CHAPTER 3

Supplementary Material: Specialist Report

Avifauna report

Strategic Environmental Assessment for the proposed Boegoebaai Port and Special Economic Zone (SEZ)

WORK PACKAGE 1

Avifaunal Specialist Assessment

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AFRIAVIAN ENVIRONMENTAL

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1 EXECUTIVE SUMMARY

The Transnet National Ports Authority has embarked on the determination of the feasibility for the development, construction, and operation of a deep-water port with associated landside port facilities in Boegoebaai, Northern Cape. The proposed new port development is primarily for the enablement of the Northern Cape's Provincial Economic Development strategy including the Green Hydrogen Strategy and expanding the mining and industrial base in the Northern Cape.

A Strategic Environmental Assessment (SEA) has been initiated through a collaboration between the South African National Energy Development Institute (SANEDI), Northern Cape Economic Development Trade and Investment Promotion Agency (NCEDA), and Transnet National Ports Authority (TNPA) (the Project Steering Committee (PSC)). The Council for Scientific and Industrial Research (CSIR) has been appointed to undertake an independent SEA. The overarching purpose of the SEA is to develop an integrated decision-making framework to guide the planning of the proposed Boegoebaai Port, Special Economic Zone, and wider Namakwa region in a sustainable manner.

AfriAvian Environmental has been appointed by the CSIR to conduct the Avifaunal SEA for the Boegoebaai Port Special Economic Zone and wider Namakwa region.

Eighty-seven (87) bird species have been recorded in the Broader Area through the Second Southern African Bird Atlas Project (SABAP2). Of the 87 species, 47 are considered priority species. Priority species were defined as species that are particularly sensitive to displacement due to disturbance and/or habitat loss, endemic and near-endemic species, all Species of Conservation Concern (SCC), and range restricted species. Of the 87 bird species recorded in the Broader Area, 13 species were selected for further assessment. This selection includes species of conservation concern as well as those that are endemic or near-endemic to South Africa.

The Boegoebaai Port and SEZ SEA development site predominantly exhibits medium and high sensitivity from an avifaunal perspective. Although the region does not host a wide diversity of birds, it is home to range-restricted species such as Barlow's Lark, as well as potentially supporting Endangered Martial Eagle and Endangered Ludwig's Bustard. Additionally, dunes, freshwater pans, and estuarine habitats along the coast support various species of conservation concern, including the Critically Endangered Damara Tern. Consequently, all proposed developments within the SEZ should incorporate an avifaunal specialist study.

2 INTRODUCTION

The Transnet National Ports Authority has embarked on the determination of the feasibility for the development, construction, and operation of a deep-water port with associated landside port facilities in Boegoebaai, Northern Cape. The proposed new port development is primarily for the enablement of the Northern Cape's Provincial Economic Development strategy including the Green Hydrogen Strategy and expanding the mining and industrial base in the Northern Cape.

Green hydrogen production, at the scale envisaged, is a diverse and multifaceted process with many direct and indirect impacts, both positive and negative. All programme components (including their interconnected transport corridors) would require vast areas of land surface, as well as other resource intensive inputs, all proposed in a sparsely populated but ecologically sensitive arid region. Existing land uses in the study area include conservation, agriculture, tourism, and mining.

A Strategic Environmental Assessment (SEA) has been initiated through a collaboration between the South African National Energy Development Institute (SANEDI), Northern Cape Economic Development Trade and Investment Promotion Agency (NCEDA), and Transnet National Ports Authority (TNPA) (the Project Steering Committee (PSC)). The Council for Scientific and Industrial Research (CSIR) has been appointed to undertake an independent SEA. The overarching purpose of the SEA is to develop an integrated decision-making framework to guide the planning of the proposed Boegoebaai Port, Special Economic Zone, and wider Namakwa region in a sustainable manner.

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3 SCOPE OF STUDY

The purpose of this avifaunal study is to determine the main issues and potential impacts of the proposed project on avifauna based on existing information and field assessments. The scope of the study is as follows:

- Identify, describe, and map the land use dynamics and change trends of the receiving environment and broader region as it relates to avifauna, as well as the environmental sensitivities around the Boegoebaai Port and SEZ development.
- Assess the distribution and habitat requirements of avifaunal species of conservation concern (SCC) and the avifaunal communities in the area.
- The avifaunal component will form part of the overall Terrestrial Ecological Assessment within the SEA framework, with a strong focus on desktop and spatial data.
- Evaluate the conservation importance and significance of the site with special emphasis on the status of threatened species
- Discuss the expected impacts associated with the Boegoebaai Port Development and associated infrastructure.
- Identify potential sensitive environments and receptors that may be impacted on by the proposed development.

4 APPROACH & METHODOLOGY

To assess the avifaunal sensitivity of the broader area, various data sets were used to compile sensitivity layers for each species of conservation concern. The layers were ranked according to endemicity and conservation status, and fine scale habitat suitability to develop a four-tier sensitivity map.

The following information sources and methods were used to conduct this study:

- Bird distribution data from the Second Southern African Bird Atlas Project (SABAP2) was obtained (https://sabap2.birdmap.africa/), to ascertain which species occur in the pentads where the proposed Boegoebaai Port Development is to be located. A pentad grid cell covers 5 minutes of latitude by 5 minutes of longitude (5' × 5'). Each pentad is approximately 8 × 9 km. To get a more representative impression of the birdlife in the area, a consolidated data set was obtained for a total of 20 pentads some of which intersect and others which are near the proposed Development Site, henceforth referred to as the "**Broader Area**" (Error! Reference source not found.**1**). To date, a total of 43 full protocol checklists (i.e., intensive bird listing surveys lasting a minimum of at least two hours each) and 135 ad hoc protocol lists (surveys lasting less than two hours but still yielding valuable data) have been completed for the eight pentads where the Project is located.
- The SABAP2 data in this region is usually not as comprehensive as in the rest of South Africa due to decreased observer effort (fewer people living in the area and access difficulty), therefore the data was also supplemented by species distribution models and habitat suitability models as well as general knowledge of the area.
- A target species list was generated by assessing SABAP2 data, BirdLasser citizen science data and intersecting species distribution models with a 5km Proposed Area of Impact (PAOI) buffer around the Boegoebaai SEZ. This assessment of all available data yielded a priority list of 13 threatened and/or

endemic avian species that were included in the analysis. Species distribution models have been developed for more than >100 SCCs as part of a national assessment of avian sensitivity. Species distribution models were developed using a standardised methodology that is aligned with what was used to develop avian models for the DFFE National Screening Tool.

- A classification of the vegetation types at the Development Site was obtained from the First Atlas of Southern African Birds (SABAP1) and the 2018 National Vegetation Map compiled by the South African National Biodiversity Institute (Mucina & Rutherford 2006, SANBI 2018).
- The national threatened status of all priority species was determined with the use of the most recent edition of the Red List Book of Birds of South Africa, Lesotho, and Swaziland (Taylor et al. 2015), and the latest authoritative summary of southern African bird biology (Hockey et al. 2005).
- The global threatened status of all priority species was determined by consulting the latest (2024) IUCN Red List of Threatened Species (http://www.iucnredlist.org/).
- The database on the Key Biodiversity Areas (KBAs) of South Africa (Key Biodiversity Areas in South Africa - SANBI) was consulted for information on potentially relevant KBAs near the Development Site.
- An intensive internet search was conducted to source information on the impacts of the proposed development on avifauna.
- Satellite imagery (Google Earth © 2024) was used to view the Broader Area on a landscape level and to help identify bird habitat on the ground.
- The South African National Biodiversity BGIS map viewer was used to determine the locality of the Development Site relative to National Protected Areas.
- The DFFE National Screening Tool was used to determine the assigned avian sensitivity of the Development Site.
- A weighted sensitivity model will be used for all Species of Conservation Concern (SCC) & range restricted terrestrial endemics.
    - This model incorporated 13 species that were selected for further assessment in the proposed area of impact. This selection includes species of conservation concern as well as those that are endemic or near-endemic to South Africa.
- Data inputs included:
    - Species Distribution Models (SDMs) for each of the 13 selected species (see above)
    - Nest sites
    - Confirmed species presence (BirdLasser®, tracking data, SABAP2)
    - Freshwater body/aquatic ponding GIS layer
    - Habitat Suitability Models (HSMs)
- Fine scale habitat suitability models have been developed for two threatened species that are known to occur in the SEZ and are sensitive to habitat disturbance:
    - Black Harrier (EN) – breeding endemic within South Africa. A fine scale habitat suitability model was developed to identify any potential breeding habitat located within the PAOI.
    - Barlow's Lark (now lumped with Dune Lark – see section 6.3 below) - a large proportion of its global range is located between Port Nolloth and Alexander Bay in South Africa. A fine scale habitat suitability model was developed to identify and map core suitable habitat within the PAOI for this range-restricted species.

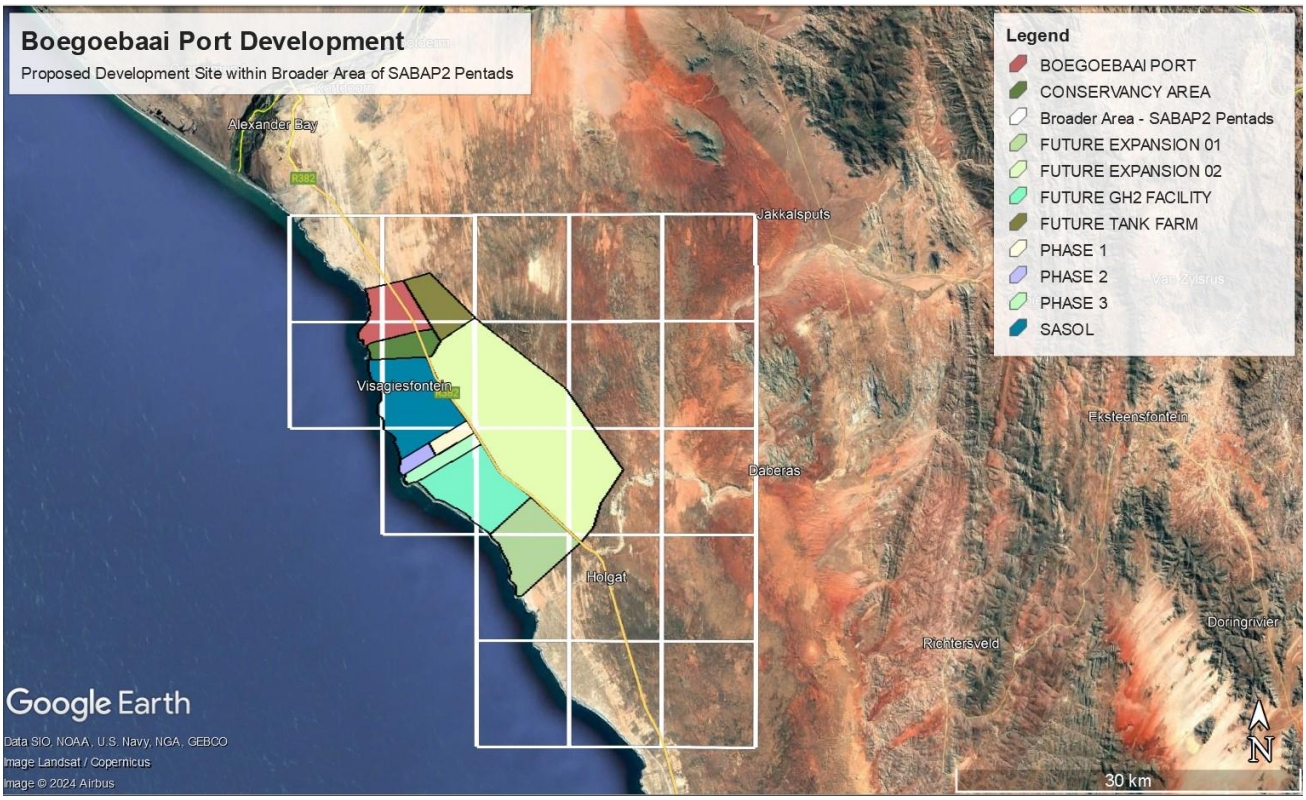

Figure 1: Proposed Development Site location within the Broader Area of 20 SABAP2 pentads.

5 ASSUMPTIONS & LIMITATIONS

This study assumed that the sources of information used in this report are reliable. In this respect, the following must be noted:

- The focus of the study is primarily on the potential impacts of the Project on priority species which were defined as follows:
  - South African Red List species (Species of Conservation Concern)
  - South African endemics and near endemics
  - Waterbirds; and
  - Raptors
  - Species vulnerable to disturbance and/or habitat loss
- The assessment of impacts is based on the baseline environment as it currently exists at the Development Site and nearby surrounding environment.
- Conclusions in this study are based on experience of these and similar species in different parts of South Africa. Bird behaviour can never be entirely reduced to formulas that will be valid under all circumstances.
- The **Development Site** is the area of 33,500 hectares where the proposed Boegoebaai Port and SEZ development and associated infrastructure is to be located.
- The **Broader Area** refers to the area covered by the 20 SABAP2 pentads within which the Boegoebaai Port and SEZ development is to be located (**Figure 1**).

6 RESULTS OF DESKTOP STUDY

6.1 Key Biodiversity Areas

Key Biodiversity Areas (KBAs) are 'sites that contribute significantly to the global persistence of biodiversity', which means they are the most important places in the world for species and their habitats – whether these be in terrestrial, freshwater, estuarine, or marine ecosystems.

The Global Standard for the Identification of Key Biodiversity Areas, published in 2016, sets out internationally agreed scientific criteria for the identification of KBAs worldwide. Sites qualify as global KBAs if they meet the specific standardised criteria and quantitative thresholds focused on one or more of five trigger aspects:

1. Threatened biodiversity;
2. Geographically restricted biodiversity;
3. Ecological integrity;
4. Biological processes; and
5. Irreplaceability through quantitative analysis.

The Development Site is located within the Namaqualand Sandveld North KBA (KBA ID 100876) (**Figure 2**). This site qualifies as a Key Biodiversity Area of international significance that meets the thresholds for ten (10) criteria described in the Global Standard for the Identification of KBAs (A1a, A1b, A1d, A2, B1, B2, B3a, B4, D1a and E). Based on current available information, 45 species meet one or more KBA criteria for this site. The KBA trigger species at this site include amphibians, birds, butterflies, mammals, plants, and reptiles. The site meets criterion A1 due to the presence of significant proportions of the global populations of 11 threatened species. The site regularly holds 35 individual geographically restricted species, therefore meeting criterion B1. Assemblages of co-occurring range-restricted species in the Amphibia, Caryophyllales, Reptilia, and Saxifragales taxonomic groups regularly present within the site meet criterion B2. An aggregation of at least 1% of the global population of one species is regularly present at the site, therefore it meets criterion D1. A quantitative analysis of irreplaceability indicates that the site is 100% irreplaceable for the global persistence of nine species, therefore meeting criterion E. The site holds significant proportions of the global extent of three threatened ecosystems (meeting criterion A2) and 7 geographically restricted ecosystems (meeting criterion B4).

Namaqualand Sandveld North is a large terrestrial site that is unprotected but has Other Effective Area-Based Conservation Measures (OECM) coverage, found in the Northern Cape, South Africa (Key Biodiversity Areas Partnership 2024). Mainly flat to slightly undulating landscape of coastal peneplain. The vegetation is a low species-rich shrubland dominated by a plethora of erect and creeping succulent shrubs (*Cephalophyllum, Didelta, Othonna, Ruschia, Tetragonia, Osteospermum, Zygophyllum*) as well as non-succulent shrubs (*Eriocephalus, Calobota, Pteronia, Salvia*). The annual vegetation, mixed with the perennial component can present spectacular flowering displays in wet years. Spiny grasses (*Cladoraphis*) are a common sight on wind-blown semi stable dunes, with 1-2 m erect to spreading shrubs, mostly with malacophyllous leaves, are found protected from the wind between dunes. Relatively homogeneous vegetation covers fairly stable sand sheets. Depth of sand and soil crust define the character of habitat types (Key Biodiversity Areas Partnership 2024). On the active dunes, depending on the aspects of the slopes and on the phase of deflation and sedimentation, different plant communities occur.

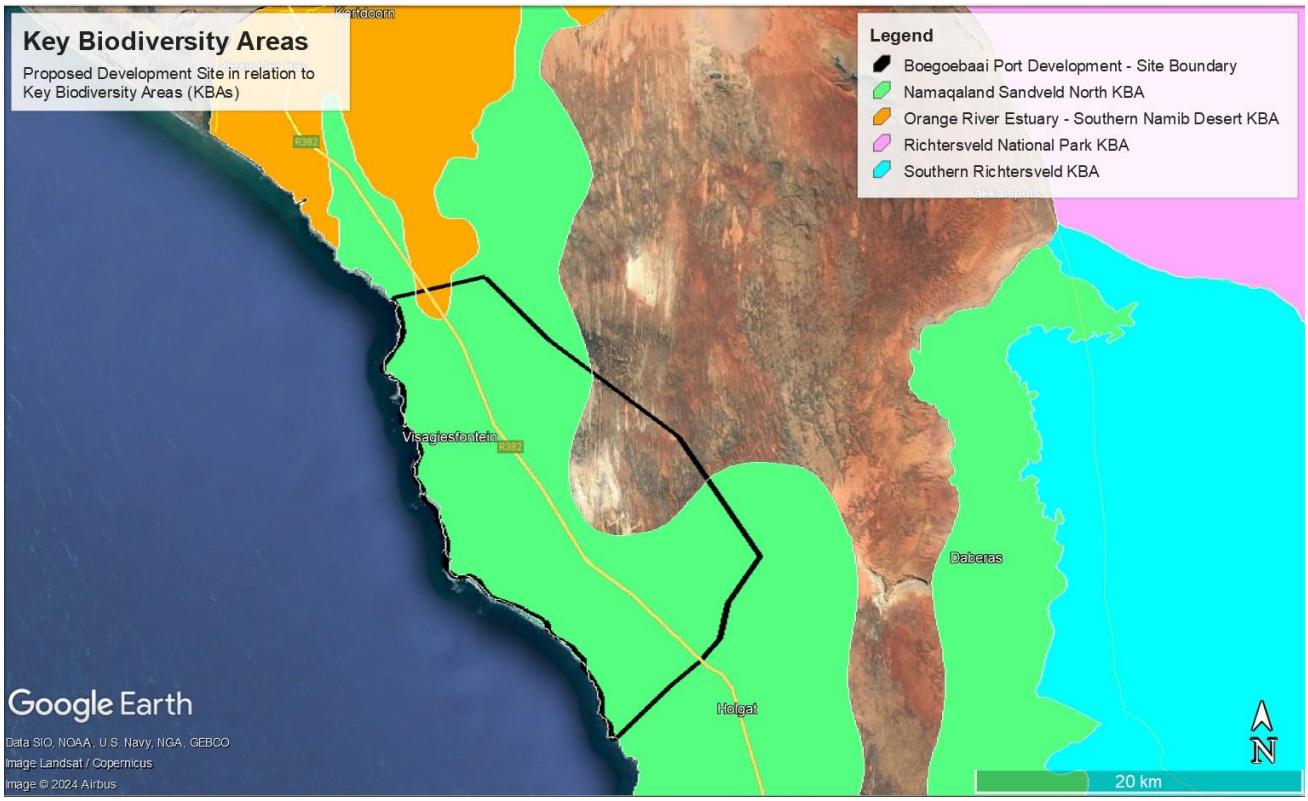

Figure 2: Proposed Boegoebaai Port and SEZ Development Site (boundary outlined in black) in relation to Key Biodiversity Areas.

6.2 Habitat Features

The proposed Development Site is mostly located within the Succulent Karoo Biome and Namaqualand Sandveld Bioregion with a small section in the north located within the Desert Biome (Mucina & Rutherford 2006, VegMap 2018). The two main vegetation types within the Development Site are Richtersveld Coastal Duneveld and Northern Richtersveld Yellow Duneveld (VegMap 2018) (**Figure 3**). Richtersveld Coastal Duneveld occurs in landscapes which are generally flat with some large, gently rolling hills. Only the Boegoeberg Twins south of Alexander Bay form steeper rocky slopes. Northern Richtersveld Yellow Duneveld is characterized by flat sand shields, often interrupted by dunes, which normally form flat whalebacks. Steep dune crests and dune valleys form only rarely—here the vegetation mirrors different topographic units: the dune tops are covered with *Stoeberia utilis*, while the interdune valleys are dominated by *Mesembryanthemum pseudoschlichtianum, M. arenosum, Cheiridopsis robusta* and *Cephalophyllum ebracteatum*.

Fairly stable sand sheets are covered by relatively homogeneous vegetation. The character of the habitat types is defined by the depth of the sand and soil crust. Different plant communities occur on active dunes, depending on the slope aspects and on phases of deflation and sedimentation. *Stoeberia utilis* often grows on the dune crests, while *S. beetzii* is found more on stabilised sand sheets. *Lampranthus hoerleinianus* and *Cladoraphis cyperoides* are pioneers settling in habitats created by recent sand deflation.

The climate in the area is known for extreme wind speeds and sand blasting from the south. There is a high storm frequency. Mean Annual Precipitation is 50–80 mm, with winter rains clearly predominant. The area also has a medium to high frequency of sea fog.

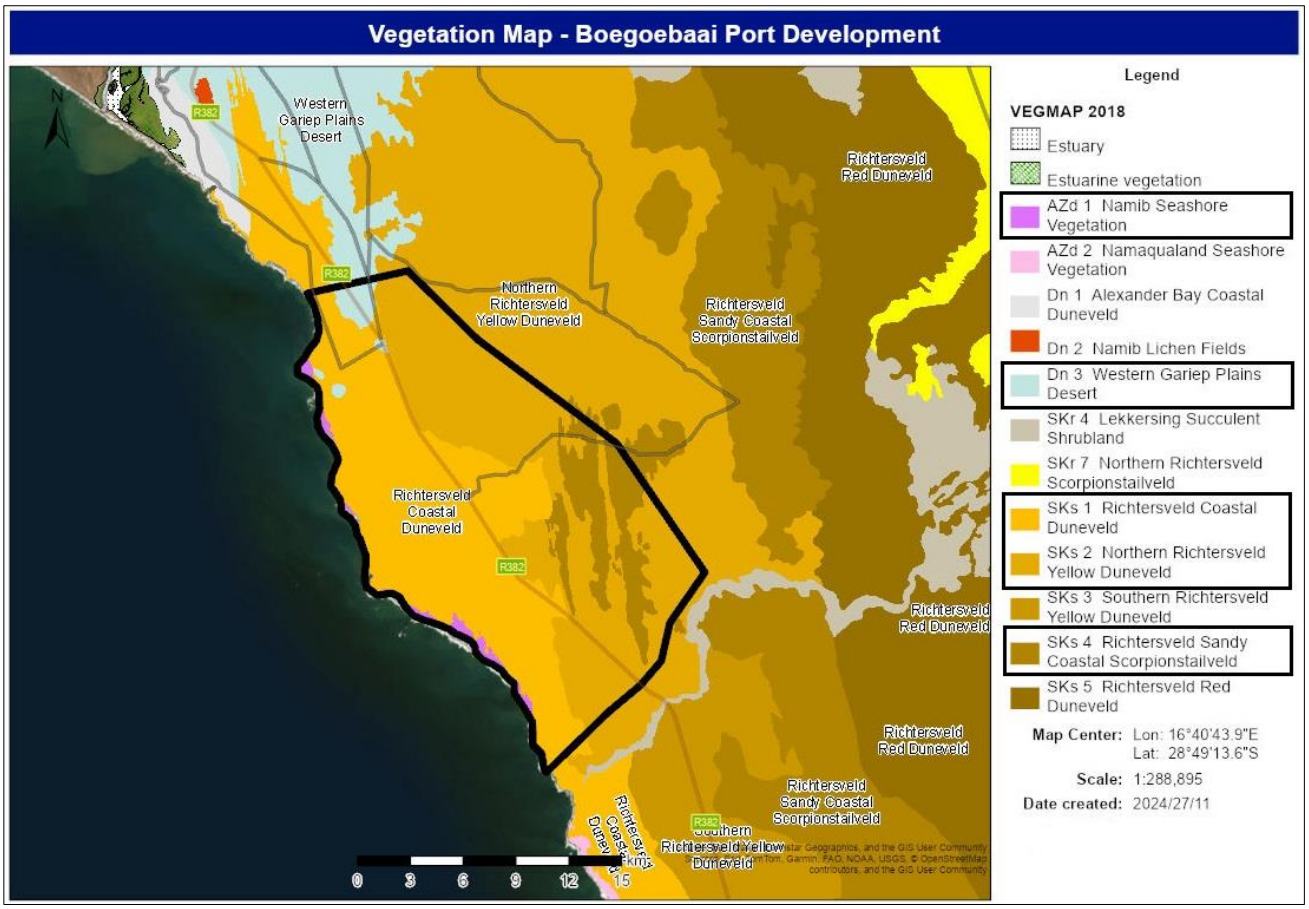

Figure 3: Vegetation Map of proposed Development Site.

6.2.1 Coastal Duneveld

The two main vegetation types within the Development Site are Richtersveld Coastal Duneveld and Northern Richtersveld Yellow Duneveld (**Figure 4**). Refer to Section 5.2 above.

Figure 4: Coastal Duneveld habitat at and near the proposed Development Site.

6.2.2 *Rocky Outcrops*

The Development Site and surrounding environment contains rocky outcrops with boulder-strewn slopes (**Figure 5**). Rocky outcrops can be vital habitat for avifauna, offering shelter, nesting sites, and feeding opportunities (BirdLife International 2021). The crevices, ledges, and overhangs within these rocky areas and boulder-strewn slopes can provide safe nesting locations, protected from predators and harsh weather conditions. These features also serve as roosting sites for various bird species, including raptors, songbirds (passerines), and ground-nesting birds. The microhabitats formed by rocky outcrops support a diversity of insects, seeds, and small vertebrates, which provides a food source for avian species (Newton 2010). Some birds, like swifts and cliff-nesting raptors, are specially adapted to exploit these environments, making rocky outcrops critical for their survival. The open vantage points and thermals associated with these areas are ideal for birds of prey to hunt and survey their surroundings (Debus 2001).

Figure 5: Rocky hills and outcrops at the proposed Development Site.

6.2.3 Surface Water

Depressions in the landscape and hollows in the granite boulders throughout the area hold water during the rainy season and acts as an important source of water for avifauna. The Holgat River is located just south of the proposed Development Site. Surface water is very important habitat for avifauna in this arid environment, especially waterbirds and waders including flamingos and terns. These areas will also attract raptors that prey on other bird species.

6.3 Bird Species in the Broader Area

Eighty-seven (87) bird species have been recorded in the Broader Area through the Second Southern African Bird Atlas Project (SABAP2). Of the 87 species, 47 are considered priority species. Priority species were defined as species that are particularly sensitive to displacement due to disturbance and/or habitat loss, endemic and near-endemic species, all Species of Conservation Concern (SCC), and range restricted species. Of the 87 bird species recorded in the Broader Area, 13 species were selected for further assessment. This selection includes species of conservation concern as well as those that are endemic or near-endemic to South Africa (**Table 1**).

It should be noted that observer effort in this area is generally low due to the sparseness of the human population and the remoteness (accessibility) of the area. Therefore, the SABAP2 species list is not necessarily fully comprehensive of the Broader Area.

Table 1: Species of Conservation Concern and/or endemic species that have been recorded in the Broader Area where the proposed Development Site is located. CR = Critically Endangered, EN = Endangered, VU = Vulnerable, NT = Near Threatened, E = Endemic, NE = Near Endemic.

Species Name	Scientific Name	Global Conservation Status	Regional Conservation Status	Endemism
Bank Cormorant[1]	*Phalacrocorax neglectus*	EN	EN	
Black Harrier	*Circus maurus*	EN	EN	NE
Cape Cormorant[2]	*Phalacrocorax capensis*	EN	EN	
Cape Long-billed Lark	*Certhilauda curvirostris*	-	-	E
Caspian Tern	*Hydroprogne caspia*	-	VU	
Curlew Sandpiper	*Calidris ferruginea*	NT	-	
Damara Tern	*Sterna balaenarum*	LC	CR	
Dune Lark (Coastal)*	*Calendulauda erythrochlamys patae*	-	-	NE
Eurasian Curlew	*Numenius arquata*	NT	NT	
Great White Pelican	*Pelecanus onocrotlus*	-	VU	
Greater Flamingo	*Phoenicopterus roseus*	-	NT	
Jackal Buzzard	*Buteo rufofuscus*	-	-	NE
Lanner Falcon	*Falco biarmicus*	-	VU	
Ludwig's Bustard	*Neotis ludwigii*	EN	EN	
Martial Eagle	*Polemaetus bellicosus*	EN	EN	

https://ebird.org/species/jacbuz1?siteLanguage=en_ZA

*See species account below regarding its taxonomic and red data status.

6.3.1 Summary descriptions of threatened and endemic species

Black Harrier *Circus maurus*

Black Harriers (Globally and Regionally Endangered) are one of southern Africa's most rare near-endemic raptors and have been uplisted from Vulnerable to Endangered in South Africa and Namibia in 2015. The regional population of the near-endemic Black Harrier has been quantified at less than 1 000 mature individuals with an estimated continuing decline of at least 20% within the next two generations (Taylor et al. 2015). Although Black Harriers are unlikely to breed within the PAOI, the presence of suitable foraging habitat is evident.

Black Harriers breed in the montane fynbos, renosterveld and strandveld habitats of the Western Cape and many individuals disperse into the karoo and grassland habitats during the autumn and winter months (Simmons et al. 2005).

The main threats facing this species include habitat loss and fire. The species is thought to have lost up to 50% of its core breeding habitat in the last century owing to extensive land transformation by agriculture

[1] Marine species have not been included in this Terrestrial Avifaunal Study. Marine species assessments are included in the Marine Specialist Study for the Boegoebaai SEA.
[2] Marine species have not been included in this Terrestrial Avifaunal Study. Marine species assessments are included in the Marine Specialist Study for the Boegoebaai SEA.

(particularly in the Overberg), invasive alien vegetation, and urbanisation within the Fynbos Biome (Curtis et al. 2004). An isolated population of about 10 mature individuals occurs in northern coastal Namibia, where they may breed.

Cape Long-billed Lark *Certhilauda curvirostris*

The Cape Long-billed Lark is near-endemic to South Africa, occurring from the extreme south of Namibia through to the western side of the Northern and Western Cape Provinces of South Africa. It generally prefers coastal scrub, such as sandplain fynbos, strandveld, renosterveld and dunes with sparse vegetation (Hockey et al. 2005). Cape Long-billed Lark could occur throughout the PAOI within scrubland habitat.

Their population is suspected to be in decline owing to the effects of agriculture and mining (BirdLife International 2025).

Caspian Tern *Sterna caspia*

The regional population of Caspian Tern (Regionally Vulnerable) is estimated to be <1 000 mature individuals. The species also has a restricted number of breeding locations which makes it prone to the effects of human activities (disturbance displacement) or stochastic events within a short period of time (Taylor et al. 2015). Within the region, it is concentrated at estuaries and sheltered bays along the coastline and at large, permanent inland waterbodies (Hockey et al. 2005). Within the PAOI Caspian Terns are likely to use freshwater pans and estuarine habitats along the coast.

Caspian Terns are highly susceptible to disturbance displacement particularly during their breeding period, some of these disturbances include egg collecting and predation by domestic dogs (Crawford et al. 2012). Extreme weather events such as heavy rainfall, droughts and heat waves can also impact on the breeding success of this species (du Toit et al. 2003). Lesser threats include the bioaccumulation of heavy metals, pesticides, and other chemical pollutants (to which this species may be particularly prone due to its diet which includes large fish). The bioaccumulation of pollutants may lead to eggshell thinning and other impacts on breeding success (Crawford et al. 2012).

Curlew Sandpiper *Calidris ferruginea*

Curlew Sandpipers (Globally Vulnerable) occur on coastal brackish lagoons, tidal mud- and sandflats, estuaries, saltmarshes, exposed coral, rocky shores and tidewrack on sandy beaches (Hockey et al. 2005). Inland they occur on the muddy edges of marshes, large rivers and lakes (both saline and freshwater), irrigated land, flooded areas, dams and saltpans (Dodman 2014). Within the PAOI Curlew Sandpiper are likely to use estuarine habitats along the coast.

Recent monitoring data suggest that this widely distributed species has likely declined by 30–49% over the past three generations (15 years) (BirdLife International (2025). While the exact causes remain uncertain, potential factors include habitat loss and degradation—especially in stopover and wintering areas—along with climate change impacts that may reduce breeding success (BirdLife International (2025). Additional threats such as disturbance and hunting may also contribute to the decline.

Damara Tern *Sterna balaenarum*

The Damara Tern (Globally Near Threatened and Regionally Critically Endangered) occurs along the western coast of Africa; within southern Africa it is locally common along the coast of Namibia and the Northern Cape Province of South Africa (Hockey et al. 2005). It generally prefers arid desert shores, especially with sheltered bays and reefs, while it mainly breeds on gravel plains between dunes and on salt pans (Hockey et al. 2005). Damara Terns are known to have bred in dune fields along the coast in the PAOI - the current status of these areas is however unknown (Taylor et al. 2015).

Off-road vehicles pose a significant threat to Damara Tern colonies by causing nest abandonment and directly leading to egg and chick fatalities through crushing of nests (Braby et al. 2009). The prohibition of off-road vehicles on South African beaches has helped mitigate these disturbances, resulting in improved breeding success (Williams et al. 2004). Additionally, semi-natural threats, including higher jackal and gull

populations driven by human activity, as well as the growing numbers of seals and seal colonies in South Africa and Namibia, have increased the risk of predation (Braby et al. 2011).

Dune Lark (Coastal) *Calendulauda erythrochlamys patae*

The regional subspecies of the Dune Lark that occurs in the coastal plain of Namaqualand in north-western Northern Cape, South Africa, was until very recently regarded as a unique species, Barlow's Lark *Calendulauda barlowi* (Ryan & Kirwan 2022). The Dune Lark is listed as Least Concern, and its distribution ranges into Namibia, however we treated this regional subspecies as a priority species because of its high local abundance and its distinct habitat requirements.

The species is distributed in a highly localised and constrained area within South Africa. It is largely restricted to coastal shrubland between Port Nolloth and Alexander Bay and as such is considered a range-restricted habitat specialist species. It is estimated that approximately 18% its overall distribution and 30% of its South African distribution falls with the PAOI. The regional subspecies of the Dune Lark occurs in karroid dwarf shrubland, sparse Succulent Karoo, coastal Duneveld and semi-desert areas with scattered *Euphorbia* clumps (Dean & Ryan 1997). The species can be found anywhere within the PAOI with suitable shrubland. Habitat loss in this key area could significantly impact the species population.

The population trend is suspected to be in decline (Taylor et al. 2015), possibly due to grazing pressure which leads to a lack of suitable vegetation. Populations in restricted-access diamond-mining zones may be relatively stable. The regional subspecies of the Dune Lark is restricted to natural habitats and are generally absent from transformed areas as they are sensitive to overgrazing (Ryan & Dean 2005).

Eurasian Curlew *Numenius arquata*

In the southern African region Eurasian Curlews frequent muddy coasts, bays and estuaries with tidal mudflats and sandflats (Snow and Perrins 1998), rocky and sandy beaches with many pools, mangroves, saltmarshes, coastal meadows and pastures (Navedo et al. 2013). They can also occur inland at lakes and rivers and utilise wet grasslands and arable fields during migration (del Hoyo et al. 1996). Curlews are likely to occur in estuarine habitats along the coast within the PAOI.

Several key populations of the Eurasian Curlew, classified as Near Threatened both globally and regionally, are suspected to be experiencing moderately rapid declines. This species is a non-breeding Palaearctic migrant, present in South Africa from September to March (Taylor et al. 2015).

Greater Flamingo *Phoenicopterus roseus*

In South Africa, the Greater Flamingo (Regionally Near Threatened) occurs mainly in the central and south-western regions. It generally prefers coastal mudflats, inland dams, sewage treatment works, small temporary pans and river mouths, while it exclusively breeds at recently flooded, large eutrophic shallow salt pans (Hockey et al. 2005). Within the PAOI flamingos are likely to use freshwater pans and estuarine habitats along the coast.

The southern African population of Greater Flamingo has undergone declines of >40% over the past three generations. Unfortunately, there are no data to support similar trends within the regional population although it is suspected to be approaching the 30% threshold qualifying this species as regionally Near Threatened. The population declines are largely due to lowering water tables at major breeding sites as well as collisions with powerlines. Collisions with wind turbines have also become a potential threat.

Great White Pelican *Pelecanus onocrotalus*

The regional population of Great White Pelican (Regionally Vulnerable) has been quantified at *c.* 2 500 pairs, restricted to less than 5 breeding locations, and is vulnerable to short-term human activities and stochastic events. For these reasons, the species is assessed as regionally Vulnerable. Freshwater pans and estuarine habitats along the coast are habitats along the coast that pelicans are likely to use.

In the Western Cape Province, South Africa, breeding sites are relatively secure, but reliance on offal from farms presents a significant concern. This feeding behaviour may lead to extreme fluctuations in food availability and increase the risk of avian pathogen transmission (Crawford et al. 1995), which could have

severe consequences (Kemper et al. 2007). The long-term impact of this foraging shift on the population remains uncertain, as does the continued availability of this food source. Lesser threats include human disturbance at breeding colonies (Berry et al. 1973), pollution, particularly plastic ingestion (Crawford et al. 1995), collisions with power lines, and the effects of drought, which can cause starvation and breeding failure.

Jackal Buzzard *Buteo rufofuscus*

The Jackal Buzzard is not regionally or globally threatened, but it is classified as near-endemic. Its range includes South Africa, Lesotho and Namibia, as well as the extreme southern, and southwestern parts of Mozambique and Botswana (Kemp & Kirwan 2020). Their main strongholds are the Eastern Cape, Lesotho, the Drakensberg and Midland regions of KwaZulu Natal. They are also abundant in the central and North-western Karoo (Tippett 2024).

Jackal Buzzards occur over a wide range of open grassland habitats, primarily above 100m in altitude. This species is primarily mountain dwelling but also occur in rocky areas and their range extends from sea level to mountain tops at 3 300m altitude. They are well adapted to diverse environments, from fairly wet habitats to semi desert coastal regions of Namibia.

This species maintains a stable population with relatively high numbers, and they have no major predators. Threats include habitat loss, and they are highly susceptible to collisions with man-made structures such as wind turbines, powerlines and steep-sided reservoirs (Nkomo et al. 2024). In addition, their scavenging behaviour exposes them to the risk of poisoned carcasses (Van den Heever et al. 2019), although they scavenge mainly roadkill and hunt small mammals, birds and reptiles.

Lanner Falcon *Falco biarmicus*

The Lanner Falcon (Regionally Vulnerable) is widely distributed across Africa, the Arabian Peninsula, and the Western Palearctic (Ferguson-Lees & Christie 2001). Within the southern African region, it is found throughout South Africa, Lesotho, and Swaziland, though in low densities, with the highest concentrations recorded in the Western Cape and KwaZulu-Natal.

Lanner Falcons mostly occur in open grassland, cleared woodlands and agricultural areas. Breeding pairs tend to favour cliffs as nesting and roosting sites; however, they will also use alternative structures such as trees, pylons and buildings (Hockey et al. 2005). Within the PAOI they would use the powerline in the west and could potentially hunt over the entire area.

The main threat to the Lanner Falcon is habitat loss and transformation within the Grassland Biome, driven by urbanization, agriculture, and afforestation. These changes have led to a decline in preferred prey species and reduced foraging opportunities (Barnes & Jenkins 2000).

Ludwig's Bustard *Neotis ludwigii*

Ludwig's Bustard (Globally and Regionally Endangered) is near-endemic to the region occurring in western Namibia and western South Africa, with some records from south-western Angola, Botswana and western Lesotho (Taylor et al. 2015). It generally prefers the semi-arid shrublands of the Karoo, Namib Desert and Nama Karoo, occasionally visiting cultivated land and the southern Kalahari. Ludwig's Bustards could occur throughout the PAOI within scrubland habitat.

The main threat to Ludwig's Bustards is mortalities originating from collisions with distribution and telephone lines. The power network in the region is extensive and increasing and causes high levels of mortality with unsustainable rates of 0.63 fatal collisions/km/year being recorded on transmission lines in the Karoo, which result in an estimated annual toll of 8 600 birds (Jenkins et al. 2011). Poisoning and displacement due to disturbance are also threats to this bird species.

Martial Eagle *Polemaetus bellicosus*

Martial Eagles (Globally Near Threatened and Regionally Endangered) occur in much of sub-Saharan Africa. In southern Africa, it is widespread but uncommon, generally preferring flat, open woodland, such as savanna, forest edges and drainage woodland in shrubland. It may move into open farmland with stands of

trees. Within the PAOI, they would utilize the powerline in the west and potentially cover the entire area for hunting.

Barnes (2000) identifies human activities outside protected areas as the primary drivers of Martial Eagle population decline. Key threats include direct persecution through shooting and trapping by small-stock farmers, indirect poisoning, drowning in sheer-walled farm reservoirs, loss of natural prey due to habitat degradation, nest site disturbance, and electrocution on electricity pylons. The process of rangeland modification and degradation (primarily by overgrazing) affects eagle populations, at least indirectly by influencing the distribution, abundance, and accessibility of prey (Taylor et al. 2015).

6.4 DFFE Screening Tool

The Development Site and immediate environment is classified partially as LOW and partially as HIGH sensitivity for avifauna according to the Animal Species Theme of the DFFE Screening Tool (**Figure 4**). The high sensitivity classification is linked to the possible occurrence of Lanner Falcon *Falco biarmicus* (Regionally Vulnerable). The Development Site contains confirmed habitat for species of conservation concern (SCC) as defined in the Protocol for the specialist assessment and minimum report content requirements for environmental impacts on terrestrial animal species (Government Gazette No 43855, 30 October 2020). SCCs are listed on the IUCN Red List of Threatened Species or South Africa's National Red List website as Critically Endangered, Endangered, Near Threatened or Vulnerable.

The occurrence of SCC at the Development Site and within the Broader Area is confirmed by the SABAP2 data as indicated in **Table 1** (Section 5.3).

Based on the confirmed habitat, the SABAP2 data, and modelling outputs the classification of **HIGH** sensitivity for avifauna in the Screening Tool is supported.

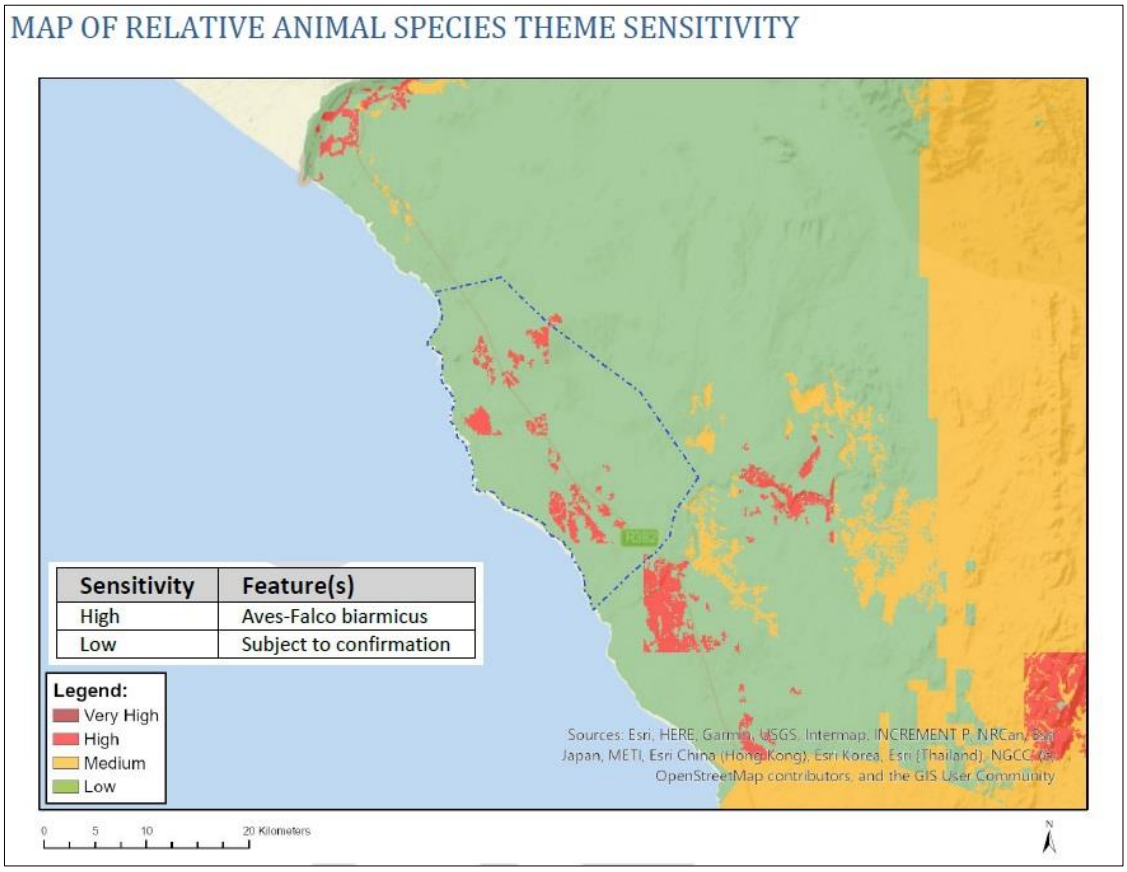

Figure 6: The National Web-Based Environmental Screening Tool map of the Development Site, indicating sensitivities for the Animal Species Theme.

6.5 Sensitivity Analysis

To achieve the categorisation of low, medium, high, and very high sensitivity classes, a rigorous methodology was employed. This methodology entailed the integration of various data sources, including remote sensing, topographical, land-cover, and climatic data.

Species selection:

A target species list was generated by assessing SABAP2 data, BirdLasser citizen science data and intersecting species distribution models with a 5 km Proposed Area of Impact (PAOI) buffer around the Boegoebaai SEZ. This assessment of all available data yielded a priority list of 13 threatened and/or endemic avian species that were included in the analysis. Species distribution models have been developed for more than >100 SCCs as part of a national assessment of avian sensitivity. Species distribution models were developed using a standardised methodology that is aligned with what was used to develop avian models for the DFFE National Screening Tool.

Habitat suitability and species distribution modelling:

We scripted and used an R workflow to prepare, pre-process, and analyse remote sensing, topographical, land-cover, and climatic data. A classification modelling framework, which included the use of an ensemble model, was used to assess habitat suitability for target species. An ensemble modelling approach incorporates the use of more than one classification algorithm, drawing on the strengths of each, and resisting any inherent bias that could be present in a single model. The modelling workflow included data partitioning, model training, variable selection, model testing, model optimization through hyperparameter tuning, and final model predictions. We partitioned the overall occurrence and pseudo-absence dataset into training (80%) and testing (20%) subsets. Subsequently, we trained the primary models using the Random Forest, ANN and Maxnet algorithms, followed by hyperparameter tuning and model optimization using the genetic algorithm (Vignali et al. 2020). Variable importance and partial dependence plots were generated for the final set of variables selected following initial model training and optimization.

Weighted sensitivity analysis:

A workflow utilising a weighted algorithm was scripted and implemented in Python. The weighted algorithm incorporated weights for red data status, endemic status, range size, and data (nest/roost sites, core area of occupancy, sightings, etc.), or model (distribution model vs fine-scale breeding habitat suitability model) type. The weighted algorithm applies greater sensitivity weights to species that are more threatened (e.g. Critically Endangered or Endangered) and are either endemic or highly range-restricted within South Africa. Furthermore, data types that included nests, roosts or/or areas of core occupancy received the highest weights for the respective data/model type criterion. Although there was no nest or roost site data within the Boegoebaai SEZ, the area does occur within a core occupancy area of the range-restricted Barlow's Lark. All distribution models, habitat suitability models and other data types are ingested into the weighted algorithm with species and data specific weights applied to generate an overall avian sensitivity map for the Boegoebaai SEZ.

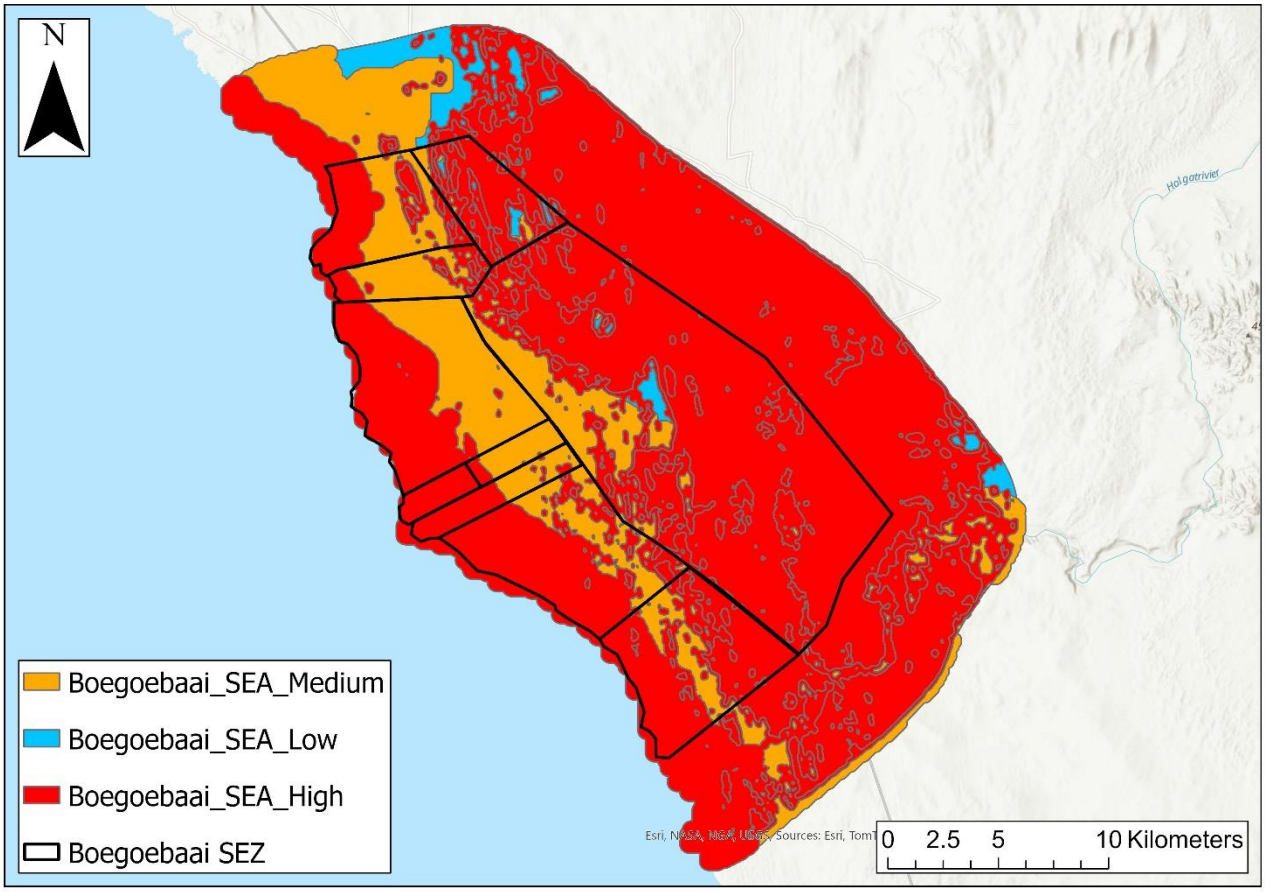

Figure 7: The avian sensitivity layer generated from the weighted analysis incorporating 13 avian species selected for further assessment.

6.6 Potential Impacts on Avifauna

6.6.1 Displacement due to Disturbance

The construction phase of the proposed Project can disturb bird populations and their habitats, particularly if construction activities occur in or near areas that birds rely on for nesting, feeding, or roosting. Birds are highly sensitive to changes in their environment, and the disruption caused by the construction and operation of the proposed Project can have several adverse effects.

The noise and activity associated with vehicles, machinery and construction operations can disturb birds, especially those sensitive to human presence or loud sounds. Species that require quiet and undisturbed environments for nesting or breeding may abandon their nests if they perceive the area as unsafe or stressful. This disturbance can disrupt breeding cycles, leading to reduced reproductive success and therefore population declines.

Additionally, the presence of machinery and vehicles can pose direct threats to birds through collisions or accidental disturbances. Birds, particularly ground-nesting species, or those flying low over the area, may be at risk of injury or mortality from these activities.

The construction and operation of the proposed Project may involve several activities aimed at excavating, processing, and utilizing materials for construction purposes. Some of the activities which could be associated with the proposed Project, which could cause species displacement due to disturbance, include:

- Site Selection and Preparation: This involves identifying suitable locations for the proposed Project based on proximity to construction sites needing materials and the quality of materials available. Site preparation may include clearing vegetation and levelling the area.

- Excavation: The primary construction activity could be excavation, where soil, gravel, sand, or other materials are extracted from the ground using heavy machinery such as excavators, bulldozers, or loaders. This activity will be a significant source of noise and movement disturbance.

- Material Processing: Excavated materials often need processing to meet specific size and quality requirements for construction. This can involve crushing, screening, or washing the materials to remove impurities and ensure consistency.

- Material Stockpiling: Processed materials are stockpiled onsite for storage and subsequent transportation to construction sites. Proper stockpiling techniques are important to prevent erosion, maintain material quality, and ensure safety.

- Transportation: Transporting materials for the proposed Project to construction sites is a significant part of operations. This may involve using trucks, conveyor belts, or other equipment to move materials efficiently and safely.

- Port activities introduce noise pollution, artificial lighting, and increased human presence, which can disturb birds' natural behaviours and deter them from utilizing the remaining habitats (Rodrigues et al. 2019).

6.6.2 Displacement due to Habitat Loss/Transformation

Construction activities and infrastructure, such as pipelines, powerlines and roads, can fragment habitats and restrict species movement/dispersal. Port developments can have significant impacts on avifauna, primarily through habitat loss and degradation. The construction and expansion of ports often involve land reclamation, dredging, and the destruction of wetlands and intertidal zones, which are critical habitats for many bird species (Dugan 1990; BirdLife International 2021). These areas serve as feeding, nesting, and roosting sites, particularly for migratory shorebirds that rely on undisturbed coastal habitats during their journeys (Goss-Custard & Verboven 1993).

The loss of vegetation and natural landscapes disrupts ecological balance, leading to reduced food availability and increased competition among avian species (Ma et al. 2014). Pollution from port operations, including possible oil spills and chemical runoff, can degrade water quality and affect the health of aquatic ecosystems, further impacting bird populations dependent on these areas (Boersma et al. 2001). Such habitat loss and fragmentation can result in declining bird populations, threatening the biodiversity of avian communities in and around the proposed Development Site.

6.6.3 Avifaunal Aspects and Impacts Register

Aspect	Potential Impact	Receiving Environment of Concern
Construction Noise and Activity	Disturbance to bird populations, particularly in nesting, feeding, or roosting areas	Areas near construction sites. 500 m – 2 km ~ species dependant.
Presence of Machinery and Vehicles	Risk of injury or mortality to birds, especially ground-nesting species	Construction sites and surrounding areas. Actual site extent.
Site Selection and Preparation	Clearing of vegetation, leading to habitat loss	Selected construction site. Actual site extent.
Excavation	Noise disturbance and movement disruption	Excavation sites. 500 m to 1 km – species dependant.
Material Processing	Further noise and activity	Processing sites. 500 m to 1 km –

Aspect	Potential Impact	Receiving Environment of Concern
	disturbance	species dependant.
Material Stockpiling	Potential erosion and habitat disruption	Stockpiling areas. 500 m to 1 km – species dependant.
Transportation of Materials	Increased noise pollution and habitat disturbance	Transportation routes. Actual site extent.
Port Activities	Noise pollution, artificial lighting, and increased human presence deterring natural bird behaviours	Port areas and surrounding habitats. 500 m to 1 km – species dependant.
Habitat Loss/Transformation	Fragmentation of habitats, restricted species movement, and reduced food availability	Pipeline, powerline, and road areas; coastal habitats. 500 m to 1 km – species dependant.
Pollution from Port Operations	Degraded water quality affecting aquatic ecosystems and bird populations	Areas near port operations and aquatic ecosystems. 500 m to 1 km – species dependant.

7 AVIFAUNAL ASSESSMENT STRATEGIES FOR EIA STUDIES

7.1 Agreements & Conventions

Table 2 below lists agreements and conventions which South Africa is party to, and which are relevant to the conservation of avifauna.

Table 2: Agreements and conventions which South Africa is party to, and which are relevant to the conservation of avifauna

Convention Name	Description	Geographic Scope
African-Eurasian Waterbird Agreement (AEWA)	The Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA) is an intergovernmental treaty dedicated to the conservation of migratory waterbirds and their habitats across Africa, Europe, the Middle East, Central Asia, Greenland, and the Canadian Archipelago. Developed under the framework of the Convention on Migratory Species (CMS) and administered by the United Nations Environment Programme (UNEP), AEWA brings together countries and the wider international conservation community in an effort to establish coordinated conservation and management of migratory waterbirds throughout their entire migratory range.	Regional
Convention on Biological Diversity (CBD), Nairobi, 1992	The Convention on Biological Diversity (CBD) entered into force on 29 December 1993. It has three main objectives: The conservation of biological diversity The sustainable use of the components of biological diversity The fair and equitable sharing of the benefits arising out of the utilization of genetic resources.	Global
Convention on the Conservation of Migratory Species of Wild Animals, (CMS), Bonn, 1979	As an environmental treaty under the aegis of the United Nations Environment Programme, CMS provides a global platform for the conservation and sustainable use of migratory animals and their habitats. CMS brings together the States through which migratory animals pass, the Range States, and lays the legal foundation for internationally coordinated conservation measures throughout a migratory range.	Global
Convention on the International Trade in	CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora) is an international agreement between	Global

Convention Name	Description	Geographic Scope
Endangered Species of Wild Flora and Fauna, (CITES), Washington DC, 1973	governments. Its aim is to ensure that international trade in specimens of wild animals and plants does not threaten their survival.	
Ramsar Convention on Wetlands of International Importance, Ramsar, 1971	The Convention on Wetlands, called the Ramsar Convention, is an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources.	Global
Memorandum of Understanding on the Conservation of Migratory Birds of Prey in Africa and Eurasia	The Signatories will aim to take co-ordinated measures to achieve and maintain the favourable conservation status of birds of prey throughout their range and to reverse their decline when and where appropriate.	Regional

7.2 National Legislation

7.2.1 Constitution of the Republic of South Africa, 1996

The Constitution of the Republic of South Africa provides in the Bill of Rights that: Everyone has the right –

(a) to an environment that is not harmful to their health or well-being; and

(b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that –

(i) prevent pollution and ecological degradation;

(ii) promote conservation; and

(iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

7.2.2 The National Environmental Management Act 107 of 1998 (NEMA)

The National Environmental Management Act 107 of 1998 (NEMA) creates the legislative framework for environmental protection in South Africa and is aimed at giving effect to the environmental right in the Constitution. It sets out a number of guiding principles that apply to the actions of all organs of state that may significantly affect the environment. Sustainable development (socially, environmentally, and economically) is one of the key principles, and internationally accepted principles of environmental management, such as the precautionary principle and the polluter pays principle, are also incorporated. NEMA also provides that a wide variety of listed developmental activities, which may significantly affect the environment, may be performed only after an environmental impact assessment has been done and authorization has been obtained from the relevant authority. Many of these listed activities can potentially have negative impacts on bird populations in a variety of ways. The clearance of natural vegetation, for instance, can lead to a loss of habitat and may depress prey populations, while erecting structures needed for generating and distributing energy, communication, and so forth can cause mortalities by collision or electrocution.

NEMA makes provision for the prescription of procedures for the assessment and minimum criteria for reporting on identified environmental themes (Sections 24(5)(a) and (h) and 44) when applying for environmental authorisation. The Protocol for the specialist assessment and minimum report content requirements for environmental impacts on terrestrial animal species (Government Gazette No 43855, 30 October 2020) is applicable in the case of this proposed development.

7.2.3 The National Environmental Management: Biodiversity Act 10 of 2004 (NEMBA) and the Threatened or Protected Species Regulations, February 2007 (TOPS Regulations)

The most prominent statute containing provisions directly aimed at the conservation of birds is the National Environmental Management: Biodiversity Act 10 of 2004 read with the Threatened or Protected Species Regulations, February 2007 (TOPS Regulations). Chapter 1 sets out the objectives of the Act, and they are aligned with the objectives of the Convention on Biological Diversity, which are the conservation of biodiversity, the sustainable use of its components, and the fair and equitable sharing of the benefits of the use of genetic resources. The Act also gives effect to CITES, the Ramsar Convention, and the Bonn Convention on Migratory Species of Wild Animals. The State is endowed with the trusteeship of biodiversity and has the responsibility to manage, conserve and sustain the biodiversity of South Africa.

7.3 Provincial Legislation

The current legislation applicable to the conservation of fauna and flora in the Northern Cape is the Northern Cape Nature Conservation Act No 9 of 2009. It provides for the sustainable utilisation of wild animals, aquatic biota and plants; the implementation of the Convention on International Trade in Endangered Species of Wild Fauna and Flora; describes offences and penalties for contravention of the Act; provides for the appointment of nature conservators to implement the provisions of the Act; provides for the issuing of permits and other authorisations; and provides for matters connected therewith.

7.4 Guidelines

The following sources were consulted to determine the investigation protocol that is required for the site:

- Protocol for the specialist assessment and minimum report content requirements for environmental impacts on animal species (Government Notice 1150 30 October 2020, as amended by Government Notice 3717 28 July 2023); and

- Guidelines for the Implementation of the Terrestrial Flora (3c) & Terrestrial Fauna (3d) Species Protocols for EIAs in South Africa produced by the South African National Biodiversity Institute on behalf of the Department of Environment, Forestry and Fisheries (2020).

7.5 Avifaunal Monitoring Plan

For all proposed developments in the Boegoebaai Port or SEZ, an EIA specialist avifaunal assessment will be required. The avifaunal specialist studies should adhere to the following monitoring recommendations:

- Consult existing avifaunal data resources such as SABAP2 and Birdlasser® to obtain known records of avifauna for the specific area of influence (PAOI).
- Perform comprehensive baseline monitoring within the proposed development footprint to establish the avian species composition with specific reference to species of conservation concern as listed in section 5.3.
- In high and very high sensitivity areas multiple surveys spanning different seasons to account for migratory and seasonal variations in abundance and species diversity would be required.
- Surveys to be designed in line with best practise guidance and in line with assessing the potential impacts of the proposed development. E.g. applicable guidelines for renewable energy developments should apply when such projects are being assessed.
- Data collected to be submitted to SABAP2 (refer to Species assessment guidelines *SANBI 2020*).
- Consultation with species specialists and NGO's (such as BLSA) for information and refinement of assessments and species-specific guidance or guidelines is recommended.

8 CONCLUSIONS & RECOMMENDATIONS

The Boegoebaai Port and SEZ SEA development site predominantly exhibits medium and high sensitivity from an avifaunal perspective. Although the region does not host a wide diversity of birds, it is home to range-restricted species such as the Dune Lark (Coastal), as well as potentially supporting Endangered Martial Eagle and Endangered Ludwig's Bustard. Additionally, dunes, freshwater pans, and estuarine habitats along the coast support various species of conservation concern, including the Critically Endangered Damara Tern. Consequently, all proposed developments within the SEZ should incorporate an avifaunal specialist study.

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APPENDIX A – Bird Species List for the Broader Area (20 Pentads)

EN = Endangered, VU = Vulnerable, NT = Near Threatened

Species Name	Scientific Name	SABAP2 Reporting Rate % (across 20 pentads)		Global Status	Regional Status
		Full Protocol	Ad Hoc Protocol		
Acacia Pied Barbet	*Tricholaema leucomelas*	0,00	0,75	-	-
African Oystercatcher	*Haematopus moquini*	0,00	11,19	-	-
African Sacred Ibis	*Threskiornis aethiopicus*	0,00	2,24	-	-
African Stonechat	*Saxicola torquatus*	65,12	5,22	-	-
Alpine Swift	*Tachymarptis melba*	16,28	2,24	-	-
Bank Cormorant	*Phalacrocorax neglectus*	0,00	1,49	EN	EN
Barlow's Lark	*Calendulauda barlowi*	74,42	17,16	-	-
Barn Swallow	*Hirundo rustica*	4,65	0,00	-	-
Black Harrier	*Circus maurus*	11,63	1,49	EN	EN
Black-chested Snake Eagle	*Circaetus pectoralis*	11,63	6,72	-	-
Black-eared Sparrow-Lark	*Eremopterix australis*	18,60	2,24	-	-
Black-headed Canary	*Serinus alario*	0,00	1,49	-	-
Black-necked Grebe	*Podiceps nigricollis*	0,00	2,24	-	-
Black-winged Stilt	*Himantopus himantopus*	0,00	2,24	-	-
Bokmakierie	*Telophorus zeylonus*	62,79	3,73	-	-
Booted Eagle	*Hieraaetus pennatus*	2,33	0,00	-	-
Bradfield's Swift	*Apus bradfieldi*	23,26	0,00	-	-
Cape Bunting	*Emberiza capensis*	20,93	2,24	-	-
Cape Cormorant	*Phalacrocorax capensis*	2,33	9,70	EN	EN
Cape Crow	*Corvus capensis*	51,16	17,16	-	-
Cape Long-billed Lark	*Certhilauda curvirostris*	58,14	9,70	-	-
Cape Penduline Tit	*Anthoscopus minutus*	2,33	1,49	-	-
Cape Sparrow	*Passer melanurus*	58,14	9,70	-	-
Cape Teal	*Anas capensis*	4,65	2,24	-	-
Cape Wagtail	*Motacilla capensis*	4,65	3,73	-	-
Capped Wheatear	*Oenanthe pileata*	46,51	11,19	-	-
Chat Flycatcher	*Melaenornis infuscatus*	4,65	0,75	-	-
Cinnamon-breasted Warbler	*Euryptila subcinnamomea*	0,00	0,75	-	-
Common Ostrich	*Struthio camelus*	11,63	4,48	-	-
Dusky Sunbird	*Cinnyris fuscus*	37,21	0,00	-	-

Species Name	Scientific Name	SABAP2 Reporting Rate % (across 20 pentads)		Global Status	Regional Status
		Full Protocol	Ad Hoc Protocol		
Eurasian Whimbrel	*Numenius phaeopus*	0,00	1,49	-	-
Familiar Chat	*Oenanthe familiaris*	11,63	1,49	-	-
Greater Crested Tern	*Thalasseus bergii*	0,00	2,24	-	-
Greater Flamingo	*Phoenicopterus roseus*	0,00	2,99	-	NT
Greater Kestrel	*Falco rupicoloides*	32,56	8,96	-	-
Greater Striped Swallow	*Cecropis cucullata*	2,33	0,00	-	-
Grey Heron	*Ardea cinerea*	2,33	8,96	-	-
Grey Tit	*Melaniparus afer*	30,23	1,49	-	-
Grey-backed Cisticola	*Cisticola subruficapilla*	76,74	3,73	-	-
Grey-backed Sparrow-Lark	*Eremopterix verticalis*	41,86	1,49	-	-
Grey-headed Gull	*Chroicocephalus cirrocephalus*	0,00	0,75	-	-
Hadada Ibis	*Bostrychia hagedash*	2,33	0,00	-	-
Hartlaub's Gull	*Chroicocephalus hartlaubii*	0,00	2,99	-	-
Jackal Buzzard	*Buteo rufofuscus*	32,56	10,45	-	-
Karoo Chat	*Emarginata schlegelii*	20,93	2,99	-	-
Karoo Lark	*Calendulauda albescens*	60,47	6,72	-	-
Karoo Long-billed Lark	*Certhilauda subcoronata*	6,98	1,49	-	-
Karoo Prinia	*Prinia maculosa*	67,44	0,75	-	-
Karoo Scrub Robin	*Cercotrichas coryphoeus*	53,49	5,22	-	-
Kelp Gull	*Larus dominicanus*	0,00	11,19	-	-
Kori Bustard	*Ardeotis kori*	0,00	1,49	NT	NT
Lanner Falcon	*Falco biarmicus*	18,60	2,99	-	VU
Large-billed Lark	*Galerida magnirostris*	9,30	0,75	-	-
Lark-like Bunting	*Emberiza impetuani*	48,84	3,73	-	-
Lesser Flamingo	*Phoeniconaias minor*	0,00	0,75	NT	NT
Long-billed Crombec	*Sylvietta rufescens*	0,00	1,49	-	-
Ludwig's Bustard	*Neotis ludwigii*	44,19	3,73	EN	EN
Malachite Sunbird	*Nectarinia famosa*	9,30	2,24	-	-
Martial Eagle	*Polemaetus bellicosus*	2,33	2,24	EN	EN
Mountain Wheatear	*Myrmecocichla monticola*	6,98	0,00	-	-
Namaqua Dove	*Oena capensis*	13,95	0,75	-	-
Namaqua Sandgrouse	*Pterocles namaqua*	32,56	4,48	-	-
Namaqua Warbler	*Phragmacia substriata*	4,65	0,00	-	-

Species Name	Scientific Name	SABAP2 Reporting Rate % (across 20 pentads)		Global Status	Regional Status
		Full Protocol	Ad Hoc Protocol		
Pale Chanting Goshawk	*Melierax canorus*	58,14	23,13	-	-
Pied Avocet	*Recurvirostra avosetta*	0,00	2,24	-	-
Pied Crow	*Corvus albus*	65,12	26,12	-	-
Red-capped Lark	*Calandrella cinerea*	41,86	2,24	-	-
Rock Kestrel	*Falco rupicolus*	39,53	8,21	-	-
Rock Martin	*Ptyonoprogne fuligula*	27,91	3,73	-	-
Rufous-eared Warbler	*Malcorus pectoralis*	55,81	5,97	-	-
Sandwich Tern	*Thalasseus sandvicensis*	0,00	0,75	-	-
Sickle-winged Chat	*Emarginata sinuata*	4,65	0,00	-	-
South African Shelduck	*Tadorna cana*	0,00	0,75	-	-
Southern Fiscal	*Lanius collaris*	18,60	2,24	-	-
Speckled Pigeon	*Columba guinea*	25,58	0,75	-	-
Spike-heeled Lark	*Chersomanes albofasciata*	37,21	2,99	-	-
Spotted Eagle-Owl	*Bubo africanus*	0,00	2,24	-	-
Spotted Thick-knee	*Burhinus capensis*	2,33	4,48	-	-
Tractrac Chat	*Emarginata tractrac*	83,72	13,43	-	-
Western Barn Owl	*Tyto alba*	0,00	1,49	-	-
White-breasted Cormorant	*Phalacrocorax lucidus*	0,00	5,97	-	-
White-fronted Plover	*Charadrius marginatus*	0,00	5,22	-	-
White-throated Canary	*Crithagra albogularis*	39,53	2,24	-	-
White-throated Swallow	*Hirundo albigularis*	2,33	0,00	-	-
Yellow Canary	*Crithagra flaviventris*	58,14	8,96	-	-
Yellow-bellied Eremomela	*Eremomela icteropygialis*	2,33	1,49	-	-
Yellow-billed Kite	*Milvus aegyptius*	0,00	0,75	-	-

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