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**THE INFLUENCE OF EXOTIC SHRUBS ON BIRDS OF URBAN
YELLOW BOX-BLAKELY'S RED GUM (*E. melliodora*-*E. blakelyi*)
WOODLAND IN CANBERRA.**

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Abstract

This study considered the influence of exotic shrubs on birds in urban patches of Yellow Box-Blakely's Red Gum (*E. melliodora*-*E. blakelyi*) woodlands in the Australian Capital Territory, Canberra. The aim of this research was to identify native and exotic birds that have their abundance influenced by exotic shrubs. The purpose of this work was to provide more information to managers of this woodland about the potential impacts of weed control on birds living in woodland reserves adjacent to suburban areas.

Birds were sampled between 1996 and 1998 using the twenty minute area-search method to derive estimates of bird abundance. Around 680 twenty minute area-searches were completed, with 665 of these undertaken at 12 two hectare plots with varying levels of exotic shrub cover over a period of ten months. The abundance of birds for each of the ten months sampled were compared by pooling sites into four classes of exotic shrub cover. Classes of exotic shrub cover were nil, light, moderate and dense. Seasonal inferences were drawn from non-parametric analysis of variance. Non-parametric measures of association were used to test for correlation between the mean abundance of bird species at different woodland sites and percentage foliage estimates of exotic shrub cover. Percentage foliage estimates of native shrub cover were included in tests for correlation between bird abundance and exotic shrub cover by applying partial measures of association. To support statistical information, observations of birds in exotic shrub cover were also recorded. In one woodland site birds were sampled before and after the removal of exotic shrub cover. No statistical tests were applied to these samples because of a lack of replication; however, descriptive graphs of the abundance of selected birds following weed control are presented. To investigate the effect that exotic shrub invasion may have on the composition of bird assemblages in woodland cluster analysis and ordination of the 12 sites using the mean abundance of the 75 species recorded between July 1997 and June 1998 were also undertaken.

The presence of exotic shrub cover in *E. melliodora*-*E. blakelyi* woodland in Canberra was found to have differential effects on bird abundance. Wrens, finches, thornbills, whistlers and pigeons were more abundant in woodland sites where exotic shrubs were present when compared to sites with no or little exotic shrub cover. Fruit-eating birds, such as Silvereyes (*Zosterops lateralis*), Pied Currawong (*Strepera graculina*) and Crimson Rosella (*Platycercus elegans*), were more

abundant in woodland with exotic shrubs in winter and autumn when these shrubs provided food in the form of berries. The abundance of fruit-eating birds, and wrens and finches was reduced in a single woodland site following the removal of most of the exotic shrub cover. The Common Blackbird (*Turdus merula*) was the only exotic bird which showed a strong association with exotic shrubs in woodland, while the Laughing Kookaburra (*Dacelo novaeguineae*) was negatively correlated with exotic shrub cover, possibly because prey is harder to detect and capture in woodland with a shrubby understorey.

Cluster analysis and ordination of the 12 woodland sites did not group sites into the four experimental classes used to undertake analysis of variance. Multivariate analysis, however, did reveal that seasonal peaks in the abundance of fruit eating birds affected the composition of bird assemblages by increasing the mean abundance of these birds in densely invaded sites. Similarly, structural differences in the understorey resulted in some birds being more abundant in woodland sites invaded by exotic shrubs when compared to sites lacking a shrubby understorey. The distance between some sites confirmed this stark difference in bird life when plotted in three dimensions.

The results of this study suggest that exotic shrubs add food and structural complexity to woodland habitat. Benefits of structural complexity for small native birds in woodland include nest sites and protection from predators. These benefits may operate at certain thresholds of invasion, as the woodland site with the densest level of exotic shrub invasion showed a slight decrease in the number of wrens and finches. Adverse impacts from exotic shrub invasion may include reduced open ground in which to forage and loss of floristic diversity in the understorey. In effect, exotic shrubs add and remove resources in woodland habitat, benefiting some bird species and limiting others.

These findings suggest that the removal of exotic shrub cover in woodland located in urban landscapes simplifies the structural complexity of the understorey, reducing the quality of habitat for some birds. Thus, adverse impacts on biodiversity arising from the invasion of exotic shrubs in woodland need to be considered against the important role that a diverse bird population has in maintaining ecosystem function.

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