

CONTENTS

	Page
5. OPERATIONAL MANAGEMENT	3
5.1 COMBINING CONSERVATION AND CONSTRUCTION/OPERATIONAL ACTIVITIES.....	4
5.2 BIODIVERSITY MANAGEMENT	7
5.2.1 Fire management	7
5.2.2 Invasive vegetation management	12
5.2.3 Game Management.....	15
5.2.4 Ecosystem Management.....	18
5.2.5 Sustainable Harvesting (as required).....	20
5.2.6 Erosion Prevention and Control	22
5.2.7 Baseline Data Collection	24
5.3 HERITAGE MANAGEMENT	26
5.4 EDUCATIONAL DEVELOPMENT AND RECREATIONAL ACTIVITIES	28
5.4.1 Environmental Education	28
5.4.2 Biodiversity Research.....	28
5.4.3 Recreation Facilities Management.....	28
5.4.4 Management of Visitor Activities	28
5.5 SECURITY.....	31
5.6 OPERATIONAL MANAGEMENT OF THE KOEBERG NATURE RESERVE.....	33
5.6.1 Infrastructure development and maintenance.....	33
5.6.2 Transmission Corridor Management.....	33
5.6.3 Monitoring and Reporting	34
5.6.4 Annual Koeberg Management Plan Review	34

LIST OF FIGURES

Figure 5-1 Strategic Management Cycle	3
Figure 5-2 Process for the implementation of the Management Plan	4
Figure 5-3 The location of the fire breaks and associated infrastructure	9
Figure 5-4 Invasive vegetation map	13

LIST OF TABLES

Table 5-1 Combining Conservation and Construction in support of the KNPS and additional future stations	5
Table 5-2 Water bodies to replenish water for aerial firefighting	8
Table 5-3 Water bodies and hydrants for the replenishment of skid units and fire tenders	8
Table 5-4 Operational Requirements – Biodiversity Management: Fire Management	10
Table 5-5 Operational Requirements – Biodiversity Management: Invasive Vegetation Management	14
Table 5-6 Operational Requirements – Biodiversity Management: Game Management.....	16
Table 5-7 Operational Requirements – Biodiversity Management: Ecosystem Management.....	19
Table 5-8 Operational Requirements – Biodiversity Management: Sustainable Harvesting	21
Table 5-9 Operational Requirements – Biodiversity Management: Erosion Prevention and Control	23
Table 5-10 KMA animal SCC for tracking of unique siting	24
Table 5-11 Operational Requirements – Biodiversity Management: Baseline Data Collection	25
Table 5-12 Operational Requirements – Heritage Management.....	27

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Table 5-13 Permissible and prohibited activities within the Nature Reserve28
Table 5-14 Operational Requirements – Educational Development and Recreational Activities30
Table 5-15 Operational Requirements – Security 32
Table 5-16 Operational Requirements – Operational Management of the Koeberg Nature Reserve36

CHAPTER REVISION INFORMATION

Date Signed	Rev.	Remarks
April 2015	0	Sub-Revision 1: 18 July 2014 Included the comments received on 19 June 2014 from CoCT and CapeNature. Sub-Revision 2: August 2014 Included comments received from formal review from Eskom, CapeNature and CoCT Sub-Revision 3: 20 April 2015 Included updates and comments received from the public review.

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5. OPERATIONAL MANAGEMENT

This Section translates each of the key environmental aspects identified Strategic Management Framework described (Chapter 3) through the Operational Management Framework (Chapter 4) into Key Deliverables and Management Activities, which will be used to inform annual plans of operation and the resources required to implement them. The management system employed at Koeberg that oversees the execution is currently ISO 1400, OHSAS 1800 and ISO 9000 compliant.

The existing system has been developed with the long term operation phase of the KNPS and Nature Reserve in mind, and will be revised at different phases of the stations operation to remain relevant. The system follows a strategic management cycle (Figure 5-1) with the identification of policy and legal and other requirements, used to determine objectives for immediate and long term actions. These are implemented and performance assessed in terms of set criteria on a continual basis.

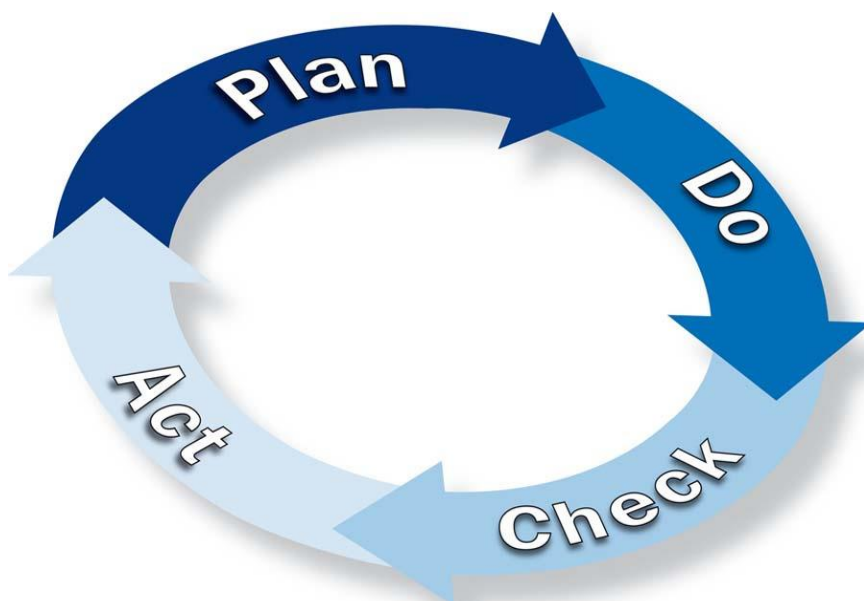


Figure 5-1 Strategic Management Cycle

The actual management process and activities involved in the Koeberg Nature Reserve Management Plan as shown in Figure 5-2.

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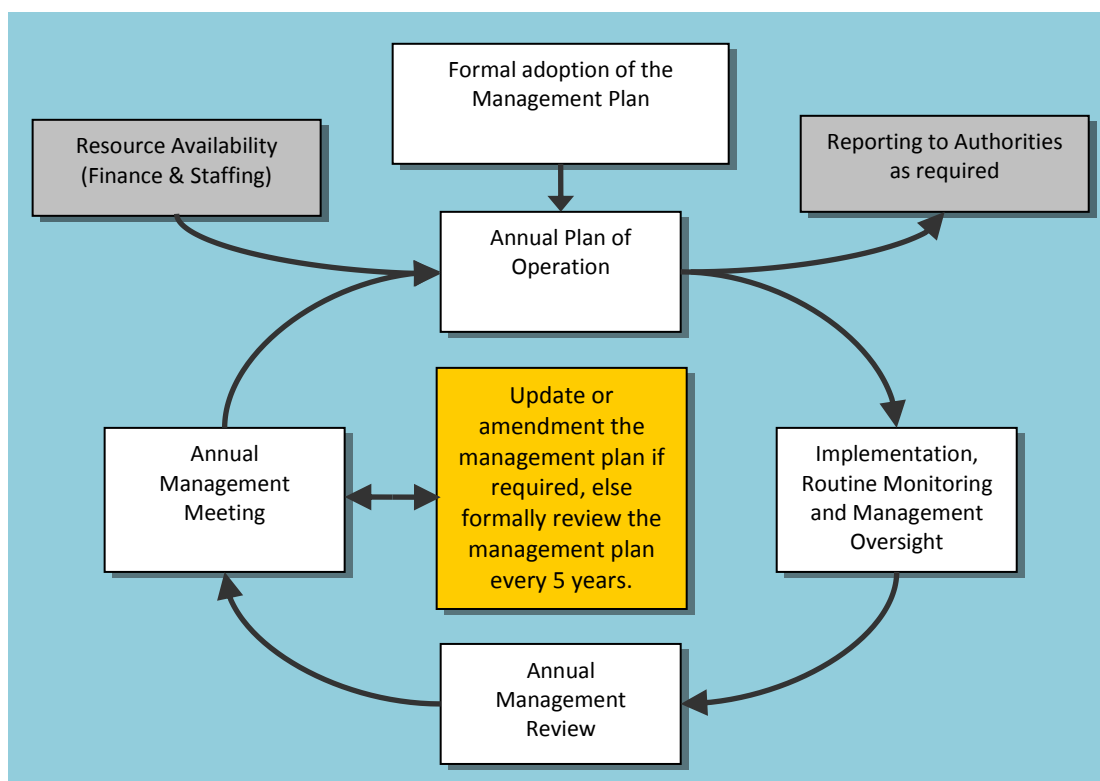


Figure 5-2 Process for the implementation of the Management Plan

5.1 COMBINING CONSERVATION AND CONSTRUCTION/OPERATIONAL ACTIVITIES

In order to fulfil the purpose of the management plan the integration of and the interaction between the management of the nature reserve and the Koeberg Nuclear Power Station (KNPS), the management of any significant negative impacts on the biodiversity value of the site and the continuous operation of the KNPS, as well as any future development is crucial.

Table 5-1 illustrates various activities that or can occur within the DZ and CZ.

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Table 5-1 Combining Conservation and Construction in support of the KNPS and additional future stations

COMBINING CONSERVATION AND CONSTRUCTION/OPERATIONS ACTIVITIES				
Objectives	To manage and prevent the impact of current operations related to the KNPS and other facilities in the DZ and CZ			
	To manage and prevent or minimise the impact of proposed new developments within the DZ on the DZ and CZ			
	To manage and prevent or minimise the impact of proposed new developments within the CZ on the DZ and CZ			
	To rehabilitate any land within the CZ disturbed by construction, operational, or emergency activities to acceptable rehabilitation standards			
Legal Framework	NEMA, as amended			
Key Deliverables	Management Activities	Management Target	Responsibility	Timeframe
Protection of bird breeding sites	Limit activities that could disturb the nesting and breeding habits to those essential to the operation of Koeberg.	Maintain an environment that encourages breeding.	KNPS & KMA	Ongoing
Waste Management	All personnel, including contractors must ensure that wastes are disposed into the allocated containers clearly marked on site.	Clean and litter-free site Effective waste management Correct disposal of various waste streams	KNPS & KMA	Ongoing
	No person is allowed to dispose any material into the storm or effluent drains, or into a dedicated container allocated to a different material.			
	Waste handling, collection and disposal operations are managed and controlled by the waste management contractor.			
	The waste management contractor ensures that all wastes are disposed of in accordance with the hazardous nature of the material. The ELM Group will evaluate this on an on-going basis.			
	All waste should be disposed of at a registered waste disposal site.			
	Exact quantities of all waste streams exiting site are compiled by the waste management contractor and monitored by the site and the ELM Group. Waste			

	quantities must be sent to Corporate: Environmental Management on a monthly basis.			
	All appropriate waste disposal certificates must be issued to site. Safe disposal certificates are kept by the site for a period of 3 years.			
	All sites must be cleared of litter on an on-going basis.			
Pollution Control Management	Have effective control measure to deal with any potential spill.	No spills in the CZ. Effective pollution control.	KNPS & KMA	Ongoing
	Reporting all minor and major spills that can cause pollution within the DZ and CZ, spills such as diesel, cement (during construction activities), and any other such as waste, chemicals, etc.	Effective clean-up operations when a spill does occur.		
Stormwater Management	Effective stormwater management within the DZ to prevent erosion and the formation of artificial wetlands.	No unacceptable stormwater damage.	KNPS & KMA	Ongoing
	Effective stormwater management along gravel routes and structures within the CZ to prevent erosion and the formation of artificial wetlands.			
New Developments within the DZ	Screen all proposed developments within the DZ to assess the environmental impacts on the DZ and CZ.	Maintain the SDP of new and proposed developments.	KNPS & KMA	Project specific
	Update the SDP to reflect the new development.	Ensure all development is performed in line with requirements.		
	If required, update or amend the Management Plan.			
New Sustainable Developments within the CZ	Screen all proposed developments within the CZ to assess the environmental impacts on the DZ and CZ.	Maintain the SDP of new and proposed developments.	KNPS & KMA	Project specific
	Update the SDP to reflect the new development.	Ensure all development is performed in line with requirements.		
	If required, update or amend the Management Plan.			
Rehabilitation of disturbed land	Rehabilitate any land within the CZ disturbed by construction, operational, or emergency activities to acceptable rehabilitation standards.	Land to be rehabilitated in appropriate timescales.	KMA	Project specific

5.2 BIODIVERSITY MANAGEMENT

This section focuses on biodiversity management within the Conservation Zone of the Koeberg Nature Reserve, and includes;

- Section 5.2.1: Fire Management;
- Section 5.1.1: Invasive Vegetation Management;
- Section 5.2.3: Game Management;
- Section 5.1.1: Ecosystem Management;
- Section 5.1.1: Sustainable Harvesting;
- Section 5.2.6: Erosion Protection and Control; and
- Section 5.2.7: Baseline Data Collection.

5.2.1 Fire management

The majority of the Nature Reserve has not burnt for the last 30 years. The vegetation is therefore reasonably mature and in an exceptionally good condition.

Koeberg Nature Reserve's primary fire management objectives, based on an understanding of the impact and cause of veldfires, are:

- To prevent the occurrence of human-induced wildfires;
- To prevent the occurrence of fires within and along the transmission corridor (in line with the approved Transmission Corridor Management Plan and Vegetation Management Plan of the Dassenberg-Koeberg 132kV powerline);
- To protect persons and property (buildings and infrastructure), on or immediately adjacent to the Nature Reserve, from wildfires;
- To suppress unplanned wildfires within the Nature Reserve;
- To reduce the potential for the spread of wildfires on, from, or onto the Nature Reserve;
- To work co-operatively with neighbours, Fire Protection Association (FPA) and municipal fire brigade services in managing fires within the Nature Reserve;
- To prevent the loss of indigenous flora and fauna;
- To undertake controlled burning as means of vegetation management as an option; and
- To prevent the loss of electrical supply to the national electricity grid.

The preparedness objectives are based on an understanding of veldfire behaviour. The response and suppression objectives are based on an understanding of veldfire behavior and fire impact and fulfilling the requirements as set out in section 17 of the National Veld and Forest Fire Act (1998).

- Establish and maintain the necessary trained human resources to manage fires.
- Purchase and maintain the necessary equipment to manage fires.
- Design, establish and maintain a network of fire breaks (Figure 5-3).
- Institute a programme for prescribed (controlled) burning (as last resort).

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- Develop and implement a coordinated capacity to respond to and contain wildfires.
- Burning permit is applied for on a yearly basis, if required. All ecological burns must be approved by the manager of Fire Risk Management at Koeberg.

Permanent water bodies of adequate proportions are relatively absent in this area. The water bodies which are suitable for replenishing water for aerial firefighting are as follow:

Table 5-2 Water bodies to replenish water for aerial firefighting

Surrounding Water bodies	Coordinates	
Atlantic Ocean	33°46'40.27"S	18°26'46.38"E
Melkbos Pan	33°44'2.99"S	18°27'14.00"E
Table Bay Nature Reserve	33°50'19.38"S	18°29'26.23"E
Atlantic Beach Estate	33°44'3.01"S	18°26'58.37"E
Melkbos Wastewater Treatment Works	33°42'21.44"S	18°27'29.42"E
Koeberg Nature Reserve Dams	33°38'12.48"S	18°24'49.13"E

Table 5-3 Water bodies and hydrants for the replenishment of skid units and fire tenders

Water Bodies/Fire Hydrants (FH) in Nature Reserve	Coordinates	
Conservation office (FH 1)	33° 39' 57.1"S	18° 26'29.1"E
Fire training centre (FH 2)	33°39'56.7"S	18°26'28.8"E
Fire training centre (FH 3)	33°39'56.2"S	18°26'28.8"E
Fire training centre (FH 4)	33°39'55.2"S	18°26'28.7"E
Conservation dam	33° 39'53.6"S	18° 26'33.1"E
CoCT dams	33° 38'18.8"S	18° 24'49.3"E
Duynefontein street hydrants	Various	

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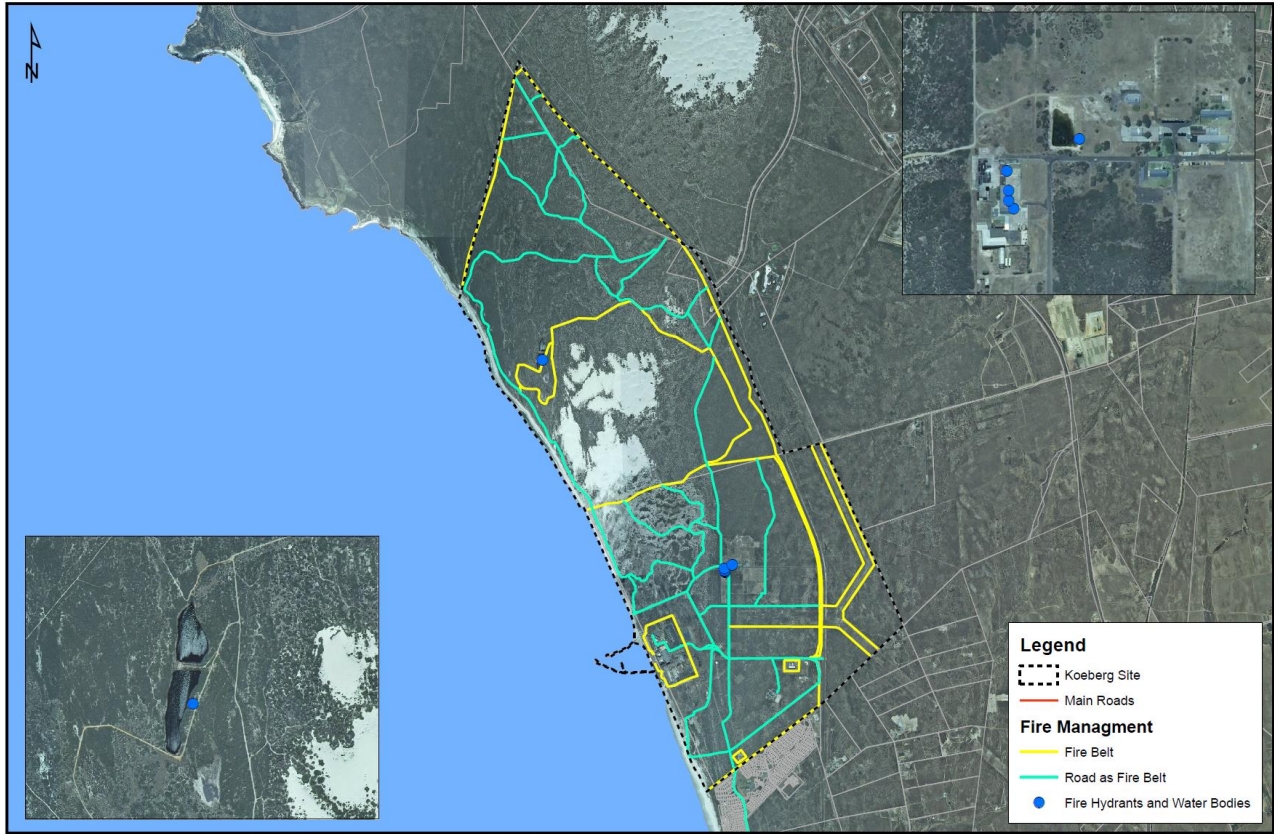


Figure 5-3 The location of the fire breaks and associated infrastructure¹

The detailed operational requirements for fire management are set out in Table 5-4 below.

¹ No veld age map is available, since no fires has occurred within the Koeberg Nature Reserve for the past xx years or is planned within the Koeberg Nature Reserve.

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Table 5-4 Operational Requirements – Biodiversity Management: Fire Management

FIRE MANAGEMENT				
Objectives	To ensure conservation of species and processes by maintaining and improving ecosystem functioning.			
	To allow for natural fire processes to occur without impacting on safety and infrastructure.			
	To ensure the implementation of effective conservation management interventions.			
Legal Framework	National Veld and Forest Act No. 101 of 1998 CoCT: Air Quality By-Law (2010)			
Key Deliverables	Management Activities	Management Target	Responsibility	Timeframe
Reduce wildfires due to human negligence.	Create Fire Awareness amongst staff and visitors.	No wild fires in the Nature Reserve SHE talks (for staff) and printed media.	KMA	Ongoing
	Eradication and control of alien infestations (where necessary).	See Section 5.2.2.	N/A	N/A
Reduce/prevent the spread of fires.	Monitoring and maintenance of the Nature Reserve fire breaks and hydrants.	Fire breaks, servitudes and corridors in an appropriate condition. No fires underneath powerlines.	KMA	Ongoing
	To maintain the state of servitudes and corridors in required state.			
	Ensure the appointment and training of firefighting staff and maintenance of firefighting equipment.	Equipment checked once a week. Maintenance is as per factory requirements. Firefighting staff undergoes annual training.	KMA	Ongoing
Maintain partnerships to improve fire management	Attend Local FPA Meetings.	Regular attendance FPA meeting every two months.	KMA & FPA	Ongoing
	Maintain Firebreak Agreements with Neighbours.	Agreements in place with neighbours and FPA.		
Control of Burning Programme to assist in maintaining the ecological integrity of the Nature Reserve	Any burn must be done in accordance with relevant legislation.	Obtaining relevant permits prior to any controlled burn.	KMA	Annually
	Elimination of alien vegetation through controlled burning programme.	Use of controlled burning programme, as a last resort, for invasive vegetation clearing due to concerns associated	KMA	Annually

		with running fires.		
	Burning of Fynbos to germinate and spread seeds.	Frequency to be determined by the KMA on guidance of 12 to 15 years for Atlantis Sand Fynbos and 20 to 100 years for Cape Flats Dune Strandveld (McDonalds, 2013)	KMA	As and when required.
	Burning within and along the transmission corridor is not allowed.	If considered necessary, an option of reseedling can be considered to maintain the ecological integrity underneath powerlines.	KMA	As and when required.

5.2.2 Invasive vegetation management

A listed invasive species means any species, which is listed in terms of section 70 of the NEM: Biodiversity Act (2004), whose establishment and spread occurs outside of its natural distribution range.

Alien plants are non-native plants that have been introduced by humans, often intentionally and for a specific purpose (e.g. to stabilise dunes). Some species of alien plants become invasive in their new environments because they are free from their native predators and pathogens. Given their potential for rapid increase (in excess of 7% per year) (Cowling 1997), alien invasive plants will likely form dense stands that encroach much of the remaining intact area if no control measures are put in place.

As a result, invasive alien vegetation is a major threat to the natural habitat of the Koeberg Nature Reserve, and causes impacts through:-

- competition – indigenous plant species are out-competed
- reducing habitat diversity (which directly impacts on the fauna);
- habitat fragmentation (restrict natural movement of indigenous populations and species);
- high consumption of water (An average *A. cyclops* tree can consume up to 150-200 litres of water per day);
- the loss of biodiversity – flora, habitats and fauna (what essentially makes the area unique);
- the loss of the scenic beauty of the area as the natural vegetation is replaced by dense stands of monotonous and unattractive rooikrans; and
- the creation of large standing fuel loads which exacerbate the dangers of wildfires.

About 25%, approximately 700 ha, of the Nature Reserve is still infested with alien invading plants such as *A. cyclops* (rooikrans) and *A. saligna* (Port Jackson) as shown in Figure 5-4. Alien eradication is an ongoing long-term project. It is virtually impossible to completely eradicate all the alien plants from the Nature Reserve.

Re-invasion from neighbouring properties will always be a problem. Alien plants on adjacent properties act as a source of seed that may be dispersed by birds onto the Nature Reserve.

In undertaking invasive vegetation control, Eskom has a programme for the annual clearance of alien vegetation² and it includes the ongoing maintenance of the cleared areas to prevent re-establishment of alien vegetation where possible. This programme prioritises key infestation area and focuses on containing the infestation that is most like to spread into new areas.

The detailed operational requirements for fire management are set out in Table 5-5 below.

² Due to budget constraints the clearing contract had to be cancelled. Eskom will do clearing with the conservation team, but a number cannot be prescribed at the moment. This is subject to change as funding becomes available.



Figure 5-4 Invasive vegetation map

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Table 5-5 Operational Requirements – Biodiversity Management: Invasive Vegetation Management

INVASIVE VEGETATION MANAGEMENT				
Objectives	To establish a long-term programme (including resources and funding) for the eradication of invasive vegetation species.			
	To enhance biodiversity protection and conservation.			
	To ensure conservation of species and processes by maintaining and improving ecosystem functioning.			
Legal Framework	NEM: Biodiversity Act (2004) Conservation of Agricultural Resources Act No. 43 of 1983 Agricultural Pest Act No. 36 of 1983			
Key Deliverables	Management Activities	Management Target	Responsibility	Timeframe
Eradicate alien and invasive species	Annually identify and map the alien invasive flora within or threatening the Nature Reserve and identify and monitor areas in that have been previously cleared.	Areas infested by aliens (rooikrans & Port Jackson) to be reduced year on year.	KMA	Annually
		Desired fynbos types are restabilising in cleared areas as expected.	KMA	Annually
Implement biological control	Identify Potential Biological Control Sites and Prioritise Accordingly.	Eskom has agreements in place with neighbours when required, and will consult with CapeNature as and when required.	KMA & CN	Annually
	Map and Update Biological Control Sites.			
Prevent further introduction of aliens	Rehabilitate any land within the CZ disturbed by construction, operational, or emergency activities to acceptable rehabilitation standards.	Land to be rehabilitated in appropriate timescales.	KMA & CN	Annually

5.2.3 Game Management

Within the boundaries of the Nature Reserve, there are a number of different game species which include the steenbok (*Raphicerus campestris*), duiker (*Sylvicapra grimmia*), springbok (*Antidorcas marsupialis*), Burchell's zebra (*Equus burchelli*), Eland (*Taurotragus oryx*), Gemsbok (*Oryx gazella*), Blue Wildebeest (*Connochaetes taurinus*), caracal (*Felis caraca*) and the small grey mongoose (*Galerella pulverulenta*).

The management of game within the Nature Reserve will be further elaborated in a specific Game Management Plan approved by the KMA.

Game capture and relocation requires a permit in terms of section 44 (1)(a) of the Cape Nature Ordinance (Ordinance 19 of 1974). For birds this provision only applies to birds that are listed as protected or endangered in terms of Ordinance 19 of 1974.

If required, animals are captured in the Nature Reserve using either chemical immobilisation (larger game species) or through capture in nets (smaller game like springbok). Injured animals, depending on the injury, are either captured and treated on site or taken to the veterinary facility for treatment, or only put down on site if unavoidable. Animals requiring rehabilitation might be transported to CapeNature approved rehabilitation facilities. All mortalities must be recorded and animal carcasses are disposed of in two ways;-

- Animals that died of natural causes (or non-chemical induced mortalities) such as predation or due to accidents such as collisions must be disposed of at the "scavenger cafeteria".
- Animals that were euthanized or animals that were put down due to injuries after M-99 was administered must be buried in an area and in a manner where scavengers will not dig up the carcass.

Feral or stray domesticated animals are captured and taken to the local shelter, Peanut Animal Welfare. If these animals can be domesticated they will be rehomed, otherwise they are euthanized.

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Table 5-6 Operational Requirements – Biodiversity Management: Game Management

GAME MANAGEMENT				
Objectives	To ensure the effective management of game within the Nature Reserve.			
	To ensure effective conservation of species and processes by maintaining and improving ecosystem functioning.			
Legal Framework	Animal Health Act No. 7 of 2002 Animal Matters Amendment Act No. 42 of 1993 Animals Protection Act No. 71 of 1962 Cape Nature Conservation Ordinance 19 of 1974 Game Theft Act No. 105 of 1991 Medicines Control Act No. 101 of 1965 Veterinary and Para-veterinary Professions Act No. 19 of 1982			
Key Deliverables	Management Activities	Management Target	Responsibility	Timeframe
Monitoring - Game Numbers and Impact	Conduct reliable game counts for each species of game. This is done by dividing the Nature Reserve in compartments or drive counts.	Maintain a stable population of animals that is not significantly impacting the ecosystems.	KMA	At least once a year between December and February
	Monitoring the impact of the animals on the ecosystems.			
Monitoring – Health and parasite control	To get animals together to assess the condition, external parasite infestation, conditions of new born and general health (by making bales of Lucerne routinely available).	To have animals in a healthy condition.	KMA	Weekly
	Supply of game pallets containing IVOMEK and game lick blocks as a form of supplement feeding and nutritional supplement.	Continuous parasite control.		Ongoing
	Two dip dispensers placed in strategic locations for the transmittance of Deadline onto animals.			
Game Capture and Relocation (including injuries and rehabilitation)	Maintain a valid Certificate of Adequate Enclosure for the capture and keeping of animals on the permit.	Maintain the permit in terms of section 35 of the CapeNature Ordinance.	KMA	Apply for a permit every 3 years.
	Ensure valid permits for the Capture and Transport	Animals will only be captured and	KMA	As and when

	(relocation) of wild animals.	transported under a valid permit under section 44(1) of the CapeNature Ordinance.		required.
	Ensure the safe immobilisation of animals, i.e. chemical immobilisation (larger game) or capture in nets (smaller game).	Appropriate capture of animals that do not harm animals.	KMA	As and when required.
	Ensure compliance with the Medicine Control Act, Act No. 101 of 1965 and the Veterinary and Para-Veterinary Professions Act, Act No 19 of 1982, respectively.	Compliance with requirements for control and conditions of use of potential narcotic anaesthetics.	KMA	As and when required.
Management of Game Injuries/Mortalities	Investigate the cause of injuries or mortalities.	Implementation of any corrective actions related to investigation of injuries / mortalities.	KMA	As and when required.
	Disposal of carcasses (natural or non-chemical induced mortalities and chemical induces mortalities).	Record all mortalities. Correct disposal of animal carcasses.		
Water Supply	Ensure safe drinking water for game – the 3 dams constructed and a number of drinking troughs.	Water in dams is sampled weekly to assess the water quality. Troughs are cleaned out weekly to prevent the spread of disease.	KMA & CoCT	Weekly
Poaching Control	Regular patrols are done by conservation staff and security staff to deter poaching.	Detect and prevent the poaching of animals within the Nature Reserve.	KMA	Ongoing
Capture of feral and domestic animals	Ensure the removal of feral and stray animals to the local shelter (Peanut Animal Welfare)	To have no feral or domestic animals within the Nature Reserve	KMA & Local Shelter	As and when required

5.2.4 Ecosystem Management

The Conservation Zone as laid out in Section 4.3 and explained in more detail in Tables 4.1 and 4.2, highlights a number of important and sensitive ecosystems within the Nature Reserve.

The focus of ecosystem management is to maintain the integrity of the ecosystems and the aquifer.

KNPS has an existing water permit in place for the abstract of water from various boreholes within the Nature Reserve, currently only one borehole is utilised as drinking water for animals.

Parts of the Nature Reserve is situated on the Witzands Aquifer. The CoCT has an agreement with Eskom which allows the abstraction of groundwater from the aquifer via boreholes located within the Nature Reserve, and to discharge treated effluent into the effluent dams. The CoCT has a monitoring programme in place for to monitor the water levels and quality of the boreholes.

KMA is to advise CoCT staff on their return to office if any of the above are found to be a potential threat to wildfire or mankind.

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Table 5-7 Operational Requirements – Biodiversity Management: Ecosystem Management

ECOSYSTEM MANAGEMENT				
Objectives	To maintain the ecological integrity of the ecosystems and wetlands within the Nature Reserve.			
	To maintain the natural processes within each of these ecosystems and provide suitable habits for threatened and endangered species characteristic to each ecosystem.			
Legal Framework	National Environmental Management Act No. 107 of 1998, as amended Specific Environmental Management Acts Conservation of Agricultural Resources Act No. 43 of 1983			
Key Deliverables	Management Activities	Management Target	Responsibility	Timeframe
Maintain the ecological integrity of the sensitive vegetation types and its dune systems	Prevent activities that can negatively impact the ecosystem, such as - Prohibit the exploitation/harvesting of fauna. - Prohibit the feeding of wildlife. - Prevent the introduction of wildlife to prevent inbreeding and over population. - Prevent the disturbance (erosion or footpaths) of pristine dune ridges. - Limit access and minimise human disturbance in breeding areas (Black Oyster Catcher).	No recorded incidences of prohibited activities	KMA & CN	Ongoing
Manage wetlands according to recognised best practice knowledge and guidelines	Vehicular traffic prohibited in permanently wet areas	Maintain wetlands to a healthy condition.	KMA & CN	Ongoing
	No excess groundwater to be pumped into any wetland			
	Monitor and ensure to the control of alien encroachment into wetlands			
	Monitor and control reed and bulrush infestation			
Manage seepage and CoCT effluent dams	To ensure that the CoCT's Management and Monitoring Plan is executed as per the agreement between the Eskom and CoCT.	Compliance with conditions stipulated in by water authorities.	KMA & CoCT	Ongoing
	Removal water hyacinth, including reed and bulrush control by cutting.	To maintain an appropriate environment for effluent dams.	KMA	Ongoing

5.2.5 Sustainable Harvesting (as required)

With the exception of harvesting bush reed (reducing fire load and wetland maintenance) and fynbos collection for annual flower shows, the KMA does not generally entertain the concept of sustainable harvesting.

The Sustainable Utilisation of Wild Fynbos Resources ensures that the use does not exceed the regenerative and/or productive capacity of the specific plant species. It is important, therefore, to make certain that species are harvested in a manner that minimizes harvesting impact on individual populations and are in line with all relevant legislation, i.e. permit issued by CapeNature. If and when harvesting is required the following criteria are to be applied:

- A cautionary approach must be followed whereby an amount not exceeding 50 % of the flower heads produced on a yearly basis by a plant shall be removed.
- No harvesting may occur one year prior to a burn.
- No harvesting of seeding plants between one and five years after a burn.
- Correct harvesting equipment that is in good working condition must be used at all times.
- No cuts shall be made to old growth of the plant stem and cuts must be at an angle of 45° to the stem.
- No breaking or uprooting of plants is allowed.

An exclusion block representative of all harvestable species utilized must be created to ensure population persistence. The block should be demarcated and included on the map incorporating the management zones. The exclusion block may be utilized further for research and monitoring purposes.

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Table 5-8 Operational Requirements – Biodiversity Management: Sustainable Harvesting

SUSTAINABLE HARVESTING (as required)				
Objectives	To ensure the sustainable use of wild fynbos resources.			
	To ensure the conservation of biodiversity where harvesting operations occur.			
	To monitor the impact of harvesting on selected fynbos species.			
Legal Framework	Cape Nature Conservation Ordinance 19 of 1974			
	National Forest Act No. 84 of 1998			
	NEM: Biodiversity Act (2004)			
	Threatened and Protected Species Regulations (December 2011)			
Key Deliverables	Management Activities	Management Target	Responsibility	Timeframe
Minimise harvesting impact	Develop a plan to manage the impact of harvesting, if and when required, that is compliant with relevant legislation and meets harvesting criteria.	When harvesting is done, a harvesting record should be maintained.	KMA	As and when required.

5.2.6 Erosion Prevention and Control

Any activity that can cause the degradation of soil, including overgrazing, soil erosion by means of wind or water, sinkholes, cleaning/treatment of hydrocarbon contamination etc., should be prevented or controlled.

In addressing soil erosion, the following guiding principles should be adhered to:

- Areas impacted by soil erosion should be stabilised and re-vegetated with indigenous plant species to prevent the spread of listed invasive plant species.
- Areas susceptible to soil erosion, or showing early signs of soil erosion such as loss of vegetation cover along access routes and trails, should be managed to prevent soil erosion.

The following intervention can be considered to prevent the occurrence of erosion;

- Reduce the direct causes of current erosion;
- Managing construction activities to prevent future erosion;
- Stabilise existing erosion features; and
- Repair existing erosion to original ground level.

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Table 5-9 Operational Requirements – Biodiversity Management: Erosion Prevention and Control

EROSION PREVENTION AND CONTROL				
Objectives	To ensure implementation of effective conservation management interventions during development.			
	To prevent the degradation of soil and ensure soil conservation.			
	To prevent the resultant loss of vegetation and degradation of wetland features.			
Legal Framework	Conservation of Agricultural Resources Act No. 43 of 1983			
Key Deliverables	Management Activities	Management Target	Responsibility	Timeframe
Prevent and mitigate soil erosion during any development in the CZ and DZ	Map erosion sites, such as construction sites, embankments, roads/verges and ensure photographs are available.	Proactively identify areas of erosion to allow timeous prevention and rehabilitation. Record for future follow-up.	KMA	As and when required
	Develop a method statement/erosion maintenance plan on rehabilitation of areas affected by erosion.			
	Monitor the effectivly of the erosion control mitigation, and site recovery.			
	Clearly demarcate areas being rehabilitated.			
Monitoring and maintenance of access routes, hiking and MTB trails (CZ)	Monitor the condition of access routes, hiking and MTB trails to prevent soil erosion.	Proactively identify areas of erosion to allow timeous prevention and rehabilitation. Record for future follow-up.	KMA	Ongoing
	Develop a method statement/erosion maintenance plan on rehabilitation of areas affected by erosion.			
Monitor and prevent the degradation due to soil erosion in the CZ.	Monitor the CZ for unexpected erosion.	Proactively identify areas of erosion to allow timeous prevention and rehabilitation. Record for future follow-up.	KMA	Ongoing

5.2.7 Baseline Data Collection

Information on the locality of Rare, Endangered and Endemic species is beneficial for effective monitoring and trending. This objective aims to improve the biological knowledge base through the implementation and promotion of effective baseline data collection and research opportunities.

The focus of the KMA with regards to data collection is to record any unique siting of the animals Species of Conservation Concern (SCC) as listed in Table 5-10 and as detailed in Table 5-11.

Table 5-10 KMA animal SCC for tracking of unique siting

Species	Reason for Inclusion
Blouberg dwarf burrowing skink <i>Scelotes montispectus</i>	Near Threatened reptile
Crowned cormorant <i>halacrocorax neglectus</i>	Near Threatened avifauna
Bank cormorant <i>Phalacrocorax coronatus</i>	Endangered avifauna
Caspian tern <i>Hydroprogne caspia</i>	Near Threatened avifauna
Swift terns <i>Sterna bergii</i>	Near Threatened avifauna
African Black Oystercatchers <i>Haematopus moquini</i>	Near Threatened avifauna
Black Harrier <i>Circus maurus</i>	Near Threatened avifauna
Honey Badger <i>Mellivora capensis</i>	Near Threatened mammal

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Table 5-11 Operational Requirements – Biodiversity Management: Baseline Data Collection

BASELINE DATA COLLECTION				
Objectives	To collect biodiversity knowledge			
Key Deliverables	Management Activities	Management Target	Responsibility	Timeframe
Record Keeping	Record all unique and credible siting of animal species as listed in Table 5-10.	Maintaining an accurate list of siting's with locations.	KMA	Ongoing
Allow the CoCT, CapeNature and any other research initiative to conduct specific conservation monitoring programmes within the CZ	Approve research initiatives and allow access to perform specific conservation monitoring.	Not applicable.	KMA	As and when required

5.3 HERITAGE MANAGEMENT

This section focuses on heritage management within the Conservation Zone of the Koeberg Nature Reserve.

As discussed in Section 2.5.8 fossiliferous deposits were encountered in several of the geological strata in the 1970's. As such Pleistocene fossils and Early Stone Age artefacts were encountered.

During physical surveys conducted as part of the Nuclear 1 EIA it was revealed that the heritage significance of the site varied. No colonial period heritage sites were found while heritage sites relating to the Late Stone Age are few. The heritage significance of the Duynefontein option relates to its Miocene paleontological and Pleistocene archaeological and paleontological deposits.

Although no aspects of the cultural landscape and associated person-made structures that are of any particular significance, or protected by the National Heritage Resources Act (1998) have been discovered within the Nature Reserve, every attempt should be made to protect all archaeological sites and artefacts.

The two identified beacons and dam house that exist on site are being conserved.

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Table 5-12 Operational Requirements – Heritage Management

HERITAGE MANAGEMENT				
Objectives	To conserve any archaeological and/or paleontological artefacts and manage to maximise benefits to all			
Legal Framework	National Heritage Resources Act No. 25 of 1998			
Key Deliverables	Management Activities	Management Target	Responsibility	Timeframe
Conserve the two beacons and dam house	Map and conserve the two identified beacons located within the Nature Reserve.	No damage or vandalism.	KMA	Ongoing
	Area to be out of bounds to any vehicles and pedestrians.	No recorded incidence of damage and trespassing.	KMA	Ongoing
Manage the discovery of any archaeological and/or paleontological artefacts	The collection of archaeological and/or paleontological artefacts is prohibited.	All discoveries are recorded and managed appropriately.	KMA	As and when required
	Any proposed development within the Nature Reserve, as part of its environmental impact assessment, must consider the presence and impact of archaeological and/or paleontological resources.		KMA	As and when required
	Liaise with Heritage Western Cape (HWC) on the discovery of any heritage resources to ensure its conservation.		KMA/HWC	As and when required

5.4 EDUCATIONAL DEVELOPMENT AND RECREATIONAL ACTIVITIES

5.4.1 Environmental Education

School, university and private groups can arrange guided hikes and nuclear and environmental education presentations through the Koeberg's Visitors Centre.

5.4.2 Biodiversity Research

Students from universities and universities of technology can submit research proposals for consideration. If the research is approved they will receive a permit to conduct their research in the nature reserve. One of the permit conditions is that Eskom should receive a copy of their final work.

5.4.3 Recreation Facilities Management

Two hiking trails and a mountain bike trail have been developed on the Nature Reserve, namely;

- The Grysbok trail starts at the covered parking area opposite the Visitors Centre and follows a circular route through the Nature Reserve with a stroll along the beach and offers panoramic views of Table Mountain. This trail offers two options of 5,7 km and 2,5 km with a view of ruins of a historical farmhouse and a natural pan, and
- The Dikkop trail also starts at the covered parking area opposite the Visitors Centre and follows a circular route through which leads the hiker through widely varying terrain. This trail offers three options of 9,5 km, 19 km and 22,3 km.
- The mountain bike trails follows the service routes through the Nature Reserve.

A number of structures such as trail resting spots and a bird hide have been erected along the trails. These structures are inspected and cleaned on a regular basis.

No public vehicles are allowed into the CZ and onto beaches. Eskom has limited access onto the beach to do monitoring on the beach profiles and sea life.

The impact of the different types of public access must be monitored and relevant management practices applied and adapted accordingly.

5.4.4 Management of Visitor Activities

All visitors are required to sign in and get a day permit at the access point of entry, i.e. West Coast Road and the Duynefontein entrance, respectively.

Table 5-13 Permissible and prohibited activities within the Nature Reserve

Permissible activities	Prohibited Activities
Hiking on demarcated trails	Littering
Mountain biking on demarcated trail	Picking of Flora
Birding	Poaching or disturbance or feeding of fauna
Vehicles are allowed only on tarred roads	Pets

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Special events on approval of the KMA	Firearms
	Open Fires
	Access to the beach, except on the marked Dikkop Trail
	Fishing
	Swimming
	Diving, Surfing, Kite-Surfing
	Paragliding, Parachuting
	Boating

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Table 5-14 Operational Requirements – Educational Development and Recreational Activities

EDUCATIONAL DEVELOPMENT AND RECREATIONAL ACTIVITIES				
Objectives	To promote environmental education and biodiversity research.			
	To promote the use of Koeberg’s recreational facilities, i.e. mountain bike and hiking trails.			
Key Deliverables	Management Activities	Management Target	Responsibility	Timeframe
Promote nuclear and environmental education	Facilitate public visits to the Nature Reserve and Koeberg Visitor’s Centre	To increase the number of visitors year on year.	KMA	Ongoing
Support research initiatives	Permit environmental related research projects within the Nature Reserve.	Final research material to be made available to Koeberg.	KMA	As and when required
Maintain recreational facilities in support of activities in the Nature Reserve	Maintain the existing hiking and mountain bike trails, and basic facilities to cater for visitors to the Nature Reserve.	To allow the public to enjoy the hiking and mountain biking routes. Facilitate easy public access without incident. No incidents of inappropriate behaviour.	KMA	Ongoing
	Monitor usage and behaviour of visitors in the Nature Reserve			
	Ensure appropriate signage to be erected at main entrances that the use of these facilities are at own risk.			
Management of annual events approved by the KMA	Annual Koeberg Nature Reserve Open Day – NSRI (4x4)	To ensure successful events with no sustainable negative impact on the CZ.	KMA	Annually
	Annual Koeberg 15 km Fun Run			
	Annual Koeberg Cross Country League			

5.5 SECURITY

In order to limit impacts due to illegal trespassing on Eskom land it is essential to establish proper boundaries. It will also be advantageous to have a proper, well maintained fence line demarcating the boundaries of the Eskom property.

Fencing is used to demarcate the boundary of the Eskom property, to create a security controlled (limited access area) and to act as a game enclosure. Inside fences are used to provide a boundary between the CZ and the DZ, where appropriate.

Access to the Koeberg Nature Reserve and KNPS are strictly controlled by Koeberg Security located at the main access gates. No member of the public is allowed to enter the KNPS without the required clearance and security checks.

The Nature Reserve is regularly patrolled to ensure no illegal occupiers settle on the land.

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Table 5-15 Operational Requirements – Security

SECURITY				
Objectives	To ensure the buffer area around the KNPS with access control determined by the KNPS Security programme			
	To ensure maintenance of game/boundary fences			
Legal Framework	Cape Nature Conservation Ordinance 19 of 1974 Fencing Act No. 31 of 1963			
Key Deliverables	Management Activities	Management Target	Responsibility	Timeframe
Security (Access Control)	Level of access to the site is determined and controlled by Koeberg security and the KMA.	Only authorised persons entering Eskom premises.	KNPS, KMA & SAPS	Ongoing
	Access controls (requirements) are determined by the Koeberg Security and the KMA.			
	Where possible, trespassers will be apprehended. KNPS/KMA will maintain a relationship with SAPS for law enforcement.			
Fence Management (Boundary/Game fences)	Maintain existing boundary and game fences.	Maintain fence in good condition.	KMA	Ongoing
	Maintain a firebreak, a road or low fynbos vegetation on the inside of the fence to ensure access for maintenance and patrols.			
	Spray of herbicides underneath the fence to keep clear of plant growth (minimise the impact of veld fires).			
Patrols	Ensure access along fences, the beach and all areas within the DZ and CZ to allow staff to patrol the site for trespassers.	No trespassers or prohibited activities performed in the CZ. Identify areas where fence maintenance is required.	KMA & KNPS	Ongoing
	Regular inspections of the integrity of fences surrounding DZ and CZ.			
	Maintain 4x4 access for vehicle patrol purposes			

5.6 OPERATIONAL MANAGEMENT OF THE KOEBERG NATURE RESERVE

Operational management of the Koeberg Nature Reserve includes;

Section 5.6.1: Infrastructure development and maintenance in the CZ;

Section 5.6.2: Transmission Corridor Management

Section 5.6.3: Monitoring and Reporting; and

Section 5.6.4: Development of the Annual Plan of Operation.

5.6.1 Infrastructure development and maintenance

In order for KNPS and the Koeberg Nature Reserve to operate appropriately, adequate facilities and infrastructure are developed and maintained both for access, conservation purposes and to enhance the educational and recreational experience of the visitors.

All existing roads (tarred and gravel) must be maintained to prevent erosion. Degradation preventative measures are in place and include;

- Diving at low speeds (not to exceed 35 km/h);
- Utilising 4x4 (as authorised by KMA) when driving in soft sand;
- Preventing erosion of road and track surfaces;
- All roads used regularly should be marked clearly;
- Ensure vehicles do not deviate from demarcated routes; and
- Continuous inspection of roads.

The other infrastructure within the CZ that required routine maintenance includes the bird hide, trail rest stops, boardwalks and trail signage, and is typically wooden structures.

5.6.2 Transmission Corridor Management

According to the Eskom's Standard of Busch Clearing and Maintenance within the Overhead Powerline Servitudes (ESKASABG, 2000) the servitude and access roads are to be cleared. For each specific site the requirements for the removal of vegetation is specified.

For the section of the Dassenberg overhead line located within the Koeberg Nature Reserve no fires are allowed on the dune thicket in the frontal dune system (i.e. the first dune system encountered as one travels from the KNPS, starting at the first gravel service road and then grading into a transitional dune thicket-fynbos type. The vegetation type here is rare and is mainly dune strandveld but has transitional fynbos elements, which grade into Atlantis Sand Fynbos towards the east.

The following maintenance activities are to be undertaken within the transmission corridor:

- No controlled fires;
- Brush cut tall vegetation to 1.5 m;
- Removal of all alien vegetation; and
- No or limited bossie cutting, as this will result in high impact on the vegetation and will reduce the species diversity steadily with continued cutting.

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5.6.3 Monitoring and Reporting

During the execution of their daily operations, the staff of the KMA monitors and assesses various aspects of the Nature Reserve as laid out in the Management Plan.

Routine monitoring and management oversight within the KMA is performed in order to check the status of implementation of the Management Plan to allow early identification of potential areas of concern, allowing them to be addressed timeously. This will entail;-

- Identifying potential areas of concerns or opportunities so that they can be addressed timeously;
- Ensure adequate and appropriate interventions to address environmental degradation;
- Review the status of the Site Development Plan and any known proposed developments in the vicinity of the Nature Reserve;
- Monitor compliance to legal requirements;
- Monitor all incidents/events that occurred impacting the objectives of the Nature Reserve; and
- Provide input for the annual management review and the reporting to the relevant authorities.

5.6.4 Annual Koeberg Management Plan Review

The purpose of the annual review of the Koeberg Nature Reserve Management Plan is to:

- State how effectively the management plan has been implemented.
- Assist in determining the focus for the annual plan of operation and the setting of appropriate time frames and budgets.
- Enable effective adaptive management by identifying changes and modifying management interventions.

The review will be facilitated through the completion of the template contained in Chapter 7 and will seamlessly generate the Annual Plan of Operations (APO) for the following financial year.

An annual management meeting is to be held for the Nature Reserve. The purpose of the annual management meeting for the Nature Reserve is to:

- Review the effectiveness of implementation of the Management Plan as documented in the annual management plan review;
- Assist in determining the focus for the next Annual Plan of Operation considering realistic timeframes and the available budget, based on the key environmental aspects set out in the management plan.
- Enable effective adaptive management by identifying changes and the need to modify management interventions as described in the management plan's objectives, strategic outcomes, management activities or targets.

The management plan will be submitted to the MEC every 5 years for approval. Only major changes or amendment to the management plan require approval from the MEC prior to completion of the 5 years cycle.

In developing Annual Plans of Operation (APO's) for the upcoming year Nature Reserve the resource requirements, associated with management activities and targets set out in the operational management framework must considered the available budget all available resources. The following broadly identifies the issues that must be routinely provided for:

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- Administration and management of the Nature Reserve.
- Implementation of the vegetation clearance in the transmission corridors.
- Firefighting response to wildfires and maintenance of the firebreaks.
- An ongoing invasive vegetation removal programme.
- An ongoing soil erosion control and rehabilitation programme.
- Patrolling of the site and its boundaries (i.e. fence).
- Maintenance of roads, paths and fences within the site.
- Maintenance of facilities and infrastructure within the site.

The annual budget available for conservation management is determined as part of the annual Eskom budgeting process which is directly influenced by the prevailing Eskom budget. The budget for the current financial year (2014/15) for conservation management of 3 sites (Duynefontein, Thyspunt and Bantamsklip) including the Koeberg Nature Reserve is approximately R10,000,000.00 for the year.

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Table 5-16 Operational Requirements – Operational Management of the Koeberg Nature Reserve

OPERATIONAL MANAGEMENT OF THE NATURE RESERVE				
Objectives	Effective management and operation of the nature reserve.			
	Infrastructure must be maintained to avoid any damage to the environment and ensure the safety of staff and visitors to the site.			
Key Deliverable	Management Activities	Management Target	Responsibility	Timeframe
Road Maintenance	Road to be maintained in a serviceable condition.	Acceptable road conditions.	KMA	Ongoing
Maintain infrastructure within the CZ (typically wooden)	Regularly inspect and maintain when necessary.	Maintain the condition of the infrastructure to be safe, user friendly and in a reputable state.	KMA	Ongoing
Legal Compliance	Ensure compliance with existing legislation and policies.	Legal Compliance	KMA	Ongoing
	Ongoing review of new or draft legislation and policies.			
Transmission Corridor Management	Manage and maintain vegetation along the transmission corridor network.	Minimise the fire hazard risk along the transmission corridor	KMA	Ongoing
Monitoring and reporting	Management oversight within the KMA of the status of implementation of the Management Plan.	Quarterly reporting of the status of implementation. (Template provided in Chapter 6)	KMA	Quarterly
	Report to the Authorities on the implementation of the Management Plan.	Proof that the reports were sent as required to the relevant Authorities.	KMA	Annually
Management review of the effectiveness of the Management Plan	Annually review the effectiveness of achieving the objectives of the Management Plan and determine any specific actions needed to resolve or address gaps in the Annual Plan of Operation (APO) for the upcoming year.	Perform the Management Review internally, present to CapeNature, and submit to the Authorities prior to the end of June each year. (Template provided in Chapter 7)	KMA & CN	Annually