

Birds on the edge: species at risk from climate change

Stephen Garnett

2002 was a dry year in the rainforests of Cape York Peninsula, and proved tough for local bird species, particularly the white-faced robin – a delightful little bird that takes insects from the forest floor. Of the robins that were tagged, only around 25 per cent survived that year (in normal years, annual survival tops 70 per cent).



Credit: © S Bennett /AustralAvian Images

More heat and less rain, however, is what the scientific models tell us to expect of the future climate for the region.

In fact, Cape York Peninsula is one of many regions around Australia expected, over the next 60 years or so, to become unsuitable for the birds that live there. If we want to keep them, we have some tough choices to make about how we allocate the nation's conservation dollars.

The sorts of choices we have to make are outlined in *Climate Change Adaptation Plan for Australian Birds*, a new book from CSIRO Publishing that I co-edited with colleague, Donald Franklin.

In assessing how climate change is likely to affect our birds, the book's contributors have looked at two factors – the *sensitivity* and *exposure* of different bird species to climate change effects.

Exposure refers to the extent of climate change – including temperature, rainfall, fire frequency, storm intensity and sea-level rise – likely to be experienced by a species.

Sensitivity takes into account the characteristics of each species that might make them more or less sensitive to climate change. For instance, a low reproductive rate may make it more difficult for birds to recover from heat waves; reliance on special food sources or habitat may make them less resilient to change; or a small brain size may mean a species is less likely to adapt.

Sensitivity is usually not critical to a species' survival, unless that species is exposed to changes in aspects of climate

that matter most to them.

For most species, we don't know what these critical climate-related 'trigger points' are. But we can at least produce models of the climate in which a species lives at the moment, and predict where the 'climate envelope' is likely to shift. For some species, the climate they prefer will shift to a different part of the country, or disappear altogether.



Credit: © S Bennett /AustralAvian Images

What happens when the climate envelope is pushed too far? We already know that temperatures above 45°C, sustained for several hours, can cause death in birds. In 2010, on the south coast of south-western Australia, abnormally high temperatures of 47–48°C were associated with the death of many Carnaby's black-cockatoos (*Calyptorhynchus latirostris*). On the other side of the continent, in northern Victoria, low rainfall associated with a 12-year drought led to the 'collapse' of native bird populations in box-ironbark forests.

The species we think are most sensitive and are likely have greatest exposure are the ones about which we should be most concerned. The modelling used in the book, which drew on the largest set of bird-location data in Australia ever assembled, suggests that the most vulnerable birds are at the periphery of the continent – places like Cape York Peninsula and the Top End of the Northern Territory, or large offshore islands like the Tiwis and Kangaroo Island.

What are we to do? Is the present situation without hope for biodiversity? Well, yes and no.

We can do things to help birds meet the challenges of climate change, but the choices are limited. The two extremes are letting them cope, at one end of the spectrum, and establishing captive colonies at the other. In between lie opportunities for governments and natural resource managers to:

1. reduce local threats already facing vulnerable species, so they are better able to cope with a changed climate, or
 2. shift them to places where the climate will improve, if we know and if habitat is available.
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Credit: © S Bennett /AustralAvian Images

In the face of climate change, some values that conservationists and wildlife managers have long held dear may become a hindrance rather than a guide to good management. National parks and other reserves set up to conserve the status quo may end up conserving something quite different, undermining their current philosophical foundation and demanding a fresh perspective. In landscape regeneration projects, local provenance may no longer be best for the maintenance of biodiversity.

To save species we may need to move them to new locations, in the process undermining (or at least questioning or redefining) concepts of 'native' and 'invasive'. More fundamentally, we may need to move away from concepts of 'natural' and embrace ecosystem processes as benchmarks rather than patterns from the past.

Any conservation activity will cost money, but nothing like the cost of losing species that have evolved over millions of years, and that, once lost, will be gone forever.

For the moment at least, the key action is monitoring, so that we can identify which bird species we need to help first. And then to have a firm idea of which support options have the support of the public. This book demonstrates that our wildlife managers, given adequate resources and policy support, should not feel helpless in the face of climate change.

Dr Stephen Garnett is a professor at the Research Institute for the Environment and Livelihoods (RIEL) at Charles Darwin University, Darwin. He is recognised nationally and internationally for research on conservation management, particularly of threatened species. He has more recently become involved in research related to the knowledge economy in tropical Australia, including how to increase Indigenous involvement in the economy and how to pool knowledge resources to increase economic productivity. With Dr Donald Franklin, a Research Fellow at CDU, Dr Garnett co-edited the forthcoming book, [Climate Adaptation Plan for Australian Birds](#) and also co-edited the [Action Plan for Australian Birds](#).

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