

Seed eaters in the Noel Kempff Mercado National Park, Bolivia

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Introduction

Seed eaters (*Sporophila* spp.) are small finches of open habitat, particularly common in the lowlands of South America. The males are typically brightly coloured and easy to recognise, but females and immature birds are generally warm brown in coloration, and virtually inseparable in the field. Identification is made more difficult by the fact that mixed-species flocks are formed outside the breeding season, in which males are relatively scarce⁹. There are currently 32 recognised species of seed eaters¹⁰, although the taxonomy of this genus is still incomplete. The ranges of most species are centred on the grasslands of the central and southern parts of the continent⁹, where they are threatened by the destruction of cerrado and pampas vegetation, and also by extensive trapping^{6,7}.

A total of 14 species of *Sporophila* have been recorded from the lowlands of Bolivia¹. Nine of these have been sighted in the Noel Kempff Mercado National Park^{1,11}, eastern Santa Cruz department, where some 500,000 ha of pristine campo and cerrado habitat exists². This total includes the endangered Black-and-tawny Seed eater *S. nigrorufa*⁵, which has a restricted range centred around extreme eastern Bolivia and adjacent areas of Brazil⁹, and is at risk from the destruction of cerrado habitat^{5,6}. Two near-threatened species, Dark-throated Seed eater *S. ruficollis* and Rufous-rumped Seed eater *S. hypochroma*, at risk from habitat loss and extensive trapping^{5,6}, are also found within the park⁷.

Between 20 August and 26 September 1994, an expedition from Nottingham University, U.K.⁸, surveyed seed eaters in the Noel Kempff Mercado National Park by using line-transects^{3,4}. An area of seasonally inundated grassland was targeted (close to Los Fierros, at 14°30'S 61°10'W) where a range of seed eaters had been recorded previously^{2,9}. This area of grassland covers 200 km², and is entirely surrounded by lowland tropical forest. Additional extensive areas of savanna lie to the south, and less than 15 km to the east is the base of the Serranía de Huanchaca, which supports almost 500,000 ha of campo and cerrado habitats.

Results

A total of 923 seed eaters were recorded. Five species were identified from males in breeding plumage (14% of birds seen). Double-collared Seed eaters *S. caerulescens*, were infrequent in scrubby savanna close to the forest edge, but the remaining four species, *S. ruficollis*, Tawny-bellied Seed eater *S. hypoxantha*, *S. hypochroma*, and *S. nigrorufa* were concentrated in mixed flocks. These flocks often contained a number of other granivorous finches, in particular Blue-black Grassquits *Volatinia jacarina*, but also small numbers of Wedge-tailed Grass-finches *Emberizoides herbicola*.

Due to the low number of identifiable birds, data for the four flocking seed eater species were analysed together, thus providing a combined density and population estimate for *Sporophilas* at Los Fierros. Using the relative frequencies of each species based on sightings of mature males, these figures were broken down to provide results for individual species, shown in Table 1.

Table 1: Density and population estimates for seed eaters at Los Fierros.

Species	Number of males seen	Density (birds ha ⁻¹)	Population at Los Fierros
<i>S. ruficollis</i>	73	0.81	16,160
<i>S. hypoxantha</i>	34	0.37	7,400
<i>S. hypochroma</i>	20	0.22	4,480
<i>S. nigrorufa</i>	2	0.02	440
Total for the four species	—	1.42 (±0.34)	28,480 (±6,800)

95% confidence limits given in brackets

The threatened *S. nigrorufa*, with only two males seen, was the least numerous of the four species recorded in mixed flocks. Although the estimates for this species will be of limited accuracy (due to the small sample size), it was clearly less common than the others by an order of magnitude. As such, *S. nigrorufa* appears rare at Los Fierros, at least during the austral winter. The remaining species were present in good numbers, comprising a major element of the savanna avifauna. The local abundance of *S. ruficollis* in



Grassland near Los Fierros, Noel Kempff Mercado National Park (J. W. Pearce-Higgins)

this area is a particularly important discovery for this near-threatened bird.

Two major habitat divisions were apparent at Los Fierros. In the centre of the savanna, the vegetation appeared similar to wet campo, characterised by large expanses of knee-high grass, punctuated by clumps of shrubs and small trees centred on termite mounds. Around the periphery of the savanna were more scrubby areas, with a high density of bushes and trees, more analogous to campo sujo⁸.

There were clear differences in seedeater abundance between the two habitats. Seedeaters were largely restricted to wet campo in the centre of the savanna, with very few birds seen in less open areas. This pattern can best be related to two differences between the habitats. The open sward of the wet campo habitat is conducive to ground foraging by seedeaters. Furthermore, the enhanced visibility of such areas is likely to promote flock formation as it allows greater observation of conspecifics and predators. Secondly, and perhaps of greatest significance, was the high density of grass-seed in the favoured habitat. Seed distribution was very patchy, but when measured using quadrats, seeds were significantly more numerous in areas of wet campo ($t=-7.11$, $df=87$, $p<0.001$). Local seedeater distribution thus appears, not surprisingly, to be governed primarily by food supply, and perhaps also by habitat structure.

Conclusion

Significant numbers of rare seedeater species exist within the Los Fierros savanna of Noel Kempff Mercado National Park. Although the presence of these species at the site was recorded

previously^{1,2}, this study supplies the first estimates of density and population size. Additionally, we have revealed that seedeaters were concentrated in wet campo habitat with a high density of grass-seed and an open structure.

The Noel Kempff Mercado National Park embraces over 500,000 ha of campo and cerrado habitats², within which there is the potential for large populations of these threatened and near-threatened species to be protected. Certainly, the national park is at the centre of the *S. nigrorufa* range^{6,9}, and although this species appears rare at Los Fierros, at least during the austral winter, previous records of several hundred individuals at Flor de Oro (13°33'S 61°00'W) in late spring 1991⁶ confirm the importance of the area for this bird. *S. hypochroma* has a patchy range⁹ and, until recently⁶, was categorised as threatened, suggesting that its significant population at Los Fierros is important. Both *S. ruficollis* and *S. hypoxantha* have wide distributions across the savannas of the national park, and if similar densities of birds exist throughout, then very large populations are present. Although *S. hypoxantha* is generally regarded as the most abundant seedeater within its range⁹, *S. ruficollis* was twice as common at Los Fierros, and indeed was the second most numerous bird in the savanna⁸.

On the basis of this and other work^{2,5}, it appears that the two areas of seasonally flooded grassland at Los Fierros and Flor de Oro are vital for seedeaters within the national park, and are certainly of a high conservation priority. However, as short surveys do not take into account the migratory or nomadic behaviour that many seedeaters exhibit^{5,6,9} there is a clear need for further research into the distribution and abundance of these species.

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