

# Regional Bird Extinctions

and their implications for  
vegetation clearing policy

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The Scarlet Robin. **Photo** by Brian Furby

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MacArthur and Wilson (1967) founded modern conservation biology with their theory of island biogeography. The theory explains one of the few reliable rules of modern ecology: that small areas of habitat support fewer species than large areas of habitat. From a conservation perspective the theory provides a fairly robust rule of thumb, that reducing habitat area to 10% of its former extent will "eventually" cause about 50% of species dependent on natural habitat to disappear.

The Mount Lofty Ranges of South Australia is an "island" of relatively high rainfall (500mm-800mm) forest and woodland, isolated from similar areas in eastern Australia by much drier mallee habitat. Only about ten percent of the original 500 000 ha of native vegetation remains intact. In a wake-up call to Australian ornithologists and conservationists, Ford and Howe (1980) used the theory of island biogeography to predict that, of an original terrestrial bird fauna of about 120 species, almost 50 would eventually become extinct in the Mount Lofty Ranges.

Garnett and Crowley (2000) list eight species that have already disappeared:

*King Quail, Swift parrot, Glossy Black Cockatoo, Swamp Parrot, Azure Kingfisher, Rufous Fieldwren, Regent Honeyeater and Barking Owl.*

While the loss of eight such remarkable species is lamentable, the loss of another 42 would be catastrophic, almost unbelievable.

What explains the mismatch between the number of actual extinctions and those predicted? Were Ford and Howe (1980) wrong? Is the theory of island biogeography not applicable to fragmented habitat on continents? Now that vegetation clearance controls have been implemented and habitat loss in the Mount Lofty Ranges has almost ceased, is there nothing left to worry about.

## The extinction debt

Another ominous prediction of the theory of island biogeography suggests that there is indeed plenty to worry about. Systems that become fragmented and reduced in area are expected to enter a long period of "relaxation" to lower levels of species richness. Thus there will be a substantial time lag between the loss of habitat and the consequent loss of species. For long-lived species like birds, this time lag is likely to be hundreds of years.



The Spotted Quail Thrush. **Photo** by Brian Furby

In short, our past actions, destroying 90% of all the native vegetation, have incurred an extinction debt. The extinction debt is the future loss of species that is a consequence of past actions, in this case maybe another 40 species of terrestrial birds. This debt will have to be paid as a result of past actions, but might be partly avoided by research and management in the short-term and large-scale habitat reconstruction in the long term. But if such actions to be effective, it is critical they be targeted towards preserving the species most at risk. If 40 more species are likely to become extinct, then a key question is "which species will be next?" Sadly, this question is all too easy to answer.

## Almost or already gone

Eight species already have populations well below what we would consider viable:



The Beautiful Firetail **Photo** by Brian Furby

*Square-tailed Kite, Bush Stone-curlew, Little Lorikeet, White-throated Gerygone, Spotted Quail-thrush, Olive-backed Oriole, Brown Quail and Flame Robin.*

In some cases they were always rare and enigmatic. We predict that most of these species will be declared regionally extinct within 50 years. Their demise is predictable and will take the total loss to 16 species, **13% of the original 120 species.**

The conventional wisdom in population viability studies is that any species that has fallen below a total population size of 500 is more than likely to become extinct.

Most of the species in this position in the Mt Lofty Ranges can still be easily found by an experienced observer, but their long-term persistence is unlikely unless their decline can be quickly reversed.

Species whose populations are isolated and species that depend more heavily on natural habitat are more likely to disappear. Taking this into account, the wisdom of varied South Australian ornithologists, our own survey data, and information summarised by Paton et al. (1994), we believe that the following 16 further species are all likely to be gone within 200 years:

**Painted Button-quail ; Beautiful Firetail ; Southern Emu-wren ; Chestnut-rumped Hylacola ; Brown Treecreeper ; Tawny-crowned Honeyeater; Pallid Cuckoo ; Black-chinned Honeyeater ; Tawny Frogmouth; Brush Bronzewing; Shining Bronze Cuckoo ; Singing Bushlark ; Southern Whiteface ; Grey Butcherbird ; Restless Flycatcher ; Bassian Thrush.**

We can think of these as the "living dead", species that would once have had secure populations but that are now almost certainly doomed.

If their loss eventuates, the toll will have risen to 32 species, **27% of the original avifauna.**

However, the most disturbing prediction of the theory is that as many as 20 more species will eventually disappear - species like the scarlet robin, diamond firetail, crested shrike-tit, eastern spinebill and yellow-tailed black cockatoo - species that we currently consider relatively common.



Restless Flycatcher **Photo** Peter Charles

In the case of the scarlet robin, it seems already to be on the way down, not only in the Mt Lofty Ranges, but elsewhere in its range. Will revegetation save these species? If so, where in the landscape should revegetation be focused so as to minimise the loss?

With present knowledge, we are unable to answer such questions. However, obtaining answers is imperative, because evidence is mounting that birds are declining right across the agricultural zones of southern Australia (Ford et al. 2000). We can and must use the Mount Lofty Ranges experience to inform actions across the remainder of Australia.

## Do regional extinctions really matter?

While regional extinctions diminish the quality of life of all people living in that region, do they really matter? Surely only the complete loss of a species from the whole of its range is of concern?



The Azure Kingfisher **Photo** by Brian Furby

While none of the Mount Lofty Ranges present and future extinctions mean the loss of a full species, they do often represent the loss of a unique subspecies. Being inhabitants of an isolated area of wetter forest, many of the birds in the Mount Lofty Ranges are genetically quite distinct from their conspecifics elsewhere.

They are a fundamental component of biodiversity that represents within-species variation and the potential for new speciation.

In addition, the nationwide declines in many species mean that they may soon be endangered in all parts of their range. Restoring habitat in the Mt Lofty Ranges may provide a critical refuge for populations of these species in the future.

## Implications for vegetation retention

Information from South Australia provides an important lesson for other Australian states that are currently grappling with vegetation clearance controls. As we can see from the Mount Lofty Ranges tragedy, retaining only 10% of the native vegetation in a region will ensure massive local species loss. What about other parts of South Australia? The South-East of SA has about 13% of the original vegetation and has suffered similar species loss to the Mount Lofty Ranges.

In contrast, Kangaroo Island retains about 40% of its original native vegetation, and aside from the early loss of the Kangaroo Island Emu, has suffered no definite local bird extinctions so far. Taking the theory and empirical evidence together, regional habitat retention targets must be at least 30% for every habitat type and well above that for the entire landscape if we are to avoid substantial loss of regional bird species. Other Australian states have either already crossed this threshold or are rapidly approaching it.

We hope that they will have the wisdom to learn from South Australia's mistakes, rather than repeating them.

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The Brown Treecreeper Photo by Brian Furby