Habitat and Distribution of Korimako/Bellbird in and around Christchurch

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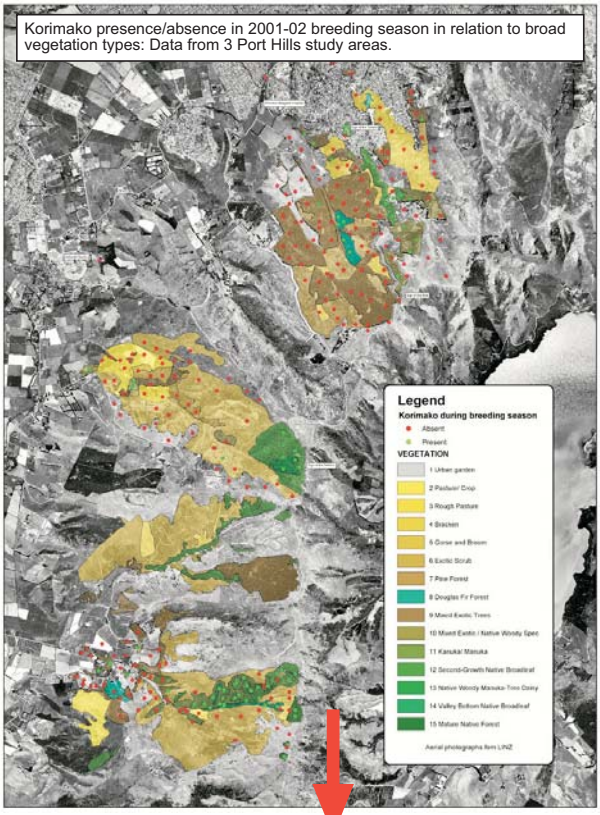
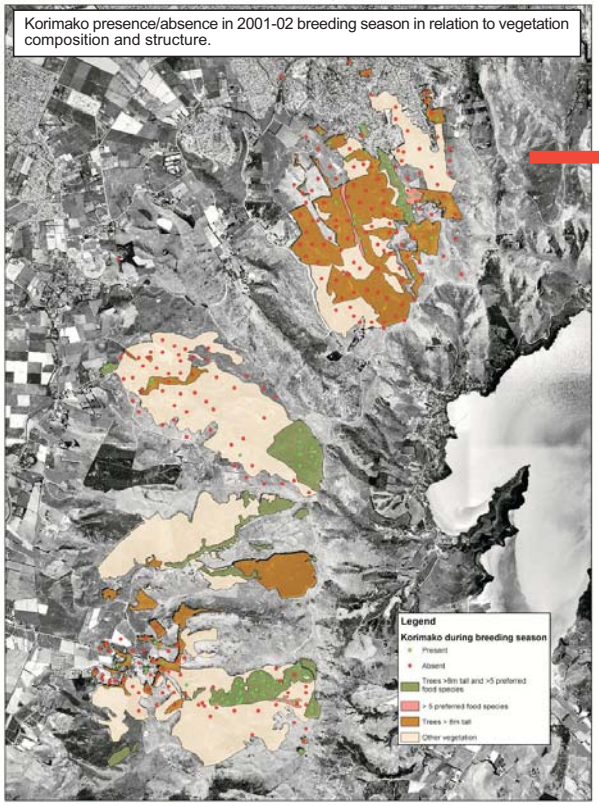
Landcare Research



Korimako presence/absence in 2001-02 breeding season in relation to broad vegetation types: Data from 3 Port Hills study areas.



Korimako presence/absence in 2001-02 breeding season in relation to vegetation composition and structure.

Introduction: Korimako/Bellbird in Canterbury

The wooded habitat available in Canterbury for korimako and other native bush birds is geographically fragmented and mixed in species composition. However, korimako are widespread in Canterbury, indicating that the exisiting habitat cannot be altogether unsuitable. For the most part (though not exclusively) korimako nest in the larger patches of native bush, such as those in the Port Hills, and some remain there year round. Other korimako travel out across the Canterbury Plains, farmland and Christchurch city to feed during the winter (non-breeding) season.

Aim of the project

Large areas of mature indigenous forest generally provide good habitat for korimako populations in the long term. However, understanding korimako habitat use and population sustainability in the fragmented, mixed vegetation of lowland Canterbury is more complex. Our project aims to describe and model korimako habitat in this complex landscape. To be successful, the model must:

1. Recognise differences in behaviour and resource needs between the breeding and non-breeding seasons, and model the two seasons separately,
2. Model not only local vegetation characteristics (like presence of food plants and structure of trees for nesting) but also the spatial (size and distance) relationships between different areas of vegetation – korimako is a mobile species which can and does exploit a range of spatially separate resources.

We hope that the process of developing this model will increase our understanding of how mobile bird species (including korimako) make use of fragmented habitat such as that throughout farmland and peri-urban areas. We also intend our model to be used for "what-if" analysis, such as: "if we plant a new area of native bush in a certain location, what effect will that have on korimako habitat quality, and what resources should that new area of bush contain?"

Derive rules that describe habitat use during breeding season:

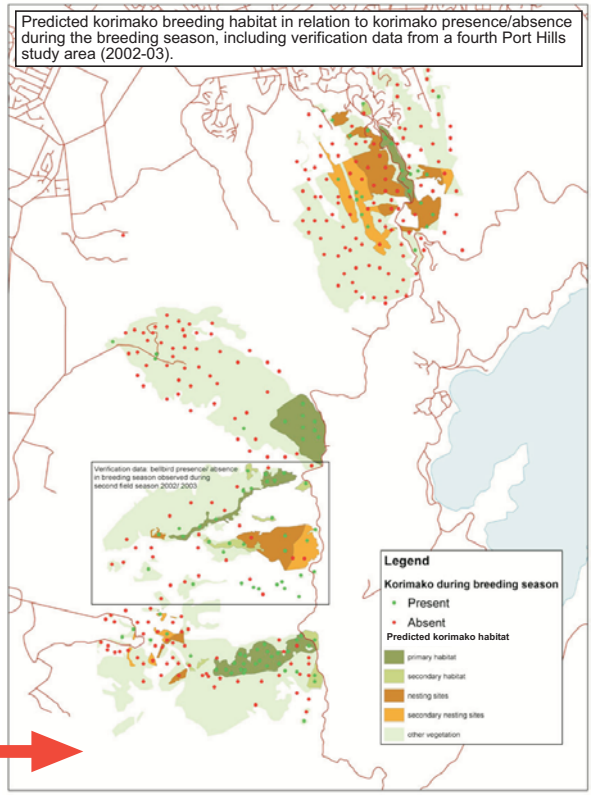
PRIMARY HABITAT: Meets foraging, nesting and "social" needs.
>5 preferred food species, trees >8m tall, patch size >10ha

SECONDARY HABITAT: Meets foraging and nesting needs for several pairs, but relies on primary habitat for "social" needs.
>5 preferred food species, trees >8m tall, patch size >1ha and <=10ha, within 500m of primary habitat

NESTING SITES: Meets needs for nest site, but relies on primary or secondary habitat for foraging and often "social" needs.
<5 preferred food species, trees >8m tall, within 500m of primary or secondary habitat

SECONDARY NESTING SITES: Meets needs for nest site, but relies on other foraging sites, and on other nesting areas for "social" needs.
<5 preferred food species, trees >8m tall, within 500m of other foraging, and within 500m of Nesting Sites

Apply rules to GIS map of vegetation characteristics to predict suitable breeding habitat



Predicted korimako breeding habitat in relation to korimako presence/absence during the breeding season, including verification data from a fourth Port Hills study area (2002-03).

Discussion

The majority of main breeding areas are correctly predicted in the results map. However, the rules are simplistic at this stage, and several limitations can be seen.

1. Some areas of pine and Douglas fir near Victoria Park are predicted to be suitable breeding habitat, but korimako were seen only in the Douglas fir. Fieldwork showed that there are more food plants under the Douglas fir (though mostly still <5). Pruning/foliage density may also be different between plantations.
2. Korimako presence in the relatively small patches of native bush at the base of the Port Hills (those isolated from the primary habitat) is not well explained by these rules.
3. We do not yet have well-determined figures for "social distance" (how close to other pairs do korimako prefer to nest?) and "foraging distance" (how far will a korimako travel from the nesting site to feed?)

Conclusions

The process of spatial modelling of korimako breeding habitat is forcing us to take a quantitative look at minimum requirements for food, nesting sites, and distances to resources that cannot be found inside the breeding territory. Our simple model so far does predict breeding habitat use in many cases, but also highlights gaps in our knowledge about korimako breeding ecology.

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