

## **Supplementary Material**

### **Bird diversity increases after patchy prescribed fire: implications from a before–after control–impact study**

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**Table S1. List of the 53 species seen or heard within 50 m of survey sites ( $N = 96$ ). The twenty-one groups used in multiple-covariate distance sampling (MCDS) contain individual species or groups of species assumed to have similar detectability**

Common name	Scientific name	Group used in MCDS	Proportion sites occupied
Australian King-Parrot	<i>Alisterus scapularis</i>	Parrots	0.013
Australian Raven	<i>Corvus coronoides</i>	Corvids/currawongs	0.005
Bassian Thrush	<i>Zoothera lunulata</i>	Misc.	0.031
Black-faced Cuckoo-Shrike	<i>Coracina novaehollandiae</i>	Misc.	0.003
Blue-winged Parrot	<i>Neophema chrysostoma</i>	Parrots	0.005
Brown Thornbill	<i>Acanthiza pusilla</i>	Brown Thornbill	0.758
Brown-headed Honeyeater	<i>Melithreptus brevirostris</i>	Melithreptus	0.117
Buff-rumped Thornbill	<i>Acanthiza reguloides</i>	Thornbills	0.003
Common Blackbird	<i>Turdus merula</i>	Misc.	0.021
Common Bronzewing	<i>Phaps chalcoptera</i>	Misc.	0.005
Crescent Honeyeater	<i>Phylidonyris pyrrhopterus</i>	Crescent Honeyeater	0.521

Crested Shrike-tit	<i>Falcunculus frontatus</i>	Whistlers	0.016
Crimson Rosella	<i>Platycercus elegans</i>	Parrots	0.307
Eastern Spinebill	<i>Acanthorhynchus tenuirostris</i>	Eastern Spinebill	0.281
Eastern Yellow Robin	<i>Eopsaltria australis</i>	Petroicidae	0.271
Fan-tailed Cuckoo	<i>Cacomantis flabelliformis</i>	Cuckoos	0.036
Flame Robin	<i>Petroica phoenicea</i>	Petroicidae	0.008
Gang-gang Cockatoo	<i>Callocephalon fimbriatum</i>	Cockatoos	0.029
Golden Whistler	<i>Pachycephala pectoralis</i>	Whistlers	0.242
Grey Currawong	<i>Strepera versicolor</i>	Corvids/currawongs	0.008
Grey Fantail	<i>Rhipidura albiscapa</i>	Fantails	0.396
Grey Shrike-thrush	<i>Colluricincla harmonica</i>	Grey Shrike-thrush	0.224
Laughing Kookaburra	<i>Dacelo novaeguineae</i>	Misc.	0.010
Mistletoebird	<i>Dicaeum hirundinaceum</i>	Silvereye	0.003
Musk Lorikeet	<i>Glossopsitta concinna</i>	Parrots	0.003
New Holland Honeyeater	<i>Phylidonyris novaehollandiae</i>	Melithreptus	0.021

Olive Whistler	<i>Pachycephala olivacea</i>	Whistlers	0.008
Olive-backed Oriole	<i>Oriolus sagittatus</i>	Whistlers	0.005
Pied Currawong	<i>Strepera graculina</i>	Corvids/currawongs	0.044
Red Wattlebird	<i>Anthochaera carunculata</i>	Red Wattlebird	0.357
Red-browed Finch	<i>Neochmia temporalis</i>	Misc.	0.005
Rose Robin	<i>Petroica rosea</i>	Petroicidae	0.068
Rufous Fantail	<i>Rhipidura rufifrons</i>	Fantail	0.065
Rufous Whistler	<i>Pachycephala rufiventris</i>	Whistler	0.005
Sacred Kingfisher	<i>Todiramphus sanctus</i>	Cuckoos	0.008
Satin Bowerbird	<i>Ptilonorhynchus violaceus</i>	Misc.	0.036
Satin Flycatcher	<i>Myiagra cyanoleuca</i>	Misc.	0.063
Scarlet Robin	<i>Petroica boodang</i>	Petroicidae	0.034
Shining Bronze-Cuckoo	<i>Chalcites lucidus</i>	Melithreptus	0.018
Silvereye	<i>Zosterops lateralis</i>	Silvereye	0.419
Singing Honeyeater	<i>Lichenostomus virescens</i>	Melithreptus	0.003

Spotted Pardalote	<i>Pardalotus punctatus</i>	Pardalotes	0.052
Striated Pardalote	<i>Pardalotus striatus</i>	Pardalotes	0.135
Striated Thornbill	<i>Acanthiza lineata</i>	Thornbills	0.362
Sulphur-crested Cockatoo	<i>Cacatua galerita</i>	Cockatoos	0.044
Superb Fairy-wren	<i>Malurus cyaneus</i>	Superb Fairy-wren	0.201
Tree Martin	<i>Petrochelidon nigricans</i>	Misc.	0.018
White-browed Scrubwren	<i>Sericornis frontalis</i>	White-browed Scrubwren	0.526
White-eared Honeyeater	<i>Lichenostomus leucotis</i>	Melithreptus	0.036
White-naped Honeyeater	<i>Melithreptus lunatus</i>	Melithreptus	0.159
White-throated Treecreeper	<i>Corombates leucophaea</i>	White-throated Treecreeper	0.586
Yellow-faced Honeyeater	<i>Lichenostomus chrysops</i>	Yellow-faced Honeyeater	0.388
Yellow-tailed Black-	<i>Calyptrorhynchus funereus</i>	Cockatoos	0.016

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Cockatoo

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**Table S2. Candidate models of species richness, the occurrence of individual species, and species turnover applied at the coarse and fine scales**

At the coarse scale, fixed effects were the two-level categorical variables time (before, after) and treatment (control, impact), and the three-level categorical variable topographic position (topog.; gully, mid-slope, ridge). At the fine scale, before fire bird data were used as controls, and fixed effects were time and proportion burnt (prop. burnt)

Scale	Response variable	Model	Question posed by the model
Coarse	Species richness; occurrence of individual species	Topog.	Is species richness or occurrence related to topographic position?
		Time $\times$ Treatment	Is there an overall change at the impact area after fire?
		Time $\times$ Treatment + Topog.	Are there consistent changes at all topographic positions after fire?
		Time $\times$ Treatment $\times$ Topog.	Are there inconsistent changes at different topographic positions after fire (e.g. a decrease on ridges and/or an increase in gullies)?
	Species turnover	Treatment	Is there an overall change at the impact area after fire?
		Treatment + Topog.	Is there a consistent change at all topographic positions after fire?
		Treatment $\times$ Topog.	Are there inconsistent changes at different topographic positions after fire?

(e.g. an increase on ridges)?

Fine	Species richness;	Time + Prop. burnt	Is there a consistent change after fire (e.g. an increase at all plots)?
	occurrence of individual species	Time $\times$ Prop. burnt	Are there inconsistent changes after fire (e.g. a decrease at burnt sites and no change at unburnt sites)?
	Species turnover	Prop. burnt	Are there inconsistent changes after fire (e.g. an increase at burnt sites and no change at unburnt sites)?

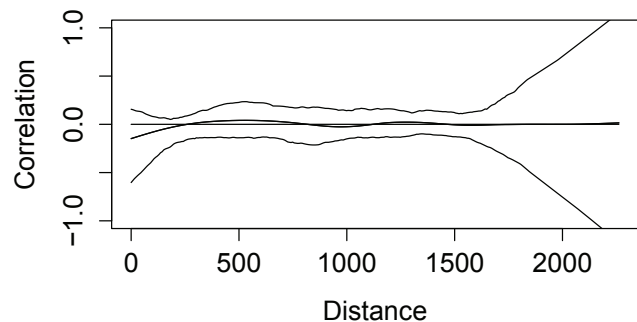


**Fig. S1.** Spatial autocorrelation for residuals of top-ranked models with pointwise 95% confidence intervals for: (a) coarse-scale control: species turnover; (b) coarse-scale impact: species turnover; (c) coarse-scale control: species richness; (d) coarse-scale impact: species richness; (e) site-scale: species richness; (f) site scale: occurrence of brown thornbill; (g) site scale: occurrence of superb fairy-wren; and (h) site scale: occurrence of eastern yellow robin. See Tables 1 and 2 in main text for information on top-ranked models.

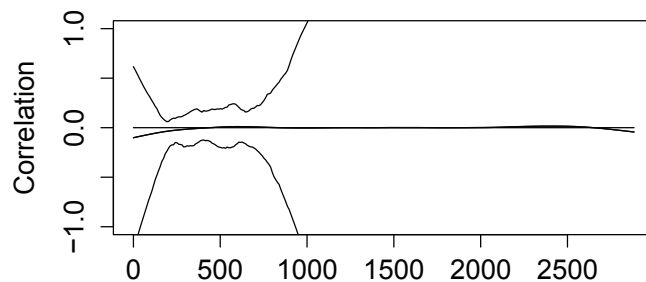
### Coarse scale

#### *Species turnover*

(a) Control

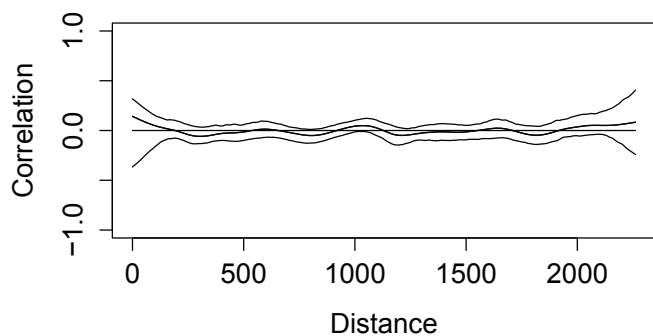


(b) Impact

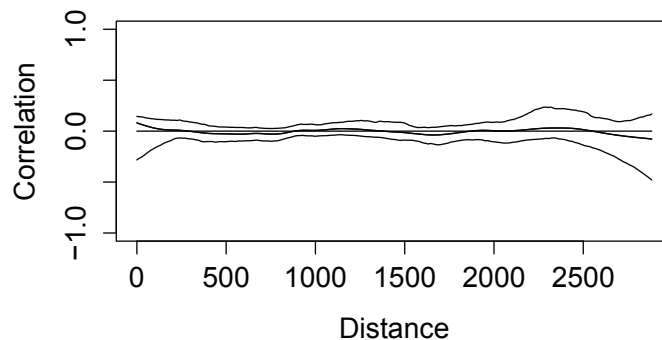


#### *Species richness*

(c) Control

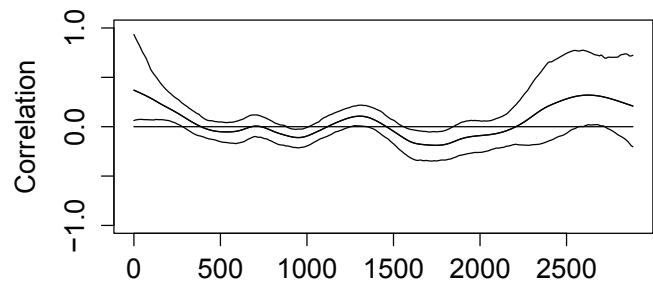


(d) Impact

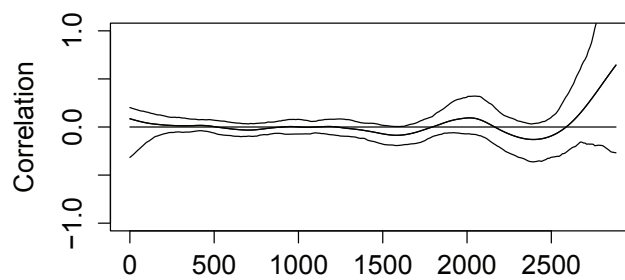


### Site scale

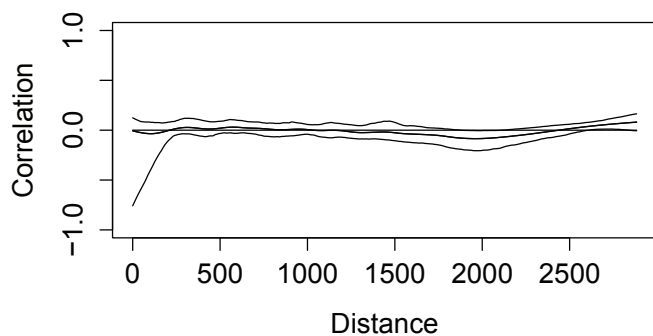
(e) Species richness



(f) Occurrence of brown thornbill



(g) Occurrence of superb fairy-wren



(h) Occurrence of eastern yellow robin

