

Landscape Connections Trust - Biodiversity in East Otago

May 2016

The Landscape Connections Trust is undertaking a biodiversity project in the East Otago area. Project aims are to enhance indigenous biodiversity on productive landforms where it has been reduced the most, by improving connections between areas of indigenous habitat. The project is known locally as 'Beyond Orokonui' as it is about extending improved biodiversity management across a wider landscape than the pest exclusion-fenced and intensively-managed Orokonui Ecosanctuary (310 hectares).

Strategic options for biodiversity management of indigenous forest birds are, however, hampered by a lack of information on the distributions of local forest birds, and their habitat requirements within the project area. The aim of this Birds NZ-funded project is to provide more detailed information on distribution and abundance for both indigenous and exotic forest birds, and relate it to habitat attributes using habitat mapping.



The project utilised citizen science, involving trained volunteers, to count birds within the project area. The counts aimed to cover all forest bird habitats in the project area, regardless of tenure, as comparison of fragmented habitats on private rural land against the larger, less fragmented habitats in protected areas was an important objective of the study. Other advantages of using members of the community to undertake counts on rural landholdings are that:

- Local people receive training on indigenous bird recognition and bird counts.
- Local people establish relationships with rural landholders.
- Rural landholders become more engaged with and appreciative of indigenous biodiversity.

The project used 5MBC methodology and covered as many different habitat patches as possible. A subset of sites were counted on repeat occasions. Birds were recorded if they were seen or heard within the habitat, and if they were flying over the habitat, but analysis of habitat relationships was restricted to birds recorded within the habitat. Birds were recorded at a total of 625 different count sites distributed throughout the project area between August 2014 and mid-December 2015. As the amount and distribution of potential forest bird habitat was extensive, not all areas of forest bird habitat could be sampled, and larger areas of habitat were under-sampled. The approach taken was to count more intensively at local sites scattered across the project area.

Thirty-three bird species were observed in five-minute counts, eighteen of which were indigenous species, and fifteen of which were introduced and naturalised species. Three of the indigenous species are currently listed as Threatened or At Risk (Robertson *et al.* 2013). South Island kākā (*Nestor meridionalis meridionalis*; Threatened-Nationally Vulnerable) was observed only within the Orokonui Ecosanctuary, while South Island rifleman/tītīpounamu (At Risk-Declining) were recorded in low numbers, and South Island fernbird/mātā (At Risk-Declining) were only recorded rarely.

Most of the birds counted during the study were widespread within the study area in both large continuous habitats and small isolated habitats, and did not appear to be limited by dispersal. Study results emphasized the importance of indigenous forest habitat for birds in spring. Habitat type or extent explained the relative abundance of all of the modelled indigenous bird species except riroriro, which is fairly uniformly distributed. Habitat type or extent also explained the abundance of the exotic species such as dunnoek, blackbird, and chaffinch.

Coastal forest and treeland appeared to be a poor spring habitat for kōparapara which are omnivorous, and for pipirihika which are insectivorous, but coastal treeland was an important habitat for chaffinches in spring, when these birds feed their young on invertebrates. Coastal forest and treeland habitat within the study area tended to be heavily grazed and most of the areas of this habitat type sampled were not fenced to exclude stock. Depletion of food resources through the lack of a subcanopy and understorey, which provide structural and compositional diversity, is the most likely cause of the negative relationships with kōparapara and pipirihika.

The frugivorous silvereye/pihipihi was significantly associated with broadleaved indigenous forest in spring, most probably because early-fruiting species such as fuchsia are a common component of indigenous broadleaved forest in the study area. Avoidance of exotic coniferous forest in spring is likely due to the lower abundance of fleshy fruited trees and shrubs within exotic coniferous forest.

Two exotic species - dunnoek and chaffinch - were negatively associated with the more intact forest type, rimu-miro forest, but positively associated with more modified forest types such as regenerating forest and, coastal forest, and exotic coniferous forest. Together with blackbirds, which were more abundant where there were lower amounts of forest bird habitat, these relationships indicate that exotic bird species are more abundant where there has been greater loss and modification of indigenous forest habitats. The South Island tomtit / miromiro showed an opposite tendency to blackbirds, being more abundant where there were larger amounts of forest bird habitat within easy reach of the count site. Type of forest habitat appeared unimportant for miromiro, so long as there was plenty of it. Further research, for example on the productivity of miromiro in different habitats, may show that some habitats are more important than others.

The ultimate causes of these habitat preferences are not known, but availability of food resources is likely to be the strongest determinant of forest bird distribution and abundance during the spring breeding period. It is also possible that pest animal densities differ in spring between different habitat types, which could affect the abundance of bird species differently in different habitats.

Thanks to Kelvin Lloyd and Des Smith of Wildland Consultants Ltd, who have managed the data collection, analysis and reporting. Their research will be used to directly inform the landowners who have participated in this project, encouraging appropriate management for habitat. We would like to pass on an enormous thank you to the many Birds NZ volunteers from Dunedin. Without their effort and enthusiasm this project would not have succeeded.