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date 6 August 2020

Melkhoutrivier Farm
Swellendam
6740

Dear Mr. JOHANNES PIETERSE BOOYSEN

GAME MANAGEMENT PLAN & RISK ASSESSEMENT FOR THE INTRODUCTION OF NYALA & IMPALA AND OTHER EXTRA-LIMITAL GAME SPECIES

CapeNature has evaluated the Game management plan & Risk Assessment for the Introduction of nyala, impala, common reedbuck, sable antelope, roan antelope, blue wildebeest and common waterbuck for 'Melkhoutrivier farm', and confirms that it has been approved in terms of CapeNature's Game Translocation and Utilization Policy (GTUP), amended August 2019, subject to the following conditions:

1. The plan is approved for the following extra-limital species: nyala, impala, common reedbuck, sable antelope, roan antelope, blue wildebeest and common waterbuck only.
2. In addition, a monitoring program to evaluate the impacts these species have on biodiversity, both fauna and flora, as well as the sensitive vegetation on the property of Melkhoutrivier farm must be implemented. Furthermore, if remedial action renders that the impacts to the sensitive vegetation cannot be mitigated significantly, CapeNature reserves the right to instruct the removal of these species at the expense of the landowner. Such instruction will be dependent on the relevant scientific monitoring data submitted for consideration.
3. It is crucial that monitoring reports, as prescribed in the risk assessment, must be submitted to CapeNature with three (3) months after the three-year trial period for consideration. Failure to do so may result in future permits being revoked.
4. Applications for the import, export and translocation of these species remain subject to the permitting system of CapeNature.
5. The provisions of the Nature Conservation Ordinance (Ordinance 19 of 1974) remain applicable with regard to the buying and selling of game, and therefore game must still be bought and sold in accordance with valid permits issued by CapeNature. Any wild animals that were previously acquired without the required permits are not automatically considered to be legally

acquired, with the approval of any game management plan and or risk assessment.

6. The approval of the Game Management Plan & Risk Assessment for the introduction of extralimital species for Melkhoutrivier farm, does not absolve the applicant from complying with the legal requirements in terms of the Nature Conservation Ordinance (Ordinance 19 of 1974) for the existing game currently on the property.
7. In terms of the CapeNature Fencing Policy 23 January 2015, that I must maintain a Class 6, 2.4m game fence that shall prevent the species nyala and impala from escaping my property, namely Melkhoutrivier.
8. Furthermore, in terms of the same CapeNature Fencing Policy 23 January 2015, that I must maintain a Class 4, 2.4m dangerous game fence with electrification that shall prevent any buffalo from escaping my property, namely Melkhoutrivier farm.
9. Introduction of game is subject to inspection and approval of game fencing specification.

Congratulations, and thank you for your contribution to the expansion of the conservation economy in the Western Cape.

Yours sincerely



Alan Wheeler
Landscape Manger: South
Directorate: Conservation Operations.
CapeNature.

MELKHOUTRIVIER

Portion of Portion 1 of Farm 492, Malgas.
Municipality of Swellendam

HANNES BOOYSEN



GAME MANAGEMENT PLAN

As required by provincial policy for the translocation of 'extralimital' game species to the relevant property and their long-term management in accordance with the principles of sustainability.

Amended Report
Following on the input of CapeNature
19 JUNE 2020

Prepared by:
SW van der Merwe Environmental Planning
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GLOSSARY

Adequately enclosed	In relation to land means enclosed by— (a) any fence, wall or obstruction of any kind whatsoever forming all enclosure from which any wild animal is unable to escape without breaking it; (b) any natural boundary through or over which any wild animal will under normal circumstances not pass, or (c) any combination of fences, walls, obstructions or boundaries referred to in paragraphs (a) and (b) so that any wild animal cannot escape from such land (refer Section 2 of Ordinance 19 of 1974).
Alien species	(a) a species that is not an indigenous species; or (b) an indigenous species translocated or intended to be translocated to a place outside its natural distribution range in nature, but not an indigenous species that has extended its natural distribution range by natural means of migration or dispersal without human intervention; (Read with 'extralimital') (See Section 1 of NEMBA).
Biodiversity	It is an abbreviation of 'biological diversity' which is described as the mix of species in an ecosystem that enables the system both to provide a flow of ecosystem services under given environmental conditions, and to maintain that flow if environmental conditions change. The loss of biodiversity limits the resilience of the affected ecosystem, which in turn, may have direct negative socio-economic implications. Furthermore, biodiversity is the degree of variation of life forms within a given ecosystem, biome, or an entire planet. Biodiversity is one measure of the health of ecosystems, and life on earth today consists of many millions of distinct biological species.
CapeNature	CapeNature is the public institution with the statutory responsibility for biodiversity conservation in the Western Cape Province.
Captivity	In relation to any wild animal means the keeping within an enclosure by

	means of any fence, wall or obstruction of any kind whatsoever in such a way that such wild animal is unable to maintain itself by natural means; (See Section 2 of Ordinance 19 of 1974).
Catchment or catchment area	The entire drainage area from which water flows into a river or other water body. Also known as a watershed, it is an extent or area where surface water from rain and melting snow or ice converges to a single point, usually the exit of the basin, where water joins on other water body such as a river, lake, reservoir, estuary, wetland, sea or ocean. Generally consisting of various smaller 'quaternary' catchments, or 'sub-catchments'.
CBA	Critical Biodiversity Area.
Certificate of Adequate Enclosure	A document issued in terms of section 35 of the Nature Conservation Ordinance, No. 19 of 1974, for protected wild animals listed on the certificate.
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora, Washington, 1973.
CoAE	Certificate of Adequate Enclosure.
Conservation	The management of human use of the biosphere to yield the greatest benefit to present generations while maintaining the potential to meet the needs and aspirations of future generations. Conservation thus includes sustainable use, protection, maintenance, rehabilitation, restoration, and enhancement of the natural and cultural environment.
Ecosystem	A dynamic system of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit.
EM	Effective Microbes.
Environment	The surroundings within which humans exist and that are made up of: a) the land, water and atmosphere of the earth; b) micro-organisms, plant and animal life; c) any part or combination of (a) and (b) and the interrelationships among and between them; and the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.

ESA	Ecological Support Areas
Extralimital species	Indigenous species outside its historic natural distribution range.
ISO	International Organisation for Standardisation. It's the international standard-setting body and the use of standards ensures that products and services are safe, reliable and of good quality.
LAU	Large Animal Unit
LUPO	Land Use Planning Ordinance 15 of 1985
NEM:BA	National Environmental Management: Biodiversity Act 10 of 2004.
NEMA	National Environmental Management Act 107 of 1998.
SANBI	South African National Biodiversity Institute.
Species	Plants, animals, or other organisms that do not normally interbreed with individuals of another kind, including any sub-species, cultivar, variety, strain, hybrid, or geographically separate population provided they are not part of another species.
Sustainable development	Sustainable development is <i>development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs.</i>

INDEMNIFICATION

The recommendations and guidelines presented in this GMP (Game Management Plan) are premised upon the quoted scientific information and other data applicable to the area and the land-use addressed. The data base has been interrogated, interpreted, and applied in context of the unique place-specific characteristics of the subject area, and supplemented by means of the study and analysis undertaken as premise for the drafting of the GMP.

The recommendations and guidelines presented are furthermore based upon industry norms and standard procedures applicable to the land-use or projects provided for in the GMP. These norms and standards have been translated into place-specific management recommendations and guidelines for the subject area.

SW van der Merwe Environmental Planning, as the author of the GMP, has taken reasonable steps, and has applied the precautionary principle as it relates to scrutinising and applying the available data base. However, it does not accept responsibility and/or liability for:

1. The correctness of baseline information and for any inappropriate recommendation and guideline that result from incorrect information.
2. Any losses due to failure on the part of the executor of the GMP to follow the guidance presented in the GMP.



SW VAN DER MERWE

19 JUNE 2020

CHAPTER 1 INTRODUCTION

This game management plan (GMP) pertains to the farm Melkhoutrivier (further also referred to as 'the farm') near Malgas in the Swellendam Municipality. The farm belongs to Hannes Booysen of High Riding Estate, Sir Lowrys Pass.

This GMP is based on the principles of integrated planning, which is an antithesis for site-specific planning that ignores the context of the planning area. Conventional farm planning often treats planning areas as 'islands' with little, or no, connectivity to their surroundings. In this regard, the Melkhoutrivier plans build on the statement of the IUCN (1995)¹ that *sustainability requires planning and management for biodiversity conservation across human dominated landscapes. To achieve this, areas should no longer be considered as islands of designated land-use within a sea of development but as an integral part of each region as a whole in terms of holistic environmental care.*

The GMP pertains to the introduction and long-term management of the following extralimital species:

- a) Blue Wildebeest (*Connochaetes taurinus*)
- b) Common Reedbuck (*Redunca arundinum*)
- c) Common Waterbuck (*Kobus ellipsiprymnus*)
- d) Impala (*Aepyceros melampus*)
- e) Nyala (*Tragelaphus angasii*)
- f) Roan Antelope (*Hippotragus equinus*)
- g) Sable Antelope (*Hippotragus niger niger*)

The owner's plans and intentions for the game are flexible and subject to on-going monitoring. Accordingly, this GMP also provides for the management of the farm for as it relates to:

- (i) Other suitable species that may be considered in terms of special arrangements, namely:

¹ IUCN, 1995. *National Biodiversity Planning*. World Conservation Unit. http://newsroom.wri.org/newsrelease_text.cfm?NewsReleaseID=113.

- Bontebok (*Damaliscus pygargus*)
 - Cape Buffalo (*Cyncerus caffer*)
- (ii) Common species that occur or may be considered for introduction, including:
- Cape eland (*Taurotragus oryx oryx*)
 - Gemsbok (*Oryx gazelle*)
 - Red hartebeest (*Alcelaphus buselaphus caama*)
 - Springbok (*Antidorcas marsupialis*)

The management plan was prepared in compliance with CapeNature's policy document entitled *Game Translocation and Utilisation Policy for the Western Cape Province* (February, 2011).

1.1 KEY ASPECTS OF THE DOCUMENT

The overarching objectives of the GMP are to:

- a) Ensure that risks posed to biodiversity by the introduction of extralimital game species are effectively mitigated.
 - b) Ensure sustainability of natural areas.
 - c) Ensure ecological integrity of all introduced and naturally-occurring species.
 - d) Effective protection, biosecurity and compliance.
 - e) Enable the owner to, in strict compliance with the applicable legislation and policy, purchase, breed and sell suitable game species through the live game industry.
- Accordingly, the GMP is to enable the owner to:
- (i) Translocate game species indigenous to South Africa, including defined extralimital species into and within the subject region.
 - (ii) Translocate the species listed in this document between Melkhoutrivier and farms with approved GMPs.
- f) Provide assurance to the CapeNature, neighbours, and other key stakeholders that the objectives of sustainability would be served and that best-practice management interventions would be implemented so as to ensure that the entire Melkhoutrivier operation represents an improvement of the state of the environment as contemplated by the applicable statutes. In this regard, specific reference is made to the long-term

- protection of the Critical Biodiversity Areas (CBAs) that occur on the farm (refer to Section 5).
- g) Contextualise and motivate the following:
- (i) Translocation to and keeping on the farm of Impala and Nyala as applied for in terms of Section 6 of the *Game Translocation and Utilisation Policy for the Western Cape Province* as amended (a comprehensive risk and habitat assessment has been prepared and submitted under separate cover to CapeNature for Impala and Nyala).
 - (ii) Exemption, in terms of the Nature Conservation Ordinance, 1974 (Ordinance 19 of 1974) (Sections 80 and 44(1) & (E)) to buy / sell / donate / receive as a donation and transport a wild animal within the province only of the following species:
 - Cape eland (*Taurotragus oryx oryx*)
 - Gemsbok (*Oryx gazelle*)
 - Red hartebeest (*Alcelaphus buselaphus caama*)
 - Springbok (*Antidorcas marsupialis*)
- i) Enable best-practice management of the farm and the game by means of the following:
- (i) Providing a basis for the management of the game on the farm and of the resources upon which they depend.
 - (ii) Indicating potential difficulties that might be encountered and steps to mitigate these.
 - (iii) Preventing the occurrence of alien, hybridised or invasive fauna and flora on the farm and in the immediate environs.
 - (iv) Ensuring that the species that occur create as little as possible risk to the receiving environment.
 - (v) Protecting the genetic integrity of locally endemic mammals.
 - (vi) Ensuring the maintenance of the genetic integrity of the species to be introduced.

1.2 DOCUMENT STRUCTURE AND COMPLIANCE CHECKLIST

The document comprises the aspects listed in the table below. This structure complies with CapeNature's policy pertaining to the drafting of game management plans and addresses the site-specific aspects of Melkhoutrivier as an entity. The table also comprises a compliance checklist that could be used by CapeNature for the adjudication of the document.

CHAPTER	ASPECT	COMPLIANCE (For official use)	
		Yes V	No X
1	Objectives of the management plan		
2	Owner and property detail		
	Ecosystem Context and status		
3	Habitat characteristics and assessment		
4	Guiding vision, goals and objectives		
5	Animals to be introduced		
6	Potential threats and risks, and mitigation		
7	Management specifications and guidelines		
8	Continual improvement of operations		
9	Document management		

CHAPTER 2 BACKGROUND INFORMATION

2.1 CONTACT DETAIL

Owner: Johannes Pieterse Booysen
 ID Number: 690907 5262 085
 Postal Address: 69 High Riding Drive; High Riding Estate; Sir Lowrys Pass; 7129
 Cell: +27 83 4148 468
 Tel: +27 21 851 1283
 E-mail: hannes@jpbcivils.co.za

2.2 FARM DETAIL

2.2.1 LOCATION

Melkhoutrivier is located in the Swellendam Municipality approximately 7 km due east of Malgas.
 Access to the farm is provided by Malgas-Infanta Main Road 268.



Figure 1: Location of Melkhoutrivier.

2.2.2 CADASTRAL CONTEXT

The farm consists of a single unit entitled Portion of Portion 1 of Farm 492, Malgas. The portion is approximately 360 ha in extent. The cadastral context of the property is illustrated by Figure 2.

The title deed does not contain any restrictions that prohibit the keeping of game. The property is zoned for agriculture in terms of the Land Use Planning Ordinance No. 15 of 1985.



Figure 2: Cadastral context of the farm.

2.3 LOGISTICAL SUPPORT FOR THE GAME PROJECT

The farm is being developed in accordance with dedicated Terrain Development Plan (refer to Chapter 7.1). The plan provides for various existing and envisaged logistical support items, including:

- a) A lodge building and amenities.
- b) Adequate buildings for staff, storage and shed.
- c) Adequate access roads occur throughout the farm.
- d) Adequate underground and stored surface water.
- e) The farm and the various camps are being fenced with a Class 1 fence as provided for in CapeNature's Minimum Specifications for Adequate Enclosure of 23 January 2015.

2.4 CURRENT LAND-USE

Approximately 50% (i.e. 180 ha) of the farm has been totally modified and fragmented due to regular cultivation. The game farming will be undertaken on the modified areas only.

Melkhoutrivier and its surrounding areas are characterised by low to medium-low farming income potential (refer to Figure 3).

The farm is bordered by farmland used for mixed conventional agriculture and primarily tourism-related development along the Breede River. Portions 6/494, 19/492, 31/492, 11/492 and 8/492 fall within the latter category (refer to Figure 4).

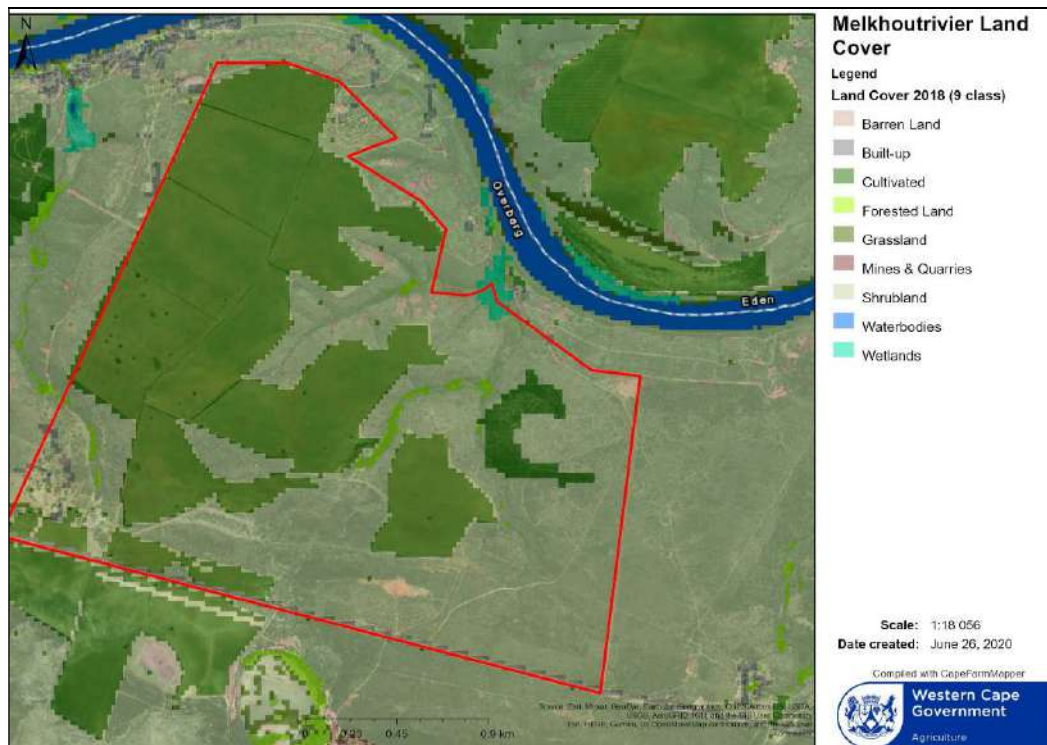


Figure 3: Melkhoutrivier Land Cover (Adapted from CapeFarmMapper²).

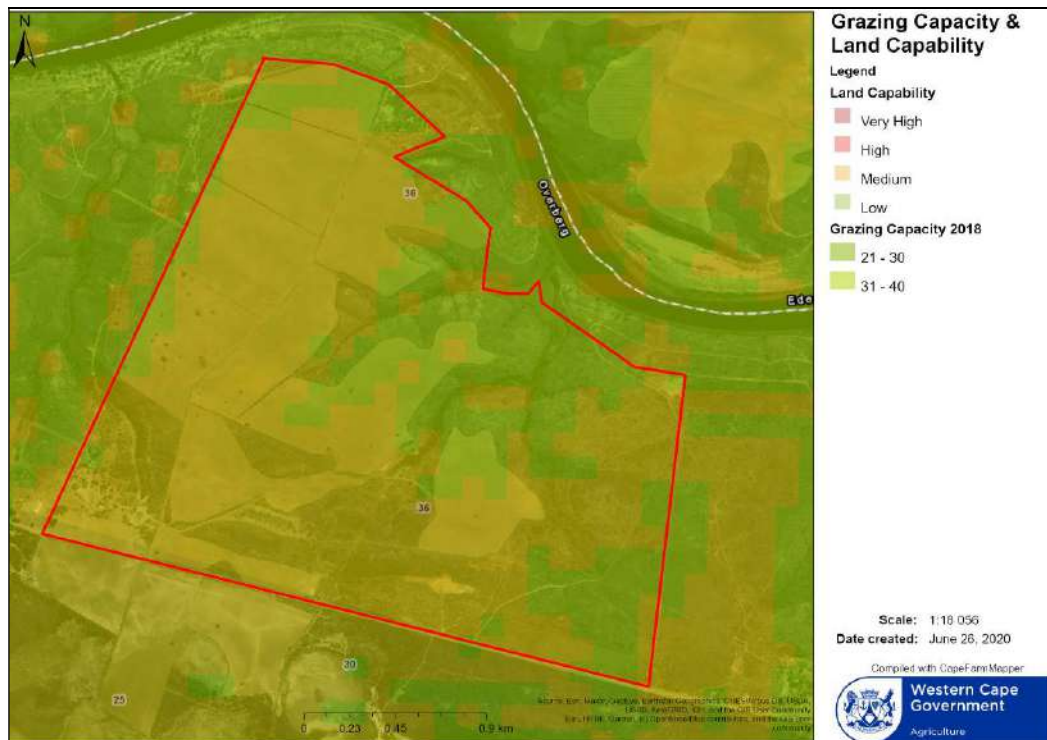


Figure 4: Farming income potential of Melkhoutrivier and surroundings (CapeFarmMapper).

² CapeFarmMapper is a product of the Western Cape Department of Agriculture. This online mapping tool is designed to assist with spatial information queries and decision making in the fields of agriculture and environmental management.

CHAPTER 3 ECOSYSTEM CONTEXT AND STATUS

3.1 REGIONAL CONSERVATION CONTEXT

The farm is located in close proximity to the Breede River which is a major conservation corridor and is tucked in between the De Hoop Nature Reserve and the designated Gouritz Cluster Biosphere Reserve. As such, it forms part of the transitional area between these two entities.

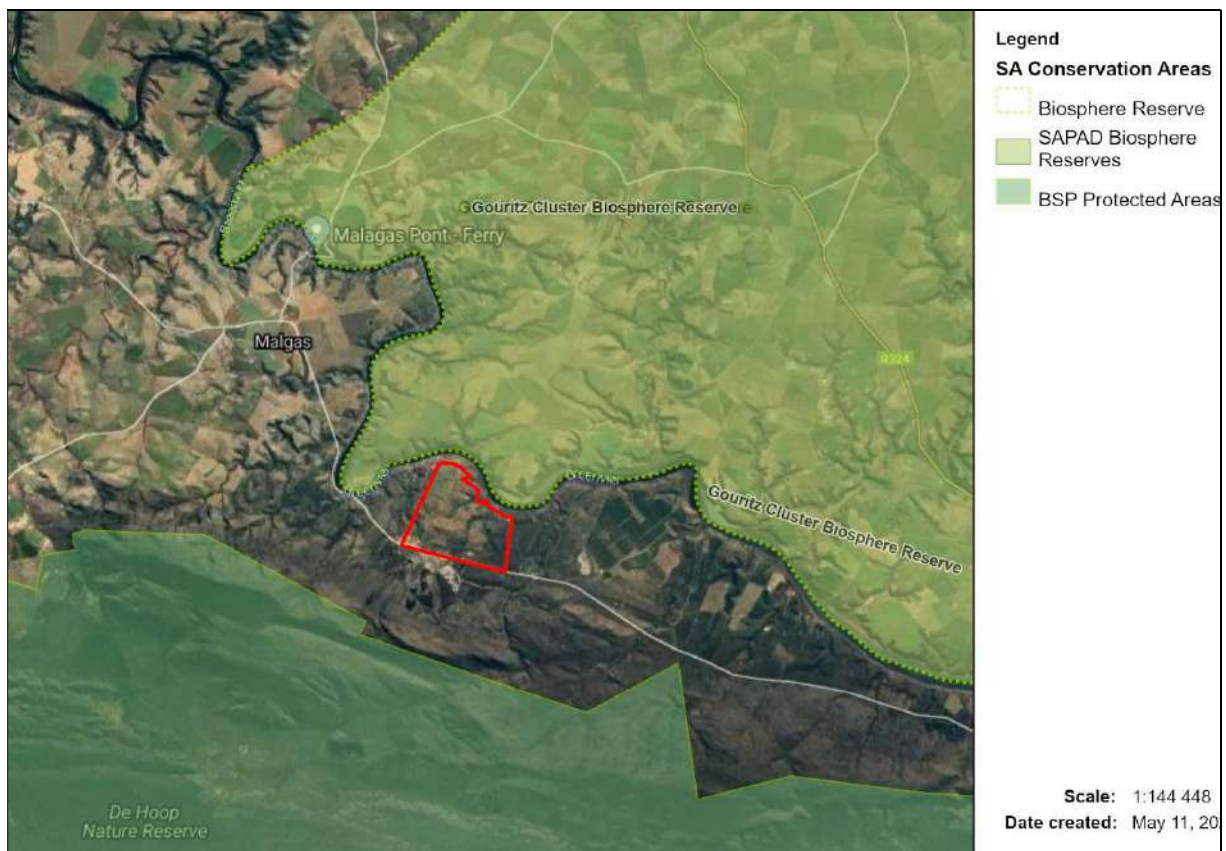


Figure 5: Melkhoutrivier is located in the transitional area between De Hoop Nature Reserve and the designated Gouritz Cluster Biosphere Reserve (Adapted from CapeFarmMapper).

3.2 MELKHOUTRIVIER IN CONTEXT OF THE CRITICAL BIODIVERSITY AREAS

According to the official Critical Biodiversity Areas³ (CBA) map⁴ (Pence, 2017⁵) Melkhoutrivier comprises a CBA (primarily associated with the on-site riverine areas) and a buffering ESA (Ecological Support Area). The ESA is essential for the long-term sustainability of the CBA (Pool-Stanvliet et al, 2017)⁶.



Figure 6: Melkhoutrivier in context of the mapped CBAs (Source: Pence, 2017)⁷.

³ CBAs incorporate areas that need to be safeguarded in order to meet national biodiversity thresholds areas required to ensure the continued existence and functioning of natural species and ecosystems, including the delivery of ecosystem services; and/or important locations for biodiversity features or rare species.

⁴ This map aims to guide sustainable development by providing a synthesis of biodiversity information to decision makers.

⁵ Pence, G.Q.K. 2017. The Western Cape Biodiversity Spatial Plan: Technical Report. In Prep. Western Cape Nature Conservation Board (CapeNature), Cape Town.

⁶ Pool-Stanvliet, R., Duffell-Canham, A., Pence, G. & Smart, R. (2017). The Western Cape Biodiversity Spatial Plan Handbook. Stellenbosch: CapeNature.

⁷ Pence, G.Q.K. 2017. The Western Cape Biodiversity Spatial Plan: Technical Report. In Prep. Western Cape Nature Conservation Board (CapeNature), Cape Town.

3.2 MELKHOUTRIVIER AS PART OF THE DISTRIBUTION OF VULNERABLE VEGETATION TYPES

The primary reason for the conservation status of the area is the natural vegetation types that occur, or which occurred on the farm in the past. The relevant vegetation types on Melkhoutrivier are classified as (refer to Figure 7):

- Potberg Ferricrete Fynbos
- Potberg Sandstone Fynbos
- Cape Lowland Alluvial Vegetation



Figure 7: Vegetation types that characterise Melkhoutrivier (Adapted from CapeFarmMapper).

The characteristic indigenous plant species that occur on the farm and the vicinity include the following:

GROWTH FORM	SPECIES
Small Trees	<i>Brabejum stellatifolium</i> , <i>Chrysanthemoides monilifera</i> , <i>Euryops speciosissimus</i> , <i>Gymnosporia buxifolia</i> , <i>Heeria argentea</i> , <i>Lebeckia cytisoides</i> , <i>Leucadendron argenteum</i> , <i>Maytenus</i> spp, <i>Metalasia densa</i> , <i>Metrosideros angustifolia</i> , <i>Morella cordifolia</i> , <i>Olea europaea</i> ssp <i>Africana</i> , <i>Passerina corymbosa</i> , <i>Rhus angustifolia</i> , <i>Rhus lucida</i> , <i>Wiborgia obcordata</i> .

Tall Shrubs	<i>Diastella proteoides</i> , <i>Diosma hirsute</i> , <i>Erica lasciva</i> , <i>Phylica cephalantha</i> , <i>Senecio halimifolius</i> , <i>Serruria glomerata</i> , <i>Stoebe plumose</i> , <i>Anthospermum aethiopicum</i> , <i>Aspalathus callosa</i> , <i>A. hispida</i> , <i>A. spinosa</i> subsp. <i>spinosa</i> , <i>A. ternata</i> , <i>Berzelia languinosa</i> , <i>Chrysanthemoides incana</i> , <i>Cliffortia eriocephalina</i> , <i>Erica articularis</i> , <i>E. pulchella</i> , <i>Eriocephalus africanus</i> , <i>Galenia africana</i> , <i>Gnidia spicata</i> , <i>Leucadendron floridum</i> , <i>Leucospermum hypophyllo-carpodendron</i> , <i>Metalasia adunca</i> , <i>Passerina ericoides</i> , <i>Euryops thunbergii</i> .
Low Shrubs	<i>Anthospermum galioides</i> , <i>Anthospermum spathulatum</i> , <i>Aspalathus spinosa</i> , <i>Aspalathus spinosa</i> , <i>Athanasia trifurcata</i> , <i>Athanasia trifurcate</i> , <i>Athanasia trifurcate</i> , <i>Bobartia filiformis</i> , <i>Diosma hirsuta</i> , <i>Elytropappus rhinocerotis</i> , <i>Maytenus oleoides</i> , <i>Muraltia decipiens</i> , <i>Osmitopsis asteriscoides</i> , <i>Osteaspermum spinosum</i> , <i>Paranomus capitatus</i> , <i>Pentzia incana</i> , <i>Phylica gracilis</i> , <i>Thesium funale</i> , <i>Leucospermum muirri</i> , <i>Leucadendron laxum</i> , <i>Pronium serratum</i> , <i>Chondropetalum rectum</i>
Herbs	<i>Berkheya armata</i> , <i>Corymbium scabum</i> , <i>Cotula turbinata</i> , <i>Crassula expansa</i> , <i>Dianthus bolusii</i> , <i>Grammatotheca bergiana</i> , <i>Knowltonia capensis</i> , <i>Knowltonia vesicatoria</i> , <i>Lichtenstenia obscura</i> , <i>Manulea cephalotes</i> , <i>Mohria caffrorum</i> , <i>Otholobium hirtum</i> , <i>Pteridium aquilinum</i> , <i>Spiloxene flaccida</i> , <i>Stachys aethiopica</i> .
Geophytic Herbs	<i>Albuca maxima</i> , <i>Aristea cantharophila</i> , <i>Borbartia indica</i> , <i>Geissorhiza alticola</i> , <i>Lanaria lanata</i> , <i>Melasphaerula ramosa</i> , <i>Mohria caffrorum</i> , <i>Ornithogalum thyrsoides</i> , <i>Oxalis pes-caprae</i> , <i>Romulea flava</i> , <i>Romulea flexuosa</i> , <i>Watsonia marginata</i> .
Graminoids (Grasses)	<i>Calopsis paniculata</i> , <i>Cannomois parviflora</i> , <i>Cannomois virgata</i> , <i>Cynodon dactylon</i> , <i>Digitaria eriantha</i> , <i>Ehrharta calycina</i> , <i>Ehrharta capensis</i> , <i>Elegia juncea</i> , <i>Eragrostis capensis</i> , <i>Ficinia indica</i> , <i>Ficinia oligantha</i> , <i>Harporchloa falx</i> , <i>Heteropogon contortus</i> , <i>Hordeum capense</i> , <i>Hyparrhenia hirta</i> , <i>Junus capensis</i> , <i>Merxmüllera stricta</i> , <i>Pentaschistis densifolia</i> , <i>Pentaschistis pallid</i> , <i>Restio filiformis</i> , <i>Restio triticeus</i> , <i>Themeda triandra</i> , <i>Tribolium hispidum</i> ,
Possible Endemic Taxa	<i>Acmadenia faucitincta</i> , <i>Babiana secunda</i> , <i>Brunsvigia elandsmontana</i> , <i>Cliffortia acockii</i> , <i>Geissorhiza furva</i> , <i>Indigofera triquetra</i> , <i>Lotononis complanata</i> , <i>Moraea aristata</i> , <i>Nivenia corymbosa</i> , <i>Osmitopsis tenuis</i> , <i>Oxalis fragilis</i> , <i>Pelargonium</i>

	<i>viciifolium</i> , <i>Salvia thermaruma</i> , <i>Serruria incrassata</i> , <i>Spetaea lachenaliiflora</i> , <i>Thereianthus ixioides</i> , <i>Thesium diversifolium</i> , <i>Tritoniopsis pulchella</i> .
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3.3 MELKHOUTRIVIER AS A HABITAT FOR NATURAL FAUNA

A variety of ungulates, smaller mammals, avifauna, reptiles, etc. occur on the farm and in the vicinity. The tables below summarise the species that are known to occur in the sub-region within which the farm is located. Larger ungulates that occur on adjoining farms and which may be of significance for Melkhoutrivier are also listed.

TYPE	SPECIES
Mammals	Bushbuck (<i>Tragelaphus scriptus</i>), Bushpig (<i>Potamochoerus larvatus</i>), Caracal (<i>Felis caracal</i>), Grey Rhebok (<i>Pelea capreolus</i>), Cape Grysbok (<i>Raphicerus melanotis</i>), Baboon (<i>Papio ursinus</i>), Honey Badger (<i>Mellivora capensis</i>), Grey Mongoose (<i>Galerella pulverulenta</i>), Striped Polecat (<i>Ictonyx straitus</i>), Porcupine (<i>Hystrix africaeaustralis</i>), Water Mongoose (<i>Atilax paludinosus</i>), Striped Field mouse (<i>Rhabdomys pumilio</i>), Namaqua Rock Mouse (<i>Aethomys namaquensis</i>), Spiny Mouse (<i>Acomys subspinosus</i>), Vlei Rat (<i>Otomys irroratus</i>), Elephant Shrew (<i>Elephantulus rupestris</i>), Cape Clawless Otter (<i>Aonyx capensis</i>), Eland (<i>Taurotragus oryx</i>), Plains Zebra (<i>Equus quagga</i>), Springbok (<i>Antidorcas marsupialis</i>), Bontebok (<i>Damaliscus pygargus</i>), Blue Wildebeest (<i>Connochaetes taurinus</i>), Sable Antelope (<i>Hippotragus niger niger</i>), Waterbuck (<i>Kobus ellipsiprymnus</i>), Cape Buffalo (<i>Cyncerus caffer</i>).
Birds	Verreaux's Eagle (<i>Aquila verreauxii</i>), Spotted Eagle Owl (<i>Bubo africanus</i>), Orange-breasted Sunbird (<i>Nectarinia violacea</i>), Cape Spurfowl (<i>Pternistis capensis</i>), Cape Bulbul (<i>Pycnonotus capensis</i>), Striped Flufftail (<i>Sarothrura affinis</i>), Cape Siskin (<i>Crithagra totta</i>), Victorin Warbler (<i>Cyrptillas victorini</i>), Peregrine Falcon (<i>Falco peregrinus</i>), Black Harrier (<i>Circus maurus</i>), Denham's Bustard (<i>Neotis denhami</i>), Southern Black Korhaan (<i>Afrotis afra</i>), Cape Rockjumper (<i>Chaetops frenatus</i>), Ground Woodpecker (<i>Geocolaptes alivaceus</i>).
Reptiles	Hawequa Flat-tailed Gecko (<i>Afroedura hawequensis</i>), Oelofsen's Girdled Lizard (<i>Cordylus oelofsen</i>), Cross-marked Grass Snake (<i>Psammophis crucifer</i>), Cape Cobra

	(<i>Naja nivea</i>), Berg Adder (<i>Bitis atropus</i>), Puff Adder (<i>Bitis arietans</i>), Cape Legless Skink (<i>Acontias meleagris</i>), Spotted Sand Lizard (<i>Pedioplanis lineocellata</i>)
Amphibians	Cape Platanna (<i>Xenopus gilli</i>), Cape Mountain Toad (<i>Capensibufo rosei</i>), Western Leopard Toad (<i>Amietophrynus pantherinus</i>), Arum Lily Frog (<i>Hyperolius horstockii</i>), Banded Stream Frog (<i>Stronylopus grayi</i>).
Endemic Taxa	Cape Sugarbird (<i>Promerops cafer</i>), Protea Canary (<i>Serinus leucopterus</i>), Verreaux's Mouse (<i>Praomys verreauxii</i>), Protea Seed eater (<i>Crithagra leucoptera</i>).

3.4 ECOSYSTEM THREAT STATUS

The locational uniqueness of the farm and its predominant habitat types and associated fauna and flora imply that Melkhoutrivier comprises ecosystem components that are respectively classified as follows:

- Critically Endangered: Portions within the riparian corridor of the Breede River.
- Endangered: Portion located within the buffer zone of the above.
- Least Threatened: Part of the transitional area towards De Hoop Nature Reserve.

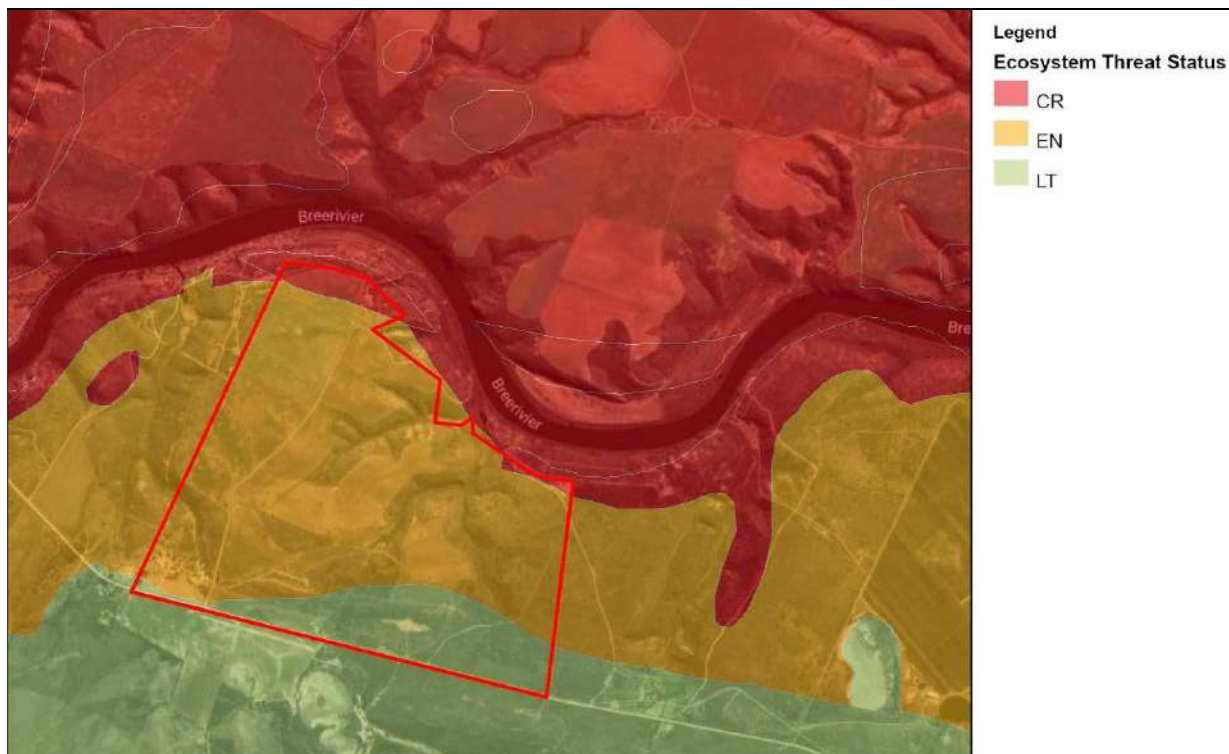


Figure 8: Status of the broader ecosystem within which Melkhoutrivier is located (Adapted from CapeFarmMapper).

CHAPTER 4 GAME SPECIES THAT MAY BE CONSIDERED

The species that may be considered for introduction are listed in the table below. It is important to note that:

- The species listed in the table will not necessarily be introduced or kept simultaneously.
- The various species have been listed in order to assess the desirability (from an adaptability and habitat suitability perspective) of their introduction and to enable the issuing of a Certificate for Adequate Enclosure for all species that are deemed suitable for introduction.

'EXTRALIMITAL' SPECIES	NUMBER	DESIRABILITY
Blue Wildebeest (<i>Connochaetes taurinus</i>)	5	Moderate
Common Reedbuck (<i>Redunca arundinum</i>)	5	Low
Impala (<i>Aepyceros melampus</i>)	10	Low
Nyala (<i>Tragelaphus angasii</i>)	10	Moderate
Roan Antelope (<i>Hippotragus equinus</i>)	5	Low
Sable Antelope (<i>Hippotragus niger niger</i>)	5	Moderate
Waterbuck (<i>Kobus ellipsiprymnus</i>)	5	Moderate
'SPECIAL ARRANGEMENT' SPECIES	NUMBER	
Bontebok (<i>Damaliscus pygargus</i>)	10	Moderate
Cape Buffalo (<i>Cyncerus caffer</i>)	5	Moderate
'COMMON' SPECIES	NUMBER	
Cape Eland (<i>Taurotragus oryx oryx</i>)	5	High
Gemsbok (<i>Oryx gazella</i>)	5	Low
Red Hartebeest (<i>Alcelaphus buselaphus caama</i>)	5	Low
Springbok (<i>Antidorcas marsupialis</i>)	10	Low

The Blue Wildebeest, Springbok and Gemsbok may include colour variants. The breeding of such colour variants would be premised upon the views of the Scientific Authority of the South African National Biodiversity Institute (SANBI) (2014)⁸ namely that *the breeding of genetically inferior*

⁸ www.sanbi.org/biodiversity-science/science.../scientific-authority Aug 13, 2014.

recessive colour morphs does not further the conservation of South Africa's wild biodiversity. However, if managed efficiently, the ecological risk associated with this practice is considered low and is outweighed by the economic potential of the practice⁹.

CHAPTER 5 POLICY AND VISION

5.1 ENVIRONMENTAL POLICY FOR MELKHOUTRIVIER

The environmental policy for the farm is *a statement by the owner of his intentions and principles in relation to his overall environmental performance, which provides a framework for action and for the setting of objectives and targets* (SABS ISO 14004:1996{E}). The following policy guides the management of the farm:

- a) Melkhoutrivier forms an integral part of the Breede River terrestrial corridor and the transitional area between the designated Gouritz Cluster Biosphere Reserve and De Hoop Nature Reserve. The farm is accordingly managed in terms of the guiding principles and directives embodied by the subject entities.
- b) All activities on the farm are undertaken in accordance with the principles of sustainability (including environmental, social, and economic sustainability). Sustainability refers to the *'equitably distributed achievement of social, ecological and economic quality of life'*. *Therefore, sustainability is more than maintaining the regenerative capacities of natural ecosystems. It is about simultaneously meeting our material needs, striving for social and economic equitability and justice, and preserving all aspects of biodiversity and the natural environment* (Aberley, 1999¹⁰)

⁹ *The genes responsible for rare colour morphs in a wide range of wildlife species are generally recessive in nature and are therefore very infrequently expressed in naturally occurring populations. The threat posed by the selective breeding of recessive colour morphs will depend on the size and genetic make-up or diversity and viability of the population receiving these recessive colour morphs. It is highly unlikely however that animals selectively bred for the expression of a rare coat colour would have any significant effect on a natural population should they escape, as the homozygous recessive genes would clearly have little effect in an overwhelmingly heterozygous population. The only real threat may arise in a situation where there is a large scale 'mixing' of recessive colour morphs into a population of dominant colour morphs, which in practice is highly unlikely to occur. The breeding of genetically inferior recessive colour morphs does not further the conservation of South Africa's wild biodiversity. However, if managed efficiently, the ecological risk associated with this practice is considered low and is outweighed by the economic potential of the practice.*

¹⁰ Aberley, D., 1999: *Interpreting bioregionalism: A story from nay voices.* <http://www.vedegylet.hu/okopolitika/Aberley%20-%20Interpreting%20Bioregionalism.pdf>

- c) The key principles relating to land-use as presented in the Western Cape Land-use Planning Act 3 of 2014 (LUPA) are given effect in all operations and activities undertaken on the farm. These principles relate to giving effect to the following aspects of land-use:
- Justice.
 - Sustainability.
 - Efficiency.
 - Good administration.
 - Resilience.
- d) Melkhoutrivier supports a systems approach to sustainability. This means the economic system (i.e. money), the social system (i.e. people), and the ecosystem are imbedded within each other, and then integrated through efficient adaptive management that holds all together in an efficient regulatory framework.

Sustainability implies the continuous and mutually compatible integration of these systems over time. Sustainable development means making sure that these systems remain mutually compatible, while the key development challenges are met through specific actions undertaken in accordance with best-practice management interventions.



5.1.1 PRINCIPLES SUPPORTING THE ENVIRONMENTAL POLICY

The above environmental policy is premised upon the following principles:

- a) Integrated conservation on private land such as Melkhoutrivier is the foundation of an integrated land-use management system advocated by CapeNature.
- b) Biodiversity conservation is a prerequisite for sustainability and for biodiversity conservation to succeed, the maintenance of environmental integrity is imperative.
- c) The mix of species in an ecosystem enables that system both to *provide* a flow of ecosystem services under given environmental conditions, and to *maintain* that flow if environmental conditions change. The loss of biodiversity therefore limits the resilience of the affected ecosystem, which in turn, may have direct negative economic implications.

5.2 GUIDING VISION FOR THE GAME

The developmental and managerial directives presented in this document are guided by and are focused on giving effect to the following vision for the game namely:

'A dedicated nature-based land-use which strives to optimise the use of the natural capital vested with the farm'.

5.3 OVERARCHING GOAL AND OBJECTIVES

The overarching aim is to ensure that the game operation contributes meaningfully to the long-term sustainability of the owner's commercial land-uses on the relevant farm by means of the following objectives:

- a) Enhancing environmental integrity
- b) Enhancing economic efficiency
- c) Ensuring biosecurity

Biosecurity refers to measures that are taken to prevent or stop harmful effects to human, animal and plant life. The measures taken are a combination of processes and systems that have been put in place by bioscience, technological innovations and best-practice managerial interventions. The main aim of biosecurity, as it relates to Melkhoutrivier, is to enhance the health of both the animals introduced and the supporting environment through the control and management of biological risk factors.

CHAPTER 6 IMPACTS AND THREATS

The premise for assessing the potential impacts of the game is that the legal land-use for the farm is agriculture, and that the proposed game project is the permissible under this land-use. The key objective of the owner is to promote long-term sustainability (refer to Chapter 5). Sustainable game farming arguably potentially holds significant strategic and ecological advantages over conventional stock farming. The primary purpose of the impact assessment undertaken for the game is to enable the owner to:

- a) Identify and optimally unlock the potential advantages inherent to sustainable game farming.
- b) Identify and avoid potential detrimental impacts or mitigate unavoidable impacts to the extent possible.
- c) In general, improve on the environmental performance of conventional farming that had been practiced on the farm to date.
- d) Manage the farm in a manner that ensures the restoration and long-term maintenance of the ecosystem services vested with the farm as an integral part of the broader ecosystem.

6.1 POTENTIAL IMPACTS

In order to determine the potential impacts of the proposed game the subject habitats were sampled and assessed with the aid of photographic records, sample waypoints and a desktop analysis. The key criteria and assessments are listed in the table below.

IMPACT DESCRIPTION	NATURE	DURATION	SIGNIFICANCE
1. Giving effect to global sustainability obligations	Positive	Long-term	Low
2. Impact on conservation targets	Positive	Long-term	Moderate
3. Giving effect to CBA designations	Positive	Long-term	Moderate
4. Impact on natural habitat types			
a) Impact on the natural vegetation	No impact	Long-term	Moderate
b) Impact on naturally-occurring fauna	No impact	Long-term	Moderate

The rationale for the assessments cited in the table is as follows:

6.1.1 GIVING EFFECT TO GLOBAL SUSTAINABILITY OBLIGATIONS

From a global perspective, the underlying objective of Melkhoutrivier is to help give effect to sustainability by means of sustainable development. This is also the main function of the

designated nearby Gouritz Cluster Biosphere Reserve¹¹. Sustainable development is globally acknowledged as a concept which recognises the interdependency between economic growth (prosperity), social justice (people) and environmental integrity (planet).

The vital importance of sustainable development for the immediate and long-term wellbeing of the globe and its inhabitant human, faunal and floral communities and for the supporting ecosystems has been reiterated and confirmed by the adoption of the Sustainable Development Goals (referred to as the Global SDGs) by the United Nations on 25 September 2015. The South African Government and all other spheres of government in the country are obliged to give practical effect to the relevant 17 SDGs illustrated by Figure 9.

WHAT ARE THE SUSTAINABLE DEVELOPMENT GOALS?

The Sustainable Development Goals (SDGs), otherwise known as the Global Goals, are a universal call to action to end poverty, protect the planet and ensure that all people enjoy peace and prosperity.

These 17 Goals build on the successes of the Millennium Development Goals, while including new areas such as climate change, economic inequality, innovation, sustainable consumption, peace and justice, among other priorities. The goals are interconnected – often the key to success on one will involve tackling issues more commonly associated with another.

The SDGs work in the spirit of partnership and pragmatism to make the right choices now to improve life, in a sustainable way, for future generations. They provide clear guidelines and targets for all countries to adopt in accordance with their own priorities and the environmental challenges of the world at large. The SDGs are an inclusive agenda. They tackle the root causes of poverty and unite us together to make a positive change for both people and planet.

¹¹ Mandatory performance auditing in all of the biosphere reserves in the Western Cape has identified a common flaw, namely inadequate focus on the sustainable development obligation.



Figure 9: Sustainable Development Goals adopted by the United Nations on 25 September 2015.

Melkhoutrivier and its various embodied land-uses directly and indirectly give effect to several of the SDGs, with specific reference to numbers 12, 13 and 15.

6.1.2 IMPACT ON CONSERVATION TARGETS

A key objective is to replace domestic stock and conventional farming activities with a land-use that are compatible with the objectives of biodiversity conservation. Large ungulates historically occurred throughout the region where they concentrated in suitable habitats (Skead 1987¹²). Melkhoutrivier and environs have in all probability historically been subject to modification by large ungulates. It can only be assumed that such modification has always been a key element of the ecology of the area which contributed to its historic natural functioning.

Due to the fragmentation of the ecosystem the positive effect of such habitat modification through natural migration of ungulates has ceased. However, the objective for Melkhoutrivier is to

¹² Skead, C.J. 1987. Historic Mammal Incidence in the Cape Province. Chief Directorate Nature and Environmental Conservation of the Provincial Administration of the Cape of Good Hope.

unlock any ecological benefits that may be associated with game as an antithesis for conventional cultivation and stock farming. The adaptive management approach and associated monitoring (refer to Chapter 9) will fulfill a vital function in this process of exploring the potential benefits of game in this regard.

6.1.3 IMPACT ON CBA DESIGNATION

It may be argued that the official CBA designation has been arbitrary and that it may be subjective and inaccurate and that it requires conclusive ground-truthing and scientific proof. The factual situation is that the CBA designation is subject to the goodwill and good practices of the landowner. The site planning and sustainable practices presented in this GMP present the opportunity to entrench the CBA status of the farm as cited in Chapter 3.2.

6.1.4 IMPACT ON NATURAL HABITAT CONDITIONS

The overarching threat associated with any land-use is habitat modification. A key mitigation strategy adopted for Melkhoutrivier is to enhance the vegetation cover in the natural areas and to create cultivated areas that can sustain the proposed game in the long-term.

The natural habitats will not be used for any extralimital game; the occurrence of naturally-occurring species such as Bushbuck and Cape Grysbok will be enhanced by promoting adequate habitat conditions. The numbers of such species will be controlled by means of natural predation.

The condition of the cultivated game camps will be enhanced by means of sustainable farming practices aimed at creating a permanent cover of palatable plants and avoiding any form of erosion and soil loss. The scientific rationale for the latter strategy vests with the interrelationships between climate, run-off and vegetation. Figure 10 illustrates, in an elementary manner, the main factors involved in these interrelationships.

The element of *farm economy* as indicated by Figure 10 is not an environmental factor, it may, however, directly influence decisions on game numbers which, in turn, has an effect on the vegetation and practically everything associated with it. This is especially relevant to the

composition, density, productivity and stability of the cultivated vegetation. From a hydrological perspective, the type of vegetation and its density has a direct effect on run-off (and concomitant rate of erosion), microclimate and soil moisture status).

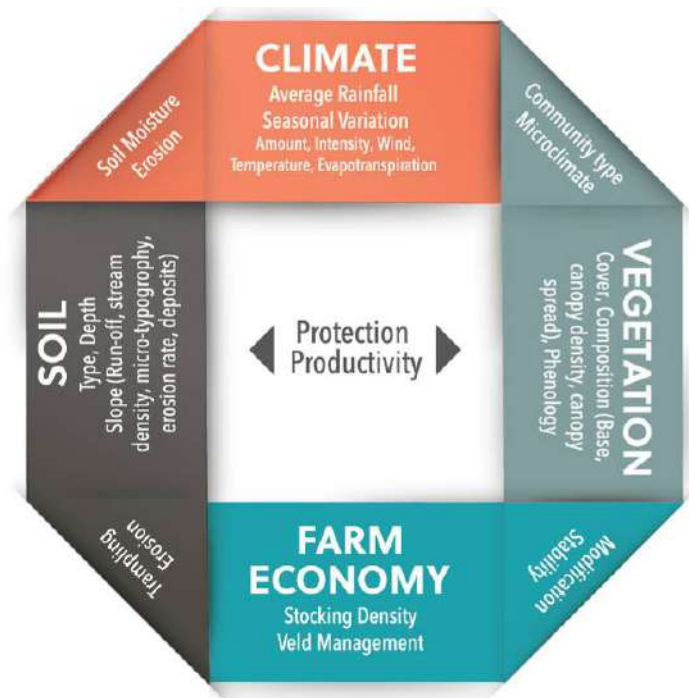


Figure 10: The interrelationships between climate, vegetation, soil, and farm economy (Adapted from Roux, 1981¹³).

It is an accepted principle that, the sparser the vegetation, the higher the run-off and, consequently, the greater the rate of erosion and unproductive water losses. A further key principle is that where run-off increases soil moisture decreases. This implies that the deterioration of plant cover leads to a sequence of general unsustainability. Melkhoutrivier will focus on continuously applying best-practice habitat management strategies and techniques in order to retain an appropriate interrelationship between climate, vegetation, soil, and farm economy as indicated by Figure 10.

It is concluded that:

- a) The cultivated areas will, upon completion, be suitable for game to be introduced.

¹³ Roux, PW. 1981 Interrelationships between climate, vegetation and runoff in the Karoo. *Karoo Agric*, 2(1), 4–8. Roux, P. W. (1981b).

- b) If the conditions and guidelines presented in Chapter 7, Chapter 8 and Chapter 9 were complied with, the game-based land-use would have a lower ecological impact than the conventional farming that had been practiced on the farm historically.

6.1.5 IMPACT ON NATURALLY-OCCURRING FAUNA

The potential threats of the game operation as it relates to naturally-occurring fauna are summarised in the table below.

	DESCRIPTION	RISK RATING
MAMMALS	With the exception of Bontebok, none of the mammal species known to occur naturally in the vicinity are considered to be endangered or vulnerable. There is however a risk that the proposed Nyala may out-compete the Bushbuck that occur.	Negligible
AMPHIBIANS	No threatened or near-threatened amphibians are known to occur on the farm on a permanent basis.	No risk
REPTILES	No threatened or near-threatened reptiles are known to occur on the farm on a permanent basis.	No risk
BIRDS	No threatened or near-threatened birds are known to occur on the farm on a permanent basis.	No risk

6.2 POTENTIAL RISKS AND THREATS TO THE GAME TO BE INTRODUCED

The game and enabling infrastructure are the main cost items of the project as a whole. It is therefore imperative that efficient measures be implemented to ensure that an adequate state of biosecurity¹⁴ be achieved and maintained throughout the duration of the project.

¹⁴ Biosecurity refers to measures that are taken to prevent or stop harmful effects to human, animal and plant life. The measures taken are a combination of processes and systems that have been put in place by bioscience, technological innovations and best-practice managerial interventions. The main aim of biosecurity, as it relates to Melkhoutrivier, is to enhance the health of both the animals introduced and the supporting environment through the control and management of biological risk factors.

The table below summarises the general threats and challenges associated with the game operation:

	DESCRIPTION OF THREAT	MITIGATION & CONTINGENCY MEASURES	SIGNIFICANCE IF MITIGATED
1	<u>Post-release stress:</u> Game species are generally susceptible to trauma during translocation and can be nervous and flighty when separated from familiar surroundings. This could result in animals escaping from the dedicated game area and moving into areas where their presence would be undesirable.	Every known procedure will be applied to ensure that the animals are translocated in an appropriate manner. In addition, the following mitigation specifications apply: a) The fences of the farm comply with the conditions set by CapeNature. The game will not be able to breach the fences. Fencing will be monitored on a weekly basis. b) Any escaped animals will be treated in accordance with the guidelines of CapeNature (refer to Annexure 1). c) For 14 days immediately after the release of any game, human presence and movement in the game area will be limited to imperative management actions, e.g. repairing of fences and other infrastructure, assisting distressed or injured animals, etc. d) Avoiding stress and minimising the risk of animals breaking out of the farm. This will be achieved by: (i) Constructing an appropriate at a suitable location. (ii) Maintaining boundary fences. (iii) If it is suspected that an animal had	Moderate

		contracted any disease, a veterinarian will be informed and the incidence will be treated appropriately. e) If the animal has sustained a life-threatening injury a veterinarian will advise on the treatment or euthanasia of such animal. f) Reports on escaped damage-causing animals will be investigated immediately and the relevant role-players informed. The owner will take charge of the recovery/relocation of the animal/s with the assistance of a specialised game capturer.	
2	<u>Hybridisation:</u> A key objective of the game is to breed and keep animals of high genetic integrity.	The following measures will apply to prevent hybridisation: a) Species that are susceptible to hybridisation will be kept in separate and adequately-fenced camps.	Negligible
3	<u>Bovine Malignant Catarrhal fever</u> Blue Wildebeest is a potential carrier of Bovine Malignant Catarrhal fever (BMC or Snotsiekte). Although Blue Wildebeest do not exhibit clinical signs of	The following guidelines will be maintained to avoid the spread of BMC¹⁶: a) Avoiding stress and minimising the risk of animals breaking out of the game camp. b) Avoiding manipulation of the herd in the first four months after calving. c) Placing of water holes, dams and posts away from boundary fences. d) Maintaining boundary fences in a good state.	Low

¹⁶ Dr Ulf Tubbesing. Wildebeest and the Bovine Malignant Catarrhal Fever (Snotsiekte) Issue – A Game Ranchers Perspective.

	this disease, they are carriers of the herpes virus causing the African form of BMC ¹⁵ .	e) Escaped animals will be dealt with immediately and the relevant role-players will be informed.	
4	<u>Adverse climatic conditions:</u> The predominant climate holds a threat to the viability of species such as Sable. Based upon standard stock farming indexes, extended cold and wet conditions could have a negative impact on the growth rate of the game and could lead to the occurrence of fungal diseases.	The following measures have been instituted to mitigate expected impacts: a) An appropriate shelter will be considered. The game will receive supplementary feeding inside the shelter. b) If required, effective drainage systems will be installed at the constructed shelter to prevent water-logging of soils and muddy underfoot conditions.	Low
5	<u>Wildfires</u> The area surrounding Melkhoutrivier is susceptible to periodic wildfires. Smoke and the smell of wild fires may be disconcerting	The following mitigation measures apply: a) Fences will be protected against fire by means of firebreaks wherever they may be susceptible to fire damage. b) Efficient arrangements will be made with the Garden Route District Municipality and	Moderate

¹⁵ The disease is characterised by a high fever, severe inflammation of the mucosa lining the mouth and upper intestinal tract, nose and eyes, causing nasal discharge, infection of the eyes, and salivation. Occasionally nervous symptoms, diarrhoea, skin lesions and arthritis are also observed. It usually affects only a small number of animals at a time but results in high percentage mortality amongst infected animals. The lack of understanding and the relative economic unimportance of BMC (thus limited funding available for research), explains why no effective vaccine is available to protect cattle from the disease. A BMC outbreak poses no threat to the meat export market. The symptoms of the disease are in no way diagnostic, however, there are reliable laboratory tests available that can positively identify BMC infected animals and even differentiate between BMC of wildebeest and sheep origin.

	for the game.	neighbouring properties as it relates to managing fires.	
6	<u>Loss of animals post-introduction</u>	There is a risk of losing animals during the months following introduction. Such risk vests with the following: a) Malnutrition due to inadequate nutritional value of the new habitat. b) Inadequate supplementary feeding. c) Exceptionally cold weather that is different to conditions characterising the source habitat. d) Bad physical condition and state of health of animals due to conditions at the source habitat. e) Inferior genetic material. It is imperative that such risk be mitigated by means of the following: (i) Selecting species that are best suited for the available habitat, including vegetative and climatic conditions. (ii) Alternatively implement permanent supplementary feeding programme with suitable feed. (iii) Construct an appropriate shelter as part of the boma that would provide protection during extremely cold conditions. (iv) Only buy animals that are in good condition and from a habitat that is more-or-less similar to the destination habitat. (v) Ensure that the animals are from an acceptable genetic pool. Therefore, only obtain animals from a reputable game	High

		capturer and service provider. (vi) Obtain adequate insurance covering all aspects of the introduction and post-introduction phase. Obtain such insurance from a reputable insurer. (vii) Ensure strict compliance with all of permit regulations of CapeNature and veterinary requirements (where applicable).	
7	<u>Accidental escapes</u>	a) Any escaped animals will be treated in accordance with the guidelines of CapeNature (refer to Annexure 1). b) Any such actions will be undertaken within one week following the escape. CapeNature reserves the right to deal with the escaped animal(s) at the cost of the owner if appropriate actions were not taken within the said period.	Negligible
8	<u>Nutritional poisoning</u>	a) Animals may be poisoned by eating toxic plants that occur on the farm. b) During the period August-October animals will be monitored daily for any signs of sickness and will be treated timeously¹⁷.	Moderate

¹⁷ a) Factors contributing to plant poisoning

The risk of plant poisoning may be increased due to the following:

- (i) After the dry season, poisonous plants are usually among the first green plants to appear. A number are also at their most toxic in the young stage when most attractive to stock.
- (ii) Some poisonous plants are highly resistant to drought and may be the only green plants available for animals to eat.
- (iii) Animals are sometimes poisoned when feeding on fodder such as hay, silage, and concentrates containing poisonous plants, fungi or chemicals.
- (iv) Young and older animals are more susceptible. Their livers do not have the capacity to eliminate the toxins.
- (v) Hungry animals graze more greedily and are less selective and therefore more likely to be poisoned. As noted, this can occur in conditions of drought or overgrazing.
- (vi) Pregnant animals also tend to be less selective and have a higher intake than normal and may therefore be poisoned.

b) Symptoms

Some signs of poisoning are:

		c) The farm has been subject to grazing by domestic stock throughout all seasons with negligible confirmed mortality due to nutritional poisoning. Game is generally less susceptible to nutritional poisoning.	
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The most significant poisonous plants that occur at Melkhoutrivier include:

-
- (i) Blood/blood-component signs: Pale, yellow, bluish or brownish membranes, green-tinged faeces, listlessness, animal stops eating, will bleed easily, red-wine to coffee-coloured urine. In dead animals: ulcers in the stomach, bleeding, and a pale yellow, blue or brown colouring of the carcass.
 - (ii) Digestive signs: Animal stops eating, salivation, dehydration, fluid from the mouth and nose, vomiting, constipation, diarrhoea, swollen belly.
 - (iii) Heart signs: When the heart is affected, an animal may drop dead suddenly when it is being chased, for example. Also, the animal tends to stand with its head low and the stomach tucked in. It sometimes grinds its teeth or groans, and the heart rate increases.
 - (iv) Liver signs: Vomiting, yellow discoloration of membranes, swelling of the belly and face. In dead animals: fluid in the chest and abdomen.
 - (v) Nervous signs: Restlessness, sensitivity to sounds and touch, high-stepping, difficulty in walking, muscle tremors, aimless wandering, staggering, blindness, convulsions, paralysis.
 - (vi) Reproductive signs: Difficulty giving birth, poorly developed udder, enlarged belly, enlarged vulva, suppressed milk production, abortions, deformed young, males not interested in mating.
 - (vii) Respiratory signs: Increased breathing rate, animal grunts when breathing, frothing at the mouth.
 - (viii) Skin signs: Itchiness and reddening of skin, scale or crust formation, rough coat, thick fluid on the skin, hair or wool loss, animals seek shade, feet are warm and painful to the touch, difficulty in walking.
 - (ix) Urinary signs: Little or no urine production, swelling of the belly, change in colour of the urine, which may also contain crystals (small stones), a great thirst.
 - c) Methods of dealing with the phenomenon include:
 - (i) Efficient habitat management: Good veld management that prevents over-grazing and includes alternate grazing in one form or another, can maintain conditions that are least favourable for the increase of toxic plants and plant poisoning.
 - (ii) Providing adequate minerals: Adequate provisioning of minerals prevents the over utilisation of a specific plant species, which can become toxic to protect itself against over utilisation. Wild animals also have an innate ability to sense when they are ill or have a mineral deficiency – this ability is called a picorism.
 - (iii) Importing game: Animals, which mature in a certain area, know and avoid the toxic plants that occur there. Game from other areas is not familiar with the toxic plants on the new farm and is less selective. It is, therefore, advisable to only buy game from areas in which the same toxic plants occur.
 - d) The two main methods of the annihilation of harmful secondary products are:
 - (i) Degradation of the toxin in the gastro-intestinal tract. Feeding the animal with activated charcoal may 'soak up' the poison.
 - (ii) Detoxification: Healthy gastro-intestinal micro-organisms can render many poisons harmless. Proline (a naturally produced chemical) in the saliva of browsers binds with tannin, also rendering it harmless.

***Moraea* spp. (Afr) Bloutulp****Description:**

This bulbous plant has three to five long, strap-shaped, flat leaves and attractive iris-like flowers borne on a branched flowering stem. The colours of the flowers vary from yellow, mauve, pink, pale blue depending on the specie.

***Datura* spp. (Afr) Galbol, Maanblom****Description:**

It grows to a height of 1,5 m. It is a robust annual plant with thick stems, large irregularly lobed, hairless leaves and large attractive white or pale purple flowers. Distinctive fruits are thorny capsules that split open to release numerous small kidney-shaped blank seeds

***Lantana* spp. (Afr) Lantana****Description:**

Lantana camara is an exotic ornamental shrub that has become a noxious weed, particularly in the moist eastern parts of the country. The small trumpet-shaped, yellow to orange, red and mauve to white flowers are borne in dense terminal clusters, usually with flowers of two different colours occurring in one cluster. The fruits are small black berries, much relished by birds that spread the seeds.

Ornithogalum thyrsoides (Afr) Tjenkerientjee



Description:

The plant occurs naturally in disturbed ground, marshy hollows and on damp slopes. It is a perennial herb between 20cm and 50cm high with a round bulb that becomes dormant in the winter.

The common name derives from the 'chinking' sound made when the leaves are rubbed together. The species is indigenous to the Western and Northern Cape.

CHAPTER 7 DEVELOPMENT AND MANAGEMENT SPECIFICATIONS AND GUIDELINES

The farm is being developed in accordance with a dedicated Terrain Development Plan (refer to Figure 11).

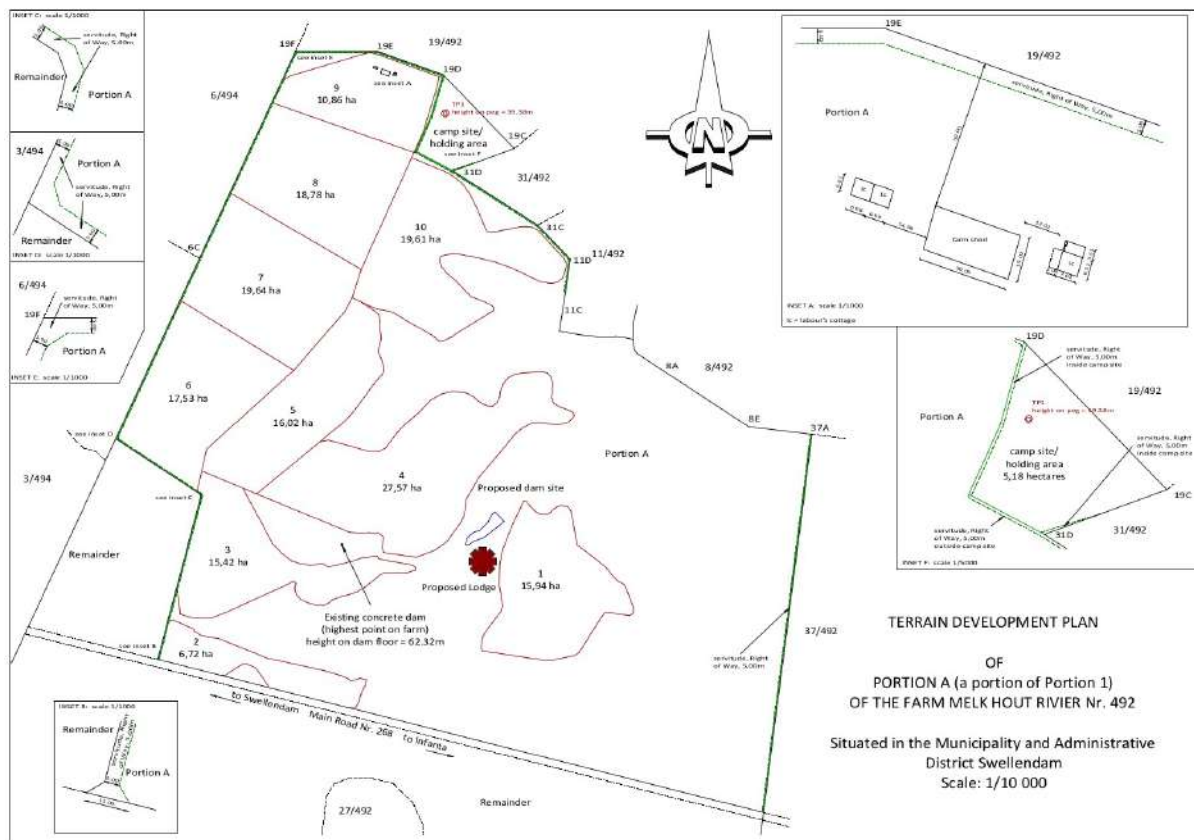


Figure 11: Terrain Development Plan for Melkhoutrivier.

The development of the camps are being undertaken in a phased manner, with Phase 1 being the original camp (Figure 12) and Phase 2 being the remainder of the game area (refer to Figure 13).



Figure 12: The Phase 1 camp for the original introductions.

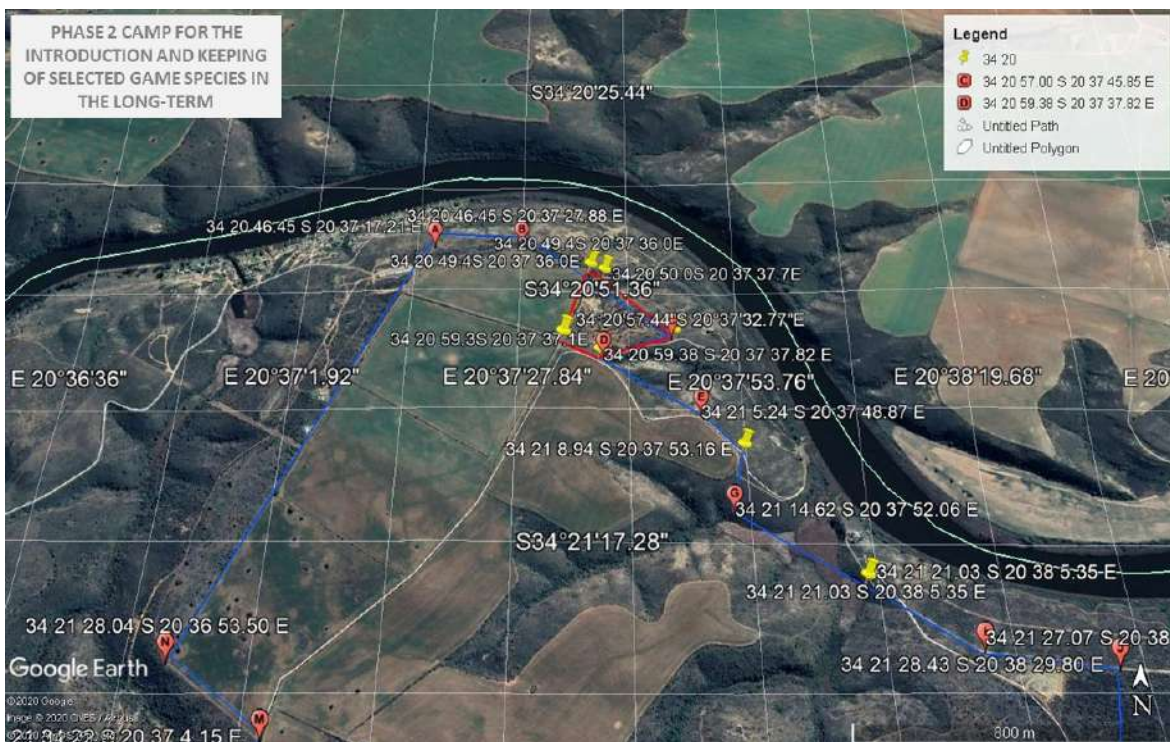


Figure 13: The Phase 2 camp as the larger cultivated game area.

The primary infrastructural items as it relates to the management of the game are as follows:

7.1 ENCLOSURE MANAGEMENT

7.1.1 FENCING

The modified and cultivated areas on the farm is approximately 180 ha in extent; approximately 168 ha of this area consist of ten cultivated camps that have been fenced or are in the process of being fenced.

The periphery of the camps is being fenced with a Class 1 fence as prescribed by CapeNature's CapeNature's Minimum Specifications for Adequate Enclosure of 23 January 2015. The specifications are as follows:

CATEGORY	ITEMS	MATERIAL & GUIDELINES	MEASUREMENTS
POLES	Straining, gate & corner posts	Wood	120 – 140 mm
	Line	Wood	120 – 140 mm
	Droppers	Wood	32 – 50 mm
SPACING (MAX)	Straining posts	Planted at 90 cm	100 – 150 m
	Line poles	Planted at 60 cm	10 m
	Droppers		2 m
WIRING	2.1 m Veldspan or Bonnox supplemented by steel wire strands up to 2.5 m.	Standard spacing of 100 mm between steel wire strands	

The specifications of interior (camp) fences will be determined by the game species to be kept; for example:

- Where Nyala, Impala and Roan were to be introduced, the relevant camps would be fenced with a Class 1 fence.
- If Buffalo were to be considered a dedicated camp with a Class 4 fence would be created. This fence would comprise two electrified steel strands with a minimum current strength of

6000V. These strands will be mounted on off-set brackets on the inside of the fence at 500 mm and 1000 mm from ground level.

Where possible, the fences will be permeable to allow for the movement of small, naturally-occurring wild animals such as Cape Grysbok, while having regard for the size and the behaviour of the animals to be introduced into the camps. The following management specifications apply:

- a) The condition of all fences will be monitored weekly and/or immediately after heavy rain.
- b) A fence patrol logbook will be kept. This book will address overall fence condition, vegetation encroachment, damage, fence maintenance/repair, detail of voltage checks.
- c) Any damage will be repaired with immediate effect.

7.1.2 CULTIVATION

Cultivation and pasture planting will be undertaken in accordance with the following principles:

- a) Guidance and advice will be sought and working relationships established with experts in this field, e.g. Elsenburg. The viability of implementing *Effective Microbes*¹⁸ as a standard practise will be explored.
- b) Based upon soil tests undertaken in collaboration with the Department of Agriculture a mixture of suitable grasses will be considered, with Smutsfinger Grass (*Digitaria eriantha*), Kikuyu (*Pennisetum clandestinum*), Buffalo Grass (*Stenotaphrum secundatum*) and Rooisaadgras (*Ehrharta calycina*) being the species to be considered.

7.1.3 WATER INFRASTRUCTURE

All species to be introduced depend on daily drinking. The provision and, in particular, the location of water points is a key aspect that has a bearing on the sustainability of any grazing regime. Scientific references that are particularly relevant to Melkhoutrivier include the following:

¹⁸ *Effective Microbes* can be applied as inoculants to increase the microbial diversity of soils and plants which, in turn, can improve soil health and growth, yield and quality of plants. It can suppress soil-borne pathogens, accelerate the decomposition of organic wastes and crop residues, and increase the availability of mineral nutrients and useful organic compounds to plants. Moreover it will enhance the activities of beneficial indigenous micro-organisms, such as Mycorrhizae, that fix atmospheric nitrogen, thereby replacing chemical fertilizer and pesticides.

- Repetitive feeding and trampling around permanent water points lead to degradation of soil and vegetation (Adler and Hall, 2005¹⁹).
- The increase in general herbivore pressure across a property and the creation of extreme degradation nodes around water points can lead to property level impacts such as a reduction of resilience and therefore a greater sensitivity to negative effects of disturbance (Cumming *et al.*, 2005²⁰). The reduction in the resilience and greater sensitivity to disturbance can result in ecological consequences which are contradictory to the objectives of the property (Cumming *et al.*, 2005).

The following management guidelines apply:

- a) It is a known phenomenon that game species are generally averse to drinking from conventional water troughs. It is therefore important that constructed water points look as natural as possible. They should ideally consist of a shallow (<300 mm) ditch with a radius of 2-3 m, and with a concrete floor to prevent water from draining away.
- b) When constructing and locating new waterhole, the following requirements apply:
 - (i) The water supply should be permanent and reliable, especially during times of drought.
- c) The water points are to be inspected for breakages or damage on a daily basis. And repaired immediately.
- d) Water points are to be cleaned once every two weeks to prevent the accumulation of algae and other aquatic organisms.

7.1.4 CONSTRUCTED SHELTERS

An appropriate shelter will be considered. The shelter will consist of two distinct sections which, in turn, will constitute a roofed component and an open boma component. The roof will be of corrugated iron and the walls will be of 2.1 m wooden slats or droppers (refer to Figure 14). The open area of the shelter will face away from the generally cold northerly winter winds. If required, effective drainage systems will be installed at the constructed shelter to prevent water-logging of

¹⁹ Adler, P.B. & Hall, S.A., 2005. The development of forage production and utilization gradients around livestock water points. *Landscape Ecology* 20:319-333.

²⁰ Cumming, G.S., Alcamo, J., Sala, O., Swart, R., Bennet, E.M. & Zurek, M., 2005. Are existing global scenarios consistent with ecological feedbacks? *Ecosystems* 8:143-152.

soils and muddy underfoot conditions. The shelter will include watering and feeding troughs that will be installed in a manner that prevents injury to the animals.

The following management guidelines apply:

- a) The shelter will be cleaned on a weekly basis to prevent pollution and limit the occurrence of parasites.
- b) The shelter will be inspected daily for breakages or any other form of damages. These will be repaired with immediate effect.



Figure 14: Perspective of the shelter.

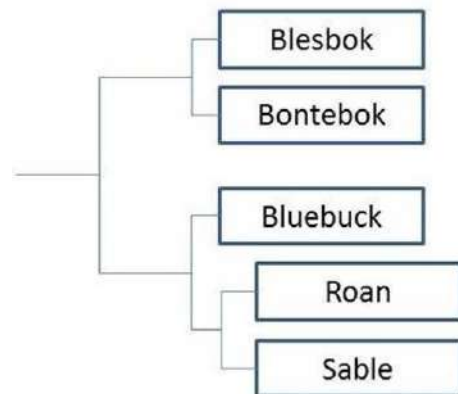
7.2 GAME POPULATION MANAGEMENT

In order to ultimately generate an acceptable return on investments, quality animals have to be bred. Ongoing enhancement of the genetic integrity of the population will therefore be an imperative management objective.

7.2.1 PREVENTING HYBRIDISATION

Hybridisation is a key risk factor and will be prevented at all cost through the measures cited in Chapter 6.2. The threat of hybridization will be prevented by avoiding introduction of any species that are susceptible to hybridization.

With regard to the Sable family it is noted that they share the genus *Hippotragus* with the extinct Bluebuck (*H. leucophaeus*). They are all members of the family Bovidae. An analysis of mitochondrial DNA extracted from a mounted specimen of the Bluebuck indicated that it was outside the clade containing the Roan and Sable. The study concluded that the Bluebuck is a distinct species, and not merely a subspecies of the Roan. The diagram shows the position of the various relatives (Robinson *et al*, 1996 analysis²¹).



7.2.2 HARVESTING

Surplus animals would be culled as required. The following management guidelines apply:

- a) Animals that are surplus to the stocking rate will be removed.
- b) The key strategy for managing the stocking rate is to reduce the number of animals as soon as the following thresholds are reached:
 - (i) General condition of the animals, i.e. animals losing weight and signs of sickness and abnormal behavior.
 - (ii) Irregular breeding and abortion.
 - (iii) Overly aggressive behaviour.

7.3 SUPPLEMENTARY FEEDING

In a suitable natural habitat wild species have little need for supplementary feeding as their free ranging habits enable them to pursue more nutritious grazing and therefore satisfy their requirements. However, where animals are kept in suboptimal habitat conditions, supplementary feeding is required.

²¹ [Jump up ^](https://doi.org/10.1007/s001140050269) Robinson, T.J.; Bastos, A.D.; Halanych, K.M.; Herzig, B. (1996). "Mitochondrial DNA sequence relationships of the extinct blue antelope *Hippotragus leucophaeus*". *Die Naturwissenschaften*. 83 (4): 178–82. [doi:10.1007/s001140050269](https://doi.org/10.1007/s001140050269). [PMID 8643125](https://pubmed.ncbi.nlm.nih.gov/8643125/).

When formulating diets for wild animals it is important to consider dietary habits in the wild and environmental features that affect energy and nutrient need. Free-ranging wildlife are often on varied diets because of range conditions, and the usable ratios of energy to protein may vary widely (Cooper et al., 1988²²).

A basic requirement guideline per day can be given as 10 grams of protein per MJ of ME intake (Owen-Smith, 1985). When animals are introduced into a new habitat they should first be adapted by giving them access to natural feed or by providing good quality hay. The adaptation period should take two to three weeks after which time the animals should be used to being artificially fed.

At this time a more balanced ration can be fed using an energy value of 10 MJ ME/kg and protein concentrate of 10% for maintenance, 11-12% for lactation and 14-15% for growing animals. Browsers would require higher levels of protein (14-16%) for maintenance and 18% for lactation and growth. Balanced concentrates or antelope cubes can initially be mixed with chopped hay and finally, when eaten readily, fed separately at 1-1.5% of body weight together with roughage fed ad lib. Concentrates should not exceed 40% of the daily feed intake. Acidosis can be a serious problem with game and care should be taken to ensure the gradual introduction of concentrates over a 2- 3 week period. Non-protein nitrogen should not be used as a protein source for nonruminants. Provide feed in a shallow trough at ground level. Water should be provided ad lib also in shallow troughs.

Ongoing supplementary feeding for grazers is a prerequisite and standard practice at Melkhoutrivier. Such supplementary feeding would be in the form of 'subsistence feeding' which constitutes the provision of suitable hay, such as Teff, Oulandsgrass and Oats ad lib on an ongoing basis. This practice is premised on the principle that grazers are bulk and roughage eaters which have capacious stomachs normally filled to capacity with relatively low-quality feed composed mostly of grass.

²² Cooper, S.M., Owen-Smith, N. and Bryant, J.P., 1988. Foliage acceptability to browsing ruminants in relation to seasonal changes in leaf chemistry of woody plants in South African savanna. *Oecologia Berl.*, 75, 336.

7.4 STOCKING RATE

The feeding model to be applied on the farm constitutes the permanent provision of cultivated sustenance on approximately 168 ha supplemented with suitable fodder as required.

Determining an appropriate stocking rate for the farm is complex. Accordingly the guidelines in this regard are premised on the precautionary principle. The following determinants have been considered:

- The *QGIS Land Use and Cape Farm Mapper* of Department of Agriculture.
- Standard agricultural indices provided by the Department of Agriculture.

The Western Cape Department of Agriculture and existing cultivation models and local knowledge indicate that suitably-cultivated and irrigated paddocks on the soil types along the Lower Breede River have an extremely high carrying capacity. In terms of the precautionary principle an arbitrary capacity of 1 LAU per 5 ha has been adopted for the purposes of determining a norm for the farm. In terms of this, the 168 ha of cultivated land on the farm can theoretically and conservatively sustain in the order of 34 LAUs.

The following guiding principles apply:

- a) The proposed species will not necessarily be introduced, or introduced simultaneously.
- b) The various species have been listed in order to assess the desirability of their introduction and to enable the issuing of a Certificate for Adequate Enclosure for all species that are deemed suitable for introduction.

Column 1 of the table below states the species and Column 2 the possible numbers. Column 3 provides the LAU equivalent represented by the various species. Column 4 indicates the total number of LAUs represented by the population cited in Column 2. Column 5 indicates the total number of LAUs that can be kept sustainably.

PERMUTATION FOR SPECIES AND NUMBERS FOR THE CULTIVATED AREAS				
1 SPECIES TO BE CONSIDERED	2 ENVISAGED NUMBER OF ANIMALS (I.E. POPULATION)	3 LAU EQUIVELANT PER ANIMAL	4 TOTAL LAUs REPRESENTED BY THE POPULATION	5 CARRYING CAPACITY (I.E. LAUs THAT CAN BE KEPT ON THE CULTIVATED AREA)
Blue Wildebeest	5	0.50	2.50	
Common Reedbuck	5	0.21	1.05	
Impala	10	0.19	1.90	
Nyala	10	0.26	2.60	
Roan	5	0.62	3.10	
Sable	5	0.58	2.90	
Waterbuck	5	0.55	2.75	
TOTAL LAUs REPRESENTED BY THE GAME			16.80	I.E. @ 5 HA PER LAU
PORTION SIZE (HA)			168.00	34

7.5 PARASITE CONTROL

Ticks and their associated diseases are a major constraint to livestock farming. Most African wildlife have innate resistance to such diseases but may act as reservoirs for a number of tick-borne diseases such as Corridor disease. For example, Cape Buffalo are the natural host for the protozoan parasite *Theileria parva*, which causes Corridor disease and is transmitted to cattle via the vector *Rhipicephalus appendiculatus* (the brown ear tick). This is a primary reason for the strict veterinary control over the movement of Buffalo.

The game at Melkhoutrivier may be susceptible to parasite infestation, particularly roundworm and ticks. Such parasite may have the following consequences:

- Animals under social, environmental or nutritional stress may succumb to parasite infestation.
- Ticks attach to hairless areas around the anus, testes, sheath, udder and teats. The damage caused can result in reproduction losses.

- c) Ticks cause large wounds, secondary bacterial infection and maggot infestation (screwworm).

7.5.1 FACTORS CONTRIBUTING TO PARASITE INFESTATION

Game that are adapted to their natural habitat are reasonably adapted to parasites. However, this ability may be jeopardised by the following factors:

- a) Keeping game in a totally foreign and unnatural habitat.
- b) Exceeding the carrying capacity of the veld which results in overgrazing and a decline in the quality and amount of grazing.
- c) Introduction of species not indigenous to a region and hence not adapted to the local tick species.
- d) Restricting the natural migration patterns of animals, thus preventing them from moving away from problem areas, which results in an increase in parasites on this grazing.
- e) Prevention of natural selection. Under captivity and/or unnatural conditions (e.g. without natural predators) weaker individuals are often allowed to survive and their genetics allowed to continue.

7.5.2 GUIDELINES FOR ADDRESSING THE PARASITE CHALLENGE

Severe tick infestations on wildlife are frequently an indication of any underlying management problem. Therefore, a key strategy is to consider and address the root-cause of the problem. Such cause may generally be addressed or mitigated by means of the following:

- a) Faecal egg counts conducted every second week to establish the degree of parasite infestation. Treatment is required if the parasite egg count exceeds 1000.
- b) Permanent removal of any animals that are visually very heavily tick infested as well as any diseased or weak animals.
- c) Introduction of species such as Blue Wildebeest that have an innate resistance to ticks. Few adult ticks are found on them in their natural habitat.
- d) Controlled burning of the habitat could be considered. However, although fire may kill large numbers of free-living ticks present on the vegetation at the time, its long-term

- effects seem to be limited, particularly if animals are not excluded from the burnt area once there is a flush of new vegetation.
- e) Treating newly-acquired wildlife with a reliable, broad-spectrum acaricide. This will reduce the risk of introducing ticks into an area in which they did not previously occur as well as eliminating the stress of pre-existing tick burdens on the new introductions.
 - f) On-going observation for an abundance of ticks.
 - g) Chemical tick control through administering acaricide by means of a self-medicating applicator coupled to a bin containing licks or food concentrates to which the animals are attracted. Most of the species considered for Melkhoutrivier are inclined to take supplementary feed in such bins. This can be accomplished by:
 - (i) Acaricidal feedblocks.
 - (ii) Medication of preferred food items with commercially available anthelmintics.
 - (iii) Applying Afrivet Redline Acaricidal Balls by means of a paint-ball gun. These balls contain flumethrin (similar to the active ingredient in Coopers Redline pour-on) which kills ticks and sterilises female ticks, preventing them from laying eggs.
 - h) Administration of long-acting antiparasitides by means of:
 - (i) Darting.
 - (ii) Self-application via pressure or light sensitive apparatus.
 - (iii) Applicators such as the Duncan applicator. Such applicators work on the principle that antiparasitides and medicine are easiest and efficiently transferred or applied to the animal while it is feeding.



Figure 15: Afrivet Redline Acaricidal Balls applied by means of a paint-ball gun.

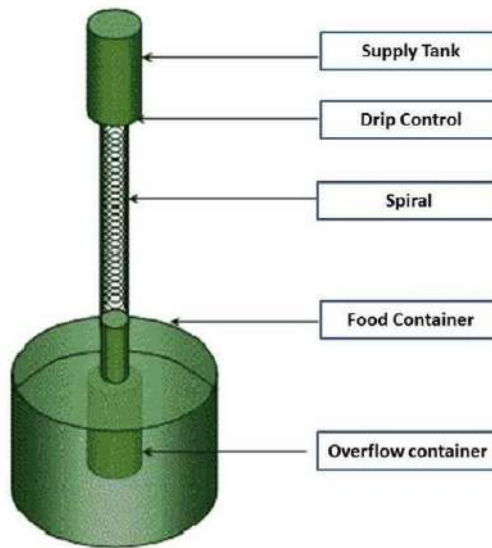


Figure 16: The Duncan applicator.

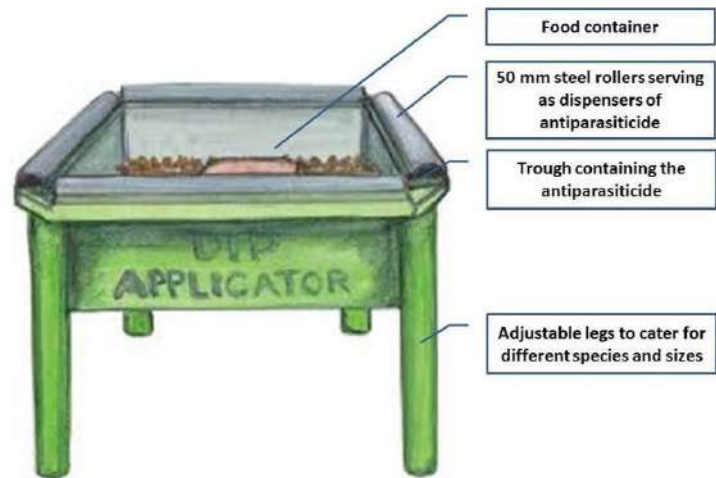


Figure 17: Oom Gielie's applicator.



Figure 18: An efficient antiparasiticide.

7.6 CONTINGENCY AND EXIT POLICY

The exit policy simply implies the removal of any species if the thresholds for sustainability have been reached. The owner undertakes to implement the conditions and terms set out in the National Environmental Management Act (NEMA) and the National Environmental Management: Biodiversity Act (NEM:BA). These conditions and obligations are applicable to any management actions undertaken on the farm.

7.7 CONSULTATION AS IT RELATES TO ON-GOING MANAGEMENT ADVICE AND EMERGENCY

Guidance and/or assistance pertaining to the key aspects of the game operation will be sought from experts in the respective fields. The various aspects and potential service providers are as follows:

a) Habitat and population management, translocation and permit issues, etc.:

Sibusiso Ngubane

Conservation Officer –Off Reserve Langerberg Unit

Tel: 0871581867



b) Disease and injuries, feeding requirements and general animal health:

Elsenburg Veterinary Services

Contact person: Dr Gary Buhrmann

Contact No: 021 808 5111

c) Disaster management:

Overberg District Municipality

Contact No: 028 425 1157

d) Helicopter Services for game search and capture

Mossel Bay Helicopters

Kobus Crous

Contact No: 083 275 7063

CHAPTER 8 MELKHOUTRIVIER AS A PART OF THE BROADER ENVIRONMENT

8.1 TOWARDS INTEGRATED ENVIRONMENTAL MANAGEMENT

As stated previously, Melkhoutrivier is managed in accordance with the protocols and directives applicable to the nearby designated Gouritz Cluster Biosphere Reserve. A key characteristic of these directives is that it constitutes partnerships among landowners who are encouraged to adopt conservation-conscious farming methods and, where possible, to set aside portions of land to be conserved. Melkhoutrivier falls in this category.

As cited previously, the farm is abutted by properties managed as, or earmarked as biodiversity conservation areas. The main ecosystem services rendered by these areas, in particular those associated with the Breede River, are to:

- a) Provide a habitat for plant and animal species associated with the predominating vegetation types.
- b) Contribute to the ecological integrity and aesthetic value of the area.
- c) Support the natural functioning of the CBAs occurring in the area.

The main environmental aspects to be addressed in an integrated and holistic manner by all concerned are as follows:

8.2 MAIN SUB-REGIONAL MANAGEMENT ASPECTS AND DIRECTIVES

ASPECT	OBJECTIVE	RATIONALE	POLICY AND GUIDELINES
Consolidation of nature areas so as to create a contiguous ecosystem.	a) Consolidate Melkhoutrivier with the abutting natural habitats on and manage this larger system as an integrated system.	Sustainability requires planning and management for biodiversity conservation across human dominated landscapes. To	Melkhoutrivier supports the implementation of a partnership-based, rational, and science-supported sub-regional integrated land-use management initiative. Models that could be considered

	b) This system should serve as a protected area incorporating diverse landscapes, ecosystems, habitats, communities, species, and culturally significant sites.	achieve this, areas should no longer be considered as islands of designated land-use within a sea of development but as an integral part of each region as a whole in terms of holistic environmental care (IUCN, 1995).	include the following: a) Special Management Area (SMA) model ²³ . b) Conservancy programme of CapeNature. c) Stewardship programme of CapeNature ²⁴ . d) Landcare Programme of the Dept of Agriculture ²⁵ .
Fire management	Implement an artificial burning regime in order to: a) Enhance the well-being of the natural vegetation in the area. b) Limit the danger to property and infrastructure posed by wildfires.	Fynbos is a fire-adapted vegetation type that requires regular burning for its persistence. In the absence of fire, Fynbos is gradually replaced by thicket species. It thrives on infertile soils and fire is the mechanism that	a) The proposed consolidated conservation area should be managed by means of an artificial fire regime which complies with the requirements of correct season of burning (i.e. late summer/autumn), correct frequency (i.e. intervals of 12-15 years) and ideal intensity (i.e. high

²³ The Nuwejaars Wetlands SMA near breadasdorp is a functional SMA. The SAM covers approximately 45 000 ha which incorporate the globally-significant wetlands of the Agulhas Plains. Due to the exemplary public good and environmental value created by the SMA, huge financial contributes have accrued to the latter. The contributions include a donation of €2 million from the United Nations Development Programme (UNDP) and a significant capital amount from the Development Bank of Southern Africa (DBSA). The SMA concept is probably unique in South Africa.

²⁴ CapeNature's innovative stewardship programme partners with private and communal landowners in the Western Cape to conserve areas of outstanding biodiversity, helping the country meet national and international conservation targets and preserve ecosystem services.

²⁵ LandCare programme of the Western Cape Department of Agriculture is a national movement aimed at restoring sustainability to land and water management in both rural and urban areas. It encompasses integrated sustainable natural resource management where the primary causes of natural resource decline are recognised and addressed. LandCare is community-based and community-led and seeks to achieve sustainable livelihoods through capacity building and related strategies.

		recycles nutrients from old moribund growth into the soil. Fire has a double impact on Fynbos – it plays a role in germination and it also acts as a mineralizing agent. Some Fynbos species die during fire and regenerate from seed stored in the canopy e.g. Serotinous proteaceae.	intensity). b) This can be initiated by means of a mosaic burning regime ('kolbrandstelsel') which provides for a diversity of veld ages and which favours the production of low shrubs, herbs, grasses and geophytes. c) Firebreaks would not be a cost-effective <u>long-term</u> fire management strategy, the reasons being: (i) Firebreaks are never totally reliable. (ii) The initial and maintenance cost thereof is immensely high. (iii) Adequate firebreaks have a detrimental ecological impact in that a significant area has to be cleared from vegetation.
Alien plant eradication	Eradicate all alien species that have a detrimental impact on the natural functioning and the delivering of inherent	Invasive alien vegetation refers to plants that cause human, environmental or economic harm.	Strategies that may be implemented in the proposed consolidated area include: a) Physical cutting and removal of plants (chipping of woody material is the

	ecosystem services.	Alien plants generally consume more water than local plants, depleting valuable underground water resources. Dense alien plant infestations provide a dense biomass that has a huge influence on fire behaviour, creating an excessive heat load and damaging soil structure.	ideal method). b) Biological control by distributing the following: (i) Multivoltine midge (<i>Dasineura dielsi</i>) that induces galls on the ovary of its host. The gall it stops the flower from forming thereby reducing seed production. (ii) Gall forming rust fungus (<i>Uromycladium tepperianum</i>) which kills the plants by reducing flowering and seed set (particularly on Port Jackson).
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CHAPTER 9 CONTINUAL IMPROVEMENT OF OPERATIONS

9.1 ADAPTIVE MANAGEMENT

Melkhoutrivier is managed in accordance with the principles of adaptive management. The latter is a process that promotes flexible decision-making that can be adjusted in the face of uncertainties as outcomes from management actions and other events become better understood. Careful monitoring and auditing of these outcomes both advances scientific understanding and helps adjust policies or operations as part of an iterative learning process.

Adaptive management also recognises the importance of natural variability in contributing to ecological resilience and productivity. It is not a 'trial and error' process, but rather emphasises learning while doing.

Figure 19 illustrates the steps of the adaptive management process that applies to the management of Melkhoutrivier and the game operation in particular. Adaptive management does not represent an end in itself, but rather a mechanism towards more effective decisions and enhanced performance (Williams *et al*, 2009²⁶). Adaptive management is based on an explicit articulation of the management problem, what is known (and not known) about the resource system being managed, and the objectives of management (Williams *et al*, 2009).



Figure 19: Steps of adaptive management applicable to Melkhoutrivier.

9.2 MONITORING AND AUDITING

The concept of continual improvement is embodied in the management plan and is the guiding principle for all management actions to be undertaken in the operation. Continual improvement is achieved by evaluating the relevance and performance of the management plan against the set operational objectives (refer to Chapter 5) and identifying opportunities for improvement.

The ongoing monitoring of defined aspects of the operation is, logically, of key importance for the operation as a whole. The monitoring will be of a nature and scale that is appropriate to the scale of the operation. These actions will initially be limited and uncomplicated – this may however change as the operation unfolds and as information becomes available. The initial monitoring actions are categorised as follows (the categories are colour-coded to facilitate coherent recording):

- | | |
|----|----------------------------|
| a) | Infrastructure monitoring. |
| b) | Game monitoring. |
| c) | Resource monitoring. |

²⁶ Williams, B.K., Szaro, R.C., and Shapiro, C.D., 2009: *Adaptive Management: The U.S. Department of the Interior Technical Guide*. Adaptive Management Working Group, U.S. Department of the Interior, Washington, DC.

The monitoring will be undertaken in accordance with the checklists appended in Annexure 3. Copies of the completed checklist, photographic records, and any monitoring reports will be kept on record in Annexure 4 for auditing by CapeNature. Audit reports will be filed in Annexure 4 and, together with the completed checklists, used as a basis for continual improvement of operations.

Monitoring photographs are taken twice a year during March and September at defined and permanently marked points within the designated game camps and within the natural areas on the farm (to be determined), and in accordance with the process illustrated by Figure 20.

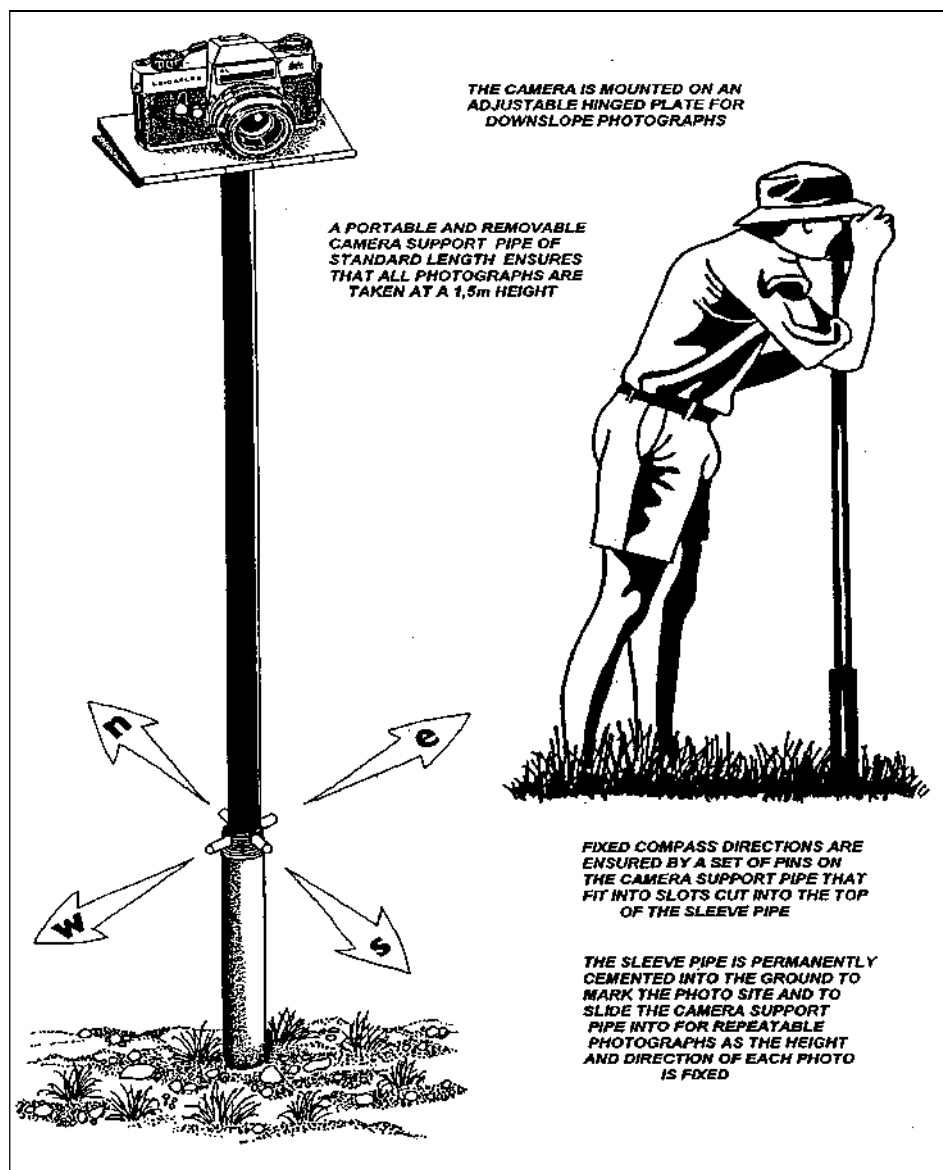


Figure 20: Procedure for fixed-point photographic monitoring.

CHAPTER 10 CONCLUSION

The management plan will be subject to continual improvement and an updated draft will be submitted to CapeNature if the amendment were substantial. The management plan will, in its evolving format, be applicable for the 5-year period from July 2020 to June 2025. Thereafter, it will be revised in its totality and amended as may be required.

The signing of this document by the applicant means that the latter commits himself to complying with the specifications, commitments and responsibilities cited in this document and to any applicable legislation and policy, with specific reference to the Nature Conservation Ordinance 19 of 1974, the Provincial Notice 955 of 1975, and CapeNature's policy entitled *Game Translocation and Utilisation Policy for the Western Cape Province* (February 2011). The owner undertakes to implement the conditions and terms set out in the National Environmental Management Act (NEMA) and the National Environmental Management: Biodiversity Act. These conditions and obligations will be applicable to any management actions undertaken on the subject area of this management plan, i.e. Melkhoutrivier, Malgas. This GMP is effectively the owner's response and commitment to the goals and objectives of sustainable land-use as advocated by CapeNature and the national and global conservation fraternity.

The signing of the management plan by CapeNature means that the document meets the requirements set in the applicable policy and that it is accordingly approved as the official management directive for the proposed game operation.

OWNER

MELKHOUTRIVIER FARM

DATE

DIRECTOR

CAPENATURE

DATE