Which major forest and shrubland groups support the greatest abundance of native birds across public conservation land?

Summary

Native birds are most abundant in native forests with broadleaved trees or podocarps as major components. There is no difference in abundance between native and introduced birds in beech forests and shrublands. Comparing the distribution of two particular species – bellbirds (native) and chaffinches (introduced) – showed chaffinches are more abundant than bellbirds in beech forest. A goal for management of beech forests and shrublands could be to enhance dominance by native birds.

Main findings

- Native birds (all species combined) were much more numerous than introduced birds (all species combined) in any forest with broadleaved trees or podocarps as major components.

- In beech forests (one or two species of beech as dominant trees) and in shrublands, there is no strong evidence for a difference between the abundances of native and introduced birds.

- There is no strong evidence for differences in abundance of either bellbird or chaffinch across the various forests and shrubland.

- In beech forest, chaffinches were more abundant than bellbirds.

Why is this important?

There has been a focus on native birds in New Zealand, and evidence of declines in their ranges. Introduced birds are generally overlooked in trying to understand current trends in native birds. In two widespread woody ecosystems (shrublands and beech forests), introduced birds make up a substantial proportion of total bird abundance. We need to understand the role they play in these ecosystems and whether their abundances might make it difficult to boost numbers of native birds. A goal for management of shrublands and beech forests could be to improve dominance by native birds. The greater abundance of chaffinches in beech forests than of bellbirds could be because that beech forest provides superior habitat for a seed-predator (chaffinch) than for an omnivore (bellbirds consume insects, nectar, and fruit).
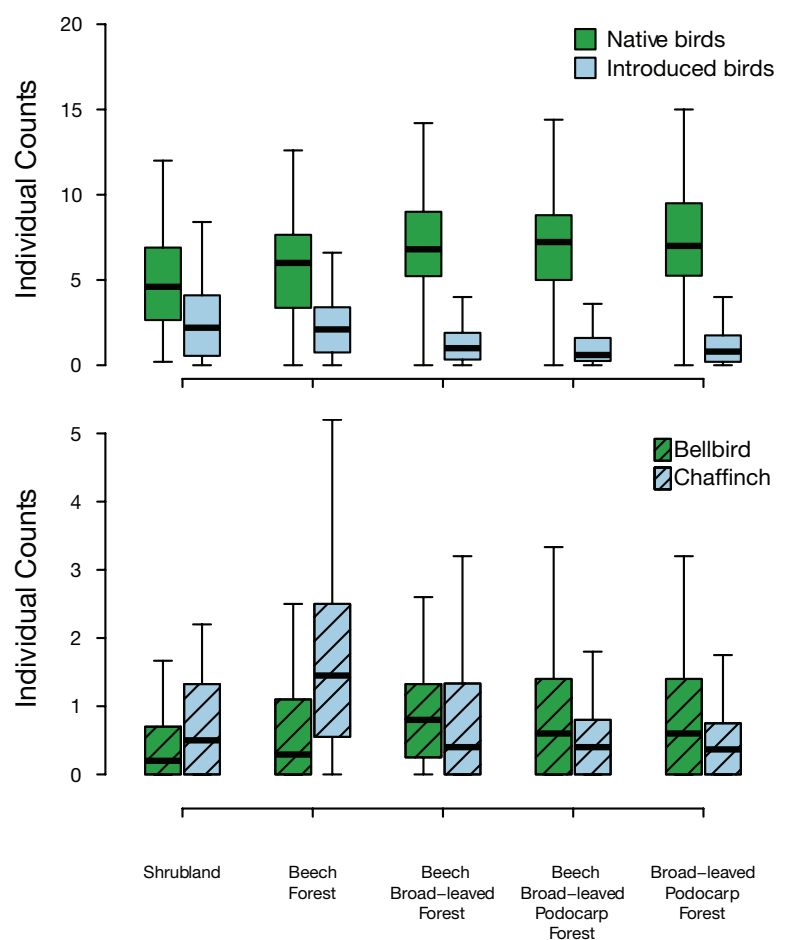
Definitions and methodologies

- This uses information from two Measures, 5.1.1 ("Size-class structure of canopy dominants") and 5.1.2 ("Demography of widespread animal species – Birds"), assessed at the same points across all public conservation land (Tier One systematic national sampling).
- Data for vegetation composition was collected between 2009 and 2014.
- Data for the abundance of birds was collected between 2011 and 2014.
- Delineation of shrublands and the four different kinds of forests used here follows a quantitative classification of 1177 plots (including all DOC Tier One plots) on a systematic national sample. There were 35 sample points in shrublands, 76 in beech forest, 119 in beech–broad-leaved forest, 94 in beech–broad-leaved–podocarp forest, and 126 in broad-leaved–podocarp forest.
- Each sampled location had five bird count stations where standardised five-minute bird counts were carried out. All species seen and heard were counted and recorded along with an estimate of approximate distance. Only data within 100 m of the count stations were used in this analysis.
- The counts of each species were carried out across the count stations within a location and then divided by the number of count stations where sampling actually occurred to obtain an average count per station for each sampling location.
- Bird count data were obtained from 443 sampling locations that were either shrubland or could be classed as being beech forest, beech–broad-leaved forest, beech–broad-leaved–podocarp forest, or broad-leaved–podocarp forest. Of the 443 sampling locations, 70% had data from all five count stations, 18% from four, 9% from three, 2% from two, and 1% from 1 count station only.
- The data are observed counts only and do not therefore account or attempt to correct for non-detection (i.e. a species was present but was not counted).
- The box plots depict the 75% and 25% percentiles as the upper and lower bound of each box respectively, with the heavy scored line within each box representing the median value. The tip of the upper whisker above each box is located at the smaller of either the maximum x value or at 1.5× the value of the box length added to the upper bound of the box. Similarly, the tip of the lower whisker below each box is located at the larger of either the minimum x value or at 1.5× the value of the box length subtracted from the lower bound of the box.

Where can I find more information (links)

Wiser et al. 2011 *Applied Vegetation Science 14*, 506–523.

http://www.landcareresearch.co.nz/publications/researchpubs/Department_of_Conservation_biodiversity_indicators_2014_assessment.pdf