BirdLife
SOUTH AFRICA
Giving Conservation Wings

THE STATE OF SOUTH AFRICA'S BIRDS

2018

THE STATE OF SOUTH AFRICA'S BIRDS REPORT 2018
Published by BirdLife South Africa
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Design by Bryony van Wyk, Martin R Taylor and Faansie Peacock
Cover African Black Oystercatcher by Martin R Taylor

Recommended citation
Taylor MR, Peacock F. 2018. State of South Africa's Bird Report 2018. Johannesburg: BirdLife South Africa.

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A male Northern Black Korhaan proclaims ownership of his territory (Martin R Taylor)

BIRDLIFE SOUTH AFRICA

BirdLife South Africa is the Country Partner of BirdLife International and is a registered Non-Profit Organisation and Public Benefit Organisation. BirdLife South Africa is the only dedicated bird conservation NGO in South Africa, representing a membership network of more than 5 600 members and 35 bird clubs, and through conservation, lobbying, advocacy, community conservation and education programmes attempts to achieve the conservation of birds and their habitats. As a BirdLife Country Partner, BirdLife South Africa accesses the expertise and global network of BirdLife International. BirdLife South Africa commits to:

1. Preventing extinctions in the wild.
2. Maintaining, and where possible improving, the conservation status of all bird species.
3. Conserving the sites and habitats important for birds and other biodiversity.
4. Sustaining the vital ecological systems that underpin human livelihoods and enrich the quality of people's lives.

In the process, BirdLife South Africa will empower people and contribute to the alleviation of poverty, and will strive to ensure sustainability in the use of natural resources.

PROJECT PARTNERS AND FUNDERS

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BirdLife SOUTH AFRICA Giving Conservation Wings

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FOREWORD

It is with great pleasure that SANBI has partnered with BirdLife South Africa on the production of this key publication focusing on the status of our nation's birds. Sadly it is evident that a large number of species are under pressure with the threats facing our birds being immense. It is however encouraging to see the work being undertaken by a wide variety of stakeholders in the conservation sector in their attempts to address these threats and reverse the downward trends seen in so many of the populations of our threatened bird species. The conservation of our bird species is one such challenge and it is up all of us to take on the responsibility of protecting this special group to ensure that this national asset is enjoyed by all of our people into the future.

Moshibudi Rampedi

Moshibudi Rampedi
Chief Executive Officer
South African National Biodiversity Institute
9 January 2018

Spring flower abundance in West Coast National Park, one of South Africa's most important IBAs (Ranel Peacock)

FOREWORD

The 2017 State of South Africa's Bird Report provides a snapshot of the current conservation status of birds in our country. The outlook is not good, with the recently reviewed regional Red List indicating that 134 species are now threatened with extinction. The number of Endangered and Critically Endangered bird species has increased significantly since the 2000 assessment, with 51 species now listed in these categories. Going further back, one sees that the status of our avifauna has deteriorated over the past three decades. This is succinctly detailed in the Red List Index. It is clear that our bird populations are in trouble and this should be of concern to all South Africans. As birds are indicators of the health of ecosystems which are so essential to human well being, inferences can be made about effects on humans, biodiversity, and ecosystem processes. The threats driving the declining conservation status of birds are varied, with land degradation and transformation, as well as the extractive industries, leading the way. Fortunately South Africa has a strong and active conservation sector with a number of different organisations, ranging from government departments to conservation NGOs, working hard to ameliorate these pressures. The next decade will be critical if we are to halt population declines, address threats, and thus improve the conservation status of our birds. In order to do this, it will take a massive amount of effort and cooperation by many stakeholders to ensure that future generations will be able to benefit from our country's spectacular diversity of birds.

Mark D Anderson

Mark D Anderson
Chief Executive Officer
BirdLife South Africa
11 January 2018

Pallid Harrier, a globally Near Threatened raptor (Dylan Vasapolli)

"Thanks to long-term research and monitoring, bird ecology, distribution and life history traits are well documented and understood"

SOUTH AFRICA'S BIRDS: AN OVERVIEW

South Africa is rich in birds with 856 bird species recorded in the region, including the Prince Edward Islands. The *State of South Africa's Birds* 2018 report provides a synopsis of the conservation status or **STATE** of these birds, the threats or **PRESSURES** that they face and the measures or **RESPONSES** being put in place to improve their conservation status. Assessing the conservation status of birds is extremely important but determining the reasons why the birds are declining, i.e. the pressures, is just as important. This assists conservation authorities to formulate a response – a figurative toolbox of different conservation interventions that can be unpacked to deal with specific problems. Birds can help set, meet and track the Aichi Biodiversity Targets. As part of the Strategic Plan for Biodiversity 2011-2020, the member states of the Convention on Biological Diversity agreed to 20 headline 'Aichi Biodiversity Targets'. Governments are translating these to the national level through their National Biodiversity Strategies and Action Plans. Data on birds can help the South African government to set targets, focus actions and monitor success for the conservation of biodiversity.

Cape Rockjumper (Dylan Vasapolli)

BIRDS AS INDICATORS FOR BIODIVERSITY

- Unlike many other taxon groups, bird taxonomy in South Africa is well known and is relatively stable.
- Thanks to both research by ornithologists and monitoring by birdwatchers, bird distribution, ecology and life history traits are well understood.
- Birds are easy to identify, survey and monitor, and historical databases exist for comparative trends.
- Birds are diverse, found in nearly all habitats and occur across the country.
- Birds usually occupy high trophic levels in food webs and are thus sensitive to environmental change, making them excellent early-warning systems.
- Bird population trends often mirror those of other species.
- Birds are flagships for general nature conservation: they are popular, engage the public and resonate with decision-makers.
- Birds are economically important.

856 bird species recorded in South Africa

68 endemic or near-endemic species in the region

132 threatened or near threatened species

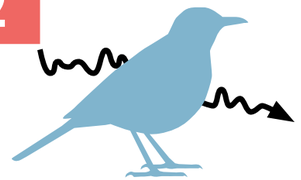
REPORT STRUCTURE: STATE | PRESSURE | RESPONSE | MONITORING

1

legislation | pp. 8-9

An initial section of the report briefly summarises the South African environmental **legislation** framework, which provides a backdrop as to how the conservation of birds and their habitats is dealt with by the South African government.

2



state: species | p. 10-19

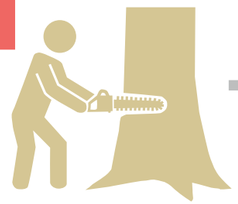
There are two sections on the **state** of birds and their habitats, which set the scene for this document. From a **species** perspective, the results of the recent 2015 Regional Red List Process are provided, giving an overview as to which groups are under the most pressure and how these groups have fared over time.

3

state: biomes | pp. 20-

The second section on **state** assesses the health of the terrestrial **biomes**, rivers, estuaries and marine ecosystems that regional bird populations rely on. This section highlights the link between threatened birds and their habitats, and identifies key environmental problems.

4



pressure | p. 40-49

The section on **pressure** summarises major threats to key bird species, ecological groups and important bird populations within the region. Pressures are brought about predominantly by the increasing burden that development in the modern age imposes on natural ecosystems. Specific case studies that exemplify these threats are provided.

5

response | p. 50-73

The section on **response** identifies case studies highlighting conservation projects by different stakeholdersthat are designed to reduce the pressures discussed in the **pressure** chapter and so improve the **state** of the ecosystems in which our bird species reside. Effective conservation requires many different approaches and this is reflected in the choice of case studies; species-specific interventions are highlighted, as are environmental education initiatives.

6

monitoring | p. 74-77

Knowledge of biodiversity leads to better understanding, better management, and thus to better conservation and protection of our biological resources. **Monitoring** is needed both to assess the effectiveness of conservation **responses** and to provide an early warning of **pressures**. A section on different monitoring schemes focusing on birds in South Africa is included.

"South Africa's legislative framework provides a strong basis for the conservation of biodiversity"

A pair of Broad-billed Rollers photographed in Mapungubwe National Park, IBA SA001 (Clive Kaplan)

THE LEGAL FRAMEWORK:
LEGISLATION ON BIODIVERSITY CONSERVATION

The Constitution of South Africa The Constitution of South Africa is the supreme law to the country. It provides the legal foundation for the existence of the republic, sets out the rights and duties of its citizens and defines the structure of the government. Section 24 enshrines the right to the environment. Every South African citizen has the right to an environment that is not harmful to their health or well-being; that is is protected, for the benefit of present and future generations, through reasonable legislative and other measures; that prevents pollution and ecological degradation; that promotes conservation; and that secures ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

Biodiversity Act The National Environmental Management Act (Act 107 of 1998) creates the framework to enforce Section 24 of the Constitution. NEMA serves as the 'umbrella' legislation under which all other environmental legislation falls. It also provides the overarching definitions and principles governing environmental law.

Protected Areas Act The National Environmental Management: Protected Areas Act (Act 57 of 2003) provides for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes; for the establishment of a national register of all national, provincial and local protected areas; for the management of those areas in accordance with national norms and standards; for intergovernmental co-operation and public consultation in matters concerning protected areas; and for matters in connection therewith. Only areas listed as protected areas under the Protected Areas Act contribute to the protected areas network. The Protected Areas Act allows for the declaration of a protected area on state, private or communal land and for the landowner to be recognised as the management or co-management authority of a protected area in certain instances.

National Biodiversity Strategy and Action Plan (NBSAP) The National Environmental Management: Biodiversity Act (Act 10 of 2004) provides for the management and conservation of South Africa's biodiversity within the framework of NEMA (see above); for the protection of species and ecosystems that warrant national protection; for the sustainable use of indigenous biological resources; for the fair and equitable sharing of benefits arising from bioprospecting involving indigenous biological resources; for the establishment and functions of a South African National Biodiversity Institute (SANBI); and for matters connected therewith. It provides for the coordinated management, conservation and sustainable use of biodiversity across the whole country. The Biodiversity Act is key for threatened bird species as well as threatened ecosystems.

National Biodiversity Framework The NBF is a framework published in terms of the Biodiversity Act to coordinate and align the efforts of the many organisations and individuals involved in conserving and managing South Africa's biodiversity, in support of sustainable development. While the NBSAP is comprehensive and long-term, the NBF focuses on the most urgent strategies and actions within the short to medium term. The Biodiversity Act requires it to be reviewed every five years. The first NBF was published by the DEA in 2009.

National Protected Area Expansion Strategy The NPAES aims to expand South Africa's network of protected areas. It sets ecosystem-specific protected area targets and identifies important geographical areas for protected area expansion. The first NPAES was developed in 2008, with the goal of achieving cost-effective expansion of the protected area network that enhances ecological sustainability and resilience to climate change. The current NPAES is under revision at present.

National Biodiversity Assessment The NBA is a periodic assessment of the state of South Africa's biodiversity. Led by SANBI in partnership with a wide range of organisations, it is part of that organisation's mandate to monitor and report on the country's biodiversity. The State of South Africa's Birds being compiled by BirdLife South Africa is an example of this.

7/11 riverine specialists are threatened in South Africa

Like many other water-associated species, the Half-collared Kingfisher has decreased in many parts of its South African range and is now classified as regionally Near Threatened (Dylan Vasapolli)

"South Africa is one of the few countries in the world to have a Biodiversity Act and a National Biodiversity Institute"

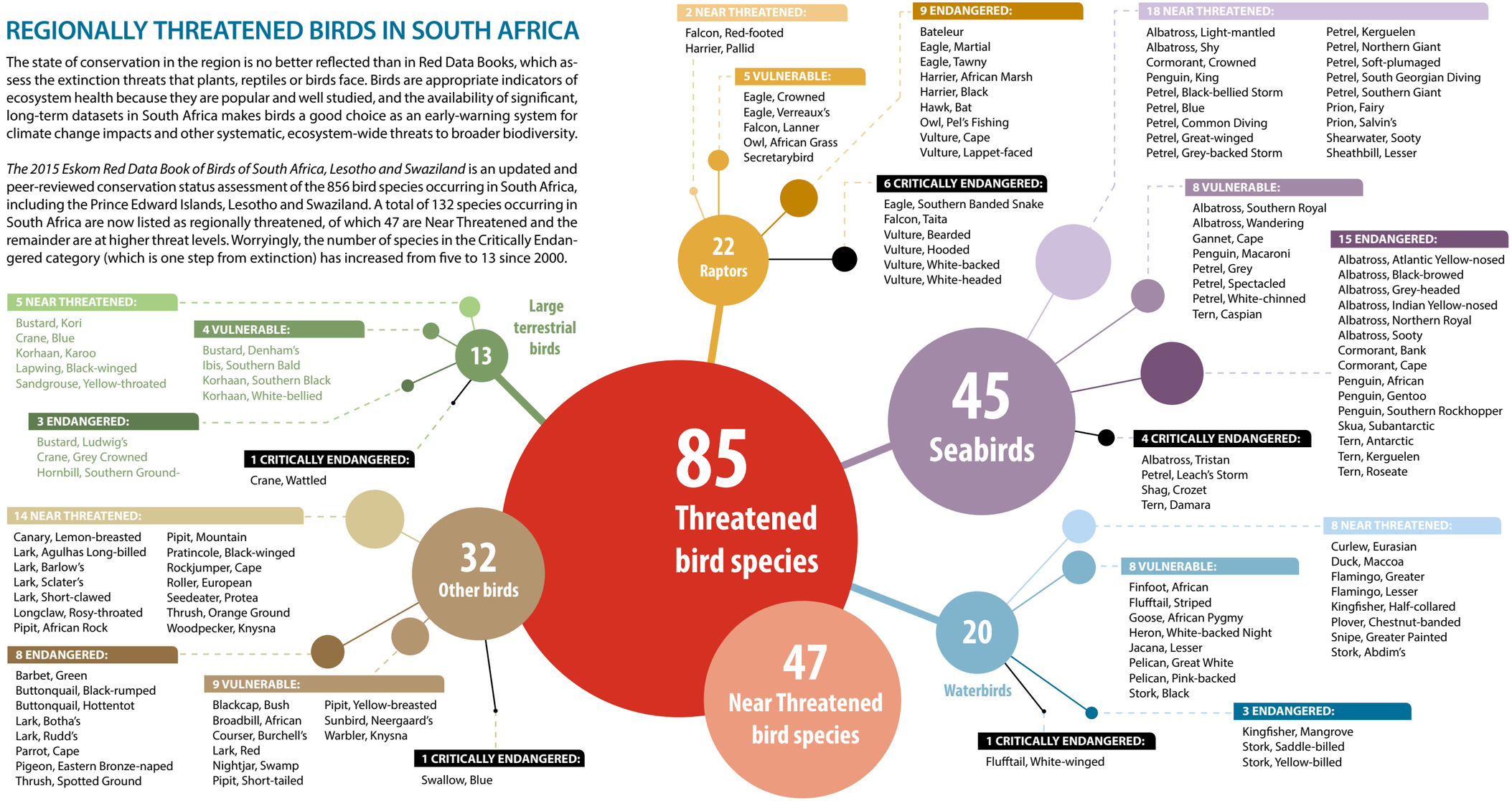
(Martin R Taylor)

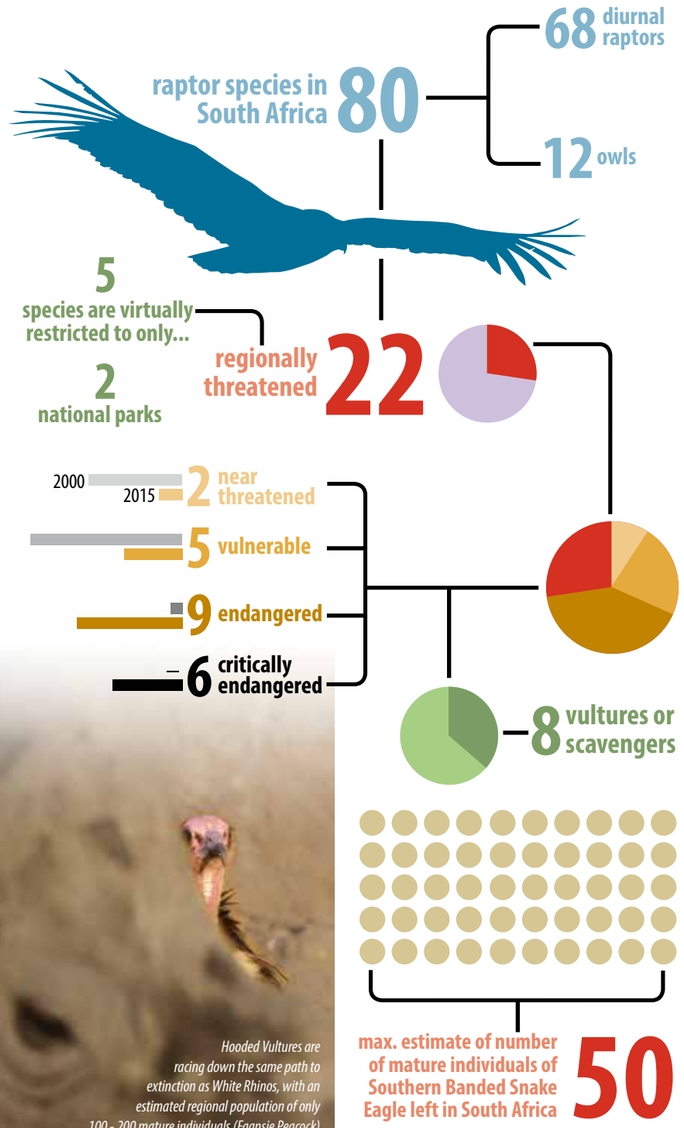
"132 bird species in South Africa are regionally threatened with extinction"

REGIONALLY THREATENED BIRDS IN SOUTH AFRICA

The state of conservation in the region is no better reflected than in Red Data Books, which assess the extinction threats that plants, reptiles or birds face. Birds are appropriate indicators of ecosystem health because they are popular and well studied, and the availability of significant, long-term datasets in South Africa makes birds a good choice as an early-warning system for climate change impacts and other systematic, ecosystem-wide threats to broader biodiversity.

The 2015 Eskom Red Data Book of Birds of South Africa, Lesotho and Swaziland is an updated and peer-reviewed conservation status assessment of the 856 bird species occurring in South Africa, including the Prince Edward Islands, Lesotho and Swaziland. A total of 132 species occurring in South Africa are now listed as regionally threatened, of which 47 are Near Threatened and the remainder are at higher threat levels. Worryingly, the number of species in the Critically Endangered category (which is one step from extinction) has increased from five to 13 since 2000.





Hooded Vultures are racing down the same path to extinction as White Rhinos, with an estimated regional population of only 100 - 200 mature individuals (Faansie Peacock)

RAPTORS IN DECLINE

South Africa has a high diversity of raptors, representing six families, but worryingly, more than a quarter are now considered threatened. Significantly, a large portion of the species that were listed as Vulnerable in the 2000 assessment have found their way into the Endangered category and some have managed to leapfrog categories all together;the Southern Banded Snake Eagle, for example, moved from Vulnerable straight Critically Endangered.

Of great concern is the plight of the scavenging raptors in South Africa. In line with reports from both East Africa and West Africa, the region's vulture populations are in steep decline. The Bearded Vulture, together with the Hooded Vulture, White-backed Vulture and White-headed Vulture, is leading the headlong rush of the region's vultures towards extinction, with all four of these species classified as regionally Critically Endangered. The Cape Vulture, whose breeding distribution once covered southern Africa, is now being pushed back into its last remaining strongholds in the Limpopo and Eastern Cape provinces as is the Lappet-faced Vulture, now largely confined to protected areas in the Northern Cape, Mpumulanga and KwaZulu-Natal provinces. These species are joined by the Tawny Eagle and Bateleur, two obligate scavengers that are now both listed as regionally Endangered.

Three species out of the 22 are habitat specialists that are constrained by their very specific ecological requirements: Bat Hawk, African Marsh Harrier and Pel's Fishing Owl. Three raptors, Martial Eagle, Bateleur and Tawny Eagle, all require vast home territories.

Raptors are apex predators and while we expect them to naturally occur in lower numbers than other groups of birds, we also recognise that they are indicators for lower trophic levels that may also be in decline. Compounding this, the majority of raptors tend to be comparatively large bodied, reproduce slowly, some are migratory and some are specialist predators - all factors that increase the number of risks that a species will face.

" Raptors are apex predators and strong indicators for trophic levels and ecosystem function; worryingly, more than a quarter of South Africa's raptor species are now threatened "

Bateleur (Martin R Taylor)

"Seabirds have deteriorated at a faster rate than any other group and now account for a third of the region's threatened species"

Shy Albatross (Dylan Vasapolli)

SEABIRDS UNDER PRESSURE

Seabirds, which as a group share many characteristic traits with raptors, are sadly also in decline. Globally this group of birds has fared extremely poorly, deteriorating at a faster rate than any other comparable groups of birds. While largely out of sight (the Prince Edward Islands are situated 1 769 km south-east of Port Elizabeth), they constitute a relatively large proportion of South Africa's avifauna (12% of the species assessed in the 2015 Red Data book) and an even larger proportion of threatened species, with 45 seabirds now on the regional Red List and accounting for 34% of all threatened bird species in the region. The skew towards higher threat categories is new, with the pattern in 2000 conforming more to the predicted representation of fewer species in higher threat categories. The poor conservation status of seabirds is a consequence of several key life history strategies that are biased towards very slow reproductive rates. Seabirds breed almost exclusively on islands, which means that they are behaviourally poorly equipped to deal with disturbance and they are particularly sensitive to introduced predators, a feature they share with other island-endemic bird species. Thirdly, fisheries heavily exploit marine ecosystems across the entire globe, and mortality from direct seabird-fishery interactions and competition between seabirds and fisheries provide conditions to depress annual survival rates.

storms
sensitive to disturbance
oil
avian cholera
extreme temperatures
fisheries bycatch
introduced predators
predation by pelicans
plastic
slow reproductive rates
predation by gulls
shifts in prey distribution
threats to seabirds
mice
climate change
predation by seals
reach sexual maturity late
decrease in prey abundance
limited to islands
displacement by seals

Dylan Vasapolli

67%
estimated decline in world population of **Black-browed Albatross** over three generations

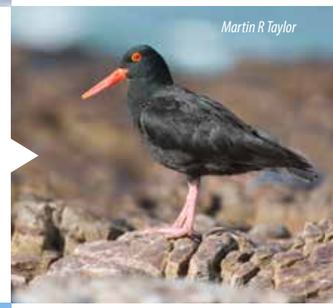
Dylan Vasapolli

8 000
number of **White-chinned Petrels** killed annually as accidental bycatch in longline fishery in the 1990s; rates have dropped significantly thanks to conservation efforts

100 km
length of coastline of Marion and Prince Edward islands, along which **Lesser Sheathbills** live

Paul Tixier

37%
increase in regional population of **African Black Oystercatcher**, leading to downlisting from Near Threatened (2000) to Least Concern (2015)



Martin R Taylor

Dylan Vasapolli

10
years it took for population of the near-endemic **African Penguin** to plummet by 36% to only 20 000 pairs (2011)

Faansie Peacock

1 900
number of breeding pairs of **Crowned Cormorants** in South Africa, representing 66% of the world population

3
number of breeding colonies of **Cape Gannet** in South Africa

Faansie Peacock

36
approximate number of breeding pairs of **Damara Tern** along South Africa's coastline

Jo Balmer

WADER WOES

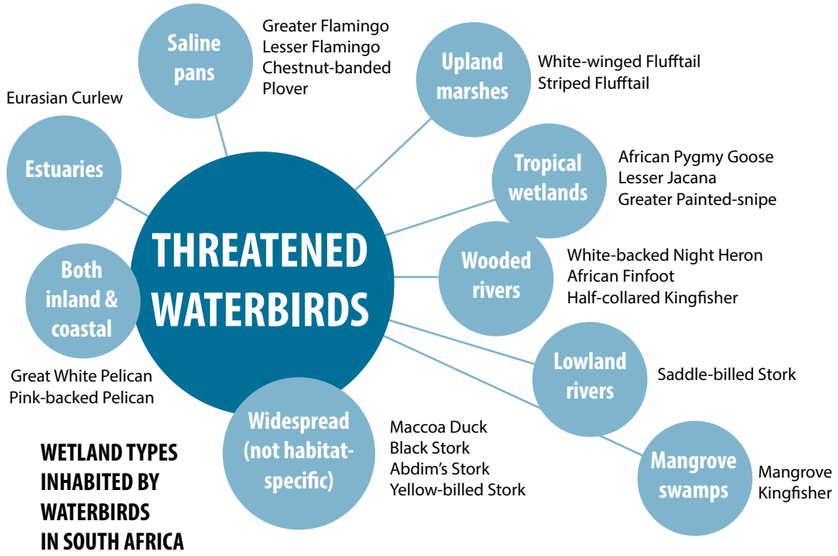
Numbers of Palearctic migratory waders - birds that are particularly sensitive to environmental variation and as a result are indicators of change in their environments - have decreased dramatically across their range. This is indicative of the threats being faced by this group at northern hemisphere breeding grounds, along migration routes and locally. Massive alterations to South Africa's c. 250 estuaries, which have been massively altered by abstraction, damming, pollution and disturbance by human development and recreational activities, have no doubt contributed to the poor conservation status of this group. As populations of migratory birds dwindle, we can expect the numbers to drop most radically in the country's position at the far end of the migration route.

Common Greenshank (Martin R Taylor)

WANING WATERBIRDS

Waterbirds, which are dependent on freshwater and estuarine ecosystems for foraging, tend to be excellent indicators of the health of the ecosystems upon which they depend. Encouragingly, there has been a small decrease in the number of waterbirds considered to be threatened since the 2000 regional Red List assessment, with just 20 (13%) of the 141 members of this group falling within the threatened or Near Threatened categories. The genuine change in status of certain species such as the near-endemic African Black Oystercatcher are encouraging and, in contrast to the other groups examined, the proportion of Vulnerable and Endangered species is more in line with what one would predict. While there has been some improvement some worrying trends are, however, coming to light. Some species are restricted to very few breeding locations (e.g. Yellow-billed Stork, Pink-backed Pelican), which make them intrinsically vulnerable to detrimental change.

> "Waterbirds are excellent indicators of the health of ecosystems"



WETLAND TYPES INHABITED BY WATERBIRDS IN SOUTH AFRICA

LARGE TERRESTRIAL BIRDS: RUNNING OUT OF SPACE

Large terrestrial birds, such as bustards and cranes, are poorly protected by formal conservation through official protected areas. In total, 44 large terrestrial species were assessed in 2015 of which 13 were evaluated as Threatened or Near Threatened, a marginal improvement in conservation status of this group from the 2000 assessment. Large terrestrial species, as a group, are subject to the vagaries of their ecological life traits: they require large territories, with population sizes being self-evidently smaller for a given area than those of smaller species. Larger birds also tend to have smaller clutches and reach sexual maturity later, and therefore the impacts of adult mortality are more severe and longer lasting. Following the 2015 assessment, Wattled Crane remains Critically Endangered while Ludwig's Bustard, Grey Crowned Crane and Southern Ground-Hornbill have moved up from Vulnerable in 2000 to Endangered in 2015. The good news is that two of the largest species, the Kori Bustard and Blue Crane, have both been downlisted to Near Threatened. As habitat transformation and degradation increase due to escalating human demands, it is likely that this group will decrease in the future. Simply put, the world is becoming too small for these large and spectacular open-country species.

> "Simply put, the world is becoming too small for these large and spectacular species"

1 825 estimated breeding pairs of the endemic Southern Bald Ibis

Southern Bald Ibis (Martin R Taylor)

"Habitat loss and degradation remain an overarching concern for all these taxa"

OTHER THREATENED SPECIES

The remainder of the species assessed in the 2015 regional assessment constitute a diverse assemblage of 35 species dominated by passerines, many of which are endemic to the region. Their inclusion is driven not by taxonomic affinities but rather a dependence upon the habitat in which they live. Eight species that are dependent upon the highly fragmented Forest Biome are represented, including the regionally Endangered Eastern Bronze-naped Pigeon and Cape Parrot, as well as the range-restricted Green Barbet, which occurs only in the 39 km^2 Ngoye Forest in KwaZulu-Natal. The precarious state of the region's grasslands is reflected in the large number of terrestrial passerines in this category, including seven larks and four pipits. A further nine species are split between the Fynbos Biome (five) and karoo (four) biomes. The threats faced by these species are manifold and diverse, and effective conservation strategies need to take into account the ecology, biogeography and demographics of each species individually. That being said, habitat loss and degradation remain an overarching concern for all these taxa.

5 number of forests Eastern Bronze-naped Pigeon is thought to breed in

39 km^2 range of the regionally Endangered Green Barbet

<600 number of Spotted Ground Thrushes in South Africa

Orange Ground Thrush (Francois du Plessis)

1 **Coastal Namaqualand** | Barlow's Lark

2 **Bushmanland** | Burchell's Courser, Sclater's Lark, Red Lark

3 **Mountain Fynbos** | Hottentot Buttonquail, Cape Rockjumper, Protea Seedeater

4 **Overberg** | Agulhas Long-billed Lark

5 **Coastal Forest** | Knysna Woodpecker, Knysna Warbler, Spotted Ground Thrush

6 **Mid-altitude Grasslands** | Black-rumped Butttonquail, Blue Swallow, Short-tailed Pipit

7 **Escarpment Forests** | Cape Parrot, Bush Blackcap, Orange Ground Thrush

8 **Mountains** | Mountain Pipit, African Rock Pipit

9 **High-altitude Grasslands** | Rudd's Lark, Botha's Lark, Yellow-breasted Pipit

10 **Wetlands/Grasslands** | Black-winged Pratincole

11 **Semi-arid Savannah** | Short-clawed Lark

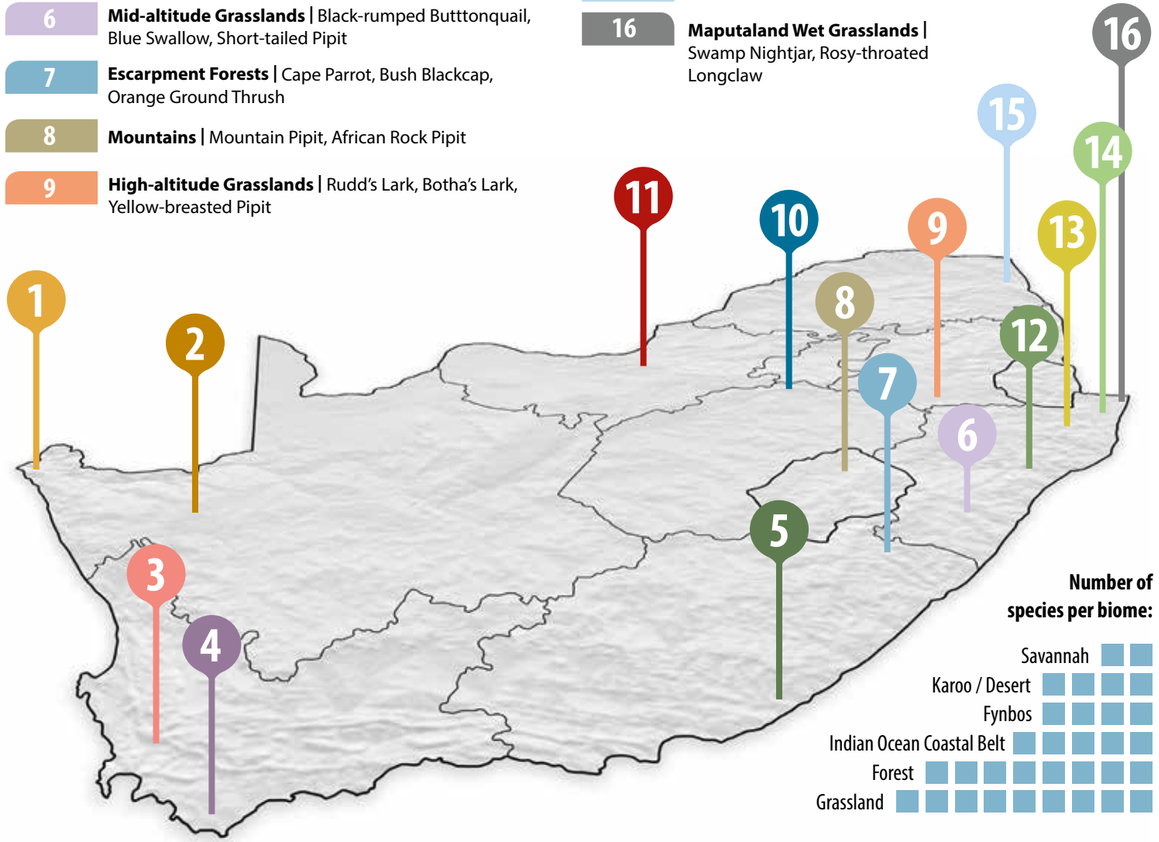
12 **Zululand Forests** | Green Barbet, E. Bronze-naped Pigeon

13 **Sand Forest** | African Broadbill, Neergaard's Sunbird

14 **Subtropical Savannah** | Lemon-breasted Canary

15 **Savannah** | European Roller

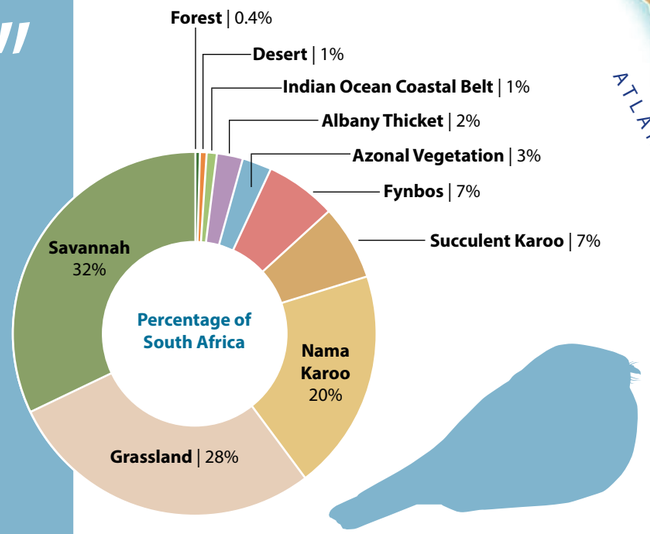
16 **Maputaland Wet Grasslands** | Swamp Nightjar, Rosy-throated Longclaw



"Threatened terrestrial ecosystems tend to be concentrated in areas that are hubs of economic production"

BIOMES OF SOUTH AFRICA

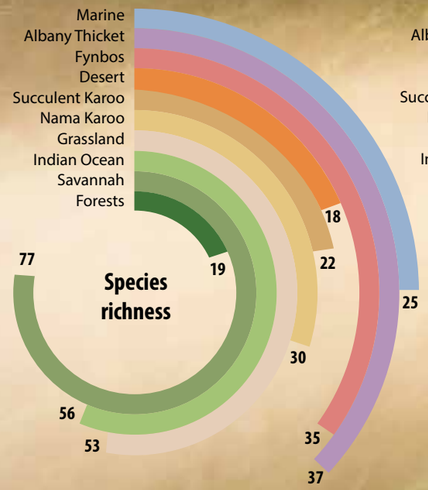
An examination of the conservation of South Africa's birds would be incomplete without an investigation into the state of the country's biomes. Healthy biomes are essential for the intrinsic value of the ecological communities that occur in them as well as for the essential ecological services that accrue not only to the fauna and flora of South Africa, but to humans as well. Healthy ecosystems within these biomes offer protection from natural hazards, provide regulated nutrient cycles, maintain healthy catchments that in turn supply South Africa with water, allow for crop pollination and the maintenance of food security and, crucially, support the development of key sectors such as ecotourism and the wildlife economy. Unfortunately, the country's nine terrestrial biomes, upon which we rely so much, are under pressure from a wide range of human-induced threats, including agriculture, afforestation, mining and urban expansion. Increased economic production has seen threatened terrestrial ecosystems being fragmented to a point where they are mere fractions of their former selves, embedded in production landscapes. Nearly a quarter of terrestrial ecosystems are protected while 35% have no protection at all. In this section we examine the state of these biomes upon which avifaunal communities depend, including South Africa's offshore islands and marine ecosystems.

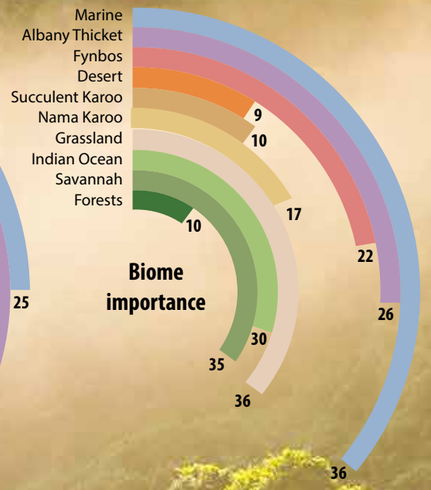


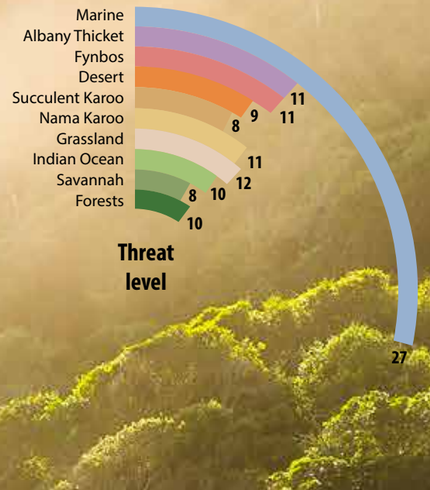
"77% of all of South Africa's bird species occur in the Savannah Biome"

BIOME ANALYSIS:
ALL ARE NOT CREATED EQUAL

The following three graphs detail the relationship between biomes and threatened species in South Africa. Species richness refers to the number of species occurring in a single biome: from the species richness graph we can ascertain that the majority of threatened species occur in the Savannah and Indian Ocean Coastal Belt biomes, with 77 and 56 species respectively. The importance of the Marine Biome is reinforced in the second graph with the number of threatened species represented as a percentage of the total number of threatened species in the region. Together with the Grassland Biome, the Marine Biome has 36% of all threatened species occurring in it. These two biomes are closely followed by the Savannah (35%) and Indian Ocean Coastal Belt (30%) biomes. Despite the relatively large number of threatened species occurring in those biomes, it is in fact the Marine Biome that has the highest percentage of its inhabitants (27%) as threatened, followed by the Grassland Biome with 12%

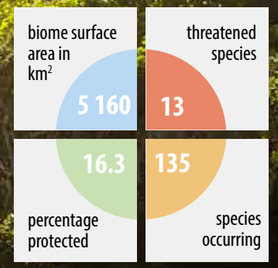






FOREST BIOME

Restricted to areas with a mean annual rainfall in excess of 525 mm, the Forest Biome is patchily distributed across five of the country's provinces. The fragmentation of these forests has resulted in few patches covering an area larger than 1 km^2. Occurring from sea level to over 2 100 masl and stretching from Western Cape Province to Limpopo Province, forest types are, not surprisingly, extremely diverse. Historically, forests in South Africa have been exploited for their hardwoods or cleared for the establishment of exotic tree plantations. Invasive alien plants such as Blackwood *Acacia melanoxylon*, have established in areas formerly occupied by forests. The Forest Biome is particularly vulnerable to land-use change, while under different climate change scenarios it will retract significantly as a result of increased fire and reduced rainfall. Several Afromontane forest bird species are endemic to the region, including Bush Blackcap, Forest Buzzard, Knysna Warbler, Knysna Woodpecker and Forest Canary. In addition to these endemics, this biome is essential for several of South Africa's Endangered bird species, including Eastern Bronze-naped Pigeon, Crowned Eagle, Spotted Ground Thrush and Cape Parrot. Fragmentation is a major driver behind the extinction risks faced by these species. In the order of 44% of the Forest Biome has been destroyed, with just 16.3% receiving some form of protection.



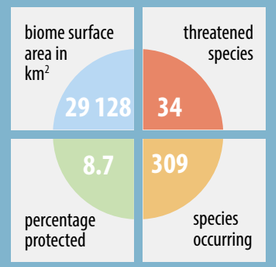
Peter Chadwick

ALBANY THICKET BIOME

Limited to the coastal provinces of Western Cape, Eastern Cape and KwaZulu-Natal, the Albany Thicket Biome is a product of rainfall that is too low to support forests but sufficient to provide some protection against fires. Dominated by evergreen, sclerophyllous species and a high cover of Karroid succulent shrubs, Albany Thicket is easily distinguished from the complex mosaic of surrounding ecoregions as a dense, spiny shrubland rising to 2 - 2.5 m. It contains important centres of endemism for Karroid succulent flora and succulent *Euphorbia* species while a significant grass cover is lacking. Often impenetrable, the Albany Thicket Biome is transitional to other biome types. Despite 44% of this biome having already been destroyed and only 8.7 % conserved, mainly due to 17 000 ha of habitat recently incorporated into the Addo Elephant National Park, this biome is one of the least threatened and is predicted to suffer losses only in high-risk climatic scenarios. The floral richness and endemism is not reflected in the vertebrate fauna, which has moderate richness and low rates of endemism. While no bird species are restricted to Albany Thicket, the biome sustains important populations of several South African endemics, including threatened species like Knysna Warbler and Knysna Woodpecker.

The endemic Southern Tchagra is a secretive denizen of Albany Thicket habitats (Jo Balmer)

Various euphorbias and aloes are typical plant species of Albany Thicket (Jo Balmer)



FYNBOS BIOME

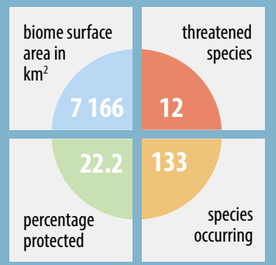
Cape Spurfowl (Faansie Peacock)

Situated predominantly in the Western Cape Province, and to a lesser extent the Northern Cape and Eastern Cape provinces, the Fynbos Biome is characterised by its high richness in plant species (8 000) and endemicity (68%). The contribution of the Fynbos Biome to the species richness and endemicity of the Cape Floral Kingdom is overwhelming. Despite occupying less than 6% of South Africa, the Fynbos Biome contributes more than one third of the country's plant species. Unfortunately only 20.2% has been conserved while 33% has been destroyed. Almost 1 700 plant species in the Fynbos Biome are threatened with extinction. Urban expansion and agriculture have driven habitat loss, while several invasive alien plant species have had severe impacts on highly localised species. The misuse of fire has had a negative impact on vegetation types within this biome. The Fynbos Biome is an important habitat type in terms of avian species richness for South Africa, hosting six endemic passerine bird species and a further six of South Africa's 18 endemics. Species shared with the Nama Karoo Biome, such as Grey-backed Cisticola and Karoo Prinia, indicate a biogeographical connection between these two biomes. By 2100, the Mediterranean-type biomes around the globe are projected to experience the largest proportional loss of biodiversity of all terrestrial biomes due to their significant sensitivity to multiple biodiversity threats and interactions among these threats. The conclusion of protected area contract agreements between South African National Parks and private landowners saw 33 000 ha of Succulent Karoo being included in the Namaqua National Park and 44 000 ha of Renosterveld and lowland fynbos being included in the buffer area of the Agulhas National Park.

Kogelberg Nature Reserve (Ronél Peacock)

DESERT

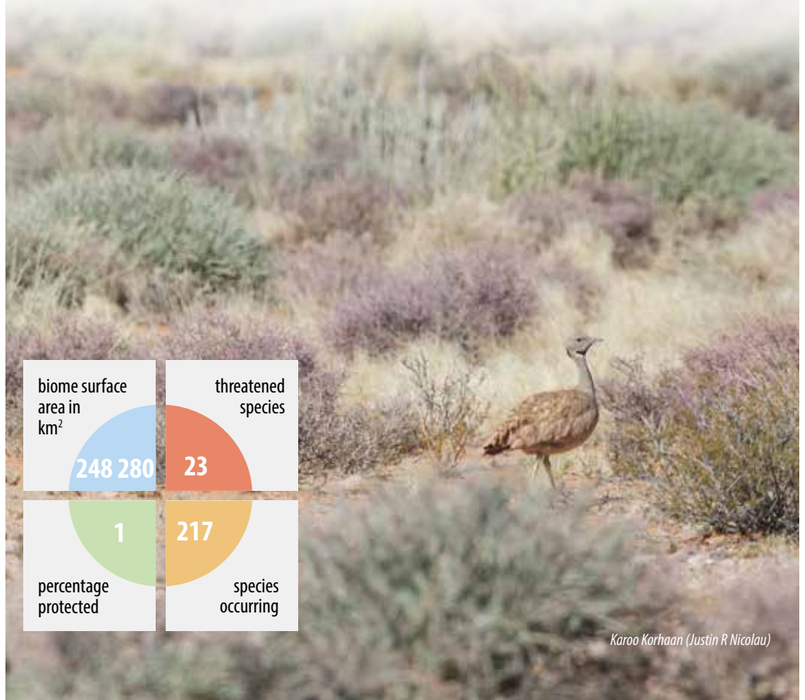
While most true desert is found outside South Africa, there is a small representative portion in the Springbokvlakte area of the Richtersveld in the lower Orange River valley. The vegetation of the Desert Biome is dominated by annual plants and grasses that emerge after rarely abundant rainfall events. The climate is characterised by occasional summer rainfall, but the levels of summer aridity are high, with an average of 35 mm of rainfall received per year. In various climate change scenarios, the Desert Biome will expand at the expense of other biomes in the region.




Peter Chadwick

NAMA KAROO BIOME

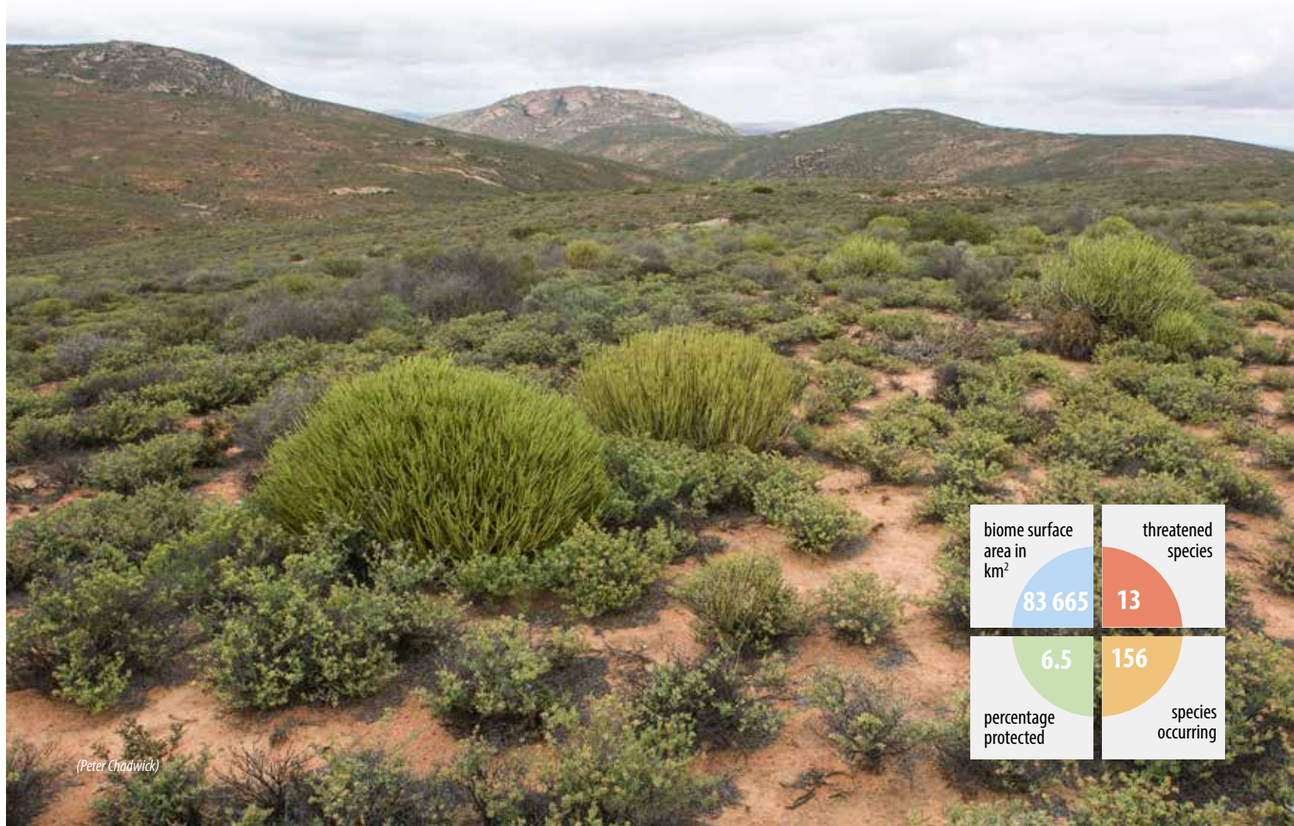
Occurring on the central plateau of the western half of South Africa, from altitudes of 500 to 2 000 masl, the Nama Karoo Biome is the second largest biome in the region. Limited summer rainfall, which varies between 100 - 520 mm per year, is one of the main drivers of this biome type. Only 1% of the Nama Karoo Biome receives any form of protection while 20% has been destroyed. Invasive alien plants, such as Prickly Pear *Opuntia aurantiaca* and Mesquite *Prosopis glandulosa*, have had a severe negative impact on this biome, as has overgrazing by livestock. Climate change is predicted to have a major detrimental effect on the Nama Karoo, with large portions of its current area likely to be replaced by savannah and desert in future. The avifauna of this biome is characterised by typically ground-dwelling species of open habitats, although tree-lined watercourses have allowed several aroboreal species to penetrate the interior of this biome. Birds such as Black-headed and White-throated canaries, Red Lark and Sclater's Lark, Karoo Chat, Karoo Korhaan, Layard's Tit-babbler and Cinnamon-breasted Warbler are characteristic of this dry but dramatic landscape. Many of the bird species occurring in the Nama Karoo are highly nomadic and able to respond rapidly to environmental events such as rainfall and insect irruptions.



Karoo Korhaan (Justin R Nicolau)

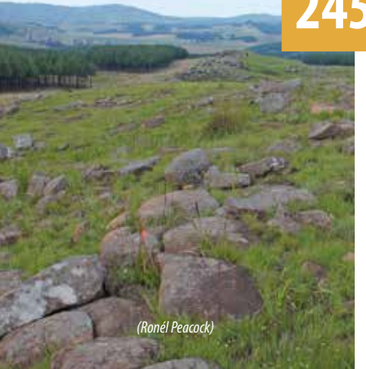
SUCCULENT KAROO BIOME

Covering the arid north-western parts of South Africa, including Namaqualand and the Richtersveld, the 83 665 km² Succulent Karoo Biome hosts the greatest diversity of succulent plants in the world with *c.* 33% of the floral species in the region being endemic. It is characterised by dry, hot summers and low winter rainfall. Only 30 000 km² remains in a pristine state with just 6.5% of the biome under formal conservation. This includes the Camdeboo National Park, covering 19 400 ha, which was added as South Africa's 22nd national park on 30 October 2005. An estimated 21% of the Succulent Karoo Biome has been destroyed. The biome is vulnerable to several land-use pressures, particularly overgrazing on communal lands, agricultural activities such as ostrich farming, mining activities and the illegal collection of plants and animals for trade. Climate change is forecast as having the potential to impact drastically upon this biome. Several bird species, such as Ludwig's Bustard, Burchell's Courser, Lark-like Bunting and various larks, move between the Nama Karoo and Succulent Karoo biomes to exploit favourable conditions associated with rainfall.



(Peter Chadwick)

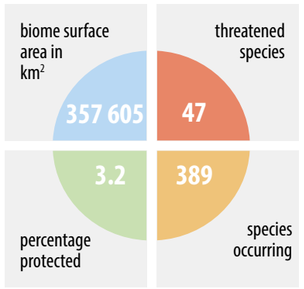
"60% of our grasslands has been destroyed and only 2.4% is conserved, making this one of South Africa's most beleaguered biomes"



(Ronél Peacock)

GRASSLAND BIOME

The Grassland Biome, second only to the Fynbos Biome in terms of diversity, covers about a third of South Africa and is represented in seven of the country's provinces. It extends from the interior of the Eastern Cape and KwaZulu-Natal provinces, over the escarpment and onto the central plateau containing the provinces of Free State, Gauteng, North West, Mpumalanga and Limpopo. Grasslands are dominated by a single layer of grass species, with frost, fire and grazing being the main inhibitors preventing colonisation by trees. They play a vital role in ensuring the well-being of ecosystem processes, especially in terms of freshwater management. Poor people are heavily dependent on the Grassland Biome, taking advantage of its grazing for their livestock. 60% of this biome has been destroyed mainly due to urban and industrial expansion, agriculture and afforestation, as well as poor land-use management practices. Mining represents one of the largest threats, with in excess of 2 000 km^2 currently being mined or having been earmarked for exploration. With more than 50% of grassland ecosystem types not included in the protected area network and only 3.2% conserved, the Grassland Biome is one of South Africa's most beleaguered biomes. Climate change models have indicated that large portions may be replaced by savannah and potentially forest. Together with the Indian Ocean Coastal Belt, the Grassland Biome has been prioritised for action based on the combined threats of land-use and climate change. Several South African endemics, including Southern Bald Ibis, Red-winged Francolin, Melodious Lark, Rudd's Lark, Botha's Lark, Blue Swallow and Yellow-breasted Pipit are dependent upon this biome. The regionally Critically Endangered Bearded Vulture is restricted to the alpine grasslands of South Africa and Lesotho.

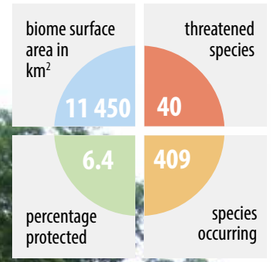


245 number of Wattled Cranes still persisting in South Africa's grasslands

Wattled Crane (Richard Flack)

INDIAN OCEAN COASTAL BELT

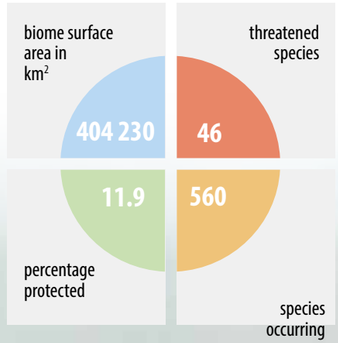
The Indian Ocean Coastal Belt stretches from the Eastern Cape in the south to KwaZulu-Natal and further north into Mozambique. It is characterised by dense thickets of spiny shrubs (up to 4 m tall), large-leaved mega-herbs, dwarf trees (species of *Allophylus, Apodytes and Mimusops*) and abundant vines, and it has poorly developed undergrowth due to the shading effect of the closed canopy. Dwarf coastal dune shrublands on exposed, wind-blasted and salt-sprayed dune slopes bordering tall thickets also occur in this biome. Based on a comparison of the threatened status and protection levels of South Africa's biomes, the Indian Ocean Coastal Belt was at most threat from land-use change and was accorded the highest priority. Key species associated with the Indian Ocean Coastal Belt include Livingstone's Turaco, Rudd's Apalis, Lemon-breasted Canary and Neergaard's and Plain-backed sunbirds.



(Faansie Peacock)

SAVANNAH BIOME

The Savannah Biome occupies just under one third of South Africa, extending into neighbouring Botswana, Zimbabwe and Mozambique. This biome is characterised by a grassy ground layer and a distinct upper layer of woody plants. A major factor delimiting the biome is the lack of sufficient rainfall, which prevents the upper tree layer from dominating, coupled with fire and grazing, which keep the grass layer dominant. Savannah vegetation types are used predominantly for grazing, mainly by cattle or game. Despite 43% of this biome being irreparably damaged or destroyed, the conservation status of savannah is comparatively good, with 11.9% conserved. Under different climatic models, the Savannah Biome is projected to expand within its geographic range, partly replacing grassland, although an increase in woody cover could shift parts of this biome towards woodland or even forest. Bird species typical of this biome include Crested Francolin, Red-crested Korhaan, Pearl-spotted Owlet, Lilac-breasted Roller, Black-crowned Tchagra, Yellow-fronted Tinkerbird and Violet-eared Waxbill. The Savannah Biome is extremely important to South Africa's raptor species.



(Martin R Taylor)

"79% of the total area of estuaries in South Africa is classified as threatened"

ESTUARIES

There are nearly 300 recognised estuaries along the South African coast and they support large numbers of wading birds that depend on the quality of estuaries within the region. A national assessment of the region's estuaries was recently completed and a large number of them were reported to be in "good" to "excellent" condition. Unfortunately, they represented very small systems, while the larger, important nursery systems were predominantly of "poor" to "fair" quality, indicating a general decline in the health of these larger systems. Of the total area of estuaries in South Africa, 79% was classified as threatened; 43% of the country's estuary types are threatened while 59% of these are not protected. 69% of the 70 400 ha that fall within Important Bird Areas are in a poor condition while 72% of estuaries in Marine or other Protected Areas (65 900 ha) are in a poor condition. Forty percent less freshwater is entering our estuaries and the reduction in flow is uncoupling critical ecological linkages between terrestrial and marine environments. Characteristic bird species include Common, Wood, Marsh and Curlew sandpipers, Greenshank and Little Stint. Regionally, there have been several reports documenting declines in wader numbers. Populations of *Calidris* sandpipers on the west coast of South Africa have plummeted by as much as 90% and White-fronted Plovers by 40%. A 70% decline in waterbirds has been reported from Durban Bay, KwaZulu-Natal. Coastal and inshore marine ecosystems are more threatened than offshore ecosystem with 43% of estuary types being threatened. What is of concern is that the larger, more important nursery systems were predominantly of "poor" to "fair" quality, indicating a general decline in the health of the larger systems. Significantly, St Lucia, South Africa's flagship estuary and most important estuary system for birds, is in a poor state.

Annual surveys of waterbirds add to knowledge regarding population trends of visiting Palearctic species (Martin R Taylor)

RIVERS, LAKES AND WETLANDS

Wetlands, which make up 2.4% of the country's area, are the most threatened of all South Africa's ecosystems, with 48% of wetland ecosystem types listed as Critically Endangered. This small area represents high-value ecological infrastructure that provides critical ecosystem services such as water purification and flood regulation. High water yield areas are of strategic importance for water security. Fifty-seven per cent of river ecosystem types are threatened (25% Critically Endangered, 19% Endangered and 13% Vulnerable). Tributaries tend to be in better ecological condition than main rivers, so the proportion of threatened river ecosystem types is higher if only main rivers are assessed, with 65% threatened (including 46% Critically Endangered). The proportion of threatened river ecosystem types is higher among lowland and lower foothill rivers than among upper foothills and mountain streams, reflecting the fact that the intensive agriculture and urban areas are often found in lowlands, as well as the accumulation of impacts on rivers as they flow from source to sea. Only 14% of river ecosystem types are well protected and 50% are not protected at all. Mountain streams are best protected and lowland rivers have the highest proportion of ecosystem types with no protection. The most threatened wetland types are floodplain wetlands because they are often found in highly productive land where people drain or bulldoze them to make way for agriculture. Most land-based protected areas were not designed to protect rivers; however, with some adjustments to their design and management, land-based protected areas could make a much greater contribution to protecting river ecosystems.

"Wetlands are the most threatened of all South Africa's ecosystems, with 48% of wetland types classified as Critically Endangered"

The iSimangaliso Wetland Park is a key system on the east coast of South Africa (Martin R Taylor)

"Coastal islands provide breeding platforms for the majority of the global populations of six Benguela endemics"

OFFSHORE ISLANDS

The Benguela Current, a nutrient-rich upwelling system, and the fortuitous location of several offshore islands have created conditions for the evolution of seven endemic seabirds. All the country's coastal islands are within the upwelling waters and consequently provide breeding platforms for the majority of the global populations of six of the seven Benguela-endemic species: Bank, Cape and Crowned cormorants, Cape Gannet, Hartlaub's Gull and African Penguin. All but the gull are globally threatened. The seventh species, the Damara Tern, doesn't breed on islands and the vast majority of the population occurs in Namibia. Most of the larger offshore islands are formally protected, as are mainland breeding sites for the African Penguin. Due to the collapse of seabird populations on the West Coast and in Namibia, Algoa Bay, at the eastern extreme of upwelling waters, is now the most important area globally for Cape Gannet and African Penguin. Yet even here, harbour developments, overfishing, climate change and proposed oil and gas drilling and infrastructure developments pose massive risks to these colonies.

10 estimated number of Leach's Storm Petrels breeding on South African offshore islands

17 number of major offshore islands along South Africa's coast

57 percentage decline of Cape Cormorant at six of its main breeding islands

60 percentage of Cape Cormorant population breeding at Dyer Island

15 number of offshore islands that host African Penguin colonies

8 number of threatened species dependent on offshore islands

3 number of offshore islands that host Cape Gannet colonies

47 percentage of offshore islands with protected status

Cape Gannet, with a mixed tern roost in the background (Faansie Peacock)

"Offshore marine ecosystems are the most poorly protected of all"

Indian Yellow-nosed Albatross (Martin R Taylor)

MARINE ECOSYSTEMS

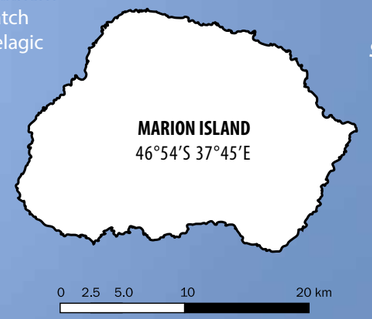
South Africa's offshore marine ecosystems are the most poorly protected of all our biomes. Nutrient-rich waters welling up from the Benguela Current are responsible for some of the most productive fisheries in the southern hemisphere. Unfortunately, fish stocks are being depleted at a rapid rate, with 42% of South African marine stock overexploited. At present, while 23% of the coastline is protected in Marine Protected Areas, less than 0.5% of South Africa's mainland ocean ecosystems are formally protected, compared to 8% of terrestrial areas. Marine ecosystems face several threats that are likely to intensify in future. Mariculture, which elsewhere has caused catastrophic environmental damage, is a rapidly growing industry that requires very careful management approaches. A recent surge in prospecting for oil and gas deposits has raised concerns, while advances in bulk marine sediment mining techniques have opened up the offshore environment to unprecedented destruction. Environmental changes on South Africa's West Coast are thought to have led to a south-eastward shift in pelagic fish distribution. While this has not posed a problem for the several albatross, petrel and shearwater species that occur in the region, it has greatly affected our several endemic island-breeding seabirds, such as cormorants and gannets, that depend on small pelagic fish that are also an important target of the commercial fishing industry. This unfortunate situation has led to birds competing with fisheries for resources, especially when fishing takes place close to breeding colonies. Changes in climatic conditions are also having an undeniable impact, with increases in sea temperatures, acidity and sea-levels likely to intensify the pressures mentioned above, increasing the amount of stress on offshore marine ecosystems.

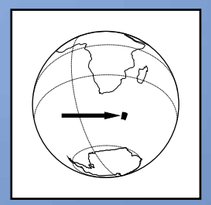
334 km² area of the Prince Edward Islands

Great-winged Petrel (Martin R Taylor).

THE PRINCE EDWARD ISLANDS

South Africa's sub-Antarctic islands, namely Prince Edward and Marion, are in considerably better condition than our coastal islands, with full protected area status and an extensive Marine Protected Area declared in 2014. They are a sanctuary for prodigious and globally significant numbers of breeding seabirds, some of which are threatened worldwide. Only one island group in the Southern Ocean, the Crozet Islands, has more breeding seabird species than the Prince Edward Islands. A commercial longline fishery for Patagonian Toothfish around the Prince Edward Islands and on nearby seamounts caused enormous seabird mortality since its inception in the mid-1990s; that threat was eliminated in the legal fishery very soon, but rampant poaching remains a huge threat throughout the Southern Ocean. Furthermore, most of the islands' seabirds forage on the high seas throughout the Southern Ocean, where bycatch in demersal and pelagic longline fisheries continues to drive decreases. Finally, predation by introduced mice on seabird chicks at marion Island is increasing.





28 threatened species breeding on the Prince Edward Islands

2.5m pairs of seabirds breed on the Prince Edward Islands

King Penguin (Shutterstock)

Wandering Albatross (Peter Ryan)

Marion Island (Peter Ryan)

"IBAs play a critical role in identifying and safeguarding important ecosystems"

IMPORTANT BIRD AND BIODIVERSITY AREAS

A NETWORK OF IBA SITES FOR BIRDS

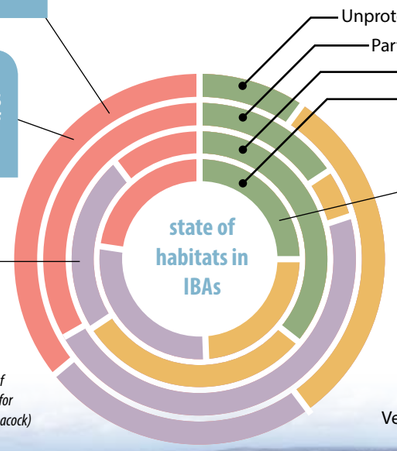
Between 2011 and 2014 local experts assisted BirdLife South Africa with a revision of the IBA Directory for South Africa. The 2015 review assessed the validity of current IBAs, identified new IBAs, aligned boundaries and updated site descriptions. The revised IBA Directory provides an inventory of sites for the 112 IBAs, covering more than 14 million ha. Simultaneously, the data were used to analyse the state, threat and response of the IBA network across the different protection levels, which resulted in the publication of the first IBA Status Report for South Africa. Overarching threats were ranked and habitat types and IBAs were prioritised for conservation action. The IBA Programme's main conservation actions include increasing the protection level and improving the habitat management practices of these priority IBAs.

Number of Global IBAs	98
Number of Sub-regional IBAs	14
Total area	14 136 750 ha
Mean area	126 220 ha
Smallest IBA	10 ha
Largest IBA	2 136 380 ha
% of South Africa's surface area	11.6%

grasslands, fynbos and wetlands are highly threatened and under-represented in the protected areas network

unprotected and partially protected IBAs have a higher degree of degraded habitat

even in protected IBAs, habitat quality has declined



only 25% of IBAs hold optimal habitat

West Coast National Park and Saldanha Bay Islands IBA is one of South Africa's most important strongholds for waders and Strandveld endemics (Ronél Peacock)

STATE OF HABITAT IN IBAs

	not protected	partially protected	fully protected	all IBAs combined
Rocky areas	2	2	9	13
Forests	2	15	21	38
Savannah	4	5	12	21
Grassland	11	14	30	55
Shrubland	8	12	16	36
Desert	7	NA	1	8
Inland wetlands	20	17	40	77
Marine/tidal	1	2	3	6
All habitats	55	67	132	254

light grey signifies unfavourable or very unfavourable habitat state within the IBA

numbers are IBA sites evaluated per category

extent of colour shows percentage of favourable or near favourable habitat

forest and savannah IBAs have a relatively large proportion of favourable habitat

very few IBAs contain true desert habitat, making them all the more important

desert IBAs contain only 14% favourable habitat

wetlands in protected IBAs are in significantly better state than in partially or unprotected IBAs

data from >250 habitat assessments within the 112 IBAs

"There are approximately 13 000 IBAs worldwide; South Africa's 112 IBAs span more than 14 million ha"

IMPORTANT BIRD AND BIODIVERSITY AREAS (IBAs)

"IBAs are identified using standard, internationally agreed criteria that are scientifically defensible"

LIMPOPO

1 Mapungubwe National Park (P)
2 Kruger National Park and adjacent areas (P)
3 Soutpansberg (P)
4 Blouberg Vulture Colonies (P)
5 Wolkberg Forest Belt (P)
6 Polokwane Nature Reserve (U)
7 Waterberg System (P)
8 Nyl River Floodplain (P)
9 Northern Turf Thornveld (U)
10 Blyde River Canyon (P)

MPUMALANGA

13 Misty Mountain Nat. Heritage Site (F)
14 Kaapsehoop (F)
15 Loskop Dam Nature Reserve (F)
16 Steenkampsberg (P)
17 Songimvelo Nature Reserve (F)
18 Amersfoort–Bethal–Carolina (U)
19 Chrissie Pans (P)
20 Grasslands (P)

GAUTENG

21 Blesbokspruit (P)
22 Suikerbosrand Nature Reserve (F)
130 Devon Grasslands (U)

NORTH WEST

23 Pilanesberg National Park (F)
24 Botsalano Nature Reserve (F)
25 Magaliesberg (P)
26 Barberspan and Leeupan (P)

NORTHERN CAPE

27 Kalahari Gemsbok National Park (F)
28 Spitskop Dam (U)
29 Augrabies Falls National Park (F)
30 Orange River Mouth Wetlands (U)
31 Dronfield (U)
32 Kamfers Dam (U)
33 Benfontein (U)
34 Mattheus-Gat Conserv. Area (U)
35 Haramoep & Black Mnt. Mine (U)
36 Bitterputs Conservation Area (U)
37 Platberg–Karoo Conservancy (U)

FREE STATE

39 Sandveld & Bloemhof Dam (P)
42 Alexpan (U)
43 Ingula Nature Reserve (U)
44 Willem Pretorius Game Reserve (F)
45 Murphy's Rust (U)
46 Sterkfontein Dam NR (P)
47 Golden Gate Highlands NP (F)
48 Rooiberge–Riemland (U)
49 Soetdoring Nature Reserve (F)
50 Kalkfontein Dam NR (F)
51 Upper Orange River (F)

KWAZULU-NATAL

52 Ndumo Game Reserve (F)
55 Phongolo Nature Reserve (F)
56 Ithala Game Reserve (F)
59 Chelmsford Nature Reserve (F)
60 Hluhluwe–iMfolozi Park (F)
61 Lake Eteza Nature Reserve (F)
62 Spioenkop Nature Reserve (F)
63 Umlalazi Nature Reserve (F)
64 Maloti Drakensberg Park (F)
65 Ngoye Forest Reserve (F)
66 Entumeni Nature Reserve (F)
67 Dlinza Forest Nature Reserve (F)
69 Umvoti Vlei (P)
71 KwaZulu-Natal Mistbelt Forests (P)
72 Hlatikulu (U)
74 Karkloof (P)
75 Umgeni Vlei Nature Reserve (F)
76 Midmar Nature Reserve (F)
77 Impendle Nature Reserve (F)
78 KwaZulu-Natal Mistbelt Grasslands (U)
79 Richards Bay Game Reserve (F)
80 Greater Ngwangwana River (F)
81 Franklin Vlei (U)
83 Penny Park (U)
84 Mount Currie Nature Reserve (F)
85 Oribi Gorge Nature Reserve (F)
86 Umtamvuna Nature Reserve (F)
123 Mount Moreland (U)
128 iSimangaliso Wetland Park (F)

EASTERN CAPE

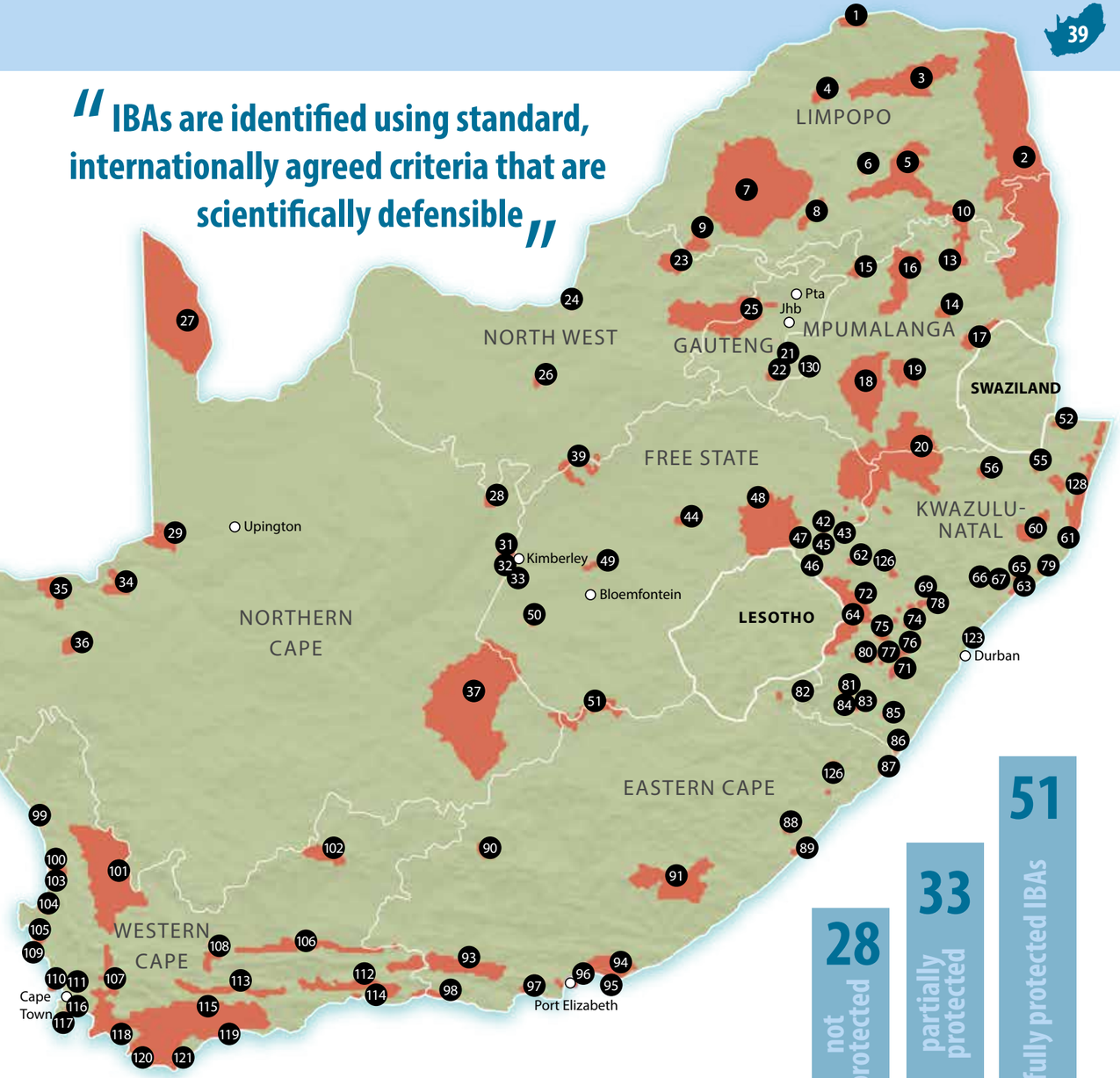
82 Matatiele Nature Reserve (F)
87 Mkhambathi Nature Reserve (F)
88 Colleywobbles Vulture Colony (U)
89 Dwesa–Cwebe Nature Reserve (F)
90 Camdeboo National Park (F)
91 Amatola–Katberg Mountain (P)
93 Kouga–Baviaanskloof Complex (P)
94 Woody Cape Section: Addo Elephant National Park (P)
95 Algoa Bay Islands: Addo Elephant National Park (F)
96 Swartkops Estuary–Redhouse and Chatty Saltpans (P)
97 Maitland–Gamtoos Coast (P)
98 Tsitsikamma–Plettenberg Bay (P)
126 Pondoland Cape Vulture (U)

WESTERN CAPE

99 Olifants River Estuary (U)
100 Bird Island (F)
101 Cedarberg–Koue Bokkeveld Complex (P)
102 Karoo National Park (F)
103 Verlorenvlei Estuary (U)
104 Berg River Estuary (U)
105 West Coast NP and Saldanha Bay Islands (F)
106 Swartberg (P)
107 Boland Mountains (P)
108 Anysberg NR (F)
109 Dassen Island (F)
110 Robben Island (F)
111 Rietvlei Wetland: Table Bay NR (F)
112 Outeniqua Mountains (P)
113 Langeberg Mountains (P)
114 Wilderness–Sedgefield Lakes Complex (P)
115 Overberg Wheatbelt (U)
116 False Bay Nature Reserve (F)
117 Boulders Beach (F)
118 Cape Whale Coast (P)
119 De Hoop Nature Reserve (F)
120 Dyer Island Nature Reserve (F)
121 Agulhas Plain–Heuningnes Estuary (P)

Of South Africa's 112 IBAs, 46% are fully protected, while 29% have partial protection and 25% are completely unprotected.

PROTECTION STATUS
F = Fully Protected
P = Partially Protected
U = Unprotected



28 not protected

33 partially protected

51 fully protected IBAs

"The primary threat to the country's birds is that of habitat loss"

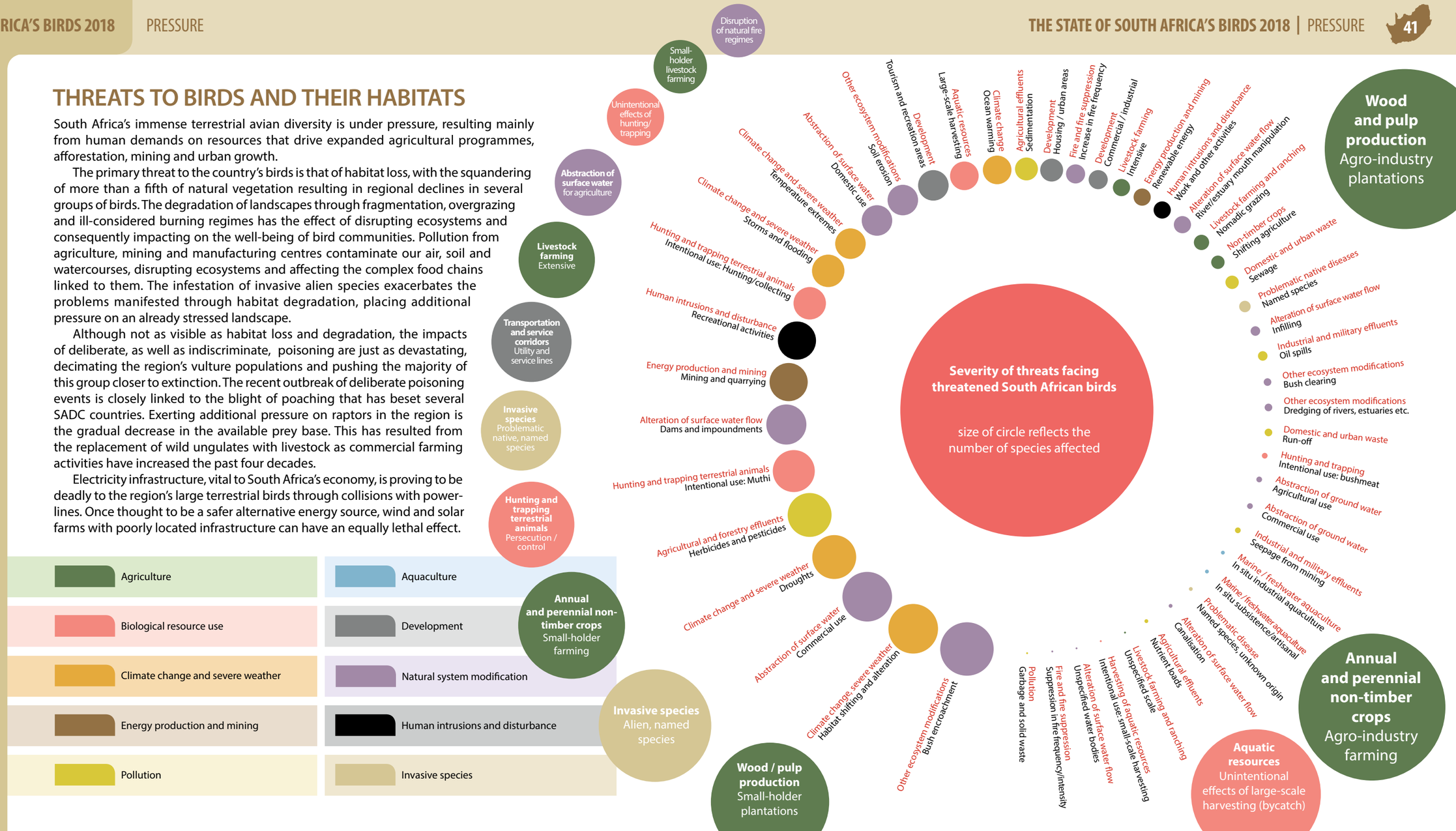
THREATS TO BIRDS AND THEIR HABITATS

South Africa's immense terrestrial avian diversity is under pressure, resulting mainly from human demands on resources that drive expanded agricultural programmes, afforestation, mining and urban growth.

The primary threat to the country's birds is that of habitat loss, with the squandering of more than a fifth of natural vegetation resulting in regional declines in several groups of birds. The degradation of landscapes through fragmentation, overgrazing and ill-considered burning regimes has the effect of disrupting ecosystems and consequently impacting on the well-being of bird communities. Pollution from agriculture, mining and manufacturing centres contaminate our air, soil and watercourses, disrupting ecosystems and affecting the complex food chains linked to them. The infestation of invasive alien species exacerbates the problems manifested through habitat degradation, placing additional pressure on an already stressed landscape.

Although not as visible as habitat loss and degradation, the impacts of deliberate, as well as indiscriminate, poisoning are just as devastating, decimating the region's vulture populations and pushing the majority of this group closer to extinction. The recent outbreak of deliberate poisoning events is closely linked to the blight of poaching that has beset several SADC countries. Exerting additional pressure on raptors in the region is the gradual decrease in the available prey base. This has resulted from the replacement of wild ungulates with livestock as commercial farming activities have increased the past four decades.

Electricity infrastructure, vital to South Africa's economy, is proving to be deadly to the region's large terrestrial birds through collisions with power-lines. Once thought to be a safer alternative energy source, wind and solar farms with poorly located infrastructure can have an equally lethal effect.



"South Africa's immense avian diversity is under pressure, resulting mainly from human demands on resources"

Pale Chanting Goshawk (Martin R Taylor)

(Peter Chadwick)

Compounding the existing challenges is the looming threat of climate change which, is set to push a large number of the region's species towards extinction, and particularly those associated with arid habitats or high altitudes. At sea, fish stocks upon which seabirds depend have been heavily exploited, and mortality from direct seabird-fishery interactions and competition between seabirds and fisheries provide conditions to depress annual seabird survival rates. To a lesser extent, the introduction of invasive alien species, such as cats and mice to Marion Island, has had - and continues to have - a negative impact on seabirds. Many bird species are affected by more than one threat: while high-impact threats affect the majority of the population and cause rapid declines, low-impact threats affect the minority and cause slower, albeit still significant, declines. In this section a summary is provided of the major threats currently impacting upon our bird communities. Threats affecting Important Bird and Biodiversity Areas (IBAs) are examined, as are cross-cutting threats that increase the extinction risk to birds.

THREATS TO IBAs

The percentage of IBAs facing threats, and particularly those under full protection, is particularly worrying considering that these sites should be managed as conservation areas. The threat types recorded most often for fully protected IBAs are (in order of frequency): invasive and other problematic species; natural system modification through fire; and biological resource use from hunting and fishing. All three threat types are management-related and result in habitat degradation and species loss. The threat types recorded most frequently in partially protected and unprotected IBAs are: natural system modification as a result of fire and changes to watercourses and water levels; agriculture (livestock, crops and timber plantations); and invasive and other problematic species. These threats result in the degradation and loss of habitat, and consequently the disappearance of species. It should be noted that threat types vary from one biome to another and, therefore, from one region to another. For instance, fynbos faces pressure from fire and invasive species, whereas estuaries are impacted by changes to watercourses upstream of them. Grasslands are largely under pressure from fire and agriculture, although on the Highveld coal mining is one of the most severe pressures on grassland and wetland habitats and their respective bird species.

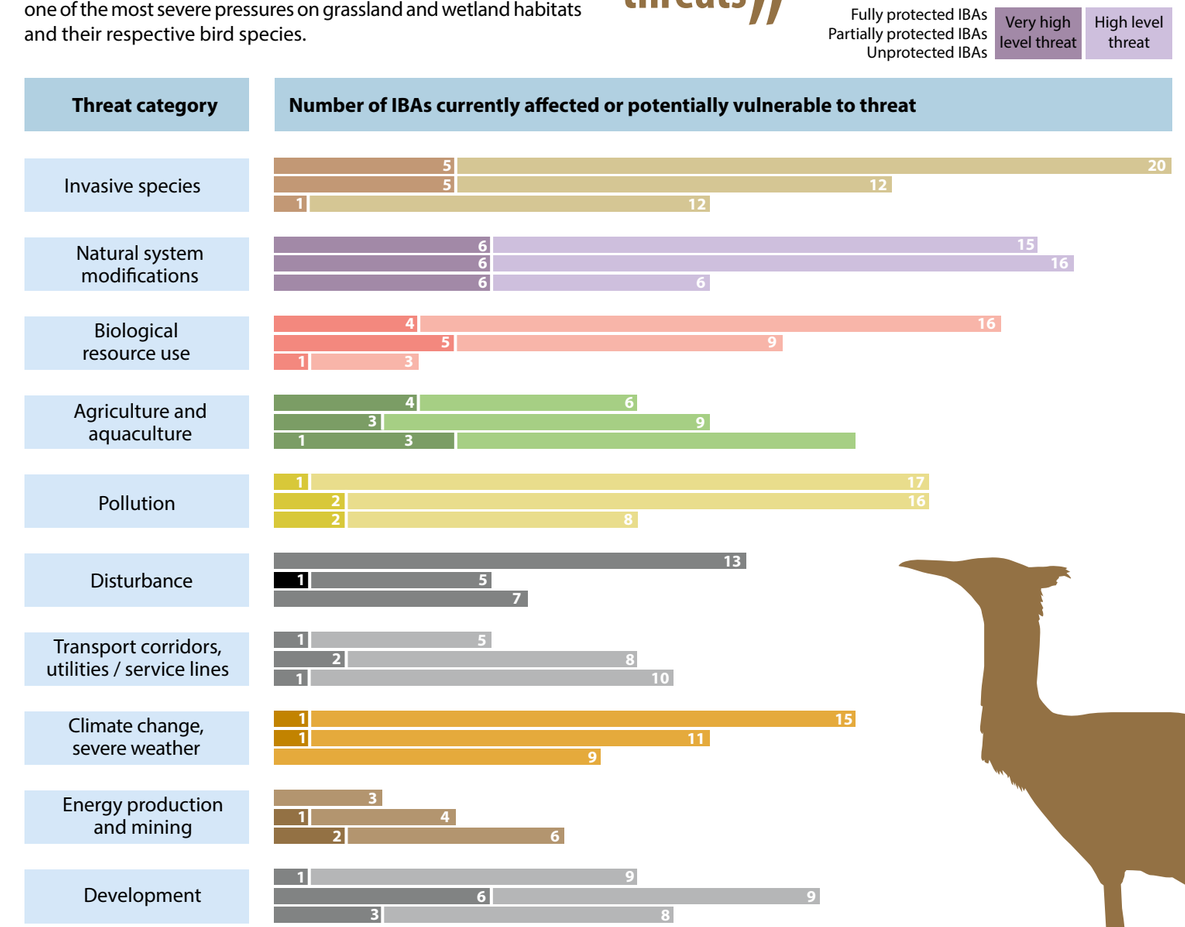
39% of IBAs face at least one very high threat

48% of IBAs face at least one high threat

52% of partially protected IBAs face very high threats

25% of fully protected IBAs face very high threats

"IBAs are under serious pressure from a broad spectrum of threats"



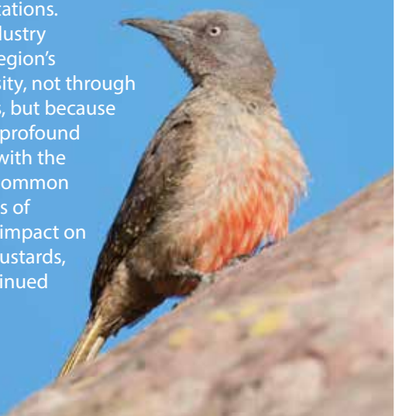
"Mpumalanga faces unprecedented environmental threats that will have significant consequences for South Africa's future prosperity"

MINING IN THE MPUMALANGA GRASSLANDS:
A MAJOR THREAT TO VITAL BIRD HABITATS

South Africa's birds, and the habitats upon which they depend, are coming under increasing pressure from the mining sector and nowhere is this more prevalent than in Mpumalanga Province. Coal deposits, a major component of South Africa's current energy requirements, lie under some of the most important grassland and wetland habitat, essential for the long-term survival of several bird species and other biodiversity. These areas are also vital to continued water production, food security and sustainable livelihoods through the Biodiversity Economy. Applications to mine in or alongside formally declared protected areas continue to be processed by government agencies, despite mining being prohibited inside or in the buffer zones of protected areas. Mpumalanga Tourism and Parks Agency data for 2000–2011 show that applications for development covered 61% of that province's area. Mining in Mpumalanga has other impacts other than habitat loss and degradation and the loss of water generation; air pollution created by coal fired power stations has resulted in the poorest air quality in South Africa. Of these 3 600-odd applications, 88% were mining-related. Most recently, the Steenkampsberg Important Bird and Biodiversity Area, 11 km northeast of Belfast, Mpumalanga has seen increased applications for mining. These proposed activities lie above a wetland network that includes Middelpunt Vlei, home to the Critically Endangered White-winged Flufftail.

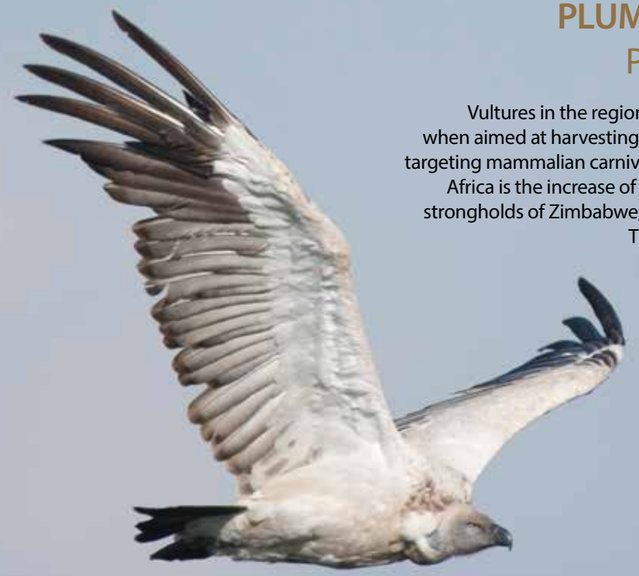
COMMERCIAL AFFORESTATION:
THE SINGLE GREATEST THREAT TO OUR BIRDS?

Afforestation poses a special threat to South African grasslands, particularly as the country's regions of highest grassland biodiversity overlap extensively with the most suitable areas for timber plantations. Commercial afforestation is probably the industry that poses the single greatest threat to the region's endemic and threatened birds and biodiversity, not through radical alteration of vegetation communities, but because concentration of large numbers of trees has profound consequences for the hydrology of an area, with the drying up of streams and wetlands being a common result. The afforestation of grasslands in parts of Mpumalanga has had a particularly adverse impact on large terrestrial species such as cranes and bustards, which require vast open landscapes for continued survival.



Ground Woodpecker (Martin R Taylor)

PLUMMETING VULTURE POPULATIONS:
POISONING, POACHING AND MUTHI



Vultures in the region are under threat from poisoning, which may be deliberate, e.g. when aimed at harvesting birds for the traditional health industry, or accidental, e.g. when targeting mammalian carnivores. An extremely concerning recent development in southern Africa is the increase of mass poisoning incidents of vultures in the large protected area strongholds of Zimbabwe, Botswana and Namibia, ostensibly to cover poaching activities. The wide-ranging nature of vultures means that birds originating from South Africa could easily succumb to such incidents in the neighbouring states. Unconfirmed low levels of poisoning, probably with organophosphates, are suspected in many birds taken to animal rehabilitation centres. The non-steroidal anti-inflammatory drug NS diclofenac, a major potential threat to *Gyps* vultures that caused severe declines in Asia, is not currently known to be widely used for veterinary purposes in the region.

9/11 of Africa's vultures occur in South Africa, with important populations of 6 species

70% of the world's 23 vultures are globally threatened or near threatened

98% decline in the recent devastating vulture crash in India and South Asia

50 - 60% decline that has been measured in savannah species over the past three decades

579 vultures were poisoned in South Africa between 2011 and 2016

294 vultures were killed through poisoning in South Africa in the first half of 2016

29% of vulture deaths may be attributable to harvesting of vulture body parts for traditional medicine

Cape Vulture (Martin R Taylor)

"The impacts of climate change on biodiversity in South Africa are predicted to be severe and are already occurring"

Chestnut-banded Plover (Dylan Vasapolli)

CLIMATE CHANGE: AN INCREASING FACTOR IN BIRD DECLINES

Climate change is now considered a major driving force behind species declines and is a factor that is likely to modify the relationships between human density and species richness patterns. The impacts of climate change on biodiversity in South Africa are predicted to be severe and are already occurring. In time the South African IBA network is likely to become less effective for conserving endemic birds according to future climate change models. Although additional conservation areas brought into existence by programmes such as biodiversity stewardship are likely to introduce valuable flexibility to conservation management, only limited options are available for such expansions and the conservation value of these areas is likely to be compromised by changing climate. In addition, many of these high-priority areas that fall outside IBAs are also outside the current formal protected areas network. The idea that as a nation we can conserve species where they currently exist is therefore unrealistic given recent climate change predictions. Future conservation planning decisions need to be based upon the future habitat requirements of species as opposed to current projections.

Demographic/ecological traits	Example
Restricted range	Knysna Warbler, Red Lark, Green Barbet
Limited to islands	Cape Gannet, Roseate Tern
Limited to mountain tops	Mountain Pipit, Bearded Vulture
Specific niche requirements (diet, roost, nest)	Palm-nut Vulture, sugarbirds
Reliance on vulnerable or ephemeral habitats	Chestnut-banded Plover
Obligate co-evolutionary relationship with other species	Oxpeckers; host-specific brood parasites
Limited dispersal tendencies	Blue Crane
Sedentary and territorial	Eagles
High population saturation	Various long-lived birds
Existing conservation threats	African Penguin

Life history/behavioural traits	Example
Slow reproductive rates	Long-lived species
Small clutch size	Large, long-lived species
Extended parental care	Long-lived species
Sensitivity to human disturbance/settlement	Raptors, wetland birds
Morphological and behavioural traits affecting heat stress	Sclater's Lark, waders
Sensitivity to floods, especially with regard to nests	Flamingos, African Skimmer
Tendency to stay in parents' territory	Co-operative breeders, arid-country species
Long-distance migrants	Barn Swallow, warblers, some shrikes

Data from Simmons et al. (2004)

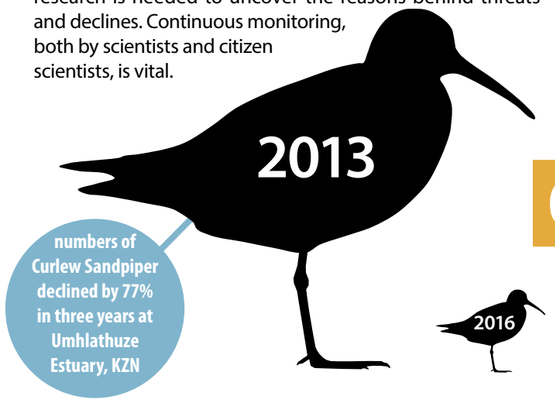
SHOREBIRD DECLINES: WADERS WANING WORLDWIDE

Global populations of Palearctic waders are plummeting with a third of the planet's species in danger. Six are already extinct, and it's probably too late for three more. Nine are Critically Endangered and require urgent and sustained conservation actions for their immediate survival. Unless we intervene now, future generations will never have the chance to see these extraordinary birds. Waders, with their specialised feeding ecologies and incredible global migrations, are sensitive indicators of ecosystem health. Widespread degradation of wetlands, reclamation of tidal flats and agricultural intensification, all exacerbated by the effects of climate change, are pushing species further towards extinction every day. Many migratory species are reliant on one or two key staging sites - if these places are lost, the birds will follow. If we are to save these remarkable birds, international conservation and cooperation is critical. Coordinated research is needed to uncover the reasons behind threats and declines. Continuous monitoring, both by scientists and citizen scientists, is vital.

>90% decline in Curlew Sandpipers

<600 number of Chestnut-banded Plovers in South Africa

15 392 km migration of Ruff from South Africa to Siberia



numbers of Curlew Sandpiper declined by 77% in three years at Umhlathuze Estuary, KZN

WIND ENERGY: AN EMERGING THREAT

The relaxation of the state's monopoly on power production has seen an influx of private developers interested in South Africa's renewable energy sector. Interest has been considerable, with in excess of 50 wind energy projects under way and with a number more planned. A range of different bird species, and in particular large, slow-flying species, are prone to collisions with man-made structures such as wind turbines and power-lines, especially where these obstacles occur as apparently prominent features in open airspace. Disturbance can lead to birds being displaced and excluded from areas of suitable habitat - effectively loss of habitat for them. The effects attributable to wind farms are variable and are specific to species, season- and site. Robust, objective baseline studies are needed to inform sensitive siting that will minimise deleterious effects on birds, other wildlife and their habitats. There is also a need for post-construction monitoring at installations in sensitive environments.

THE POWER-LINE GRID VS. LARGE BIRD SPECIES

South Africa's core energy grid comprises more than 350 000 km of power-lines and will increase significantly in extent with a capacity expansion budget currently in excess of R300-billion. Numerous published and unpublished studies have clearly demonstrated that overhead high-tension wires or cabling, and particularly commercial power-lines, pose a threat to large terrestrial and wetland birds as well as some smaller, fast-flying species. Large birds that are relatively ungainly in flight (e.g. flamingos, cranes and bustards) are vulnerable to flying directly into utility wires and cables and breaking their necks or limbs, particularly if the cables are strung close to points of take-off and landing, such as near wetlands. Declines in some species may be attributed directly to these collision events. Efforts to find a proven and reliably effective collision mitigation strategy have not yet been successful.

0.63 fatal collisions/km/year in Ludwig's Bustard in the Karoo

"The primary threat to pelagic seabirds is the accidental yet deadly interaction with fisheries"

OVER-EXPLOITATION OF FISH STOCKS: PUSHING BENGUELA ENDEMICS TO EXTINCTION

3/3 of South Africa's marine cormorants threatened

470 pairs of Bank Cormorant remaining in the region

57% decrease in Cape Cormorants at 6 main breeding islands

In coastal and marine environments, commercial stocks of harvestable fish species have been over-exploited, which has reduced food supply for many inshore foraging seabirds and resulted in concomitant declines. The fisheries based on the rich Benguela ecosystem off the West Coast have greatly depleted stocks of some species, including Pilchard and Cape Anchovy, with others soon to follow. This has had an impact on the Cape Gannet and African Penguin, two Benguela-endemic seabirds, both of which have recently been uplisted to regionally Endangered. Bycatch by commercial fishers is a serious problem in the marine environment, leading to the incidental mortality of non-target species, with rates varying between 5% and 70% of the total catch.

"One of the largest threats to islands is the arrival of unwanted alien species"

PRINCE EDWARD ISLANDS' SEABIRD COLONIES: WHEN THE CAT'S AWAY, THE MICE WILL PLAY

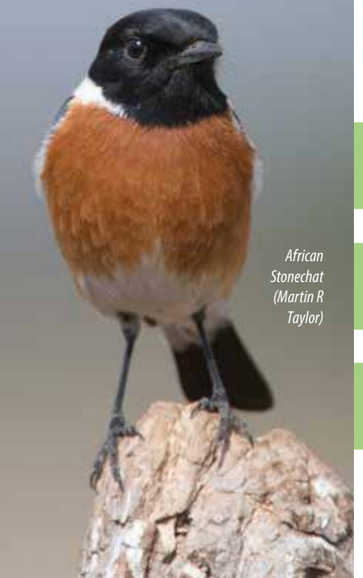
As in the case of other sub-Antarctic islands, one of the largest threats to the Prince Edward Islands is the arrival of unwanted alien animals and plants, as well as disease-bearing agents. In a time of climate change, when the islands are becoming warmer and drier, it appears that introduced species have a better chance of becoming established. Unfortunately, seabirds have a near-universal habit of breeding exclusively on islands, which means that they are behaviourally poorly equipped to deal with disturbance and are particularly sensitive to introduced predators, a feature they share with other island-endemic bird species. Feral cat were removed from Marion Island after a long campaign that used disease, night shooting, trapping and poisoning to achieve eventual success. The remaining alien mammal, the House Mouse, will prove much harder to eradicate. Studies on Gough Island indicated that this species was responsible for the poor breeding success of Tristan Albatross and Atlantic Petrel. Population models indicate that the levels of predation are sufficient to cause population decreases. With the absence of predators following the eradication of feral cat, mice now pose a significant threat to breeding colonies of seabirds on the Prince Edward Islands.

COMMERCIAL FISHERIES: DEVASTATING SEABIRD POPULATIONS

The primary threat to Procellariiform seabirds such as albatrosses, petrels and shearwaters is their accidental, yet deadly interaction with longline and trawl fisheries. In South Africa, those fisheries overlap completely with one of the most important foraging grounds of these birds. The nutrient-rich waters off the Western Cape and the eastern Agulhas Bank (Eastern Cape) support the country's most economically valuable longline and trawl fisheries, as well as a large proportion of the global populations of several seabirds, particularly during the austral winter. Procellariiforms are adapted to foraging on very patchy and unpredictable, but often extremely abundant sources. Therefore, fishery discards from trawlers, or longline hooks floating near the surface and baited with squid or fish, are almost designed to attract them. Birds are hooked (on longlines) or collide with trawl cables and are dragged underwater and drowned. In the early 2000s (before solutions were successfully implemented) there were 10 000 - 20 000 seabirds being killed in the tuna longline fishery and at least as many also being killed in the South African trawl fishery each year. The problem is global - tuna fishing in particular span all ocean basins - resulting in albatrosses becoming one of the most threatened groups of birds on the planet. More than half of all pelagic seabird populations are decreasing, particularly in the albatross family (17 of 22 species threatened).

(Martin R Taylor)

"Conservation requires creative thinking, hard work and the utilisation of every tool in the conservationist's toolbox"



African Stonechat (Martin R Taylor)

RESPONSE: WORKING TOGETHER TO CONSERVE BIRDS

A number of stakeholders, including government departments, provincial conservation bodies and several conservation NGOs, are committed to addressing the threats faced by South Africa's bird populations. In this section a snapshot is given of some of the projects being implemented to ease the pressure on bird populations throughout the region. Some of the projects highlighted are species-specific, focusing on improving the extinction risk faced by the region's most threatened birds, while others take a holistic approach at a landscape scale, benefitting whole bird communities. Some projects address emerging threats, such as that of wind energy, which have the potential to impact on a large number of bird species, whereas others showcase the need to consider non-traditional conservation methods, such as utilising birding tourism and the tourism dollar, to drive the protection of birds and their habitats. Bird conservation is complex and requires creative thinking, hard work and the utilisation of every tool in the conservationist's toolbox if it is to be effective.

BIRDLIFE SOUTH AFRICA

BirdLife South Africa is a member of the BirdLife International Partnership, whose one common purpose is to conserve the world's birds and their habitats. BirdLife International has a strategy that is implemented by its Country Partners and is closely aligned with the Convention on Biological Diversity's Aichi Targets. Over the past decade BirdLife South Africa has grown into an effective and innovative conservation organisation with five conservation programmes working towards protecting South Africa's 856 bird species and 112 IBAs. The organisation employs a team of highly qualified conservation biologists, social scientists, and ornithologists, as well as support staff, and prides itself on its collective efforts to determine and implement effective and innovative solutions to conservation problems. BirdLife South Africa was responsible for publishing the *South African IBA Directory* as well as *The 2015 Red Data Book of Birds of South Africa, Lesotho and Swaziland*. The organisation is recognised as the strongest of the 24 BirdLife Partners in Africa, and one of the strongest globally. As a result, the it has been asked to play a supportive role in the subcontinent, especially in terms of assisting other BirdLife Partners and identifying conservation organisations that could potentially become BirdLife Partners in their own countries.

35 number of BirdLife South Africa staff members

35 number of BirdLife South Africa affiliated bird clubs

5 600 number of BirdLife South Africa members

SANBI: SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE

The South African National Biodiversity Institute leads and coordinates research and monitors and reports on the state of biodiversity in South Africa. It provides knowledge and information, gives planning and policy advice and pilots best-practice management models in partnership with stakeholders. SANBI engages in ecosystem restoration and rehabilitation, leads the human capital development strategy of the sector and manages the National Botanical Gardens as 'windows' to South Africa's biodiversity for enjoyment and education.

ADU: ANIMAL DEMOGRAPHY UNIT, UNIVERSITY OF CAPE TOWN

The Animal Demography Unit is a research unit of the University of Cape Town. Established in December 1991 within the Department of Statistical Sciences, it was built on the nucleus of the South African Bird Ringing Unit (SAFRING) and the Southern African Bird Atlas Project (SABAP). Established in December 1991 within the Department of Statistical Sciences at the University of Cape Town. The mission of the unit is to contribute to the understanding of animal populations, especially population dynamics, and thus provide input for their conservation. This is achieved through mass participation projects, long-term monitoring, innovative statistical modelling and population-level interpretation of results. The emphasis is on the curation, analysis, publication and dissemination of data.

EWT: ENDANGERED WILDLIFE TRUST

The Endangered Wildlife Trust is a non-governmental, not-for-profit conservation organisation founded in 1973. It fills the key niche of conservation action through applied research, field work and direct engagement with stakeholders. With specialist programmes and a large team of skilled field staff deployed throughout southern Africa, the EWT's work supports the conservation of threatened species and ecosystems. Priority interventions focus on identifying the key factors threatening biodiversity and developing mitigating measures to reduce risk and reverse the drivers of species extinction and ecosystem degradation. Through a broad spectrum of partnerships and networks, the EWT responds to the key threats driving species and ecosystem loss by developing innovative methodologies and best-practice guidelines that support reduced impact, harmonious co-existence and sustainable living for all.

PERCY FITZPATRICK INSTITUTE OF AFRICAN ORNITHOLOGY

The Percy FitzPatrick Institute of African Ornithology is located at the University of Cape Town, South Africa, where it is housed within the Department of Biological Sciences. Situated at the tip of Africa, the institute is uniquely positioned to take advantage of the vast untapped biological resources of the continent. Members of the department are committed to developing a greater understanding of these through the training of scientists and the pursuit of primary research, from evolutionary ecology to conservation biology. The institute is also home to the Niven Library, which holds what is probably Africa's most comprehensive collection and reprints of the institute's vast publication record.

CONSERVING THE TAITA FALCON: ONE OF THE WORLD'S RAREST RAPTORS

A small and highly specialised bird-hunting raptor, the Taita Falcon is sparsely and patchily distributed down the eastern side of sub-Saharan Africa, with a global population thought to be in the region of 1 000 mature individuals. The South African Taita Falcon Survey Team, a BirdLife South Africa Species Guardian, has been involved in the annual monitoring of the breeding success of the South African Taita Falcon population since 2006. The species was first discovered to be breeding in the late 1980s and subsequent surveys located eight nesting territories, suggesting a regional population of approximately 20 mature birds and unlikely to exceed 50 birds in total. The species is poorly known throughout much of its discontinuous distribution, is generally thought to be rare where it occurs and is largely restricted to well-wooded habitats and to mountains or incised river valleys where high, sheer rock faces are available as nesting and foraging sites. In South Africa, the species is regarded as one of the country's rarest breeding birds and is listed as regionally Critically Endangered. Due to the worrying declining population trend noted in South Africa and Zimbabwe to date, the surveys will be expanded to the eastern side of sub-Saharan Africa, where the species is also known to occur, in order to obtain better estimates of the global distribution, status and population

Global status: Vulnerable, with fewer than 1 000 mature individuals and less than 40 known nest sites

Regional status: Critically Endangered, with fewer than 50 birds and only 8 or 9 known nest sites

Members of the Taita Falcon Survey Team scan the Eastern Escarpment (Anthony van Zyl)

WHITE-WINGED FLUFFTAIL: SAVING SOUTH AFRICA'S MOST ENIGMATIC SPECIES

The globally Critically Endangered White-winged Flufftail is restricted to the high-altitude wetlands of Ethiopia and eastern South Africa. BirdLife South Africa and the Middelpunt Wetland Trust have initiated a number of projects to determine the conservation action required to save this species, with the work largely being sponsored by Eskom, Airports Company South Africa and the Department of Environmental Affairs. A research team of scientists and conservationists visited the Berga Wetland in Ethiopia in order to ascertain the possible migratory connection between the Ethiopian and South African populations through genetic and isotope analyses. Three peer-reviewed scientific publications have been published following the collection of blood and feather samples from seven individuals in Ethiopia and three birds in South Africa. To further our understanding of the habitat requirements and population size of this flufftail, a team of ornithologists have surveyed known historical sites and previously unexplored potential habitat throughout the region. A novel camera trap design has documented the presence, activity, occupancy and abundance of White-winged Flufftails at Middelpunt Wetland near Belfast in Mpumalanga. The current estimate of the species' global population is fewer than 250 birds, with the South African subpopulation being estimated at only 50 birds, making this species the world's rarest flufftail. In 2013, this species was uplisted by the IUCN to globally Critically Endangered, one level from Extinction in the Wild. There is much work to be done in order to prevent this flufftail from falling off the extinction precipice.

(Arno Ellmer)

50 estimate of number of birds remaining in South Africa

<10 km² area of occupancy

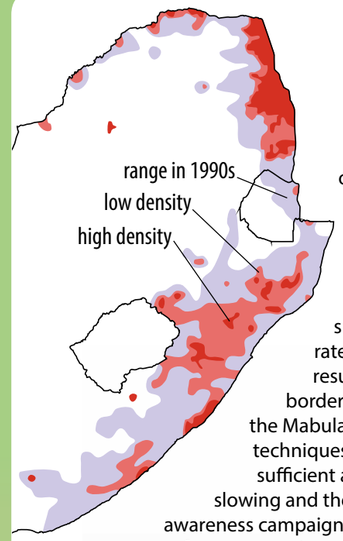
8 wetlands where the species has been recorded since 1995

(Warwick Tarboton)

LUDWIG'S BUSTARDS AND POWER-LINES

Ludwig's Bustard is a southern African near-endemic that is highly susceptible to collisions with power-lines due to its inability to manoeuvre to avoid unexpected obstacles and its limited frontal vision. On average, transmission power-lines kill 1.1 Ludwig's Bustards per kilometre per year, and distribution lines kill up to 0.9 per kilometre per year locally, making this species by far the most common collision casualty in the arid Karoo regions of South Africa (69% of all birds recovered on mortality surveys). The extent of power-lines within the range of this species is vast and expanding, and there is an urgent need to better understand the threat posed by collision mortality. Researchers at the FitzPatrick Institute of African Ornithology have been using satellite tags and stable isotopes to improve knowledge of bustard movement patterns, quantifying mortality to examine population level effects and together with the Eskom - Endangered Wildlife Trust Strategic Partnership, they have also been testing line-marking devices to seek effective mitigation.

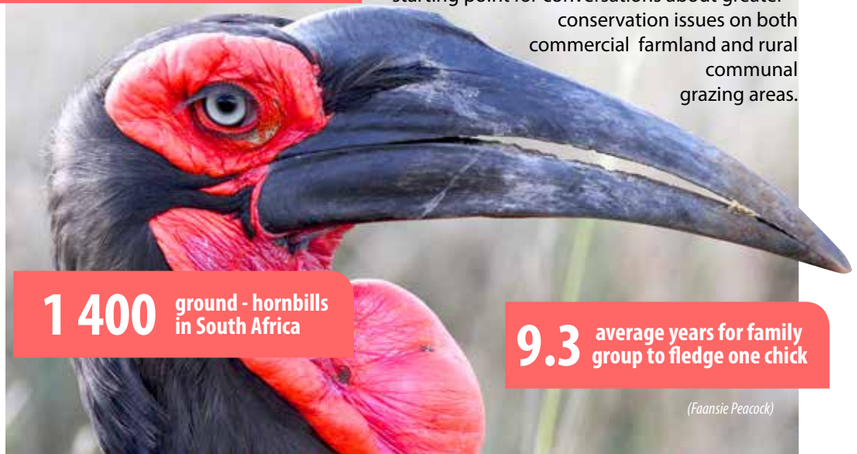
(Dylan Vasapolli)



SOUTHERN GROUND-HORNBILL: PROTECTING A BUSHVELD ICON

The Southern Ground-Hornbill faces a growing number of threats in South Africa: persecution for its window-breaking habits, accidental poisoning by incorrectly used agricultural pesticides, malicious secondary poisoning on poisoned baits destined but not designed for 'pest' species, electrocution on transformer boxes, trade for zoos and traditional practices and the ubiquitous loss of habitat and resultant loss of suitable nest trees. These threats, coupled with a slow breeding rate and a complex social and cooperative breeding structure, are resulting in the swift decline of this long-lived species beyond the borders of the largest formally protected areas. Over the past decade the Mabula Ground Hornbill Project has trialed a number of conservation techniques and now leads reintroduction efforts. No single action will be sufficient and so a multi-pronged approach is employed, with the aim of slowing and then reversing the decline. It comprises extensive education and awareness campaigns working locally with rural schools, traditional authorities and farmer committees and nationally through the available media; threat mitigation at a territory scale through a custodianship programme; conservation biology research to understand how best to use conservation action for the most gains; and the development of a national artificial nest programme. This culturally and ecologically important flagship species is also an excellent starting point for conversations about greater conservation issues on both commercial farmland and rural communal grazing areas.

250 km² territory required per group in poor habitat



1 400 ground - hornbills in South Africa

9.3 average years for family group to fledge one chick

(Faansie Peacock)

AFRICAN GRASS OWL: NOCTURNAL HUNTER IN HIGHVELD HABITATS

The African Grass Owl is a habitat specialist restricted to open, grassy marshes, wetlands and floodplains. It is estimated that there are fewer than 5 000 of these secretive birds left in southern Africa. Pressures such as unfavourable burning and grazing regimes, habitat transformation, road casualties and entanglement with fences put severe pressure on this species. The Endangered Wildlife Trust initiated work on this nocturnal predator in order to address growing concern about habitat decline and the current lack of knowledge with regard to managing Highveld grasslands for this threatened species. Coal mine rehabilitation sites represent a potential tool for the restoration of African Grass Owl habitat and may be very important for the future conservation of this species in light of the current prominence of coal mining on Highveld grasslands. This project therefore aims to investigate the requirements of the African Grass Owl with respect to habitat use and diet where they occur naturally on Highveld grasslands in order to compare and assess the current state of various coal mine rehabilitation sites as potential Grass Owl habitat. Ultimately, the project aims to develop habitat management guidelines and propose practices that would encourage the re-establishment of African Grass Owl populations and ensure their persistence on such sites.

"Coal mine rehabilitation sites represent a potential tool for the restoration of African Grass Owl habitat"

>150 African Grass Owls killed on two roads in two years in Gauteng

2 500 minimum estimated regional population (7 500 maximum)

African Grass Owl
(Francois du Plessis)

"As obligate scavengers, vultures are especially susceptible to dietary toxins and are now regarded as one of the most threatened functional guilds"

DEVELOPING A ROADMAP FOR RECOVERY:
MULTI-SPECIES ACTION PLAN FOR VULTURES

A staff member from the Endangered Wildlife Trust has, as overarching coordinator for the project, played a key role in bringing hope to threatened vulture populations, not only in South Africa, but along the Africa-Eurasia Flyway. This has been done by developing a Multi-species Action Plan which sets out 124 conservation actions designed to ameliorate the threats faced by vulture populations in the Old World. The CMS Raptors MoU, in partnership with BirdLife International, the Vulture Conservation Foundation and members of the Vulture Specialist Group of the IUCN, was instrumental in the development of this global plan, which was adopted at the Conference of the Parties (COP12) to the Convention on the Conservation of Migratory Species of Wild Animals in Manila, Philippines in October 2017. This global plan will drive concerted conservation action to address the negative trends in vulture populations, where in some instances declines in excess of 95% of some species over the past 20 years have occurred, mostly due to human-induced threats. Now that the plan has been adopted by COP12, these actions, can get under way in the 128 vulture range states, including South Africa, that are affected.

RIGHT, FROM TOP *Vulture researchers go to great lengths in their quest to conserve these increasingly rare birds. Vulture conservation often requires a dedicated, hands-on approach.*
***(1)** A vulture nest is accessed with the help of a portable crane (André Botha)*
***(2)** A Lappet-faced Vulture chick is weighed, measured, inspected to ascertain its condition, and marked with patagial wing tags before being returned to its nest (André Botha)*
***(3)** An adult White-headed Vulture showing its green plastic patagial tags, as well as a satellite-tracker backpack (André Botha)*

MAPPING VULTURE MOVEMENTS

Studying the movements of vultures by means of satellite or GSM (cellphone-based) tracking has made a great contribution to our better understanding of the flight patterns, foraging ranges and dispersal of vultures in southern Africa. Over the past 5 - 7 years more than 100 vultures of six species have been fitted with a range of tracking units as part of various studies conducted by conservation NGOs and academic institutions in the country and literally millions of data points have been collected in this manner. Information gleaned from the analysis of these data supports focused and better-informed conservation decisions. These included decisions on where to implement poisoning intervention actions, the appropriate placement of energy infrastructure and networks and the strategic location of supplementary feeding sites to benefit these endangered birds. Colour-marking of a larger sample of birds by means of wing-tagging was introduced in the region in 2006 and has also contributed to an improved understanding of vulture movements. With this knowledge, researchers and conservationists gain insights into the survival of these birds over time and the possible beneficial impact of conservation action on vulture populations.

GOING DOWN LIKE A LEAD BALLOON:
DEALING WITH DIETARY TOXINS IN VULTURES

As obligate scavengers, vultures are especially susceptible to dietary toxins and are now regarded as one of the most threatened functional guilds in the world. Although numerous studies have been done on the effect of lead poisoning on raptors in the Americas, Europe and Asia, published research on the effect, prevalence and source of lead toxicity on African raptors seems to be limited, highlighting an urgent need for further scientific study. In birds, lead exposure has been shown to result in a multi-systemic disease, with even low-level chronic exposure resulting in animals that may be less fit and more prone to weakness, starvation, impaired neurological function, lower reproductive capability and even mortality. In 2016 BirdLife South Africa launched a systematic nationwide assessment of the levels and sources of lead toxicosis in South Africa's raptors, and vultures in particular. A number of blood, tissue and bone samples have been collected from across South Africa, including De Aar, Blouberg Nature Reserve, greater Gauteng, Pietermaritzburg and Molteno and several partial Cape and White-backed vulture carcasses, victims of mass poisoning events, have been analysed. Initial results indicate that scavenging raptors in particular are susceptible to lead poisoning. BirdLife South Africa will pursue this and will be looking at implementing different measures to minimise the amount of lead in the environment that affects vultures.

Bearded Vulture (Martin R Taylor)

ON A COLLISION COURSE: PREVENTING VULTURE POWER-LINE STRIKES

"Fewer than 400 mature Lappet-faced Vultures remain in South Africa"

In 1996 a strategic partnership between the Endangered Wildlife Trust's Wildlife and Energy Programme and Eskom was formed. This partnership was created with the aim of minimising the environmental impact that electricity infrastructure has on our wildlife. Among the largest and best known impacts are avian collisions with the infrastructure and electrocutions on it with one of the most commonly affected groups being vultures. On average, 84 vultures have been killed per year on power-lines across South Africa since 1996. For a group of species that are listed as Endangered or Critically Endangered, these losses to the regional population can be significant. Due to their large wingspans, heavy bodies and gregarious nature, vultures are one of the most high-risk bird groups when it comes to mortality on power infrastructure. Incidents reported to the partnership are investigated to determine the root cause of mortality. From there, mitigation recommendations are sent by the Wildlife and Energy Programme to Eskom so that adaptationscan be made to the line to prevent further incidents.

"On average, 84 vultures are killed per year on power-lines across South Africa"

Lappet-faced Vulture (Mark D Anderson)

RESPONDING TO THE AFRICAN VULTURE CRISIS: LONG-TERM MONITORING

The Vulture Conservation and Monitoring Project was launched in 1988 as an initiative of the Vulture Study Group to monitor the Cape Vultures of the Magaliesberg. Since then it has developed into a programme that stretches across a large section of the southern African subcontinent, monitoring most Cape Vulture colonies on a continuous basis. The project has now expanded its conservation and monitoring strategy to include all other southern African vulture species, with the objective of ensuring the survival and prosperity of our vultures by increasing public awareness about them and involving members of the public in vulture conservation. Vulture monitoring takes place in regions where regional representatives are situated and all species of vultures are monitored throughout the year. Monitoring of vulture populations is a necessity to determine the success or failure of conservation activities.

Cape Vulture (Martin R Taylor)

REHABILITATION: A SECOND CHANCE

Vulture breeding and rehabilitation is a conservation tool used to reduce the losses of vultures in wild populations by putting healthy vultures back into the wild. However, monitoring these released birds is an essential part of the programme in order to assess successes as well as failures. Recently VulPro released 35 vultures at the Nooitgedacht Cape Vulture breeding colony in the Magaliesberg. Each vulture was fitted with patagial tags as well as a tracking device for monitoring purposes. With the exception of the Lappet-faced Vulture, rehabilitated vultures were housed in a purpose-built release enclosure on top of the mountain for six months for acclimatisation purposes. This is the first release of its kind on the African continent and will enable us to assess how captive-bred vultures fare compared to rehabilitated ones and the success in supplementing dwindling wild vulture colonies. It also allows us to speculate on the potential success of future reintroduction programmes where vultures are becoming extinct in some countries within southern Africa. Vultures are declining rapidly across the globe and this programme is an opportunity to put back what has been lost, making use of non-releasable vultures for breeding so that every single captive vulture contributes to the survival of wild vulture populations.

1st Saturday in September is International Vulture Awareness Day

136 organisations registered worldwide to take part in IVAD 2017

The Endangered Wildlife Trust's Birds of Prey Programme also initiated the **Annual Sasol Vulture Awareness Day** in September 2006 to create awareness of the continued plight of all vulture species occurring in the region and to highlight the work done by conservationists to monitor populations and implement effective measures to conserve these birds and their habitats. Due to the success of this event, it is now recognised internationally, with 167 organisations from 36 countries participating.

Key Biodiversity Areas (KBAs) are sites that contribute significantly to the global persistence of biodiversity and represent the most important sites for biodiversity conservation worldwide. KBAs are identified using globally standardised criteria and thresholds, and the current global KBA network consists of Important Bird and Biodiversity Areas, Areas of Zero Extinction, and KBAs previously described by the Critical Ecosystem Partnership Fund (CEPF). This network will now be verified and expanded to include taxa other than birds.

KBA
KEY BIODIVERSITY AREA

IBAs and KBAs: SAFEGUARDING AND EXPANDING KEY SITES FOR BIRDS AND BIODIVERSITY

BirdLife South Africa is responsible for managing the Important Bird and Biodiversity Areas (IBA) Programme in South Africa, with the objectives to assess, monitor, coordinate and implement conservation measures for priority IBAs. The recently published *South Africa's Important Bird and Biodiversity Areas Status Report 2015* summarises the biological state of IBAs, threats to IBAs and conservation responses in IBAs, and follows the state-threat-response model adopted by the Convention on Biological Diversity (CBD). The report also makes recommendations to government and other stakeholders on how the state of IBAs in South Africa can be improved. The report and related material is available on the BirdLife South Africa website, which also provides information on biodiversity stewardship programmes, habitat management guidelines and recommendations for Environmental Impact Assessments (EIAs). The integration of the IBA project with a global KBA network (see left) is a powerful positive shift in bird and biodiversity conservation.

BIODIVERSITY STEWARDSHIP: GROWING OUR PROTECTED AREAS NETWORK

Biodiversity stewardship is an approach to securing land in priority biodiversity areas through entering into contractual agreements with private and communal landowners. The agreements range from the formal declaration of protected areas as prescribed by the Protected Areas Act to other levels of commitment governed by the Biodiversity Act and contractual law. Biodiversity stewardship operates through provincial programmes led by conservation authorities and is a highly innovative and economically effective tool to expand South Africa's protected areas network, to establish corridors of connectivity and to ensure ecological integrity. The initiative has a wealth of benefits, including stimulation of the rural economy, management of key environmental services such as water catchments, and the facilitation of the broader biodiversity economy. This unique conservation approach has substantially increased South Africa's protected areas network and successfully offered strategic conservation for birds and other species. Between 2003 and 2014, more than 450 000 ha of protected areas were declared through this novel initiative, with an additional 560 000 ha under negotiation. The initiative faces certain constraints through lack of financial sustainability and resources to allow for additional capacity to declare further sites. Conservation NGOs have increasingly been playing a substantial role in implementing biodiversity stewardship to provide needed capacity to government agencies, but also to meet their own objectives of protecting their priority sites and species. BirdLife South Africa's IBA Programme has been supporting provinces since 2010 and to date has helped declare more than 90 000 ha as protected areas in priority IBAs. It is currently working on declaring another 130 000 ha as protected areas or designated conservation areas. It is also playing a leading role in helping to build sustainable post-declaration support mechanisms for these privately protected areas, including innovative financing and habitat management support.

450 000 ha area added to the protected area network through biodversity stewardship programmes

Pristine Highveld grasslands in Golden Gate National Park IBA (Martin R Taylor)

"36% of the region's threatened species are associated with the grassland biome"

GRASSLAND BIRD CONSERVATION: BURNING AND GRAZING BEST PRACTICE

Cattle farming in the grasslands has the potential to work towards the parallel objectives of producing livestock in an economically viable manner, improving veld condition and conserving biodiversity. BirdLife South Africa's 'Bird-friendly burning and grazing best-practice for grasslands' is intended to promote awareness of threatened grassland bird species and their conservation, primarily in the agricultural (red-meat production) sector. This peer-reviewed synthesis of scientific knowledge and expert opinion has been developed into a user-friendly, illustrated brochure for farmers and has been translated into Afrikaans and isiZulu. Recently BirdLife South Africa has produced Bird Friendly habitat management guidelines for the Fynbos Biome, building on experience gained in the Grassland Biome. Both documents are available on the BirdLife South Africa website (www.birdlife.org.za).

65 percentage of range of Botha's Lark and Rudd's Lark now uninhabitable due to degradation

3 historical core sites where Botha's Lark and Rudd's Lark are now extinct

Botha's Lark (Francois du Plessis)

MONEY TALKS: FINANCIAL SUPPORT MECHANISMS TO PROTECT YOUR LAND

BirdLife South Africa's Fiscal Benefits Project was launched in early 2015 with the aim of creating innovative finance solutions for landowners formally conserving habitats and species on their properties. The project has made significant conservation gains in the realm of biodiversity finance, including the creation of South Africa's first biodiversity tax incentive. It has also tested specific environmental taxes across the country as well as amended national tax legislation. Test sites were strategically placed in habitats that are critical to the survival of some of our country's most threatened birds, such as the Blue Swallow. The project has significantly improved understanding of and access to available tax deductions that are dedicated to biodiversity conservation and has provided significant and tangible financial benefits to landowners formally protecting key sites and species. This globally unique story bridges the gap between conventional conservation and the world of finance, illustrating that business and biodiversity are not mutually exclusive. Ultimately, providing tax deductions for formal conservation leads to both an increase in protected area expansion and an increase in the financial sustainability needed for these sites to be effectively managed and have a long-term future.

CONSERVATION OF BLUE SWALLOWS ON PRIVATE LAND

Fiscal benefits help landowners to offset some of the costs of declaring their properties as protected areas. This enables them to mobilise resources to better manage their natural habitats, for example by not converting grasslands to croplands, but rather managing them by burning and grazing and removal of invasive alien plants for the benefit of the Critically Endangered Blue Swallow.

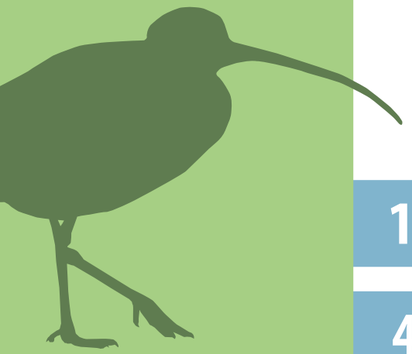
53 breeding pairs of Blue Swallows in South Africa

52% decrease in number of Blue Swallows since 2000

Blue Swallow (Clive Kaplan)

BIRDLIFE SOUTH AFRICA HIGHLAND GRASSLAND PROJECT: GAINING INSIGHT INTO SOUTH AFRICA'S MOST THREATENED SMALL PASSERINE SPECIES

The South African highland grassland system, which occurs at higher altitudes within the Grassland Biome, is known to support a diverse range of threatened and endemic avian species. The current population status and conservation measures required for some of the most threatened, endemic and localised small passerine species occurring within the highland grassland system are poorly known. BirdLife South Africa aims to address this by developing a monitoring tool that is effective at estimating the population status of severely range-restricted and elusive threatened small passerines. Focal species covered in the study included the Endangered Rudd's Lark and Botha's Lark and the Vulnerable Yellow-breasted Pipit. Results from the study highlight the current range of these species, incorporating new sites as well as sites no longer occupied, current measures of relative abundance, population trends and status, drivers of species presence and a conservation network design required to accommodate these species within South Africa's protected area network.



WESTERN CAPE ESTUARIES PROJECT

The estuaries of South Africa's Western Cape Province are one of the country's most productive but vulnerable habitats, providing nursery areas for fish and feeding and staging areas for significant populations of migratory birds. Many are at risk from multiple threats, including unsustainable land use and unsound land-management practices, in part due to their lack of formal protection. In response to this, BirdLife South Africa's Western Cape Estuaries Conservation Project focuses on the expansion and proclamation of protected areas at three high-priority estuaries, identified as Important Bird and Biodiversity Areas in the Western Cape, and on working with landowners to improve conservation action within these estuaries and their catchment areas to further enable their maintenance and management. The sites, the Berg River Estuary IBA at Velddrif on the West Coast, and the Klein River and Bot-Kleinmond River estuaries near Hermanus, which form part of the Cape Whale Coast IBA, are some of the most important estuaries in South Africa for conserving birds and biodiversity. Havens for populations of several internationally and nationally important bird species, these estuaries offers substantial tourism and recreational potential, as do their natural settings, if managed appropriately. They are vital as a nursery for juvenile fish, many species of which form the basis of employment for the local communities, as well as being fundamental to supplying the wider commercial fishing industry.

17 threatened bird species at Western Cape estuaries

40 000 number of birds at Western Cape estuaries

65 000 ha area targeted for formal protection

"The East Atlantic Flyway is used each year by approximately 90 million birds"

EAST ATLANTIC FLYWAY: MIGRATION STATION

The East Atlantic Flyway, a component of the Africa-Eurasia Flyway, is used each year by approximately 90 million birds migrating between their breeding grounds in the northern hemisphere and non-breeding areas further south in Europe and the western half of Africa. Many migrant species have undergone substantial declines over the past few decades, with several species now regarded as globally threatened. To minimise the threats facing birds on their annual migration route, BirdLife's Migratory and Flyways Programme conceived the BirdLife East Atlantic Flyway Initiative, of which BirdLife South Africa is a member, in order to implement an ambitious flyway conservation programme that will improve the conservation status of migratory bird populations. The focus of the task force is to identify and address priority threats to migratory birds, strengthen the capacity of BirdLife Partners on the flyway, and promote and implement BirdLife's local-to-global approach to conservation. The taskforce facilitates local action in Europe and Africa through engagement with BirdLife Country Partners and stakeholders, encouraging the empowerment of branch networks and IBA Local Conservation Groups, and ensuring conservation action at critical sites and landscapes along the flyway.

WIND ENERGY DEVELOPMENTS: GUIDELINES AND MONITORING PROTOCOLS

Renewable energy is a burgeoning industry in South Africa, adding much-needed power to the national grid. BirdLife South Africa and its partners are helping ensure a sustainable energy mix in South Africa and are conscious of the potential impact that wind power can have on bird populations. Resources such as the BirdLife South Africa/Endangered Wildlife Trust Best Practice Guidelines for Birds and Wind Energy and BirdLife South Africa's guidelines on birds and solar energy help ensure that the effects of renewable energy on birds are adequately assessed and minimised. Ongoing engagement with ornithologists, industry, environmental practitioners and decision-makers helps ensure that interactions between renewable energy and birds are well understood and that issues are proactively addressed and avoided. In 2017 BirdLife South Africa published a report summarising the results of bird monitoring at wind farms, the first of its kind for southern Africa. Although no vultures were killed by turbine strikes during the study period, poorly located wind farms are likely to present a new threat to Bearded and Cape vultures. Other species potentially at risk include Black Harrier, Verreaux's Eagle and Martial Eagle.

TRACKING THE MOVEMENTS OF THE ENDANGERED BLACK HARRIER

Satellite tracking by the Black Harrier Working Group, BirdLife Species Guardian for this iconic near-endemic raptor, has revealed that it is highly mobile. The main threats to the Black Harrier include low genetic diversity, fire and habitat loss (up to 90% of the fertile Western Cape lowlands has been transformed in the past 150 years). The proliferation of wind farms in its core breeding range, on its migration routes and in the Lesotho Highlands adds to the potential impacts faced by this species as it seeks out rodent-rich areas across South Africa. Consequently, it is ranked high on the collision sensitivity list of the Birds and Wind Energy Specialist Group.

Black Harrier (Matthew Axelrod)

c. 550 wind turbines in operation in South Africa

4 number of birds killed per turbine per year

36% proportion of carcasses found under turbines that are raptors

(Chris van Rooyen)

"The African Penguin population is currently at approximately 14% of its 1950s level"

THE GLOBALLY ENDANGERED AFRICAN PENGUIN:
TRACKING PENGUINS IN SEARCH OF ANSWERS

The African Penguin population has decreased from in excess of a million pairs in the early 1900s to currently just 18 000 pairs. This strong downward population trajectory, which is ongoing, has prompted the species' globally Endangered status. The reasons for this catastrophic population crash are diverse, but unfortunately there remains a plethora of unanswered questions that are critical to the long-term survival of this species. In particular, a clear understanding of the ecological requirements and movements of this globally Endangered species is lacking.

The answers to such questions could help stop the precipitous decrease in penguin numbers, but without knowing where these birds forage, conservationists cannot help protect them. In the past scientists have taken advantage of the fact that breeding birds will return to their nests, allowing the retrieval of small but extremely expensive GPS devices. With the advent of improved technology, there is now another option of satellite devices, which can send data directly to researchers' computers and are small enough to attach to penguins but still provide enough battery life to be useful.

This has provided an opportunity for researchers from BirdLife South Africa and the FitzPatrick Institute of African Ornithology to place satellite trackers on penguins to determine where they go after breeding and moulting. Knowledge regarding the movements of penguins will enable researchers to determine if they are likely to come into competition for food with the sardine and anchovy fisheries and will facilitate the designation of special management areas.

Peter Chadwick (4)

AFRICAN PENGUIN BREEDING COLONIES:
BRIDGING THE GAP

African Penguins generally breed on islands where they are safe from terrestrial mammalian predators but have also colonised two mainland sites. Along the South African coastline, islands are only found on the West Coast and in Algoa Bay, 600 km to the east, resulting in a c. 600 km gap between breeding colonies. A decrease in fish stocks, brought about primarily by overfishing, has caused sardine stocks to shift eastwards, out of reach of breeding penguins. The lack of islands between the West Coast and Algoa Bay, has meant that breeding penguins have not been able to follow the changing distribution of fish, resulting in a severe decrease in the penguin population. The big gap between population centres also means the penguins are vulnerable to catastrophic events, such as oil spills, in either of these areas. BirdLife South Africa has launched an ambitious project that aims to create new mainland penguin colonies in areas where fish abundance is high between the two population centres. Penguins in the new breeding colonies will be closer to their food source, while an increase in the number of colonies spreads the risk of catastrophic events. Two sites have been identified, Plettenberg Bay and De Hoop Nature Reserve, and work is being done there to monitor the fish abundance and potential terrestrial predators. The next steps are to get final approval and permits for the project and prepare the sites for penguins by setting up a predator-proof fence and installing nest boxes and decoys.

6.4% annual decrease in penguin numbers

17 African Penguin breeding colonies in South Africa

2 African Penguin breeding colonies on the mainland

202 jobs associated with the Simon's Town penguin colony

78% of visitors to Simon's Town penguin colony are international tourists

R160m annual expenditure by visitors to the Simon's Town penguin colony

R3.54b tourism income from the Simon's Town penguin colony over the next 30 years

African Penguin (Martin R Taylor)

"One of the leading causes of bird extinctions around the world has been the introduction of alien mammals to islands"

THE SCOURGE OF ALIEN MAMMALS:
MARION ISLAND MOUSE ERADICATION

One of the leading causes of bird extinctions globally in the modern era is the introduction of alien mammals to islands. South Africa has not escaped this scourge, and both feral cats and house mice were introduced to Marion Island. An eradication campaign for the cats concluded successfully in 1991, using a combination of disease, hunting, trapping and poisoning. At the time, mice were considered relatively innocuous for nesting seabirds. Recent research has demonstrated increasing levels of predation by mice on burrowing petrel and albatross chicks, and the ameliorating climate at Marion Island has caused mouse densities to explode. At Gough Island in the South Atlantic, mouse predation on seabird chicks is driving the extinction of two seabird species. This, together with the alarming increase in the spread and numbers of fatal attacks at Marion Island, is a very significant concern. BirdLife South Africa is responding by leading a collaborative effort to eradicate mice from Marion Island. A review of the feasibility, constraints and risks for eradicating mice at Marion Island by New Zealand eradication expert Dr John Parkes indicated it could be done. A coalition of stakeholders, including BirdLife South Africa and the Fitzpatrick Institute of African Ornithology, and led by the Department of Environmental Affairs, is now in full preparation mode for an aerial broadcast of rodent poison at Marion Island in 2020, with the aim of eradicating this scourge from the island for good.

Poisoned mouse bait is deployed from a bucket slung beneath a helicopter over Gough Island (Ben Dilley)

2.5m pairs of seabirds breeding on the Prince Edward Islands that could potentially be threatened by the alien House Mouse

ALBATROSS TASK FORCE:
SAVING SEABIRDS THROUGH INNOVATION

Globally, incidental mortality (as bycatch) in fisheries is the biggest threat to most albatross and petrel species. Although a diversity of solutions have been developed and tested, uptake of these by fisheries operating in areas of high seabird bycatch has been universally poor. South Africa, by contrast, is one of the most proactive and exemplary nations, having reduced seabird bycatch to insignificant levels in its largest fishing fleets. One of the most effective methods for reducing seabird bycatch is the bird-scaring line. Consisting of a main line from which several streamers hang, it acts by scaring seabirds away from the area astern of vessels where fishing operations endanger their lives. On longline vessels it keeps them away as the baited hooks are set and until they sink out of the bird's reach. In the trawl fishery seabirds are injured and often die as they collide with the exposed area of the cables (warps) that drag the trawl net along the seabed; scaring the birds away from the cables prevents this. The demersal longline fishery adopted this inexpensive and simple mitigation measure in the 1990s, where it contributed to a decrease in the bycatch rate of up to 96%. In 2006, BirdLife South Africa successfully lobbied to have bird-scaring lines made mandatory in the South African demersal hake trawl fishery. By 2010 this single measure had proven to be highly successful, reducing annual seabird mortality by 90% from the estimated 9 300 annual seabird deaths in 2004 and 2005. For albatrosses, however, the effect was even more dramatic, reducing bycatch mortality by 99%.0 Trawl fisheries now also avoid discarding offal during the setting process, as an additional seabird conservation measure. In both pelagic and demersal longline fisheries, additional measures have been introduced: night setting (when fewer birds are active), line-weighting options (to increase the sinking rates of hooks) and discarding practices (aimed at reducing the attractiveness of vessels to foraging seabirds). Compliance with these conditions in the joint-venture, foreign-flagged tuna longline fishery improved markedly in 2008, once stringent monitoring and responses for non-compliance were enacted by government.

99% reduction in albatross bycatch due to implementation of mitigation measures

7 200 number of seabirds killed annually in hake trawl fishery prior to introduction of bird scaring lines

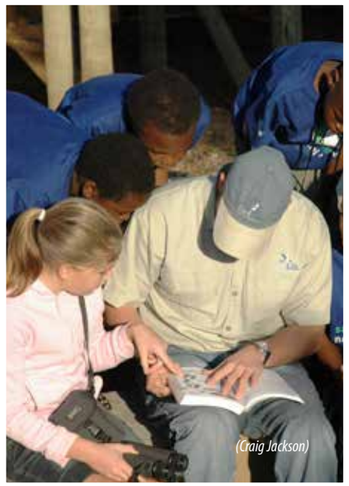
Shy Albatross (Martin R Taylor)

COMMUNITY BIRD GUIDES: PROTECTING THEIR OWN

People are essential for the conservation of South Africa's birds and their habitats. Through the BirdLife South Africa Bird Guide Training Project, the organisation has been able to engage with communities in rural areas through activities such as environmental education programmes and tree-planting initiatives, while members of those communities assist researchers with the gathering of data and showcase South Africa's diverse range of birds to birdwatchers. Over a nine-year period, BirdLife South Africa has been involved in the training of bird guides and has provided funding to guides involved in a range of conservation and environmental education initiatives. isiZulu-speaking guides have contributed significantly to a workshop on the development of isiZulu bird names in conjunction with the University of KwaZulu-Natal, while a number of bird guides are giving back to their communities through the training of fledgling bird guides with the assistance of BirdLife South Africa. Community bird guides have become ambassadors for conservation in their communities and are passionate about the conservation of birds and their habitats.

ENVIRONMENTAL EDUCATION: KEY TO THE FUTURE

BirdLife South Africa has been supporting three Junior Bird Clubs in southern Mpumalanga where close to 200 youngsters between the ages of four and sixteen meet on a weekly basis to learn a little more about the birds in their communities. Activities implemented with the Country College, The Clay Edu-Centre and Smileys Bird Clubs range from bird identification, using binoculars and field guides (a first for many of the children) to using bird monitoring apps such as BirdLasser. The clubs have also taken part in the Spring Alive project, focussing on migratory birds between Europe, Africa and Asia. They have thoroughly enjoyed the lessons developed for the 2017 season with special mention of 'Ringo – The Journey of a White Stork' children's novel and learning generally about migration over these great distances. The education of future generations is key if we are to ensure the long term survival of birds and theirt habitats.



(Craig Jackson)

Junior Gabela (Niall Perrins)

BIRDING TOURISM: A MAJOR BOOST FOR THE SOUTH AFRICAN ECONOMY

BirdLife South Africa has been actively involved in the development of birding tourism in South Africa through the development of birding routes that highlight the region's core birding sites, high species diversity and ease of access. A study by the Department of Trade and Industry indicated that South Africa hosts between 21 000 and 40 000 birding tourists per year, who contribute between R 927 million and R 1 725 million per year to the local economy. Birding tourists have higher than average income levels, longer trip lengths and a greater tendency to visit multiple provinces than mainstream tourists. In addition, domestic and international birding tourist profiles correlate with priority market segments targeted by South African Tourism. By promoting birding tourism, BirdLife South Africa ensures that a value is placed on birds and more specifically, on the habitats upon which they depend.

"Birding tourism contributes between R927m and R1 725m per year to the South African economy"

c. R1 326m average annual contribution to the South African economy by birding tourism

1 000 attendees at the annual Honorary Ranger Kruger National Park birding weekends

>2 000 birdwatchers attended Flock at Sea AGAIN 2017

1 200+ birders travelled to Cape Town to see a vagrant Temminck's Stint in 2016

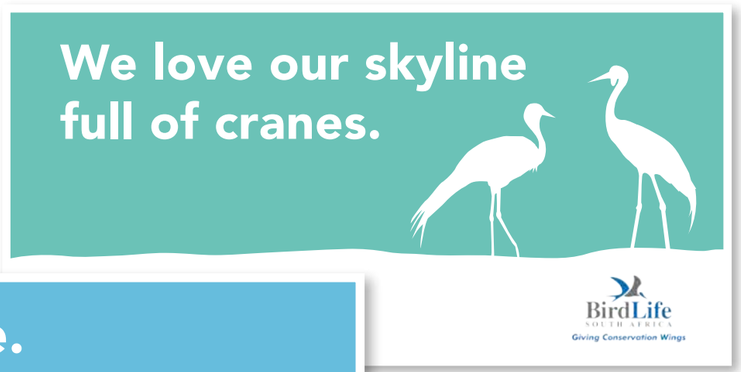
(Martin R Taylor)

AFRICAN BIRDLIFE MAGAZINE

African Birdlife is a bi-monthly magazine published by BirdLife South Africa, with a readership of about 35 000 people. The publication is an important mouthpiece for BirdLife South Africa to create awareness about bird research and conservation work, as well as to promote the joys of birding and build a sense of community in the birding fraternity.

RAISING PUBLIC AWARENESS:
PEOPLE NEED BIRDS AND BIRDS NEED PEOPLE

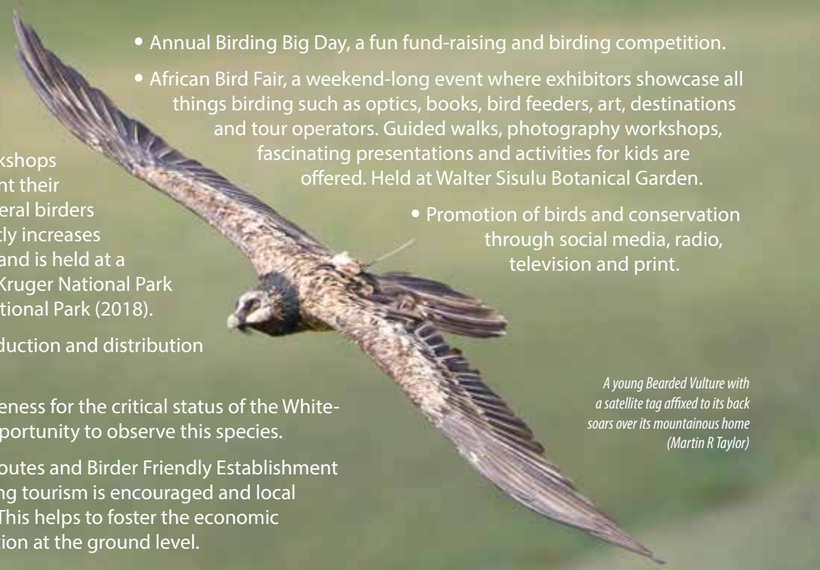
Through habitat destruction, industrialisation, agriculture and a myriad of other deleterious activities, people are mainly responsible for the beleaguered state of our birds. However, people can also rectify, or at least mitigate, the problem. In the direct sense, many species now require constant and intensive intervention to prevent extinction, while our growing understanding of other species may help to circumvent future problems. But any conservation strategy needs to recognise that a change in the hearts and minds of people is one of the most powerful weapons in the fight against extinction. Furthermore, nature management programmes should attempt to further the enjoyment, appreciation and understanding of birds and natural resources, particularly in the general public. This is achieved by advocacy and raising awareness at all levels of society. In order to conserve birds and their habitats effectively, it is essential to raise public awareness and involve people in protecting our shared natural heritage.



BirdLife South Africa's regularly updated billboards featuring conservation-themed messages and modern design are prominently displayed along roads, at airports and in shopping malls. Such proclamations have a strong impact on public awareness and perception of the importance and value of birds and their conservation.

BIRDLIFE SOUTH AFRICA:
PUBLICITY CAMPAIGNS

- Annual AGM event, termed Flock, and associated Learn About Birds (LAB) workshops give scientists the opportunity to present their research to colleagues and provide general birders with a chance to learn more. Flock greatly increases camaraderie in the birding community and is held at a different top birding site each year e.g. Kruger National Park (2016), at sea (2017), and West Coast National Park (2018).
- Bird of the Year campaign, with the production and distribution of information posters.
- Flufftail Festival to raise funds and awareness for the critical status of the White-winged Flufftail and give birders the opportunity to observe this species.
- Through the establishment of Birding Routes and Birder Friendly Establishment status to accommodation venues, birding tourism is encouraged and local businesses and bird guides supported. This helps to foster the economic importance of birds and their conservation at the ground level.
- Annual Birding Big Day, a fun fund-raising and birding competition.
- African Bird Fair, a weekend-long event where exhibitors showcase all things birding such as optics, books, bird feeders, art, destinations and tour operators. Guided walks, photography workshops, fascinating presentations and activities for kids are offered. Held at Walter Sisulu Botanical Garden.
- Promotion of birds and conservation through social media, radio, television and print.



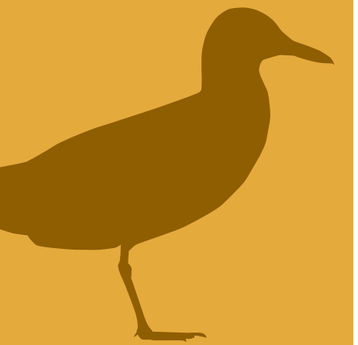
A young Bearded Vulture with a satellite tag affixed to its back soars over its mountainous home (Martin R Taylor)

SUPPORTING CONSERVATION ACROSS BORDERS:
MOZAMBIQUE AND ZIMBABWE

Birds do not recognise international boundaries. The effective conservation of resident as well as intra-African and Palearctic bird populations requires a regional effort, involving all conservation organisations in southern Africa. It is essential that assistance is provided to these organisations in order to strengthen conservation capacity for the benefit of birds and their habitats. The Royal Society for the Protection of Birds (RSPB) has for a number of years provided support to BirdLife Partners throughout the African continent with the aim of strengthening conservation networks and working towards the long-term conservation of birds. In 2014 the RSPB adopted a new approach and agreed to give BirdLife South Africa funding to start providing development support to partners in the region. BirdLife South Africa had already been involved in partner development work through its involvement with **Associação Ambiente, Conservação e Educação Moçambique** (AACEM), a bird-orientated conservation organisation in Mozambique. Likewise, funding from the RSPB enables BirdLife South Africa to provide assistance to **BirdLife Zimbabwe**, which, despite facing severe economic and political turmoil in that country, continues to undertake important conservation work.

" Birds do not recognise international boundaries- nor should conservation efforts "

"Field work is done by citizen scientists, who make a huge contribution to the conservation of birds and their habitats"

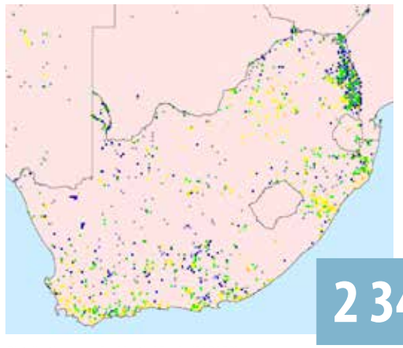


MONITORING

Monitoring provides the information that research and conservationists rely on to construct trends. Trends, which measure indices such as the change in the size of bird populations over time, are critical for establishing the extinction risk faced by birds in line with IUCN criteria and for subsequently prioritising conservation action. South Africa is blessed in having not only a large contingent of well-informed and skilled citizen scientists, but also the institutions that are able to collate and interpret data. With the onset of the digital age, applications such as BirdLasser have been developed, radically changing the manner in which data are collected by citizen scientists. The value of databases lies in their longevity and thus is essential that we continue to support the different monitoring initiatives currently under way in South Africa.

SOUTHERN AFRICAN BIRD ATLAS PROJECT

SABAP2 is the acronym for the Second Southern African Bird Atlas Project and is the follow-up to the Southern African Bird Atlas Project, which was conducted from 1987 to 1991. The current project is a joint venture between the Animal Demography Unit at the University of Cape Town, BirdLife South Africa and the South African National Biodiversity Institute (SANBI) and it aims to map the distribution and relative abundance of birds in southern Africa. The field work for this project is done by more than a thousand volunteers, known as citizen scientists. They collect the data from the field at their own cost and in their own time and thus make a huge contribution to the conservation of birds and their habitat. By September 2014, the SABAP2 database contained 110 000 checklists and a total of 5.8 million records of bird distribution. Close to 70% of the original SABAP2 atlas area (South Africa, Lesotho and Swaziland) had at least one checklist at this stage in the project's development. This information is updated continuously on the project website (*http://sabap2.adu.org.za*).



Distribution map for Martial Eagle (SABAP2)

2 349 observers who have participated in SABAP2 data gathering

110 000 checklists in the SABAP2 database

5.8m individual records of bird distribution documented

WATERBIRD COUNTS: UMHLATHUZE ESTUARY

The Umhlathuze Estuary is of considerable conservation importance not only to resident bird communities, including several Red List species that inhabit the site, but also to non-breeding Palearctic migrants. Not surprisingly, this system was ranked as the third most important estuary system in South Africa for migratory waders. Several threats, including proposed mining developments to the south as well as a lack of knowledge of the existing avifaunal communities and anecdotal evidence of major declines in waterbird numbers in the immediately adjacent Richards Bay harbour, underlined the need to undertake an avifaunal assessment of this estuary, colloquially known as the Southern Sanctuary. BirdLife South Africa, with the assistance of the Durban Natural Science Museum, completed a baseline survey in 2012 and has undertaken annual surveys of the system since then. In addition, we started a process of engaging with the relevant stakeholders regarding the threats facing the site. BirdLife South Africa has also been involved in the planning of a 2017 waterbird survey at estuaries and other wetlands along the east coast of Africa, including South Africa, Mozambique, Tanzania and Kenya.

CWAC: COORDINATED WATERFOWL COUNTS

The Animal Demography Unit launched the Coordinated Waterbird Counts (CWAC) project in 1992 as part South Africa's commitment to international waterbird conservation. This is being done by means of a programme of regular mid-summer and mid-winter censuses at a large number of South African wetlands. Regular six-monthly counts are regarded as a minimum standard; however, we do encourage counters to survey their wetlands on a more regular basis as this provides more accurate data. All the counts are conducted by volunteers; people and organisations with a passion for waterbird conservation. It is one of the largest and most successful citizen science programmes in Africa, providing much-needed data for waterbird conservation around the world. Currently the project regularly monitors more than 400 wetlands around the country and curates waterbird data for over 600 sites.

(Caroline Fox)

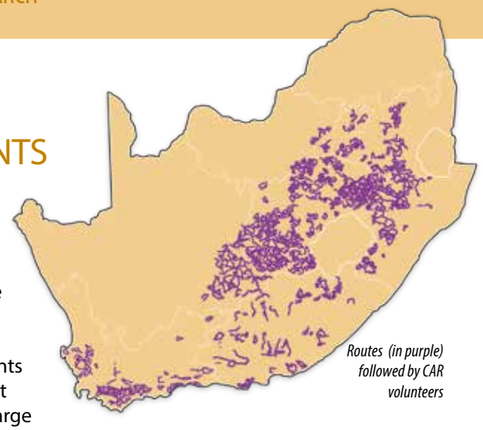
"The project monitors more than 400 wetlands around the country"

SAFRING

The South African Bird Ringing Unit (SAFRING), based at the University of Cape Town, administers bird ringing in southern Africa, supplying rings, ringing equipment and services to volunteer and professional ringers in South Africa and neighbouring countries. All ringing records are curated by SAFRING, which is an essential arm of the Animal Demography Unit. SAFRING communicates with ringers and interested parties by publishing one or two issues of a newsletter, *Afring News*, and by maintaining a list server. It liaises with the provinces that have the responsibility of issuing ringing permits. The unit has a strict code of ethics to ensure the safety of birds handled. SAFRING acknowledges the significant value of bird ringing in that it has been described as the most important tool in ornithology in the 20th century.

African Pygmy Kingfisher (Martin R Taylor)

CAR: COORDINATED AVIFAUNAL ROAD COUNTS



Routes (in purple) followed by CAR volunteers

Large and conspicuous birds offer the opportunity to monitor their populations by means of relatively simple techniques. One of these techniques is the 'road count', in which observations are made from vehicles covering fixed routes. The Animal Demography Unit has been running Coordinated Avifaunal Road Counts (CAR) throughout South Africa for the past 19 years and now includes 36 species of large terrestrial birds (cranes, bustards, korhaans, storks, Secretarybird and Southern Bald Ibis) in its database. Every six months more than 750 volunteers travel across 350 fixed routes, covering over 19 000 km, and collecting valuable data that is utilised by the Animal Demography Unit to generate population trends pertaining to these species. Large birds are increasingly coming under pressure from a range of sources, making the continued monitoring of these species increasingly important.

350 CAR routes driven by more than 750 people

19 000 km covered by CAR routes in South Africa

36 species of large terrestrial birds counted twice a year

CAPE PARROT DAYS

Kevin Ravno

Initiated in 1998, annual Cape Monitoring Days, organised by the Cape Parrot Working Group, have encouraged public involvement and contributed to long term monitoring datasets for this species. The aim is to obtain an accurate annual population estimate of the Cape Parrot as well as track its distribution and movements. The Cape Parrot, a forest specialist, is now mainly restricted to patches in a mosaic of Afromontane southern mistbelt forests from Hogsback in the Eastern Cape through to the Balgowan and Karkloof areas of KwaZulu-Natal, with a disjunct population in the Magoebaskloof region of Limpopo Province. Annual censuses by volunteers have indicated a population of 1 100-1 500 mature individuals and have assisted in the conservation efforts directed at this regionally Endangered species.

White-fronted Plover (Dylan Vasapolli)

#SHARE THE SHORES
EDUCATION AND AWARENESS SAVE WADERS

The impact of people on coastal biodiversity is increasing, with 3 billion people already living at the coastline worldwide and this number set to double by 2025. This, combined with impacts of climate change, means that beach-breeding birds are at risk. White-fronted Plovers already feel the pressure, with a 40% decline in numbers and 70% reduction in density in the Western Cape in the past 30 years. As the plover is a common, long-lived species, it took a while for anyone to notice this worrying decline. Research by the Nature's Valley Trust, in collaboration with the Percy Fitzpatrick Institute for Ornithology, has shown that disturbance by people and dogs during the breeding season is the major cause of exceptionally low overall breeding success, with <10% of eggs laid ending up as fledged chicks. Their #ShareTheShores campaign has, however, shown that cost-effective signage and high-impact education and awareness programmes can help improve breeding success quite quickly, enabling birds and people to co-exist on beaches.

Sociable Weaver nest (Martin R Taylor)

THE HOT BIRDS RESEARCH PROJECT:
IMPACTS OF CLIMATE CHANGE ON DESERT BIRDS

Deserts around the globe are heating up, primarily due to climate change. Desert bird species already live life on the edge and act as early warning systems of the impacts of change. A joint initiative by the Percy FitzPatrick Institute at the University of Cape Town and the University of Pretoria is investigating the thermal physiology and behaviour of desert birds. Research focuses on how birds at both community and species levels adapt – or in some cases fail to adapt – to a hotter world. This critical research is increasing our knowledge of thermal biology, ecophysiology, behavioural ecology and life history strategies of arid-region birds and will guide future climate change adaptation interventions.

15-37% of species will be subject to higher extinction risk due to climate change

69% predicted loss in range of Drakensberg Rockjumper by 2050 based on climate change models

Sociable Weaver (Faansie Peacock)

DIGITAL RESOURCES

BirdLife South Africa ***www.birdlife.org.za***
Information on terrestrial and seabird conservation projects, IBAs, events, birding routes, best-practice guidelines, advocacy and position statements and much more. Also offers downloadable content of publications, including this document.

South African National Biodiversity Institute (SANBI) ***www.sanbi.org***
A website detailing the different programmes managed by the South African National Biodiversity Institute, including links to recent publications and biodiversity databases.

Endangered Wildlife Trust ***www.ewt.org.za***
Resources on cranes, birds of prey and other threatened groups. Also biodiversity data downloads, scientific papers, species fact sheets, information posters, journal links and more.

Percy FitzPatrick Institute of African Ornithology ***www.fitzpatrick.uct.ac.za***
Background information on the staff, associates and students of the institute, study and research opportunities as well as links to publications produced by staff and students.

Southern African Bird Atlas Project ***http://sabap2.adu.org.za***
Fine-scale distributional and abundance data for birds.

Animal Demography Unit ***www.adu.uct.ac.za***
A multitude of data-based conservation projects, including CAR, CWAC, SAFRING and the Virtual Museum.

Mabula Ground Hornbill Project ***www.ground-hornbill.org.za***
Details work of this organisation with regard to reintroductions, research, threat mitigation and environmental education and provides links to publications as well as partners and collaborators.

Nature's Valley Trust ***www.naturesvalleytrust.co.za***
The website provides background information to the different programmes run by the trust as well partnerships the organisation is involved in.

VulPro ***www.vulpro.com***
Provides background on the activities of the organisation, results of its tracking projects, links to publications that staff have been involved in and information about upcoming events.

Regionally Threatened Bird Species ***www.speciesstatus.sanbi.org***
Species accounts for the 132 threatened species included in the *2015 Eskom Red Data Book of Birds of South Africa, Lesotho and Swaziland.*

IBA directory ***www.birdlife.org.za/conservation/important-bird-areas/iba-directory***
A webpage created for each IBA including a Google Earth map, background information about the site, information about its trigger species, a list of the most important threats and the conservation actions that are planned for it. These pages are regularly updated as new information is acquired.

SUGGESTED READING

Allan DG, Harrison JA, Navarro RA, van Wilgen BW, Thompson MW. 1997. The impact of commercial afforestation on bird populations in Mpumalanga Province, South Africa-insights from bird-atlas data. Biological Conservation, 79: 173-185.

Bester MN, Bloomer JP, van Aarde RJ, Erasmus BH, van Rensburg PJJ, Skinner JD, Howell PG, Naude TW. 2002. A review of the successful eradication of feral cats from sub-Antarctic Marion Island, Southern Indian Ocean. South African Journal of Wildlife Research, 32: 65-73.

Boshoff AF, Anderson MD. 2006. Towards a conservation plan for the Cape Griffon *Gyps coprotheres*: identifying priorities for research and conservation action. Port Elizabeth, South Africa: Nelson Mandela Metropolitan University.

Butchart SHM, Stattersfield AJ, Bennun LA, Shutes SM, Akçakaya HR, Baillie JEM, Stuart SN, Hilton-Taylor C, Mace GM. 2004. Measuring global trends in the status of biodiversity: Red List Indices for birds. PloS one, 2: e383.

Chown SL, Froneman PW. 2008. The Prince Edward Islands: land-sea interactions in a changing ecosystem. Stellenbosch, South Africa: Sun Media.

Clavero M, García-Berthou E. 2005. Invasive species are a leading cause of animal extinctions. Trends in Ecology and Evolution, 20: 110.

Coetzee BWT, Robertson MP, Erasmus BFN, Van Rensburg BJ, Thuiller W. 2009. Ensemble models predict Important Bird Areas in southern Africa will become less effective for conserving endemic birds under climate change. Global Ecology and Biogeography, 18: 701-710.

Cooper J, Baker GB, Double MIC, Gales R, Papworth W, Tasker ML, Waugh SM. 2006. The Agreement on the Conservation of Albatrosses and Petrels: rationale, history, progress and the way forward. Marine Ornithology, 34: 1-5.

Cooper J, Weimerskirch H. 2003. Exchange of the Wandering Albatross *Diomedea exulans* between the Prince Edward and Crozet Islands: implications for conservation. African Journal of Marine Science, 25: 519-523.

Crawford RJM, Tree AJ, Whittington PA, Visagie J, Upfold L, Roxburg KJ, Martin AP, Dyer BM. 2008. Recent distributional changes of seabirds in South Africa: is climate having an impact? African Journal of Marine Science, 30: 189-193.

Crawford RJM, Altwegg R, Barham BJ, Barham PJ, Durant JM, Dyer BM, Geldenhuys D, Makhado AB, Pichegru L, Ryan PG. 2011. Collapse of South Africa's penguins in the early 21st century. African Journal of Marine Science, 33: 139-156.

Crawford RJM, Dyer BM, Kotze PGH, McCue S, Meÿer MA, Upfold L, Makhado AB (eds). 2012a. Status of seabirds breeding in South Africa in 2011. Cape Town, South Africa: Oceans and Coasts, Department of Environmental Affairs.

Croxall JP, Butchart SHM, Lascelles B, Stattersfield AJ, Sullivan B, Symes A, Taylor P. 2012. Seabird conservation status, threats and priority actions: a global assessment. Bird Conservation International, 22.

Cury PM, Boyd IL, Bonhommeau S, Anker-Nilssen T, Crawford RJM, Furness RW, Mills JA, Murphy EJ, Österblom H, Paleczny M. 2011. Global seabird response to forage fish depletion—one-third for the birds. Science, 334: 1703-1706.

Devictor V, Julliard R, Couvet D, Jiguet F. 2008. Birds are tracking climate warming, but not fast enough. Proceedings of the Royal Society of London, Series B: Biological Sciences, 275: 2743-2748.

Driver A, Sink KJ, Nel JL, Holness S, Van Niekerk L, Daniels F, Jonas Z, Majiedt PA, Harris L, Maze K (eds). 2012. National Biodiversity Assessment 2011: An assessment of South Africa's biodiversity and ecosystems. South African National Biodiversity Institute and Department of Environmental Affairs. Pretoria, South Africa.

Green RE, Newton I, Shultz S, Cunningham AA, Gilbert M, Pain DJ, Prakash V. 2004. Diclofenac poisoning as a cause of vulture population declines across the Indian subcontinent. Journal of Applied Ecology, 41: 793-800.

Hofmeyr SD. 2012. Impacts of environmental change on large terrestrial bird species in South Africa: insights from citizen science data. Unpublished PhD thesis. Cape Town, South Africa: University of Cape Town.

Jenkins AR, Smallie JJ, Diamond M. 2010. Avian collisions with power lines: a global review of causes and mitigation with a South African perspective. Bird Conservation International, 20: 263-278.

Jenkins AR, van Zyl AJ, Rodrigues L, Kemp AC (eds). 2011. Survey and monitoring of the South African Taita Falcon population. Technical report. Cape Town, South Africa.

Lee ATK, Barnard P. 2015. Endemic birds of the Fynbos biome: a conservation assessment and impacts of climate change. Bird Conservation International: 1-17 DOI: S0959270914000537.

Maree BA, Wanless RM, Fairweather TP, Sullivan BJ, Yates O. 2014. Significant reductions in mortality of threatened seabirds in a South African trawl fishery. Animal Conservation, 17(6), 520-529.

Marnewick MD, Retief EF, Theron NT, Wright DR, Anderson TA. 2015a. Important Bird and Biodiversity Areas of South Africa. Johannesburg: BirdLife South Africa.

Marnewick MD, Retief EF, Wright DR, Theron NT. 2015b. South Africa's Important Bird and Biodiversity Areas Status Report 2015. Johannesburg: BirdLife South Africa.

Nel DC, Ryan PG, Crawford RJ, Cooper J, Huyser OA. 2002. Population trends of albatrosses and petrels at sub-Antarctic Marion Island. Polar Biology, 25: 81-89.

Petersen SL, Phillips RA, Ryan PG, Underhill LG. 2008. Albatross overlap with fisheries in the Benguela Upwelling System: implications for conservation and management. Endangered Species Research, 5: 117-127.

Ryan PG. 2013. Medium-term changes in coastal bird communities in the Western Cape, South Africa. Austral Ecology, 38: 251-259.

Simmons RE, Barnard P, Dean WRJ, Midgley GF, Thuiller W, Hughes G. 2004. Climate change and birds: perspectives and prospects from southern Africa. Ostrich, 75(4): 295-308.

Taylor MR, Peacock F, Wanless RM (eds). 2015. The Eskom Red Data Book of Birds of South Africa, Lesotho and Swaziland. BirdLife South Africa. Johannesburg.

Turpie JK. 1995. Prioritizing South African estuaries for conservation: a practical example using waterbirds. Biological Conservation, 74: 175-185.

Uys C, Smit-Robinson H, Marnewick D. 2013. Bird-friendly burning and grazing best-practice for grasslands: Achieving bird conservation and economic grazing objectives together in South Africa's grasslands. Technical report, BirdLife South Africa, Johannesburg, South Africa.

van Rensburg BJ, Erasmus BFN, van Jaarsveld AS, Gaston KJ, Chown SL. 2004. Conservation during times of change: correlations between birds, climate and people in South Africa. South African Journal of Science, 100: 266-272.

Wanless RM, Angel A, Cuthbert RJ, Hilton GM, Ryan PG. 2007. Can predation by invasive mice drive seabird extinctions? Biology Letters, 3: 241-244.

Wright DR, Lee ATK. 2017. Bird-friendly Habitat Management Guidelines for the endemic birds of the Fynbos Biome. BirdLife South Africa, Johannesburg, South Africa.

WWF-SA 2016. Oceans facts and futures: Valuing South Africa's ocean economy. WWF-SA, Cape Town, South Africa.

Neergaard's Sunbird (Francois du Plessis)

" I dream of our vast deserts, of our forests, of all our great wildernesses. We must never forget that it is our duty to protect this environment. "

Nelson R. Mandela