The White-fronted Chat is a small, saltmarsh-dwelling bird that is in decline Australia-wide and was listed in 2010 as a Vulnerable species in New South Wales. The species occupies moist habitats including inland swampy areas and coastal saltmarsh. There has been a significant decline in populations in inland swamps associated with changed hydrological conditions, and in coastal wetlands due to coastal development.

Healthy populations of White-fronted Chats remain in the Hunter Estuary and near Nowra, and small populations have previously been recorded in scattered coastal lakes including Tuggerah Lake and Black Ned’s Bay, Lake Macquarie. The Lake Macquarie population is likely to have been significant both for its contribution to local biodiversity, and potentially as a “stepping-stone” population with the potential to provide a link between the sizeable populations north of Newcastle and south of Nowra. With the decline and isolation of populations in Sydney, there is a risk that a major discontinuity has arisen in the species range, isolating the northern populations from the main distribution in southern Australia.

The main objective of this project was to determine the distribution and population size of White-fronted Chats in the Lake Macquarie area and the degree to which the extensive saltmarshes associated with the Lake provide habitat continuity sufficient to prevent genetic isolation between populations to the north and south. The project involved both field and laboratory components including field survey, capture/mark/release, collection of feather samples and comparison of DNA between neighbouring populations.

This study determined that a population of White-fronted Chats is no longer resident at Lake Macquarie. It is possible that dispersing birds still use the salt marsh habitat around the lake, but there is little remaining habitat that would sustain a breeding population. Most sites are too small to support a population and some are too close to human disturbance to be habitable by this sensitive species. Only Black Ned’s Bay contains a sufficient area of undisturbed saltmarsh to support a population, but even this area is limited by a lack of the preferred foraging substrate.

DNA analyses of extant populations surrounding Lake Macquarie revealed that all populations, except two, differed significantly from each other in gene frequencies. A loss of genetic diversity was evident in the Sydney populations at Towra Point and Homebush Bay, compared with the populations at Nowra, Swan Bay and Macquarie Marshes. This indicates that these small populations are strongly isolated, with insufficient dispersal to overcome inbreeding depression.

Two immigrants to the remnant population at Towra Point were derived from the population north of Newcastle, and it is likely that large patches of salt marsh such as that at Black Ned’s Bay facilitate dispersal through the inhospitable terrain provided the urbanised landscape. Protection of these patches is likely to improve the survival prospects of these small relictual populations.