

**SPECIALIST NATURAL STUDIES TOWARDS THE NOMINATION  
DOSSIER FOR THE LISTING OF THE PONTA DO OURO PARTIAL  
MARINE RESERVE AND THE MAPUTO SPECIAL RESERVE  
AS A WORLD HERITAGE SITE**

Birds

**JULY 2020 | FINAL REPORT**

Version 2



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Prepared by:



**For**

Centro Terra Viva

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**Citation:**

**MER 2016:** Specialist Natural Studies towards the Nomination Dossier for the Listing of the Ponta Do Ouro Partial Marine Reserve and the Maputo Special Reserve as a World Heritage Site: Birds. MER Specialist Report 13/2019.

All conceptual diagrams and photographic credits: MER

## REPORT DETAILS

<b>TITLE</b>	Specialist Natural Studies towards the Nomination Dossier for the Listing of the Ponta Do Ouro Partial Marine Reserve and the Maputo Special Reserve as a World Heritage Site: Birds. MER Specialist Report 13/2019.
<b>DATE</b>	Version 1 JUNE 2019; Version 2 July 2020
<b>COMPANY</b>	Marine & Estuarine Research
<b>REPORT NO</b>	MER Specialist Report 13/2019
<b>REPORT AUTHORS</b>	Nicolette Forbes & Anthony Forbes
<b>FORMAT</b>	MSWord and PDF
<b>WEB ADDRESS</b>	<a href="http://www.mer.co.za">http://www.mer.co.za</a> (only with client password and permission)

Approved for Marine & Estuarine Research by:

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Director

Approved for Client by:

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Centro Terra Viva

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## GLOSSARY AND ABBREVIATIONS

<b>Anthropogenic</b>	Having to do with people, or caused by humans.
<b>Biodiversity</b>	The variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part. This includes diversity within species, between species and of ecosystems.
<b>Community</b>	Assemblage of organisms characterised by a distinctive combination of species that occupy a common environment and interact with one another.
<b>Community composition</b>	All taxa, plants and animals, present in a community.
<b>EBA</b>	Endemic Bird Area - These are areas that are home to at least two endemic breeding bird species.
<b>Endemic</b>	Occurring only in or restricted to a specified geographic area.
<b>Habitat</b>	The natural home of an organism or community of organisms (this also includes the surrounding area). This includes biotic and abiotic features. Habitat loss or fragmentation is one of the primary causes of the loss of biodiversity and resilience.
<b>Hotspot</b>	An area considered special from an avitourism perspective because of the high biodiversity and specific bird community assemblages found there.
<b>IBA</b>	Important Bird/Biodiversity Area
<b>KZN</b>	KwaZulu-Natal
<b>MER</b>	Marine & Estuarine Research
<b>Nature-based tourism</b>	Nature-based tourism takes place mainly in natural environments, with the specific purpose of viewing and experiencing the natural features of a destination.
<b>Near-Endemic</b>	A species which is represented by most of its population within the boundary or geographic area of concern and only marginally outside of that boundary.



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**SABAP2**

Southern African Bird Atlas Project 2 (The BirdMap Project)

**TFCA**

Trans-frontier Conservation Area

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**SPECIALIST NATURAL STUDIES TOWARDS THE  
NOMINATION DOSSIER FOR THE LISTING OF THE PONTA  
DO OURO PARTIAL MARINE RESERVE AND THE MAPUTO  
SPECIAL RESERVE AS A WORLD HERITAGE SITE:  
BIRDS**



## **1 INTRODUCTION AND HISTORICAL REGIONAL CONTEXT**

Mozambique ratified the World Heritage Convention in 1982 and in 2008 included the Ponta do Ouro Partial Marine Reserve (POPMPR) on the country's list 2 for ultimate consideration for World Heritage Site (WHS) status. In the interim, and relevant to the present application, borders separating conservation areas of three southern African nations - Swaziland, Mozambique and South Africa - came down following a historic trilateral cooperation agreement to promote conservation. The agreement on the Lubombo Transfrontier Conservation Area (TFCA) was signed on 22 June 2000 in Durban at the World Economic Summit by the ministers responsible for the environment in the three countries, viz. the Mozambican Minister of Agriculture and Rural Development, Mr Helder dos Santos Felix Monteiro Mutela,





the South African Minister of Environmental Affairs and Tourism, Mr Mohammed Valli Moosa, and the Swaziland Minister of Agriculture and Cooperatives, Mr Roy Fanourakis. The establishment of the Lubombo TFCA was intended to support the broader aims and socio-economic upliftment in the southern Africa subcontinent, as well as improving regional ecosystems management.

Four specific areas were targeted in the protocol:

- ❖ The Lubombo Ponto do Ouro-Kosi Bay marine and coastal area on the Mozambique-South African borders.
- ❖ The Ndumo-Tembe-Futi elephant reserves on the border of South Africa and Mozambique.
- ❖ The Nsubane-Pongolo (Jozini) area on the border of South Africa and Swaziland.
- ❖ The Lubombo Conservancy-Hlane-Mlawula/Goba area on the border of Mozambique and Swaziland.

Under the Lubombo Spatial Development Initiative, the possibility of a Transfrontier Conservation Area (TFCA) covering an area bounded by the iSimangaliso Wetland Park in the south, the Lubombo mountains to the west, the Indian Ocean in the east and through to Maputo Bay to the north which would involve South Africa, Swaziland and Mozambique was considered. The potential to now elevate a portion of the area between Ponta do Ouro and Inhaca Island to a World Heritage Site (WHS) listing as the Ponta do Ouro Partial Marine Reserve (POPMR) is a significant step towards regional protection of a unique area.

## 2 TERMS OF REFERENCE AND SCOPE OF STUDY

The approach followed was a desktop assessment to survey the available literature and information pertaining to the area proposed for inclusion in the WHS. These features and the associated processes that generate significant biodiversity were assessed against the criteria for WHS status. Note was also taken of the *“Terms of Reference in respect of specialist natural studies towards the nomination dossier for the listing of the Ponta do Ouro Partial Marine Reserve and the Maputo Special Reserve as a*



*World Heritage Site*" as prepared by Centro Terra Nova (2018) which followed on the "*Dossier for nomination of Ponta do Ouro Partial Marine Reserve and Maputo Special Reserve to UNESCO World Heritage Site*" (Fernandes, Litulo, Pereira & Pereira 2016).

For an area to gain WHS status and be considered as a site of Outstanding Universal Value it needs to meet at least one of ten criteria (UNESCO 2019). Only four of these criteria are considered here as these are the ones which are relevant as potential criteria for this component.

- ❖ (Criterion vii) to contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance;
- ❖ (Criterion viii) to be outstanding examples representing major stages of earth's history, including the record of life, significant on-going geological processes in the development of landforms, or significant geomorphic or physiographic features;
- ❖ (Criterion ix) to be outstanding examples representing significant on-going ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals;
- ❖ (Criterion x) to contain the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation.

Three of these criteria were invoked in the case of the application for recognition of the adjacent and neighbouring iSimangaliso Wetland Park as a WHS namely (vii), (ix) and (x) and these same three criteria are also very likely as a valid backdrop against which to assess the motivation of WHS status of the POPMR.

In this report, the information synthesized and collated for the Crustacean component will be considered against these criteria to consider whether this component could add value to the case for the inscription of the POPMR as a WHS.

### 3 BACKGROUND

#### 3.1 Study area

The study area covered in this report is broadly confined to the low lying coastal region which includes the Ponta do Ouro Partial Marine Reserve (POPMR) (Figure 3-1) and is bounded to the south by iSimangaliso, to the east by the Indian Ocean including an inshore marine area, Inhaca Island and Maputo Bay to the north and a line slightly west of the Phongola/Maputo river.

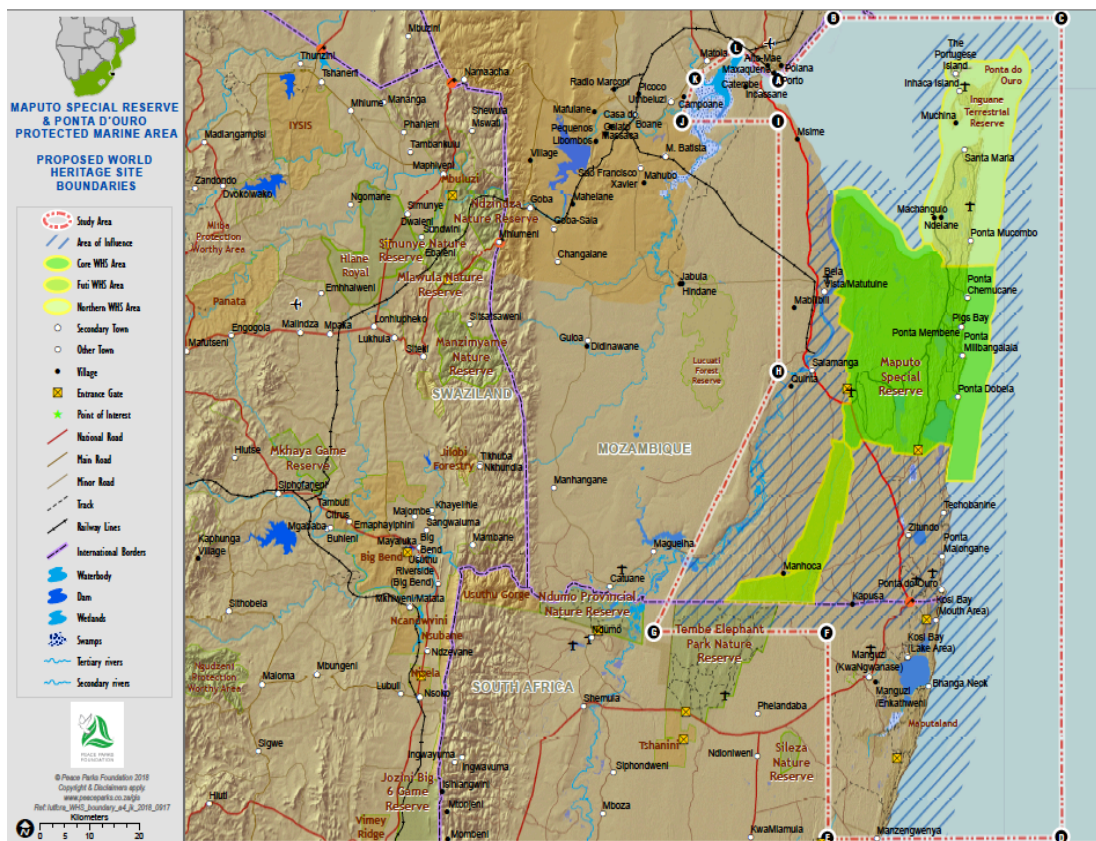


Figure 3-1 Boundaries of the proposed World Heritage Site incorporating the Ponta do Ouro Partial Marine Reserve, the Maputo Special Reserve and Futhi Corridor (from Centro Terra Viva 2018).



This report will deal with the avifauna of the area covered by the World Heritage Site nomination. This includes a wide diversity of habitats utilised by birds ranging from terrestrial grasslands, savannah and forests to dunes, wetlands, lakes, beaches and estuaries including the pelagic marine environment.

### **3.1.1 Location**

The Maputaland Centre of Endemism covers an area of approximately 17,000 km<sup>2</sup> within eastern southern Africa and comprises portions of Mozambique, South Africa and Swaziland. Forming part of the Maputaland–Pondoland–Albany biodiversity hot-spot its conservation importance was globally recognized with the proclamation of the iSimangaliso Wetland Park World Heritage Site, a total of five RAMSAR sites, the Maputo Special Reserve (MSR), the POPMR, Tembe Elephant Park and ten Important Bird Areas some of which are ranked as Globally Important Areas. It follows that a relatively high proportion of the region has formal protected area status.

### **3.1.2 Topography**

The topography of the area from iSimangaliso northwards into the POPMR represents the southern limit of the Mozambique coastal plain, characterised by a coastal dune cordon followed westwards by undulating, generally sandy vegetated hills terminating at the Lubombo mountains.

### **3.1.3 Geology and rainfall**

The geology and rainfall patterns of Maputaland combine to play a major role in determining vegetation types and consequent biodiversity levels within the region (Smith 2001). Geologically the area is characterised by rhyolitic soils in the Lubombo Mountains, Cretaceous sediments in the centre of the region and a large area of coastal sands in the east (Watkeys, Mason & Goodman 1993).

From west to east, rainfall is relatively high in the Lubombo Mountains, lower in the central region and then increases with closer proximity to the Indian Ocean. All areas show strong seasonality with higher falls in summer. Cyclones develop in

summer off Madagascar and Mozambique and appear to be coming more frequent and intense with greater southerly penetration (Aramuge, Rocha & Silva 2014). The last major such events in the area occurred in January 1966 (Cyclone Claude) and January 1984 (Cyclone Domoina).

### 3.1.1 Coastal characteristics

The coastal areas, which extend along 100 km of Indian Ocean coastline, incorporate a mix of sandy beaches and rocky outcrops. This part of Africa's east coast is strongly influenced by the warm, southward flowing Agulhas current which has a marked influence on the biota of the region.

## 4 APPROACH AND METHODS



*Purple heron one of the more unusual heron species occupying wetland and estuary habitats*

As per the Terms of Reference this was a desktop study. No direct on-site observations nor field sampling were carried out. The approach taken was to use any available information in the published or, if judged suitable, the grey literature. In the context of this particular report, information on the avifauna was gleaned



from several publications as well as the available South African Bird Atlassing Programme (SABAP2). Both authors have a working knowledge of the terrestrial and coastal avifauna of iSimangaliso, northern KZN and the southern Mozambique coastal area. Both authors also have a working experience of Inhaca Island, Maputo Bay and the Rio Maputo estuary as well as visits to the Katembe region and other coastal areas of Mozambique.

The 638 references provided to the specialists were scanned by title and further note taken of the papers dealing with the avifauna in relation to their potential relevance for the motivation for WHS status.

## 5 LIMITATIONS AND GAPS IN KNOWLEDGE



*African Jacana an inhabitant of wetland, river and estuary habitats where floating aquatic vegetation is able to thrive.*

Birds are typically the most obvious animal types in both natural, agricultural and urban environments and many have adapted to or tolerate greater proximity to humans than mammals, reptiles or amphibians. The selected publications listed above indicate a substantial foundation of knowledge of the avifauna of the study area, and very likely much more information exists than for the northern areas of the country although this is changing as these areas become more attractive and accessible to researchers, tourists and in particular birders.

The major limitation and possible gap in the present assessment process arise from the fact that the 10 publications listed above cover a period of some 40 years, and therefore provide some degree of historical changes, but the most recent is some 10 years old. This however would be compensated for by the availability of the Southern African Bird Atlas Programme 2 (SABAP 2) data which is being co-ordinated by the Percy Fitzpatrick Institute and has Mozambique participating in the programme as well as many other countries in Africa (Figure 5-1). The figure indicates the areas where recording of species and locality have occurred relative to

the study area and any gaps in these records are only be limited by low number of observers and access to different areas. This technology is relatively recent and its application in this area has not yet reached its full potential so although some data exist it is not data rich. It is noteworthy that in the South African context this SABAP programme resulted in gross changes in distribution maps after the first round of analysis and this should be borne in mind when considering future monitoring of the birds of this WHS study area.

It can be assumed that the species list is fairly comprehensive for the area, but abundance and population trend data are extremely limited as will be any quantified effect of anthropogenic impacts.

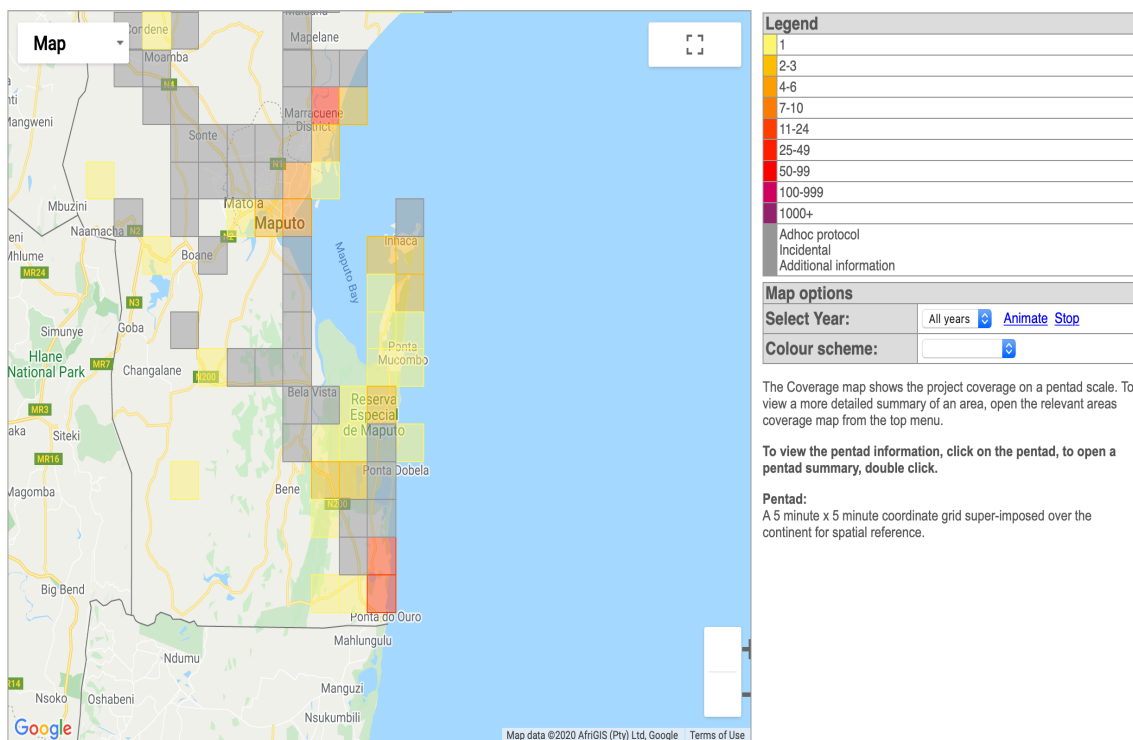


Figure 5-1 Pentads which have data collected within the WHS study area as part of the SABAP2 BirdMap project. The number of cards collected range from 1 – 20 full protocol cards and a few ad-hoc protocol cards.



## 6 THE AVIFAUNA OF THE WHS NOMINATION AREA



*Pied Kingfisher – one of the five kingfishers in the region that rely on fish for food.*

### 6.1 Country overview

The avifauna of Mozambique is generally shared with neighbouring countries and at least 674 species have been recorded (although a total as high as 735 is reported by MICOA) with at least 530 that breed within the country. Throughout the country there are considered to be only two endemic species *Apalis lynesii* and *Antisornis sousae* and a number of near-endemic and range restricted species mostly associated with special montane habitats such as Gorongosa, Namuli and the Njesi Highlands. Despite the fairly high number of bird species recorded, the avifauna of Mozambique is still one of the least studied on the African continent (Borghesio *et al.* 2009).

In general, two distinct bird communities exist in Mozambique with the boundary between them coinciding more or less with the Zambezi river. North of the Zambezi, birdlife is largely shared with that of East Africa whilst south of the Zambezi, it is



characteristic of South Africa. The forest-restricted birds are amongst the most rare, localised and endangered species from a conservation point of view, while the long coastline with extensive intertidal flats, major lowland rivers and flood-plains and the abundance of marshes and lakes all make the country extremely important for shorebirds and waterbirds. The coastal lake fringes and intertidal estuary and shoreline habitats provide highly significant wintering grounds for large numbers of Palearctic migrants during the Austral summer. The coastal barrier lakes are potential 'hotspots' for avifauna (Parker, 1999).

Bird surveys on Inhaca Island in the north of the POPMR resulted in 125 species being listed by Macnae & Kalk (1969) of which 19 were recorded breeding in either December 1953 or September 1957. In 1999 an atlas of the birds of southern Mozambique was produced and represented the first stage of the Mozambique Bird Atlas Project. Combining the Inhaca data with the extensive data set of Parker (1999) with that obtained from the South African Bird Atlassing Programme (SABAP2) which covers this area of Mozambique produced a total of 343 species (Appendix A), none of which is restricted exclusively to the study area, i.e. there are no endemic species in the study area. Despite this list very likely a slight underestimate of the areas potential the species composition indicates a community very similar to the adjacent northern KwaZulu-Natal area and the iSimangaliso Wetland Park which in terms of topography and biota reflect the Mozambique coastal plain. Despite the possibility that another 20 -30 species might be added to this list with time and detailed survey, the species diversity reflected in this relatively small area is extraordinary and compares well against the national total of approximately 674 species.

## 6.2 Important Birding Areas<sup>1</sup>

There are 15 Important Bird Areas (IBAs) designated by BirdLife International in Mozambique covering approximately 13,890 km<sup>2</sup>. One site is fully protected, 5 are

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<sup>1</sup> It is important to note that the IBAs globally are being integrated into a new broader categorisation of KBAs – Key Biodiversity Areas. As of the date of this revision this is still a work in progress.



partly protected and the remaining 9 are unprotected. The only IBAs relevant to the study area is the Maputo Special Reserve (MZ001).

The Maputo Special Reserve consists of the coastal plain lying between the Futi Channel and the Indian Ocean at the south end of the Bay of Maputo. It consists of a mosaic of forest, woodland, grassland, marshes and lakes. It forms the northern end of the IUCN-listed Maputaland Centre of Plant Endemism. The forest and woodland habitats are also represented in conservation areas in the adjacent part of South Africa, but it is only in this reserve that significant areas of the grassland habitats are protected. The impact of human activity in the area to date has been light, and much of the reserve is pristine. Between 500 and 1,300 inhabitants practise agriculture and fishing, under the control of reserve authorities.

### 6.3 Specific information sources available for the study area

The Macnae & Kalk (1969) and Kalk (1995) volumes on “The Natural History of Inhaca Island” provided general biotic species lists for Inhaca Island, beginning largely with the 1969 volume which represented a revision of an earlier 1958 edition. The initial focus on the island and its surrounds was subsequently expanded by Clancey (1971) through his “handlist” of the birds of southern Mozambique. Nhancale *et al.* (1998) discussed the significance of the alien Indian house crow on the island. De Boer & Bento (1999), in collaboration with Birdlife South Africa produced a dedicated guide to the birds of the island, the first such publication. Parker (1999) hugely extended ornithological studies in Mozambique by producing an atlas of species distribution south of the Save River based on quarter degree squares which provided highly significant background to this document. During the same period Fishpool & Evans (2001) produced a volume on Important Birding Areas in Africa which incorporated priority conservation sites, amongst which was the Maputo Special Reserve (MSR). This was based on a description of the birds of the MSR (Parker & de Boer 2000) produced under the auspices of the University of Cape Town Avian Demography Unit and the Endangered Wildlife Trust. More in depth studies were carried out (de Boer 2002) on species on a southern Mozambican mudflat and by Guldemond & van Aarde (2010) on the significance of forest patch size on bird diversity in Maputaland.



The MSR and Inhaca Island re-appear in the Southern African Birdfinder guidebook (Cohen, Spottiswoode & Rossouw 2006) as two significant birdwatching sites in southern Mozambique. The most recent and wide-ranging data set derives from the South African Bird Atlas Programme (SABAP2) which is based on records from squares referred to as pentads (5 minutes latitude by 5 minutes longitude) which provide a much finer definition than the quarter degree squares used previously. This has become possible because of technological advances in global positioning systems and bird identification apps which allow records of species presence and abundance and areas to be recorded using only a mobile cellular telephone.

## 6.4 Habitats across the study area and their associated bird communities

### 6.4.1 Wetland, Beach, Estuary and Marine Habitats

The long coastline with extensive intertidal flats, major lowland rivers and floodplains and the abundance of marshes and lakes all make the country important for waterbirds and shorebird

The main coastal species are the pelicans, the Great White *Pelecanus onocrotalus*, and Pink Backed *P. rufescens*, several storks viz. Woolly-necked *Ciconia episcopus*, Open-billed *Anastomus lamelligerus*, Saddle-billed *Ephippiorhynchus senegalensis* and Yellow-billed *Mycteria ibis* as well as Caspian tern *Hydroprogne caspia*.

During summer, large numbers of migrant waders occur in the Maputo estuary and intertidal mudflats around Inhaca Island and in the southern sections of Maputo Bay, including very high numbers of Common Ringed Plover *Charadrius hiaticula*, Curlew Sandpipers *Calidris ferruginea* and Little Stints *Calidris minuta*. Other waders include Grey Plover *Pluvialis squatarola*, Ruff *Philomachus pugnax* and Ruddy Turnstone *Arenaria interpres*; rare species that occasionally occur are Eurasian Curlew *Numenius arquata*, Bar-tailed *Limosa laponica* and Black-tailed Godwits *Limosa limosa*, Crab Plover *Dromas ardeola* and Pectoral Sandpiper *Calidris melanotis*. Other water birds that regularly utilise this area include Pied Avocet *Avocetta recurvirostra* and Goliath Heron *Ardea goliath*. A variety of terns, including Common



*Sterna hirundo*, Caspian Hydroprogne *caspia*, Little *Sternula albifrons* and Lesser Crested *Thalasseus bengalensis* regularly forage offshore and roost on sheltered sandbanks

Studies conducted by de Boer & Longamane (1996) and de Boer (2000) demonstrated that human activities in intertidal habitats have serious impacts on shorebirds and migratory waders. They observed a negative correlation between foraging time and human presence. Exploitation of littoral organisms by the local population is common along the Mozambican coast. This represents a potential threat to the conservation of shorebirds and waders as does the accelerated growth of the tourist industry along the Mozambican coast.

Inhaca island supports a variety of bird communities due to the diversity of habitats which include mangroves, freshwater swamps, mudflats and dune forest. Most notably, a selection of tropical coast species is reliably found here with what would be considered to be birdwatching drawcard species or 'specials' as they are known such as Western Osprey *Pandion haliaetus*, Sooty Falcon *Falco concolor*, Greater Sand Plover *Charadrius leschenaultii*, Green Malkoha *Ceuthmocares australis*, Mangrove Kingfisher *Halcyon senegaloides* and Eastern Olive Sunbird *Cyanomitra olivacea* (Cohen *et al.* 2006). Of these *H. senegaloides* is a mangrove swamp specialist in estuaries in northern KZN during the winter months. There are probably less than 100 individual birds in the South African population. The Mozambique mangroves are likely to support a much higher number of these charismatic and localised birds.

Along the coastline, Grey-headed *Larus cirrocephalus* and Kelp Gull *Larus dominicanus* and seasonal small numbers of Cape Cormorant *Phalacrocorax capensis* occur. White-fronted Plover *Charadrius marginatus* are residents on beaches, nesting in dune slacks while migratory Sanderling *Calidris alba* forage in the swash zone on the shore in summer. A number of offshore seabird species are present in the coastal waters outside their breeding season. These include Cape Gannet *Morus capensis*, White-chinned Petrel *Procellaria aequinoctialis*, and Shy *Thalassarche cauta*, Indian Yellow-nosed *T. carteri* and Black-browed Albatross *T. melanophris*. Rare tropical seabirds come south from their breeding grounds off northern



Mozambique and are occasionally present. These include Red-footed Booby *Sula sula*, Greater Frigatebird *Fregatta minor* and Tropical Shearwater *Puffinis bailloni*, and it is likely that more attention given to these offshore waters will produce further species that are currently considered rare in South African waters.

#### 6.4.2 Terrestrial habitats

The terrestrial habitats of grassland, savannah and forests are found throughout this area and are best represented within the Maputo Special Reserve which covers an area of 104 000 ha and has a mosaic of forest, woodland, grassland, marshes and lakes within it. Spotted Ground Thrush *Geokichla guttata* has recently been discovered here and may be a breeding resident. Southern Banded Snake Eagle *Circaetus fasciolatus* is a breeding resident, as is Neergards Sunbird *Nectarinia neergardi*, which is also a near-endemic to southern Mozambique, with more than 5% of its global population occurring at this site. Another restricted-range species here is Brown Scrub-robin *Cercotrichas signata*, a significant species of the South African forests EBA (EBA 089). The extensive marshes and flooded grasslands hold notable numbers of rails/crakes and other marshland species, including Wattled crane *Balearica regulorum* and Hottentot Buttonquail *Turnix hottentotus*. It is listed by BirdLife International as an Important Bird and Biodiversity Area (IBA) and this status is triggered by the occurrence of some IUCN red-listed threatened and range restricted species (Table 6-1).

Table 6-1: Populations of IBA trigger species (BirdLife International 2019). Code: NT Near Threatened; EN Endangered; LC Least Concern

Species	Current IUCN Red List Category	Season	Year(s) of estimate	Population estimate
Southern Banded Snake-eagle <i>Circaetus fasciolatus</i>	NT	resident	1999	present
Cape Vulture <i>Gyps coprotheres</i>	EN	unknown	-	unknown
Brown-headed Parrot	LC	resident	1999	present



**CENTRO TERRA VIVA**

<i>Poicephalus cryptoxanthus</i>				
Woodwards' Batis <i>Batis fratrum</i>	LC	resident	1999	present
Gorgeous bushshrike <i>Telophorus quadricolor</i>	LC	resident	1999	present
Rudd's Apalis <i>Apalis ruddi</i>	LC	resident	1999	present
Black-bellied Starling <i>Notopholia corusca</i>	LC	resident	1999	present
Spotted Ground-thrush <i>Geokichla guttata</i>	EN	resident	1999	present
Grey Sunbird <i>Cyanomitra verreauxii</i>	LC	resident	1999	present
Neergaard's Sunbird <i>Cinnyris neergaardi</i>	NT	resident	1999	present
Pink-throated Twinspot <i>Hypargos margaritatus</i>	LC	resident	1999	present

It is important to note that while the forest and woodland habitats are also represented in conservation areas in the adjacent part of South Africa (iSimangaliso/Tembe), it is only in this reserve that significant areas of the grassland habitats are protected. This makes this an extremely significant regional area for grassland, wetland and woodland birds. The impact of human activity in the area to date has been light, and much of the reserve is considered pristine (BirdLife International 2019). A proposal for the development of a harbour at the southern boundary of the reserve is currently being considered. The accompanying industrial development would encroach significantly into the reserve. Vegetation clearing mooted for the construction of a new powerline through the reserve threatens to remove a significant area of pristine forest.

Riverine forest, typically dominated by big trees such as *Ficus sycamorus*, *Acacia xanthophloea* and *Trichilia emetica*, with thickets of scrambling trees and shrubs, lines the rivers, pans and lakes. Although riverine forest shares some species with coastal forest, its species diversity is generally poorer. It does, however, hold a number of uncommon habitat restricted species such as Pel's Fishing Owl *Scotopelia peli*.

Another rare nocturnal species, the White-backed Night Heron *Gorsachius leuconotus*, roosts in riverine thickets during the day and leaves its roost at dusk to forage. The Palmnut Vulture *Gypohierax angolensis*, which feeds primarily on Raphia palm fruit, is a more northern species which extends along the coast through this



area into KZN. Fruits produced by the sycamore figs support Brown-headed Parrot *Piocephalus cryptozanthus*, African Green Pigeon *Treron calvus*, Crowned Tockus *alboterminatus* and Trumpeter Hornbill *Bycanistes bucinator*, and White-eared Barbet *Stactolaema leucotis*, African Yellow White-eye *Zosterops senegalensis*, Cape White-eye *Zosterops capensis* and Scaly-throated Honeyguide *Indicator variegatus* forage in the canopy, while Green Malkoha *Ceuthmochares aereus*, Black-throated Wattle-eye *Platysteira peltata*, African Pygmy-Kingfisher *Ispidina picta* and Brown Robin-Chat *Cercotrichs signata* prefer the thicker tangles. During summer Broad-billed Roller *Eurystomus glaucurus* occur along riverine forest edges as do the nocturnal Fiery-necked Nightjar *Caprimulgus pectoralis* and Square-tailed Nightjar *Caprimulgus fossii*. Rare and localised species that may be found in riverine forest include Sooty Falcon *Falco concolor* (summer) and Bat Hawk *Macheiramphus alcinus*. Red data species include Southern Banded Snake Eagle *Circaetus fasciolatus*, White-backed Night Heron *Gorsachius leuconotus*, Pel's Fishing Owl *Scotopelia peli*, and Black-throated Wattle-eye *Platysteira peltata*.

## 6.5 Noteworthy records

Cohen, Spottiswoode & Rossouw (2006), in their guide book on where to find 1400 bird species in southern Africa and Madagascar, list several rare or localised species also known as "specials" for the Maputo Special Reserve (MSR), viz. African pygmy goose *Nettapus auritus*, Southern banded snake-eagle *Circaetus fasciolatus*, Black-rumped buttonquail *Turnix nanus*, Senegal lapwing *Vanellus lugubris*, Lesser jacana *Microparra capensis*, Black coucal *Centropus grillii*, African broadbill *Smithornis capensis*, Rosy-throated longclaw *Macronyx ameliae*, Woodward's batis *Batis fratrum*, Neergard's sunbird *Cinnyris neergardi* and Pink-throated twinspot *Hypargos margaritatus*. Their Inhaca Island "specials" consist of Green malkoha *Ceuthmochares australis*, Olive sunbird *Cyanomitra olivacea*, Sooty falcon *Falco concolor*, Greater sandplover *Charadrius leschenaultii*, Osprey *Pandion haliaetus* and Mangrove kingfisher *Halcyon senegaloides*.





## 6.6 Values and Threats

Aside from the natural features and beauty of the area which lends itself to nature-based tourism the bird fauna described above are a significant drawcard for growing eco-tourism market and in particular avitourism<sup>2</sup>. The potential for growth of this sector from an international market and to some extent domestic is considered to be quite significant. Avitourism's potential contribution to South Africa's GDP is in the range of R1,205 billion to R2,243 billion annually. Although there are no species in the study area that cannot be seen elsewhere in the southern African region the abundance of these rarer species in this more northern area is highly likely and would need to be confirmed by the baseline surveys already mentioned and the avian significance of the area would lie in the presence of habitats under threat in the southern or northern areas relative to this area.

Most of the threats to birds are rooted in anthropogenic activities: deforestation, hunting (series threat to larger species such as ostrich), cage-bird trade, trade in traditional medicine and use of poisons to protect crops against insect pests and problematic animals. The degradation of floodplains and wetlands due to the exploitation of water resources for agriculture and construction of dams is likely to affect negatively the bird populations living in these habitats (Parker, 1999; Bento & Beilfuss, 2003; [www.iucnredlist.org](http://www.iucnredlist.org)).

Specific laws regulate hunting in Mozambique (LLC 2013). Those laws permit hunting in determined areas, require hunters to obtain a license, and protect some animals. In Mozambique, Law No. 10 of July 7, 1999, establishes the principles and basic norms concerning the protection, preservation, and sustainable use of forest and wildlife resources. Law No. 10 is regulated by Decree No. 12 of June 6, 2002. The Penal Code criminalizes hunting activities that are not in accordance with hunting regulations. No mention of birds specifically was found within this but the

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<sup>2</sup> Avitourism refers to travel outside of one's usual environment (>40km from homebase), to view birds in their natural habitat.



overarching use of animal and wildlife as terminology would include birds (cf. Section 6.7)

## 6.7 Current Management Practices, Protection and Buffers

The formal protection of the MSR and its recognition as an EBA and IBA strengthens the conservation value and status for the IBA MZ001 which is situated in this area. The formal protection of the MSR also provides a layer of protection for both the habitat and the birds. Four Endemic Bird Areas (EBAs) overlap with Mozambique: South African forests; South-East African coast; Eastern Zimbabwe mountains; and Tanzania-Malawi mountains. The four Mozambican species of the South-East African coast EBA all have more than half of their global populations within Mozambique: Rudd's Apalis *Apalis ruddi*; Neergaard's Sunbird *Cinnyris neergaardi*; Pink-throated Twinspot *Hypargos margaritatus*; and Lemon-breasted Canary *Serinus citrinipectus*.

Additional legislative protection for birds has recently been drafted (2019 – it is unknown if this is already promulgated) by the Ministry of Land, Environment and Rural Development to protect Mozambique avifauna (Portuguese copy only available). This regulation applies to all existing birdlife or that occurs in Mozambican national territory, including inland and marine waters and associated islands under national jurisdiction, and to all public or private entities that, directly or indirectly, may influence birdlife in Mozambique. Via This regulation aims to regulate the protection, conservation and sustainable use of avifauna in order to guarantee its contribution to the ecological balance and the development of tourism and science<sup>3</sup>. Protection and conservation are ensured via the protection of habitats, nesting areas and specific listed species. Additional measures may also be instigated for the protection of birds at certain times related to migration and breeding as well as the protection of zones or areas where aggregations of birds occur or where endangered or endemic species are found. A list of protected species is also included and a total of 61 species are listed in order of their red-data

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<sup>3</sup> under the terms of article 68 of Law 16/2014, of 20 June, amended and republished by Law No. 5/2017, of 11 May



threat listing status (Appendix B). However, this list relates to the whole of Mozambique and a total of 35 species are relevant to the WHS study area and are highlighted in the table in red. The development of infrastructure and construction activities that may disturb specified species or areas is also prohibited under this regulation. A number of activities are regulated including birdwatching, with clear guidance provided regarding the observation of avifauna by birders, filmmakers, photographers and other types of observers. This also takes account of the places where this observation may occur be it community lands, sensitive habitats or reserve areas. The regulation is even more comprehensive by adding to the conservation and protection section, other sections providing regulations for aviculture, hunting, taxidermy, falconry and CITES listed species.

Many of the species which occur in this area are species sensitive to disturbance (particularly the Palearctic waders), and habitat fragmentation (many of the forest species). Therefore, management practices and buffer zones would need to take particular species and ecotone habitats into account once detailed distribution maps and species diversity in different areas is firmly documented.

## 7 DISCUSSION AND CONCLUSIONS



Comparative avifaunal diversity is an excellent indicator of ecosystem stability because birds respond quickly to changes in their environments. Ecologically, birds are of significance as pollinators and help in seed dispersal. Although many other species are used as indicators, birds have the advantage in that they play a major role in attracting human attention. Furthermore, birds are relatively easy to observe and monitor. Avifaunal species assemblages are subject to fluctuations, and bird populations respond to these changes often in predictable ways. Their response varies with scale, magnitude and degree to which they face a specific impact. Direct responses are behavioural at an individual level and physiological at population levels. These impacts can influence the birth rate, death rate, and distribution of species. Therefore, along with other integrated parameters, abundance and diversity of avifaunal species can serve as an effective ecological health indicators. The concept of using birds as indicators for recognizing land ecosystems rich in biological diversity has now gained a wide global acceptance.



Birds remaining in relatively fragmented habitats are affected by human activities associated with urbanization. The focus area for WHS inscription being looked at here is under increasing pressure which may influence bird richness and abundance and therefore a baseline survey of this area as soon as possible is recommended as responses to changes can be rapid when the avifauna are considered. Thereafter using international protocols for the census of birds in different habitats would be the best starting point to assess forest, grassland and waterbirds for future monitoring. The areas would need to have a baseline survey carried out first to assess the

For an area to gain WHS status it needs to meet at least one of 10 criteria. The following three criteria were invoked in the case of the successful application for recognition of the iSimangaliso Wetland Park as a WHS. Due to its general similarity to the iSimangaliso environment, the same criteria were followed, *viz.* the area should:

- ❖ contain *superlative natural phenomena* (Authors' italics) or areas of exceptional natural beauty and aesthetic importance;
- ❖ provide outstanding examples representing significant *on-going ecological processes* (Authors' italics) in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals;
- ❖ should contain the most significant natural habitats for *in-situ conservation of biological diversity* including those containing threatened species of outstanding universal value from the point of view of *science and conservation*. (Authors' emphasis).

It can be therefore said with certainty that the bird fauna of this area is highly significant and has been recognized as such by the international birding panel which assesses areas for inclusion in the Important Bird Area network. This is because not only is there high diversity, but the area represents an exceptionally important staging area for migratory birds because of the vast expanses of intertidal habitat rich in food resources and open areas with little or no disturbance from people.



None of the species listed in Appendix A is endemic to the area under consideration, *i.e.* they are not unique to the MSR and POPMR, but much more significantly many are at the limits of their range or are highly habitat specific which renders them vulnerable to habitat loss. The prevalence of range shrinkage in many species is readily apparent from the longstanding absence of species such as Rosy-throated Longclaw *M. ameliae*, Swamp Nightjar *Caprimulgus natalensis* and Southern Banded Snake Eagle *Circaetus fasciolatus* from the adjacent South African **type** localities near Durban.

Arguably the most significant case for the proclamation of the MSR and POPMR as a WHS is the regional and global value, of the large areas of intertidal mudflats and seagrass beds, in the south-eastern area of Maputo Bay, Inhaca Island and Machangulo Peninsular. In this area the 3.9m semi-diurnal spring tidal range generates an immense habitat and food resource for migratory wading birds which are in a serious decline world-wide, very often because of habitat loss. It is critical to note that the intertidal habitat in this area is on a scale that dwarfs any similar habitat in iSimangaliso or in other sections of the POPMR. Some rarer species such as Great Bittern would favour the areas surrounding the coastal lakes adding to the value of the habitat mosaic in this region.

The significant areas of coastal forests, coastal grasslands, mesic grasslands and moist habitats surrounding wetlands and pans in this area also dwarfs similar habitats to the south making this highly significant for the rarer, localised forest bird species, wetland and grassland specialists. Of these, species such as Southern Banded Snake Eagle, a breeding resident which is critically endangered, would be illustrative of the importance of protection of these areas. It is very probable that the abundance of species which are known hard to find bird watching targets in northern Zululand would be much more abundant across this area. Species such as Plain-backed Sunbird, Rudd's Apalis, Woodward's Batis and Pink-throated Longclaw to name only a few of these would be significant ecotourism attractions for people visiting this area.



Acceptance of the POPMR as a WHS would significantly increase the protected regional area. It would also represent a major extension of the habitats in the iSimangaliso Wetland Park resulting in a major gain in habitat diversity and size, both which would improve the ecological resilience of the area. Therefore, through the lens of the bird fauna the existence of *superlative natural phenomena* (first criterion listed above) could very likely be mooted. The information available also provides very strong support in relation to the second (*on-going ecological processes*) and third criterion (*in-situ conservation of biological diversity*) listed above. There are significant *ongoing ecological processes* in terms of the interactions between marine, estuarine and freshwater environments and their biota, which maintain the high levels of productivity characteristic of these coastal systems, which in turn feed through to the many resident and migratory bird species using the intertidal habitats of southern Maputo Bay. The proposed area stands to make a significant contribution to the maintenance and *conservation of biological diversity* in southern Mozambique and to the general conservation of the Albany-Pondoland-Maputaland biological hotspot.

in an era of increasing global habitat loss, the POPMR is highly worthy of consideration as a WHS in its own right irrespective of whether this should occur as an extension or in conjunction with iSimangaliso.

Some of the advantages include

- ❖ High species diversity, richness and abundance;
- ❖ Complementary wildlife attractions A variety of different ecological biomes in close proximity to each other providing for varied holiday attractions (beaches, elephant parks, coastal forest trails, diving, fishing).
- ❖ Ease of viewing large numbers of birds quickly, e.g. avitourists can look forward to a two-week trip expectation of 200 - 300+ species list, a higher expectation than a two-week trip in other competing markets

The obvious advantage of a larger protected expanse of coastal habitats goes without saying but a stand-alone argument for the POPMR as a WHS would still hold.



However, having both with synchronous and integrated management across the region which takes account of the whole area could result in better management policies and outcomes with regional and global benefits to the natural environment and processes.





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## 9 APPENDIX A. Species recorded in study area

(list compiled by the authors using the latest SABAP2 data for this particular area of Mozambique)

Family	Species	Common Name
Podicipedidae	<i>Podiceps cristatus</i>	Great Crested Grebe
	<i>Tachybaptus ruficollis</i>	Little Grebe
Pelecanidae	<i>Pelecanus rufescens</i>	Pink Billed Pelican
	<i>Pelecanus onocrotalus</i>	Great White Pelican
Sulidae	<i>Morus capensis</i>	Cape Gannet
Phalacrocoracidae	<i>Phalacrocorax carbo</i>	White Breasted Cormorant
	<i>Phalacrocorax capensis</i>	Cape Cormorant
	<i>Phalacrocorax africanus</i>	Reed Cormorant
Ardeidae	<i>Ardea cinerea</i>	Grey Heron
	<i>Ardea goliath</i>	Goliath Heron
	<i>Ardea melanocephala</i>	Black Headed Heron
	<i>Ardea purpurea</i>	Purple Heron
	<i>Egretta alba</i>	Great Egret
	<i>Egretta garzetta</i>	Little Egret
	<i>Egretta intermedia</i>	Intermediate Egret
	<i>Egretta ardesiaca</i>	Black Heron
	<i>Bubulcus ibis</i>	Cattle Egret
	<i>Ardeola ralloides</i>	Squacco Heron
	<i>Butoroides striata</i>	Green Backed Heron
	<i>Nycticorax nycticorax</i>	Black Crowned Night Heron
	<i>Ixobrychus minutus</i>	Little Bittern
	<i>Ixobrychus sturmi</i>	Dwarf Bittern
Scopidae	<i>Scopus umbretta</i>	Hamerkop
Ciconiidae	<i>Ciconia ciconia</i>	White Stork
	<i>Ciconia nigra</i>	Black Stork
	<i>Ciconia episcopus</i>	Woolly Necked Stork
	<i>Anastomus lamelligerus</i>	African Open Bill
	<i>Ciconia abdimii</i>	Abdim's Stork
	<i>Ephippiorhynchus senegalensis</i>	Saddle Billed Stork
	<i>Leptoptilus crumeniferus</i>	Marabou Stork
	<i>Mycteria ibis</i>	Yellow Billed Stork
Threskiornithidae	<i>Threskiornis aethiopicus</i>	Sacred Ibis
	<i>Plegadis falcinellus</i>	Glossy Ibis
	<i>Bostrychia hagedash</i>	Hadedah Ibis
	<i>Platalea alba</i>	Spoonbill
Phoenicopteridae	<i>Phoenicopterus ruber</i>	Greater Flamingo
	<i>Phoenicopterus minor</i>	Lesser Flamingo
Anatidae	<i>Dendrocygna viduata</i>	White Faced Duck



**CENTRO TERRA VIVA**

Family	Species	Common Name
Sagittariidae Accipitridae	<i>Dendrocygna bicolor</i>	Fulvous Duck
	<i>Thalassornis leuconotus</i>	White Backed Duck
	<i>Anas undulata</i>	Yellow Billed Duck
	<i>Anas capensis</i>	Cape Teal
	<i>Anas hottentota</i>	Hottentot Teal
	<i>Anas erythrorhyncha</i>	Red Billed Teal
	<i>Netta erythrophthalma</i>	Southern Pochard
	<i>Sarkidiornis melanotus</i>	Knob Billed Duck
	<i>Alopochen aegyptiaca</i>	Egyptian Goose
	<i>Plectropterus gambensis</i>	Spur-Winged Goose
	<i>Nettapus auritus</i>	African Pygmy Goose
	<i>Sagittarius serpentarius</i>	Secretary Bird
	<i>Milvus aegyptius</i>	Yellow Billed Kite
	<i>Elanus caeruleus</i>	Black Winged Kite
	<i>Pernis apivorus</i>	Cuckoo Hawk
	<i>Aquila wahlbergi</i>	Wahlberg's Eagle
	<i>Lophaelix occipitalis</i>	Long Crested Eagle
	<i>Polemaetus bellicosus</i>	Martial Eagle
	<i>Stephanoaetus coronatus</i>	Crowned Eagle
	<i>Circaetus cinereus</i>	Brown Snake Eagle
	<i>Circaetus pectoralis</i>	Black Chested Snake Eagle
	<i>Circaetus fasciolatus</i>	Southern Banded Snake Eagle
	<i>Terathopius ecaudatus</i>	Bataleur Eagle
	<i>Gypohierax angolensis</i>	Palm Nut Vulture
	<i>Haliaeetus vocifer</i>	African Fish Eagle
	<i>Buteo vulpinus</i>	Steppe Buzzard
	<i>Kaupifalco monogrammicus</i>	Lizard Buzzard
<i>Accipiter badius</i>	Little Banded Goshawk (Shikra)	
<i>Accipiter minullus</i>	Little Sparrowhawk	
<i>Accipiter tachiro</i>	African Goshawk	
<i>Melierax gabar</i>	Gabar Goshawk	
<i>Circus ranivorus</i>	African Marsh Harrier	
<i>Polyboroides typus</i>	African Harrier Hawk	
Falconidae	<i>Falco concolor</i>	Sooty Falcon
	<i>Falco amurensis</i>	Amur Falcon
	<i>Falco vespertinus</i>	Red Footed Falcon
	<i>Falco rupicolus</i>	Rock Kestrel
Pandionidae	<i>Pandion haliaetus</i>	Osprey
Francolinidae	<i>Peliperdix coqui</i>	Coqui Francolin
	<i>Dendroperdix sephaena</i>	Crested Francolin
	<i>Scleroptila shelleyi</i>	Shelley's Francolin
	<i>Pternistis natalensis</i>	Natal Spurfowl
	<i>Pternistis afer</i>	Red Necked Spurfowl
	<i>Coturnix coturnix</i>	Common Quail
	<i>Coturnix delegorguei</i>	Harlequin Quail
	<i>Turnix sylvaticus</i>	Kurrichane Button Quail



**CENTRO TERRA VIVA**

Family	Species	Common Name
Numididae	<i>Numida meleagris</i>	Helmeted Guineafowl
	<i>Guttera edouardi</i>	Crested Guineafowl
Gruidae	<i>Balearica regulorum</i>	Grey Crowned Crane
Rallidae	<i>Rallus caerulescens</i>	African Rail
	<i>Amaurornis flavirostris</i>	Black Crake
	<i>Porphyrio madagascarensis</i>	African Purple Swamp Hen
	<i>Gallinula chloropus</i>	Common Moorhen
	<i>Fulica cristata</i>	Red-Knobbed Coot
	<i>Sarothrura rufa</i>	Red Chested Flufftail
Otididae	<i>Lissotis melanogaster</i>	Black Bellied Bustard
	<i>Neotis denhami</i>	Denham's Bustard
Jacanidae	<i>Actophilornis africanus</i>	African Jacana
	<i>Microparra capensis</i>	Lesser Jacana
Charadriidae	<i>Haematopus ostralegus</i>	Europasian Oystercatcher
	<i>Haematopus moquini</i>	Black Oystercatcher
	<i>Charadrius hiaticula</i>	Common Ringed Plover
	<i>Charadrius marginatus</i>	White Fronted Plover
	<i>Charadrius pallidus</i>	Chestnut Banded Plover
	<i>Charadrius pecuarius</i>	Kittlitz's Plover
	<i>Charadrius tricollaris</i>	Three-Banded Plover
	<i>Charadrius mongolus</i>	Lesser Sand Plover
	<i>Charadrius leschenaultii</i>	Greater Sand Plover
	<i>Pluvialis squatarola</i>	Grey Plover
	<i>Vanellus coronatus</i>	Crowned Lapwing
	<i>Vanellus lugubris</i>	Senegal Lapwing
	<i>Vanellus armatus</i>	Blacksmith Lapwing
	<i>Vanellus senegallus</i>	African Wattled Lapwing
Arenariidae	<i>Arenaria interpres</i>	Turnstone
Scolopacidae	<i>Xenus cinereus</i>	Terek Sandpiper
	<i>Actitis hypoleucos</i>	Common Sandpiper
	<i>Tringa glareola</i>	Wood Sandpiper
	<i>Tringa stagnatalis</i>	Marsh Sandpiper
	<i>Tringa nebularia</i>	Greenshank
	<i>Calidris ferruginea</i>	Curlew Sandpiper
	<i>Calidris minutus</i>	Little Stint
	<i>Calidris alba</i>	Sanderling
	<i>Philomachus pugnax</i>	Ruff
	<i>Limosa lapponica</i>	Bartailed Godwit
	<i>Numenius arquata</i>	Curlew
Recurvirostridae	<i>Recurvirostra avosetta</i>	Avocet
	<i>Himantopus himantopus</i>	Black Winged Stilt
Dromadidae	<i>Dromas ardeola</i>	Crab Plover
Burhinidae	<i>Burhinus capensis</i>	Spotted Thick-Knee
	<i>Burhinus vermiculatus</i>	Water Thick-Knee
Glareolidae	<i>Glareola pratincola</i>	Collared Pratincole



**CENTRO TERRA VIVA**

Family	Species	Common Name
Stercoraridae	<i>Stercorarius pomarinus</i>	Pomarine Jaeger
Laridae	<i>Larus dominicanus</i>	Kelp Gull
	<i>Larus fuscus</i>	Lesser Black Nacked Gull
	<i>Larus cirrocephalus</i>	Grey Headed Gull
	<i>Sterna caspia</i>	Caspian Tern
	<i>Sterna bergii</i>	Swift Tern
	<i>Sterna bengalensis</i>	Lesser Crested Tern
	<i>Sterna sandvicensis</i>	Sandwich Tern
	<i>Sterna hirundo</i>	Common Tern
	<i>Sterna dougalli</i>	Roseate Tern
	<i>Sterna fuscata</i>	Sooty Tern
	<i>Sterna albifrons</i>	Little Tern
	<i>Chlidonias hybrida</i>	Whiskered Tern
	<i>Chlidonias leucopterus</i>	White Winged Tern
	Columbidae	<i>Streptopelia semitorquata</i>
<i>Streptopelia capicola</i>		Cape Turtle Dove
<i>Streptopelia senegalensis</i>		Laughing Dove
<i>Oena capensis</i>		Namaqua Dove
<i>Turtur chalcospilos</i>		Emerald-Spotted Wood-Dove
<i>Turtur tympanistra</i>		Tambourine Dove
Psittacidae	<i>Treron calvus</i>	African Green-Pigeon
	<i>Poicephalus cryptoxanthus</i>	Brown Headed Parrot
Musophagidae	<i>Tauraco livingstonii</i>	Livingstone's Turaco
	<i>Gallirex porphyreolophus</i>	Purple Crested Turaco
Cuculidae	<i>Cuculus solitarius</i>	Red Chested Cuckoo
	<i>Cuculus clamosus</i>	Black Cuckoo
	<i>Chrysococcyx klaas</i>	Klaas' Cuckoo
	<i>Chrysococcyx caprius</i>	Diederik Cuckoo
	<i>Ceuthmochares aereus</i>	Green Malkoha
	<i>Centropus burchelli</i>	Burchell's Coucal
Tytonidae	<i>Tyto alba</i>	Barn Owl
	<i>Tyto capensis</i>	Grass Owl
Strigidae	<i>Strix woodfordi</i>	African Wood-Owl
	<i>Asio capensis</i>	Marsh Owl
	<i>Ptilopsis granti</i>	Southern White-Faced Scops-Owl
	<i>Glaucidium capense</i>	African Barred Owlet
	<i>Bubo africanus</i>	Spotted Eagle Owl
	<i>Scotopelia peli</i>	Pel's Fishing-Owl
Caprimulgidae	<i>Caprimulgus pectoralis</i>	Fiery Necked Nightjar
	<i>Caprimulgus fossii</i>	Square-Tailed Nightjar
Apodidae	<i>Apus affinis</i>	Little Swift
	<i>Cypsiurus parvus</i>	African Palm Swift
Coliidae	<i>Colius striatus</i>	Speckled Mousebird
	<i>Urocolius indicus</i>	Red-Faced Mousebird
Trogonidae	<i>Apaloderma narina</i>	Narina Trogon
Alcedinidae	<i>Ceryle rudis</i>	Pied Kingfisher



**CENTRO TERRA VIVA**

Family	Species	Common Name
	<i>Megaceryle maxima</i>	Giant Kingfisher
	<i>Alcedo cristata</i>	Malachite Kingfisher
	<i>Ispidina picta</i>	Pygmy Kingfisher
	<i>Halcyon senegaloides</i>	Mangrove Kingfisher
	<i>Halcyon albiventris</i>	Brown Hooded Kingfisher
	<i>Halcyon chelicuti</i>	Striped Kingfisher
Meropidae	<i>Merops apiaster</i>	European Bee-Eater
	<i>Merops superciliosus</i>	Madagascar Bee-Eater
	<i>Merops persicus</i>	Blue Cheeked Bee-Eater
	<i>Merops bullockoides</i>	White-Fronted Bee-Eater
	<i>Merops pusillus</i>	Little Bee-Eater
Coraciidae	<i>Coracias garrulus</i>	European Roller
	<i>Coracias caudatus</i>	Lilac Breasted Roller
	<i>Eurystomus glaucurus</i>	Broad Billed Roller
Upupidae	<i>Upupa africana</i>	Hoopoe
Phoeniculidae	<i>Phoeniculus purpureus</i>	Green Wood-Hoopoe
	<i>Rhinopomastus cyanomelas</i>	Common Scimitarbill
Bucerotidae	<i>Bycanistes bucinator</i>	Trumpeter Hornbill
	<i>Tockus alboterminatus</i>	Crowned Hornbill
	<i>Tockus leucomelas</i>	Southern Yellow-Billed Hornbill
Capitonidae	<i>Lybius torquatus</i>	Black Collared Barbet
	<i>Stactolaema leucotis</i>	White Eared Barbet
	<i>Pogoniulus pusillus</i>	Red-Fronted Tinkerbird
	<i>Pogoniulus lineatus</i>	Yellow-Rumped Tinkerbird
	<i>Trachyphonus vaillantii</i>	Crested Barbet
Indicatoridae	<i>Indicator indicator</i>	Greater Honeyguide
	<i>Indicator variegatus</i>	Scaly-Throated Honeyguide
	<i>Indicator minor</i>	Lesser Honeyguide
	<i>Prodotiscus regulus</i>	Brown-Backed Honeybird
Picidae	<i>Campethera abingoni</i>	Golden-Tailed Woodpecker
	<i>Dendropicos fuscescens</i>	Cardinal Woodpecker
	<i>Dendropicos namaquus</i>	Bearded Woodpecker
Jynxidae	<i>Jynx ruficollis</i>	Wryneck
Calyptomenidae	<i>Smithornis capensis</i>	Broadbill
Alaudidae	<i>Mirafra africana</i>	Rufous Naped Lark
	<i>Mirafra rufocinnamomea</i>	Flappet Lark
Hirundinidae	<i>Hirundo rustica</i>	Barn Swallow
	<i>Hirundo smithii</i>	Wire Tailed Swallow
	<i>Hirundo abyssinica</i>	Lesser Striped Swallow
	<i>Hirundo semirufa</i>	Red-Breasted Swallow
	<i>Pseudhirundo griseopyga</i>	Grey Rumped Swallow
	<i>Riparia cincta</i>	Banded Martin
	<i>Psalidoprocne holomelas</i>	Black Saw-Wing
	<i>Delichon urbicum</i>	Common House Martin
	<i>Campephaga flava</i>	Black Cuckooshrike
	<i>Coracina caesia</i>	Grey Cuckoo Shrike



**CENTRO TERRA VIVA**

Family	Species	Common Name
Dicruridae	<i>Dicrurus adsimilis</i>	Fork Tailed Drongo
	<i>Dicrurus ludwigii</i>	Square Tailed Drongo
Oriolidae	<i>Oriolus larvatus</i>	Black Headed Oriole
Corvidae	<i>Corvus albus</i>	Pied Crow
	<i>Corvus splendens</i>	Indian House Crow
Paridae	<i>Parus niger</i>	Southern Black Tit
Remizidae	<i>Anthoscopus caroli</i>	Grey Penduline Tit
Timaliidae	<i>Turdoides jardineii</i>	Arrow Marked Babbler
Pycnonotidae	<i>Pycnonotus tricolor</i>	Dark-Capped Bulbul
	<i>Phyllastrephus terrestris</i>	Terrestrial Brownbul
	<i>Andropadus importunus</i>	Sombre Greenbul
	<i>Chlorocichla milanjensis</i>	Yellow-Bellied Greenbul
Nicatoridae	<i>Nicator gularis</i>	Eastern Nicator
Turdidae	<i>Turdus libonyana</i>	Kurrichane Thrush
Muscicapidae	<i>Oenanthe pileata</i>	Capped Wheatear
	<i>Cercomela familiaris</i>	Familiar Chat
	<i>Saxicola torquatus</i>	Stone Chat
	<i>Cercotrichas leucophrys</i>	White Browed Scrub-Robin
	<i>Cercotrichs signata</i>	Brown Scrub-Robin
	<i>Cossypha heuglini</i>	White-Browed Robin-Chat
	<i>Cossypha humeralis</i>	White-Throated Robin-Chat
	<i>Cossypha natalensis</i>	Red-Capped Robin-Chat
	<i>Cossypha caffra</i>	Cape Robin-Chat
	<i>Cossypha natalensis</i>	Red-Capped Robin-Chat
	<i>Muscicapa striata</i>	Spotted Flycatcher
	<i>Muscicapa adusta</i>	African Dusky Flycatcher
	<i>Muscicapa caerulea</i>	Ashy Flycatcher
	<i>Myioparus plumbeus</i>	Grey Tit-Flycatcher
	<i>Melaeornis pammelaina</i>	Southern Black Flycatcher
	<i>Sigelus silens</i>	Fiscal Flycatcher
	<i>Bradornis pallidus</i>	Pallid Flycatcher
	<i>Batis molitor</i>	Chin-spot Batis
	<i>Batis fratrum</i>	Woodward's Batis
	<i>Platysteira peltata</i>	Black-Throated Wattle-Eye
<i>Trochocercus cyanomelas</i>	Blue-Mantled Crested-Flycatcher	
<i>Terpsiphone viridis</i>	African Paradise Flycatcher	
<i>Apalis ruddi</i>	Rudd's Apalis	
Macrosphenidae	<i>Sylvietta rufescens</i>	Long Billed Crombec
Cisticolidae	<i>Eremomela scotops</i>	Green Capped Eremomela
	<i>Camaroptera brachyura</i>	Green Backed Camaroptera
	<i>Cisticola juncidis</i>	Zitting Cisticola
	<i>Cisticola textrix</i>	Cloud Cisticola
	<i>Cisticola cinnamomeus</i>	Pale Crowned Cisticola
	<i>Cisticola chiniana</i>	Rattling Cisticola
	<i>Cisticola erythrogastra</i>	Red Faced Cisticola
<i>Cisticola galactotes</i>	Rufous Winged Cisticola	





**CENTRO TERRA VIVA**

Family	Species	Common Name
Motacillidae	<i>Cisticola natalensis</i>	Croaking Cisticola
	<i>Cisticola fulvicapilla</i>	Neddicky
	<i>Prinia subflava</i>	Tawny Flanked Prinia
	<i>Motacilla aguimp</i>	African Pied Wagtail
	<i>Motacilla capensis</i>	Cape Wagtail
	<i>Anthus cinnamomeus</i>	African Pipit
	<i>Anthus trivialis</i>	Tree Pipit
	<i>Anthus caffer</i>	Bushveld Pipit
Laniidae	<i>Macronyx capensis</i>	Cape Longclaw
	<i>Macronyx croceus</i>	Yellow Throated Longclaw
	<i>Lanius collaris</i>	Common Fiscal
	<i>Lanius collurio</i>	Red Backed Shrike
	<i>Laniarius ferrugineus</i>	Southern Boubou
	<i>Dryoscopus cubla</i>	Black-Backed Puffback
	<i>Nilaus afer</i>	Brubru
	<i>Tchagra tchagra</i>	Southern Tchagra
Malaconotidae	<i>Tchagra australis</i>	Brown-Crowned Tchagra
	<i>Tchagra senegalus</i>	Black-Crowned Tchagra
	<i>Telophorus viridis</i>	Gorgeous Bush-Shrike
	<i>Telophorus sulfureopectus</i>	Orange-Breasted Bush Shrike
	<i>Telophorus olivaceus</i>	Olive Bush-Shrike
	<i>Malaconotus blanchoti</i>	Grey-Headed Bush-Shrike
	<i>Prionops plumatus</i>	White-Crested Helmet-Shrike
	<i>Prionops retzii</i>	Retz's Helmet-Shrike
Sturnidae	<i>Acridotheres tristis</i>	Common Mynah
	<i>Cinnyricinclus leucogaster</i>	Violet Backed Starling
	<i>Lamprotornis nitens</i>	Cape Glossy Starling
	<i>Lamprotornis corruscus</i>	Black Bellied Starling
Buphagidae	<i>Buphagus erythrorhynchus</i>	Red Billed Oxpecker
Nectarinidae	<i>Cinnyris mariquensis</i>	Marico Sunbird
	<i>Cinnyris bifasciatus</i>	Purple Banded Sunbird
	<i>Cinnyris neergaardi</i>	Neergaards Sunbird
	<i>Cinnyris talatala</i>	White Bellied Sunbird
	<i>Cyanomitra veroxii</i>	Grey Sunbird
	<i>Cyanomitra olivacea</i>	Olive Sunbird
	<i>Chalcomitra senegalensis</i>	Scarlet Chested Sunbird
	<i>Chalcomitra amethystina</i>	Amethyst Sunbird
	<i>Hedydipna collaris</i>	Collared Sunbird
	Zosteropidae	<i>Zosterops senegalensis</i>
<i>Zosterops virens</i>		Cape White-Eye
Passeridae	<i>Passer domesticus</i>	House Sparrow
	<i>Passer diffusus</i>	Southern Grey-Headed Sparrow
	<i>Petronia superciliaris</i>	Yellow Throated Petronia
Ploceidae	<i>Amblyospiza albifrons</i>	Thick-Billed Weaver
	<i>Ploceus bicolor</i>	Dark-Backed Weaver
	<i>Ploceus cucullatus</i>	Village Weaver



**CENTRO TERRA VIVA**

Family	Species	Common Name
	<i>Ploceus ocularis</i>	Spectacled Weaver
	<i>Ploceus velatus</i>	Southern Masked-Weaver
	<i>Ploceus intermedius</i>	Lesser Masked-Weaver
	<i>Ploceus subaureus</i>	Yellow Weaver
	<i>Ploceus xanthopterus</i>	Southern Brown-Throated Weaver
	<i>Quelea quelea</i>	Red-Billed Quelea
	<i>Euplectes orix</i>	Southern Red Bishop
	<i>Euplectes axillaris</i>	Fan-Tailed Widowbird
	<i>Euplectes ardens</i>	Red-Collared Widowbird
Estrildidae	<i>Pytilia melba</i>	Green-Winged Pytilia
	<i>Mandingoa nitidula</i>	Green Twinspot
	<i>Hypargus margaritatus</i>	Pink-Throated Twinspot
	<i>Lagonosticta rhodopareia</i>	Jameson's Firefinch
	<i>Lagonosticta senegala</i>	Red-Billed Firefinch
	<i>Uraeginthus angolensis</i>	Blue Waxbill
	<i>Estrilda astrid</i>	Common Waxbill
	<i>Estrilda perreini</i>	Grey Waxbill
	<i>Ortygospiza atricollis</i>	Quail Finch
	<i>Sporaeginthus subflavus</i>	Orange-Breasted Waxbill
	<i>Spermestes cucullata</i>	Bronze Mannikin
	<i>Spermestes bicolor</i>	Red Backed Mannikin
	<i>Spermestes fringilloides</i>	Pied Mannikin
Viduidae	<i>Vidua macroura</i>	Pin-Tailed Whydah
	<i>Vidua paradisaea</i>	Long-Tailed Paradise Whydah
Fringillidae	<i>Crithagra mozambica</i>	Yellow-Fronted Canary
	<i>Crithagra citrinipactus</i>	Lemon-Breasted Canary
	<i>Crithagra sulphurata</i>	Brimstone Canary
	<i>Crithagra gularis</i>	Streaky- Headed Seedeater
Emberizidae	<i>Emberiza flaviventris</i>	Golden Breasted Bunting

## 10 APPENDIX B – Avifaunal species listed as protected in Mozambique from the legislation regulating wild birds<sup>4</sup>

Family	Common Name	Scientific Name	Red Data Listing
Accipitridae	Rüppell's Vulture	<i>Gyps rueppellii</i>	CR
	<b>Hooded Vulture</b>	<b><i>Necrosyrtes monachus</i></b>	<b>CR</b>
	<b>White-backed Vulture</b>	<b><i>Gyps africanus</i></b>	<b>CR</b>
	<b>White-headed Vulture</b>	<b><i>Trionoceps occipitalis</i></b>	<b>CR</b>
Sylviidae	Long-billed Forest Warbler	<i>Artisornis moreaui</i>	CR
<b>Ardeidae</b>	<b>Malagasy Pond Heron</b>	<b><i>Ardeola idea</i></b>	<b>EN</b>
<b>Diomedidae</b>	<b>Atlantic Yellow-nosed Albatross</b>	<b><i>Thalassarche chlororhynchos</i></b>	<b>EN</b>
	<b>Indian Yellow-nosed Albatross</b>	<b><i>Thalassarche carteri</i></b>	<b>EN</b>
	Sooty Albatross	<i>Phoebetria fusca</i>	EN
<b>Phalacrocoracidae</b>	<b>Cape Cormorant</b>	<b><i>Phalacrocorax capensis</i></b>	<b>EN</b>
<b>Spheniscidae</b>	<b>African Penguin</b>	<b><i>Spheniscus demersus</i></b>	<b>EN</b>
<b>Sulidae</b>	<b>Cape Gannet</b>	<b><i>Morus capensis</i></b>	<b>EN</b>
<b>Accipitridae</b>	<b>Egyptian Vulture</b>	<b><i>Neophron percnopterus</i></b>	<b>EN</b>
	<b>Cape Vulture</b>	<b><i>Gyps coprotheres</i></b>	<b>EN</b>
	<b>Lappet-faced Vulture</b>	<b><i>Torgos tracheliotos</i></b>	<b>EN</b>
<b>Gruidae</b>	<b>Grey Crowned Crane</b>	<b><i>Balearica regulorum</i></b>	<b>EN</b>
Cisticolidae	Yellow-throated Apalis	<i>Apalis flavigularis</i>	EN
<b>Turdidae</b>	<b>Spotted Ground Thrush</b>	<b><i>Geokichla guttata</i></b>	<b>EN</b>
Acrocephalidae	Basra Reed-Warbler	<i>Acrocephalus griseldis</i>	EN
<b>Anatidae</b>	<b>Maccoa Duck</b>	<b><i>Oxyura maccoa</i></b>	<b>VU</b>
<b>Bucorvidae</b>	<b>Southern Ground-Hornbill</b>	<b><i>Bucorvus leadbeateri</i></b>	<b>VU</b>
Glareolidae	Madagascan Pratincole	<i>Glareola ocularis</i>	VU
Scolopacidae	Great Knot	<i>Calidris tenuirostris</i>	VU
<b>Ardeidae</b>	<b>White-backed Night-Heron</b>	<b><i>Gorsachius leuconotus</i></b>	<b>VU</b>
	Slaty Egret	<i>Egretta vinaceigula</i>	VU
Diomedidae	Wandering Albatross	<i>Diomedea exulans</i>	VU
Hydrobatidae	Matsudaira's Storm Petrel	<i>Oceanodroma matsudairae</i>	VU
	Leach's Storm Petrel	<i>Oceanodroma leucorhoa</i>	VU
<b>Procellariidae</b>	<b>White-chinned Petrel</b>	<b><i>Procellaria aequinoctialis</i></b>	<b>VU</b>
<b>Accipitridae</b>	<b>Martial Eagle</b>	<b><i>Polemaetus bellicosus</i></b>	<b>VU</b>
Gruidae	Wattled Crane	<i>Grus carunculata</i>	VU
Hirundinidae	Blue Swallow	<i>Hirundo atrocaerulea</i>	VU
Muscicapidae	Thyolo Alethe	<i>Chamaetylas choloensis</i>	VU

<sup>4</sup> REPÚBLICA DE MOÇAMBIQUE MINISTÉRIO DA TERRA, AMBIENTE E DESENVOLVIMENTO RURAL ANTE PROJECTO DE DECRETO QUE APROVA O REGULAMENTO SOBRE AVIFAUNA BRAVIA



Family	Common Name	Scientific Name	Red Data Listing
	Swynnerton's Robin	<i>Swynnertonia swynnertonii</i>	VU
Modulatricidae	Dapple-throat	<i>Arcanator orostruthus</i>	VU
<b>Charadriidae</b>	<b>Plover, Chestnut-banded</b>	<b><i>Charadrius pallidus</i></b>	<b>NT</b>
Glareolidae	Pratincole, Black-winged	<i>Glareola nordmanni</i>	NT
<b>Haematopodidae</b>	<b>Eurasian Oystercatcher</b>	<b><i>Haematopus ostralegus</i></b>	<b>NT</b>
<b>Laridae</b>	<b>African Skimmer</b>	<b><i>Rynchops flavirostris</i></b>	<b>NT</b>
<b>Scolopacidae</b>	<b>Eurasian Curlew</b>	<b><i>Numenius arquata</i></b>	<b>NT</b>
<b>Scolopacidae</b>	<b>Great Snipe</b>	<b><i>Gallinago media</i></b>	<b>NT</b>
	<b>Red-necked Stint</b>	<b><i>Calidris ruficollis</i></b>	<b>NT</b>
	<b>Bar-tailed Godwit</b>	<b><i>Limosa lapponica</i></b>	<b>NT</b>
	<b>Black-tailed Godwit</b>	<b><i>Limosa limosa</i></b>	<b>NT</b>
	<b>Curlew Sandpiper</b>	<b><i>Calidris ferruginea</i></b>	<b>NT</b>
	<b>Red Knot</b>	<b><i>Calidris canutus</i></b>	<b>NT</b>
<b>Diomedidae</b>	<b>Shy Albatross</b>	<b><i>Thalassarche cauta</i></b>	<b>NT</b>
	Light-mantled Albatross	<i>Phoebastria palpebrata</i>	NT
Hydrobatidae	Swinhoe's Storm Petrel	<i>Oceanodroma monorhis</i>	NT
<b>Phoenicopteridae</b>	<b>Lesser Flamingo</b>	<b><i>Phoeniconaias minor</i></b>	<b>NT</b>
<b>Procellariidae</b>	<b>Grey Petrel</b>	<b><i>Procellaria cinera</i></b>	<b>NT</b>
	Sooty Shearwater	<i>Ardenna griseus</i>	NT
	Jouanin's Petrel	<i>Bulweria fallax</i>	NT
	Flesh-footed Shearwater	<i>Ardenna carneipes</i>	NT
<b>Otididae</b>	<b>Kori Bustard</b>	<b><i>Ardeotis kori</i></b>	<b>NT</b>
	<b>Denham's Bustard</b>	<b><i>Neotis denhami</i></b>	<b>NT</b>
Cisticolidae	Namuli Apalis	<i>Apalis lynesii</i>	NT
	White-winged Apalis	<i>Apalis chariessa</i>	NT
Muscicapidae	East Coast Akalat	<i>Sheppardia gunningi</i>	NT
<b>Nectariniidae</b>	<b>Neergaard's Sunbird</b>	<b><i>Cinnyris neergaardi</i></b>	<b>NT</b>
Ploceidae	Olive-headed Weaver	<i>Ploceus olivaceiceps</i>	NT