Proposed Ankerlig-Omega Transmission Power Line: Terrestrial Fauna Environmental Impact Assessment Report

Prepared by

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Savannah Environmental (PTY) Ltd
On behalf of

Eskom

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1. INTRODUCTION

1.1. Background and brief

Eskom Holdings Limited is proposing the construction of a 400kV transmission power line between the Ankerlig Power Station and the already authorised Omega Substation (to be located on the farm Groot Oliphantskop 81) to transmit the additional power generated at the Ankerlig power station into the national electricity grid. The Scoping Phase of the study comparatively evaluated three alternative routes for the power line. From the specialist studies undertaken, it was concluded that the alternative Option A, following the alignment of the existing power line from Atlantis to Omega (Figure 1), would potentially have the lower impact on the overall environment as a result of consolidation of infrastructure of a similar nature and the minimisation of impacts on current and planned land use. Option A was therefore nominated as the preferred alternative for further investigation in the EIA phase.

During the public review period, a power line sub-alternative in the vicinity of Koeberg was recommended by the stakeholders. This sub-alternative is proposed to follow the alignment of the existing power lines for the section of the route past Koeberg (Figure 1). This sub-alternative is considered to be a technically feasible alternative and will also be investigated within the EIA phase.

P. le F. N. Mouton was commissioned to undertake an environmental impact assessment of the terrestrial fauna in the area to be affected by the construction of the proposed power line. The EIA report must include:

- A description of the affected environment.
- A description and assessment of environmental issues and potential impacts (including direct, indirect and cumulative impacts) that have been identified.
- A description of issues identified during the scoping process.
- A description of the methodology used to determine the significance of the impacts (and assumptions).
- An impact statement.
- An assessment of alternatives, including a summary in tabular form.
- A comparative assessment of alternatives.
- Conclusions.
- Recommended site-specific mitigation.
- Measures for inclusion in the management plan.

The aim of this report is to provide the required information for terrestrial fauna, excluding birds, for the proposed Ankerlig-Omega power line. The conclusions provided are largely based on information obtained from the literature and previous surveys done in the immediate area (e.g., Mouton *et al*. 2005). The study conforms to the requirements of Section 33 of the EIA Regulations in terms of the National Environmental

Management Act (NEMA; Act No 107 of 1998) published in Government Notice R385. This study is also in line with the Western Cape DEA&DP guideline/requirements.

1.2. Study area

At the smallest spatial scale, the study area encompasses an area between Atlantis in the north and the Omega substation in the south (Figure 1), hereafter referred to as the Atlantis study area. At the largest spatial scale which is relevant to the EIA study, the study area (hereafter referred to as the greater study area) encompasses the coastal lowlands south of 33° latitude (south of Langebaan) and west of 19° longitude (west of Porterville).

The topography of the Atlantis study area is gently rolling, but generally sloping towards the south. The vegetation of the area is Cape Flats Dune Strandveld in the north-western section, Atlantis Sand Fynbos on the sandy sections and Swartland Shale Renosterveld on the clayey sections (Mucina & Rutherford 2006). *Acacia* infestation is considerable (Figure 2) and large sections have been transformed for agriculture (Figure 3).

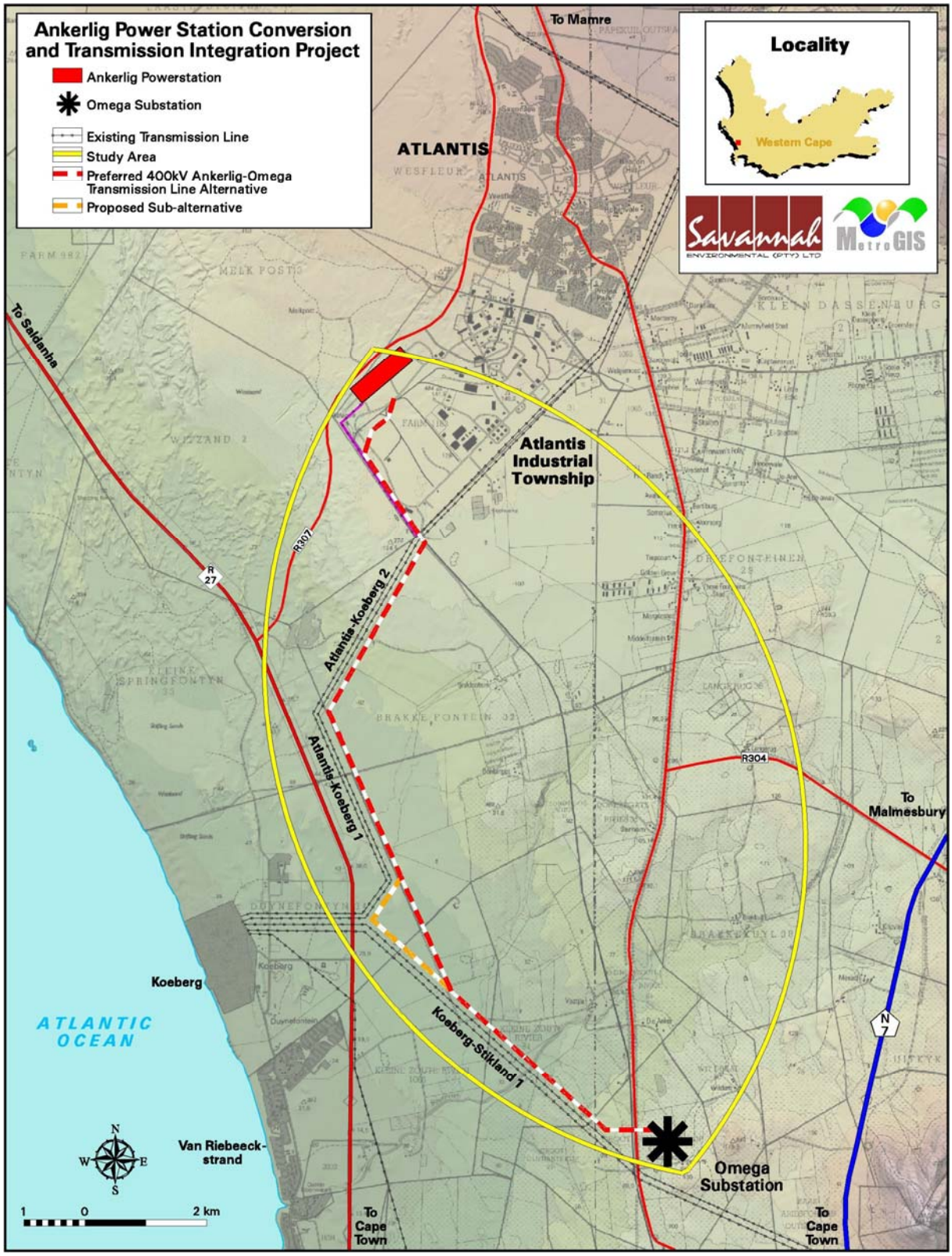

Figure 1. The route alternatives for the Ankerlig to Omega transmission line

Figure 2. Dense *Acacia* infestion along the proposed route for the new power line in the Atlantis study area.

Figure 3. In the southern section of the Atlantis study area, large sections have been transformed.

2. STUDY APPROACH

The approach adopted in the study was:

- To provide a broad overview of the fauna occurring along the south-western coastal lowlands using information obtained from authoritative publications on amphibians (Passmore & Carruthers 1995; Minter *et al*. 2004); reptiles (Branch 1998; SARCA database); and mammals (Skinner & Smithers 1990; Friedmann & Daly 2004). Due to the numbers involved, only relevant elements of the invertebrate fauna are highlighted.
- To list all threatened/sensitive species/assemblages occurring in the greater study area using the following authoritative sources: the critical evaluation and update of the Red Data List of South African butterflies by Ball (2005); a review by Baard *et al.* (1999) of the amphibians and reptiles of the Cape Floristic Region as indicators of centres of biodiversity, sensitive habitats and sites of special interest; the Atlas and Red Data Book of the frogs of South Africa, Lesotho and Swaziland (Minter *et al.* 2004); and the Red Data Book of the mammals of South Africa (Friedmann & Daly 2004).
- To consult taxon specialists regarding species/assemblages that may be negatively impacted by the proposed project. The following specialists were consulted: Dr H. Geertsema (Dept. of Entomology & Nematology, Univ. of Stellenbosch) for insects; Mr A. de Villiers (Cape Nature Conservation Board) for amphibians; and Prof J.A.J. Nel (Dept. of Zoology, Univ. of Stellenbosch) for mammals.
- In addition, a survey of the habitats and terrestrial fauna along the proposed routes was conducted, specifically to determine whether any of the Red Data species that potentially occur in the study area, are in fact present, as well as to identify sites along the route that may be more sensitive than others in terms of animal occupation. Extensive trapping for small mammals was not conducted. Active searching was condsidered sufficient for reptiles and amphibians. Raking under plants was done to locate fossorial lizards and snakes.

3. DESCRIPTION OF THE AFFECTED ENVIRONMENT

3.1. Phytogeographical setting

The geographical focus is the landscape at the south-western margin of the African continent. The development of the cold Benguela Current and the inception of summer-dry climates in the Miocene provided a significant stimulus for evolutionary change and those elements with low mobility (i.e. plants, invertebrates and lower vertebrates) evolved a distinct and diverse character in this area (Hendey 1983). Due to its high concentration of endemic plant taxa, its large numbers of species, and its vulnerability to processes that threaten its unique biodiversity, the Cape Floristic Region (CFR) is recognised globally as a biodiversity hotspot. This small area contains nearly 3% of the world's plant species on 0.05 % of the land area. The region also possesses high faunal

diversity and endemism in both its terrestrial and aquatic communities. The rich biodiversity of the CFR is due to an extensive and complex array of habitat types derived from topographical and climatic diversity in the region's rugged mountains, fertile lowlands, semi-arid shrublands and coastal dunes. The distribution of the CFR's biodiversity is also unusual in that many of the processes that sustain rare and endemic flora can occur in very small patches of remnant vegetation. It is therefore important to recognise that each fragment of natural habitat in the CFR can be worthy of conservation action.

3.2. Description of faunal habitats represented within the greater study area

3.2.1. Rocky habitat

Many animals, including many invertebrates, amphibians, reptiles, birds and mammals, are adapted to a rocky habitat. Because this habitat occurs in the form of natural islands and because of the low dispersal abilities of many invertebrates and lower vertebrates, this habitat type tends to give rise to geographical isolates. Rock habitat islets may thus house unique forms and for this reason, this habitat has high conservation importance, especially along the western coastal lowlands.

3.2.2. Coastal fynbos/coastal sand

The west coast coastal fynbos and strandveld with its sand substrate is a unique animal habitat that supports many endemic species, especially psammophylic or sand-loving species such as burrowing lizards, golden moles and mole rats.

3.2.3. Renosterveld

This veld type is found on the lowlands along the coast on shale and granite, from sea level to 400 m above. As a veld type, it is rich in a wide variety of species and dominated by renosterbos and the characteristic wealth of spring flowers. Although poor in fauna, a number of threatened species are associated with this habitat, e.g., several butterfly species, the Geometric Tortoise and the Cape Rain Frog.

3.2.4. Water bodies

Water bodies such as rivers, streams, pools, lagoons, estuaries and other wetland areas support a wide range of animal species, including many endemic species and/or species of conservation importance. The majority of frog species occurring in the greater study area are associated with water bodies. A wide range of bird species and several mammal species are also dependant on permanent or seasonal water bodies.

3.2.5. Mountain fynbos

This vegetation is characterised by ericoids, restioids and proteoid shrubs like proteas and conebushes. Trees are scarce in this veld type. Several endemic bird species are associated with this habitat type.

3.3. Potential occurrence of terrestrial fauna species of conservation concern in the greater study area

3.3.1. Invertebrates

Red Data lists exist for only a few invertebrate taxa. Ball (2005) lists eight of the butterfly species occurring south of 33ºS and west of 19ºE as Red Data species (Table 3.3.1). Dickson's Brown (*Stygionympha dicksoni*), listed as *Critically Endangered*, used to occur on the southern and western gullies of the Tygerberg Hills and on a few renosterveld-covered hills near Darling. It has not been seen for a few years now. Its presence in the Atlantis study area is doubtful. Dickson's Strandveld Copper (*Chrysoritis dicksoni*), also listed as *Critically Endangered*, was known from the area between Melkbosstrand and Atlantis, but this population is now extinct. Wallengren's Silver-spotted Copper, listed as *Endangered*, is presently only known from Kapokberg and Contreberg in the Darling district where it occurs in Swartland Granite Renosterveld. Its presence within the Atlantis study area is doubtful. Dickson's Monkey Blue (*Lepidochrysops methymna dicksoni*), now considered extinct, was formerly known from the Tygerberg Hills where it was associated with Swartland Shale Renosterveld.

A number of stag beetles (genus *Colophon*) are endemic to the Western Cape and all are Red Data listed (Hilton-Taylor 2000). All are restricted in their distribution to mountain tops where they are associated with orographic fog and cloud cover. Two of the three velvet worms (*Onychophora*) listed in the IUCN Red List 2006, occur on the Cape Peninsula. The White Cave Velvet Worm (*Peripatopsis alba*) is classified as *Vulnerable* and is known from the Wynberg Cave (Picker & Samways 1996). The Lion's Hill Velvet Worm (*Peripatopsis leonina*) is classified as *Critically Endangered* and is only known from Lion's Hill on the Peninsula (Picker & Samways 1996).

Table 3.3.1. Red Data butterfly species occurring in the Western Cape south of 33ºS and west of 19ºE as listed by Ball (2005).

Scientific name	Common name	Status	Presence in Atlantis study area
Kedestes barbarae bunta	Barber's Cape Flats Ranger	Critically endangered	Absent
Stygionympha dicksoni	Dickson's Brown	Critically endangered	Unconfirmed
Chrysoritis dicksoni	Dickson's Strandveld Copper	Critically endangered	Unconfirmed
Trimenia malagrida malagrida	Scarce Mountain Copper	Critically endangered	Absent
Trimenia malagrida paarlensis	Paarl Scarce Mountain Copper	Critically endangered	Absent
Kedestes lenis lenis	False Bay Unique Ranger	Endangered	Absent
Trimenia wallengrenii wallengrenii	Wallengren's Silver-spotted Copper	Endangered	Absent
Lepidochrysops methymna dicksoni	Dickson's Monkey Blue	Extinct	Absent

3.3.2. Amphibians

Thirty two frog species occur in the Western Cape, south of 33ºS and west of 19ºE (Minter *et al.* 2004). Of these, 12 are listed as Red Data species (Minter *et al.* 2004) (Table 3.3.2). The Table Mountain Ghost Frog, one of two critically endangered species in the Western Cape, is endemic to Table Mountain where it occupies an area of less than 10 km^2 at an altitude of 240-1060 m (Minter *et al.* 2004). The Micro Frog (*Microbatrachella capensis*), the other critically endangered frog species in the Western Cape, occurs from the Cape Flats south-eastward to the Agulhas region, but has not been recorded north of the Peninsula (Minter *et al.* 2004).

Of the two species listed as *Endangered*, the Western Leopard Toad (*Bufo pantherinus*) has a restricted coastal distribution, from the Cape Peninsula in the west to the Pearly Beach area in the east (Minter *et al.* 2004). Although it is mainly associated with sandy coastal lowlands it can also be found on the lower mountain slopes and hills near the coast. It is a wide-ranging species, but is always found in the general vicinity of wetlands habitat. It has not been recorded in coastal areas north of the Cape Peninsula (Minter *et al*. 2004). The Cape Platanna (*Xenopus gilli*) inhabits blackwater wetlands in low-lying coastal areas, from the Cape Peninsula south-eastward towards the Agulhas district (Minter *et al*. 2004).

Of the three frog species listed as *Vulnerable*, the Cape Rain Frog (*Breviceps gibbosus*) occurs from the central Cape Peninsula in the south to west of Citrusdal in the north (Minter *et al*. 2004). It appears to be associated with Renosterveld of which less than 3% still exists. It may be present in the Atlantis study area in patches of Malmesbury Shale Renosterveld. The Cape Mountain Toad (*Capensibufo rosei*) has a patchy distribution restricted to the Cape Peninsula and the mountains of the Western Cape up to the Breede River valley (Minter *et al.* 2004). It occurs in undisturbed mountain fynbos on mountain tops, but has also been recorded from low-lying plateaus on the southern Cape Peninsula. The Cape caco (*Cacosternum capense*), also listed as *Vulnerable*, occurs from the Cape Flats northwards to the Graafwater district. It may be present in the Atlantis study area, inhabiting areas with poorly drained loamy to clay soils, where it breeds in shallow, temporary, rain-filled pools and pans that form during the winter months. It also occurs in more sandy habitats (Minter *et al*. 2004).

The Landdroskop Moss Frog (*Arthroleptella landdrosia*), listed as *Near threatened*, is endemic to the Hottentots Holland and Kogelberg mountains where it inhabits montane fynbos and forest. The Cape Peninsula Moss Frog (*Arthroleptella lightfooti*) is endemic to the Cape Peninsula where it occurs from sea level to mountain top (1000 m). It inhabits seepages, both in open fynbos and kloofs, where the vegetation is thick and the substrate is sandy or rocky (Minter *et al.* 2004). The Montane Marsh Frog (*Poyntonia paludicola*), also listed as *Near threatened*, is found in the Hottentots Holland/Kogelberg mountain complex where it inhabits moist areas and streams in mountain fynbos at all altitudes between 200 and 1800 m.

The two species in the Western Cape listed as Data deficient, Drewes' Moss frog (*Arthroleptella drewesii*) and the Karoo Caco (*Cacosternum karooicum*) is known from the Kleinrivier Mountain near Hermanus, and the arid Karoo regions, respectively (Minter *et al.* 2004).

Table 3.3.2. Red Data frog species occurring in the greater study area (from Minter *et al*. 2004).

Species	Common name	Status	Presence in Atlantis study area	Threats
Heleophryne rosei	Table Mountain Ghost Frog	Critically endangered	Absent	
Microbatrachella capensis	Micro Frog	Critically endangered	Absent	
Bufo pantherinus	Western Leopard Toad	Endangered	Absent	
Xenopus gilli	Cape Platanna	Endangered	Absent	
Breviceps gibbosus	Cape Rain Frog	Vulnerable	Potentially present	Habitat destruction, Renosterveld
Capensibufo rosei	Cape Mountain Toad	Vulnerable	Absent	
Cacosternum capense	Cape Caco	Vulnerable	Potentially present	Urban expansion, invasive vegetation
Arthroleptella landdrosia	Landdroskop Moss Frog	Near threatened	Absent	
Arthroleptella lightfooti	Cape Peninsula Moss Frog	Near threatened	Absent	
Poyntonia paludicola	Montane Marsh Frog	Near threatened	Absent	
Arthroleptella drewesii	Drewes' Moss Frog	Data deficient	Absent	
Cacosternum karooicum	Karoo Caco	Data deficient	Absent	

3.3.3. Reptiles

Eighty five reptile species occur in the greater study area, including three tortoise, one terrapin, 51 lizard and 30 snake species (Branch 1998). Baard *et al.* (1999) list 15 of these as sensitive or threatened (Table 3.3.3). The endangered Geometric Tortoise (*Psammobates geometricus*) occurs well outside the Atlantis study area, with the closest population being at Eenzaamheid near Paarl. Two lizard species occurring on the south-western coastal lowlands are listed as *Vulnerable*: Both Gronovi's Dwarf Burrowing Skink (*Scelotes gronovii*) and Kasner's Dwarf Burrowing Skink (*Scelotes kasneri*) occur in coastal sand (Branch 1998). Gronovii's Dwarf Burrowing Skink occurs from Doringbaai to just north of the Cape Peninsula, while Kasner's Dwarf Burrowing Skink ranges from Lambert's Bay southward to the Saldanha-Langebaan area (Branch 1998). According to the distribution map in Branch (1998), Gronovi's Dwarf Burrowing Skink occurs on the Cape Peninsula as well, but the SARCA database shows Dassen Island as the southernmost record. It is doubtful that the species will be present in the Atlantis study area. Both species are threatened by habitat destruction and degradation along the West Coast due to extensive coastal development and alien infestation (Baard *et al.* 1999). A new burrowing skink (*Scelotes montispectus*) has recently been described from just north of Cape Town (Bauer *et al*. 2003). This species has been recorded from the Blouberg Nature Reserve and there is a distinct possibility that it may be present in the Atlantis study area.

Two girdled lizard species are listed as *Vulnerable*. The Dwarf Crag Lizard (*Pseudocordylus nebulosus*) is restricted to the Hottentots Holland Mountains (Costandius *et al*. 2006) and the Armadillo Lizard (*Cordylus cataphractus*) occurs from the Piketberg Mountains northward and inland (Branch 1998).

Five reptile species in the greater study area are listed as *Lower Risk* but sensitive to some degree. Of these, the Black Girdled Lizard (*Cordylus niger*) occurs in two isolated populations, one on the Cape Peninsula and one in the Saldanha-Langebaan area. It is the latter population that is under threat from coastal development (Cordes *et al.* 1996). The Cape Sand Snake (*Psammophis leightoni*) potentially occurs over the whole study area, but is extremely rare. Most of its distribution range is under great development pressure (Baard *et al.* 1999). The Southern Adder (*Bitis armata*) is a recently described taxon with a restricted range along the south-western coastal lowlands. It appears to be restricted to calcrete fynbos habitats from Langebaan in the north to the De Hoop Nature Reserve in the south. Threats include lowland habitat degradation and destruction through development, alien vegetation, sand mining and coastal development (Baard *et al.* 1999). The remaining two species listed as Lower Risk are both girdled lizard species. The Large-scaled Girdled Lizard (*Cordylus macropholis*) is a coastal species ranging from Yzerfontein to Kleinsee, while Oelofsen's Girdled Lizard occurs in isolated populations in the inland Cape Fold Mountains.

A further five lizard taxa are listed by Baard *et al.* (1999) in the *Data Deficient* category and also sensitive to some degree. Included are three burrowing skinks namely the

Striped Legless Skink (*Acontias lineatus grayi*), the Silvery Dwarf Burrowing Skink (*Scelotes bipes*), and Cuvier's Blind Legless Skink (*Typhlosaurus caecus*), and also Austen's Thick-toed Gecko (*Pachydactylus austeni*) and the Cape Dwarf Chameleon (*Bradypodion pumilum*).

Table 3.3.3. Reptiles in the greater study area listed as sensitive and/or threatened, and which may be useful indicators of habitats/landscapes in need of conservation attention (from Baard *et al.* 1999).

Species	Common name	Status	Presence in study area	Threats
Psammobates geometricus	Geometric tortoise	Endangered	Absent	
Scelotes gronovii	Gronovi's Dwarf Burrowing Skink	Vulnerable	Absent	
Scelotes kasneri	Kasner's Dwarf Burrowing Skink	Vulnerable	Absent	
Pseudocordylus nebulosus	Dwarf Crag Lizard	Vulnerable	Absent	
Cordylus cataphractus	Armadillo Lizard	Vulnerable	Absent	
Psammophis l. leightoni	Cape Sand Snake	Lower Risk	Unconfirmed	Urban and agricultural development
Bitis armata	Southern Adder	Lower Risk	Absent	
Cordylus macropholis	Large-scaled Girdled Lizard	Lower Risk	Unconfirmed	
Cordylus niger	Black Girdled Lizard	Lower Risk	Absent	
Cordylus oelofseni	Oelofsen's Girdled Lizard	Lower Risk	Absent	
Acontias lineatus grayi	Striped Legless Skink	Data Deficient	Absent	
Scelotes bipes	Silvery Dwarf Burrowing Skink	Data Deficient	Present	Urban development
Typhlosaurus caecus	Cuvier's Blind Legless Skink	Data Deficient	Present	Coastal development, invasive aliens
Bradypodion pumilum	Cape Dwarf Chameleon	Data Deficient	Absent	
Pachydactylus austeni	Austen's Thick-toed Gecko	Data Deficient	Present	Coastal development

3.3.4. Mammals

Sixty-seven mammal species potentially occur in the greater study area, including seven insectivores, 11 bats, one primate, three hare/rabbit species, 23 rodents, three felids, three canids, three mustelids, six viverrids, the aardvark, the dassie, and five antelope species (Skinner & Smithers 1990). Of these, eight are endemic to the greater study area (Skinner & Smithers 1990).

The underlying ecological factors determining the distribution of medium- and large-sized mammals in the Cape Floristic Region are complex and the available data allow only large scale interpretations and conservational applications (Boshoff & Kerley 2001). Migratory and nomadic behaviour is a strong feature of the demography of many species. The distributions of herbivores and the top predators and scavengers in the Cape Floristic Region are likely to have been ephemeral and patchy in the past and for some species this will also be true for the present (Boshoff & Kerley 2001).

Fifteen Red Data mammal species potentially occur in the greater study area (Table 3.3.4). Of these, the White-tailed Rat is the only one listed as *Endangered* (Friedmann & Daly 2004). Although it has a wide distribution in South Africa, it is very rare. Decrease in habitat due to agriculture and timber plantations is seen as the primary threat (Friedmann & Daly 2004). In the Western Cape, the White-tailed Rat is confined to the Cape Macchia Zone where it requires sandy soil with good cover (Friedmann & Daly 2004). It is nocturnal and terrestrial and lives in burrows or cracks in the soil (Skinner & Smithers 1990).

Grant's Golden Mole (*Eremitalpa granti*) is the only species in the list considered *Vulnerable* (Friedmann & Daly 2004). It occurs in a narrow zone along the coast from the Gariep River to Langebaan in the south. Habitat loss due to alluvial diamond mining is considered the main threat of this subterranean species (Friedmann & Daly 2004).

Seven of the Red Data mammal species occurring in the study area are listed as *Near threatened* (Friedmann & Daly 2004). Of these, five are bat species (Table 3.3.4). All five have relatively large distributions in South Africa, but because they shelter in large numbers in caves and subterranean dwellings, they are particularly sensitive to habitat alterations affecting these dwellings (Friedmann & Daly 2004).

The Fynbos Golden Mole (*Amblysomus corriae*), also listed as *Near threatened*, is restricted to lowland fynbos areas from Stellenbosch southward and eastward to Humansdorp. The water rat (*Dasymys incomptus*) occurs widely in Africa, but there is an isolated population in the Western Cape. It is nocturnal and semi-aquatic, occurring in bogs, marshes, swamps, fens, and peatlands (Friedmann & Daly 2004).

Six Red Data mammal species occurring in the study area are listed as *Data deficient*. Four of these are shrew species. All four shrew species have relatively large distributions in South Africa, they are terrestrial and nocturnal, preferring damp places, especially where there are areas of decaying leaf litter, except the Lesser Dwarf Shrew, which shows a preference for termite mounds (Skinner & Smithers 1990; Friedmann & Daly 2004).

The African Weasel (*Poecilogale albinucha*) has an extensive distribution in South Africa. It is under pressure from habitat loss, use in traditional medicine and road kills (Friedmann & Daly 2004). The Cape Golden Mole (*Chrysochloris asiatica*) is restricted in its distribution to the western half of South Africa. Occurring in sandy lowland areas, its habitat is under severe pressure from agriculture.

In a survey in the Atlantis study area, Mouton & Alblas (2005) did not find any signs of occupation by mammal species of conservation concern and it is doubtful that any Red Data mammals are associated with the area.

Table 3.3.4. Red Data mammal species occurring in the Western Cape, south of 33ºS and west of 19ºE as listed by Friedmann & Daly (2004).

Species name	Common name	Status	Presence in Atlantis study area	Threats
Mystromys albicaudatus	White-tailed Rat	Endangered	Absent	
Eremitalpa granti	Grant's Golden Mole	Vulnerable	Absent	
Myotis tricolor	Temminck's Hairy Bat	Near threatened	Absent	
Miniopterus schreibersii	Schreibers' Long Fingered Bat	Near threatened	Absent	
Rhinolophus capensis	Cape Horseshoe Bat	Near threatened	Absent	
Rhinolophus clivosus	Geoffroy's Horseshoe Bat	Near threatened	Absent	
Cistugo lesueuri	Lesueur's Wing-gland Bat	Near threatened	Absent	
Dasymys incomtus	Water Rat	Near threatened	Absent	
Amblysomus corriae	Fynbos Golden Mole	Near threatened	Absent	
Poecilogale albinucha	African Weasel	Data deficient	Absent	
Suncus varilla	Lesser Dwarf Shrew	Data deficient	Absent	
Myosorex varius	Forest Shrew	Data deficient	Unconfirmed	Habitat loss & pesticides
Crocidura cyanea	Reddish-grey Musk Shrew	Data deficient	Absent	
Crocidura flavescens	Greater Musk Shrew	Data deficient	Unconfirmed	None listed
Chrysochloris asiatica	Cape Golden Mole	Data deficient	Unconfirmed	None listed

3.4. Current and proposed nature conservation areas in the vicinity of the proposed power line

The Cape West Coast Biosphere Reserve is situated in the coastal zone north of Cape Town. Core areas consist of the West Coast National Park, and Dassen and Vondeling Islands. There is also a buffer zone and transition zones (Figure 4). The Atlantis study area is located within the transition zone of the Biosphere Reserve. The transition zone includes areas of cooperation that contain a variety of land uses, including settlements, where the area's natural resources are sustainably developed for the benefit of those who live there.

Figure 5 shows the Atlantis study area relative to other conservation areas, the most important of which are the Koeberg Private Nature Reserve, the Blouberg Nature Reserve and the Blaauw Mountain Private Nature Reserve.

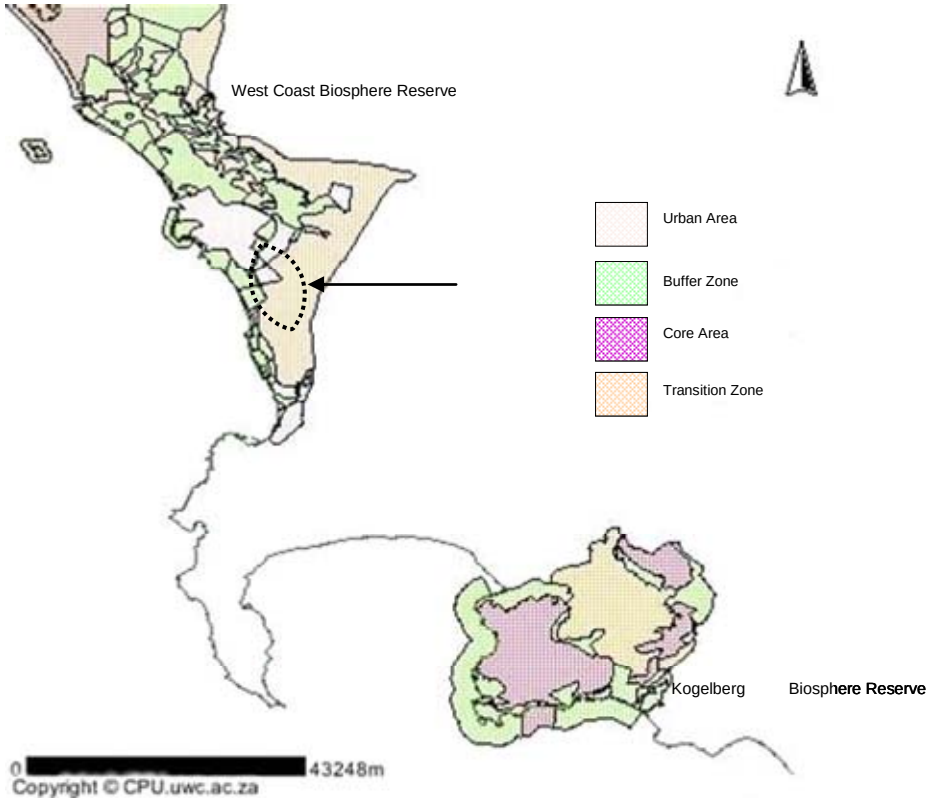

Figure 4. Map indicating the location of the Atlantis study area in relation to the West Coast Biosphere Reserve.

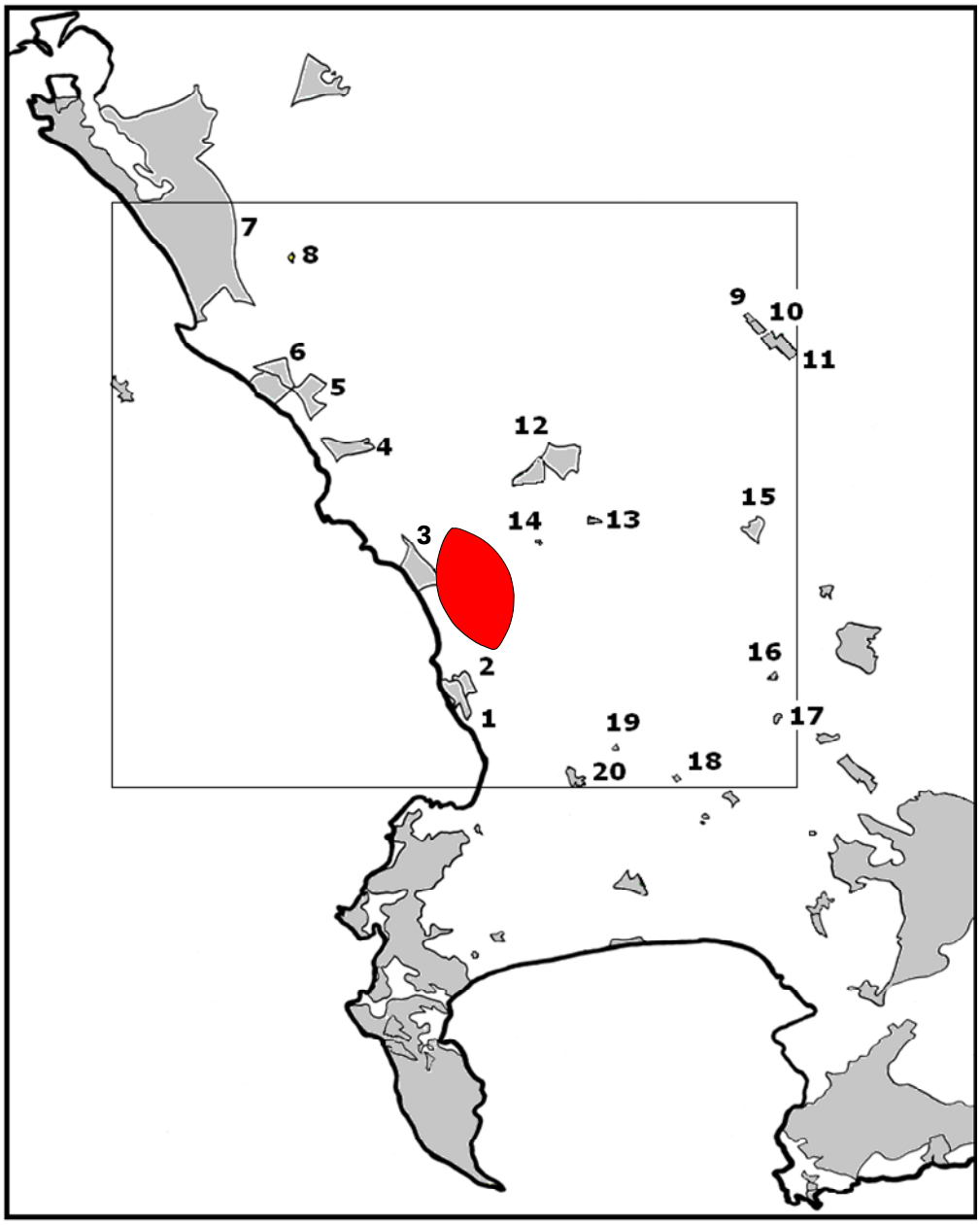

Figure 5. Conservation areas in close proximity to the Atlantis study area (indicated in red)

1. Blouberg Nature Reserve; 2. Blaauw Mountain Private Nature Reserve; 3. Koeberg Private Nature Reserve; 4. Grotto Bay Private Nature Reserve; 5. Rondeberg Private Nature Reserve; 6. Jakkalsfontein Private Nature Reserve; 7. West Coast National Park; 8. Pierre-Jeanne Gerber Private Nature Reserve; 9. Hans' Gift Private Nature Reserve; 10. Riebeeckrivier Private Nature Reserve; 11. Kasteelberg Nature Reserve; 12. Riverland Nature Reserve; 13. Kalbaskraal Local Authority Reserve; 14. Camphill Village Private Nature Reserve; 15. Paardenberg Local Authority Reserve; 16. JN Briers Louw/Limietberg Nature Reserve; 17. Joostenberg Private Nature Reserve; 18. Bracken Local Authority Reserve; 19. Durbanville Local Authority Reserve; 20. Tygerberg Local Authority Reserve

4. DESCRIPTION OF ISSUES IDENTIFIED DURING THE SCOPING PROCESS

In the scoping report for terrestrial fauna, it was suggested that an assessment of the feasibility of pre-construction removal of animals from affected areas be done.

5. METHODOLOGY OF DETERMINING THE SIGNIFICANCE OF THE IMPACTS

Direct, indirect and cumulative impacts, as well as all other issues identified are assessed in terms of the following criteria:

- The **nature**, which shall include a description of what causes the effect, what will be affected and how it will be affected.
- The **extent**, wherein it will be indicated whether the impact will be local (limited to the immediate area or site of development) or regional:
  - Local extending only as far as the development site area – assigned a score of 1;
  - Limited to the site and its immediate surroundings (up to 10 km) – assigned a score of 2;
  - Will have an impact on the region – assigned a score of 3;
  - Will have an impact on a national scale – assigned a score of 4; or
  - Will have an impact across international borders – assigned a score of 5.
- The **duration**, wherein it will be indicated whether:
  - The lifetime of the impact will be of a very short duration (0-1 years) – assigned a score of 1;
  - The lifetime of the impact will be of a short duration (2-5 years) – assigned a score of 2;
  - Medium-term (5-15 years) – assigned a score of 3;
  - Long term (> 15 years) – assigned a score of 4; or
  - Permanent – assigned a score of 5.
- The **magnitude**, quantified on a scale from 0-10, where a score is assigned :
  - 0 is small and will have no effect on the environment;
  - 2 is minor and will not result in an impact on processes;
  - 4 is low and will cause a slight impact on processes;
  - 6 is moderate and will result in processes continuing but in a modified way;
  - 8 is high (processes are altered to the extent that they temporarily cease); and
  - 10 is very high and results in complete destruction of patterns and permanent cessation of processes.

- The **probability** *of occurrence*, which shall describe the likelihood of the impact actually occurring. Probability will be estimated on a scale, and a score assigned :
  - Assigned a score of 1-5, where 1 is very improbable (probably will not happen);
  - Assigned a score of 2 is improbable (some possibility, but low likelihood);
  - Assigned a score of 3 is probable (distinct possibility);
  - Assigned a score of 4 is highly probable (most likely); and
  - Assigned a score of 5 is definite (impact will occur regardless of any prevention measures).

- The **significance**, which shall be determined through a synthesis of the characteristics described above (refer formula below) and can be assessed as low, medium or high.
- The **status**, which will be described as either positive, negative or neutral.
- The degree to which the impact can be reversed.
- The degree to which the impact may cause irreplaceable loss of resources.
- The *degree* to which the impact can by *mitigated*.

The **significance** is determined by combining the criteria in the following formula:

S = (E + D + M)P; where

S = Significance weighting
E = Extent
D = Duration
M = Magnitude
P = Probability

The **significance weightings** for each potential impact are as follows:

- < 30 points: Low (i.e. where this impact would not have a direct influence on the decision to develop in the area);
- 30-60 points: Medium (i.e. where the impact could influence the decision to develop in the area unless it is effectively mitigated),
- > 60 points: High (i.e. where the impact must have an influence on the decision process to develop in the area).

6. IMPACT STATEMENT

From the previous sections, it is clear that, although unconfirmed, animal species of conservation importance may be present in the study area. Those species that can not effectively vacate affected areas during the construction phase of the proposed transmission line, e.g., burrowing lizards and burrowing mammals, may suffer

direct mortality during construction. Although the natural habitat has been highly degraded in the study area, the construction of a new transmission line may also result in the loss of habitat of faunal significance.

7. IMPACT DESCRIPTION AND ASSESSMENT

7.1. *Direct mortality*

Description of effect

Several faunal species of conservation importance may be directly impacted on through mortality of individuals during construction of the proposed transmission line.

Assessment

At least eight reptile and two frog species of conservation concern may be present in the Atlantis study area, and if present, may suffer mortality during construction of the transmission line. The presence of none of these species has, however, been confirmed. According to present distribution records (SARCA database), the Atlantis study area is located at the edge of the distribution ranges of the reptile species, implying that the area may not represent optimal habitat for any of the species. The habitat is also highly degraded, which may further reduce the possibility of their presence. With the exception of the three shrew species listed in Table 3.3.4, no other animal species of conservation concern should be affected through direct mortality during construction. Like the amphibian and reptile species, the presence of the three shrew species on the site is unconfirmed, and seen in the light of the highly transformed nature of the habitat, it is not expected that these insectivores will be present in significant numbers. It is accordingly concluded that the impact of direct mortality on species of conservation concern during the construction of the power line along the proposed route (including the sub-alternative route) area will only be of local importance, of short duration, of low intensity and of low probability. Using the assessment methodology as set out in Section 5, the impact is therefore rated to be of overall low significance (see Table 7.1 for assessment summary). This rating is done with high confidence.

Mitigation measures

From a humanitarian point of view, every effort should be made to save and relocate any amphibian, reptile, bird or mammal that cannot flee of its own accord, encountered during the construction phase. These animals should be relocated to a suitable area immediately outside the construction footprint area, but under no circumstance to an area further away. Except for dense colonies of the Cape Gerbil *Tatera afra*, animal numbers in the *Acacia* infested habitat will be low and no formal searches will be required before construction starts, as these will be highly ineffective.

Table 7.1. Assessment summary for the potential impact of direct mortality on terrestrial fauna during construction of a power transmission line between the Ankerlig Power Station and the Omega Substation (see Section 5 for an outline of the assessment methodology).

CRITERIA	IMPACT			
	CONSTRUCTION		OPERATION	
	Without mitigation	With mitigation	Without mitigation	With mitigation
Extent	Local (1)	Local (1)	N/A	N/A
Duration	Short-term (1)	Short-term (1)	N/A	N/A
Magnitude	Minor (2)	Minor (0)	N/A	N/A
Probability	Improbable (2)	Improbable (2)	N/A	N/A
Significance	Low (8)	Low (4)	N/A	N/A
Status	Negative	Negative	N/A	N/A
Reversibility	N/A	N/A	N/A	N/A
Irreplaceable loss of resources	N/A	N/A	N/A	N/A
Can impacts be mitigated	Yes		N/A	N/A
Mitigation: Animals found on construction site and that cannot flee by themselves, should be relocated to adjacent areas.				
Cumulative impacts: None				
Residual impacts: None				

7.2 Loss of faunal habitats

Description of effect

Construction of a transmission line from Ankerlig to Omega may result in the loss of faunal habitats.

Assessment

The habitat is of extremely poor quality along the entire route for the proposed power line, including the sub-alternative route. Large sections have been completely transformed, while the remainder is heavily infested with *Acacia*. It is therefore concluded that the construction of a power line along the proposed routes will not add significantly to the already poor quality of the habitat. There do not appear to be any sensitive faunal habitats along the route.

Even if construction of a transmission line may result in the loss of faunal habitat, the impact of this on fauna will only be at a local level because of the lack of evidence that animal species of conservation concern will be affected. It is, for example, uncertain whether the ranges of the coastal lizard species of conservation concern extend onto Atlantis Sand Fynbos. Furthermore, it is uncertain whether

the Red Data frog species, the Cape Rain Frog (*Breviceps gibbosus*) and the Cape Caco (*Cacosternum capense*) are present in what is left of the original Swartland Shale Renosterveld (on the clay soils). Eskom will require a 55 m wide servitude for the new power line. The clearing of all vegetation in the servitude is an old practice which Eskom no longer practices. They will however need to clear an 8 m wide strip along the centre line of the servitude for stringing purposes. This area will be rehabilitated after construction if it is not needed as an access road. The clearing of 8 m wide strip of *Acacia* will probably have a positive impact on many terrestrial animal species, although the benefits will only be temporary. Because the habitat has already been completely transformed the probability that strip clearing will impact on threatened animal species is extremely low. Against this background, the overall significance of the impact is rated as low (see Table 7.2 for assessment summary). This rating is done with high confidence.

Mitigation measures

Because clearing of a 8 m strip of *Acacia* may positively impact on terrestrial fauna, no mitigation is required.

Table 7.2. Assessment summary for the potential impact of loss of faunal habitat on terrestrial fauna during construction of a power transmission line between the Ankerlig Power Station and the Omega Substation (see Section 5 for an outline of the assessment methodology).

CRITERIA	IMPACT			
	CONSTRUCTION		OPERATION	
	Without mitigation	With mitigation	Without mitigation	With mitigation
Extent	Local (1)	N/A	N/A	N/A
Duration	Medium-term (3)	N/A	N/A	N/A
Magnitude	Minor (2)	N/A	N/A	N/A
Probability	Probable (3)	N/A	N/A	N/A
Significance	Low (21)	N/A	N/A	N/A
Status	Positive	N/A	N/A	N/A
Reversibility	Yes		N/A	N/A
Irreplaceable loss of resources	No			
Can impacts be mitigated	N/A			
Mitigation: Not required				
Cumulative impacts: None				
Residual impacts: None				

8. COMPARATIVE ASSESSMENT OF ALTERNATIVES

Although the study area was originally vegetated by Cape Flats Dune Strandveld (on the Witsand formation sands), Atlantis Sand Fynbos (on the Springfontyn formation sands) and Swartland Shale Renosterveld (on the clay soils) (Mucina & Rutherford 2006), little of that remains. In the sandy northern half there is a mixture of natural vegetation and dense *Acacia* infestation (Figure 2), while in the more clayey central and southern parts the area has been cultivated (Figure 3) and very few patches of natural vegetation remain.

From a faunal perspective, the Cape Flats Dune Strandveld is probably the most sensitive habitat in the Atlantis study area. The recently described Blouberg Dwarf Burrowing Skink (*Scelotes montispectus*) is associated with this habitat, as well as several other species of conservation concern (Dickson's Strandveld Copper, Gronovi's Dwarf Burrowing Skink, Kasner's Dwarf Burrowing Skink, Cape Sand Snake, Large-scaled Girdled Lizard, Silvery Dwarf Burrowing Skink, Cuvier's Blind Legless Skink, and Austen's Thick-toed Gecko). Because of uncertainty how far the ranges of the coastal species extend inland into the Atlantis Sand Fynbos habitat, the power line sub-alternative in the vicinity of Koeberg (see Figure 1) would have the highest potential to impact on animal species of conservation concern. Although the preferred alternative may result in greater habitat destruction than when following the existing line with its already cleared corridor, the extremely poor quality of the habitat will negate this impact. In summary, as far as terrestrial fauna is concerned, the inland route in the vicinity of Koeberg would be the preferred one, although the case for this conclusion is not very strong.

9. CONCLUSIONS

- From a terrestrial fauna point of view, there do not appear to be any obvious risks associated with the construction of a power line between the Ankerlig Power Station and the already authorised Omega Substation.
- The habitat in the study area is highly degraded and the erection of a power line will not significantly add to the environmental stress already being experienced by terrestrial fauna in the affected areas.
- Although a number of Red Data reptile and frog species may potentially occur in the affected areas, their presence remains unconfirmed.
- The inland route in the vicinity of Koeberg (see Figure 1), would, from a terrestrial fauna perspective, be the preferred route, although the case for this decision is not very strong.
- From a humanitarian point of view, animals encountered during site clearing and pylon construction should be relocated to adjacent unaffected areas. Because of the highly transformed nature of the habitat and expected low presence of fauna, no formal search and relocation strategy is required. It

should be standard practice during all site clearing and construction activities to assist stranded animals to escape.

10. MEASURES FOR INCLUSION IN THE MANAGEMENT PLAN

Because of the highly transformed nature of the habitat and the expected absence of Red Data species in the affected areas, no measures for inclusion in the management plan are required as far as terrestrial fauna are concerned.

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