

The value of small-scale plantings for birds – a survey of tree pens on an Upper Hunter property

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INTRODUCTION

Various studies have looked at the relationship between woodland birds and remnant native vegetation, planted native trees and native pasture in agricultural landscapes. The general consensus is that large patches of native vegetation and plantings of native trees are required to support woodland birds (Barrett *et al.* 2008; Bridle *et al.* 2009; Cunningham *et al.* 2008; Hingee *et al.* 2022; Kavanagh *et al.* 2007). However, most of these studies were looking at landscape or property scales, with patch sizes of remnant vegetation and native plantings all being greater than a hectare. The present study was an opportunity to investigate how birds used much smaller scale plantings. The study was carried out on “Cressfield” (31.96° S, 150.86° E), a 1,500 hectare horse stud and cattle property located *c* 10 km north of Scone in the Upper Hunter area of NSW.

A long-term bird monitoring project was established on Cressfield in 2010 as part of the Great Eastern Ranges Initiative (<https://ger.org.au/about/our-history/>), a program initiated by the New South Wales Government. The aim of the GER Initiative was to promote nature conservation on private land, with a focus on landscape connectivity and the protection and management of native vegetation including large patches, corridors, and smaller isolated patches, known as stepping stones. The bird monitoring project at Cressfield is focused on larger, less-intensively managed areas of the property including intact woodland habitat, modified woodlands, native pasture, and the riparian areas along Kingdon Ponds and Dry Creek; waterways that run through the property (McIntyre unpubl.). None of the long-term monitoring sites were in the more intensively managed areas of the horse stud. However, approximately twenty years ago, the Cressfield management team initiated a process to fence off existing paddock trees to protect them from livestock and to establish plantings of native plants (Wayne Bedggood pers. comm.). Over 100 tree pens were established. Tree pens on Cressfield

are small (~10 m diameter, 78 m² in area) roughly circular fenced-in areas protecting either remnant trees or plantings of native or other species from stock (**Figures 1 and 2**).



Figure 1: A planted tree pen on Cressfield (image taken 24 October 2024).



Figure 2: Remnant tree pens on Cressfield (image taken 23 October 2024).

Twenty years on I asked the question: what birds are using those pens?

METHODS

Standardised surveys were conducted on 13 July 2024 and 23-24 October 2024 to determine the use of tree pens by birds. Over these three days, 67 tree pens across nine paddocks (total area: 95 hectares) were examined. Two pen types were surveyed: mixed natives plantings (45 pens, **Figure 1**) and remnant mature trees (22 pens, **Figure 2**). Planted pens contained four to eight tree stems and various shrub species. Planted pens measured about ten metres in diameter (78 m²) and were spaced an average of 73 m apart. The paddocks in which both types of pens were located were intensively managed and included cultivated land (lucerne) and both improved and unimproved pasture. I estimated that the total area of the 67 pens surveyed was about 0.5 hectares.

All bird species and numbers seen in the paddock were recorded. Each pen was observed for five minutes, noting any birds perching, foraging, or nesting. Double counting between pens was allowed, so as to focus on pen usage rather than population counts. Nesting activity evidence was noted.

The data were stored in BirdLife Australia's Birddata and analysed using JASP software (version 0.19.02, <https://jasp-stats.org/>). Descriptive statistics determined the means. An Independent Samples T-test with Welch's statistic compared samples, as the data failed the normality test due to many zeros (Quinn & Keough 2024).

RESULTS

Forty-six species were recorded across nine paddocks, including thirty species in the tree pens and an additional sixteen species in paddocks but not observed to be using the pens. The species using the pens are listed in **Table 1**, while the **Appendix** lists all 46 species. The most frequently recorded species included: Eastern Rosella *Platycercus eximius*, Striated Pardalote *Pardalotus striatus*, Rufous Songlark *Cincloramphus mathewsi*, Yellow-rumped Thornbill *Acanthiza chrysorrhoa*, Superb Fairywren *Malurus cyaneus*, Noisy Friarbird *Philemon corniculatus*, and Australian Magpie *Gymnorhina tibicen*. The results were seasonal, with birds recorded in 34% of pens surveyed in winter (10 out of 29) compared to 89% in spring (34 out of 38). One threatened species was observed using the tree pens, Grey-crowned Babbler *Pomatostomus temporalis* in Rough-barked Apple *Angophora floribunda*.

Twenty-one species were found in remnant tree pens, and eighteen species in planted pens (**Table 1**). Hollow-nesting species were more prevalent in remnant tree pens (Eastern Rosella, Striated Pardalote, Crimson Rosella *Platycercus elegans*,

Tree Martin *Petrochelidon nigricans*, Common Myna *Acridotheres tristis*). Ground foraging and understorey species were more frequent in the planted pens (Superb Fairy-wren, Australian Magpie, Rufous Songlark, Yellow-rumped Thornbill).

On average 1.6 species were recorded per pen, with an average of 3.4 birds per pen. Pens with remnant trees recorded significantly more species, 2.46 species per survey, compared to 1.16 species in planted pens (Welch -2.397, df 27.687, p 0.024). The number of birds recorded per pen did not differ significantly between those with remnant trees and planted pens (4.55 birds vs 2.80 birds, Welch -1.230, df 30.226, p 0.228). Birds, including flocks, used the pens as stepping stones, moving between them. Species observed doing this included Yellow-faced Honeyeater *Caligavis chrysops*, Yellow-rumped Thornbill, and Double-barred Finch *Stizoptera bichenovii*. While a number of nests were found, the only confirmed breeding record was Yellow-rumped Thornbill, observed visiting a nest.

Spring 2024 was an exceptional season (W. Bedgood pers. comm.). The native pasture was in excellent condition with good ground cover and species richness (pers. obs.). Notably, 24 Rufous Songlarks were recorded in one paddock on 24 October 2024. The abundance of songlarks was also noted in the November 2024 seasonal surveys on Cressfield (M. Roderick pers. comm.).

Of interest was the lack of Noisy Miners in the surveys with a reporting rate of 1% in survey compared with an overall reporting rate of 42% for the property (Birddata <https://birddata.birdlife.org.au> accessed 23 January 2026). It may be the case that the small patch size and fragmented nature of the pens did not support the species.

CONCLUSIONS

This short study found that a suite of species used tree pens. Birds were observed using the pens for breeding, foraging, roosting and as stepping stones. There were differences in species using planted pens and those using pens with remnant trees. The planted pens had the benefit of a mix of plant species and structure including trees, tall shrubs and understorey. Planted pens had more understorey birds while tree pens had more hollow-nesting species. The general lack of Noisy Miners may be due to the small patch size and fragmented nature of the pens and likely explains the presence of a range of small understorey birds in the planted pens.

Table 1: Comparison of bird species and their relative reporting rates recorded in planted pens vs remnant tree pens.

Planted Pens n = 45 surveys		Remnant Tree Pens n = 22 surveys	
Species	Reporting Rate	Species	Reporting Rate
Superb Fairywren <i>Malurus cyaneus</i>	18%	Eastern Rosella <i>Platycercus eximius</i>	36%
Australian Magpie <i>Gymnorhina tibicen</i>	16%	Striated Pardalote <i>Pardalotus striatus</i>	32%
Rufous Songlark <i>Cincloramphus mathewsi</i>	16%	Crimson Rosella <i>Platycercus elegans</i>	18%
Yellow-rumped Thornbill <i>Acanthiza chrysorrhoa</i>	11%	Yellow-rumped Thornbill <i>Acanthiza chrysorrhoa</i>	18%
Noisy Friarbird <i>Philemon corniculatus</i>	9%	Tree Martin <i>Petrochelidon nigricans</i>	18%
Double-barred Finch <i>Stizoptera bichenovii</i>	9%	Common Myna <i>Acridotheres tristis</i>	18%
Eastern Rosella <i>Platycercus eximius</i>	4%	Noisy Friarbird <i>Philemon corniculatus</i>	14%
Striated Pardalote <i>Pardalotus striatus</i>	4%	Willie Wagtail <i>Rhipidura leucophrys</i>	14%
Yellow-faced Honeyeater <i>Caligavis chrysops</i>	4%	Little Corella <i>Cacatua sanguinea</i>	9%
Pied Butcherbird <i>Cracticus nigrogularis</i>	4%	Red-rumped Parrot <i>Psephotus haematonotus</i>	9%
Willie Wagtail <i>Rhipidura leucophrys</i>	4%	Rufous Songlark <i>Cincloramphus mathewsi</i>	9%
Crested Pigeon <i>Ocyphaps lophotes</i>	2%	Common Starling <i>Sturnus vulgaris</i>	9%
Laughing Kookaburra <i>Dacelo novaeguineae</i>	2%	Galah <i>Eolophus roseicapilla</i>	5%
Blue-faced Honeyeater <i>Entomyzon cyanotis</i>	2%	Rainbow Lorikeet <i>Trichoglossus moluccanus</i>	5%
Black-faced Cuckooshrike <i>Coracina novaehollandiae</i>	2%	Musk Lorikeet <i>Trichoglossus concinnus</i>	5%
Grey Butcherbird <i>Cracticus torquatus</i>	2%	Laughing Kookaburra <i>Dacelo novaeguineae</i>	5%
Rufous Whistler <i>Pachycephala rufiventris</i>	2%	Noisy Miner <i>Manorina melanocephala</i>	5%
Welcome Swallow <i>Hirundo neoxena</i>	2%	Grey-crowned Babbler <i>Pomatostomus temporalis</i>	5%
		White-winged Triller <i>Lalage tricolor</i>	5%
		Black-faced Cuckooshrike <i>Coracina novaehollandiae</i>	5%
		Grey Butcherbird <i>Cracticus torquatus</i>	5%

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REFERENCES

- Barrett, G.W., Freudenberger, D., Drew, A., Stol, J., Nicholls, A.O. and Cawsey, E. M. (2008) Colonisation of native tree and shrub plantings by woodland birds in an agricultural landscape. *Wildlife Research* **35**: 19-32.
- Bridle, K., Fitzgerald, M., Green, D., Smith, J., McQuillan, P. and Lefroy, T. (2009). Relationships between site characteristics, farming system and biodiversity on Australian mixed farms. *Animal Production Science* **49**: 869-882.

- Cunningham, R.B., Lindenmayer, D. B., Crane, M., Michael, D., MacGregor, C., Montague-Drake, R. and Fischer, J. (2008). The Combined Effects of Remnant Vegetation and Tree Planting on Farmland Birds. *Conservation Biology* 22(3): 742-752.
- Hingee, K. L., Westgate, M. J. and Lindenmayer, D. B. (2022). Long-term monitoring in endangered woodlands shows effects of multi-scale drivers on bird occupancy. *Journal of Biogeography* 49: 879-890.
- Kavanagh, R.P., Stanton, M.A. and Herring, M.W. (2007). Eucalypt plantings on farms benefit woodland birds in south-eastern Australia. *Austral Ecology* 32: 635-650.
- McIntyre, A. (unpublished). Bird Surveys and Monitoring on Cressfield. Unpublished report to Wayne Bedgood dated March 2012.
- Quinn, G.P. and Keough, M.J. (2024). *Experimental Design and Data Analysis for Biologists*. (Cambridge University Press. 2nd edition.)
- Roderick, M. (unpublished). Cressfield Bird Surveys. Spring 2024 Update. Unpublished report to Cressfield.

Appendix. All species recorded during the 2024 surveys, and the habitat types in which they were observed.

Species	Pens planted N=45 surveys	Pens remnant trees N=22 surveys	Paddock	Overall reporting rate in pens N=67 surveys
Maned Duck <i>Chenonetta jubata</i>			P	
Pacific Black Duck <i>Anas superciliosa</i>			P	
Crested Pigeon <i>Ocyphaps lophotes</i>	2%			1%
Straw-necked Ibis <i>Threskiornis molucca</i>			P	
White-faced Heron <i>Egretta novaehollandiae</i>			P	
White-necked Heron <i>Ardea pacifica</i>			P	
Black-shouldered Kite <i>Elanus axillaris</i>			P	
Laughing Kookaburra <i>Dacelo novaeguineae</i>	2%	5%		3%
Nankeen Kestrel <i>Falco cenchroides</i>			P	
Brown Falcon <i>Falco berigora</i>			P	
Australian Hobby <i>Falco longipennis</i>			P	
Yellow-tailed Black Cockatoo <i>Zanda funerea</i>			P	
Galah <i>Eolophus roseicapilla</i>		5%		1%
Little Corella <i>Cacatua sanguinea</i>		9%		3%
Sulphur-crested Cockatoo <i>Cacatua galerita</i>			P	
Australian King-Parrot <i>Alisterus scapularis</i>			P	
Crimson Rosella <i>Platycercus elegans</i>		18%		6%
Eastern Rosella <i>Platycercus eximius</i>	4%	36%		15%
Red-rumped Parrot <i>Psephotus haematonotus</i>		9%		3%
Musk Lorikeet <i>Trichoglossus concinnus</i>		5%		1%
Rainbow Lorikeet <i>Trichoglossus moluccanus</i>		5%		1%

Species	Pens planted N=45 surveys	Pens remnant trees N=22 surveys	Paddock	Overall reporting rate in pens N=67 surveys
Superb Fairywren <i>Malurus cyaneus</i>	18%			12%
Striated Pardalote <i>Pardalotus striatus</i>	4%	32%		13%
Yellow-rumped Thornbill <i>Acanthiza chrysorrhoa</i>	11%	18%		13%
Noisy Friarbird <i>Philemon corniculatus</i>	9%	14%		10%
Blue-faced Honeyeater <i>Entomyzon cyanotis</i>	2%			1%
Yellow-faced Honeyeater <i>Caligavis chrysops</i>	4%			3%
Noisy Miner <i>Manorina melanocephala</i>		5%		1%
Grey-crowned Babbler <i>Pomatostomus temporalis</i>		5%		1%
Black-faced Cuckoo-shrike <i>Coracina novaehollandiae</i>	2%			3%
White-winged Triller <i>Lalage tricolor</i>		5%		1%
Australian Magpie <i>Gymnorhina tibicen</i>	16%			10%
Grey Butcherbird <i>Cracticus torquatus</i>	2%			3%
Pied Butcherbird <i>Cracticus nigrogularis</i>	4%			3%
Olive-backed Oriole <i>Oriolus sagittatus</i>			P	
Rufous Whistler <i>Pachycephala rufiventris</i>	2%			1%
Willie Wagtail <i>Rhipidura leucophrys</i>	4%	14%		7%
Magpie-lark <i>Grallina cyanoleuca</i>			P	
Australian Raven <i>Corvus coronoides</i>			P	
Golden-headed Cisticola <i>Cisticola exilis</i>			P	
Rufous Songlark <i>Cincloramphus mathewsi</i>	16%	9%		13%
Welcome Swallow <i>Hirundo neoxena</i>	2%			1%
Tree Martin <i>Petrochelidon nigricans</i>		18%		6%
Common Starling <i>Sturnus vulgaris</i>		9%		3%
Common Myna <i>Acridotheres tristis</i>		18%		6%
Double-barred Finch <i>Stizoptera bichenovii</i>	9%			6%