?. FAUNAL ASSESSMENT

Compiled by: Dewald Kamffer (Pr.Sci.Nat.)
ECOCHECK

?.1. Introduction

The area investigated for the proposed development of the CCGT plant (and associated infrastructure) is situated in the southern part of Mpumalanga between the towns of Meyerville and Amersfoort. It is located approximately 24km north of the Kwa-Zulu Natal boundary and 30km North Northeast of the Free State boundary. It is situated between the R23 and N11 roads.

The study area incorporates natural grassland, transformed areas (mainly maize fields), outcrops and wetlands. Significant differences in faunal composition, and ultimately faunal sensitivity, is therefore expected to exist between the various sites.

The proposed development is expected to result in the loss of approximately 100ha of grassland of varying status, depending on the final site selection. This chapter will focus on highlighting areas that are regarded sensitive in terms of faunal attributes and therefore not regarded suitable for the proposed development. Aspects of the proposed development that will contribute to a loss of biodiversity and faunal habitat include:

- 100 ha that will be used for the CCGT plant;
- a gas pipeline from the UCG plant to the CCGT plant;
- a water pipeline from the Rietpoort Balancing Dam;
- a water treatment plant;
- a sewage treatment plant; and
- borrow pits of 1.5ha each.

?.2. Methodology

Six separate sites were evaluated in this report, including:

- Site 1 (Portions 1, 3 and 7 of the farm Palmietspruit 68 HS; Portion 6 of the farm Strydkraal 53 HS; Portion 1 of the farm Roodekopjes 67 HS)
- Site 2, including:
  - Site 2a (Portion 7 of the farm Bergvliet 65 HS; Portion 4 of the farm Rietpoort 83 HS; Werda 116 HS)
  - Site 2b (Portions 3 and 4 of the farm Rietpoort 83 HS and Werda 116 HS)
- Site 3, including:
  - Site 3a (Portions 1, 2, 6, 10 and 11 of the farm Witkoppies 81 HS)
  - Site 3b (Portions 1, 5 and 6 of the farm Witkoppies 81 HS)

* Site 3c (Portions 4, 5, 8, 9, 12, 13 and 14 of the farm Witkoppies HS).

?.2.1. Status of available faunal habitat

The study area was investigated during a short site visit conducted in November 2007. Results presented in this document are based on available literature and the brief examination of the study area; it does not include any results obtained from detailed trappings and active searches periods. The aim is purely to assess available habitat and the status thereof in terms of faunal attributes; knowledge of habitat requirements of sensitive species is used extensively to determine the relative faunal sensitivity of each proposed site.

Desktop analyses of potential Red Data fauna inhabitants were compiled using:

- Invertebrates – IUCN 2004 Red Data list;
- Amphibians – Atlas and Red Data book of the frogs of South Africa;
- Reptiles – IUCN 2004 Red Data list;
- Birds – Roberts multimedia birds; and
- Mammals – Red Data book of the mammals of South Africa – a conservation assessment.

An assessment of the potential habitat available is based on the vegetation assessment relevant to this project. The Probability of Occurrence of Red Data taxa were based on known geographical distribution and habitat suitability.

?.2.2. Assessment Criteria - Fauna

A subjective rating was attributed to each of the sites for the respective impacts, based on the status of available faunal habitat on the site, as well as in the immediate surrounds. These ratings were:

High	1 (severe impacts, not mitigatable[1]);
Medium-high	2 (severe impacts, intensive/ costly mitigations measures);
Medium	3 (moderate impacts, mitigatable);
Medium-low	4 (moderate impacts, highly mitigatable); and
Low	5 (low/ no impacts)

Averaging the estimated impacts for each site result in a Site Preference Ranking (SPR) that will highlight areas that are regarded more or less ideal for the proposed development. The suitability of respective sites will generally exhibit the following characteristics:

Table 1: Habitat characteristics for Site Preference Ranking

[1] "not mitigatable' impacts generally deals with the complete transformation of habitat or destruction of red data species that cannot be reversed, even with the implementation of costly, intensive and detailed rehabilitation programmes

Site Preference	SPR (general fauna description)	Faunal score equating to SPR class
Ideal (5)	Available habitat is entirely transformed or in a degraded state, exhibiting low faunal species diversity or evidence of the presence of diverse faunal assemblages and low RD fauna probability. The area has little inherent ecological functionality left and is entirely fragmented and isolated. Low/ no conservation value with low potential for successful rehabilitation.	21-25
Preferred (4)	Available habitat is largely transformed and degraded, exhibiting low faunal diversity or evidence of diverse faunal assemblages with low RD faunal probabilities. The ecological function is compromised and a low conservation value is attributed. The potential for successful rehabilitation is however moderate-low. High fragmentation and isolation factors are attributed.	17-20
Acceptable (3)	Available habitat is moderately degraded, but natural habitat does occur in some places. Medium faunal diversity is noted with some evidence of faunal presence. Moderate RD probabilities are estimated. The inherent ecological function is still intact but may be compromised by the current levels of degradation if not managed. Successful rehabilitation of the area is possible, but costly. Moderate fragmentation and isolation factors are attributed. The conservation value is regarded moderate.	13-16
Not Preferred (2)	Available habitat is in a good condition with little evidence of disturbances/ degradation. Faunal species diversity is high and moderately high RD probabilities are attributed. Frequent evidence of faunal presence is noted. The ecological functioning is intact and very little rehabilitation is needed. Low fragmentation and isolation factors are attributed. The area is of medium conservation importance.	9-12
Sensitive (1)	Available habitat is in pristine or near pristine state and suitable for diverse faunal assemblages. Very little/ no signs of disturbance are present. The faunal diversity is high with several species of concern known to be present/ potentially present. Ecological functioning is intact and low fragmentation and isolation factors are attributed. The conservation importance is high.	5-8

No impacts were identified that are regarded beneficial to the faunal habitat and/ or faunal species/ communities of the study area since the proposed development is largely destructive. Impacts identified are similar for all sites investigated during this investigation.

The following impacts were identified that will affect the faunal habitat adversely:

- Destruction of threatened species and habitat;
- Destruction of sensitive habitat types (outcrops, riparian fringes, non-perennial streams, river, etc.);

- Destruction of pristine habitat;
- Changes in the local and regional biodiversity; and
- Impacts on surrounding natural habitat and species.

a. Destruction of Red Data Fauna Species & Associated Habitat

The loss of threatened/ protected species or habitat that is regarded suitable for these species is a significant impact on the biodiversity of a region. Threatened species, in most cases, do not contribute significantly to the biodiversity of an area in terms of sheer numbers as they generally occur in low numbers, but they are extremely important in terms of the biodiversity of an area and a high conservation value is placed on the presence of such species.

Threatened species are particularly sensitive to changes in their environment, having adapted to specific habitat requirements. Habitat changes, mostly a result of human interferences and activities, are one of the greatest reasons for these species having a threatened status. Effects of surface impacts are often permanent and recovery or mitigation is generally not perceived as possible.

b. Destruction of Sensitive Habitat & Areas of High Biodiversity

Sensitive habitat types include ridges, outcrops, riparian habitat and localised faunal habitat. These areas represent centres of atypical habitat, comprising biological attributes that are not frequently encountered in the greater surrounds. A high conservation value is attributed to the faunal assemblages of these areas as they contribute significantly to the biodiversity of a region. Furthermore, these habitat types are generally isolated and are frequently linear in nature, such as rivers and ridges. Any impact that disrupts this continuous linear nature (fragmentation) will result in further isolation of existing ecological units, affecting the migration potential of some faunal species adversely.

c. Destruction of Pristine Habitat Types

The largest extent of the study area comprises natural grassland habitat. It is however not considered pristine throughout the area and over utilisation, high grazing pressure and poor management strategies led to changes in species composition and depletion of the herbaceous layer. Aspects such as the degree of grazing, visible erosion and infestation by alien plant species are taken into account in this section. Degradation factors therefore influences the faunal sensitivities of the region and immediate surrounds adversely.

d. Changes to Habitat Diversity & Biodiversity

Transformation of natural habitat during the construction process will inevitably result in the creation of atypical and artificial habitat types that are not considered representative of the region and also not particularly suitable to natural faunal assemblages.

Furthermore, as a result of decreased habitat, increased competition and lower numbers of endemic biota, the genetic pool of species might eventually be influenced by the introduction and proliferation of non-endemic species. Faunal communities and variations have developed separate gene structures as a result of habitat selection and geographical separation and the introduction of different ecological elements might lead to different genetic selection structures, eventually affecting the genetic structure of current populations.

e. Impacts on Surrounding Natural Habitat & Species

The possibility exists that surrounding areas and species present in surrounding areas could be affected by impacts resulting from construction and operational activities. These impacts could include all of the above impacts, depending on the sensitivity and status of surrounding habitat and species. Areas that are particularly prone to this impact include riparian zones where impacts that affect the water quality results in impacts further downstream.

?.3. Faunal Attributes

?.3.1. Regional Fauna

The Wakkerstroom Region (Maputuland – Pondoland region) is considered an area of sensitive faunal habitat and is situated approximately 25km towards the east and southeast of the study area, (ENPAT, 2001). This area of sensitive vegetation and associated faunal communities is however not considered to be threatened by the proposed development. The study area is situated with the African Grasslands/ Ekengela Initiative Transition Zone, rendering all areas of natural grassland sensitive (ENPAT, National Database, Biosphere).

?.3.1. Red Data Faunal species

Sixty-eight Red Data animal species are expected to be found in the region of the study area. Most of these species have at least a moderate probability of occurrence in the study area itself; habitat characteristics required by most of these species cannot be excluded during this scoping assessment and the Precautionary Principle is consequently followed.

Table 2: Red Data animals of the study area

Biological Name	English Name	RD	Probability
INVERTEBRATES			
Metisella meninx	Marsh Sylph	VU	high
Chrysoritis aureus	Golden Opal	NT	moderate
REPTILES			
Cordylus giganteus	Giant Girdled Lizard	VU	moderate
Homoroselaps dorsalis	Striped Harlequin Snake	NT	moderate
Lamprophis fuscus	Yellow-bellied House Snake	NT	moderate
BIRDS			
Botaurus stellaris	Eurasian Bittern	CR	moderate
Ciconia nigra	Black Stork	NT	moderate
Leptoptilos crumeniferus	Marabou Stork	NT	moderate
Mycteria ibis	Yellow-billed Stork	NT	moderate
Geronticus calvus	Southern Bald Ibis	VU	moderate
Phoenicopterus ruber	Greater Flamingo	NT	low
Phoenicopterus minor	Lesser Flamingo	NT	low
Sagittarius serpentarius	Secretarybird	NT	moderate
Gyps coprotheres	Cape Vulture	VU	low
Polemaetus bellicosus	Martial Eagle	VU	moderate
Circus ranivorus	African Marsh-Harrier	VU	moderate
Circus macrourus	Pallid Harrier	NT	moderate
Circus maurus	Black Harrier	VU	low
Falco peregrinus	Peregrine Falcon	NT	moderate
Falco biarmicus	Lanner Falcon	NT	moderate
Falco naumanni	Lesser Kestrel	VU	moderate
Grus carunculatus	Wattled Crane	CR	moderate
Anthropoides paradisea	Blue Crane	VU	moderate
Balearica regulorum	Grey Crowned Crane	VU	moderate
Crex crex	Corn Crake	VU	moderate
Sarothrura affinis	Striped Flufftail	VU	moderate
Sarothrura ayresi	White-winged Flufftail	CR	low
Neotis denhami	Denham's Bustard	VU	moderate
Eupodotis barrowii	Barrow's Korhaan	VU	moderate
Eupodotis caerulescens	Blue Korhaan	NT	moderate
Eupodotis melanogaster	Black-bellied Bustard	NT	moderate
Rostratula benghalensis	Greater Painted-snipe	NT	low
Vanellus melanopterus	Black-winged Lapwing	NT	moderate
Glareola nordmanni	Black-winged Pratincole	NT	moderate
Sterna caspia	Caspian Tern	NT	low
Tyto capensis	African Grass-Owl	VU	moderate
Alcedo semitorquata	Half-collared Kingfisher	NT	moderate
Heteromirafra ruddi	Rudd's Lark	CR	moderate

Spizocorys fringillaris	Botha's Lark	EN	moderate
Lioptilus nigricapillus	Bush Blackcap	NT	low
Anthus brachyurus	Short-tailed Pipit	VU	moderate
Anthus chloris	Yellow-breasted Pipit	VU	moderate
MAMMALS			
Amblysomus septentrionalis	Higveld Golden Mole	NT	moderate
Chrysospalax villosus	Rough-haired Golden Mole	CR	moderate
Crocidura cyanea	Reddish-grey Musk Shrew	DD	moderate
Crocidura flavescens	Greater Musk Shrew	DD	moderate
Crocidura fuscomurina	Tiny Musk Shrew	DD	moderate
Crocidura hirta	Lesser Red Musk Shrew	DD	moderate
Crocidura mariquensis	Swamp Musk Shrew	DD	moderate
Crocidura silacea	Lesser Grey-brown Musk Shrew	DD	moderate
Dasymys incomtus	Water Rat	NT	moderate
Hyaena brunnea	Brown Hyaena	NT	moderate
Lemniscomys rosalia	Single-striped Mouse	DD	moderate
Lutra maculicollis	Spotted-necked Otter	NT	low
Mellivora capensis	Honey Badger	NT	moderate
Miniopterus fraterculus	Lesser Long-fingered Bat	NT	low
Miniopterus schreibersii	Schreiber's Long-fingered Bat	NT	low
Myosorex cafer	Dark-footed Forest Shrew	DD	moderate
Myosorex varius	Forest Shrew	DD	moderate
Myotis tricolor	Temminck's Hairy Bat	NT	low
Myotis welwitschii	Welwitsch's Hairy Bat	NT	low
Mystromys albicaudatus	White-tailed Rat	EN	moderate
Otomys slogetti	Sloggett's Rat	DD	moderate
Poecilogale albinucha	African Weasel	DD	moderate
Rhinolophus clivosus	Geoffroy's Horseshoe Bat	NT	moderate
Rhinolophus darlingi	Darling's Horseshoe Bat	NT	moderate
Suncus infinitesimus	Least Dwarf Shrew	DD	moderate
Suncus varilla	Lesser Dwarf Shrew	DD	moderate

?.3.1. Habitat Types in the Study area

a. Natural Grassland

For descriptions of the habitat types of the study area, please refer to the vegetation assessment. The discussion of the faunal habitat is done for the same habitat types as described in the vegetation assessment in order to enable easy comparison between the floristic and faunal assessments and also to integrate the data for final ecological discussions.

The likelihood of encountering Red Data faunal species in the natural grassland habitat type is high. Species that contribute to a moderate-high conservation status of natural grasslands include, but are not necessarily limited to:

- *Sagittarius serpentarius*
- *Glareola nordmanni*
- *Eupodotis barrowii*
- *Eupodotis caerulescens*
- *Anthus brachyurus*

A high sensitivity level is afforded to this habitat type: 1

b. Transformed and Degraded Grassland

Areas that were subjected to cultivation, fallow or active, as well as areas where infrastructure exist from recent or historic developments, constitute this habitat type. All natural faunal habitat was removed and the current vegetation, where present, comprises a high degree of pioneer species or species that are not associated with a pristine grassland conditions.

A low sensitivity level is afforded to this habitat type (5), but areas where moderate levels of degradation are noted will be afforded a sensitivity level of 3.

c. Riparian Zones

Numerous small, non-perennial drainage lines and streams occur within the study area and in close proximity to the proposed site locations. The faunal habitat status of these drainage lines and streams are regarded as moderately pristine. Species that affect the faunal habitat status of this habitat type adversely include, but are not necessarily limited to:

- *Tyto capensis*
- *Otomys slogetti*
- *Metisella meninx*
- *Crocidura mariquensis*
- *Myosorex varius*

A high sensitivity level is afforded to this habitat type: 1

d. Rocky Outcrops

Localised rocky outcrops occur scattered in the terrestrial grassland as well as the riparian zones. These areas are difficult to identify without intensive surveys as they are frequently extremely small.

The habitat characteristics are similar to the surrounding areas, but the species composition is different, contributing significantly to the diversity of the region. A high conservation value is placed on these areas as they are also suitable habitat for a number of Red Data animal species.

A high sensitivity level is afforded to this habitat type: 1

?.5. Results

Table 3: Site Preference Ranking according to faunal sensitivity

Criteria	Threatened species	Landscape sensitivity	Pristine habitat	Habitat Transformation	Surrounding habitat	SPR	Development Suitability
Site	**Criteria Ranking**						
1	4	3	3	3	3	16	**Acceptable**
2a	1	1	2	2	2	8	**Sensitive**
2b	1	1	2	2	2	8	**Sensitive**
3a	3	3	3	3	3	15	**Acceptable**
3b	5	5	5	5	5	25	**Ideal**
3c	3	2	2	3	3	13	**Acceptable**

Please note that these results also take the Mpumalanga Biodiversity Conservation Plan into consideration.

?.6. Conclusions & Recommendations

Areas that constitute pristine natural grasslands, rocky outcrops and riparian zones are not regarded suitable for the proposed development. Conversely, the proposed sample plots that are characterised by, or situated in close proximity to transformed and degraded habitat is regarded more suitable for the proposed development.

The conservation of areas that are suitable for Red Data species and pristine faunal habitat represents the main focus of conservation strategies, although not the only objectives. Early identification and elimination of these areas from the selection process is therefore critical. From the preliminary results it is therefore evident that Sites 2a and 2b are not regarded suitable in terms of faunal attributes. The loss of these areas is expected to affect faunal diversity on a local and regional scale, in spite of the relative small size of the areas. The use of either of the remaining sites is therefore recommended with suitable mitigation measures to protect surrounding sensitive habitat.