Birds invent new songs in evolutionary fast-forward

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North Island saddleback Credit: Martin Sanders

Native North Island saddlebacks have developed such distinctive new songs in the last 50 years that it is not clear if birds on one island recognise what their neighbors are singing about, a Massey University study shows.

The phenomenon is an avian equivalent of the way human language develops regional accents and dialects as people migrate and settle in new locations, and provides fresh insights into how species evolve, says biology researcher Dr. Kevin Parker, from the Institute of Natural Sciences at Albany.

He made 2700 recordings of male saddlebacks' rhythmical song on 13

islands off the coast of the North Island where the bird is found, for his doctoral thesis. When he compared them, he found only 30 per cent of the 202 different songs are shared between islands, with 70 per cent restricted to just a single island.

The study highlights the unexpected impact of human intervention – albeit well intentioned – on fundamental evolutionary processes. In this case, efforts to save the saddleback from extinction have led to dramatic changes in vocal diversity across islands probably due to "cultural bottlenecks" and "cultural mutations," says Dr. Parker, who recently graduated with a PhD in Ecology. New Zealand's conservation and translocation expertise combined with its protected offshore islands has created a unique opportunity to study and understand why the song of a bird species varies in different locations, he says.

In a series of experiments to test recognition of birdcalls, he played back recordings of familiar and unfamiliar saddleback songs to 10 pairs of saddlebacks on Motuihe Island, and observed their reactions. In cases where the mating or territorial song was more 'foreign', the birds either did not respond or left the area.

Thus, a love song for one saddleback might be nonsense to another, Dr. Parker says. "In humans, love overcomes language barriers, but in many bird species if you sing the wrong song, you are out on your own."

These variations in birdsong for mating and territory defence among isolated saddleback populations have emerged over the last 50 years, providing a snapshot of a 'micro-evolutionary" event, says Dr. Parker. It is likely the changes have come about through loss of songs following conservation translocations and subsequent errors in learning or imitating songs within new populations, he says.

Endangered saddlebacks have been translocated from the original

population on Hen Island to protected pest-free islands, initially by the New Zealand Wildlife Service in the 1960s and more recently by the Department of Conservation and community conservation groups. In that time, groups of between 20 and 50 birds have been moved to little-known Whatupuke, Lady Alice, Coppermine, Red Mercury, Cuvier, Stanley, Mokoia and Moutuhora Islands, as well as better-known Tiritiri Matangi, Little Barrier, Motuihe islands in the Hauraki Gulf, and to Kapiti Island off the coast of the Wellington, and mainland sites of Karori, near Wellington and Bushy Park, near Whanganui.

“It’s likely that the songs on different islands are similar to regional accents but in time they might progress to new languages – a bit like the development of Polynesian languages in the Pacific or the Romantic languages in Europe, a reflection of patterns of human colonisation,” Dr. Parker says.

In his current postdoctoral research, Dr. Parker is planning translocations of saddleback from three separate islands to two mainland sites, Tawharanui Regional Park and Maungatautari in the central North Island, where he will be able to observe what happens when saddlebacks with three different ‘dialects’ meet.

Provided by Massey University