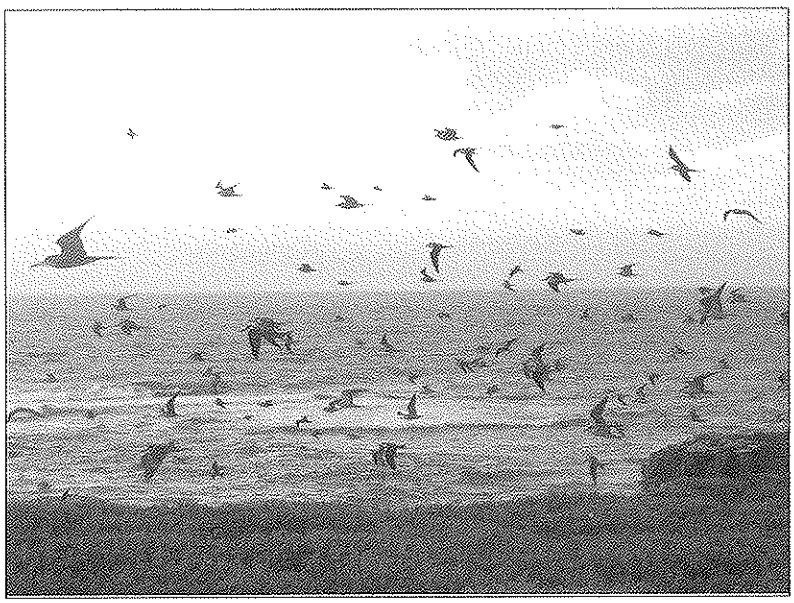
FAUNA

WINGS OF CHANGE - WHAT THE BIRDS ARE TELLING US

Nic Dunlop

Throughout human history birds have provided information to people about the state of their shared environment. Birds have long told traditional hunter gathers and agrarian societies about the passage and productivity of seasons, the coming of rain and the location of resources such as food plants or fish.



Bridled terns over Penguin Island.

Although as western urban societies we have somewhat distanced ourselves from the lore of birds, they have nevertheless warned us of impending disaster such as the ecological and health impacts of the organochlorine pesticides in the 1960s. Recently, and closer to home, the sudden death of over 9,000 nectar-feeding birds raised the alarm about the very serious threat to human health in Esperance caused by fugitive lead carbonate dust from ship-loading operations. Had it not been for a set of coincidences that triggered this spectacular response, the lead contamination would have remained undetected and unreported for many more months, with very serious health implications for that community. Birds in the Esperance area are now being used in a structured way to monitor the long-term persistence and impact of lead and nickel contamination in a project called 'Bush Canaries' – recalling the role of caged birds in warning underground coal miners about dangerous levels of monoxide gas.

Visit almost any of our small offshore islands off the south-west coast during the summer holidays and you will find the early morning sky alive with clouds of dark bridled terns. You don't need a particularly long memory to know that has not always been the case.

The bridled tern is a tropical, pelagic species more usually associated with islands with coral reefs, *Pisonia* trees and coconuts than our offshore environment. During the colonial period in Western Australia this species was recorded breeding as far south as the Houtman Abrolhos Islands. By the 1920s it was established in small breeding colonies on the small rocks around Rottnest and in Shoalwater Bay and by the late 1950s it had reached the islands off Cape Leeuwin. Until recently the most extreme breeding locality was on some stacks near Pt D'Entrecasteaux on the western south coast. However this summer a substantial colony was documented on Investigator Island, just west of the Recherche Archipelago, that probably started in the mid 1990s. Colonisation of the Recherche will probably proceed through the next few decades.

Not only have many new bridled tern colonies been founded south, and now east, of the Abrolhos Islands but observers have recorded much infilling of the conquered domain and the steady growth of established colonies such as North Fishermen near Green Head, Lancelin Island and at the Rottnest colonies. The bridled tern colony on Penguin Island near Rockingham has grown from an estimated 400 pairs in 1982 to approximately 4,000 pairs in 2007.

The trends observed in the bridled tern might be dismissed as the result of a genetic or ecological shift operating on one species. However, parallel changes have been observed in the region south of the Houtman Abrolhos in a suite of tropical pelagic seabird species. These include common noddies and sooty terns which colonised Lancelin Island during the 1990s. Lancelin Island is 150 km north of Perth and nearly 300 km south of their original limit at the Abrolhos. Both species have been prospecting Penguin Island 45 km south of Perth in recent years. Populations of red-tailed tropicbird,

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Common noddies at Lancelin Island

A common noddy pair at Lancelin Island

wedge-tailed shearwater, roseate tern and crested tern are also showing comparable shifts in distribution and / or abundance. So what we are witnessing is not a species-specific phenomenon but a sea-change, a shift in the normal distribution of prey resources for pelagic (offshore) feeding seabird species of tropical origin.

Two factors, both of which are associated with anthropogenic global warming, appear to be involved. One is the increasing frequency of the *El Nino* which causes major breeding failures in these species at the Abrolhos and further north but, curiously, not at the frontier colonies south of the Abrolhos. The second is a background rise in sea temperature off the central-west and south-western Australia coasts of approaching 1° C that has occurred over the last 30 years. This is one of the highest regional rises in ocean temperature recorded and would assist some tropical seabird prey species to disperse southwards.

It has become apparent that the responses of our tropical seabirds are portents of a changing ocean climate, a warning that our marine biodiversity and fisheries are threatened by climate change and that, like the seabirds, we will have to find ways to adjust.

The climate change signals in Western Australia are not however restricted to marine birds. A recent paper in *Austral Ornithology (Emu)* by Bureau of Meteorology scientist Lynda Chambers, reports on the analysis of bush bird and waterfowl records from Middlesex Field Study Centre near Manjimup*. The founders of this conservation property, Dick and Molly Brown, recorded the presence of birds in a 2 ha area near their homestead every day for 27 years between 1973 and 2000. This period coincided with a decline in rainfall and increase in minimum temperatures in their region and over most of south-western Australia. Dr Chambers found that amongst the migratory species nine of 19 had significantly changed their arrival times, seven of 17 species had altered departure times and eight of 17 were present for a different length of time each season. Much remains to be discovered about how our bush birds are responding to climate change and the implications for our biodiversity and the management of land for wildlife.

* L. Chambers. 2008. Trends in timing of migration of south-western Australian birds and their relationship to climate. *Emu* 108(1) 1-14

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The 'Bush Canary' project near Esperance Port.