analysis portion of the broader Conservation Development Framework. It is a multi-criteria decision-support tool for spatial planning that is designed to integrate the best available information into a format that allows for defensible and transparent decisions to be made. The Sensitivity-Value process is based on the principle that the acceptability of a development (or placement of a structure) at a site is based on the site's value (either from biodiversity, heritage, aesthetic or a combination of values) and its sensitivity or vulnerability to a variety of types of disturbance (Holness *et al*, 2005).

- The Sensitivity-Value analysis, the CDF and the associated zonation plan should form part of an adaptive management system. They will grow and change over time as the understanding of the landscapes and ecosystems improve; and
- It does not replace the need for detailed site and precinct planning and EIA compliance at site level.

2. Background and Brief

The full Sensitivity-Value analysis was not undertaken for these reserves. The small size of the nature reserves did not require any extensive analysis, with the subsequent zonation process being fairly straight forward. Only roads, structures and disturbed areas were mapped.

All geographical information work was carried out in ESRI's ArcMap version 9.3.1 GIS (Geographical Information System) using the ArcInfo license level with Spatial Analyst and 3D Analyst extensions.

3. Sensitivity-Value Summary Analysis

(Provided as reference only as several steps were omitted from this process)

Sensitivity-Value Analysis and Zoning Process methodology

Stage 1: Data synthesis and compilation

Compilation of required data for the analysis

- Spatially define the planning domain or study area.
- Evaluate available and required datasets for the Sensitivity-Value model.
- Spatial data is collected or created for each element of the Sensitivity-Value model.

Stage 2: Layer interpretation

Layer interpretation is an important component of the Sensitivity-Value process that requires a combination of spatial data interpretation and expert knowledge.

- Using the assembled data, areas are assigned a score on a common scale for each element of the model; and
- The scores achieved for each element of the model are represented as separate input layers on a GIS.

Stage 3: Sensitivity-Value Analysis

The Sensitivity-Value analysis stage involves an iterative exploration of the input layers.

- The scores achieved for each element of the model are weighted and aggregated to obtain an overall Sensitivity-Value ranking.
- Different weightings and aggregation procedures and combinations of input layers can be explored; and
- The robustness of the Sensitivity-Value analysis is examined.

The resultant Sensitivity-Value output maps should provide an initial understanding of the spatial distribution of the important and sensitive biodiversity, landscape and heritage features.

Stage 4: Development of a draft zonation plan

The outputs of the Sensitivity-Value process are used as the foundation for the development of a draft zonation plan. The Sensitivity-Value outputs and draft zonation plan are workshopped with relevant stakeholders.

Stage 5: Refinement of the draft zonation and the identification of special management overlays

Special management areas/overlays are identified using the information derived from the Sensitivity-Value analysis. Recommendations are made regarding the management of the land-use zones and special management areas.

The draft is then presented for comment to the City and stakeholder groups to obtain broad public input into the plan prior to finalisation,

Stage 6: Final Zonation and Conservation Development Framework.

The comments and input from the public participation process are integrated into the final zonation plan. The plan is passed through Council for approval and adoption.

3.1 Input Layers

The study area for the CDF was defined as the current management boundaries of the three nature reserves.

3.1.1 Biodiversity

3.1.1a Habitat Value

The habitat unit as defined by the particular vegetation community was used as the broad proxy for biodiversity value. The vegetation communities are good surrogates for habitat value as it uses readily available information that clearly delineates the distribution of distinct subsets of biodiversity across the landscape.

For all three nature reserves the vegetation types are listed as critically endangered (see Appendices Table 2) and are considered highly sensitive (to development). See Figure 1.

Base habitat map:

The Cape Town vegetation remnant map was used to delineate habitat units according to their national vegetation type. See Figure 1.

3.1.1b: Transformation # Degradation Map:

Habitat transformation and degradation was mapped from recent aerial photography (2005, 2007 and 2008). For all three reserves the roads, paths, structures and degraded areas were mapped. These features were used as is as an informant in the zonation process. See Figures 4 - 6.

Interpretation in a local context

Critically endangered vegetation types occur in the reserves. These are the heavily transformed, lowland vegetation types which include Swartland Shale Renosterveld and Cape Flats Sand Fynbos. It should be noted that in Durbanville Nature Reserve the vegetation is more ecotonal consisting of both Fynbos and Renosterveld elements.

Showstoppers#fatal flaws and special management area informants

Development of Greenfield sites within any critically endangered vegetation types or ecosystems should be approached with extreme caution, as by definition one cannot afford further biodiversity loss in these areas within the City.

All degraded sites must be prioritised for restoration. Paths and road networks must be rationalised and reduced to the absolute minimum.

3.1.2 Topographic Sensitivity

(Included for reference only)

This layer is used to identify areas with steep slopes or with sensitive geological or geomorphologic features. Significant impacts (such as accelerated soil erosion or landslides) may occur during construction in, or with improper management.
Sensitivity to erosion was not considered in this report. The steepness and habitat values provide a good enough proxy for sensitivity to erosion.

Data Inputs (GIS methods and sources)

This layer is derived from a triangular irregular network (TIN) created in ArcView 9.3.1 using the 3D Analyst extension and ArcInfo licence level. The 2m Contour layer for the City was used to calculate the base heights for the TIN. Slope angles were calculated using the 3D Analyst extension.

Outputs - See Figure 2.

Interpretation in local context

Steeps slopes are not a major factor in the reserves. All the reserves are low lying in the landscape.

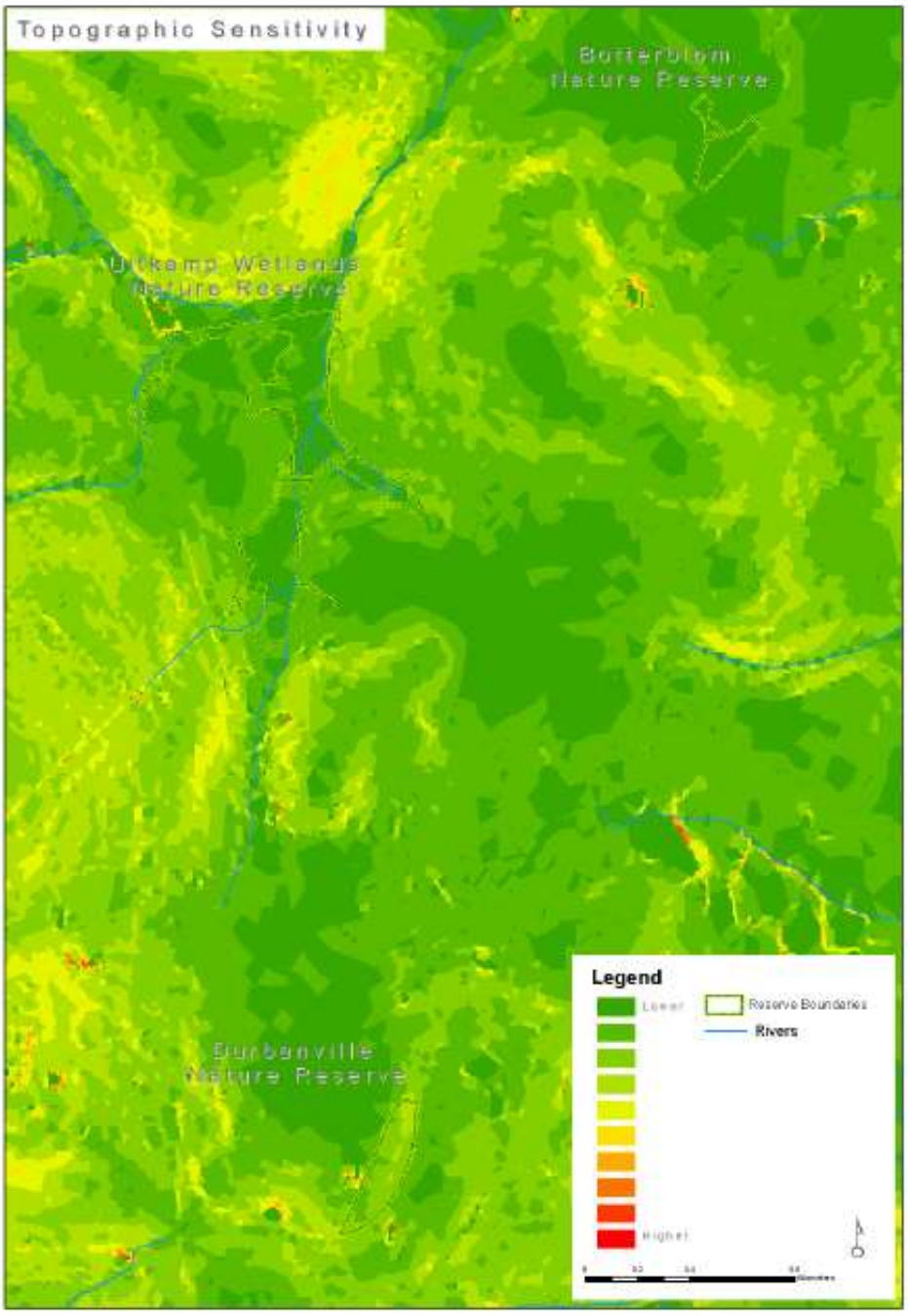

Figure 2: Topographic sensitivity map

3.1.3 Hydrological Features

The reserves are all relatively low lying in the landscape and have several small rivers and wetlands occurring within them or in close proximity.

Figure 3 shows the reserve in relation to the rivers and wetland systems. There are several storm water ponds and dams located within or near the reserves.

The hydrological sensitivity layer has two purposes: to identify areas important for maintaining hydrological processes and to identify areas where infrastructure could be damaged by flooding.

Interpretation in local context

Most of these rivers and wetlands perform an important storm water drainage function (especially in Uitkamp and Botterblom nature reserves) which is important within the urban setting. This makes the optimal functioning of these water courses and wetlands very important. The maintenance of storm water facilities (wetlands, channels and ponds) must form part of the reserve management plans where this is applicable.

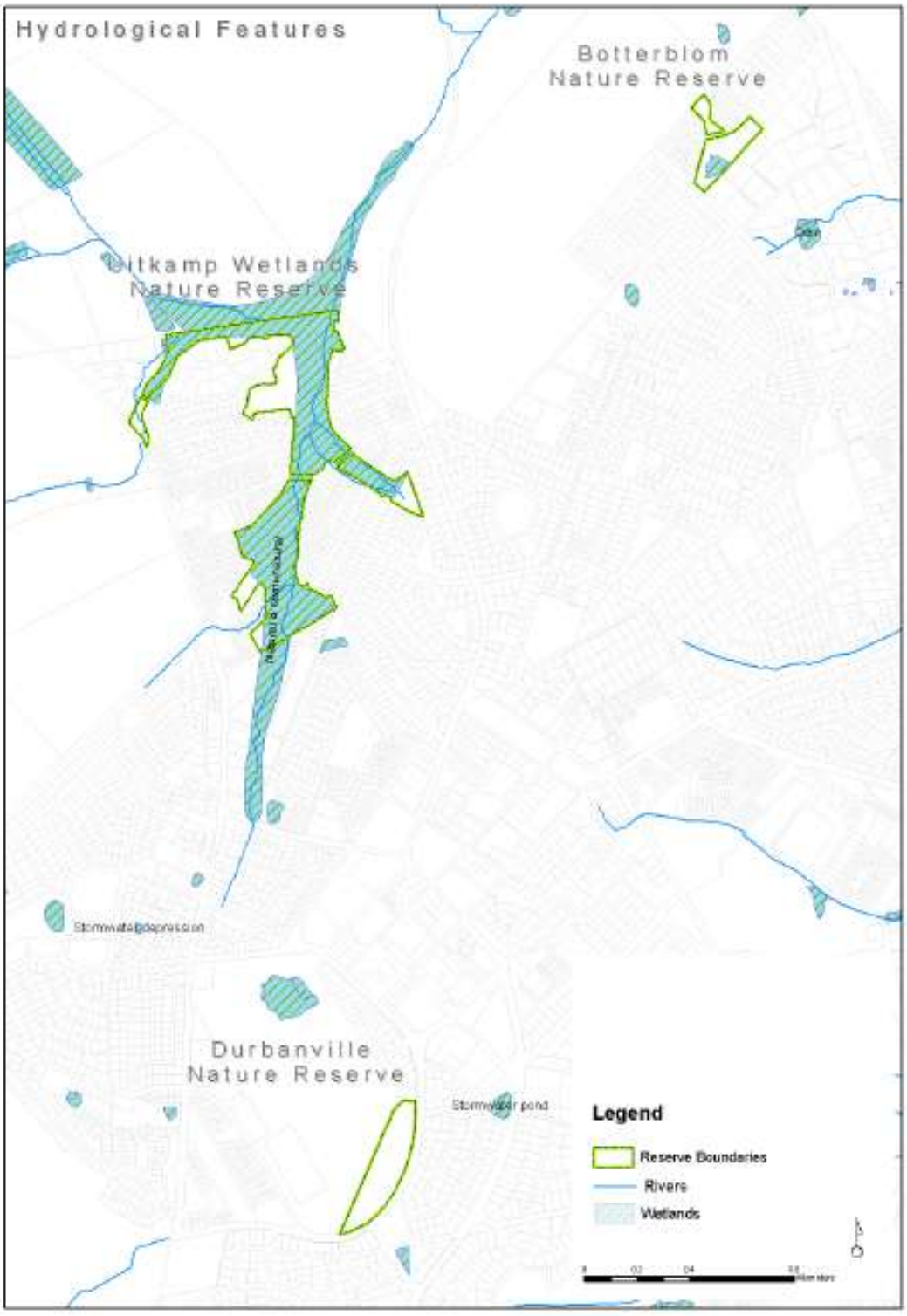

Figure 3: Hydrological features: rivers and wetlands

5. Zoning Process

5.1 Zoning Informants

This section briefly outlines the values underlying the identification of broad tourism use zones. It is important to remember that the landscape/biodiversity analysis is just one of the informants in the zonation process. Although the biodiversity analysis is intrinsically a relatively objective scientific process, other informants to the zoning process are not. Although every attempt is made to place high sensitivity-value sites into more protected zones where possible, the zoning process is in its essence a compromise between environment and development. In particular, often the identified high value sites are the key biodiversity assets that need to be made available in an appropriate manner to the ecotourism market. Direct links between the biodiversity layers and the spatial management of the reserve are made during the identification of special management areas (Where applicable). Even within broad high tourist use zones, there are likely to be areas subject to very tight conservation controls (potentially including complete exclusion of human impacts from an area).

Underlying decision making rules used in the zonation process:

- The zonation process is aimed a striking a *balance* between environmental protection and the development required to meet the broader economic and social objectives of the reserve.
- The zoning process takes into account existing development footprints and tourism access routes.
    - This is based on the underlying principle that all else being equal, an existing transformed site is preferable to a greenfields site from a biodiversity perspective.
    - Infrastructure costs are dramatically increased when developments take place away from existing infrastructure.
    - Existing tourism nodes and access routes are a reality of the economic landscape, and it is would not be possible to shut down existing tourism sites compromising the development objectives of the reserve.

- Where existing development nodes, tourist sites and access routes occur in areas with high sensitivity-value, then the broad use zoning aims to keep the development footprint as small as is realistically possible, preferably within the existing transformed site.
- Where possible, sites with high biodiversity sensitivity-value are put into stronger protection zones.
- Peripheral development is favoured and where possible should be located outside of the conservation area.

Two key points need to be emphasized:

- The designation of a broad use zone does not imply that all sites within that zone would be suitable for all the development types anticipated within that use zone. Detailed site level planning is still required, and many sites may prove to be unsuitable at a site/precinct/EIA level of planning.
- Special Management Areas/Overlays need to be formalized and the links made to the management plans.

(Adapted from Holness, 2008)

5.2 Draft Zoning Outputs

Figures 4 - 6 show the draft Zonation plans for the three reserves. The small size of these reserves makes it largely impractical to have too many small zones. Table 1 outlines the zonation category breakdown per reserve in hectares and % of total area.

Table 1: Breakdown (in HAs and % of Area) of the 3 Zonation Categories in the reserves

Zonation category	Area HA's	% of Area
	Botterblom Nature Reserve	
Conservation	3.60	100%
	Durbanville Nature Reserve	
Conservation	5.34	92.55%
Low Intensity Use	0.10	1.73%
High Intensity Use	0.33	5.72%
Total	5.77	
	Uitkamp Wetlands Nature Reserve	
Conservation	30.00	96.77%
Low Intensity Use	1.00	3.23%
Total	31	

The general consensus from the workshop was that the reserve facilities in Durbanville NR should be contained within the existing development footprint (zoned high intensity use area).

There are no development aspirations for Botterblom Nature Reserve.

In Uitkamp Wetlands NR it was felt that the highly disturbed area zoned for Low Intensity Use may be used to accommodate some kind of low impact development that would improve the accessibility of the reserve. The placement of paths and boardwalks within the conservation zone were also deemed appropriate.

Restoration and conservation should be given the highest priority in all the reserves.

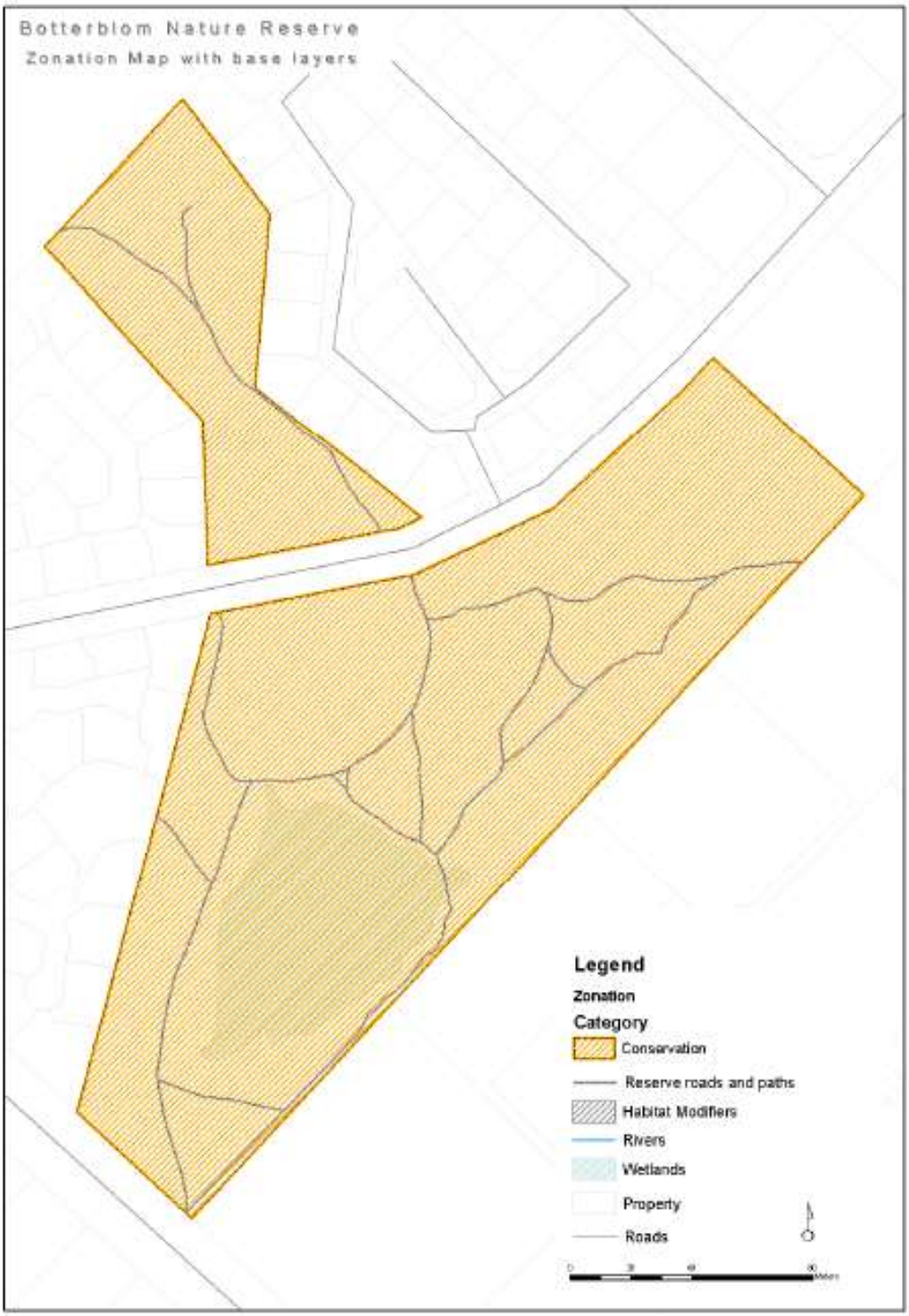

Figure 4: Draft Zonation for Botterblom Nature Reserve

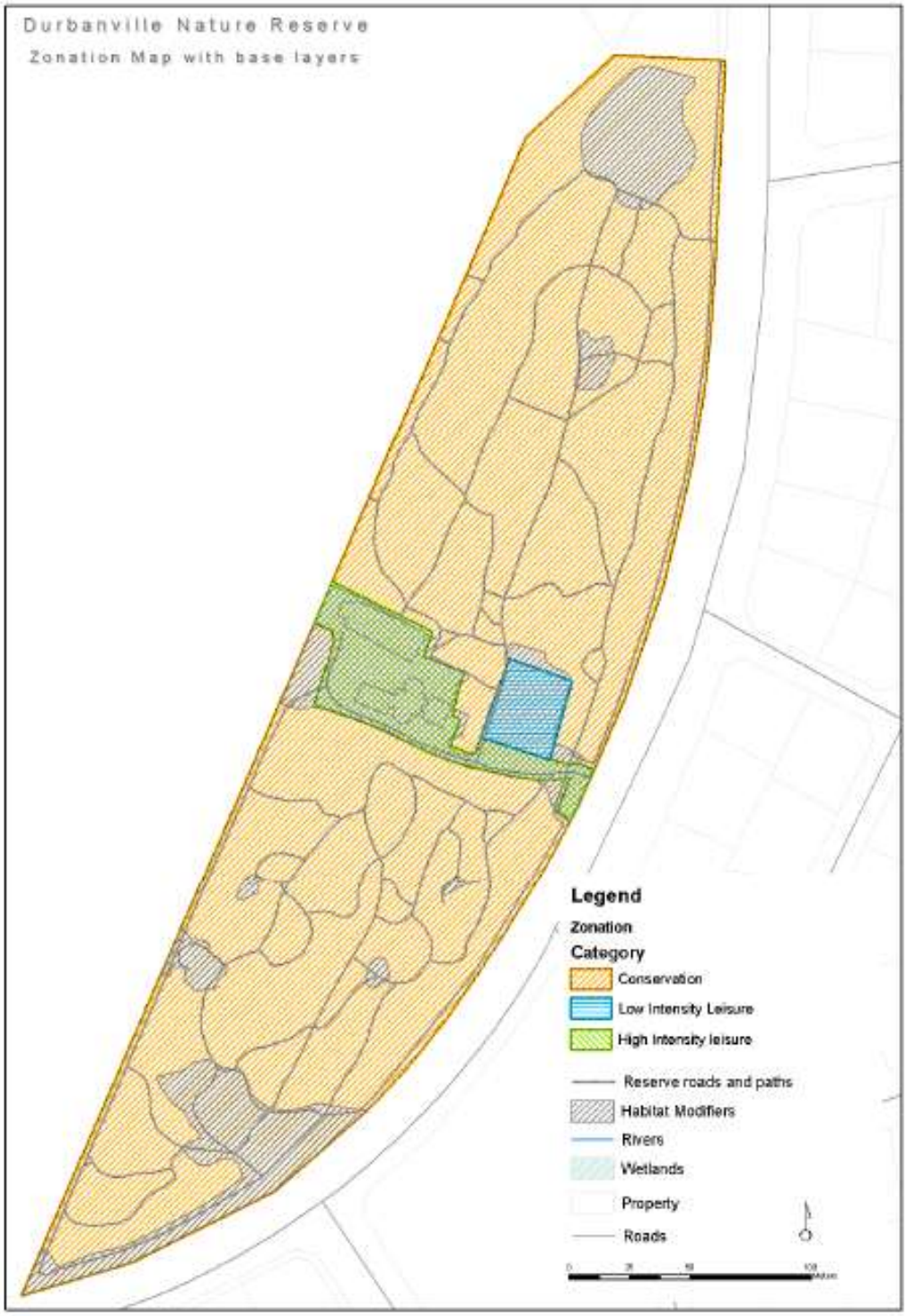

Figure 5: Draft Zonation for Durbanville Nature Reserve

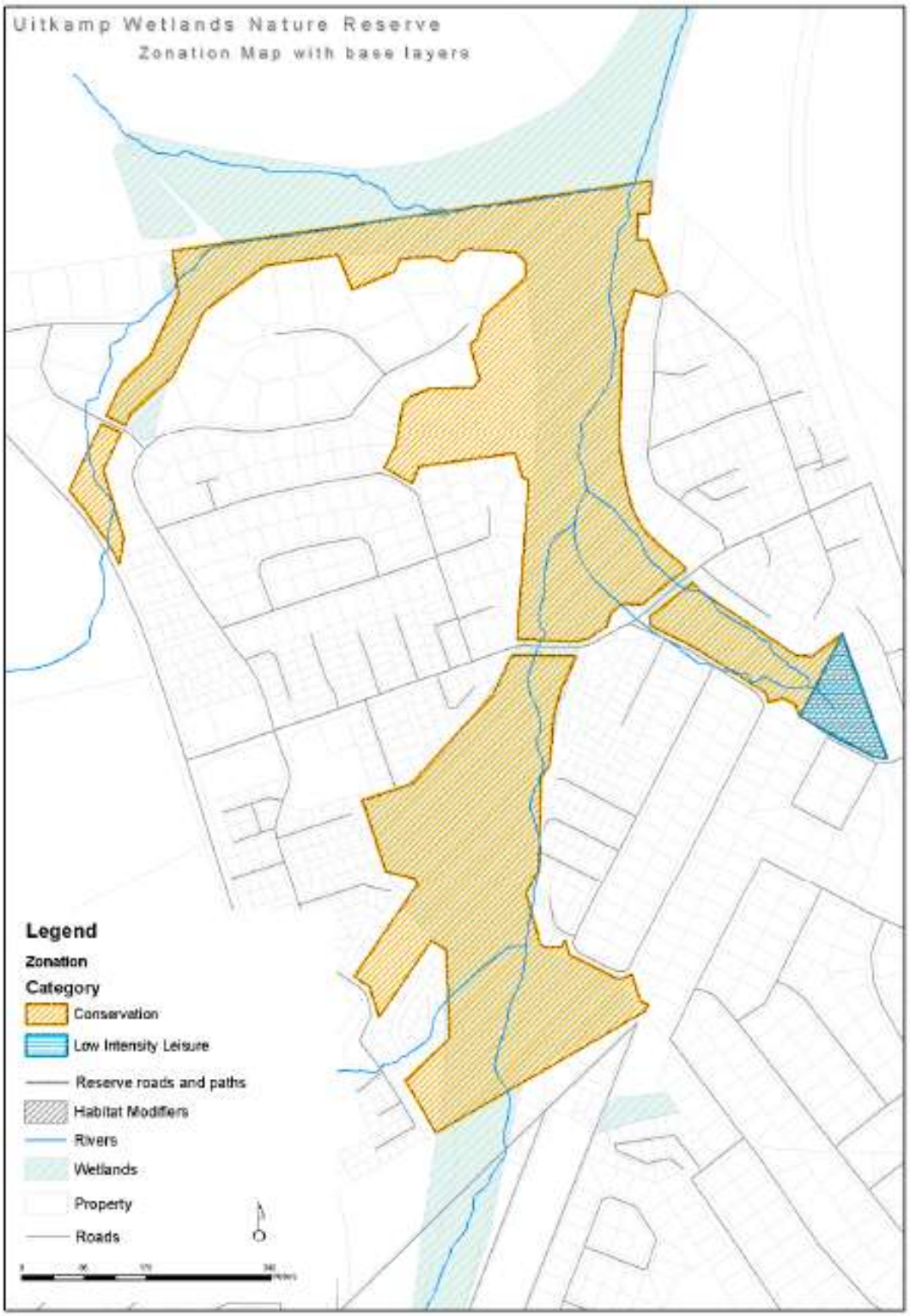

Figure 5: Draft Zonation for Uitkamp Wetlands Nature Reserve

5.3 Zoning Definitions and Descriptions

Table 3 (see Appendices) outlines the generic zones and zone descriptions. The link is still made to the Zonation used for the CapeNature Reserves (Holness, 2008) as there should be general alignment of the broader use zones for ease of comparison and integration if required in Provincial documents.

6. Conclusions and Recommendations

The 3 reserves are conserving some of the few remaining patches of CE vegetation types in the City. It is thus essential that every last square meter of degraded vegetation is restored and rehabilitated. For these reasons the following recommendations are made;

Durbanville Nature Reserve

- All infrastructure should be contained within the High Intensity Use zone as outlined in the zonation maps.
- The path network must be rationalised and all unnecessary paths closed and rehabilitated.
- All old picnic sites should be prioritised for restoration.

Botterblom Nature Reserve

- Parking should be accommodated outside of the reserve.
- The mowing of areas within the reserve should be stopped. These areas should receive the highest restoration priority.
- The maintenance and/or extension of the storm water drains/channels must be carefully managed together with catchment and storm water management.

Uitkamp Wetlands Nature Reserve

- No hard infrastructure should be constructed in the reserve
- The placement of any facility within the Low Intensity use zone should be carefully considered. Options for locating any facilities should be investigated outside of the reserve.
- The Low Intensity use area should be prioritised for rehabilitation.

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Appendices

Table 2: National vegetation types for the City of Cape Town showing historic extent, remaining extent, targets and targets achieved inside and outside Protected Areas

National Vegetation Type	Historic extent (ha)	Current extent (ha)	Selected in Bionet (ha)	Target %	Target (ha)	Extent in proclaimed Protected Areas	Target met in selected Bionet	% Target conserved	% Target met in proclaimed Protected Areas	% Selected in Bionet from current extent	% Remaining from historic extent	15% of historic extent	% that is not selected in Bionet	Conservation Status	SANBI Conservation Status
Atlantis Sand Fynbos	25234.63	15711.95	12695.95	30	7570.39	0.00	Yes	168	0	81	62	3785.19	19	VU	Not Protected
Boland Granite Fynbos	9575.31	6064.19	4807.17	30	2872.59	354.52	Yes	167	12	79	63	1436.30	21	EN	Poorly Protected
Cape Estuarine Salt Marshes	39.86	25.79	25.64	24	9.57	25.64	Yes	268	268	99	65	5.98	1	LT	Well Protected
Cape Flats Dune Strandveld: False Bay	27260.11	8467.86	7272.84	24	6542.43	1855.58	Yes	111	28	86	31	4089.02	14	EN	Poorly Protected
Cape Flats Dune Strandveld: West Coast	12700.27	10603.88	6892.82	24	3048.07	964.79	Yes	226	32	65	83	1905.04	35	LT	Poorly Protected
Cape Flats Sand Fynbos	54410.34	8466.70	8464.75	30	16323.10	464.07	No	52	3	100	16	8161.55	0	CE	Hardly Protected
Cape Lowland Freshwater Wetlands	1463.98	1095.47	1068.83	24	351.36	786.66	Yes	304	224	98	75	219.60	2	LT	Well Protected
Cape Winelands Shale Fynbos	2666.97	1706.19	1388.97	30	800.09	217.89	Yes	174	27	81	64	400.05	19	EN	Poorly Protected
Elgin Shale Fynbos	841.18	321.14	282.77	30	252.35	4.58	Yes	112	2	88	38	126.18	12	CE	Hardly Protected
Hangklip Sand Fynbos	3301.60	1910.25	1489.88	30	990.48	1363.63	Yes	150	138	78	58	495.24	22	VU	Well Protected
Kogelberg Sandstone Fynbos	9499.63	9260.73	8814.04	30	2849.89	1944.47	Yes	309	68	95	97	1424.94	VU	LT	Moderately Protected
Lourensford Alluvium Fynbos	4819.25	409.97	409.97	30	1445.77	190.30	No	28	13	100	9	722.89	0	CE	Poorly Protected
North Peninsula Granite Fynbos	1997.35	1439.12	1343.54	30	599.21	986.44	Yes	224	165	93	72	299.60	7	LT	Well Protected
Peninsula Sandstone Fynbos	21896.12	21348.95	20761.60	30	6568.83	17306.57	Yes	316	263	97	98	3284.42	3	LT	Well Protected
Peninsula Shale Fynbos	1262.79	690.37	688.96	30	378.84	686.97	Yes	182	181	100	55	189.42	0	VU	Well Protected
Peninsula Shale Renosterveld	2374.81	316.89	316.89	26	617.45	261.67	No	51	42	100	13	356.22	0	CE	Poorly Protected
South Peninsula Granite Fynbos	7148.66	2481.74	2290.70	30	2144.60	1770.19	Yes	107	83	92	35	1072.30	8	EN	Moderately Protected
Southern Afrotemperate Forest	347.52	346.79	346.79	34	118.16	276.80	Yes	294	234	100	100	52.13	0	LT	Well Protected
Swartland Alluvium Fynbos	1742.41	75.91	75.91	30	522.72	0.00	No	15	0	100	4	261.36	0	CE	Not Protected
Swartland Granite Renosterveld	8059.16	1951.89	1951.89	26	2095.38	35.64	No	93	2	100	24	1208.87	0	CE	Hardly Protected
Swartland Shale Renosterveld	46712.40	4019.33	4018.76	26	12145.22	408.13	No	33	3	100	9	7006.86	0	CE	Hardly Protected
Swartland Silcrete Renosterveld	1066.65	188.43	188.43	26	277.33	0.00	No	68	0	100	18	160.00	0	CE	Not Protected
Western Shaleband Vegetation	328.59	328.57	328.57	30	98.58	31.11	Yes	333	32	100	100	49.29	0	LT	Poorly Protected
	244749.59	97232.12	85925.67		68622.40	29935.65						36712.44			

Table 3: City of Cape Town Nature Reserves and Conservation Areas: Visitor Use Zoning - Desired State* & Experiential Qualities

Experience	Zone	Desired State*	Conservation objectives	Secondary objective	Experiential Qualities	Activities
Close To Nature Activities tend to be at landscape level	Primary conservation	Natural or near-natural areas (or areas that can be rehabilitated to this state) that are managed primarily for biodiversity conservation. The experience is one of relative solitude and wildness. The nature of the experience is dependant on the quality of the natural environment. The main accent of management is biodiversity conservation and "Pack it in Pack it out" principles are applied to all activities including management. There may be some signs of infrastructure mainly of a heritage nature. In the longer term, unused utility infrastructure (e.g. reservoirs) should be phased out and the site rehabilitated.	Natural areas should be kept intact in order to protect habitat required to meet biodiversity targets for various vegetation types and to provide undisturbed habitat for a range of species. Where possible degraded areas should be rehabilitated.	Managed to provide visitor experiences in a way that does not impact on the biodiversity objective. Where appropriate heritage values are managed as required	Relative sense of isolation	Controlled access** Research and monitoring. Accompanied small groups. The size and frequency of groups to be specified for each reserve.
	Conservation	Natural or near-natural areas (or areas that can be rehabilitated to this state) that are managed for biodiversity conservation. This zone provides experiences of a relative sense of relaxation in an environment that is openly exposed to the sights and sounds of the city. Although it is a place of quietness and naturalness, there will be more interaction between users than in the Primary Conservation Zone. The quality of the experience is less dependant on the quality of the natural environment.	Natural areas should be kept intact in order to protect habitat required to meet biodiversity targets for various vegetation types and to provide undisturbed habitat for a range of species. Where possible degraded areas should be rehabilitated.	Managed to provide visitor experiences in a way that does not impact on the biodiversity objective.	Relaxation	Self guided hiking, non-motorised access *** bird watching, etc. In reserves where access to water bodies is allowed, this area is limited to non-motorize vessels only in accordance wit the Vlei By-Laws.
Outdoor Natural Experience Activities tend to be at precinct level	Low Intensity leisure	Natural, near-natural or managed landscapes which are primarily managed to promote recreational and educational objectives. The main accent is on recreational activities which are more reliant on the quality of the facilities provided than in a Conservation Zone. By their nature these zones are placed in more transformed landscapes. Interaction and socialisation are an integral part of the experience.	Although some areas will be impacted by a range of activities and limited infrastructure, most areas should be kept largely intact and ecological processes should remain functioning. Where possible degraded areas should be rehabilitated.	Recreation and education Managed to provide a largely natural outdoor area to support the recreational and education objectives of the reserve.	Socialisation	Walking, non-motorised acces bird watching. In reserves where access to water bodies allowed, motorized vessels are only allowed under strict contr (e.g. no waterskiing, low speed limits and wake-free zones) in accordance with the Vlei By-Laws.
	High Intensity Use	High use landscapes, which are often largely transformed, which are managed largely to support visitor activities more dependent on facilities, education and administrative functions of reserves. High intensity visitor facilities with modern commercialised amenities with very concentrated, activities. The quality of the visitor experience is heavily dependant of the quality of the facilities which enable the visitor to experience the environment with a minimum of effort. Due to the high impacts these are concentrated at specific nodes. These nodes are generally situated at existing facilities including historic buildings and precincts. The main focus of management is to ensure a high quality visitor experience whilst ensuring that the activities have a minimal impact on the surrounding environment and that heritage resources are respected and celebrated.	The activities and infrastructure in these areas should be managed to minimize impacts on biodiversity and visitor experience in other zones. Where feasible, non-crucial infrastructure should over time be removed from the reserve and the sites rehabilitated.	Facilities are managed to facilitate and promote appropriate visitor activities and educational use of the reserve. Administration; provides appropriate management infrastructure to facilitate other objectives of the reserve.	Entertainment	Events, self guided walks, wheelchair accessible trails, parking, picnicking. In reserve where access to water bodies allowed, this area is appropria for high intensity uses such as power boating and waterskiing in accordance with the Vlei By-Laws.
Site Specific Level	Utility zone	Area used for utility functions such as bulk water provision, landfill sites within the protected /conservation areas etc.	The activities and infrastructure in these areas should be managed to minimize impacts on biodiversity and visitor experience in other zones. Where feasible, non-crucial infrastructure should over time be removed from the reserve and the sites rehabilitated.	Administration Conservation where appropriate	Utility	Determined at site

* Note. The "Desired State" is the long term objective of the zone and these desired conditions may not actually exist at the time of zoning. Achieving the" Desired State" will be informed by many factors and

** Accompanied access refers to controlled access. The level and type of control is determined at reserve level.

*** Non-motorised access refers to mountain bikes, horses, paragliding etc. These activities are reserve specific and reference must be made to the reserve management plan for a list of acceptable activities pe