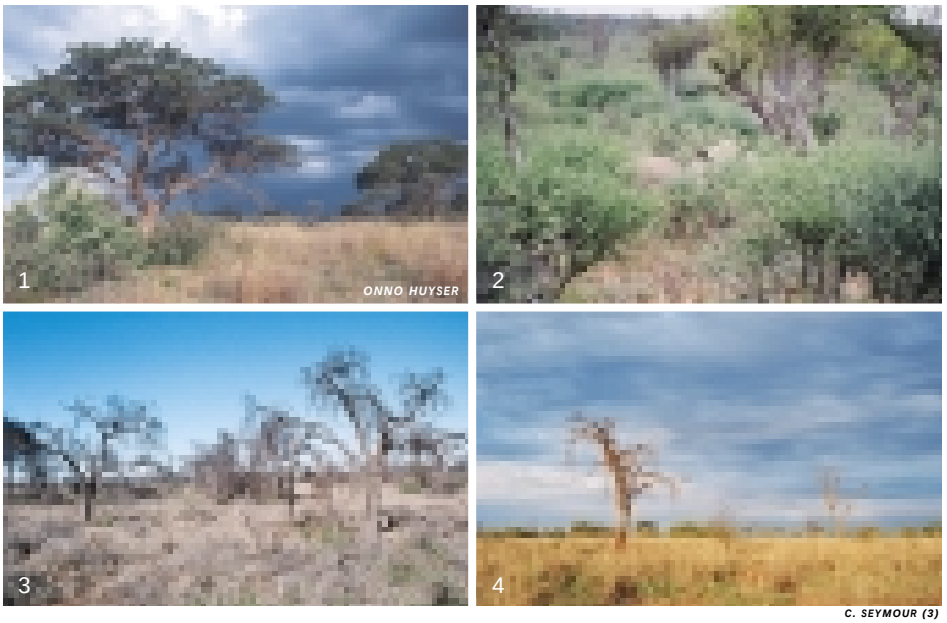
Birds and land-use in the southern Kalahari

Land-use practices frequently change habitat structure, thereby influencing the structure of bird communities. In the southern Kalahari, heavy grazing coinciding with consecutive years of good rainfall leads to bush thickening, whereby woody species such as black-thorn acacia *Acacia mellifera*, velvet raisin *Grewia flava* and driedoring *Rhigozum trichotomum* suppress the growth of grasses and herbs. In the 1980s, bush-thickened areas covered approximately 2.5 million hectares in the South African section of the Kalahari, an area larger than the Kruger National Park. In Botswana and Namibia the situation is as bad, if not worse.

In an attempt to tackle the problem, in the early 1980s bush-thickened areas in the South African Kalahari were cleared using the arboricide (tree-killing chemical) Tebuthiuron. Initially this worked well, killing only target species. Within a few years however, non-target species, including camelthorn *Acacia erioloba*, the largest tree in the region, also started to die. This habitat degradation is exacerbated by urban demand for camelthorn as braai wood; on some properties, up to 60 tonnes of wood is removed monthly.

Colleen Seymour, a Fitztitute doctoral student, investigated the effects of bush thickening, arboricide spraying and large tree removal on Kalahari birds. The study focused on identifying the biological characteristics of birds most likely to be affected. Interestingly, bush-thickened areas did not differ significantly from pristine areas in either total bird abundance or total number of species. However, species composition did differ between the two habitats, the bush-thickened areas supporting fewer hole-, ground- and tunnel-nesters. Impacted species included Eastern Clapper Lark *Mirafra fasciolata* and Ant-eating Chat *Myrmecocichla formicivora*.



C. SEYMOUR (3)

Pristine Kalahari woodland (1) degrades to bushy thicket (2) when overgrazed. Application of arboricides leaves a desolate landscape of dead trees (3), almost devoid of birds. By the time the trees themselves are removed for firewood (4), the landscape has been totally transformed, as has the associated bird community.

Species that forage on bark, hawk prey aerially or 'perch and swoop' also decrease in bush-thickened areas, as do seed-eaters. In the Kimberley area of the Kalahari, for example, Lesser Grey Shrike *Lanius minor* and Common Fiscal *L. collaris* almost disappeared. So which species do well in bush-thickened areas? Colleen found that these were mostly small bird species, insectivores, gleaners, and cup and ball nesters, including Kalahari Scrub-Robin *Cercotrichas paena* and Chestnut-vented Tit-babbler *Parisoma subcaeruleum*. There was also an increase in the number of birds with yellow, orange or red in their plumage; that is, species with bright, highly visible coloration. Birds that combine these attributes, such as Yellow-bellied Eremomela *Eremomela icteropygialis* and Cape Penduline-Tit *Anthoscopus minutus*, thrive in bush-thickened environments.

Areas treated with arboricides had far fewer birds as well as far fewer bird species. Removal of large trees resulted in a further decrease in the number of bird species, with bark-foragers such as Golden-tailed Woodpecker *Campethera abingoni* and Common Scimitarbill *Rhinopomastus cyanomelas*, and hole-nesters such as Ashy Tit *Parus cinerascens* and Acacia Pied Barbet *Tricholaema leucomelas* being the most severely affected.

Because of the difficulties of farming in such a variable and harsh environment, it is understandable that landowners may resort to spraying and tree removal for commercial sale. However, alternatives need to be considered, because not only are the impacts on birds, and presumably other wildlife (as well as water and nutrient cycles) considerable, but the area affected is enormous.

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