WOODLAND BIRD ASSEMBLAGES ON THE NEW ENGLAND TABLELANDS,
NORTHEASTERN NEW SOUTH WALES

by

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DECLARATION

I certify that the substance of this thesis has not already been submitted for any degree and is not being currently submitted for any other degree. I certify that any help received in preparing this thesis, and all sources used, have been acknowledged.

Geoff Barrett
June 1995
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ABSTRACT

There is concern that bird species are declining in many parts of the world, particularly in rural landscapes where clearing and fragmentation of habitat has been most extensive. The present study assesses the conservation status of 137 land birds that occur on the New England Tablelands in northeastern New South Wales, Australia. Only a quarter of these species are abundant and widespread, seemingly unaffected or favoured by current land management practices. The remainder are either extinct on the New England Tablelands (6 spp.), are declining (18 spp.), are vulnerable due to an apparent dependence on healthy woodland (35 spp.) or may have always been uncommon on the Tablelands (45 spp.).

Predictive models indicate that bird species richness on the Armidale Plateau, an upland region on the New England Tablelands, tends to be greater where mistletoes, large trees, fallen timber and understorey vegetation are present. More species, tend also to occur close to water-courses and in woodland sites where the herbaceous vegetation is well developed. Lower bird species richness tends to be where eucalypt dieback is extensive. The gum-box woodland, that occurs on the richer soils at lower altitude, had fewer bird species than expected. This may be due to this woodland type having been extensively cleared, and that which remains being highly degraded. Another factor may be the increased abundance of territorial species, such as the noisy miner Manorina melanocephala and fuscous honeyeater Lichenostomus fuscus, in gum-box woodland.

Repeat surveys in transects of fixed area indicate a trend towards more bird species being present in larger woodland patches. However, a single survey in a larger number of sites (294) indicates that bird species richness per site was negatively associated with the area of the woodland patch. This same survey indicates that the number of species per unit area was greatest in the intermediate-sized patches, decreasing in remnants that were either greater than 400 ha or less than six hectares in area. A single survey of
birds, on transects of fixed area, during any season, indicates that bird species richness is at least as high in patches as small as 20 ha as it is in the more extensively wooded areas. Seasonal trends indicate that intermediate-sized woodland patches (particularly 101 to 400 ha) are most important during spring and autumn, when many birds are moving through the landscape on the Armidale Plateau.

The effects of grazing by livestock, tree and understorey removal, and eucalypt dieback, were most pronounced in woodland patches that were less than 6 ha in area. Noisy miners and nest predators were also more common in these smaller woodland patches. The presence of a territorial species such as the noisy miner throughout the landscape, increases the importance of larger woodland patches at a regional level, for conserving bird species richness. A single survey in sites without noisy miners indicated that there was a negative association between bird species richness and area, however, when sites with miners were considered, the opposite trend occurred. This survey suggests that miners were less effective at excluding other bird species from their territories in woodland patches that were greater than 20 ha in area.

The reduced importance of large patches of woodland, and the lack of isolation and edge effects on the bird assemblages is partly due to the presence of extensively wooded areas that surround the Armidale Plateau. It is probably also due to the variegated nature of the landscape on the Armidale Plateau. That is, rather than being a truly fragmented landscape where woodland remnants occur as easily defined patches with discrete boundaries, the woodland remnants have a relatively open canopy, are diffusely fragmented and surrounded by scattered trees. As such, it is likely that the majority of bird species perceive the whole of the landscape to be suitable as habitat, to varying degrees. While this is likely to be so, the majority of bird species appear to use strips of vegetation as fly-ways, rather than cross open grassland. The present study indicates that strips of woodland linking patches of woodland are important, but not essential as corridors for bird movement.
As an overall conclusion, bird species richness can be maintained throughout the landscape on the Armidale Plateau by maintaining habitat heterogeneity, both within and between remnants. While existing large areas of woodland are important for conservation and should be protected from further clearing and fragmentation, it appears that a network of inter-connected remnants, each of which is at least 20 ha in area, would be sufficient to conserve the majority of locally occurring species. The establishment of such a remnant network throughout the 'off-reserve' areas between national parks, State forests and nature reserves, is consistent with sustainable farming initiatives and should be a regional conservation priority. This approach could be appropriate in other rural parts of Australia.
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PREFACE

The first and last chapters are the general introduction and general discussion respectively. Chapters 2, 3 and 4 have been written as manuscripts for publication. As a result there is some repetition, particularly in the study site descriptions and methods sections. With the exception of some minor changes, Chapter 4 is presented as it has been published in 1994 in Pacific Conservation Biology, Vol. 1, pp. 245-256. This chapter was completed prior to the other thesis chapters and prior to the full data analysis. As a result there are some slight differences in the presentation and interpretation of the results in Chapter 4. In particular, the importance of large woodland patches for conservation may be understated. Chapter 2 is the largest chapter. It describes a broad survey of birds and description of environmental parameters in 294 sites. Associate Professor Bob Hove (University of Wisconsin, Green Bay) provided expertise about the experimental design and data collection during the early stages of this project. Bob also conducted a single survey of birds in 160 of these sites, with his permission these data were used in this thesis. A second person, my co-supervisor Associate Professor Hugh Ford, also assisted with a single survey of birds in 50 sites. The environmental data were collected by up to ten field assistants, their wages paid for by the World Wide Fund For Nature (WWF).