



# Bird-Friendly

Habitat Management Guidelines  
for the endemic birds of the Fynbos Biome

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## Definitions

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### Biodiversity Hotspot

A biodiversity hotspot is a biogeographic region that is both a significant reservoir of biodiversity and is threatened with destruction. The term biodiversity hotspot specifically refers to 25 biologically rich areas around the world that have lost at least 70 percent of their original habitat.

### Cape Floristic Region

The Cape Floristic Region is a floristic region located near the southern tip of South Africa. It is the only floristic region of the Cape (South African) Floristic Kingdom, and includes only one floristic province, known as the Cape Floristic Province.

### Endemic

Native or restricted to a certain country or area.

### Fynbos

Fynbos is a small belt of natural shrubland or heathland vegetation located in the south-west of South Africa. This area is predominantly winter rainfall coastal and mountainous areas with a Mediterranean climate.

### Biome

A large, naturally occurring community of plants and animals which occupy a distinct region, and are often defined by the specific climate and dominant vegetation.

### IBA

Important Bird and Biodiversity Areas are sites which hold significant populations of threatened, endemic or congregatory bird species. IBAs form a network of sites around the world, identified in order to conserve global bird diversity.



## Introduction

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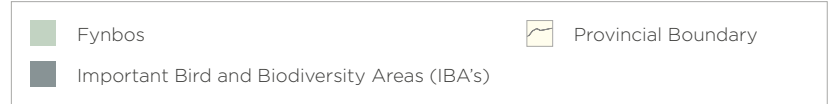
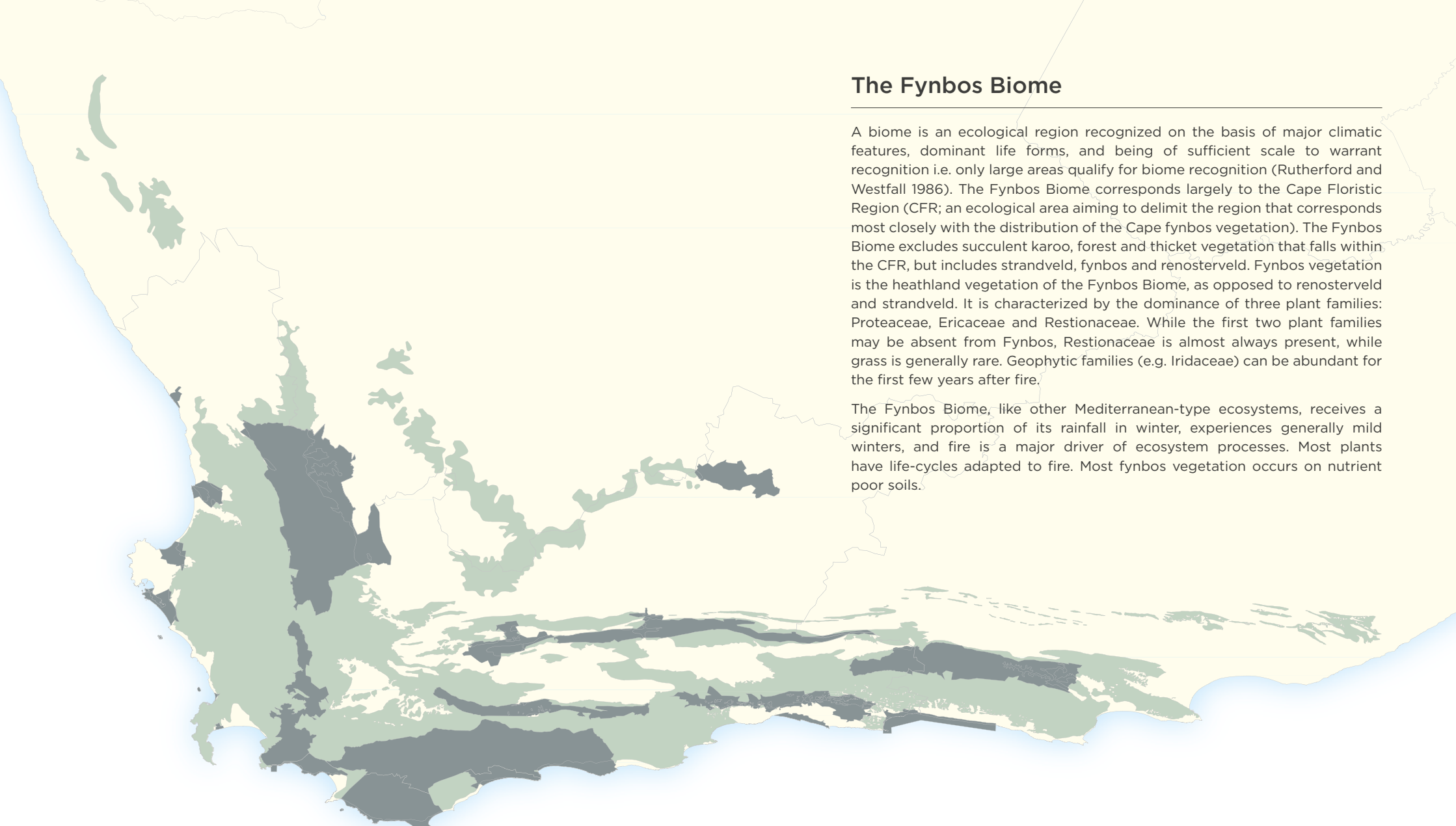
The Western Cape is well known for its Fynbos vegetation; the shrubland that is one of the most diverse plant kingdoms in the world! The high diversity and endemism of the plants found here have led to the area being described as one of the “Biodiversity Hotspots” of the world – those important places that harbour a higher number of species than elsewhere. However with the focus on the plants of this area the birds can often be overlooked. There are in fact eight species of birds which occur in the Fynbos Biome and nowhere else in the world! Many people living and working in the Fynbos may be unaware of these birds, and the special roles they play in the Fynbos. This booklet is intended to increase the general awareness of these species, whilst also providing some guidelines on how to improve the environment to support the conservation of these birds. The intended audience for this document is anyone involved in habitat or protected area management and biodiversity conservation in the Fynbos Biome, from private landowners and farmers through to government conservation agencies.

This ‘bird-friendly best-practice’ document is intended as guidance for management planning and to complement the existing Protected Area Management Plans which exist, or are currently being updated, for all protected areas within the Fynbos Biome. It is not intended to be an academic output and is not equivalent to Ecosystem Guidelines or Biodiversity Management Plans for Ecosystems (BMP-E) or Species (BMP-S), as provided for in the National Environmental Management: Biodiversity Act (Act 10 of 2004). We acknowledge our data deficiency limitations and encourage researchers to fill these gaps for the benefit of bird conservation. This ‘bird-friendly habitat management guidelines’ forms a component of BirdLife South Africa’s Western Cape Regional Conservation Programme commitment to produce a user-friendly set of management recommendations to promote the conservation of the Fynbos endemic bird species, and other threatened bird species of the Western Cape.

## The Fynbos Biome

A biome is an ecological region recognized on the basis of major climatic features, dominant life forms, and being of sufficient scale to warrant recognition i.e. only large areas qualify for biome recognition (Rutherford and Westfall 1986). The Fynbos Biome corresponds largely to the Cape Floristic Region (CFR; an ecological area aiming to delimit the region that corresponds most closely with the distribution of the Cape fynbos vegetation). The Fynbos Biome excludes succulent karoo, forest and thicket vegetation that falls within the CFR, but includes strandveld, fynbos and renosterveld. Fynbos vegetation is the heathland vegetation of the Fynbos Biome, as opposed to renosterveld and strandveld. It is characterized by the dominance of three plant families: Proteaceae, Ericaceae and Restionaceae. While the first two plant families may be absent from Fynbos, Restionaceae is almost always present, while grass is generally rare. Geophytic families (e.g. Iridaceae) can be abundant for the first few years after fire.

The Fynbos Biome, like other Mediterranean-type ecosystems, receives a significant proportion of its rainfall in winter, experiences generally mild winters, and fire is a major driver of ecosystem processes. Most plants have life-cycles adapted to fire. Most fynbos vegetation occurs on nutrient poor soils.





## Fynbos bird diversity significance and benefits

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The Fynbos Biome has high avifaunal significance, with more than 350 bird species having been recorded in the CFR during the South Africa Bird Atlas Project 2 (SABAP2). Of these, 15 are Globally Threatened and 38 are Regionally Threatened. A total of 45 of southern Africa's 68 endemic bird species occur in this region; however this figure also includes some of the karoo and forest-dependent bird species. There are eight strict fynbos endemic bird species, which are showcased in this document. This region therefore not only supports a large diversity of birds, but also many which are either threatened or localized in distribution. BirdLife South Africa's Important Bird and Biodiversity Areas (IBA) Programme, which is based on the global IBA programme, identifies sites that hold significant numbers of bird species that are threatened, range or biome-restricted or sites with high concentrations of congregatory birds. There are a number of IBAs which include Fynbos habitats and host the fynbos endemic bird species.

Birds, and the IBA sites, are able to provide many important ecosystem goods and services. Ecosystem services are generally defined as natural processes which confer some benefit to humanity. Examples include the production of oxygen by trees in tropical forests, or water provisioning from healthy mountain catchments – as is the case for many of the Cape Fold Mountain IBAs. Birds are able to provide ecosystem services through their different roles and behaviours, which include acting as pollinators, predators, scavengers, seed dispersers and ecosystem engineers. These are all behaviours which may benefit farmers in the agricultural landscape, for example through pollination or pest control, or play a vital role in maintaining ecosystem functioning, such as through seed dispersal.

Studies have also highlighted the importance of birds to local economies. A study commissioned by the South African Department of Tourism in 2009 indicated that avitourism or tourism undertaken specifically for bird watching purposes, was worth between R925 million - R1,750 billion per annum to the South African economy! An astounding figure which illustrates the true scale of this pastime in South Africa, and globally. No doubt this figure has subsequently increased, and bird-watching is regarded as one of the fastest growing leisure pursuits in the world. Such birding tourism often focuses on the presence of endemic species, those which are found nowhere else in the world, as these are often the target of international birding tourists. The Fynbos endemics are no exception, and many tourists will travel to this region specifically to see these species. The additional presence of the Karoo and forest bird species within the Cape Floristic Region places this region high up on any avid birders list of global destinations.

## Fynbos bird species accounts

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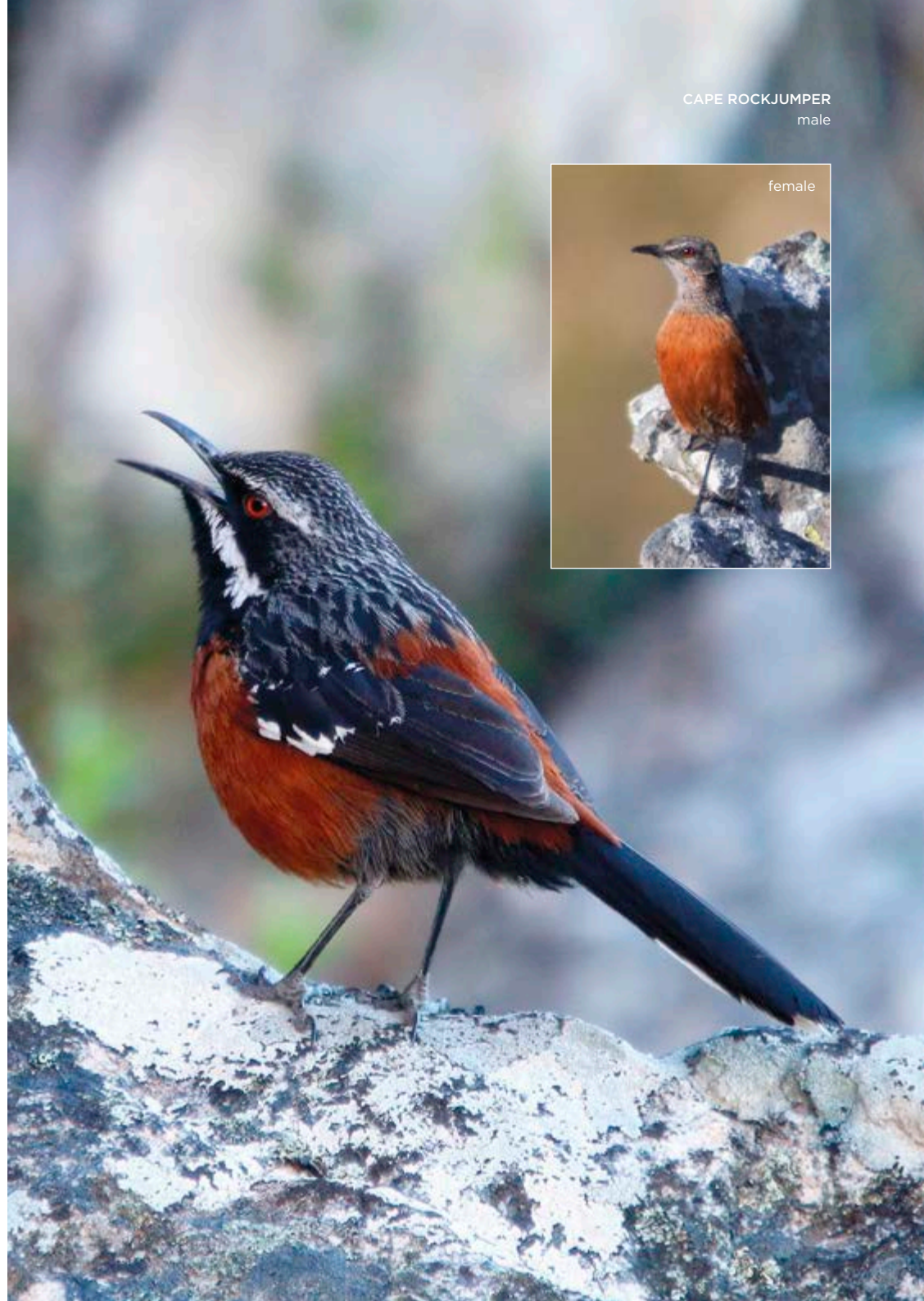
### Cape Rockjumper

The Cape Rockjumper (*Chaetops frenatus*) is a terrestrial foraging bird of open, rocky habitats. These conditions are normally associated with mountainous terrain, especially at higher altitudes within the Cape Fold mountains. As such, altitude is an important variable associated with the species' distribution. Although it may be found to sea level in the Kogelberg, suitable coastal habitat is limited eastwards with increasing summer rainfall and mild conditions favouring rapid vegetation recovery post fire in the fynbos, as well as fynbos replacement by forest. The species appears to be most abundant in the early post-fire period, up to 5-10 years.

Family groups of 2-6 birds occupy fairly fixed territories while a breeding pair dominate. The species is a facultative co-operative breeder, with young of previous breeding attempts occasionally assisting feeding chicks of the current brood. While recent detailed family observations suggest no altitudinal migration, foraging and location within a territory are influenced by temperature and wind. Under mild conditions birds may forage throughout the day, but seek shaded locations at high temperatures, and are also less active under wet and windy conditions.

Several lines of research suggest that the biggest threat to this species is global warming associated with climate change. The range of the species is restricted to regions with low mean-annual-temperature, and species declines have been most notable in regions associated with greatest warming. The species shows low physiological tolerance to high temperatures. At higher temperatures the birds are more likely to stop foraging and seek shaded or cooler microclimates within their territory, which likely ultimately influences individual fitness and nesting success.

Cape Rockjumpers are ground-nesting, and as such their nests are vulnerable to an array of predators. Nest failure rate is thus high. Conditions that favour the increase in chick and egg predators are likely detrimental to the species, for example cats and crows. The loss of apex predators e.g. leopards from the ecosystem may also lead to mesopredator release e.g. greater abundance of mongoose, baboons, wildcat, genets or other terrestrial predators.



CAPE ROCKJUMPER  
male

female

## Victorin's Warbler

Victorin's Warbler (*Cryptillas victorini*) are classically skulking insectivores found in rank vegetation, usually associated with seeps and drainage lines, but are also in found in thick, mature fynbos associated with south-facing slopes away from water. A territorial pair can be very vocal, calling throughout the day in cool conditions and their presence is best noted through their distinctive calls. They are locally common under the right conditions, with on average 12 individuals per square kilometre. Bird densities are low after fire, but recover to carrying capacity within 5 to 10 years.

While there appear to have been some declines in the species range in the far west, generally, the Victorin's Warbler is the species faring the best of the endemics overall according to SABAP data. Their use of the under-storey is likely a buffer against warmer air temperatures. They are also fairly tolerant of intermediate levels of alien vegetation encroachment (pine and wattle), but are largely absent from heavily infested areas, as are all of the endemic birds.

VICTORIN'S WARBLER  
Male and female are almost identical.



## Protea Seedeater (Canary)

The drab-coloured Protea Seedeater (*Crithagra leucoptera*) is the fynbos endemic bird species that is faring the worst in terms of relative abundance and range contraction according to SABAP data. However, the species has always been rare and elusive. Protea Seedeaters are superficially similar to Streaky-headed Seedeater, which is a more generalist granivore which tends to be less common in fynbos and more common in karoo habitat.

While Protea Seedeaters have been observed eating seeds from a wide variety of fynbos plant species, their preferred food resource appears to be seeds from Protea species. Large numbers of Protea Seedeaters have been recorded in post-fire landscapes of old-growth protea dominated veld, where they feast on the recently released seeds. There is thus concern that increased fire return intervals and the larger extent of fires may be compromising preferred food resources if Protea species are not allowed to develop sufficient seed stocks. In addition, Protea Seedeaters prefer to nest in mature Fynbos. Maintaining old-growth Protea dominated habitats, with small - medium scale burns likely favour the persistence of this species i.e it likely benefits the most from a mix of veld ages at different scales across the landscape.

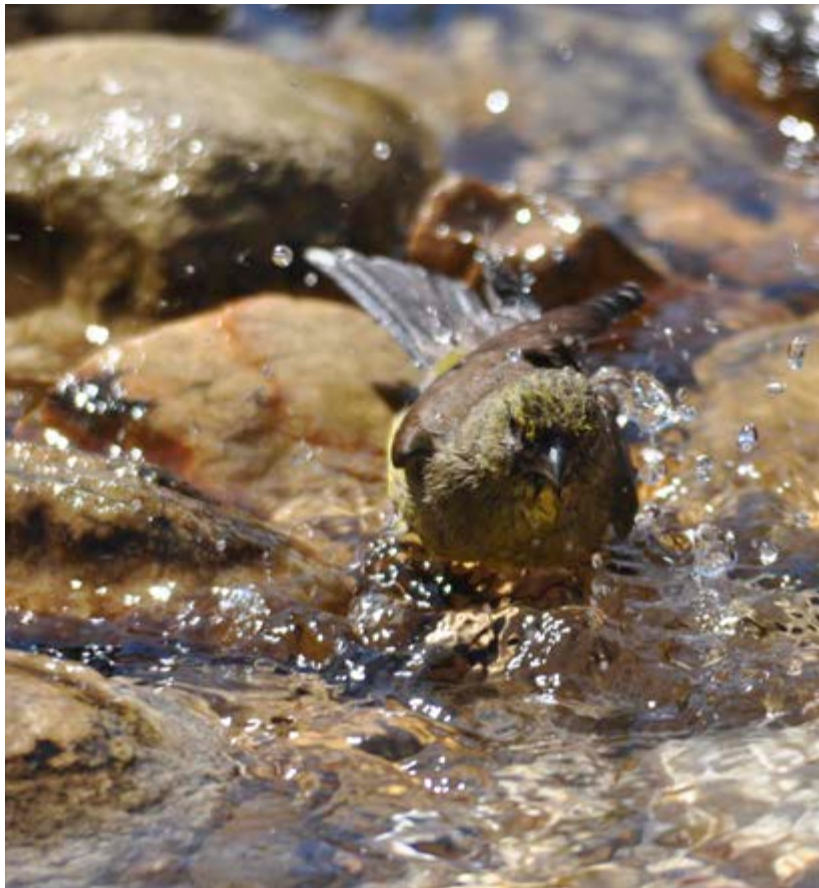
Protea Seedeaters have been recorded drinking frequently, preferring fresh and running water. Climate change impacts on rainfall, together with activities that compromise stream activity (dam construction, excessive ground-water extraction) are of concern for this species. While there is also some evidence that range is limited by temperature, causes for apparent declines in this species have yet to be conclusively determined and at this stage more research is urgently needed.

PROTEA SEEDEATER (CANARY)  
male



## Cape Siskin

Cape Siskins (*Crithagra totta*) are small canaries that can be found in large flocks in veld recovering from fire in mountain Fynbos, and in small groups throughout their range. They are found from the high mountains to sea level, and across a variety of fynbos habitat types including those that transition to karoo. They have been recorded feeding from a variety of plant species, especially restios. The species is also a fairly flexible nester, utilising a variety of nesting strata. The males show more yellow on the head, more prominent white wing tips, and less streaking on the throat compared to females. Populations appear relatively stable according to SABAP data. Like the Protea Seedeater, the main concern is the persistence of suitable drinking sites, likely coupled with range contraction associated with global warming.



CAPE SISKIN  
male



## Cape Sugarbird

Male Cape Sugarbirds (*Promerops cafer*) with their long tails are almost always easy to see as they take prominent perches in stands of old-growth, flowering Protea stands to loudly defend nectar-rich fynbos patches. Cape Sugarbirds are the most common species in stands of flowering ornithophilous proteaceae i.e. several Protea and Leucospermum (pincushion) species pollinated by birds. Cape Sugarbirds are very reliant on this subset of the proteaceae family, and although they have been observed feeding on a variety of other plant families, there is a clear preference for specific Protea species, especially the set of 'bearded' proteas e.g. Protea neriifolia. Density of these birds is quite strongly tied to the abundance of flowers, which is a function of plant height (or time since fire) and season i.e. birds move in response to available flowering resources. Increasing fire return intervals with consequences on fynbos structure and plant composition are a real threat for this species.

Cape Sugarbird is the fynbos endemic species most tolerant of the urban environment and heavily utilise a range of exotic nectar producing plants. While there may be consequences for individual fitness in terms of pathogen transfer at bird-feeders and accidental poisoning, the additional food sources in gardens may help populations on the urban fringe persist when wide-spread fires decimate food sources in natural habitats.

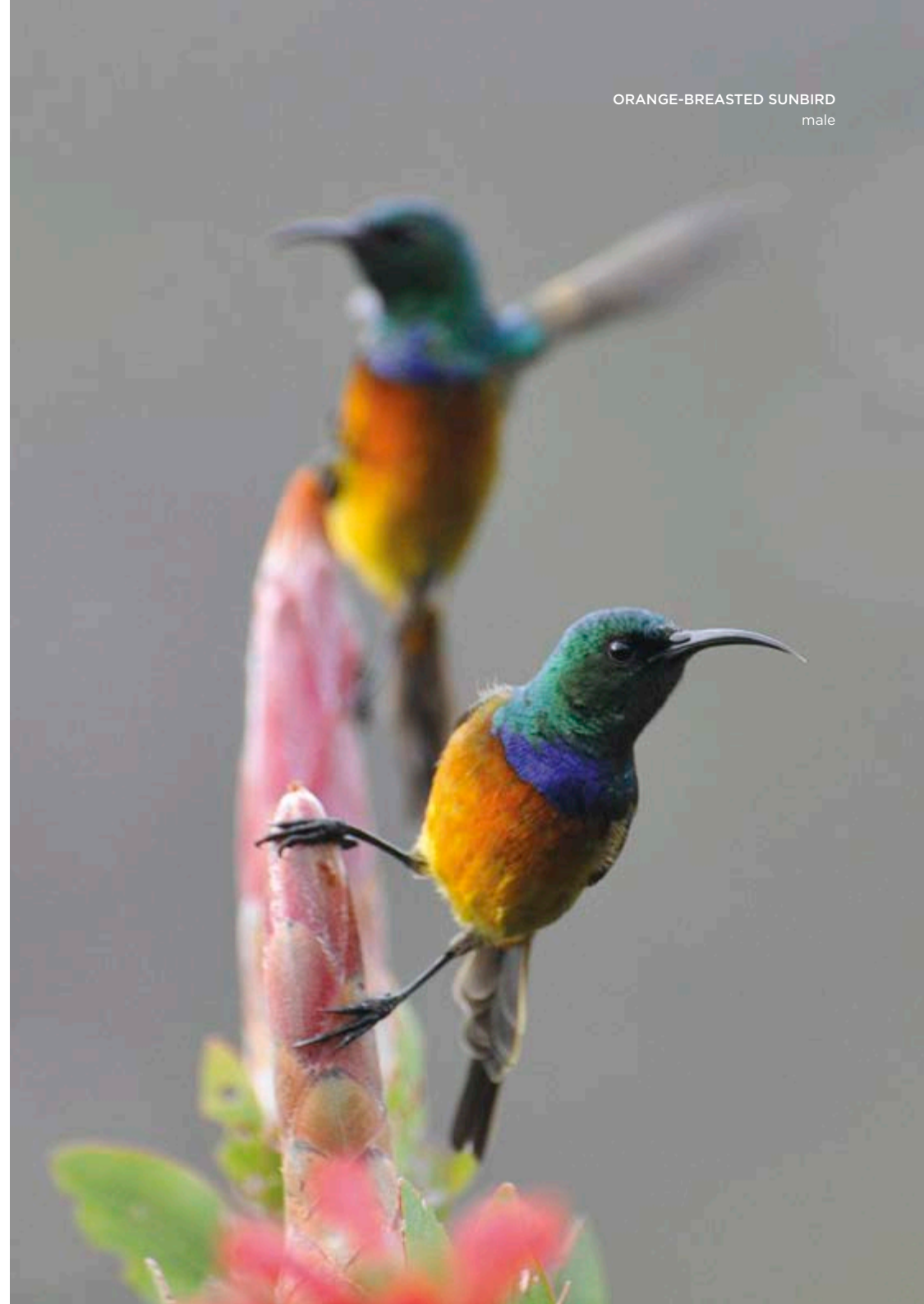
The loss of keystone summer flowering Protea species in certain parts of fynbos is also a cause for concern, given that the bulk of Protea flowering occurs in the autumn to winter period. Maintaining Cape Sugarbirds in an area requires the preservation of old-growth Protea dominated fynbos with a variety of Protea species that provide nectar resources throughout the year. Due to complex social interactions and feeding ecology within the species, it appears that the female Cape Sugarbirds (which are smaller than the males) may be more at risk during years of high temperature and low rainfall when flowering resources are scarce. While male Cape Sugarbirds often perch and display from prominent locations, females tend to be more cryptic and unobtrusive requiring greater effort to detect. As this species plays an important part in the pollination of several proteaceae species, it is essential to the long-term health of the Fynbos.



## Orange-breasted Sunbird

The small male Orange-breasted Sunbird (*Anthobaphes violacea*) is one of South Africa's most beautiful sunbirds, while the female tends to be a more yellow colour than similar sized Southern and Greater Double-collared Sunbirds. Associated with a variety of long-styled Erica species, Orange-breasted Sunbirds have also been recorded feeding on a wide variety of other plant species. Pairs of this species can persist in relatively small stands of fynbos e.g. habitat islands that escape widespread fires. They appear to reach maximum densities fairly quickly (<5 years) after fire, as they are prolific breeders capable of breeding year round. In old fynbos they can be found in very high numbers. Given all this, it is perhaps surprising that according to SABAP data the species is in moderate decline. They appear to be less tolerant of urban environments and may be less mobile compared to generalist nectarivores such as the Southern Double-collared Sunbird and Malachite Sunbird. Hence they may be more vulnerable to local changes in plant flowering cycles than species better adapted to dispersal.

While specific reasons for declines in this species are not clearly established, healthy populations do appear to be associated with broader expanses of fynbos habitat with a variety of plant species. Alien vegetation encroachment and habitat conversion are likely the biggest threats, coupled possibly with competition from generalist nectarivores e.g. the range-expanding Amethyst Sunbird. Orange-breasted Sunbirds are observed to bath more than would be expected for a nectar-feeding species, and threats to stream flow (e.g. alien vegetation encroachment and dam building ) may also be detrimental to healthy populations.



ORANGE-BREADED SUNBIRD  
male

## Hottentot Buttonquail

The Hottentot Buttonquail (*Turnix hottentottus*) is a small terrestrial bird that is rarely seen or heard. The status and descriptions of this bird in field guides is often debatable (for instance, bright yellow legs are not a diagnostic identification feature). It is a species in need of further research, with very little known about its life-history or ecology. Like other buttonquail species around the world, the Hottentot Buttonquail is likely polyandrous (a female will mate and lay eggs for several males, which play the main role in rearing the chicks). As such the female is more colourful than the male, with rufous from face to chest and white-belly. However, a good view of the bird is very rarely achieved as they usually sit tight and rely on their camouflaged backs to conceal them, only taking flight at the very last moment. Hence, most observations of this bird come from individuals flying away when colour, size and patterns are difficult to determine and confusion with the similar Common Quail are very likely.

Habitat modification and land transformation of their preferred veld types are a major threat to this species. The flat, easy to access areas have already been vastly converted by agriculture (including rape and rooibos), with alien-vegetation encroachment threatening further suitable habitat. Fire suppression in proximity to human infrastructure is also likely a threat in some situations as they appear to be largely absent from moribund vegetation. The development of wind-turbine infrastructure may also pose a threat due to habitat transformation but also bird strike: the species is suspected to migrate at night. Overall, current fire return intervals are favourable to this species, but direct threats from climate change are unclear.

The main differences in the field that distinguish Hottentot Buttonquail from Common Quail are summarised below:

Hottentot Buttonquail	Common Quail
Smaller, darker wing covets in flight	More heavily streaked; strong and fast flight
3 forward facing toes	3 forward facing toes, 1 rear, back toe
Regular, deep, hooting	'Wet-my-lips' whistle
No alarm on taking flight	Double 'weet weet' on taking flight
Usually settles within view (30-40m)	Often flies out of view
Occurs year round	Migrates to Europe in Winter
Most common in undisturbed, flat, sandy fynbos 2-4 years after fire	Generalist: Common in agricultural pasture and natural veld, including fynbos

HOTTENTOT BUTTONQUAIL  
female



## Agulhas Long-billed Lark

The Agulhas Long-billed Lark (*Certhilauda brevirostris*) is one of the species in the Long-billed Lark complex which includes five species, split from a single species in the mid-1990s due primarily to genetic evidence, but also supported by differences in body size, colour, bill length and call. The Agulhas Long-billed Lark has the smallest distribution of the five species in this complex, inhabiting the Overberg and Agulhas regions of the south-western Cape. This species differs from others in this booklet in that it often persists in disturbed land or agricultural fields, and is therefore less at risk from habitat transformation or some of the other threats impacting the Fynbos Biome. However it is also present in coastal fynbos and occasionally in parts of the karoo. It is endemic to South Africa, and the only bird completely endemic to the Western Cape.

They are identified by their heavily streaked breasts, and long curved bill, as well as during their display flight, which is similar to other members of this complex and involves the male climbing to 5 - 10 metres and then folding his wings and dropping whilst giving a descending whistle note. Pairs or individuals can be seen perched along fences in the agricultural lands, or foraging amongst the wheat stubble.

AGHULAS LONG-BILLED LARK

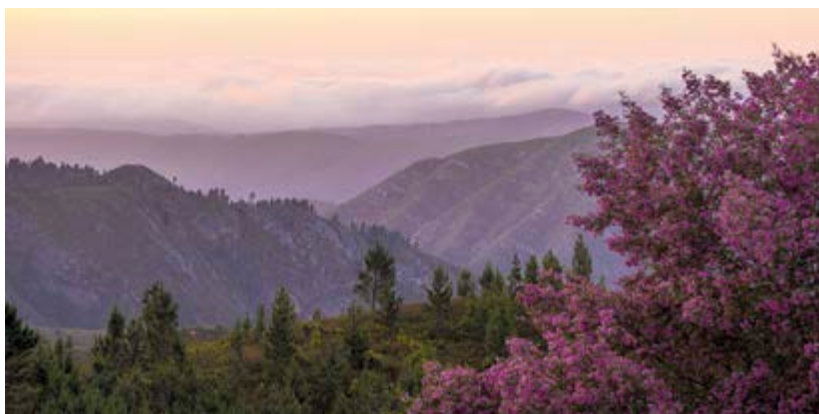


## Threats to Fynbos birds

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### Alien vegetation

Alien invasive vegetation is a serious threat to the bird habitats of the Fynbos Biome, and particularly within the Cape Fold Mountain IBAs. The alien vegetation rapidly outcompetes the slower growing Fynbos, and thus reduces the extent of natural vegetation available for the Fynbos endemic bird species. These invasive species significantly modify soil composition, fire regimes and natural plant and animal communities, threatening many indigenous species with extinction. Alien trees are also known to accelerate riverbank erosion and reduce in-stream flow through excessive transpiration. Alien invasive vegetation can lead to habitat transformation or reductions in habitat quality. Plantations often lead to an uncontrolled spread of pines, especially in mountainous areas where access and control of these plants becomes difficult and costly and this can result in a landscape level invasive alien plant problem.



Various species of alien vegetation are found across the Fynbos Biome, in varying densities across sites. Common alien plant species include Pines (*Pinus* spp.), Gums (*Eucalyptus* spp.), *Hakea* spp., a variety of Australian *Acacia* species, and *Sesbania* (*Sesbania punicea*) are present to some degree.

Stands of alien trees and plantations create habitat for numerous raptor species, many of which are specialist bird hunters. This increased predation may have negative impacts on the local bird populations in the surrounding areas, particularly if these species did not normally occur in high numbers in the Fynbos. However, there have not yet been studies to indicate that this is occurring or impacting on fynbos bird populations.

### Fire regime changes

In many Fynbos habitats across the Cape Fold Mountains, changes to natural fire regimes are impacting negatively on habitat quality through changes to plant community composition and structure. Fynbos is a fire-maintained ecosystem, and the use of fire as a driving force is now appropriately incorporated into most management plans. However human disturbance and high densities of alien vegetation have resulted in increased fire frequency across many of the Western Cape Mountains. These frequencies prevent longer-lived Fynbos plants such as some *Proteas* from establishing seed banks, and in the long-term reduce the populations of these plants thereby altering the plant communities. This in turn impacts the Fynbos endemic bird species which rely on these plant species. Conversely, on the urban fringe and in association with plantations, fires are suppressed, leading to replacement of Fynbos by forest or thicket. Unseasonal fires can have extremely high negative ecological impacts, such as soil erosion from the bare ground following a fire, and the loss of the seedbank alongside this erosion. Winter and spring fires should be avoided at all costs.



There have also been changing fire regimes across the Fynbos Biome linked to climate change impacts, and with fire occurring at greater frequencies and over wider areas, there may be a decrease in the juxtaposition of available food and nesting resources for some species e.g. Protea Canary. Protea Canaries could thus suffer additional ecological stress with increasing ambient temperatures, both directly through increasing temperature and indirectly through climate mediated changes to the habitat. Species density data for Victorin's Warbler suggests that as long as fire return intervals remain greater than five years, so allowing vegetation to recover, climate change impacts on habitat suitability may be mitigated.

## Habitat transformation and modifications to natural systems

Agricultural activities can represent both friend and foe to avian diversity; providing alternative habitat patches when managed appropriately; whilst also impacting negatively on ecosystems when mismanaged. Overall, generalist species benefit, while habitat specialists, such as the fynbos endemic bird species, are replaced. Activities in the agricultural land in the foothills of the Cape Fold Mountains can have major impacts on the ecosystems, including; habitat clearing for agricultural expansion; over-grazing and degradation of natural ecosystems; pollution due to excessive use of pesticides, fertilisers or other chemicals and excessive water abstraction.

## Climate change

Changes to the global climate due to increased Carbon Dioxide emissions possess one of the greatest challenges to people and wildlife in our lifetimes. These changes include increased annual temperatures, which are already documented for the protected areas of South Africa, and changes to rainfall regimes. It has been modelled that the Fynbos faces a drier future, with lower and more erratic rainfall. The Fynbos endemic Cape Rockjumper has poor physiological tolerance and researchers have observed behavioural changes at high temperatures. Declines in the bird atlas reporting rate for this species have been linked to increases in temperature. Many bird species, especially granivores or seed-eaters, drink regularly. Birds also use evaporative cooling to deal with high temperatures. The reduction in surface water available to birds could therefore impact directly on birds causing mortality through dehydration. The link between decreased precipitation and warmer temperatures can, therefore, have dangerous implications for birds.

In addition, a drier, warmer future with lower winter rainfall will also likely mean a higher fire return interval. More frequent fires over wider areas has already been demonstrated for parts of the Fynbos. This has implications for the survival for a host of Fynbos over storey species, e.g. Protea, which in turn has implications for population densities of Cape Sugarbird, and possibly Orange-breasted Sunbird.

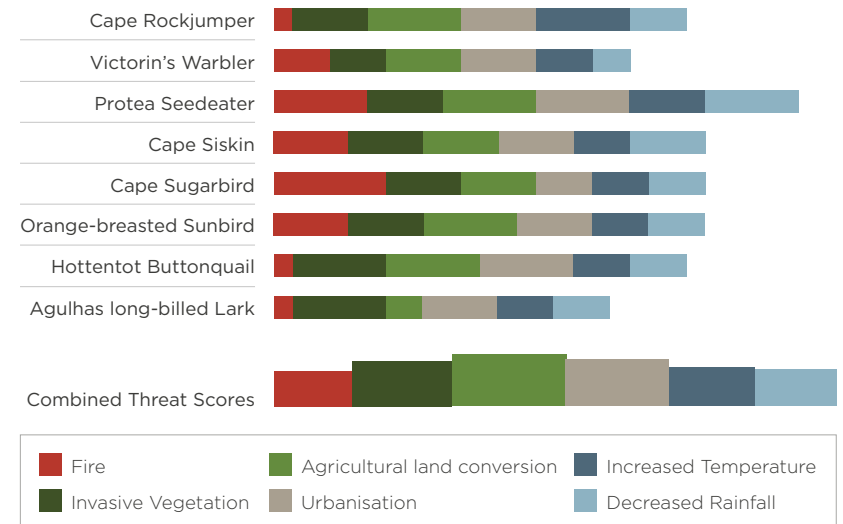
## Additional threats

Poisoning is a serious threat to avifauna, both for large terrestrial birds and raptors, which might scavenge on poisoned carcasses, and also through increased use of pesticides and insecticides, which accumulate in prey and are transferred to birds higher up the food chain. The effect of such poisons or pesticides on populations and distributions of bustards, cranes, raptors and other tertiary consumers in the region is poorly documented. There has previously been evidence of deliberate poisoning of Cape Sugarbirds on protea flower farms; however this activity was at a very low scale, and has now been eliminated through collaborative work with the flower farming industry.

Other smaller scale threats impacting on these species include road kills and collisions of birds with fences or power-line infrastructure, electrocutions, nest or roost site disturbance, depredation by dogs, cats, hunting, snaring, persecution, trade, traditional medicine (muti) and disease. The creation of illegal 4x4 tracks and illegal off-road activity in the Cape Fold Mountains can lead to a loss of Fynbos habitat for birds.

The long-term impacts of renewable energy developments, through collisions with Wind Energy Facility (WEF) infrastructure, or the loss of habitat due to construction of WEFs and solar facilities could impact negatively on threatened bird species populations.

The first graphic below illustrates the relative severity of the different threats which each species is facing. The second graphic illustrates the relative impact of each threat across all species.



## Management recommendations for Fynbos bird conservation

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The below guidelines may be applied by government conservation agencies or private individuals and farmers interested in maintaining and further improving existing fynbos habitat patches for birds. Mitigation measures are provided for each of the threats previously described, together with additional recommendations for enhancing habitat for the bird species of conservation concern in the Fynbos Biome.

### Alien invasive species

As far as possible, all alien invasive species should be identified and eradicated, with the priority to clear the lightly infested area first. This should be done in line with the legal requirements of every landowner to control invasive species on their property, and use the appropriate eradication methods for each species present. Assistance can be sought from various agencies and government departments. The appropriate rehabilitation of the natural vegetation following alien plant eradication should be encouraged. This will increase the quantity and quality of Fynbos habitat available for the endemic and threatened birds.

All landowners should familiarise themselves with the Alien and Invasive Species Regulations promulgated in 2013, in terms of section 97(1) of the National Environmental management: Biodiversity Act 10 of 2004 and the Alien and Invasive Species lists in terms of section 66(1), 70(1)(a), 71(3) and 71A of the National Environmental management: Biodiversity Act 10. For further information visit [www.invasives.org.za](http://www.invasives.org.za)

### Agricultural activities

BirdLife South Africa acknowledges the essential role which farmers play in supporting our nation's economy and providing food security for us all. Farmers are also increasingly recognised as the custodians of our biodiversity and natural resources. We therefore provide the following recommendations overleaf to those farmers interested and willing to manage their land to the benefit of biodiversity.

### Actions which can be taken are as follows:

- Minimise pesticide and other chemical use as far as possible, especially in areas adjacent to natural fynbos patches or water courses. Where the use of agrochemicals is inevitable consider using more environmentally friendly products.
- Avoid clearing of existing fynbos habitat patches wherever possible. When absolutely essential, ensure this is done in line with existing legislation and with full authorisations, as required by the National Environmental management: Biodiversity Act 10 of 2004.
- Avoid over-abstraction of water and ensure the ecological water requirements are retained in the river courses and water systems.
- Provide natural hedge-rows or strips of natural fynbos and other habitat patches between and within crops and alongside watercourses.
- Ensure placement of raptor perches and owl boxes to provide habitat for these species, which in turn help to control pest species such as Cape Gerbil.
- Avoid over-grazing of natural areas, particularly Renosterveld habitats.
- Plant indigenous, locally occurring fynbos plant species around the homestead in order to provide additional habitat.
- Allow appropriate fire regimes in natural veld patches wherever possible and never burn Fynbos vegetation in winter or spring.
- Monitor natural resource extraction. Education programmes regarding illegal poaching and other extraction activities are also recommended.

## Fire management

Active fire management already forms a major component of the management of all protected areas in the Cape Fold Mountains. Fire regimes should mimic those required by the ecology of the natural veld wherever possible. Currently issues are arising due to potential over-active fire suppression in the lowland vegetation types, and increasing fire frequencies in the mountains. Fire management activities should take the focus and all properties, both those belonging to government and private landowners must have the necessary firebreaks and firefighting equipment. Landowners should be registered with the local Fire Protection Association and have full knowledge of any protocols related to reporting and fighting fires within their regions. Fire education programmes for all staff should also be conducted. In certain instances planned burns may be required to maintain ecological functioning of the natural vegetation. This must be done in full consultation with all of the necessary authorities and as determined by ecological specialists.

## Habitat rehabilitation

Any fallow lands or degraded areas which are no longer under agricultural production, or have been previously cleared of alien vegetation, should receive some form of habitat rehabilitation. Whilst this is difficult in certain areas, if the seedbank of the Fynbos vegetation previously occurring in an area, is still present, then fire can be used to encourage fynbos plant regrowth, but note this must be done in consultation with a specialist ecologist. Those natural areas which have been impacted to a lesser degree and might recover over an extended period can also be assisted by re-seeding or replanting of natural vegetation; however it is essential that only plants from the surrounding area, or endemic to that area, are planted.

## Climate change

For landowners and managers it is hard to account for, and mitigate, the changes associated with climate change. Certainly, some level of relief to species that are temperature limited would be the protection of altitudinal gradients, which are surrogate for accounting for temperature change: it gets cooler as you get higher. Creating altitudinal corridors for these species, as well as larger landscape corridors to facilitate movements between IBAs and/or protected areas should be encouraged.

At a local, action level, everyone should be attempting to reduce their carbon footprint wherever possible: transitioning to 'green' energy sources e.g. solar; reducing travel or associated vehicle fuel emissions; assisting carbon off-set schemes; and reducing one's use of, or reliance on, the national electric grid.

## The way forward

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These are only a few examples and interested parties can contact BirdLife South Africa for additional information. They are intended to promote awareness of birds as an integral component of biodiversity. The implementation of these recommendations is encouraged by all interested landowners and other parties. These guidelines can also be read in conjunction with:

- Ecosystem Guidelines for environmental assessment in the Western Cape, 2nd edition,
- Fynbos: Ecology and Management by Esler, Pierce and de Villiers,
- Fauna and Flora of the Overberg booklet,

to provide additional recommendations for management of Fynbos and Renosterveld habitats and farmland.

The South African Important Bird and Biodiversity Areas Directory provides detailed descriptions of all 112 of South Africa's IBAs, whilst the IBA Status Report describes current threats and conservation action across this network. Both of these documents are available for download from the BirdLife South Africa website.

The Best practice guidelines for assessing and monitoring the impact of wind energy facilities on birds in southern Africa, are also available from the BirdLife South Africa website.

## Partners in bird conservation in the Fynbos Biome

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### BirdLife South Africa

BirdLife South Africa is the only dedicated bird conservation non-government organisation (NGO) in South Africa, and is actively involved in various conservation projects that deal with species, sites, habitats and people. The organisation's main focus is on threatened and endemic bird species and Important Bird and Biodiversity Areas (IBAs). We are working to protect important sites and habitats of the Fynbos Biome in the Western and Eastern Cape Provinces, whilst supporting appropriate management of existing protected areas and private lands. Formal protected area status for privately-owned land in areas of critical biodiversity importance can be achieved through the Biodiversity Stewardship Programme. We have partnered with provincial conservation agencies and other environmental NGOs in this pursuit. BirdLife South Africa's Western Cape Regional Conservation Programme has made major progress since inception in 2012 in initiating co-operation and collaboration with provincial government, NGOs and many landowners.

[www.birdlife.org.za](http://www.birdlife.org.za)

### Percy FitzPatrick Institute of African Ornithology, University of Cape Town

The Percy FitzPatrick Institute of African Ornithology is a South African biological research and conservation institute based at the University of Cape Town. The mission statement of the Institute is "to promote and undertake scientific studies involving birds, and contribute to the practice affecting the maintenance of biological diversity and the sustained use of biological resources". It has become the largest centre for ornithological research in the Southern Hemisphere and hosts research projects focusing on Fynbos birds and their conservation challenges; as well as the Hot Birds program, which highlights the challenges birds face in a warming world.

[www.fitzpatrick.uct.ac.za](http://www.fitzpatrick.uct.ac.za)

South African National Biodiversity Institute  
[www.sanbi.org](http://www.sanbi.org)

Department of Environmental Affairs  
[www.environment.gov.za](http://www.environment.gov.za)

Western Cape Department of Environmental Affairs  
and Development Planning  
[www.westerncape.gov.za/dept/eadp](http://www.westerncape.gov.za/dept/eadp)

Cape Nature  
[www.capenature.co.za](http://www.capenature.co.za)

City of Cape Town  
[www.capetown.gov.za/environment](http://www.capetown.gov.za/environment)

Eastern Cape Parks and Tourism Agency  
[www.visiteasterncape.co.za](http://www.visiteasterncape.co.za)

South African National Parks  
[www.sanparks.org](http://www.sanparks.org)

Wildlife and Environment Society of South Africa  
[www.wessa.org.za](http://www.wessa.org.za)

Overberg Renosterveld Conservation Trust  
[www.overbergrenosterveld.org.za](http://www.overbergrenosterveld.org.za)

World Wide Fund for Nature  
[www.wwf.org.za](http://www.wwf.org.za)

Western Cape Bird Routes  
[www.westerncapebirding.co.za](http://www.westerncapebirding.co.za)

Cape Bird Club  
[www.capebirdclub.org.za](http://www.capebirdclub.org.za)

Southern African Bird Atlas Project  
[www.sabap2.adu.org.za](http://www.sabap2.adu.org.za)

iSpot  
[www.ispotnature.org](http://www.ispotnature.org)

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This document was compiled by Dale Wright and Dr Alan Lee, who can be contacted for further information.

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