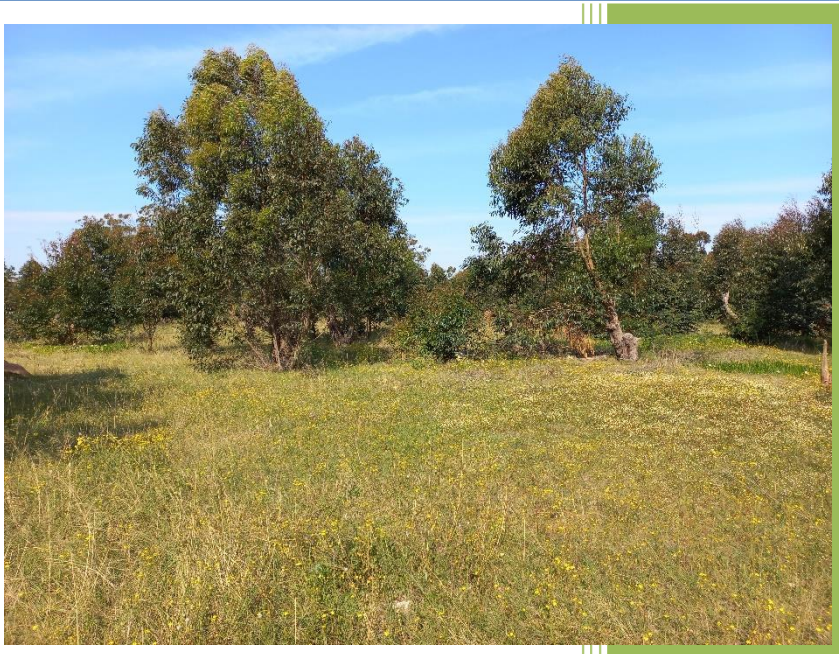
Terrestrial Biodiversity Compliance Statement for a Solar PV development in Greenbushes, NMBM, Eastern Cape



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Prepared for

Habitat Link Consulting

2 February 2023

1 Contents

1 Introduction 5
1.1 Details of Specialist and Declaration of Interest 6
1.2 Project Description 6
1.3 Terms of Reference 7
1.4 Assumptions and Limitations 8
2 Methods 9
2.1 Project Area of Influence (PAOI) 9
2.2 Desktop Assessment 10
2.3 Site Assessment 10
2.4 Impact Assessment Methodology 11
3 Study Site Description 15
3.1 Vegetation Type 15
3.1.1 National Vegetation Assessment 15
3.1.2 Regional Context 16
3.1.3 Local Context 17
3.2 National List of Threatened Ecosystems (2011) 19
3.3 Protected Areas 19
3.4 Strategic Water Source Areas 20
3.5 National Freshwater Ecoystem Priority Areas 21
3.6 Forest Patches 21
3.7 Species of Conservation Concern 21
3.7.1 Conservation Status 21
3.7.2 Plant Species 24
3.7.3 Animal Species 25
3.8 PAOI 26

4 Ecological Assessment 26
4.1 Vegetation Community Composition 26
4.2 Species of Conservation Concern 29
4.2.1 Plant Species 29
4.2.2 Animal SCCs 29
4.3 Threatened or Protected Species 34
4.4 Alien Invasive Plants 37
4.5 Ecological Sensitivity & Site Ecological Importance 37
5 Impact Assessment 39
6 Conclusions and Recommendations 39
7 References 40
Appendix 1 CV of Specialists 42
Appendix 2 Declaration of Interest 51
Appendix 3 List of Species on the Proposed Greenbushes Solar PV Site, NMBM 54
Appendix 3.1 List of Plant Species found at the proposed Greenbushes Solar PV Site, NMBM, and their conservation significance 54
Appendix 3.2 List of Herpatofauna, Mammals and Lepidoptera on the proposed Greenbushes Solar PV Site, NMBM. 56
Appendix 3.3 List of potential Avifauna occurring on the proposed Greenbushes Solar PV Site, NMBM. 66

Table of Figures

Figure 1 Location of the proposed development on the Erf 77 Greenbushes, Nelson Mandela Bay Municipality. Inset: Regional Location of the proposed development. 7
Figure 2 The National Vegetation Map of South Africa (SANBI 2006-2018). 16
Figure 3 The development site is situated in Rowallan Park Grassy Fynbos, as identified by the NMBM Conservation Assessment and Plan (SRK 2009) 18

Figure 4 The Nelson Mandela Bay Municipality Bioregional Plan CBA Network. 18

Figure 5 Protected Areas (SAPAD Q4 2022) and Eastern Cape Protected Area Expansion Strategy (ECPAES) focus areas (2010) 20

Figure 6 Threatened Species categories (SANBI 2020). 23

Figure 7 Vegetation types identified on the solar PV development site in Greenbushes, NMBM. 27

Figure 8 Sensitivity map of the Solar PV development site in Greenbushes, NMBM. 38

List of Tables

Table 1 Impact Assessment Methodology and categories. 12

Table 2 List of plant species in Algoa Sandstone Fynbos. (d=dominant, e=South African endemic, et=possibly endemic to a vegetation type). 15

Table 3 Habitat requirements and occurrence of Species of Conservation Concern and Threatened or Protected Species occurring naturally in the project site. 31

Table 4 List of Species of Conservation Concerns, as well as Threatened and Protected Species, that may occur on the proposed development site. 34

Table 5 List of Alien Invasive Species (AIS) on site. 37

ACRONYMS

AGF	ALGOA GRASSY FYNBOS
BB	BETHELSDORP BONTVELD
BID	BACKGROUND INFORMATION DOCUMENT
BP	BIOREGIONAL PLAN
CAP	CONSERVATION ASSESSMENT AND PLAN
CBA	CRITICAL BIODIVERSITY AREA
DFFE	DEPARTMENT OF FORESTRY, FISHERIES AND ENVIRONMENT
DEDEAT	DEPARTMENT OF ECONOMIC DEVELOPMENT, ENVIRONMENTAL AFFAIRS AND TOURISM
EA	ENVIRONMENTAL AUTHORISATION
EAP	ENVIRONMENTAL ASSESSMENT PRACTITIONER
ECBCP	EASTERN CAPE BIODIVERSITY CONSERVATION PLAN
EPA	ECOLOGICAL PROCESS AREA
FBAR	FINAL BASIC ASSESSMENT REPORT
IAP	INVASIVE ALIEN PLANT
NECO	NATURE AND ENVIRONMENTAL CONSERVATION ORDINANCE OF 1974
NFA	NATIONAL FORESTS ACT 84 OF 1998
NFEPA	NATIONAL FRESHWATER ECOSYSTEM PRIORITY AREA
NPAES	NATIONAL PRIORITY AREAS FOR EXPANSION OF TERRESTRIAL AREAS
NMBM	NELSON MANDELA BAY MUNICIPALITY
PAOI	PROJECT AREA OF INFLUENCE
POSA	PLANTS OF SOUTHERN AFRICA
SAPAD	SOUTH AFRICAN PROTECTED AND CONSERVATION AREAS DATABASE
SANBI	SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE
SANParks	SOUTH AFRICAN NATIONAL PARKS
SCC	SPECIES OF CONSERVATION CONCERN
SEI	SITE OF ECOLOGICAL IMPORTANCE
SWSA	STRATEGIC WATER SOURCE AREA
TOPS	THREATENED OR PROTECTED SPECIES

1 Introduction

Habitat Link Consulting (Pty) Ltd has appointed Clayton Weatherall-Thomas to conduct a Terrestrial Biodiversity, Plant Species and Animal Species Impact Assessment specialist report for the construction of a solar PV development on Erf 77 Greenbushes, Gqeberha (formerly Port Elizabeth), Nelson Mandela Metropolitan Municipality. The specialist assessment forms part of a Basic Assessment Report (BAR) process, as required by the NEMA Environmental Impact Assessment Regulations of 2014, as amended.

The DFFE online screening tool report has identified the site to have a VERY HIGH terrestrial biodiversity sensitivity, a MEDIUM animal species sensitivity, and a LOW plant species sensitivity. The DFFE Screening Report identified the need for an animal species, plant species and terrestrial biodiversity impact assessment, in terms of the assessment protocols identified in the Screening Report, namely Protocol for the Specialist Assessment and minimum report content requirements for environmental impacts on Terrestrial Biodiversity (GN 320, published 20 March 2020) and Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Plant and Animal Species (GN 1150 published on 30 October 2020). The impact assessment methodology of the Species Impact Assessment Guidelines (SANBI 2020) was utilised to determine the impact of the proposed development on both faunal and floral species.

The objectives of the assessment are to:

1. Identify the Environmental Sensitivity of the site using desktop and online resources
2. Describe the vegetation types and faunal habitat units on site, and identified sensitivities
3. Determine the threat status and sensitivity of the vegetation, plant species and animal species on site
4. Describe the level of degradation of the vegetation and habitats on site
5. Assess the impact of the proposed development on the vegetation, inclusive of plant species, animal species and ecological processes, of the site
6. Provide recommendations to mitigate the negative environmental impacts of the proposed development

1.1 Details of Specialist and Declaration of Interest

Name of specialist: Clayton Richard Weatherall-Thomas

Qualifications and Expertise: Please see *Curriculum Vitae* attached as Appendix 1

SACNASP (Ecological Science): 128641

Declaration of Interest: Please see Appendix 2

1.2 Project Description

The scope of the proposed development entails a solar PV development with supporting services, on Erf 77 Greenbushes, of approximately 2.31 ha in size (Figure 1). The flat site is situated within a developing industrial area, with residential elements remaining in the area, as well as the informal settlement Kuyga in the near vicinity.

In accordance with the amended 2014 Environmental Impact Assessment (EIA) Regulations (2014). The proposed activity may trigger EIA Regulations (Government Notice No. 983 and 985) as amended (Government Notice No. 327 and 324) promulgated in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA).

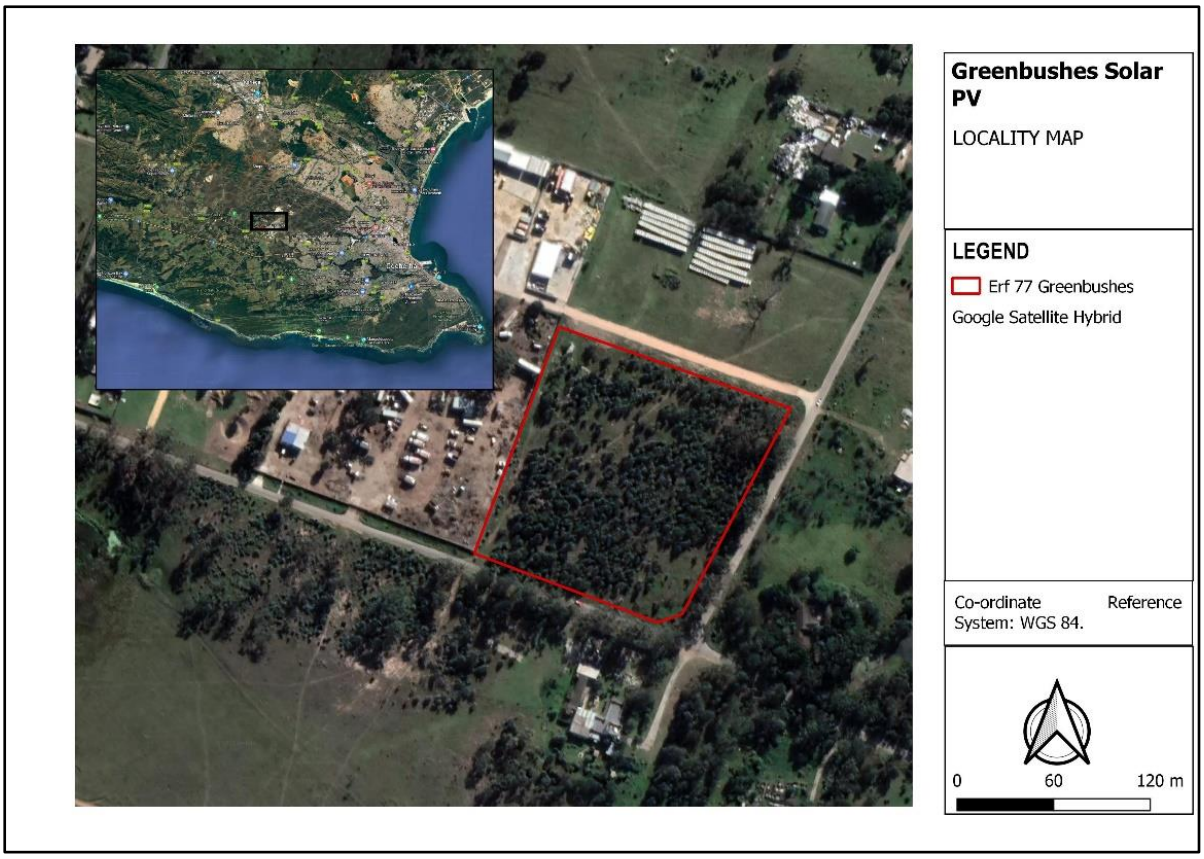

Figure 1 Location of the proposed development on the Erf 77 Greenbushes, Nelson Mandela Bay Municipality. Inset: Regional Location of the proposed development.

1.3 Terms of Reference

The Scope of this Terrestrial Biodiversity and Plant and Animal Species Assessment is designed to meet the requirements of Appendix 6 of the NEMA: EIA Regulations (2014), the Protocol for the assessment and reporting of impacts on the Terrestrial Biodiversity and Terrestrial Plant Species and Animal Species Themes, and the Species Environmental Assessment Guideline.

1. Consult all relevant Biodiversity Assessments, including Bioregional Plans and other Conservation Assessments and Plans for the municipality, including NMBM Bioregional Plan, the ECBCP, NEMBA List of Threatened Ecosystems, NEMPAA Protected Areas and Priority Areas for Expansion of Terrestrial Areas, Strategic Water Source Areas, Freshwater Ecosystem Priority Areas, and areas of Indigenous Forest as identified by the Dept of DFFE
2. Identify the biodiversity features of the site, including CBAs, EPAs

3. Identify the vegetation types and faunal habitat types using available online information, including VEGMAP, GRBP and BMR
4. Identify the threat status and sensitivities of the vegetation type
5. Compile a list of Species of Conservation Concern (SCCs) by consulting various local experts and online databases, including SANBI
6. Complete a site visit to determine the status of the vegetation and habitat types on the surrounding area of the site, including the presence of Species of Conservation Concern, Threatened of Protected Species (ToPS) and the presence of Alien Invasive Plants (AIPs). The site visit will include:
7. Vegetation survey: Due to the small scale of the project the vegetation on site will be comprehensively surveyed. All Protected and Threatened Species visible and identifiable in the field will be mapped. Photos and plant material will be collected for species that cannot be identified in the field.
8. Faunal survey: Faunal habitat types on site will be identified, and fauna will be opportunistically sampled
9. Determine the ecological drivers, process and corridors of the site
10. Map the present vegetation types/habitats of the site
11. Determine the Site Ecological Importance (SEI) of the sensitive receptors (vegetation types, plant SCCs animal SCCs) on site
12. Determine the environmental impact on the biodiversity features, vegetation and plant and animal SCCs of the site
13. Make recommendations to mitigate the negative environmental impacts on the vegetation of the site
14. Prepare a report indicating the current environmental sensitivities and Land Use guidelines for the site

1.4 Assumptions and Limitations

A number of assumptions and limitations:

1. number of assumptions and limitations:
2. The information regarding the proposed development received from the client and EAP is deemed accurate.
3. The historical vegetation on site will be based on the surrounding remaining indigenous vegetation, which are assumed to be the same.

4. All reasonable measures will be done to compile a species list for the site, including consulting existing species databases and site visit. However, it is not guaranteed that the report will produce a comprehensive species list, as only a single site visit will be done for this assessment.
5. This quote does not include any public participation meetings. If necessary, time spent will be billed accordingly.
6. The initial field sampling was conducted in September 2022, in autumn, which is the ideal season to sample fynbos vegetation. However, even though many fynbos species flower at other times of the year, including the autumn-flowering geophytes, a survey of the SCCs that may potentially occur on site indicated that one site visit was sufficient.
7. A key limitation to this study is the unavailability of the shapefiles of the updated NMBM Bioregional Plan (SRK 2014). Therefore, the older CBA network shapefiles dating back to 2009 were used in this study, and it is uncertain if any changes have taken place to the CBA network in the vicinity of the study site. A graphical illustration of the NMBM Bioregional Plan (2015) seems to indicate that no changes have occurred in the vicinity of the development site.

2 Methods

The terrestrial biodiversity assessment involved a desktop literature survey, as well a site assessment that took place on 16 September 2022. The initial site visit was conducted by Clayton Weatherall-Thomas. A comprehensive observed plant species and potential animal species list was produced and annotated according to the relevant legislation. All Threatened or Protected Species were identified, as well as any Invasive Alien Plants (AIPs).The approach used in this terrestrial biodiversity assessment, inclusive of terrestrial plant and animal species, is as follows:

2.1 Project Area of Influence (PAOI)

The Project Area of Influence is defined by the important ecosystem processes and functions that may be affected by the proposed development and its activities. The Species Environmental Assessment Guideline (2020) requires that the EAP and Specialists define the taxon-specific Project Area of Influence (PAOI) based on the spatial location of the project (footprint) and the potential extent of the impacts of the anticipated activities of the project.

2.2 Desktop Assessment

A desktop assessment of the potential plant species, vegetation types and sensitivities of the site based on data extracted from:

- Mucina and Rutherford's (2009) vegetation map and 2018 updated vegetation map and vegetation descriptions
- National Environmental Management: Biodiversity Act (Act No. 10 of 2004): National List of Threatened Ecosystems (2011)
- Eastern Cape Biodiversity Conservation Plan (ECBCP) (2019)
- Nelson Mandela Bay Municipality Bioregional Plan (2009 and 2015)

2.3 Site Assessment

A site sensitivity verification (SSV) was done to determine whether an impact assessment or compliance statement will be necessary to meet the requirements of the protocols for the terrestrial biodiversity, plant species and animal species screening report themes. The site visit and subsequent investigations determined that no plant or animal SCC will have more than a Low likelihood of occurring on site. Therefore the report will meet the requirements of an impact assessment for the Terrestrial Biodiversity screening report theme, and the requirements of a compliance statement for plant species and animal species themes.

The SSV included a site assessment on foot:

- Describing habitats and species present. All plants were identified down to their lowest possible taxonomic level using Plants of Southern Africa (POSA), accessed during May 2021, and the Red List of South African plants (SANBI 2017), accessed during May 2021.
- Document and describing present land use, as well as evidence of past land use activities.
- A species list was created and annotated to indicate Species of Conservation Concern (SCCs) according to the SANBI Red List (2020.1); Threatened or Protected Species (ToPS) (2015) according to the National Environmental Management: Biodiversity Act (Act 10 of 2004); Protected tree species according to National Forests Act 84 of 1998 (NFA), the Nature and Environmental Conservation Ordinance of 1974, and declared Alien Invasive Plant (AIPs) species according the National Environmental Management: Biodiversity Act: Alien and Invasive Species List (2020).

- A vegetation map was produced illustrating the various vegetation communities identified
- A sensitivity map was produced to classify and illustrate the sensitivity of the various identified vegetation types
- Recommend possible measures to reverse, avoid, manage or mitigate possible environmental impacts.

2.4 Impact Assessment Methodology

The Impact Assessment methodology was received from the EAP, namely Habitat Link Consulting.

Types of impacts

Different types of impacts may occur from the undertaking of an activity. The impacts may be positive or negative and may be categorized as being direct (primary), indirect (secondary) or cumulative impacts.

Direct impacts are impacts that are caused directly by the activity and generally occur at the same time and at the place of the activity (e.g. noise generated by blasting operations on the site of the activity). These impacts are usually associated with the construction, operation or maintenance of an activity and are generally obvious.

Indirect impacts of an activity are indirect or induced changes that may occur as a result of the activity (e.g. the reduction of water in a stream that supply water to a reservoir that supply water to the activity). These types of impacts include all the potential impacts that do not manifest immediately when the activity is undertaken or which occur at a different place as a result of the activity.

Cumulative impacts are impacts that result from the incremental impact of the proposed activity on a common resource when added to the impacts of other past, present or reasonably foreseeable future activities (e.g. discharges of nutrients and heated water to a river that combine to cause algal blooms and subsequent loss of dissolved oxygen that is greater than the additive impacts of each pollutant). Cumulative impacts can occur from the collective impacts of individual minor actions over a period of time and can include both direct and indirect impacts.

Factors that should be taken into account in impact prediction and assessment include:

- the nature of the impact i.e. positive, negative, direct, indirect, cumulative;

- the magnitude of the impact i.e. severe, moderate, low;
- the extent and location of the impact in terms of the area covered, volume distribution, etc;
- when the impact will occur i.e. during construction, operation and/or decommissioning as well as whether the impact will occur immediately or be delayed;
- the duration of the impact i.e. short term, long term, intermittent or continuous;
- the extent to which the impact can be reversed or not;
- the likelihood or probability of the impact actually occurring ; and
- the significance of the impact on a local, regional or global level

Table 1 Impact Assessment Methodology and categories.

CRITERIA	CATEGORIES	EXPLANATION
Overall nature	**Negative**	Negative impact on affected biophysical or human environment.
	Positive	Benefit to the affected biophysical or human environment.
Type	**Direct**	Are caused by the action and occur at the same time and place.
	Indirect or Secondary	Are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. May include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems.
	Cumulative	Is the impact on the environment, which results from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.
Extent: Spatial Extent over which impact may be experienced (E)	**Site (1)**	Immediate area of activity incorporating a 50m zone which extends from the edge of the affected area.
	Local (2)	Area up to and/or within 10km of the 'Site' as defined above.
	Regional (3)	Entire community, drainage basin, landscape etc.
	National (4)	South Africa.
Duration of impact (D)	**Very Short-term (1)**	Impact would last for the duration of activities such as land clearing, land preparation, fertilising, weeding, pruning and thinning. Quickly reversible. (0–1 years).
	Short-term (2)	The lifetime of the impact will be of a short duration (2-5 years).

CRITERIA	CATEGORIES	EXPLANATION
	Medium-term (3)	Impact would last for the duration of project activity, such as harvesting. Reversible over time (>5 - <15 years).
	Long-term (4)	Impact would continue beyond harvesting/ extraction of the trees (> 15 years).
	Permanent (5)	Impact would continue beyond decommissioning.
Severity (S)	**Negative**	Based on separately described categories examining whether the impact is destructive or benign, whether it destroys the impacted environment, alters its functioning or slightly alters the environment itself. • 0 is small and will have no meaningful 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); • 10 is very high and results in complete destruction of patterns and permanent cessation of processes.
	Positive	
Reversibility (R)	**Completely Reversible (0)**	The impact can be completely reversed with the implementation of correct mitigation and rehabilitation measures.
	Partly Reversible (0.5)	The impact can be partly reversed providing mitigation measures are implemented and rehabilitation measures are undertaken
	Irreversible (1)	The impact cannot be reversed, regardless of the mitigation or rehabilitation measures.
Irreplaceable Loss (I)	**Resource will not be lost (0)**	The resource will not be lost or destroyed provided mitigation and rehabilitation measures are implemented.
	Resource may be partly destroyed (0.5)	Partial loss or destruction of the resource will occur even though all management and mitigation measures are implemented.
	Resource cannot be replaced (1)	The resource cannot be replaced no matter which management or mitigation measures are implemented.
Probability of occurrence (P)	**Unlikely (1)**	<40% probability. Very improbable (probably will not happen).
	Possible (2)	40% probability. Improbable (some possibility, but low likelihood).
	Probable (3)	>70% probability. Probable (distinct possibility).
	Highly Probable (4)	>80 %. Highly probable (most likely).
	Definite (5)	>90% probability. Definite (impact will occur regardless of any prevention measures).
Mitigation Potential	**High or Completely Mitigatible**	Relatively easy and cheap to manage. Specialist expertise or equipment is generally not required. The nature of the impact is understood and may be mitigated through the implementation of a management plan or through 'good

CRITERIA	CATEGORIES	EXPLANATION
[i.e. the ability to manage or mitigate an impact given the necessary resources and feasibility of application.]		housekeeping'. Regular monitoring needs to be undertaken to ensure that any negative consequences remain within acceptable limits. The significance of the impact after mitigation is likely to be low or negligible.
	Moderate or Partially Mitigatible	Management of this impact requires a higher level of expertise and resources to maintain impacts within acceptable levels. Such mitigation can be tied up in the design of the Project. The significance of the impacts after mitigation is likely to be low to moderate. May not be possible to mitigate the impact entirely, with a residual impact(s) resulting.
	Low or Unmitigatible	Will not be possible to mitigate this impact entirely regardless of the expertise and resources applied. The potential to manage the impact may be beyond the scope of the Project. Management of this impact is not likely to result in a measurable change in the level of significance.
Impact Significance [Dur+Ext+R+I+ Sev] X Probability	**Negligible (0-22)**	Risk/impact may result in very minor alternations of the environment and can easily be avoided by implementing appropriate mitigation measures and will not have an influence on decision-making
	Low (>22 ≤ 45)	Risk/impact may result in very minor alternations of the environment and can easily be avoided by implementing appropriate mitigation measures and will not have an influence on decision-making
	Moderate **(>45 ≤ 68.5)**	Risk/impact will result in moderate alternation of the environment and can be reduced or avoided by implementing appropriate mitigation measures and will only have an influence on decision-making if not properly mitigated
	High (>68.5 ≤ 90)	Risk/impact will result in high alternation of the environment even with the implementation of appropriate mitigation measures and will have an influence on decision-making
	Very High) (>90 - 105)	Risk/impact will result in major alternation of the environment even with the implementation of appropriate mitigation measures and will have an influence on decision-making

3 Study Site Description

3.1 Vegetation Type

3.1.1 National Vegetation Assessment

The Vegetation Map for South Africa, Lesotho and Swaziland (VegMap) by Mucina & Rutherford (2006) is most widely accepted classification of South Africa's vegetation. It includes information on the conservation status and indicator species for each recognised vegetation type in the country. This biodiversity planning product also forms the basis for the NEM Biodiversity Act list of Threatened Ecosystems. The 2018 (SANBI 2006-2018) version of the VegMap has recently been released.

The site is situated in **Algoa Sandstone Fynbos,** a vegetation type that occurs as a grassy shrubland on coastal flats between Van Stadens and Summerstrand in the Gqeberha area(Figure 2). It occurs on acidic lithosol soils derived from Ordovician sandstones of the Table Mountain Group (Cape Supergroup). Algoa Sandstone Fynbos is classified as **Critically Endangered** as more than 50% of the vegetation type has been transformed due to urban development and agriculture. Dominant species are included in Table 2. Species endemic to the vegetation type include *Agathosma gonaquensis, Cyclopia pubescens* (found in wetlands), *Erica etheliae* and *Holothrix longicornu*.

Table 2 List of plant species in Algoa Sandstone Fynbos. (d=dominant, e=South African endemic, et=possibly endemic to a vegetation type).

Growth Form	Species
Shrubs	Tall Shrubs: *Protea eximia*, *P. neriifolia*, *P. repens*. Low Shrubs: *Agathosma hirta*, *A. ovata*, *Erica zeyheriana*, *Euryops ericifolius*, *Helichrysum appendiculatum*, *H. teretifolium*, *Leucadendron salignum*, *L. spissifolium* subsp. *phillipsii*, *Leucospermum cuneiforme*, *Protea cynaroides*, *P. foliosa*, *Tephrosia capensis*.
Herbs	Succulent Herb: *Crassula pellucida* subsp. *marginalis*
Graminoids:	Graminoids: *Aristida adscensionis* (d), *A. congesta* (d), *Cynodon dactylon* (d), *C. incompletus* (d), *Eragrostis obtusa* (d), *Panicum maximum* (d), *Tragus berteronianus* (d), *Cenchrus ciliaris*, *Cyperus capensis*, *Digitaria argyrograpta*, *Ehrharta calycina*, *Enneapogon scoparius*, *Eragrostis curvula*, *Eustachys paspaloides*, *Heteropogon contortus*, *Panicum deustum*, *Sporobolus fimbriatus*, *Stipa dregeana*, *Themeda triandra*.

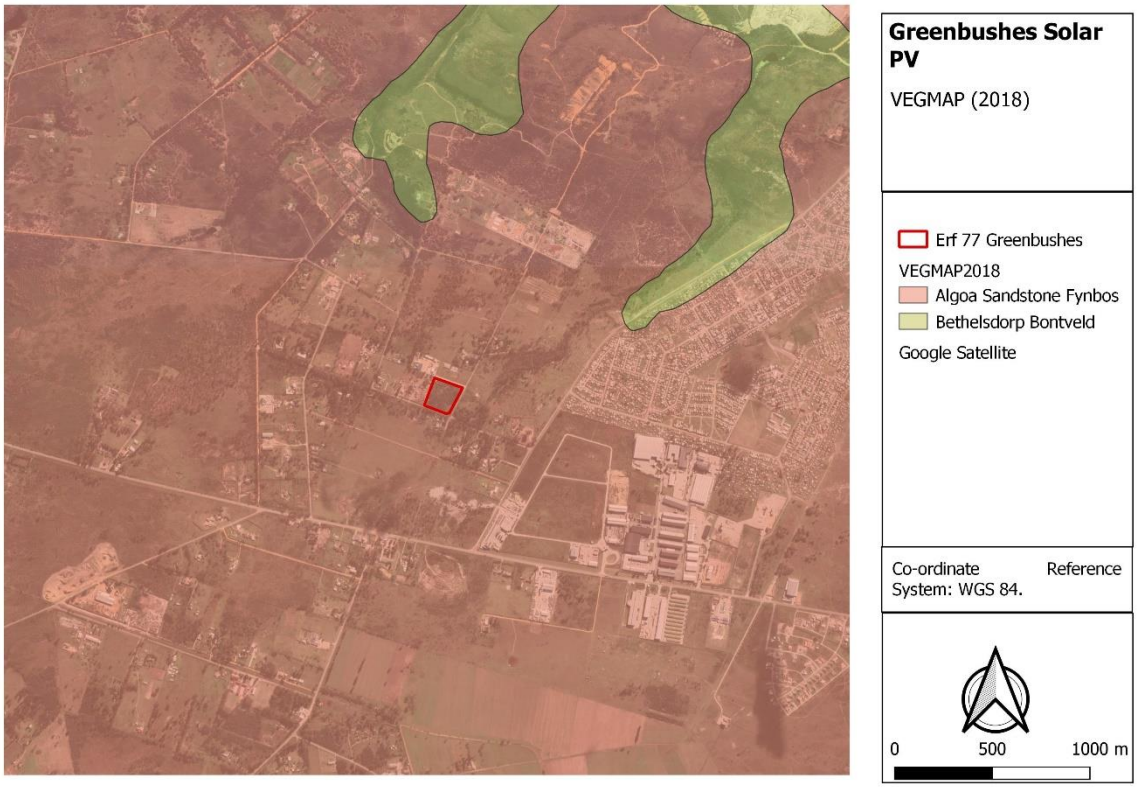

Figure 2 The National Vegetation Map of South Africa (SANBI 2006-2018).

3.1.2 Regional Context

3.1.2.1 Eastern Cape Biodiversity Conservation Plan (ECBCP) (2019)

The Eastern Cape Biodiversity Conservation Plan (ECBCP 2019) is a regional systematic biodiversity conservation plan for the Eastern Cape, gazetted in October 2020. Its aim is to avoid further loss or degradation of biodiversity priority areas and ecological support areas. The plan sets certain development guidelines based on a calculated biodiversity score for different landscapes. Basically the terrestrial areas covered by the plan are designated as Critical Biodiversity 1, 2, or 3 areas, each with specific development recommendations.

A complete revision of the ECBCP was published in 2019. Terrestrially, it excluded the NMBM Bioregional Plan (2014) and Coega OSMP (2014) as well, as these were existing fine-scale biodiversity assessments. Therefore, there is no updated ECBCP layer for the terrestrial environment in the NMBM, and reference must be made to CBA layers in the finer-scale plans. In terms of Aquatic CBAs identified by the ECBCP, the appointed aquatic specialist will include it in their assessment.

3.1.3 Local Context

3.1.3.1 NMBM Bioregional Plan

The Final NMBM Conservation Assessment and Plan (SRK 2010) formed the basis for the NMBM Final Bioregional Plan (2014, gazetted 30 March 2015), which provides a spatial framework for development in the municipal area (Figure 3). The assessment identifies sensitive areas (Critical Biodiversity Areas) that impose certain biodiversity related constraints on development. The Plan identifies and describes vegetation types on a local scale, and the vegetation type identified on site is **Rowallan Park Grassy Fynbos**.

Rowallan Park Grassy Fynbos is present on level areas of quartzitic sandstone. The dominant species are *Lanaria lanata, Microloma tenuifolium, Cyrtanthus obliquus, Gasteria nitida* and *Podylaria calyptrate* (SRK Consulting, 2009). This vegetation type is classified as Vulnerable.

The site falls within the Nelson Mandela Bay Municipality, and is thus covered by the NMBM Bioregional Plan (SRK 2014). The Nelson Mandela Bay Conservation Assessment and Plan (SRK 2010) identifies a CBA Network that, if safeguarded, will adequately conserve a representative portion of the biodiversity of NMBM, on a vegetation type scale. Integrated into the CBA network are Ecological Process Areas (EPAs) that were identified to ensure the persistence of ecological processes, namely edaphic gradients, riverine systems and sand movement corridors. The proposed site does not occur in a CBA or EPA, and thus the land use guidelines identified in the Bioregional Plan are not relevant for this development (Figure 4).

Figure 3 The development site is situated in Rowallan Park Grassy Fynbos, as identified by the NMBM Conservation Assessment and Plan (SRK 2009).

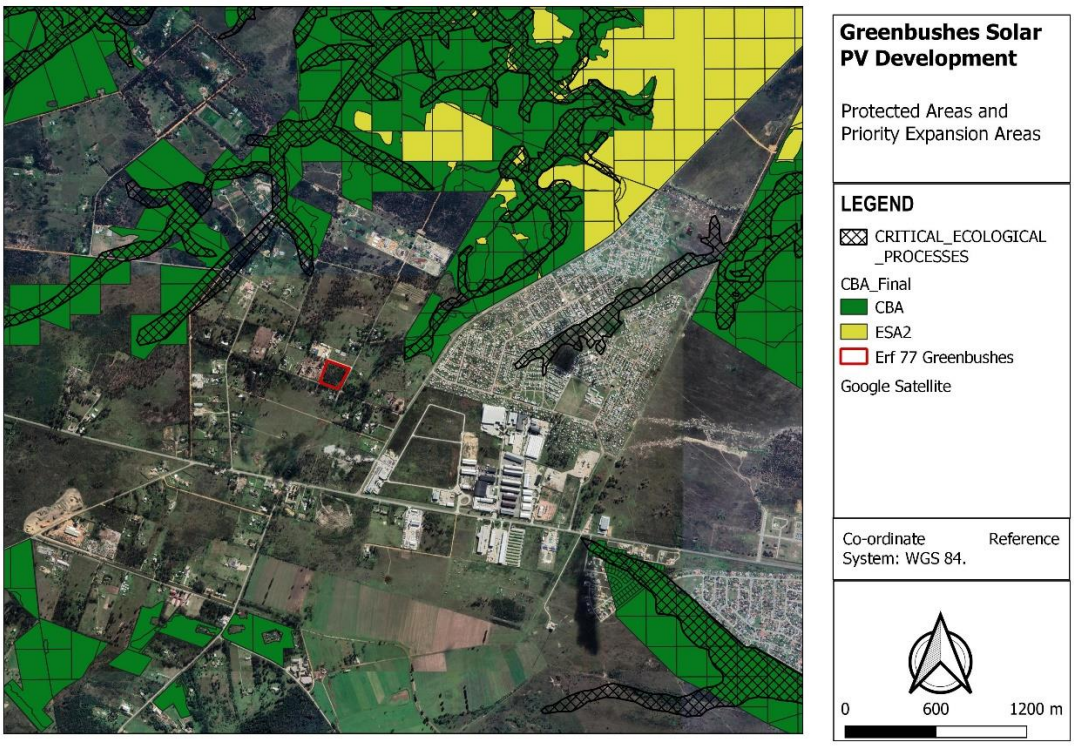

Figure 4 The Nelson Mandela Bay Municipality Bioregional Plan CBA Network.

3.2 National List of Threatened Ecosystems (2011)

The NEMBA (Act 10 of 2004) provides for listing of threatened or protected ecosystems, in one of four categories: Critically Endangered, Endangered, Vulnerable or Protected. Threatened ecosystems are listed in order to reduce the rate of ecosystem and species extinction by preventing further degradation and loss of structure, function and composition of threatened ecosystems. The purpose of listing protected ecosystems is primarily to conserve sites of exceptionally high conservation value (SANBI, Biodiversity Geographic information Systems (BGIS)). Importantly, any land-use change application occurring within an ecosystem listed as Critically Endangered or Endangered in terms of the Biodiversity Act will automatically require environmental authorisation. Algoa Sandston Fynbos is a Threatened Ecosystem, and classified as Critically Endangered in the draft version of the updated List of Threatened Ecosystems. As a Threatened Ecosystem, clearing of more than 300 m^2 of vegetation will trigger the need for an Environmental Authorisation (EA). However, no intact vegetation is on site, and the site can be considered transformed.

3.3 Protected Areas

Protected areas are areas of land or sea that are protected by law and managed mainly for biodiversity conservation (DEA 2016). Protected areas are declared under the National Environmental Management: Protected Areas Act (Act 57 of 2003). The Protected Areas Act provides for several categories of protected areas, including special nature reserves, national parks, nature reserves, marine protected areas and protected environments. Development is regulated within protected areas, as well as buffer areas around them.

The National Protected Area Expansion Strategy (NPAES) presents a 20-year strategy for the expansion of protected areas in South Africa, as they currently do not adequately conserve a representative portion of South Africa's biodiversity (DEA 2016). NPAES identifies priority areas where the expansion of protected areas should take place.

The proposed solar PV development site does not occur within or near to any protected area, or near to an area identified by NPAES (Figure 5).

Figure 5 Protected Areas (SAPAD Q4 2022) and Eastern Cape Protected Area Expansion Strategy (ECPAES) focus areas (2010)

3.4 Strategic Water Source Areas

Strategic Water Source Areas (SWSAs) are defined as areas of land that either: (a) supply a disproportionate (i.e. relatively large) quantity of mean annual surface water runoff in relation to their size and so are considered nationally important; or (b) have high groundwater recharge and where the groundwater forms a nationally important resource; or (c) areas that meet both criteria (a) and (b) (Le Maitre *et al.* 2018). They include transboundary Water Source Areas that extend into Lesotho and Swaziland. A number of river systems in the Eastern Cape, such as the Gamtoos, Keiskamma, Mbashe and the Mzimvubu, are fed by upper catchments which experience a disproportionately high rainfall and are considered “water factories” of South Africa (ECBCP 2019). SWSAs are mapped at a national level and represent areas where 50% of South Africa’s rain falls over less than 8% of the land area. Initiatives aimed at managing these SWSAs for enhanced downstream water quality and quantity are underway. Groundwater Strategic Areas with high rates of recharge were identified as well, and cover 9% of SA. SWSAs will be included in the appointed aquatic specialist’s assessment.

3.5 National Freshwater Ecoystem Priority Areas

The National Freshwater Ecosystem Priority Areas (NFEPA) project is a collaborative effort aimed at identifying Freshwater Ecosystem Priority Areas (FEPAs) to meet national biodiversity goals for freshwater ecosystems, and to develop a basis for enabling effective implementation of measures to protect FEPAs, including freeflowing rivers (Nel *et al.* 2011).

NFEPA project identified River FEPAs and associated sub-quaternary catchments, wetland and estuary FEPAs, wetland clusters, as well as Phase 2 FEPA and associated sub-quaternary catchment areas. Fish Sanctuaries (FishSA), together with Fish Migration Areas and Upstream Management Areas, were defined to conserve populations of threatened freshwater fish species in South Africa.

Fish sanctuaries were identified at the scale of sub-quaternary catchments. Five types of conservation areas were identified for each species: Fish Sanctuaries (areas required to meet fish population targets); Fish Migration Corridors (areas required for migration between required habitats, usually between mainstem and tributary habitat); Rehabilitation and Translocation Areas (areas crucial to the survival of the highly threatened fish species they support); and Upstream Management Areas (areas that need to be managed to prevent degradation of downstream Fish Sanctuaries and Fish Migration Corridors). NFEPAs will be included in the appointed aquatic specialist's assessment.

3.6 Forest Patches

Forest is protected under the National Forest Act, Act 84 of 1998. A permit is required to disturb forest. Patches of forest have been mapped at various scales in South Africa. There are no forest patches within the corridor of the proposed project.

3.7 Species of Conservation Concern

3.7.1 Conservation Status

South Africa uses the internationally endorsed IUCN Red List Categories and Criteria in the Red List of South African plants (SANBI 2020). This scientific system is designed to measure species' risk of extinction. The purpose of this system is to highlight those species that are most urgently in need of conservation action.

Due to its strong focus on determining risk of extinction, the IUCN system does not highlight species that are at low risk of extinction, but may nonetheless be of high conservation importance. Because the Red List of South African plants is used widely in South African conservation practices such as systematic conservation planning or protected area expansion, we use an amended system of categories designed to highlight those species that are at low risk of extinction but of conservation concern (Figure 6).

- Extinct (EX) A species is Extinct when there is no reasonable doubt that the last individual has died. Species should be classified as Extinct only once exhaustive surveys throughout the species' known range have failed to record an individual.
- Extinct in the Wild (EW) A species is Extinct in the Wild when it is known to survive only in cultivation or as a naturalized population (or populations) well outside the past range.
- Regionally Extinct (RE) A species is Regionally Extinct when it is extinct within the region assessed (in this case South Africa), but wild populations can still be found in areas outside the region.
- Critically Endangered, Possibly Extinct (CR PE) Possibly Extinct is a special tag associated with the category Critically Endangered, indicating species that are highly likely to be extinct, but the exhaustive surveys required for classifying the species as Extinct has not yet been completed. A small chance remains that such species may still be rediscovered.
- Critically Endangered (CR) A species is Critically Endangered when the best available evidence indicates that it meets at least one of the five IUCN criteria for Critically Endangered, indicating that the species is facing an extremely high risk of extinction
- Endangered (EN) A species is Endangered when the best available evidence indicates that it meets at least one of the five IUCN criteria for Endangered, indicating that the species is facing a very high risk of extinction.
- Vulnerable (VU) A species is Vulnerable when the best available evidence indicates that it meets at least one of the five IUCN criteria for Vulnerable, indicating that the species is facing a high risk of extinction.
- Near Threatened (NT) A species is Near Threatened when available evidence indicates that it nearly meets any of the IUCN criteria for Vulnerable, and is therefore likely to become at risk of extinction in the near future.

- Critically Rare A species is Critically Rare when it is known to occur at a single site, but is not exposed to any direct or plausible potential threat and does not otherwise qualify for a category of threat according to one of the five IUCN criteria.

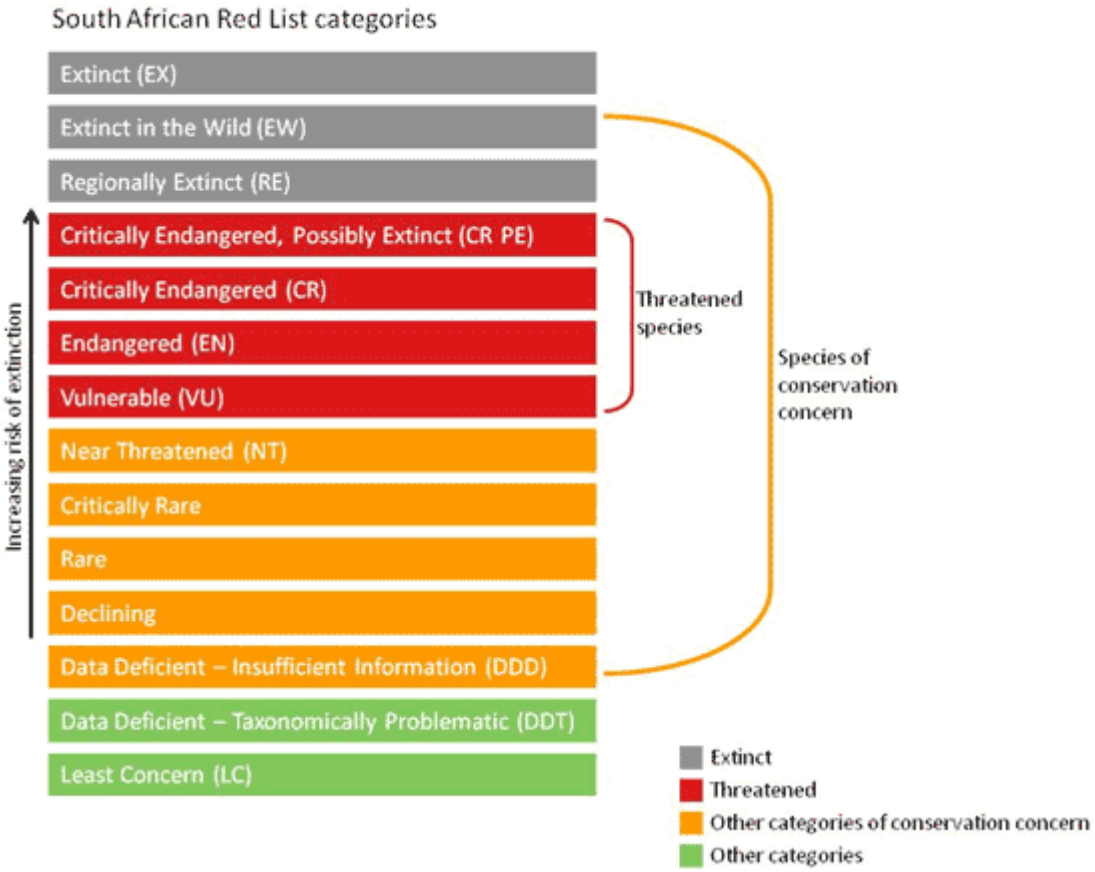

Figure 6 Threatened Species categories (SANBI 2020).

- Rare A species is Rare when it meets at least one of four South African criteria for rarity, but is not exposed to any direct or plausible potential threat and does not qualify for a category of threat according to one of the five IUCN criteria. The four criteria are as follows:
    - Restricted range: Extent of Occurrence (EOO) <500 km2, OR
    - Habitat specialist: Species is restricted to a specialized microhabitat so that it has a very small Area of Occupancy (AOO), typically smaller than 20 km2, OR
    - Low densities of individuals: Species always occurs as single individuals or very small subpopulations (typically fewer than 50 mature individuals) scattered over a wide area, OR
    - Small global population: Less than 10 000 mature individuals.

- Least Concern A species is Least Concern when it has been evaluated against the IUCN criteria and does not qualify for any of the above categories. Species classified as Least Concern are considered at low risk of extinction. Widespread and abundant species are typically classified in this category.
- Data Deficient - Insufficient Information (DDD) A species is DDD when there is inadequate information to make an assessment of its risk of extinction, but the species is well defined. Listing of species in this category indicates that more information is required and that future research could show that a threatened classification is appropriate.
- Data Deficient - Taxonomically Problematic (DDT) A species is DDT when taxonomic problems hinder the distribution range and habitat from being well defined, so that an assessment of risk of extinction is not possible.
- Not Evaluated (NE) A species is Not Evaluated when it has not been evaluated against the criteria. The national Red List of South African plants is a comprehensive assessment of all South African indigenous plants, and therefore all species are assessed and given a national Red List status. However, some species included in Plants of southern Africa: an online checklist are species that do not qualify for national listing because they are naturalized exotics, hybrids (natural or cultivated), or synonyms. These species are given the status Not Evaluated and the reasons why they have not been assessed are included in the assessment justification.

Threatened species are species that are facing a high risk of extinction. Any species classified in the IUCN categories Critically Endangered, Endangered or Vulnerable is a threatened species. Species of conservation concern (SCC) are species that have a high conservation importance in terms of preserving South Africa's high floristic diversity and include not only threatened species, but also those classified in the categories Extinct in the Wild (EW), Regionally Extinct (RE), Near Threatened (NT), Critically Rare, Rare, Declining and Data Deficient - Insufficient Information (DDD). All South African plant species have been rated, according to their extinction threat, using that have been adapted by SANBI.

3.7.2 Plant Species

A number of data sources exist to identify the location of SCCs. The Threatened Species Programme (TSP), has a database of locations of SCCs. This is based on herbarium records, as well as recent searches by experts, and volunteer programmes such as the Custodians of

Rare and Endangered Wildflowers (CREW). iNaturalist, a citizen science electronic platform for posting pictures of species in order for them to be identified by experts, is a source as well.

The Probability of Occurrence (POO) is rated according to the availability of suitable habitat, and whether the species has been previously recorded in the general vicinity of the assessed area. Data for habitat requirements was based on the species descriptions of the Red List (SANBI 2020.1), as well as Bredenkamp 2019). The Probability of Occurrence was rates as:

- Low: no described preferred habitat occurs within the PAOI, and no identification records within the vicinity of the PAOI; or charismatic (easy to identify) species whose preferred habitat has been comprehensively searched but species not located
- Medium: habitat requirements are unknown or not clear but species recorded within 20 kms of PAOI; or degraded habitat occurs within PAOI; or habitat occurs within PAOI but no idenfication records within the vicinity of the PAOI
- High: habitat occurs within the PAOI, and identification records occur within the vicinity of the PAOI
- Confirmed: species was identified within the PAOI.

No Plant SCCs were identified by the online screening tool report as potentially occurring within the project site. Furthermore, due to the transformed nature of the site and no SCCs identified during the site visit, no SCCs were assessed. The surrounding fynbos vegetation has a high number of SCCs, but the probability of these species occurring on site is low, based on the condition of the site.

3.7.3 Animal Species

A number of data sources were used to identify SCCs and TOPs that could potentially occur within the project site. These include:

- Measey (2011), Frog Atlas of Southern Africa (FrogMap) for amphibians
- Bates *et al.* (2014), Reptile Atlas of Africa (ReptileMap) for reptiles
- Childs *et al.* (2016), Mammal Atlas of Africa (MammalMap) for mammals
- Atlas of African Lepidoptera (ButterflyMap) for butterflies
- SABAP2 for Birds

The DFFE Screening Report identified 3 SCCs as potentially occurring within the study site, the cricket species *Aneuryphymus montanus* and the mammals *Chlorotalpa duthieae* and Sensitive species 8. All three were considered to have a Medium sensitivity, namely that modelled habitat occurs on site but there have been no recent observations. Besides these

species, a number of birds were identified as potentially occurring on site (Table 4). The probability of occurrence of these species will be discussed in a later section.

3.8 PAOI

The PAOI is relatively limited to the proposed footprint of the development, as well as a buffer down the slope on the north-eastern side. Most impacts will occur during construction phase, although the increased amount of traffic and hardening of surfaces will result in operational impacts as well.

4 Ecological Assessment

4.1 Vegetation Community Composition

Vegetation on site

The study site can be considered transformed, and no indigenous vegetation remains. There is evidence of historical soil disturbance, and building rubble and litter is present across the site (Figure 7).

The site can be described as an open Eucalyptus woodland, with the majority of the site dominated by the invasive tree species *Eucalyptus camaldulensis,* as well as a few *Acacia mearnsii*. The ground layer consists of weedy and common grasses, succulents and herbs, the common grass species being *Cynodon dactylon, Ergrostis curvula, Sporobolus africanus* and *Stenotaphrum secundatum*. Weedy herbs and ground covers, such as *Alternanthera pungens, Arctotheca calendula, Cotula australis, Emex australis, Lepidium didymum, Medicago polymorpha, Senecio glutinosus, Tephrosia capensis, trifolium repens* are common. Dwarf and medium sized shrubs on site were *Chyrsocoma ciliata, Diospyros dichrophylla, Helichrysum cymosum, Hermannia althaefolia, Senecio pterophorus* and *Solanum linnaeanum.* A few succulents, mostly pioneer species (*Aizoon glinoides, Carpobrotus edulis, Drosanthemum hispidum, Mesembryanthemum aitonis*) occur between the building rubble and in the open patches. Garden escapes, such as *Aloe maculata* and *Crassula multiclava*, were present as well.

Figure 7 Vegetation types identified on the solar PV development site in Greenbushes, NMBM.

A number of indigenous fynbos species occur on site, mostly in very low numbers, and more than likely secondary colonisation from the intact fynbos in the vicinity. These species are *Agathosma capensis, Muraltia alopecuroides, Searsia lucida* and Struthiola *parviflora*.

Plate 1 Photos of the Erf 77 Greenbushes, NMBM. The site is transformed, being dominated by an open Eucalyptus woodland and weedy common grass, herb and succulent species. Building rubble and litter is common.

4.2 Species of Conservation Concern

4.2.1 Plant Species

No plant Species of Conservation Concern (SCC) were identified on site. The site is transformed, previous soil disturbance has taken place, and no habitat for SCCs remain. The likelihood of any SCCs occurring on site is considered low.

4.2.2 Animal SCCs

A total of 230 bird species of which 7 are SCCs, 16 frog species (no SCCs), 76 reptile species of which 2 are SCCs, 47 mammal species of which 3 are SCCs, 118 butterfly species of which 1 is an SCC were recorded as potentially occurring on site, as they have been recorded in the Quarter Degree Square(QDS) (Table 3). However, this does not mean that their feeding or breeding habitat occurs on site.

Of these, no SCCs were confirmed on site or rated as having a High Probability of Occurrence; 1 was rated as medium and the remainder as Low. Of the species identified by the online Screening tool report, all were rated as Low. There is no habitat on site for Sensitive species 8, and *Chlorotalpa duthiae* has only been recorded in densely wooded habitat to the south of the site. *Aneurphymus montanus* occurs on cool, south-facing fynbos slopes, whereas the site is flat and transformed. The nearest population is recorded near Graaff-Reinet.

Two potential tortoise taxa, namely *Chersobius boulengeri* and *Psammobates tentorius* subsp. *tentorius*, were recorded in the QDS. However, the nearest populations for these two species are in the drier karoo habitats to the north of the development site.

Falco biarmicus (Lanner Falcon) is a non-migratory species that is widespread across Africa, western Asia and southern Europe. It inhabits a wide variety of habitats, from lowland deserts to forested mountains, including Mediterranean shrublands, and is recorded up to 5,000 m. It can tolerate disturbance. Small birds make up most of its diet, particularly quails, pigeons and doves, as well as bats, which it hunts by horizontal pursuit. It is listed as Vulnerable in South Africa and Least Concern internationally.

Sagittarius serpentarius (Secretary bird) is a large, non-migratory bird of prey endemic to Africa, where it is usually found in the open grasslands and savanna of the sub-Saharan region (Retief 2015). Prey may consist of insects such as locusts and beetles, mammals ranging in size from mice to hares and mongoose, crabs, lizards, snakes, tortoises, small birds, bird eggs, and sometimes dead animals killed in grass or bush fires. As a population, the Secretary

bird is mainly threatened by loss of habitat due to fragmentation by roads and development and overgrazing of grasslands by livestock. Some adaptation to altered areas has been recorded but the trend is for decline. It is listed as Vulnerable both regionally and globally. This species is seen on occasion in the Hopewell / Van der Kemps Kloof areas.

Table 3 Habitat requirements and occurrence of Species of Conservation Concern and Threatened or Protected Species occurring naturally in the project site.

	Family	Species Name	Common Name	SCC	Endemism	Protected	Screening Report	Habitat Requirements	Probability of occurrence
Butterflies	LYCAENIDAE	*Chrysoritis thysbe whitei*	Algoa opal	EN	Endemic (EC)			Algoa Dune Strandveld less than 1 km from the shoreline, with low scrub and a moderate amount of intervening open sand.	Low
Grasshoppers	Acrididae	*Aneuryphymus montanus*	Yellow-winged Agile Grasshopper	VU			Medium	Cool, south facing fynbos slopes	Low
Frog	Brevicepitidae	*Breviceps adspersus*	Bushveld Rain Frog	LC	Endemic (EC)			Semi-arid habitats with sandy to sandy-loam soils.Eastern Thorn Bushveld, Spekboom Succulent Thicket and Valley Thicket. Tolerates disturbance.	Low
	Pyxicephalidae	*Pyxicephalus adspersus*	Giant Bull Frog	LC		ToPS Protected		Fossorial, drier savannas with the presence of shallow temporary pools. Cannot tolerate urbanisation.	Low
Reptile	Chamaeleonidae	*Bradypodion taeniabronchum*	Elandsberg Dwarf Chameleon	LC, LC	Endemic (EC)	ToPS Protected		Montane fynbos and one isolated coastal wetland	Low
	Gerrhosauridae	*Tetradactylus fitzsimonsi*	FitzSimons' Long-tailed Seps	VU, VU		ToPS Protected		Unknown. Found in Eastern Fynbos-Renosterveld and Albany Thicket. Does not tolerate transformation or fire.	Low
	Scincidae	*Acontias orientalis*	Eastern Cape legless skink	LC	Endemic (EC)	ToPS Protected		Fossorial, in coastal areas and alluvial soils in inland valleys of the Eastern Cape.	Low
	Scincidae	*Acontias lineicauda*	Algoa legless skink	LC	Endemic (EC)	ToPS Protected		Fossorial, in relatively dry coastal areas and alluvial soils in inland valleys of Algoa Bay in the Eastern Cape. Up to 500 m altitude. Tolerant to habitat transformation.	Low
	Lacertidae	*Nucras taeniolata*	Striped sandveld lizard	LC, LC	Endemic (EC)	ToPS Protected		Soft and hard soils and shale in mesic to arid environments. Has been recorded in thicket habitats of Algoa Bay in the Eastern Cape. Burrows at base of bushes or shelter under rock slabs.	Low

		Scelotes anguineus	Algoae burrowing skink	LC	Endemic (EC)	ToPS Protected		Fossorial. Leaf litter or subsurface of loamy and sandy soils. Coastal dunes and thickets in wider Algoa Bay area	Low
Mammal									
	Bovidae	*Raphicerus melanotis*	Cape Grysbok	LC		ToPS Protected		Thickets and shrublands with dense cover in Cape Floristic Region	Low
	Felidae	*Panthera pardus*	Leopard	VU		ToPs Vulnerable		Wide habitat tolerance	Low
	Bovidae	*Sensitive Species 8*		VU		ToPs Vulnerable	Medium	Dense woodlands and thickets	Low
	Chrysochloridae	*Chlorotalpa duthieae*	Duthie's Golden Mole	VU			Medium	Alluvial sands and sandy loams in the southern Cape Afrotemperate forests. Tolerates disturbance.	Low
	Equidae	*Equus zebra*	Cape Mountain Zebra	LC		ToPS Endangered, NECO Schedule 1			
	Mustelidae	*Aonyx capensis*	African Clawless Otter	NT				Restricted to riverine systems	Low
	Mustelidae	*Poecilogale albinucha*	African Striped Weasel	NT				Wide habitat tolerance, preferring grassy habitats, including fynbos with dense grass cover.	Low
Birds		*Campethera notata*	Knysna Woodpecker	NT, NT				Coastal and valley bush, woodland and forest fringes	Low
		Bradypterus sylvaticus	Knysna Warbler	VU, VU				Thick undergrowth and tangles in forest, forest edge, and coastal thickets	Low

Circus ranivorus	African Marsh Harrier	EN, LC	TOPs Protected	Permanent wetlands, both inland and coastal	Low
Falco biarmicus	Lanner Falcon	VU, LC		Open grassland, cleared woodlands and agricultural areas	Low
Falco peregrinus	Peregrine Falcon	LC,LC	TOPs Protected		
Buteo trizonatus	Forest Buzzard	LC, NT		Montane plantations and forests, including adjacent grasslands	Low
Neotis denhami	Denham's Bustard	VU, NT	TOPs Protected	Coastal and sub-coastal belt, extending to the Karoo Midlands	Low
Sagittarius serpentarius	Secretary bird	VU, EN		Open grassland and scrub, with the ground cover shorter than 50 cm and with sufficient scattered trees as roost/nest sites	Low

4.3 Threatened or Protected Species

The following legislation was consulted to determine whether a species is protected by Legislation:

- National Environmental Management: Biodiversity Act 10 of 2004 – Publication of Lists of Species that are Threatened or Protected, Activities that are Prohibited and Exemption from Restriction (GNR 151 of 2007) as amended;
- Nature and Environmental Conservation Ordinance of 1974; and
- National Forests Act No. 84 of 1998 – List of Protected Trees (published 8 September 2017).
- Convention on International Trade in Endangered Species of Wild Fauna and Flora
- (CITES)

There are a total of 99 Threatened or Protected Species recorded on site, protected under various legislation (see Table 4). No species protected by the National Forest Act of 1998 are present.

There are a total of 7 animal species potentially occurring on site that is listed under ToPS, none of which have a Medium or higher probability of occurrence. There is a very limited possibility that *Aloeides clarki, Bradypodion taeniabronchum* and *Circus ranivorus* (listed as Protected) and *Panthera pardus* or *Philantomba monticola* (listed as Vulnerable) would occur on site. No ToPS plant species occur on site.

There are 4 plant species protected under the NECO, and potentially 95 protected animal species, although by far the vast majority would not occur on site. All species are listed as Endangered under Schedule 3 or Protected under Schedule 4.

These species require a permit from DEDEAT for their removal.

Table 4 List of Species of Conservation Concerns, as well as Threatened and Protected Species, that may occur on the proposed development site.

FAMILY	SPECIES	NECO	ToPS
Plants			
Aizoaceae	*Aizoon glinoides* L.f.	Sch 4	
Aizoaceae	*Carpobrotus edulis* (L.) N.E.Br.	Sch 4	
Aizoaceae	*Drosanthemum hispidum* (L.) Schwantes	Sch 4	
Aizoaceae	*Mesembryanthemum aitonis* Jacq.	Sch 4	
Frogs			
Brevicepitidae	*Breviceps pentheri*	Sch 2	
Bufonidae	*Sclerophrys capensis*	Sch 2	
Bufonidae	*Sclerophrys pardalis*	Sch 2	
Hyperoliidae	*Hyperolius marmoratus*	Sch 2	

Hyperoliidae	*Hyperolius marmoratus verrucosus*	Sch 2	
Hyperoliidae	*Kassina senegalensis*	Sch 2	
Hyperoliidae	*Semnodactylus wealii*	Sch 2	
Phrynobatrachidae	*Phrynobatrachus natalensis*	Sch 2	
Pipidae	*Xenopus laevis*	Sch 2	
Pyxicephalidae	*Amietia delalandii*	Sch 2	
Pyxicephalidae	*Cacosternum boettgeri*	Sch 2	
Pyxicephalidae	*Cacosternum nanum*	Sch 2	
Pyxicephalidae	*Pyxicephalus adspersus*	Sch 2	Protected
Pyxicephalidae	*Strongylopus fasciatus*	Sch 2	
Pyxicephalidae	*Strongylopus grayii*	Sch 2	
Pyxicephalidae	*Tomopterna delalandii*	Sch 2	
Reptiles			
Ag+A20:B93amidae	*Agama aculeata aculeata*	Sch 2	
Agamidae	*Agama atra*	Sch 2	
Chamaeleonidae	*Bradypodion barbatulum*	Sch 2	
Chamaeleonidae	*Bradypodion sp. (Groendal)*	Sch 2	
Chamaeleonidae	*Bradypodion taeniabronchum*	Sch 2	Protected
Chamaeleonidae	*Bradypodion ventrale*	Sch 2	
Colubridae	*Dasypeltis scabra*	Sch 2	
Colubridae	*Philothamnus hoplogaster*	Sch 2	
Colubridae	*Philothamnus occidentalis*	Sch 2	
Colubridae	*Philothamnus semivariegatus*	Sch 2	
Cordylidae	*Chamaesaura anguina anguina*	Sch 2	
Cordylidae	*Cordylus cordylus*	Sch 2	
Cordylidae	*Karusasaurus polyzonus*	Sch 2	
Cordylidae	*Pseudocordylus microlepidotus fasciatus*	Sch 2	
Cordylidae	*Pseudocordylus microlepidotus microlepidotus*	Sch 2	
Gekkonidae	*Chondrodactylus bibronii*	Sch 2	
Gekkonidae	*Goggia essexi*	Sch 2	
Gekkonidae	*Hemidactylus mabouia*	Sch 2	
Gekkonidae	*Lygodactylus capensis*	Sch 2	
Gekkonidae	*Pachydactylus geitje*	Sch 2	
Gekkonidae	*Pachydactylus maculatus*	Sch 2	
Gekkonidae	*Pachydactylus mariquensis*	Sch 2	
Gerrhosauridae	*Gerrhosaurus flavigularis*	Sch 2	
Gerrhosauridae	*Tetradactylus fitzsimonsi*	Sch 2	
Gerrhosauridae	*Tetradactylus seps*	Sch 2	
Lacertidae	*Nucras lalandii*	Sch 2	
Lacertidae	*Nucras livida*	Sch 2	
Lacertidae	*Nucras taeniolata*	Sch 2	
Lacertidae	*Pedioplanis lineoocellata pulchella*	Sch 2	

Lacertidae	*Tropidosaura gularis*	Sch 2	
Lacertidae	*Tropidosaura montana rangeri*	Sch 2	
Lamprophiidae	*Duberria lutrix lutrix*	Sch 2	
Lamprophiidae	*Lamprophis aurora*	Sch 2	
Lamprophiidae	*Lamprophis fuscus*	Sch 2	
Lamprophiidae	*Lamprophis guttatus*	Sch 2	
Lamprophiidae	*Lycodonomorphus inornatus*	Sch 2	
Lamprophiidae	*Lycodonomorphus laevissimus*	Sch 2	
Lamprophiidae	*Lycodonomorphus rufulus*	Sch 2	
Lamprophiidae	*Lycophidion capense capense*	Sch 2	
Lamprophiidae	*Prosymna sundevallii*	Sch 2	
Lamprophiidae	*Pseudaspis cana*	Sch 2	
Pelomedusidae	*Pelomedusa galeata*	Sch 2	
Scincidae	*Acontias gracilicauda*	Sch 2	
Scincidae	*Acontias lineicauda*	Sch 2	
Scincidae	*Acontias meleagris*	Sch 2	
Scincidae	*Acontias orientalis*	Sch 2	
Scincidae	*Scelotes anguineus*	Sch 2	
Scincidae	*Scelotes caffer*	Sch 2	
Scincidae	*Trachylepis capensis*	Sch 2	
Scincidae	*Trachylepis homalocephala*	Sch 2	
Scincidae	*Trachylepis sulcata sulcata*	Sch 2	
Scincidae	*Trachylepis varia sensu stricto*	Sch 2	
Scincidae	*Trachylepis variegata*	Sch 2	
Testudinidae	*Chersina angulata*	Sch 2	
Testudinidae	*Chersobius boulengeri*	Sch 2	
Testudinidae	*Homopus areolatus*	Sch 2	
Testudinidae	*Psammobates tentorius tentorius*	Sch 2	
Testudinidae	*Stigmochelys pardalis*	Sch 2	
Varanidae	*Varanus albigularis albigularis*	Sch 2	
Varanidae	*Varanus niloticus*	Sch 2	
Mammals			
Bovidae	*Antidorcas marsupialis*	Sch 2	
Bovidae	*Philantomba monticola*	Sch 2	Vulnerable
Bovidae	*Raphicerus melanotis*	Sch 2	
Bovidae	*Tragelaphus scriptus*	Sch 2	
Bovidae	*Tragelaphus strepsiceros*	Sch 2	
Equidae	*Equus zebra zebra*	Sch 1	Endangered
Nycteridae	*Nycteris thebaica*	Sch 2	
Procaviidae	*Procavia capensis*	Sch 2	
Rhinolophidae	*Rhinolophus capensis*	Sch 2	
Rhinolophidae	*Rhinolophus clivosus*	Sch 2	

Soricidae	*Crocidura flavescens*	Sch 2	
Soricidae	*Myosorex varius*	Sch 2	
Vespertilionidae	*Kerivoula lanosa*	Sch 2	
Vespertilionidae	*Miniopterus natalensis*	Sch 2	
Vespertilionidae	*Neoromicia capensis*	Sch 2	
Birds			
	Neotis denhami	Sch 2	Protected
	Falco peregrinus	Sch 2	Vulnerable
	Circus ranivorus	Sch 2	Protected

*P=Protected in Schedule 2 and 4 of the Nature and Environmental Conservation Ordinance 19 of 1974

4.4 Alien Invasive Plants

It is the duty of a landowner to remove or manage all Alien Invasive Species (IAS) on their property. AIS are defined by the National Environmental Management: Biodiversity Act, Act 10 of 2004: Alien and Invasive Species Lists of 2020. A list of AIS on site are included in Table 5. All Category 1a and 1b species must be controlled and removed from the property. A permit is required to keep Category 2 species. Category 3 species may remain but must be controlled and no further planting is allowed.

Table 5 List of Alien Invasive Species (AIS) on site.

Category 1	Category 2
Cirsium vulgare (Savi) Ten. (1b) *Eucalyptus camaldulensis* Dehnh. subsp. *Camaldulensis* (1b) *Opuntia monacantha* Haw.(1b)	*Acacia mearnsii*

4.5 Ecological Sensitivity & Site Ecological Importance

The sensitivity map was derived by identifying the conservation and biodiversity priorities of the site, and groundtruthing them with a site visit. The desktop assessment considered the following conservation tools and plans:

- Online Screening Tool Report
- NMBM BP (CBAs, EPAs, PAs)
- NEMBA Threatened Ecosystems

Although the site was not situated within a CBA or any other priority area, it was located in Algoa Sandstone Fynbos, a Critically Endangered vegetation type. However, the site visit determined that the site has been transformed, with little fynbos remaining. The conservation status of the site was rated as LOW. The whole site can be developed as no NO Go Areas were identified in this study.

Figure 8 Sensitivity map of the Solar PV development site in Greenbushes, NMBM.

5 Impact Assessment

The Online Screening Tool Report identified the site as having a VERY HIGH Terrestrial Biodiversity sensitivity, a MEDIUM animal species and a LOW plant species sensitivity. However, the site assessment identified the site to be completely transformed, with no natural vegetation or faunal habitat for SCCs remaining. Therefore, the sensitivity of the site, in terms of the terrestrial biodiversity, plant species and animal species, is LOW, and no impact assessment will be done for the site. This report will meet the requirements of a compliance statement for the previously mentioned themes.

6 Conclusions and Recommendations

The site for the proposed Solar PV development on Erf 77 Greenbushes is transformed, and can be considered to be an open Eucalyptus woodland. The soil of the site was previously disturbed, and large amounts of building rubble and litter is present. The site has a low conservation value, and there is no reason why the development cannot be approved, from a terrestrial biodiversity perspective. The following recommendations can be included in the Environmental Management Programme, to improve the sustainability of the site and surrounding area:

1. Clear all Alien Invasive Species (AIS) from the site, and continue with AIS monitoring during the operation phase of the development.
2. Limit the use of pesticides and herbicides during the operation phase, particularly with the control of AIS.
3. Reduce the areas and stockpiles of bare soil during construction phase by using adequate covers or sowing with fast growing grasses such as kweek (*Cynodon dactylon*).
4. Utilise indigenous fynbos shrubs, grasses and trees when landscaping the site after construction phase is complete.
5. Ensure proper stormwater management by channeling flows into a stormwater pond, ensuring that it does not flow directly into any nearby watercourses.

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Appendix 1 CV of Specialists

Clayton Richard Weatherall-Thomas

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Chelsea
Port Elizabeth
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083 401 8091
environment@algoacme.co.za

Pr. Sc. Nat (Ecological Science) (Registration no. 128641)
Registered EAP (Registration no. 2019/681

Employment History

Environmental Assessment Practitioner

March 2017-ongoing Algoa Consulting Mining Engineers, Port Elizabeth

- Conducting of Environmental Impact Assessments (EIAs); Compiling Environmental Management Programme Reports (EMPr); Environmental Audits, Conduct Public Participation and correlating reports; Undertaking Botanical and Ecological Impact Assessment Specialist Reports

Conservation Officer

October 2011-December 2012 Wildlife and Environmental Society of South Africa (WESSA), Port Elizabeth

- Co-ordinate the Nelson Mandela Bay Metropolitan's Biodiversity Stewardship Programme (NMBMBSP), including site assessments, communication with landowners and other stakeholders, management plans; The capacitation of Custodians of Rare and Endangered Wildflowers (CREW) volunteers and NMBM staff

January 2012-June 2013 Nelson Mandela Metropolitan Municipality (NMBM), Port Elizabeth (Acting NMBMOSS Co-ordinator)

- Facilitate the gazetting of the NMBM Environmental Management Framework (EMF); Support the NMBM Land Use Co-ordinator in terms of conflict resolution regarding the NMB MOSS; implement the rezoning process in terms of Land Use Planning Ordinance of 1985 to ensure that the correct legal zoning is enacted; Provide ecological comments on EIAs

Student Demonstrator (Part-time, ad hoc basis)

2004-2015 Nelson Mandela Metropolitan Municipality (NMBM), Port Elizabeth

- Demonstrating and Assisting various Botany modules; marking practicals

Herbarium Assistant

March 2008-December 2008 Nelson Mandela Metropolitan Municipality (NMBM), Port Elizabeth

- Identification of plant species

Ecological Specialist (ad hoc basis)

2006-ongiong Self-employed, Port Elizabeth

- Faunal, Floral and Ecological Specialist reports for Environmental Impact Assessments; Species identification and assistance with the writing of Water Research Commission (WRC) reports

Education

2002-2004 Nelson Mandela Metropolitan University, Port Elizabeth

- BSc Biological Sciences
- Graduated cum laude

2005 Nelson Mandela Metropolitan University, Port Elizabeth

- BSc Hons Botany
- Graduated cum laude
- Terrestrial Ecology focus

2006-2008 Nelson Mandela Metropolitan University, Port Elizabeth

- MSc Botany
- "Seed germination and seedling survival in the mesic thickets of the Eastern Cape"
- Graduated cum laude

2009-incomplete Nelson Mandela Metropolitan University, Port Elizabeth

- PhD Botany
- "Determination of the Utilization Threshold for the maintenance of Thicket floral diversity"

Other Courses:

- 2018 IWRM, the NWA and Water Use Authorisations, focusing on WULAs and IWWMPs

Experience relating to Environmental Impact Assessments

BASIC ASSESSMENT REPORTS

- 2022 Basic Assessment and EMPr for Draaibosch Quarry Mining Permit Application, Komga, Eastern Cape-ongoing
- 2021 Basic Assessment and EMPr for Indlovu Sand Prospecting Right Application, Oyster Bay, Eastern Cape-ongoing

- 2020 Prospecting Right, including BA and EMPr for Ikwezi Mining, Hankey
- 2019 Basic Assessment report for Sogea Satom pre cast concrete wind tower factory, Prieska: Withdrawn
- 2019 Basic Assessment Report for Ngqura Sand, NMBM:
- 2018 Basic Assessment and EMPr for Schoenmakers Mining, NMBM
- 2017 BA and EMPr for the proposed Loerie Lime limestone mine near Loerie in the Eastern Cape
- 2017 BA and EMPr for Sandman Quarries cc, NMBM

ENVIRONMENTAL IMPACT REPORTS

- 2022 EIA and EMPr for Blue Rock Quarry, Libode, Eastern Cape-ongoing
- 2021 EIA and EMP for Bonavista Farm, Kinkelbos – Ongoing
- 2020 EIA and EMPr for Million Steams Clay Mine and Brickyard-Ongoing
- 2020 EIA and EMPr for Coega Mining, Coega SEZ
- 2019 EIA and EMPr for King William's Town Quarry - Ongoing
- 2019 EIA Report and EMPr for Driftsands Mining, NMBM
- 2018: EIA Report and EMPr for Kleinfontein Mine, Loerie
- 2017 EIA Report and EMPr for the proposed Lloyds Clay Mine near Motherwell in the Eastern Cape
- 2017 EIA Report and EMPr for the proposed Prieska Gypsum Mine near Prieska in the Northern Cape

ENVIRONMENTAL AUDITS

- 2022 Environmental Audit for Ngqura Sand, NMBM
- 2021 CEMZA Cementitious Grinding Facility in Coega SEZ Closure Audit
- Environmental Audit for Glendore Rover Sandpit, NMBM
- Environmental Audit for Glendore Rover Limestone, NMBM
- 2017/2021 Environmental Management Programme Performance Assessment for Sandman Quarries cc

Experience relating to Terrestrial Biodiversity Specialist Assessments

BIODIVERSITY / ECOLOGICAL ASSESSMENT REPORT

2022: C.R. Weatherall-Thomas: Terrestrial Biodiversity Impact Assessment for expansion of pastures on Bonavista, Kinkelbos, Eastern Cape-ongoing

2022: C.R. Weatherall-Thomas: Biodiversity Impact Assessment for Million Streams Clay Mine and Brick Plant, Empangeni, KwaZulu-Natal-ongoing

2021: B.M. Colloty & C.R. Weatherall-Thomas. Botanical Impact Assessment for a residential development at Kuyga, Eastern Cape

2021 B. M. Colloty & C.R. Weatherall-Thomas. Terrestrial Biodiversity and Plant Species Impact Assessment for Chatty-Dedisa Grid Extension, NMBM, Eastern Cape

2021 B. M. Colloty & C.R. Weatherall-Thomas. Terrestrial Biodiversity and Plant and Animal Species Specialist Report for Malabar Shopping Centre, NMBM

2021 C.R. Weatherall-Thomas. Botanical Opinion letter for Erf 3010 Kirkwood, Sundays River Valley Municipality

2021: C.R. Weatherall-Thomas. Botanical Opinion Letter for the expansion of Mount Frere Police Station, Umzimvubu Municipality

2020: C.R. Weatherall-Thomas. Botanical Opinion Letter for the expansion of Kamesh Police Station, NMBM

2020: C.R. Weatherall-Thomas. Botanical Opinion for the proposed poultry broiler facility and abattoir on Portion 24 of the Farm Waggie 110, within the Sundays River Valley Local Municipality, Eastern Cape

2020 B. M. Colloty & C.R. Weatherall-Thomas. The proposed agricultural development on Portion 1 & 2 of the Farm Kwade Hoek 52 and the remaining extent of the Farm Schelm Drift 53, Makana Local Municipality, Eastern Cape

2020: C.R. Weatherall-Thomas. Botanical Screening Opinion Letter for Proposed development on Erf 10261, NMBM

2019: C.R. Weatherall-Thomas. Botanical Specialist Report for Mount Coke Quarry, Buffalo City Municipality, Eastern Cape

2019 C.R. Weatherall-Thomas. Botanical Specialist Report for Subdivision of Farm Hogsback Plateau No. 21, Raymond Mhlaba Municipality

2019: C.R. Weatherall-Thomas. Botanical Impact Assessment for Ibhino Sand, NMBM

2019: C.R. Weatherall-Thomas. Botanical Specialist Report for Florida Heights, NMBM, Eastern Cape.

2019: C.R. Weatherall-Thomas. Screening Report for Portion 3 of Farm Zwartebosch 347, Kouga Municipality.

2019: C.R. Weatherall-Thomas. Botanical Specialist Report for Kleinfontein Kalkmyn, Kouga Municipality.

2018: C.R. Weatherall-Thomas. Botanical Specialist Report for Sogea Satom Pre Cast Concrete Wind Tower Factory, Siyathemba municipality, Northern Cape.

2018: Botanical Specialist Report for Driftsands Mining, NMBM, EC.

2018: Botanical Screening Report for Addo Drift East, Sundays River Valley Municipality.

2017: M. Fernandes, J. Adams and C. R. Weatherall-Thomas. Macrophyte health and updated estuary habitat and plant species data for Western Cape estuaries.

2017: E. Milne & C.R. Weatherall-Thomas. Botanical Impact of KimCrusher, Northern Cape.

2017: E. Milne & C.R. Weatherall-Thomas. Ecological Impact Report for Luke Mason Alluvial Diamond Mine, Northern Cape.

2015: A. Grobler & C.R. Weatherall-Thomas. Botanical Assessment of the proposed FreshGro Citrus Development, Sundays River Valley Municipality.

2012: C.R. Weatherall-Thomas & M. Louw. Proposed Redhouse-Chelsea arterial and walker drive extension: Evaluation of the type and state of vegetation, species of conservation concern, and rocky outcrops between the various arterial alignment alternatives.

Papers

Robbert Duker, Richard M. Cowling, Derek R. du Preez, Marius L. van der Vyver, Clayton R. Weatherall-Thomas and Alastair J. Potts (2014) Community-level assessment of freezing tolerance: frost dictates the biome boundary between Albany subtropical thicket and Nama-Karoo in South Africa. Journal of Biogeography 42(1): 167-178

Conference presentations

C.R. Weatherall-Thomas, E.E. Campbell and R.M. Cowling (2014) The influence of megaherbivory on the patterns of succulent plant distribution at a bushclump scale. AZEF/Thicket Forum conference presentation

C.R. Weatherall-Thomas (2013) CREW with a cause. Thicket Forum conference presentation.

C.R. Weatherall-Thomas, E.E. Campbell and R.M. Cowling (2013) Determination of the utilization threshold for the maintenance of Thicket floral diversity. Centre for African Conservation Ecology Forum

C.R. Weatherall-Thomas & E.E. Campbell (2007) Seed germination and seedling survival in coastal Thicket: initial results. Thicket Forum/Grasslands Society of South Africa conference poster presentation.

C.R. Weatherall-Thomas & E.E. Campbell (2006) Secondary succession of Thicket at a limestone quarry in the Gamtoos River Valley, South Africa. South African Association of Botanists conference presentation.

Other Experience

Chairperson of the Algoa branch of the Botanical Society of South Africa

Custodians of Rare and Endangered Wildflowers (CREW) Champion

Member of the organizing committee of the Thicket Forum

Competent in MS Word, Excel and Power Point, ArcGIS.

Professional Bodies

Pr. Sci. Nat (SACNASP)

References

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Botany Lecturer and Botanical Specialist
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Environmental Assessment Practitioners Association of South Africa

Registration No. 2019/461

Herewith certifies that

Clayton Richard
Weatherall-Thomas

is registered as an

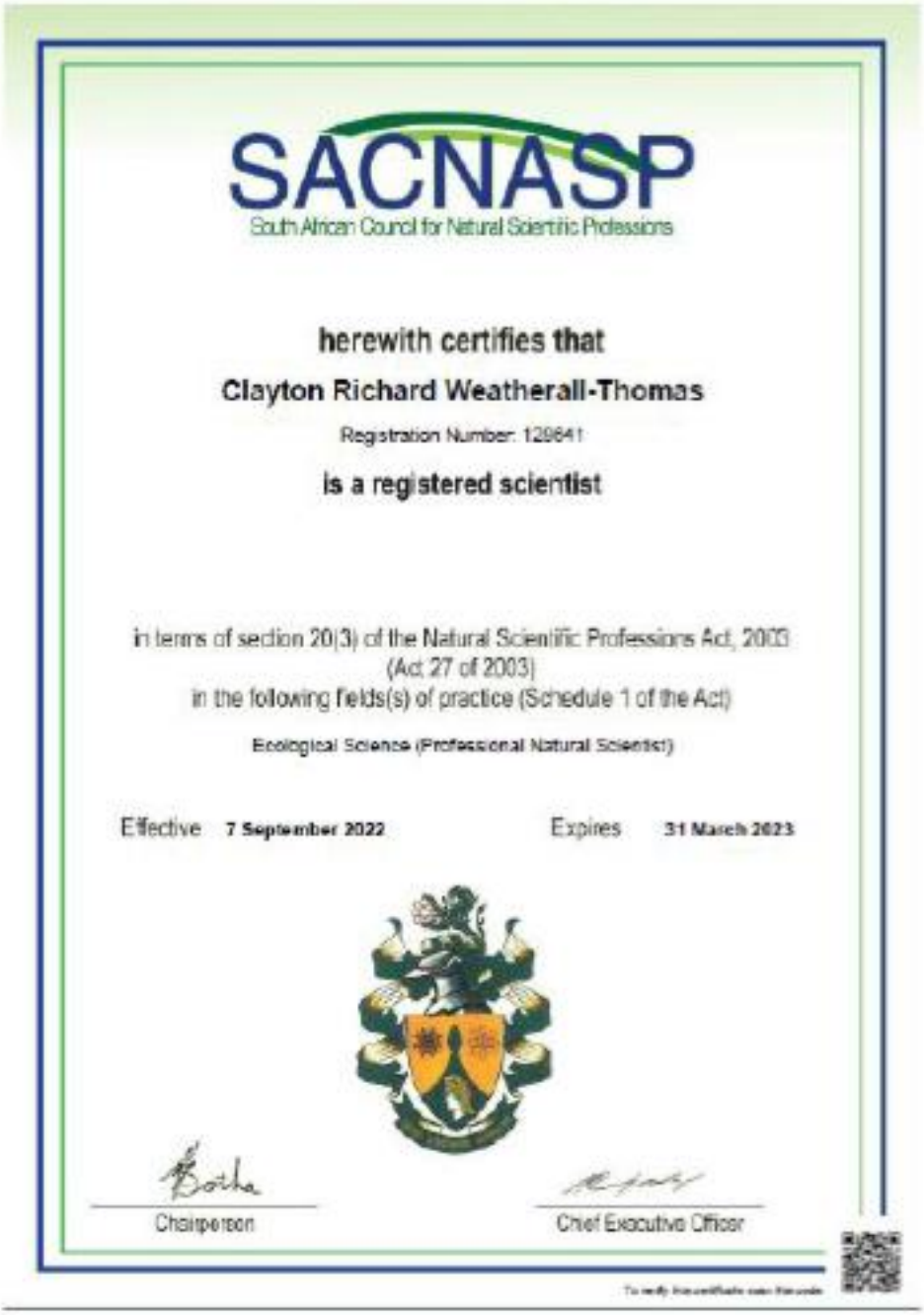
Environmental Assessment Practitioner

Registered in accordance with the prescribed criteria of Regulation 15. (1) of the Section 24H Registration Authority Regulations (Regulation No. 843, Gazette No. 40154 of 22 July 2016, of the National Environmental Management Act (NEMA), Act No. 107 of 1998, as amended).

Effective: 01 March 2022 Expires: 28 February 2023

Chairperson Registrar

SAQA



SACNASP

South African Council for Natural Scientific Professions

herewith certifies that

Clayton Richard Weatherall-Thomas

Registration Number: 129841

is a registered scientist

in terms of section 20(3) of the Natural Scientific Professions Act, 2003
(Act 27 of 2003)
in the following fields(s) of practice (Schedule 1 of the Act)

Ecological Science (Professional Natural Scientist)

Effective **7 September 2022** Expires **31 March 2023**

Chairperson

Chief Executive Officer

Appendix 2 Declaration of Interest

Province of the EASTERN CAPE
ECONOMIC DEVELOPMENT, ENVIRONMENTAL AFFAIRS & TOURISM

DETAILS OF SPECIALIST AND DECLARATION OF INTEREST IN TERMS OF REGULATIONS 12 AND 13 OF THE AMENDMENTS TO THE ENVIRONMENTAL IMPACT ASSESSMENT REGULATIONS, 2014 AS AMENDED.

	(For official use only)
File Reference Number:	
NEAS Reference Number:	
Date Received:	

Application for environmental authorization in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and the Amendments to the Environmental Impact Assessment Regulations, 2014. This form is valid as of 6 January 2021.

PROJECT TITLE

THE PROPOSED DEVELOPMENT OF A 2.5 MEGAWATT SOLAR PHOTOVOLTAIC (PV) FACILITY ON ERF 77, GREENBUSHES, WITHIN THE NELSON MANDELA BAY MUNICIPALITY, EASTERN CAPE

SPECIALIST [1]	**Terrestrial Biodiversity, including Ecology, Flora and Fauna**		
Contact person:	**Clayton Weatherall-Thomas**		
Postal address:	**PO BOX 6237, Walmer, Gqeberha**		
Postal code:	**6001**	**Cell:**	**083 401 8091**
Telephone:	**NA**	**Fax:**	
E-mail:	**claytonwt@gmail.com**		
Professional affiliation(s) (if any)	**SACNASP (128641)**		

Version 2 January 15 2021

Project Consultant:	**Habitat Link Consulting**		
Contact person:	**Roberto Almanza**		
Postal address:	**117 Cape Road, Mount Croix**		
Postal code:	**6001**	Cell:	**082 930 8711**
Telephone:		Fax:	-
E-mail:	**roberto@habitatlink.co.za**		

4.2 The SPECIALIST

I, , declare that –

General declaration:

- I act as the independent Specialist in this application
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting environmental impact assessments, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, regulations and all other applicable legislation;
- I will take into account, to the extent possible, the matters listed in regulation 8 of the regulations when preparing the application and any report relating to the application;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- I will ensure that information containing all relevant facts in respect of the application is distributed or made available to interested and affected parties and the public and that participation by interested and affected parties is facilitated in such a manner that all interested and affected parties will be provided with a reasonable opportunity to participate and to provide comments on documents that are produced to support the application;
- I will ensure that the comments of all interested and affected parties are considered and recorded in reports that are submitted to the competent authority in respect of the application, provided that comments that are made by interested and affected parties in respect of a final report that will be submitted to the competent authority may be attached to the report without further amendment to the report;
- I will keep a register of all interested and affected parties that participated in a public participation process; and
- I will provide the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not
- all the particulars furnished by me in this form are true and correct;

- will perform all other obligations as expected from an environmental assessment practitioner in terms of the Regulations; and
- I realise that a false declaration is an offence and is punishable in terms of section 24F of the Act.

Disclosure of Vested Interest (delete whichever is not applicable)

- I do not have and will not have any vested interest (either business, financial, personal or other) in the proposed activity proceeding other than remuneration for work performed in terms of the Amendments to Environmental Impact Assessment Regulations, 2014 as amended.
- ~~I have a vested interest in the proposed activity proceeding, such vested interest being:~~

Signature of the environmental assessment practitioner:

NA

Name of company:

02/02/2023

Date:

Signature of the Commissioner of Oaths:

Date:

Designation:

[1] Curriculum Vitae (CV) attached

Official stamp (below).

Appendix 3 List of Species on the Proposed Greenbushes Solar PV Site, NMBM

Appendix 3.1 List of Plant Species found at the proposed Greenbushes Solar PV Site, NMBM, and their conservation significance

FAMILY	SPECIES	Transformed	Threat status	NFA	NECO	ToPs	Alien
Aizoaceae	*Aizoon glinoides* L.f.		LC				
Aizoaceae	*Carpobrotus edulis* (L.) N.E.Br.		LC		Sch 4		
Aizoaceae	*Drosanthemum hispidum* (L.) Schwantes		LC		Sch 4		
Aizoaceae	*Mesembryanthemum aitonis* Jacq.		LC		Sch 4		
Amaranthaceae	*Alternanthera pungens* Kunth		NE				*
Anacardiaceae	*Searsia lucida* (L.) F.A.Barkley		LC				
Asphodelaceae	*Aloe maculata* All. subsp. *maculata*		LC		Sch 4		
Asteraceae	*Cirsium vulgare* (Savi) Ten.		NE				1b
Asteraceae	*Arctotheca calendula* (L.) Levyns		LC				
Asteraceae	*Chrysocoma ciliata* L.		LC				
Asteraceae	*Cotula australis* (Spreng.) Hook.f.		LC				
Asteraceae	*Erigeron* sp.		NE				*
Asteraceae	*Helichrysum cymosum* (L.) D.Don subsp. *cymosum*		LC				
Asteraceae	*Pseudognaphalium luteoalbum* (L.) Hilliard & B.L.Burtt		LC				
Asteraceae	*Senecio glutinosus* Thunb.		LC				
Asteraceae	*Senecio pterophorus* DC.		LC				
Asteraceae	*Sonchus oleraceus* L.		NE				
Asteraceae	*Taraxacum officinale* Weber		NE				*
Brassicaceae	*Lepidium africanum* (Burm.f.) DC. subsp. *africanum*		LC				
Brassicaceae	*Lepidium didymum* L.		NE				*
Cactaceae	*Opuntia monacantha* Haw.		NE				1b
Caryophyllaceae	*Polycarpon tetraphyllum* (L.) L.		NE				*

Crassulaceae	*Crassula multicava* Lem. subsp. *multicava*	LC		
Cyperaceae	*Isolepis marginata* (Thunb.) A.Dietr.	LC		
Ebenaceae	*Diospyros dichrophylla* (Gand.) De Winter	LC		
Fabaceae	*Acacia mearnsii* De Wild.	NE		2
Fabaceae	*Medicago polymorpha* L.	NE		*
Fabaceae	*Tephrosia capensis* (Jacq.) Pers.	LC		
Fabaceae	*Trifolium repens* L.	NE		*
Hyacinthaceae	*Albuca* sp.			
Malvaceae	*Hermannia althaeifolia* L.	LC		
Myrsinaceae	*Lysimachia arvensis* (L.) U.Manns & Anderb. var. *arvensis*	NE		*
Myrtaceae	*Eucalyptus camaldulensis* Dehnh. subsp. *camaldulensis*	NE		1b
Orobanchaceae	*Striga gesnerioides* (Willd.) Vatke	LC		
Oxalidaceae	*Oxalis corniculata* L.	NE		*
Oxalidaceae	*Oxalis depressa* Eckl. & Zeyh.	LC		
Poaceae	*Cynodon dactylon* (L.) Pers.	LC		
Poaceae	*Eragrostis curvula* (Schrad.) Nees	LC		
Poaceae	*Sporobolus africanus* (Poir.) Robyns & Tournay	LC		
Poaceae	*Stenotaphrum secundatum* (Walter) Kuntze	LC		
Polygalaceae	*Muraltia alopecuroides* (L.) DC.	LC		
Polygonaceae	*Emex australis* Steinh.	LC		
Rutaceae	*Agathosma capensis* (L.) Dummer	LC	Sch 4	
Schrophulariaceae	*Phyllopodium cuneifolium* (L.f.) Benth.	LC		
Solanaceae	*Solanum linnaeanum* Hepper & P.-M.L.Jaeger	LC		
Thymeleaceae	*Struthiola parviflora* Bartl. ex Meisn.	LC		

Appendix 3.2 List of Herpatofauna, Mammals and Lepidoptera on the proposed Greenbushes Solar PV Site, NMBM.

FAMILY	SPECIES	COMMON NAME	THREAT STATUS	NECO	ToPS
Frogs					
Brevicepitidae	*Breviceps pentheri*	Eastern Cape Rain Frog	LC	Sch 2	
Bufonidae	*Sclerophrys capensis*	Raucous Toad	LC	Sch 2	
Bufonidae	*Sclerophrys pardalis*	Eastern Leopard Toad	LC	Sch 2	
Hyperoliidae	*Hyperolius marmoratus*	Painted Reed Frog	LC	Sch 2	
Hyperoliidae	*Hyperolius marmoratus verrucosus*	Painted Reed Frog (subsp. verrucosus)	LC	Sch 2	
Hyperoliidae	*Kassina senegalensis*	Bubbling Kassina	LC	Sch 2	
Hyperoliidae	*Semnodactylus wealii*	Rattling Frog	LC	Sch 2	
Phrynobatrachidae	*Phrynobatrachus natalensis*	Snoring Puddle Frog	LC	Sch 2	
Pipidae	*Xenopus laevis*	Common Platanna	LC	Sch 2	
Pyxicephalidae	*Amietia delalandii*	Delalande's River Frog	LC	Sch 2	
Pyxicephalidae	*Cacosternum boettgeri*	Common Caco	LC	Sch 2	
Pyxicephalidae	*Cacosternum nanum*	Bronze Caco	LC	Sch 2	
Pyxicephalidae	*Pyxicephalus adspersus*	Giant Bull Frog	LC Decreasing	Sch 2	Protected
Pyxicephalidae	*Strongylopus fasciatus*	Striped Stream Frog	LC	Sch 2	
Pyxicephalidae	*Strongylopus grayii*	Clicking Stream Frog	LC	Sch 2	
Pyxicephalidae	*Tomopterna delalandii*	Cape Sand Frog	LC	Sch 2	
Reptiles					
Ag+A20:B93amidae	*Agama aculeata aculeata*	Common Ground Agama	LC	Sch 2	
Agamidae	*Agama atra*	Southern Rock Agama	LC	Sch 2	
Chamaeleonidae	*Bradypodion barbatulum*	Beardless Dwarf Chameleon	LC	Sch 2	
Chamaeleonidae	*Bradypodion sp. (Groendal)*	Groendal Dwarf Chameleon	LC	Sch 2	
Chamaeleonidae	*Bradypodion taeniabronchum*	Elandsberg Dwarf Chameleon	LC	Sch 2	Protected
Chamaeleonidae	*Bradypodion ventrale*	Eastern Cape Dwarf Chameleon	LC	Sch 2	
Colubridae	*Crotaphopeltis hotamboeia*	Red-lipped Snake	LC		
Colubridae	*Dasypeltis scabra*	Rhombic Egg-eater	LC	Sch 2	

Colubridae	*Dispholidus typus typus*	Boomslang	LC		
Colubridae	*Philothamnus hoplogaster*	South Eastern Green Snake	LC	Sch 2	
Colubridae	*Philothamnus occidentalis*	Western Natal Green Snake	LC	Sch 2	
Colubridae	*Philothamnus semivariegatus*	Spotted Bush Snake	LC	Sch 2	
Cordylidae	*Chamaesaura anguina anguina*	Cape Grass Lizard	LC	Sch 2	
Cordylidae	*Cordylus cordylus*	Cape Girdled Lizard	LC	Sch 2	
Cordylidae	*Karusasaurus polyzonus*	Karoo Girdled Lizard	LC	Sch 2	
Cordylidae	*Pseudocordylus microlepidotus fasciatus*	Karoo Crag Lizard	LC	Sch 2	
Cordylidae	*Pseudocordylus microlepidotus microlepidotus*	Cape Crag Lizard	LC	Sch 2	
Elapidae	*Aspidelaps lubricus lubricus*	Coral Shield Cobra	LC		
Elapidae	*Hemachatus haemachatus*	Rinkhals	LC		
Elapidae	*Naja nivea*	Cape Cobra	LC		
Gekkonidae	*Chondrodactylus bibronii*	Bibron's Gecko	LC	Sch 2	
Gekkonidae	*Goggia essexi*	Essex's Pygmy Gecko	LC	Sch 2	
Gekkonidae	*Hemidactylus mabouia*	Common Tropical House Gecko	LC	Sch 2	
Gekkonidae	*Lygodactylus capensis*	Common Dwarf Gecko	LC	Sch 2	
Gekkonidae	*Pachydactylus geitje*	Ocellated Gecko	LC	Sch 2	
Gekkonidae	*Pachydactylus maculatus*	Spotted Gecko	LC	Sch 2	
Gekkonidae	*Pachydactylus mariquensis*	Marico Gecko	LC	Sch 2	
Gerrhosauridae	*Gerrhosaurus flavigularis*	Yellow-throated Plated Lizard	LC	Sch 2	
Gerrhosauridae	*Tetradactylus fitzsimonsi*	FitzSimons' Long-tailed Seps	LC	Sch 2	
Gerrhosauridae	*Tetradactylus seps*	Short-legged Seps	LC	Sch 2	

Lacertidae	*Nucras lalandii*	Delalande's Sandveld Lizard	LC	Sch 2	
Lacertidae	*Nucras livida*	Karoo Sandveld Lizard	LC	Sch 2	
Lacertidae	*Nucras taeniolata*	Albany Sandveld Lizard	LC	Sch 2	
Lacertidae	*Pedioplanis lineoocellata pulchella*	Common Sand Lizard	LC	Sch 2	
Lacertidae	*Tropidosaura gularis*	Cape Mountain Lizard	LC	Sch 2	
Lacertidae	*Tropidosaura montana rangeri*	Ranger's Mountain Lizard	LC	Sch 2	
Lamprophiidae	*Aparallactus capensis*	Black-headed Centipede-eater	LC		
Lamprophiidae	*Boaedon capensis*	Brown House Snake	LC		
Lamprophiidae	*Duberria lutrix lutrix*	South African Slug-eater	LC	Sch 2	
Lamprophiidae	*Homoroselaps lacteus*	Spotted Harlequin Snake	LC		
Lamprophiidae	*Lamprophis aurora*	Aurora House Snake	LC	Sch 2	
Lamprophiidae	*Lamprophis fuscus*	Yellow-bellied House Snake	LC	Sch 2	
Lamprophiidae	*Lamprophis guttatus*	Spotted House Snake	LC	Sch 2	
Lamprophiidae	*Lycodonomorphus inornatus*	Olive House Snake	LC	Sch 2	
Lamprophiidae	*Lycodonomorphus laevissimus*	Dusky-bellied Water Snake	LC	Sch 2	
Lamprophiidae	*Lycodonomorphus rufulus*	Brown Water Snake	LC	Sch 2	
Lamprophiidae	*Lycophidion capense capense*	Cape Wolf Snake	LC	Sch 2	
Lamprophiidae	*Prosymna sundevallii*	Sundevall's Shovel-snout	LC	Sch 2	
Lamprophiidae	*Psammophis crucifer*	Cross-marked Grass Snake	LC		
Lamprophiidae	*Psammophis notostictus*	Karoo Sand Snake	LC		
Lamprophiidae	*Psammophylax rhombeatus*	Spotted Grass Snake	LC		
Lamprophiidae	*Pseudaspis cana*	Mole Snake	LC	Sch 2	
Leptotyphlopidae	*Leptotyphlops nigricans*	Black Thread Snake	LC		
Pelomedusidae	*Pelomedusa galeata*	South African Marsh Terrapin	LC	Sch 2	
Scincidae	*Acontias gracilicauda*	Thin-tailed Legless Skink	LC	Sch 2	
Scincidae	*Acontias lineicauda*	Algoa Bay Legless Skink	LC	Sch 2	

Scincidae	*Acontias meleagris*	Cape Legless Skink	LC	Sch 2	
Scincidae	*Acontias orientalis*	Eastern Legless Skink	LC	Sch 2	
Scincidae	*Scelotes anguineus*	Algoa Dwarf Burrowing Skink	LC	Sch 2	
Scincidae	*Scelotes caffer*	Cape Dwarf Burrowing Skink	LC	Sch 2	
Scincidae	*Trachylepis capensis*	Cape Skink	LC	Sch 2	
Scincidae	*Trachylepis homalocephala*	Red-sided Skink	LC	Sch 2	
Scincidae	*Trachylepis sulcata sulcata*	Western Rock Skink	LC	Sch 2	
Scincidae	*Trachylepis varia sensu stricto*	Common Variable Skink	LC	Sch 2	
Scincidae	*Trachylepis variegata*	Variegated Skink	LC	Sch 2	
Testudinidae	*Chersina angulata*	Angulate Tortoise	LC	Sch 2	
Testudinidae	*Chersobius boulengeri*	Karoo Padloper	EN, EN	Sch 2	
Testudinidae	*Homopus areolatus*	Parrot-beaked Tortoise	LC	Sch 2	
Testudinidae	*Psammobates tentorius tentorius*	Karoo Tent Tortoise	NT, NT	Sch 2	
Testudinidae	*Stigmochelys pardalis*	Leopard Tortoise	LC	Sch 2	
Typhlopidae	*Afrotyphlops bibronii*	Bibron's Blind Snake	LC		
Typhlopidae	*Rhinotyphlops lalandei*	Delalande's Beaked Blind Snake	LC		
Varanidae	*Varanus albigularis albigularis*	Rock Monitor	LC	Sch 2	
Varanidae	*Varanus niloticus*	Water Monitor	LC	Sch 2	
Viperidae	*Bitis arietans arietans*	Puff Adder	LC		
Viperidae	*Causus rhombeatus*	Rhombic Night Adder	LC		
Mammals					
Bathyergidae	*Bathyergus suillus*	Cape Dune Mole-rat	LC		
Bathyergidae	*Cryptomys hottentotus*	Southern African Mole-rat	LC		
Bathyergidae	*Georychus capensis*	Cape Mole-rat	LC		
Bovidae	*Antidorcas marsupialis*	Springbok	LC	Sch 2	
Bovidae	*Philantomba monticola*	Blue Duiker	VU	Sch 2	Vulnerable
Bovidae	*Raphicerus melanotis*	Cape Grysbok	LC	Sch 2	
Bovidae	*Tragelaphus scriptus*	Bushbuck	LC	Sch 2	
Bovidae	*Tragelaphus strepsiceros*	Greater Kudu	LC	Sch 2	
Canidae	*Canis mesomelas*	Black-backed Jackal	LC		
Canidae	*Otocyon megalotis*	Bat-eared Fox	LC		

Cercopithecidae	*Chlorocebus pygerythrus*	Vervet Monkey	LC		
Cercopithecidae	*Papio ursinus*	Chacma Baboon	LC		
Equidae	*Equus zebra zebra*	Cape Mountain Zebra	LC	Sch 1	Endangered
Felidae	*Caracal caracal*	Caracal	LC		
Felidae	*Felis silvestris*	Wildcat	LC		
Felidae	*Panthera pardus*	Leopard	VU		
Gliridae	*Graphiurus (Graphiurus) murinus*	Forest African Dormouse	LC		
Herpestidae	*Cynictis penicillata*	Yellow Mongoose	LC		
Herpestidae	*Herpestes pulverulentus*	Cape Gray Mongoose	LC		
Herpestidae	*Suricata suricatta*	Meerkat	LC		
Leporidae	*Lepus saxatilis*	Scrub Hare	LC		
Muridae	*Aethomys namaquensis*	Namaqua Rock Mouse	LC		
Muridae	*Desmodillus auricularis*	Cape Short-tailed Gerbil	LC		
Muridae	*Gerbilliscus afra*	Cape Gerbil	LC		
Muridae	*Grammomys dolichurus*	Common Grammomys	LC		
Muridae	*Mastomys natalensis*	Natal Mastomys	LC		
Muridae	*Mus (Nannomys) minutoides*	Southern African Pygmy Mouse	LC		
Muridae	*Mus musculus musculus*	House Mouse	LC		Invasive
Muridae	*Otomys irroratus*	Southern African Vlei Rat (Fynbos type)	LC		
Muridae	*Otomys saundersiae*	Saunders' Vlei Rat	LC		
Muridae	*Otomys unisulcatus*	Karoo Bush Rat	LC		
Muridae	*Rattus rattus*	Roof Rat	NE		Invasive
Muridae	*Rhabdomys pumilio*	Xeric Four-striped Grass Rat	LC		
Mustelidae	*Mellivora capensis*	Honey Badger	LC		
Nesomyidae	*Dendromus mesomelas*	Brants's African Climbing Mouse	LC		
Nesomyidae	*Saccostomus campestris*	Southern African Pouched Mouse	LC		
Nycteridae	*Nycteris thebaica*	Egyptian Slit-faced Bat	LC	Sch 2	
Procaviidae	*Procavia capensis*	Cape Rock Hyrax	LC	Sch 2	
Rhinolophidae	*Rhinolophus capensis*	Cape Horseshoe Bat	LC	Sch 2	
Rhinolophidae	*Rhinolophus clivosus*	Geoffroy's Horseshoe Bat	LC	Sch 2	

Soricidae	*Crocidura flavescens*	Greater Red Musk Shrew	LC	Sch 2	
Soricidae	*Myosorex varius*	Forest Shrew	LC	Sch 2	
Vespertilionidae	*Kerivoula lanosa*	Lesser Woolly Bat	LC	Sch 2	
Vespertilionidae	*Miniopterus natalensis*	Natal Long-fingered Bat	LC	Sch 2	
Vespertilionidae	*Neoromicia capensis*	Cape Serotine	LC	Sch 2	
Viverridae	*Genetta tigrina*	Cape Genet (Cape Large-spotted Genet)	LC		
Butterflies					
CRAMBIDAE	*Loxostege frustalis*		LC		
EREBIDAE	*Amata kuhlweini*		LC		
EREBIDAE	*Pericyma mendax*		LC		
EREBIDAE	*Utetheisa pulchella*		LC		
GEOMETRIDAE	*Rhodometra sacraria*		LC		
HESPERIIDAE	*Afrogegenes sp.*		LC		
HESPERIIDAE	*Afrogegenes letterstedti*	Brown dodger	LC		
HESPERIIDAE	*Afrogegenes ocra*	Yellow dodger	LC		
HESPERIIDAE	*Alenia sandaster*	Karoo dancer	LC		
HESPERIIDAE	*Eagris nottoana knysna*	Rufous-winged elfin	LC		
HESPERIIDAE	*Eretis umbra umbra*	Small marbled elf	LC		
HESPERIIDAE	*Gomalia elma elma*	Green-marbled skipper	LC		
HESPERIIDAE	*Kedestes lepenula*	Chequered ranger	LC		
HESPERIIDAE	*Kedestes macomo*	Macomo ranger	LC		
HESPERIIDAE	*Metisella metis paris*	Gold-spotted sylph	LC		
HESPERIIDAE	*Metisella orientalis*	Eastern sylph	LC		
HESPERIIDAE	*Pelopidas thrax*	White-branded swift	LC		
HESPERIIDAE	*Sarangesa phidyle*	Small elfin	LC		
HESPERIIDAE	*Spialia asterodia*	Star sandman	LC		
HESPERIIDAE	*Spialia nanus*	Dwarf sandman	LC		
HESPERIIDAE	*Spialia spio*	Mountain sandman	LC		
HESPERIIDAE	*Tsitana uitenhaga*	Uitenhage sylph	LC		
LYCAENIDAE	*Aloeides almeida*	Plain russet	LC		
LYCAENIDAE	*Aloeides aranda*	Yellow russet	LC		
LYCAENIDAE	*Aloeides depicta*	Depicta russet	LC		
LYCAENIDAE	*Aloeides macmasteri*	Large plain russet	LC		
LYCAENIDAE	*Aloeides pallida pallida*	Giant russet	LC		
LYCAENIDAE	*Aloeides pierus*	Veined russet	LC		

LYCAENIDAE	*Aloeides quickelbergei*	Outeniqua russet	LC		
LYCAENIDAE	*Aloeides trimeni trimeni*	Brown russet	LC		
LYCAENIDAE	*Anthene amarah amarah*	Black-striped ciliate blue	LC		
LYCAENIDAE	*Anthene definita definita*	Steel-blue-ciliate blue	LC		
LYCAENIDAE	*Anthene livida livida*	Pale ciliate blue	LC		
LYCAENIDAE	*Anthene talboti*	Savanna ciliate blue	LC		
LYCAENIDAE	*Axiocerses croesus*	Dark-banded scarlet	LC		
LYCAENIDAE	*Cacyreus fracta fracta*	Water geranium bronze	LC		
LYCAENIDAE	*Cacyreus lingeus*	Bush bronze	LC		
LYCAENIDAE	*Cacyreus marshalli*	Common geranium bronze	LC		
LYCAENIDAE	*Capys alpheus alpheus*	Orange banded protea	LC		
LYCAENIDAE	*Chrysoritis beulah*	Gully opal	LC		
LYCAENIDAE	*Chrysoritis chrysaor*	Burnished opal	LC		
LYCAENIDAE	*Chrysoritis palmus margueritae*	Water opal	LC		
LYCAENIDAE	*Chrysoritis pyroeis hersaleki*	Sand-dune opal	Vulnerable (SABCA 2013)		
LYCAENIDAE	*Cupidopsis cissus cissus*	Meadow blue	LC		
LYCAENIDAE	*Deudorix antalus*	Brown playboy	LC		
LYCAENIDAE	*Durbaniella clarki jenniferae*	Little rocksitter	LC		
LYCAENIDAE	*Eicochrysops messapus messapus*	Cupreous ash blue	LC		
LYCAENIDAE	*Iolaus mimosae mimosae*	Mimosa sapphire	LC		
LYCAENIDAE	*Iolaus silas*	Southern sapphire	LC		
LYCAENIDAE	*Lachnocnema durbani*	Grassland woolly legs	LC		
LYCAENIDAE	*Lampides boeticus*	Pea blue	LC		
LYCAENIDAE	*Lepidochrysops sp.*		LC		
LYCAENIDAE	*Lepidochrysops asteris*	Brilliant giant cupid	LC		
LYCAENIDAE	*Lepidochrysops australis*	Southern giant cupid	LC		
LYCAENIDAE	*Lepidochrysops ketsi ketsi*	Ketsi giant cupid	LC		
LYCAENIDAE	*Lepidochrysops patricia*	Patrician giant cupid	LC		

LYCAENIDAE	*Lepidochrysops robertsoni*	Robertson's giant cupid	LC		
LYCAENIDAE	*Lepidochrysops variabilis*	Variable giant cupid	LC		
LYCAENIDAE	*Leptomyrina lara*	Cape black-eye	LC		
LYCAENIDAE	*Leptotes sp.*		LC		
LYCAENIDAE	*Leptotes pirithous pirithous*	Common zebra blue	LC	NECO Protected	
LYCAENIDAE	*Lycaena orus*	Western sorrel copper	LC		
LYCAENIDAE	*Myrina silenus ficedula*	Common fig tree blue	LC		
LYCAENIDAE	*Oraidium barberae*	Dwarf blue	LC		
LYCAENIDAE	*Phasis braueri*	Eastern arrowhead	LC		
LYCAENIDAE	*Tarucus thespis*	Vivid pierrot	LC		
LYCAENIDAE	*Trimenia argyroplaga argyroplaga*	Large silver-spotted copper	LC		
LYCAENIDAE	*Trimenia macmasteri macmasteri*	Karoo silver-spotted copper	LC		
LYCAENIDAE	*Zizeeria knysna knysna*	African grass blue	LC		
NOCTUIDAE	*Brephos festiva*		LC		
NYMPHALIDAE	*Acraea acara acara*	Acara acraea	LC		
NYMPHALIDAE	*Acraea horta*	Garden acraea	LC		
NYMPHALIDAE	*Acraea lygus*	Lygus acraea	LC		
NYMPHALIDAE	*Acraea neobule neobule*	Wandering donkey acraea	LC		
NYMPHALIDAE	*Aeropetes tulbaghia*	Table mountain beauty	LC		
NYMPHALIDAE	*Bicyclus safitza safitza*	Black-haired bush brown	LC		
NYMPHALIDAE	*Cassionympha cassius*	Rainforest dull brown	LC		
NYMPHALIDAE	*Catacroptera cloanthe cloanthe*	Pirate	LC		
NYMPHALIDAE	*Charaxes brutus natalensis*	White-barred charaxes	LC		
NYMPHALIDAE	*Charaxes jahlusa jahlusa*	Pearl-spotted charaxes	LC		
NYMPHALIDAE	*Charaxes pelias*	Protea charaxes	LC		

NYMPHALIDAE	*Charaxes varanes varanes*	Pearl charaxes	LC		
NYMPHALIDAE	*Danaus chrysippus orientis*	African plain tiger	LC		
NYMPHALIDAE	*Dira clytus eurina*	Cape autumn widow	LC		
NYMPHALIDAE	*Eurytela hiarbas angustata*	Pied piper	LC		
NYMPHALIDAE	*Hypolimnas misippus*	Common diadem	LC		
NYMPHALIDAE	*Junonia hierta cebrene*	Yellow pansy	LC		
NYMPHALIDAE	*Junonia orithya madagascariensis*	African blue pansy	LC		
NYMPHALIDAE	*Neptis saclava marpessa*	Spotted sailer	LC		
NYMPHALIDAE	*Pardopsis punctatissima*	Polka dot	LC		
NYMPHALIDAE	*Precis archesia archesia*	Garden inspector	LC		
NYMPHALIDAE	*Precis octavia sesamus*	Southern gaudy commodore	LC		
NYMPHALIDAE	*Pseudonympha magus*	Silver-bottom brown	LC		
NYMPHALIDAE	*Stygionympha vigilans*	Western hillside brown	LC		
NYMPHALIDAE	*Telchinia rahira rahira*	Marsh telchinia	LC		
NYMPHALIDAE	*Vanessa cardui*	Painted lady	LC		
NYMPHALIDAE	*Vanessa hippomene hippomene*	Southern short-tailed admiral	LC		
PAPILIONIDAE	*Papilio dardanus cenea*	Mocker swallowtail	LC		
PAPILIONIDAE	*Papilio demodocus demodocus*	Citrus swallowtail	LC		
PAPILIONIDAE	*Papilio nireus lyaeus*	Narrow green-banded swallowtail	LC		
PIERIDAE	*Belenois creona severina*	African caper white	LC		
PIERIDAE	*Belenois gidica abyssinica*	African veined white	LC		
PIERIDAE	*Belenois zochalia zochalia*	Forest caper white	LC		

PIERIDAE	*Catopsilia florella*	African migrant	LC		
PIERIDAE	*Colias electo electo*	African clouded yellow	LC		
PIERIDAE	*Colotis antevippe gavisa*	Red tip	LC		
PIERIDAE	*Colotis euippe omphale*	Southern round-winged orange tip	LC		
PIERIDAE	*Colotis evagore antigone*	Small orange tip	LC		
PIERIDAE	*Dixeia charina charina*	African ant-heap white	LC		
PIERIDAE	*Dixeia pigea*	Small ant-heap white	LC		
PIERIDAE	*Eronia cleodora*	Vine-leaf vagrant	LC		
PIERIDAE	*Eurema brigitta brigitta*	Broad-bordered grass yellow	LC		
PIERIDAE	*Mylothris agathina agathina*	Eastern dotted border	LC		
PIERIDAE	*Nepheronia buquetii buquetii*	Buquet's vagrant	LC		
PIERIDAE	*Pinacopteryx eriphia eriphia*	Zebra white	LC		
PIERIDAE	*Pontia helice helice*	Southern meadow white	LC		
PIERIDAE	*Teracolus eris eris*	Banded gold tip	LC		
SPHINGIDAE	*Macroglossum trochilus*		LC		

Appendix 3.3 List of potential Avifauna occurring on the proposed Greenbushes Solar PV Site, NMBM.

Common name		Scientific Name		SCC*	ToPS
	Bokmakierie	*Telophorus*	*zeylonus*		
	Hamerkop	*Scopus*	*umbretta*		
	Mallard	*Anas*	*platyrhynchos*		
	Neddicky	*Cisticola*	*fulvicapilla*		
	Quailfinch	*Ortygospiza*	*atricollis*		
	Ruff	*Calidris*	*pugnax*		
	Secretarybird	*Sagittarius*	*serpentarius*	VU, EN	
Apalis	Bar-throated	*Apalis*	*thoracica*		
Apalis	Yellow-breasted	*Apalis*	*flavida*		
Avocet	Pied	*Recurvirostra*	*avosetta*		
Barbet	Acacia Pied	*Tricholaema*	*leucomelas*		
Barbet	Black-collared	*Lybius*	*torquatus*		
Batis	Cape	*Batis*	*capensis*		
Batis	Chinspot	*Batis*	*molitor*		
Bishop	Southern Red	*Euplectes*	*orix*		
Bishop	Yellow	*Euplectes*	*capensis*		
Bittern	Little	*Ixobrychus*	*minutus*		
Boubou	Southern	*Laniarius*	*ferrugineus*		
Brownbul	Terrestrial	*Phyllastrephus*	*terrestris*		
Bulbul	Cape	*Pycnonotus*	*capensis*		
Bunting	Cape	*Emberiza*	*capensis*		
Bunting	Golden-breasted	*Emberiza*	*flaviventris*		
Bushshrike	Grey-headed	*Malaconotus*	*blanchoti*		
Bushshrike	Olive	*Chlorophoneus*	*olivaceus*		
Bustard	Denham's	*Neotis*	*denhami*	VU, NT	Protected
Buzzard	Common	*Buteo*	*buteo*		
Buzzard	Forest	*Buteo*	*trizonatus*	LC, NT	
Buzzard	Jackal	*Buteo*	*rufofuscus*		
Camaroptera	Green-backed	*Camaroptera*	*brachyura*		
Canary	Brimstone	*Crithagra*	*sulphurata*		
Canary	Cape	*Serinus*	*canicollis*		
Canary	Forest	*Crithagra*	*scotops*		
Canary	Yellow	*Crithagra*	*flaviventris*		
Canary	Yellow-fronted	*Crithagra*	*mozambica*		
Chat	Familiar	*Oenanthe*	*familiaris*		

Common name		Scientific Name		SCC*	ToPS
Cisticola	Cloud	*Cisticola*	*textrix*		
Cisticola	Grey-backed	*Cisticola*	*subruficapilla*		
Cisticola	Lazy	*Cisticola*	*aberrans*		
Cisticola	Levaillant's	*Cisticola*	*tinniens*		
Cisticola	Wailing	*Cisticola*	*lais*		
Cisticola	Zitting	*Cisticola*	*juncidis*		
Coot	Red-knobbed	*Fulica*	*cristata*		
Cormorant	Reed	*Microcarbo*	*africanus*		
Coucal	Burchell's	*Centropus*	*burchellii*		
Crake	African	*Crecopsis*	*egregia*		
Crake	Baillon's	*Zapornia*	*pusilla*		
Crake	Black	*Zapornia*	*flavirostra*		
Crane	Blue	*Grus*	*paradisea*		
Crow	Cape	*Corvus*	*capensis*		
Crow	Pied	*Corvus*	*albus*		
Cuckoo	African Emerald	*Chrysococcyx*	*cupreus*		
Cuckoo	Black	*Cuculus*	*clamosus*		
Cuckoo	Diederik	*Chrysococcyx*	*caprius*		
Cuckoo	Jacobin	*Clamator*	*jacobinus*		
Cuckoo	Klaas's	*Chrysococcyx*	*klaas*		
Cuckoo	Red-chested	*Cuculus*	*solitarius*		
Cuckooshrike	Black	*Campephaga*	*flava*		
Darter	African	*Anhinga*	*rufa*		
Dove	Cape Turtle	*Streptopelia*	*capicola*		
Dove	Emerald-spotted Wood	*Turtur*	*chalcospilos*		
Dove	Laughing	*Spilopelia*	*senegalensis*		
Dove	Lemon	*Columba*	*larvata*		
Dove	Red-eyed	*Streptopelia*	*semitorquata*		
Dove	Rock	*Columba*	*livia*		
Dove	Tambourine	*Turtur*	*tympanistria*		
Drongo	Fork-tailed	*Dicrurus*	*adsimilis*		
Duck	African Black	*Anas*	*sparsa*		
Duck	White-faced Whistling	*Dendrocygna*	*viduata*		
Duck	Yellow-billed	*Anas*	*undulata*		
Eagle	African Fish	*Haliaeetus*	*vocifer*		
Eagle	Booted	*Hieraaetus*	*pennatus*		
Eagle	Long-crested	*Lophaetus*	*occipitalis*		
Eagle-Owl	Spotted	*Bubo*	*africanus*		
Eagle-Owl	Verreaux's	*Bubo*	*lacteus*		
Egret	Great	*Ardea*	*alba*		

Common name		Scientific Name		SCC*	ToPS
Egret	Little	*Egretta*	*garzetta*		
Egret	Western Cattle	*Bubulcus*	*ibis*		
Falcon	Lanner	*Falco*	*biarmicus*	VU, LC	
Falcon	Peregrine	*Falco*	*peregrinus*		ToPS Vulnerable
Fiscal	Southern	*Lanius*	*collaris*		
Flycatcher	African Dusky	*Muscicapa*	*adusta*		
Flycatcher	African Paradise	*Terpsiphone*	*viridis*		
Flycatcher	Blue-mantled Crested	*Trochocercus*	*cyanomelas*		
Flycatcher	Fiscal	*Melaenornis*	*silens*		
Flycatcher	Spotted	*Muscicapa*	*striata*		
Francolin	Grey-winged	*Scleroptila*	*afra*		
Francolin	Red-winged	*Scleroptila*	*levaillantii*		
Goose	Domestic	*Anser*	*anser*		
Goose	Egyptian	*Alopochen*	*aegyptiaca*		
Goose	Spur-winged	*Plectropterus*	*gambensis*		
Goshawk	African	*Accipiter*	*tachiro*		
Goshawk	Gabar	*Micronisus*	*gabar*		
Grassbird	Cape	*Sphenoeacus*	*afer*		
Grebe	Little	*Tachybaptus*	*ruficollis*		
Greenbul	Sombre	*Andropadus*	*importunus*		
Greenshank	Common	*Tringa*	*nebularia*		
Guineafowl	Helmeted	*Numida*	*meleagris*		
Gull	Grey-headed	*Chroicocephalus*	*cirrocephalus*		
Gull	Kelp	*Larus*	*dominicanus*		
Harrier	African Marsh	*Circus*	*ranivorus*	EN, LC	Protected
Harrier	Black	*Circus*	*maurus*		
Harrier-Hawk	African	*Polyboroides*	*typus*		
Heron	Black-crowned Night	*Nycticorax*	*nycticorax*		
Heron	Black-headed	*Ardea*	*melanocephala*		
Heron	Goliath	*Ardea*	*goliath*		
Heron	Grey	*Ardea*	*cinerea*		
Heron	Purple	*Ardea*	*purpurea*		
Honeybird	Brown-backed	*Prodotiscus*	*regulus*		
Honeyguide	Lesser	*Indicator*	*minor*		
Honeyguide	Scaly-throated	*Indicator*	*variegatus*		
Hoopoe	African	*Upupa*	*africana*		
Ibis	African Sacred	*Threskiornis*	*aethiopicus*		
Ibis	Glossy	*Plegadis*	*falcinellus*		
Ibis	Hadada	*Bostrychia*	*hagedash*		
Jacana	African	*Actophilornis*	*africanus*		

Common name		Scientific Name		SCC*	ToPS
Kestrel	Rock	*Falco*	*rupicolus*		
Kingfisher	Brown-hooded	*Halcyon*	*albiventris*		
Kingfisher	Giant	*Megaceryle*	*maxima*		
Kingfisher	Half-collared	*Alcedo*	*semitorquata*		
Kingfisher	Malachite	*Corythornis*	*cristatus*		
Kingfisher	Pied	*Ceryle*	*rudis*		
Kite	Black-winged	*Elanus*	*caeruleus*		
Kite	Yellow-billed	*Milvus*	*aegyptius*		
Lapwing	Blacksmith	*Vanellus*	*armatus*		
Lapwing	Crowned	*Vanellus*	*coronatus*		
Lark	Cape Clapper	*Mirafra*	*apiata*		
Lark	Eastern Clapper	*Mirafra*	*fasciolata*		
Lark	Red-capped	*Calandrella*	*cinerea*		
Lark	Rufous-naped	*Mirafra*	*africana*		
Longclaw	Cape	*Macronyx*	*capensis*		
Mannikin	Bronze	*Spermestes*	*cucullata*		
Martin	Banded	*Riparia*	*cincta*		
Martin	Brown-throated	*Riparia*	*paludicola*		
Martin	Rock	*Ptyonoprogne*	*fuligula*		
Moorhen	Common	*Gallinula*	*chloropus*		
Mousebird	Red-faced	*Urocolius*	*indicus*		
Mousebird	Speckled	*Colius*	*striatus*		
Nightjar	Fiery-necked	*Caprimulgus*	*pectoralis*		
Oriole	Black-headed	*Oriolus*	*larvatus*		
Ostrich	Common	*Struthio*	*camelus*		
Owl	African Grass	*Tyto*	*capensis*		
Owl	African Wood	*Strix*	*woodfordii*		
Peafowl	Indian	*Pavo*	*cristatus*		
Pigeon	African Green	*Treron*	*calvus*		
Pigeon	Speckled	*Columba*	*guinea*		
Pipit	African	*Anthus*	*cinnamomeus*		
Pipit	Nicholson's	*Anthus*	*nicholsoni*		
Pipit	Plain-backed	*Anthus*	*leucophrys*		
Plover	Kittlitz's	*Charadrius*	*pecuarius*		
Plover	Three-banded	*Charadrius*	*tricollaris*		
Plover	White-fronted	*Charadrius*	*marginatus*		
Pochard	Southern	*Netta*	*erythrophthalma*		
Prinia	Karoo	*Prinia*	*maculosa*		
Puffback	Black-backed	*Dryoscopus*	*cubla*		
Quail	Common	*Coturnix*	*coturnix*		
Rail	African	*Rallus*	*caerulescens*		

Common name		Scientific Name		SCC*	ToPS
Raven	White-necked	*Corvus*	*albicollis*		
Robin-Chat	Cape	*Cossypha*	*caffra*		
Sandpiper	Common	*Actitis*	*hypoleucos*		
Sandpiper	Curlew	*Calidris*	*ferruginea*		
Sandpiper	Wood	*Tringa*	*glareola*		
Saw-wing	Black (Southern Africa)	*Psalidoprocne*	*pristoptera holomelas*		
Scrub Robin	Brown Scrub	*Cercotrichas*	*signata*		
Scrub Robin	Karoo	*Cercotrichas*	*coryphoeus*		
Scrub Robin	White-browed	*Cercotrichas*	*leucophrys*		
Seedeater	Streaky-headed	*Crithagra*	*gularis*		
Shelduck	South African	*Tadorna*	*cana*		
Shoveler	Cape	*Spatula*	*smithii*		
Snipe	African	*Gallinago*	*nigripennis*		
Sparrow	Cape	*Passer*	*melanurus*		
Sparrow	House	*Passer*	*domesticus*		
Sparrow	Southern Grey-headed	*Passer*	*diffusus*		
Sparrowhawk	Black	*Accipiter*	*melanoleucus*		
Sparrowhawk	Rufous-breasted	*Accipiter*	*rufiventris*		
Spoonbill	African	*Platalea*	*alba*		
Spurfowl	Red-necked	*Pternistis*	*afer*		
Starling	Black-bellied	*Notopholia*	*corusca*		
Starling	Cape	*Lamprotornis*	*nitens*		
Starling	Common	*Sturnus*	*vulgaris*		
Starling	Pied	*Lamprotornis*	*bicolor*		
Starling	Red-winged	*Onychognathus*	*morio*		
Stilt	Black-winged	*Himantopus*	*himantopus*		
Stint	Little	*Calidris*	*minuta*		
Stonechat	African	*Saxicola*	*torquatus*		
Stork	White	*Ciconia*	*ciconia*		
Sugarbird	Cape	*Promerops*	*cafer*		
Sunbird	Amethyst	*Chalcomitra*	*amethystina*		
Sunbird	Collared	*Hedydipna*	*collaris*		
Sunbird	Greater Double-collared	*Cinnyris*	*afer*		
Sunbird	Grey	*Cyanomitra*	*veroxii*		
Sunbird	Malachite	*Nectarinia*	*famosa*		
Sunbird	Southern Double-collared	*Cinnyris*	*chalybeus*		
Swallow	Barn	*Hirundo*	*rustica*		
Swallow	Greater Striped	*Cecropis*	*cucullata*		

Common name		Scientific Name		SCC*	ToPS
Swallow	Lesser Striped	*Cecropis*	*abyssinica*		
Swallow	Pearl-breasted	*Hirundo*	*dimidiata*		
Swallow	White-throated	*Hirundo*	*albigularis*		
Swamphen	African	*Porphyrio*	*madagascariensis*		
Swift	African Black	*Apus*	*barbatus*		
Swift	African Palm	*Cypsiurus*	*parvus*		
Swift	Little	*Apus*	*affinis*		
Swift	White-rumped	*Apus*	*caffer*		
Tchagra	Southern	*Tchagra*	*tchagra*		
Teal	Cape	*Anas*	*capensis*		
Teal	Red-billed	*Anas*	*erythrorhyncha*		
Thick-knee	Spotted	*Burhinus*	*capensis*		
Thick-knee	Water	*Burhinus*	*vermiculatus*		
Thrush	Olive	*Turdus*	*olivaceus*		
Tinkerbird	Red-fronted	*Pogoniulus*	*pusillus*		
Tit	Cape Penduline	*Anthoscopus*	*minutus*		
Turaco	Knysna	*Tauraco*	*corythaix*		
Wagtail	Cape	*Motacilla*	*capensis*		
Warbler	Knysna	*Bradypterus*	*sylvaticus*	VU, VU	
Warbler	Lesser Swamp	*Acrocephalus*	*gracilirostris*		
Warbler	Little Rush	*Bradypterus*	*baboecala*		
Warbler	Willow	*Phylloscopus*	*trochilus*		
Waxbill	Common	*Estrilda*	*astrild*		
Waxbill	Swee	*Coccopygia*	*melanotis*		
Weaver	Cape	*Ploceus*	*capensis*		
Weaver	Dark-backed	*Ploceus*	*bicolor*		
Weaver	Southern Masked	*Ploceus*	*velatus*		
Weaver	Spectacled	*Ploceus*	*ocularis*		
Weaver	Thick-billed	*Amblyospiza*	*albifrons*		
White-eye	Cape	*Zosterops*	*virens*		
Whydah	Pin-tailed	*Vidua*	*macroura*		
Wood Hoopoe	Green	*Phoeniculus*	*purpureus*		
Woodpecker	Cardinal	*Dendropicos*	*fuscescens*		
Woodpecker	Knysna	*Campethera*	*notata*	NT, NT	
Woodpecker	Olive	*Dendropicos*	*griseocephalus*		

*The Threatened Status of the species is displayed with the regional status first and the international status second.