

**ECOLOGICAL PATTERNS IN A TERRESTRIAL BIRD COMMUNITY IN
ARID NORTH-WESTERN NEW SOUTH WALES**

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Preface

I certify that the substance of this thesis has not already been submitted for any degree and is not currently being submitted for any other degree or qualification.

I certify that any help received in preparing this thesis, and all sources used, have been acknowledged in this thesis.

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[Redacted Signature]

Judith Elizabeth Smith

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Abstract

Ecological patterns were investigated in a bird community in a variable and unpredictable arid environment. About half the species recorded were resident, one third nomadic and the remainder spring-summer or winter migrants. The different strategies, residency, nomadism and migration, were related to other parameters including population dynamics, habitat selection, foraging, nesting, drinking and aggressive behaviour.

Over four years the composition of the bird community changed continually. Drought had a deleterious effect on the avifauna, but its effect differed between species. Run-on habitats (creeklines) supported denser populations and more species of birds than run-off habitats. The composition of the creekline avifauna reflected a gradient from wetter, eucalypt-fringed creeklines to drier, non-eucalypt creeklines.

Seven feeding guilds were identified. The main feeding substrate was the ground, followed by foliage and air. Perennial plants provided most foliage, flower and bark feeding substrates. Residents tended to be generalised or opportunistic feeders. The greater mobility of nomads allowed dietary specialisation.

Although many species were ground-feeders, few nested on the ground. Overall, spring breeding predominated, but breeding activity was reduced during drought. A regular breeding pattern in residents may be a consequence of their relatively stable food supplies, opportunistic diets and, for insectivorous residents, their tendency to breed cooperatively. Few nomads bred during drought and none were cooperative breeders.

Many birds, especially honeyeaters and granivores, were potentially limited by the availability of drinking water. The abundant White-plumed Honeyeater was an aggressive species and may exclude other birds from its habitat, eucalypt woodland, which would otherwise act as a drought refuge.

Examples were found of species with intermediate strategies between residency, nomadism and migration. Species with different strategies can coexist because they respond to environmental variability at different geographical scales.

Several factors, including individualistic responses of species to temporal and

spatial variability, the aggression of the White-plumed Honeyeater, positive associations between species in mixed-species flocks, and predation, play a part in determining the structure of the bird community. The implications for the conservation of arid zone birds are discussed.