Bird report for the proposed

SONBESIE

Solar Power Plant

Fig. 1. Scrub thicket developed in thin Kalahari sands over often exposed bedrock

Prepared for: **Sonbesie Solar Power Plant (RF) (Pty) Ltd.**

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EXECUTIVE SUMMARY

Sonbesie Solar Power Plant (RF) (Pty) Ltd proposes to develop a photovoltaic Solar Power Plant (hereafter SPP) of up to 115 MW, with associated infrastructure, with a total footprint of 264 hectares on the remaining extent of the farm Retreat-IN located 5 km southeast of the town Vryburg in the Naledi Local Municipality of South Africa's North West Province. This scoping report concerns the potential impacts the development may have on birds of the directly affected, and immediately surrounding, areas.

Field observations and use of available data indicate that the broader area is likely to have populations of some 200 species of birds.

The site proposed for the SPP is a relatively flat area covered by shrub thickets interspersed with grass and areas of tree savannah. Destruction of this vegetation will cause displacement of most birds that currently use the area. These primarily affected bird species all have wide ranges and none are considered threatened. There are extensive areas of similar habitat in areas adjacent to the proposed SPP into which the displaced birds can move. Assuming that the adjoining habitat is already occupied to saturation, displaced birds will have to compete with established residents and the result is likely to be a reduction in the regional population of each species. However, due to the low productivity of the affected habitats the number of individuals per concerned species is small and the overall effect is considered negligible.

Though no red data listed bird species were observed at the site it is likely that individuals of red-listed species may sometimes occur on or over the site in its current condition. However, in the absence of any particular feature to attract them, these individuals will be at most only transient users of the area to be developed. Thus the development of the proposed SPP will have no marked effect on red-listed species.

A feature of potential concern is the possibility that polarized light from the PV panels, which at night gives the impression that there is a waterbody, may cause night-flying birds to descend and die from collision with the structures. It is recommended that bird monitoring is carried out through the first year of the post-construction phase.

Development of the SPP is likely to produce a range of short-term and acute impacts on birds during construction as well as longer-term, chronic, impacts in the operational period. These impacts are mainly features that will, to varying extent, degrade habitats adjacent to the developed area. A number of mitigation measures are suggested that will reduce the effects of these impacts.

This report is based on a desk-top review of available information and field observations on three days following months of hot dry weather. Bird use of the area may be different after the regional rains and, to assess this, a follow-up survey is to be made towards the end of the rainy season.

The conclusion of this scoping report is that, provided the indicated mitigations are followed, the impacts of the proposed development on local bird populations are of an acceptable level.

1. INTRODUCTION

Sonbesie Solar Power Plant (RF) (Pty) Ltd proposes to develop a photovoltaic Solar Power Plant (hereafter SPP) of up to 115 MW, with associated infrastructure, with a total footprint of 264 hectares on the remaining extent of the farm Retreat-IN located 5 km southeast of the town Vryburg in the Naledi Local Municipality of South Africa's North West Province. African Insights was appointed to conduct the bird scoping study for the Environmental Impact Assessment.

1.1 Proposed development

At application phase, the development footprint (construction and operation) is envisaged to cover an area of approximately 264 ha. Vegetation will be cleared from the core area. The construction will include:

- PV panel arrays on mounting structures, with a maximum export capacity of 115 MW and a maximum height of 5 m, oriented from east to west;
- Underground cabling between panel structures;
- Internal unpaved roads with a maximum width of 6 m
- Central inverters to convert DC current to AC
- A new, step-up, substation of 1 ha that will link to an existing powerline
- An above-ground power line to link the new substation to an existing 132 kV substation that is off-site (an alternative layout to that depicted in this report is being investigated by the client);
- Subcontractor site camps, workshops and offices
- Storage and lay-down areas, water storage tanks, waste recycling area

This report uses the results of a desktop studies and field observations on three days to assess the potential impacts of the Sonbesie development on birds during the construction and operational phases.

1.2 Terms of reference

The terms of reference were to:

- Rate the development in terms of its potential impacts on birds taking into consideration baseline data;
- Suggest optional or essential ways in which to mitigate negative impacts and enhance positive impacts;
- Where possible, take into consideration the cumulative effects associated with this and other projects which are either developed or in the process of being developed in the local area;

The specialist reserves the right to amend this report, recommendations and conclusions at any stage, if extra information becomes available.

This report may not be altered without the specific and written consent of the specialist who authored it.

2 METHODS

2.1 Desktop study

Following the BirdLife South Africa best practise guidelines (Smit 2014) the following data banks held at the Animal Demography Unit, University of Cape Town were consulted: CAR (Co-ordinated Avian Road counts), CWAC (Co-ordinated Waterbird Counts) and SABAP (South African Bird Atlas Project) phases 1 and 2.

This region of the North West Province has been subject to relatively little documentation of bird status. Neither CAR nor CWAC surveys have been conducted in the Quarter degree square (QDS) 2724BA in which the Sonbesie property is located. The SABAP database contains no information for either the pentad, or the QDS in which Sonbesie is located.

2.2 Field study

Observations of birds were made on three calendar days across a period of five days in November 2015, i.e. in the early summer with hot and very dry conditions. Observations were made in the late afternoon (after 15.00) on two days and in the early morning (from 05.00) on one day. On each day the site proposed for development was driven around by the two observers and on the morning visit transects were walked through sample areas of each broad vegetation type. A planned additional morning survey could not be conducted because the access gate was locked.

3. THE AFFECTED ENVIRONMENT

The footprint area of the proposed Sonbesie SPP is a small section of an extensive plain of low relief. Other than trees the only "topographic" features on the site are un-natural fences, electricity poles and pylons and a few farm or associated buildings.

There are, from an avian perspective, three types of "natural" vegetation on the site. These are shrub thicket, tree savannah, and grass (Figs. 1-2). There are no localized patches of critical vegetation for birds.

Fig. 2. "Tree savannah" habitat with heavily over-grazed grass areas.

There is no natural permanent waterbody on, or adjacent to the site. Within the overall site, but excluded from the area proposed for development, there is a depression within the tree savannah which after good rains supports a shallow ephemeral wetland as indicated by the presence of some waterside associated plant species (Fig. 3).

Fig. 3. The site of a probable ephemeral pan. This can flood only after heavy rains and being so shallow is likely to dry out rapidly and be of little value to birds. This depression is within the overall area proposed for the development of the Sonbesie SPP but within a sector excluded from development

4 BIRD SURVEY RESULTS

4.1 Species recorded

A total of 64 bird species were recorded during observations across 3 calendar days (Appendix 10.2). This is relative to a total of ca. 200 bird species that should occur in the far larger area of the quarter degree square in which Sonbesie lies.

In the hot and dry conditions which prevailed during the field survey an irrigated field beside the farmstead – but outside the area to be developed – supported a range of species not otherwise reported from the development area.

4.2 Priority species

No red listed bird species were observed during the field survey. However, it is likely that several red listed bird species may occur. The key issues are: 1) the degree to which the SPP area is essential habitat for them; and 2) whether they occur regularly. There are no any features on the site that will particularly attract any red-listed species on other than on an extremely irregular, transient, basis. Thus most are only likely to be transients that make occasional, usually short-term, use of the farm area and this is insufficient reason to oppose development.

4.3 Programme for further monitoring

The bird faunas of this part of South Africa are poorly known and especially for the area that includes the Sonbesie property. It is unwise to base decisions solely on the three days of bird observations all made towards the end of a hot, dry period. Ideally surveys should be conducted in all four seasons but at the very least a repeat survey should be conducted towards the end of the local, summer, rainfall season i.e. in March or April.

It should be a requirement for development of the Sonbesie SPP that impacts on birds be appraised by regular monitoring. This monitoring should be continued over at least two years of operation as time is needed for plant life to develop and bird use of the area will increase as the plants grow. Surveys of bird presence, especially for collision victims, should be conducted over a few days in at least each summer and winter period. These surveys should be performed according to a protocol drawn up by a supervising bird specialist who should write annual reports. These reports will provide information for any further development at this proposed site and usefully provide information for the appraisal of the anticipated other solar array proposals in southern Africa.

4.4 Cumulative Impacts

There is potential for cumulative impacts on regional bird populations as a result of other developments in the region. A number of additional SPPs have been proposed. There is the even greater potential impact in situations where farmers convert areas of natural vegetation into cropland. The regional proposed SPPs are being listed, along with other possible causes of cumulative impacts, in the full EIA report which will also comment on the perceived overall impact if these developments go ahead. All that can be said at this stage is that, if the other proposed SPPs go ahead, there will inevitably be increased loss and fragmentation of habitat for those bird species dependent on the habitats transformed. Fortunately, during assessment of six regionally proposed SPPs including the Sonbesie SPP, no species were recorded that do not have extensive distributions, and so populations, in the wider region. Thus, whilst there will be a reduction in species populations, there is no reason to predict that any species will be threatened in terms of gross reduction in either its regional or global populations.

5. IMPACT ASSESSMENTS

5.1 Introduction

The key issue for this faunal report is the potential for impacts associated with the development of the SPP to affect the populations of local birds and especially those of conservation priority species. These impacts on birds may be either direct i.e. through loss of habitat as well as collision mortality; or indirect through affects on other elements of the environment which then affect the birds.

A photovoltaic solar energy facility has three life-phases: 1) construction; 2) operation; and 3) de-commissioning. These three phases differ in their environmental impacts. Construction and de-commissioning are short-term periods of dramatic and acute environmental disturbance whereas in the operational phase impacts are steady, long-term – over 20-30 years - and so of chronic impact.

The Sonbesie SPP is to be located in an environment which is semi-arid. This environment is one of low productivity. The pace of soil development, of plant growth, ecological succession, and hence any ecological recovery, is slow. Indeed, environmental restoration may be unfeasible. The impacts of the SPP are likely to continue to affect the local environment, and so the local bird fauna, for decades after de-commissioning. However, it is likely that as the proposed PV panels reach the end of their operational life they will be replaced so in terms of the time envisaged in this report the development situation is permanent. In the event that panel renewal does not happen legislation requires that a de-commissioning EIA be conducted. Consequently de-commissioning is not further considered in this report.

Accessible information on the environmental impacts of SPPs is severely limited. This is due, in part, to the relatively recent development of SPPs and the normal lag time before impacts are realised, assessed and the results published. Most information is in environmental compliance documents and other, non-peer reviewed, grey literature of limited distribution and accessibility. Two recent over-views of the environmental impacts of renewable energy facilities have stressed that, on an international basis, information on the effects of solar energy developments is particularly limited (Hotker*et al*. 2005, Lovich & Ennen 2011). Nevertheless, a range of known, or potential, environmental impacts as a result of SPPs have been identified (Lovich & Ennen 2011). As these might directly or indirectly affect birds at Sonbesie all the identified impacts on the local fauna and are considered here.

The development will have impacts on two broadly defined areas: 1) the “core” of the SPP where existing terrain will be covered by structures or converted into roads and other infrastructure; and 2) the “surrounds” where the terrain will be not be developed but where there will be indirect effects emanating from the core. The “surrounds” include undeveloped patches within the overall core. It is impossible to precisely define the outer periphery of the surrounds as the distance over which impacts have effect will vary with weather, especially wind, as well as moonlight etc. conditions.

No alternatives were supplied for the development site.

5.2 Construction period

This is the period of most dramatic and acute potential impacts on local fauna. It is not feasible at this pre-approval stage to indicate the time frame and seasonality of construction although both factors will potentially affect the scale of impacts. The key impacts in this period, in diminishing order of importance, are the destruction of habitats, disturbance, and dust emission.

5.2.1 Disturbance

Construction period disturbance will be greatest in the core area. This will cause the displacement of birds and most other larger vertebrates (tortoises, hares, mongooses etc.) and the likely death of animals that do not leave (e.g. lizards and rodents). Disturbance during this period will also have potentially considerable impact on the surrounds. It will suppress bird activities and may lead to temporary displacement from affected areas i.e. those closest to lay-down areas or where buildings are constructed. Changes in sound volume of only a few decibels can lead to substantial animal responses. Noise will especially be generated during construction

5.2.2 General pollution

During construction, the use of heavy machinery and vehicles, and the mixing and use of cement, will inevitably lead to some chemical pollution of soil and ground water. Waste water, fuel spills and other pollutants such as herbicides and pesticides will contaminate the environment and may poison insects which birds prey upon. Pollution of soil can be especially damaging if it occurs in areas that are intended for later rehabilitation to a natural state. Nutrient-rich effluents, such as sewage, can cause water pollution.

5.2.3 Dust

Development of the SPP involves clearance of existing vegetation from the core and some grading of the soil surface. The soils of the core area are poorly consolidated Kalahari sands i.e. with a high proportion of fine material which if disturbed results in dust. Clearance of the stabilizing vegetation, and especially grading, will expose the soil surface to wind and, unless this is suppressed, will create large quantities of dust through the construction period and until a stable condition is re-established.

Depending upon wind conditions dust can carry over large distances. Dust can have dramatic effects on ecological processes at all scales (reviewed by Field *et al*. 2010). Dust adheres to plants downwind of a source. This affects the gas exchange, photosynthesis, and water use of the dusted plants and together these affects reduce the plants' primary production. Wind driven dust also abrades soft plant materials. In these ways dust can, indirectly, affect agricultural food crops and wildlife food plants (Farmer 1993; Greening 2011). Dusted plants are less palatable to animals, especially insects, and so this will affect local food resources for birds. However, dust deposited down-wind, whilst having a temporary negative impact, should have a mild fertilizing effect after the silt is washed off plants by rain and deposited on the ground.

The removal of finer soil materials as dust has long-term local effects as these materials contain most of the cation-exchange capacity, water holding capacity, and fertility of soil. In particular the loss of fine materials from soil reduces the ability of plants to re-establish since germinants rely on soil resources and water held in the uppermost soil layers. The loss of dust will affect any re-growth under the panels and along internal dirt service roads.

5.2.4 Habitat destruction and fragmentation

The final footprint of the proposed SPP is quite small. However, during construction, there will be fairly extensive habitat destruction, alteration and fragmentation. Some of this may be temporary, e.g., laydown areas for machinery and materials, but in some cases it may be permanent, e.g., workshops, substations, roads and power line servitudes. This will result in localised destruction of food resources and prey species, with low magnitude of impact, but the duration of the effect will be long-term, extending beyond the lifetime of the SPP.

The SPP and its associated environmental changes may fragment the habitat for non-volant, and especially small, animals but is unlikely to have substantial impact on birds which can quickly fly across the area.

5.3 Operational period

A number of factors will create potentially negative impacts on birds through the predicted 25-30 year operational life of the PV panels. These relatively long-term and chronic impacts are: continued disturbances; light pollution – both ecological and polarizing; electromagnetic radiation; and dust.

5.3.1 Light pollution

Photovoltaic solar energy facilities cause two types of light pollution. These are ecological light pollution (ELP), which has different impacts by day and at night, and polarizing light pollution (PLP). The Vryburg area has low levels of existing light pollution so the localized effects of nocturnal light pollution are likely to be greater than in areas where there are already higher levels of existing light pollution.

5.3.2 Ecological Light Pollution (ELP)

Daylight reflected from the PV panels can adversely affect animal physiology, behaviour, and population ecology potentially through alteration of predation, competition and reproduction (Longcore & Rich 2004). Animals may experience increased orientation or disorientation, and are attracted to or repulsed by glare. This can affect their foraging, reproduction, communication and other critical behaviours.

It is unclear to what extent there may be night illumination associated with the SPP. Outdoor lighting of the short-wavelength type (white and blue lights) attracts night-flying insects from considerable distances. This can lead to high levels of mortality of insects, many of which are critically important to normal ecosystem functioning and form an important part of the diets of bats (Frank 1988) and some nocturnal birds.

5.3.3 Polarized Light Pollution (PLP)

Many kinds of animals, especially those that are night active, are well tuned to polarized light and use it as a source of information. Horvath *et al*. (2009) have reviewed the effects of polarized light. Polarizing light is more effectively reflected from smooth dark surfaces. In nature water surfaces are the primary source of horizontal polarization by reflection. Many aquatic insects and night dispersing waterbirds use PL to find suitable water bodies for feeding and breeding habitat. Glass, or similar smooth surfaces, share important physical characteristics with the surface of dark water and polarize light strongly. SPPs with their extensive banks of light polarizing panels may form supernormal optical stimuli and appear as exaggerated water surfaces. This can impact the animals' ability to judge safe and suitable habitats. This is especially important for insects with limited flight duration. Many waterbirds fly by night and apparently use moon and star polarized light reflected off water to indicate the presence of a waterbody. If such birds fly down to land at what they assume is a waterbody they may collide with the panels and deaths from such collisions have been recorded at a solar energy facility in North America (McCrary *et al*. 1986).

Shallow waterbodies, where dabbling ducks can readily feed from the benthos are a scarce and limiting resource in semi-arid areas like this area of the North West Province. These birds regularly reconnoitre at night to see where alternative waterbodies exist. This is especially the case in the late dry season when most waterbodies in the region have dried down and birds are forced to locate alternative wetlands. In the absence of published information on mortality of birds at photo voltaic arrays, and specifically of such potential impacts on African bird species, it is impossible to predict the potential scale of such mortality. However, international experience is that at least small numbers of a range of bird species will die as a result of collision with the panels (McCrary *et al*. 1986).

5.3.4 Electro-Magnetic Radiation (EMR)

When electricity is passed through cables it generates electric and magnetic fields. To transmit energy internally within SPPs a distribution system of buried electricity cables is used. These can lead to chronic, but localized, electromagnetic radiation (EMR). Balmori (2009) has reviewed the impacts of increased local EMR on animals. These impacts include: reduced male fertility; embryonic deformities; weakened immune systems and so susceptibility to infectious diseases, bacteria, viruses and parasites. Insects are especially impacted and their local populations decline. Bird navigation abilities may also be impacted by EMR.

EMR at the Sonbesie SPP could have both positive and negative impacts. The positive impact is that if EMR leads to a major local reduction of insects this will decrease the attraction of the SPP to birds and so reduce the impact of other potential negative impacts. However, on the negative side, a lack of insects may then reduce the breeding success, and numbers, of birds in the adjoining areas. Reduced insect availability will, through lack of food, especially increase infant mortality in birds.

5.3.5 Power line strikes and electrocution

Power lines pose a collision risk to some bird species particularly larger birds bats (Jenkins et al. 2010). Collision risk is largely influenced by the situation of power lines, but also by their visibility (especially of the earth wire) to birds. Animals will be electrocuted if, when attempting to perch on an electrical structure, they succeed in bridging the air gap between live and earthed components. The risk of electrocution is highest on low voltage infrastructure with relatively small air gaps.

No powerline layout was available at the time of report writing. Bird collision mortality with powerlines is usually only considered important where lines pass close to waterbodies. Where they do they should be provided with bird diverters that are visible by day and especially at night. Suitable solar powered diverters are available.

6 SUGGESTED MITIGATIONS

Unlike the situation in windfarms where bird observations may suggest relocation of structures, there is no reason from a bird perspective why the proposed layout should be subject to any change. The mitigations recommended here are for smaller scale features and actions.

6.1 Minimize the direct impact area:

Wherever possible, natural vegetation should be left intact. Corridors of natural vegetation should be maintained between developed areas on site (e.g. lay-down areas and PV panel field). Construction and final footprints should be kept to an absolute minimum. During construction, the footprint area of each construction site must be demarcated with stakes and hazard tape (or some equivalent method) prior to site clearance, and should remain marked out during construction. Keep peripheral developments to a minimum and as close to planned development nodes as possible. Rehabilitate all disturbed areas immediately after the completion of construction. Consult an ecologist to give input into rehabilitation specifications.

6.2 Reduce impacts in the developed area

Use low-impact methods of excavation and avoid the use of explosives. Where possible, create lay-downs in previously disturbed areas and make use of existing power lines and substations. After construction, remove all infrastructure and equipment not required for the post-decommissioning functioning of the facility.

No power line layout was available at the time of report writing, but bird collision mortality with power lines is only considered important where lines pass close to waterbodies. Avoid crossing waterbodies with power lines. Where they do they should be provided with bird diverters that are visible by day and, especially, by night. Suitable solar powered diverters are available to achieve this.

6.3 Pollutants

Do not use herbicides or pesticides on site. During the construction phase, apply standard measures to avoid spills and mitigate those that occur. Specifically spoil or waste material should not be dumped within 50 m of natural areas, remove it to a licensed dump site. Effluents or polluted water generated during construction must not be discharged into natural areas.

6.4 Dust

Reduce and control construction dust through the use of approved dust-suppression techniques, e.g. : 1) Use fine water sprays used to dampen down the site; 2) screen the whole site to stop dust spreading; 3) cover skips and trucks loaded with construction materials and continually damp down with low levels of water.

6.5 Disturbance

Keep construction and maintenance periods as short as possible. Restrict construction and maintenance activities to daylight hours. Keep blasting to an absolute minimum. If blasting is necessary, employ techniques that minimise noise, vibration and dust. Reduce the noise associated with construction and maintenance activities as far as possible.

6.6 Limit light pollution

To minimize any impacts on birds all lighting at the SPP should be kept to a minimum. Where lighting is necessary, it is recommended that long-wavelength (red or orange) low-pressure sodium lights are used, or that lights are fitted with ultraviolet filters. Light fittings should be directional and shielded. Install sealed light fittings so that insects cannot reach the light source. Screen interior lighting with blinds, curtains, etc. to prevent exterior light pollution. Long lines of lights should be avoided.

7. IMPACT EVALUATIONS

Suggested mitigations will have minor affects on significance and probability

Criteria	Rating	Description	Significance	Probability
HABITAT LOSS & FRAGMENTATION				
Extent of spatial influence	Low	Site specific	Low	Definite
Impact magnitude	High	No mitigation is possible		
Duration	High	Beyond de-commissioning		
POLARIZING LIGHT POLLUTION				
Extent of spatial influence	Medium	Within 10 km radius	High	Definite
Impact magnitude	Medium	Design modification		
Duration	Medium	Project lifespan		
ECOLOGICAL LIGHT POLLUTION				
Extent of spatial influence	Low	Site specific	Low	Definite
Impact magnitude	Very low			
Duration	Medium	Project lifespan		
ELECTROMAGNETIC RADIATION				
Extent of spatial influence	Low	Site specific	Medium	Definite
Impact magnitude	Medium			
Duration	Medium	Project lifespan		
DUST POLLUTION				
Extent of spatial influence	Medium		Low	Definite
Impact magnitude	Medium			
Duration	High	Beyond de-commissioning		
NOISE				
Extent of spatial influence	Low	Site specific	Low	Probable
Impact magnitude	Very low			
Duration	Medium	Project lifespan		

8. CONCLUSIONS

The loss of habitat due to development of the SPP will have the greatest impact on those bird species that are dependent on the shrubland habitats. These species have generally extensive distributions and the small number of individuals displaced from the proposed development is not considered of conservation importance. No conservation priority species will be particularly affected as they range over considerably wider areas than that to be affected. Nor, currently, are there other marked developments known in the Vryburg region that might stress the regional populations through an accumulation of negative impacts. Those bird species – the majority in terms of both diversity and numbers – that occur in the wider area but primarily outside the shrubland habitat are unlikely to experience notable negative impacts as a result of the development. The one issue of concern is the potential for waterbirds traversing the area at night to mistake the polarized light from the PV panels for a waterbody with the subsequent risk of their death through collision with the structures. Based on currently available information the impact significance on birds is expected to be low and this assessment is viewed as having acceptable detail in terms of impact assessment. Further bird impact assessment following the regional rainy season is needed for the EIA process.

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10. APPENDICES

10.1 DECLARATION OF CONSULTANT'S INDEPENDENCE AND QUALIFICATIONS

Dr. Anthony (Tony) Williams is an independent consultant. He has no business, financial, personal or other interest in the activity, application or appeal in respect of which he was appointed other than fair remuneration for work performed in connection with the activity, application or appeal. There are no circumstances that compromise the objectivity of this specialist performing such work.

Dr. Williams has been a professional ornithologist for 46 years, including: 1) 9 years as a researcher at the FitzPatrick Institute of African Ornithology, at Cape Town University; 2) 25 years as specialist ornithologist in the conservation departments of South West Africa (1982-1988) and the Cape (latterly Western Cape) Province of South Africa (including five years secondment at the (then) Avian Demography Unit at Cape Town University; and 3) 12 years as a ornithological consultant and independent researcher.

The findings, results, observations, conclusions and recommendations given in this report are based on the author's best scientific and professional knowledge, as well as available information.

10.2 LIST OF BIRD SPECIES OBSERVED

Birds recorded at, over, or immediately around, the site of the proposed Sonbesie SPP in November 2015

RESIDENT PASSERINES

Bulbul, Red-eyed
Bunting, Golden-breasted
Canary, Yellow
Chat, Ant-eating
Cisticola, Neddicky
Crombec, Long-billed
Crow, Pied
Drongo, Fork-tailed
Finch, Scaly-feathered
Flycatcher, Chat
Flycatcher, Fiscal
Flycatcher, Marico
Lark, Fawn-coloured
Lark, Rufous-naped
Mynah, Common
Pipit, Plain-backed
Pipit, African

Pipit, Buffy
Prinia, Black-chested
Scrub-robin, Kalahari
Shrike, Common Fiscal
Skrike, Bokmakierie
Shrike, Brubru
Sparrow, House
Sparrow, Cape
Sparrow, Grey-headed
Sparrow-weaver, White-browed
Starling, Cape Glossy
Tit, Ashy
Tit-babbler, Chestnut-vented
Thrush, Groundscraper
Wagtail, Cape
Waxbill, Violet-eared
Weaver, Southern Masked
White-eye, Orange River

RESIDENT NON-PASSERINES

Buzzard, Steppe
Dove, Cape Turtle
Dove, Laughing
Dove, Namaqua
Egret, Cattle
Goshawk, Pale Chanting
Hoopoe, African
Kestrel, Greater
Korhaan, Northern Black
Lapwing, Crowned
Lapwing, Blacksmith
Mousebird, Red-faced
Pigeon, Speckled
Sandgrouse, Burchell's
Scimitarbill
Thick-knee, Spotted

AERIAL FORAGERS, MIGRANTS & TRANSIENTS

Bee-eater, Blue-cheeked
Bee-eater, European
Bee-eater, Swallow-tailed
Cuckoo, Jacobin
Martin, Rock
Shrike, Lesser Grey
Spoonbill
Swallow, Barn
Swallow, Cliff
Swallow, Greater-striped