Cape Sugarbird: Flowering *Protea* may predict occurrence and abundance

Alan T.K. Lee [1, 2]

[1] Birds & Environmental Change Programme, Climate Change & BioAdaptation Division, South African National Biodiversity Institute

[2] Percy FitzPatrick Institute of African Ornithology, University of Cape Town, Rondebosch 7701, South Africa

alan.tk.lee@googlemail.com

Introduction

The Cape Sugarbird *Promerops cafer* (Fig. 1) is one of six species of bird restricted to the Fynbos biome. The bird is an important pollinator of certain *Protea* species and the close association between this endemic bird and a subgroup of flowering species of the *Protea* genus has been known for some time [1]. Reliance of Cape Sugarbirds on other Fynbos families or environmental variables less well known. Increased fire frequency and climate change may impact on this species habitat [2], and some evidence suggests range has contracted over the last 20 years [3]. Loss of this key species may have implications for the pollination of a wide range of *Protea* species. We aimed to:

1.Determine the status of Cape Sugarbird across the Fynbos biome; 2. Determine the proportion of 'proteoid' mountain Fynbos (consisting of >30% mature *Protea* species);3. Identify correlates of occurrence of Cape Sugarbird and a range of plant family and environmental variables

Methods

1.From January to May 2012, birds were recorded during point counts throughout mostly intact Mountain Fynbos (Fig. 2). Density was calculated using DISTANCE 6.0.

2.At each point, habitat variables were recorded including altitude, aspect, slope, veg. height, proportion of 30 principal plant families (or functional groups e.g. bird pollinated vs non-bird pollinated proteaceae). Flowering status of all *Protea* spp was recorded to the closest 10% and a flower score calculated from *Protea* abundance and height.

3.Cape Sugarbird relative abundance (total birds / point) was correlated with 40 variables using Spearman Correlation Coefficients.

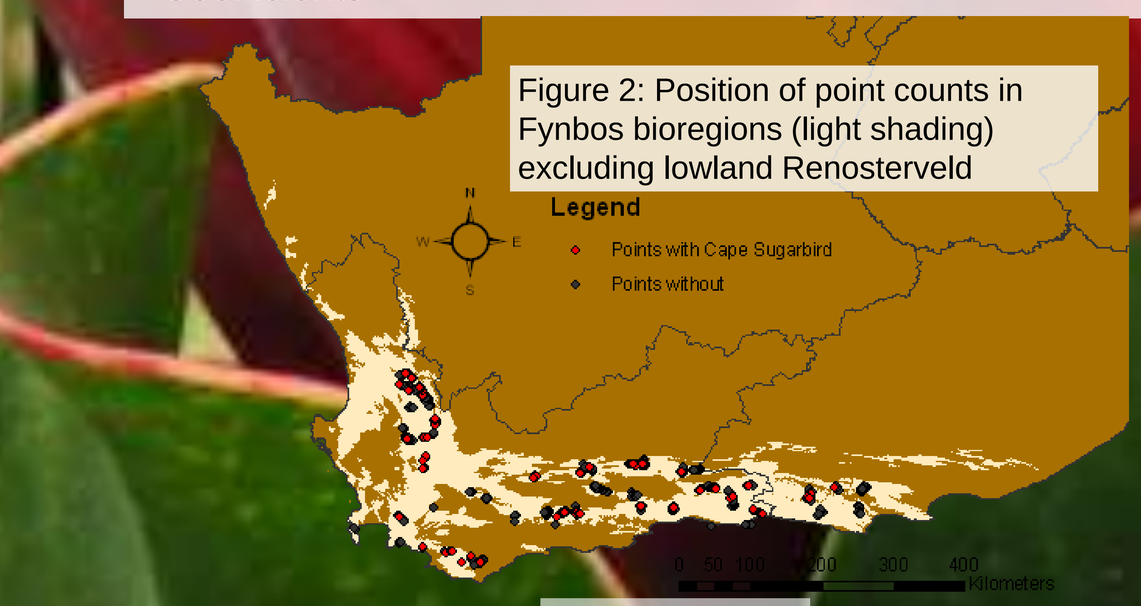


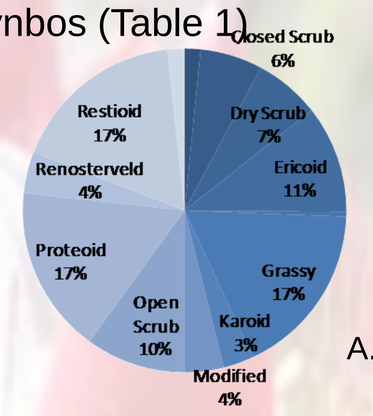
Figure 2: Position of point counts in Fynbos bioregions (light shading) excluding lowland Renosterveld

Results

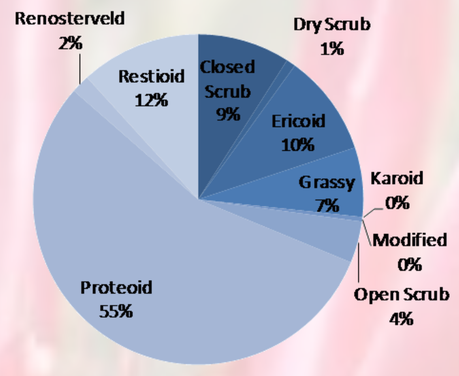
1.A total of 361 Cape Sugarbirds (249 groups) were recorded during 820 counts, with an overall density estimate of 17 (13-21) birds/km^2

2.17% of points were classified as 'proteoid', and 55% of bird encounters were recorded in this habitat type (Fig. 3)

3.Cape Sugarbird abundance was strongly positively correlated with bird pollinated *Protea*, *Protea* flower scores, vegetation height and other proteaceae; while negatively correlated with grass, rocky outcrop and plant families associated with dry Fynbos (Table 1).



A.



B.

Figure 3: Habitat classification of points based on dominant vegetation types (A), compared to occurrence of Cape Sugarbird within vegetation types (B).

Figure 1: A male Cape Sugarbird perched on *Protea eximia* bud

Table 1: Top 14 correlates of Cape Sugarbird relative abundance (birds/point). cs = Spearman's Correlation Coefficient.

Variable	cs	p
Bird Protea	0.387	.000
Protea Flower	0.381	.000
Vegetation height	0.197	.000
Other Protea	0.18	.000
ERICACEAE	0.1	.004
BRUNIACEAE	0.08	.028
Bare ground	-0.07	.044
ROSACEAE	-0.07	.046
Longitude	-0.073	.036
CRASSULACEAE	-0.073	.037
'Forbs'	-0.077	.028
SAPINDACEAE	-0.079	.023
Outcrop	-0.097	.005
POACEAE	-0.184	.000

Conclusions

Cape Sugarbird populations can still be considered healthy, occurring more in tall stands of proteaceae dominated by bird pollinated species with a high proportion of flowers. We estimate the population to be between 755638 – 1.2 million based on an area of suitable Fynbos bioregions [4] of 58 126km [2]. Negative correlation with dry Fynbos elements suggests this species is vulnerable to global climate change where most models predict a drier future across the core range of this species. *Protea* flowers are an important food for Cape Sugarbirds and several other bird species. Fires which destroy mature stands of *Protea* threaten not just the plants, but also birds which rely on them.

References

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