Woodland birds and rural towns: artificial clutch survival in fragmented Box-Ironbark forests

WOODLAND BIRDS AND RURAL TOWNS: ARTIFICIAL CLUTCH SURVIVAL IN FRAGMENTED BOX-IRONBARK FORESTS

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ABSTRACT: Woodland birds are declining throughout the agricultural landscapes of south-eastern Australia, but the specific mechanisms driving these declines remain unclear. Reproductive failure via clutch depredation could conceivably contribute to these declines. Although site-scale habitat may influence the risk of clutch failure, larger-scale influences, such as whether a landscape contains a rural town or not ('landscape type'), may also play a role. This study monitored artificial open-cup nests deployed in three pairs of the two landscape types and: 1) indexed clutch survival and predator assemblage; and 2) determined if clutch survival was influenced by landscape type and/or local habitat characteristics. High levels of clutch depredation were observed in both landscape types and for all landscapes, with no evidence to suggest that landscape type or habitat characteristics influenced clutch survival or the time-to-first-predator visit. Predator assemblage also was consistent between landscape types. Generalist avian predators were the most common egg predators. Such egg predators may be ubiquitous throughout the fragmented Box-Ironbark woodlands of south-eastern Australia.

Keywords: artificial nests, box-ironbark forest, clutch loss, egg predators, nest loss, reproduction, woodland birds

Habitat loss and modification, including a rapid expansion of agricultural areas, are key threatening processes to global biodiversity (Foley et al. 2005; Hanski 2005; Fischer & Lindenmayer 2007; Sala et al. 2000). Landscape change has a variety of detrimental effects on biodiversity, including reduced and fragmented habitat, altered patch shape and size, reduced connectivity and degraded habitat quality (Hanski 2011; Johnson et al. 2011). Globally, agricultural landscapes are associated with the loss of biodiversity; prominent among these are birds (Johnson et al. 2011). For example, woodland bird decline has been widely reported from the woodlands of south-eastern Australia (Ford et al. 2009; Bennett & Watson 2011; Ford 2011). However, the specific mechanisms driving woodland bird decline largely remain unknown (Ford 2011; Bonthoux et al. 2013).

Although loss and fragmentation of woodlands reduces the connectivity of bird populations (Cooper & Walters 2002; Amos et al. 2014), it also may underpin or interact with other negative processes such as suppressed reproductive success (Evans 2004; Cunningham et al. 2014), which could conceivably reduce the viability of populations persisting within modified landscapes (Frankham et al. 2002; Hanski 2011; Johnson et al. 2011). Long-term isolation of populations can reduce fertility and demographic diversity (Gyllenberg et al. 2002); however, clutch depredation is widely regarded as the likely prominent factor contributing to woodland bird decline

(Bennett & Watson 2011; Ford 2011) with open-cup nesting species perhaps most vulnerable to depredation (Martin 1993; Remes et al. 2012). Depredation of clutches or broods is recognised as the leading cause of avian reproductive failure (Martin 2002; Robertson et al. 2014). Many studies report higher levels of clutch predators (Robertson et al. 2014), and high depredation of clutches in woodlands, using both real (Debus 2006) and artificial nests (Matthews et al. 1999; Debus 2006; Robertson et al. 2014).

Generalist predators (mostly birds and small mammals) have often been implicated in high egg depredation rates (Martin & Joron 2003; Wegge et al. 2012; Ruffell et al. 2014), with generalist avian species such as ravens and crows being common egg predators (Gardner 1998; Marzluff et al. 2007; Ekanayake et al. 2015). The dominant, most connected landscape feature surrounding woodland habitats can influence egg predator distribution (Debus 2006; Robertson et al. 2014) with greater abundance of habitat generalist predators observed in woodland patches close to agricultural lands and irrigated land-use (Robertson et al. 2014). Population densities of generalist egg predators also might increase in response to the loss and fragmentation of woodland habitat (Andren 1992; Robertson et al. 2014), thus driving increased rates of clutch depredation (Andren 1992; Ford et al. 2001). Superabundant generalist egg predators are often

associated with the presence of nutritional subsidies throughout modified landscapes, e.g. agriculture, exotic vegetation and general human food waste (Marzluff & Neatherlin 2006; Robertson et al. 2014). Many egg predators, especially generalist predators, occur at higher densities around human settlements (Sorace & Gustin 2009; Vincze et al. 2017). In rural regions, a different egg-predator assemblage and higher rates of clutch depredation therefore may be expected in landscapes where towns are present.

Several factors may influence the risk of clutch depredation. At a local scale (i.e. immediate vicinity of the nest), the structural components (e.g. shrub height, canopy cover) of the habitat may affect habitat suitability for egg predators and thus their abundance and encounter rates with nests (Evans 2004). At the scale of the woodland patch (i.e. the discrete patch of woodland in which the nest is located), clutch depredation rates may increase with the extent of edge-habitat (Paton 1994; Nilon et al. 1995). In addition, depredation often occurs more regularly within edge-habitat zones as opposed to interior habitat (Nilon et al. 1995; Gardner 1998; Major et al. 1999; Berry 2002). At a much broader landscape scale (region surrounding the woodland patch), the type, extent and fragmentation of habitats present may influence predator assemblages (Debus 2006; Robertson et al. 2014) and therefore have the potential to affect clutch depredation rates. In addition to these factors, the degree of nest crypsis (i.e. camouflage) also influences egg depredation rates (Gotmark et al. 1995; Howlett & Stutchbury 1996; Weidinger 2002; Evans 2004; Colombelli-Négrel & Kleindorfer 2009; Borgmann & Conway 2015). Thus, any study of egg depredation should consider the different scales at which depredation may operate.

Our study aimed to determine the relative importance of local- and landscape-scale factors on clutch survival of woodland birds in Box-Ironbark forests in the 'Goldfields' region of central Victoria. This is a region of high conservation significance supporting a rich diversity of woodland birds. Specifically, we aimed to determine whether the presence of a rural town in the landscape resulted in a higher proportion of generalist egg predators and reduced clutch survival of woodland bird nests. We used artificial nests rather than real nests to minimise our impact on nesting birds, to ensure an adequate sample size, and to control for patch-scale effects. Despite some criticism of studies that use artificial nests (see Faaborg 2004), it is a widely used method and we considered this an effective approach for documenting relative abundance and assemblage of generalist avian egg predators between landscape types.

METHODS

This study was conducted between September and December 2016 in the 'Goldfields' region of central Victoria (Figure 1). Since European settlement, much of this region has been cleared and modified by mining, logging and agriculture, resulting in habitat loss and highly fragmented forests. Box-Ironbark forest is the dominant vegetation type, characterised by Grey Box, Red Box, Red Ironbark and Yellow Gum, with a relatively sparse understorey of wattles, shrubs, herbs and grasses. Because its component tree species produce nectar and pollen throughout the year and support a high diversity of birds and other wildlife, Box-Ironbark forest is of high conservation significance.

Site selection

For our study, we defined a landscape as a 10 km diameter circular area containing at least 1000 ha of Box-Ironbark forest. We then defined two landscape types: 1) 'rural town' landscape, and 2) 'agricultural' landscape. Rural towns were considered as small settlements of between 950 and 1700 people, with housing and other infrastructure concentrated in an area of up to 25 hectares. We chose three 'rural town' landscapes centred on the towns of Maldon, Heathcote and Rushworth. For each of these, we selected a neighbouring 'agricultural' landscape. Paired landscapes were separated by 9 to 20 km (Figure 1).
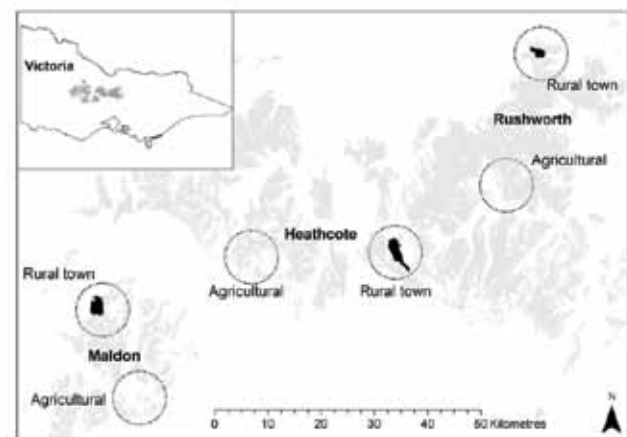

Figure 1: The six Box-Ironbark forest study landscapes (three 'rural town' landscapes (Rushworth, Heathcote and Maldon) and paired agricultural landscapes. Box-Ironbark forest is shaded in grey and area of the towns in black. The location of the Goldfields region in Victoria is shown in the inset map.

Within each of the six landscapes, we randomly selected 25 sites in Box-Ironbark forest. To control for patch-scale effects we selected sites that were on public land, >100 m from a road, >50 m from a walking track, and not within gullies. Sites were at least 200 m apart. Site selection was undertaken within a Geographic Information System (ArcGIS 10.2.2) and based on statewide spatial layers of

Figure 2: Photographs of (A) a deployed artificial nest, (B – p. 10) a clutch depredation event involving a Grey Currawong, and (C – p. 11) a White-winged Chough. Images Beau Meney.

public land (Department of Environment, Land, Water and Planning [DELWP], 2016a), Ecological Vegetation Classes (DELWP 2016b), and roads (DELWP 2016c). On visiting these sites, some were found to be not suitable (e.g. mapping errors, recent fire, high anthropogenic disturbance). This resulted in between 20 and 25 sites being selected in each landscape, and a total of 133 sites. At each site a tree was selected for deployment of an artificial nest. We chose a box eucalyptus tree (Grey Box, *Eucalyptus microcarpa*; Red Box, *Eucalyptus polyanthemos*; Yellow Box, *Eucalyptus melliodora*; or Long-leaved Box, *Eucalyptus goniocalyx*) that was alive and with a >10 cm trunk diameter.

Artificial nests and clutches

We modelled nests and clutches on those of eleven woodland bird species that use open-cup, cryptic nests, and which are widely distributed and common throughout the study area (Beruldsen 2003; Tzaros 2005) (Appendix A). Artificial nests were half tennis balls (9 cm diameter x 5.5 cm depth) with an outside coating of sawdust and a moulded layer of coconut fibre. All artificial nests were weathered by leaving them outdoors for six days. Each nest contained a clutch of two Japanese Quail (*Coturnix japonica*) eggs (Appendix A). The artificial nests were secured in upward forks above head height (190.4 ± 2.0

cm) using black tie wire (Figure 2).

Scoutguard™ (model SG550V) infrared cameras were used to monitor clutch survival and to identify causes of loss for fifteen days following nest deployment (see Weston et al. 2017). An interval of fifteen days was chosen as the average incubation period of the model species (Appendix A). Cameras were weathered for six days to minimise any scent and were fixed to either a stem of the nest tree, or a separate tree adjacent to the nest at a maximum distance of 5 m. When possible, we mounted a camera so that the clutch was visible in images taken. Cameras were programmed to capture three images at high sensitivity when triggered. This resulted in three images being taken over a seven-second period, with a delay of 1.2 seconds from trigger to first photo (Scoutguard undated). Deployment of a nest and camera at a site was postponed until the next day if potential egg predators (e.g. ravens, currawongs) were present.

Habitat assessment

In January and February 2017 (i.e. post artificial nest monitoring), we assessed habitat characteristics that we considered may influence predator assemblage and nest survival. A square of 400 m² was established, centred on the tree, and with corners defined by the termini of equidistant,

14.14 m long transects along the cardinal directions. We measured the following along each transect: 1) the height of shrubs (woody vegetation >20 cm high and <10 cm diameter of trunk at breast height [DBH]) intersecting the transect; 2) the distance of each shrub from the nest tree; 3) tree canopy cover directly above the observer 7 m from the nest tree; and 4) the DBH of trees with basal stems located within the plot. Measurements of each of these habitat structure variables were averaged to provide a single value for the variable within each site. Nest crypsis was indexed as the distance at which the nest was no longer visible to the observer in each cardinal direction. The distance was measured using a rangefinder (Zeiss Victory 8 x 26 T* PRF, ± 1 m accuracy) and averaged for the site. The same observer completed all assessments.

Statistical analysis

Camera images were examined to determine clutch survival and to identify potential egg predators. For 94 of 133 nests, images allowed us to confirm the day of clutch depredation. For the remaining nests, clutches were not visible in images so we were limited to identifying nest visitors. We used Kaplan-Meier survival analysis (Mills 2011) to compare time-to-first-clutch predator between the two landscape types, and between the six landscapes

(N = 94 nests). Survival analysis was undertaken using R statistical software version 3.4.0 (R Core Team 2017) using the 'survival' package version 2.41 (Therneau 2015).

We used ANOSIM (and visualisations of NMDS) to determine if habitat characteristics differed between the six landscapes. All habitat variables measured were used and standardised prior to analysis. We used Euclidean distance as the resemblance measure. To model the influence of landscape- and local-scale factors on clutch depredation, we first used Principal Component Analysis (PCA) followed by varimax rotation to reduce the number of explanatory terms for habitat in models. PCA was performed on standardised variables: canopy cover, shrub density, shrub height, shrub distance from nest, DBH and average number of tree stems. Two factors explained 48.2% of variance in the dataset, and were selected to describe site-scale habitat (Table 1). PC1 (henceforth 'shrub succession') described a gradient of shrub characteristics from sites with high shrub density and low shrub height (low PC1 scores), to sites with low shrub density and tall shrub height (high PC1 scores; Table 1). PC2 ('tree succession' gradient) describes a gradient of tree characteristics from sites with high tree DBH and low number of tree stems (low PC2 scores), to sites with low tree DBH and high number of tree stems (high PC2 scores; Table 1).

High depredation rates precluded analysis of fate of the nest (i.e. survived/not survived). We used Generalised Linear Mixed Models (GLMM) to test whether time-to-first-predator visit (logged) by clutch predators was influenced by landscape type, and local-scale habitat variables (nest crypsis, shrub succession [PC1] and tree succession [PC2]). Landscape identity was included as a random term. All explanatory variables were standardised to allow direct comparison of parameter estimates. A null model and seven candidate models containing explanatory term combinations that were thought to be potentially influential on time-to-first-predator visit were tested (Table 2). Akaike's Information Criterion corrected for small sample sizes (AICc) was used to rank models with the lowest AICc value indicating the model that best approximated reality. AICc is recommended when the ratio between the sample size and number of variables is less than 40 (Burnham & Anderson 2002), as was the case in this study. AICc differences (Δ i) were calculated — these differences indicate the level of support for each model, with Δ i <2 indicating substantial support and Δ i >10 indicating essentially no support for a model. Akaike weights (wi)

Table 1: Principal Components Analysis of standardised habitat variables recorded at 133 sites throughout Box-Ironbark forest of Central Victoria (factor loading scores).

Habitat variables	PC1 (shrub succession)	PC2 (tree succession)
Average canopy cover (%)	0.543	0.163
Average shrub density (count)	-0.819	0.121
Average shrub height (cm)	0.825	0.023
Average shrub distance (cm)	-0.025	0.001
Tree DBH (cm)	-0.057	-0.786
Average tree stems (count)	-0.047	0.744
Variance explained (%)	27.5	20.6
Cumulative variance explained (%)	27.5	48.2

Table 2: Model selection results for models relating time-to-first-predator visit to explanatory variables: landscape type (Rural town/ Agricultural), nest crypsis, habitat structure (PC1: *shrub succession* and PC2: *tree succession*). Included are: number of model parameters (K), Akaike's information criterion corrected for small sample sizes (AICc), AICc differences (Δ_i), and Akaike weights (w_i).

Model	K	AICc	Δ_i	w_i	R^2
Null	3	89.19	0.00	0.32	0
Landscape type	4	89.76	0.57	0.24	0.009
Nest crypsis	4	90.50	1.31	0.17	0.006
Landscape type + Nest crypsis	5	90.67	1.47	0.15	0.017
Habitat structure	5	93.01	3.82	0.05	0.038
Landscape type + Habitat structure	6	93.69	4.50	0.03	0.031
Nest crypsis + Habitat structure	6	94.41	5.22	0.02	0.016
Landscape type + Nest crypsis + Habitat structure	7	94.65	5.46	0.02	0.023

Table 3: Habitat characteristics within each landscape. Values for shrub, trees and crypsis are averaged across sites in each landscape.

Landscape	N sites	Box-Ironbark forest cover in landscape (%)	Shrubs			Trees			Crypsis (m)
			Shrubs / transect	Distance (m)	Height (m)	Canopy cover (%)	DBH (cm)	N	
Maldon – Town	22	36.67	12.99	7.00	1.01	30.92	18.73	13.45	30.45
Maldon – Agricultural	22	26.51	7.07	6.93	1.39	31.32	17.94	16.23	29.13
Heathcote – Town	23	38.10	11.10	6.39	1.59	31.76	20.50	10.91	27.28
Heathcote – Agricultural	25	44.16	12.83	7.28	1.19	35.54	17.44	22.89	22.38
Rushworth – Town	20	33.27	9.08	7.59	1.33	27.73	21.74	8.78	21.52
Rushworth – Agricultural	21	52.32	8.14	7.82	1.28	30.88	20.96	13.73	36.31
Range			1.25–54.75	2.50–10.68	0.44–4.86	0–57	13.10–38.04	3–49	3.62–75.10
Mean			10.3	7.15	1.3	31.52	19.47	14.58	27.75
SE			0.74	0.12	0.06	1.07	0.37	0.72	1.25

also were calculated and provided weight of evidence in favour of a model being the best model with $w_i > 0.9$ indicating strong support for a model. Because there were several competing 'best' models ($\Delta_i < 2$), we used model-averaging to estimate coefficients for each explanatory term (Symonds & Moussalli 2011). Explanatory terms were considered to influence time-to-first-predator visit when 95% confidence intervals of the model-averaged coefficient did not overlap zero. Statistical analyses were undertaken using R. Model selection and averaging were performed using the 'AICcmodavg' package version 2.1 (Mazerolle 2017).

We compared predator assemblage (i.e. the species of predators visiting nests, excluding unknown predators or clutches that survived) between landscape types (three landscapes per type), and sites within each landscape as replicates using a permutational analysis of variance (PERMANOVA) (Legendre & Legendre 1998). The PERMANOVA analysis was structured to test predator assemblages (coded as presence/absence and based on an Sorensen resemblance matrix) against landscape type (fixed factor) with landscape identity as a random factor.

Table 4: Egg predators and the frequency at which they were recorded as the first visitor to an artificial nest during a 15-d deployment period (N = 133 nests).

Common name	Scientific name	Number of sites visited	Percentage of nests visited (%)
Brown Goshawk	*Accipiter fasciatus*	1	0.8
Grey Shrike-thrush	*Colluricincla harmonica*	7	5.3
Australian Magpie	*Gymnorhina tibicen*	7	5.3
Grey Currawong	*Strepera versicolor*	8	6.0
Australian Raven	*Corvus coronoides*	2	1.5
Little Raven	*Corvus mellori*	16	12.0
White-winged Chough	*Corcorax melanorhamphos*	24	18.1
Common Brushtail Possum	*Trichosurus vulpecula*	1	0.8
Common Ringtail Possum	*Pseudocheirus peregrinus*	2	1.5
Sugar Glider	*Petaurus breviceps*	4	3.0
Unknown spp.		45	33.8
None recorded		16	12

Table 5: Results of the permutational multivariate ANOVA analysis (PERMANOVA) of predator assemblage across landscape type.

Source	df	Pseudo-F	P (perm)	Unique permutations
Landscape type	1	0.31706	0.992	555
Landscape (Landscape type)	4	1.4809	0.090	999
Residuals	69			
Total	74			

RESULTS

Landscape and habitat characteristics

Cover of Box-Ironbark forests varied between the six landscapes, ranging from 26 to 52% cover. There was considerable inter-site variation in habitat characteristics (Table 3); however, this variation was not linked to landscape (ANOSIM, Global R = 0.005, P = 0.20) (Table 3).

High levels of artificial clutch depredation were detected in all landscapes, with only 12 (12.8%) of 94 clutches for which clutches were visible in images surviving that period. Of the surviving nests, eight were recorded for town landscapes and four recorded for agricultural landscapes. Survival analysis revealed no difference in clutch survival between landscapes (N = 94 nests, χ^2 = 2.4, d.f. = 5, p = 0.790). The interval from deployment to detection by a potential egg predator was short, with 54% of nests visited by potential egg predators within the first three days (Figure 3). Ten potential egg

predator species were identified, including seven birds, two of which accounted for 34% of all first visitors to nests (N = 133, Table 4). The three non-avian predators were the Sugar Glider (*Petaurus breviceps*), Common Ringtail Possum (*Pseudocheirus peregrinus)* and Common Brushtail Possum (*Trichosurus vulpecula*). Predators could not be identified at 45 (38.5%) nests due to cameras failing to detect the visitor. PERMANOVA indicated predator assemblages were similar between landscape types (Table 5).

Four models (including the null model) to explain time-to-clutch depredation had AICc differences (Δ i) <2. However, the 95% confidence intervals of the model-averaged coefficient estimates overlapped zero, indicating that these variables did not have an influence on time-to-nest visit (model-averaged coefficients and standard error: landscape type, 0.07 ± 0.08; crypsis, 0.02 ± 0.03; PC1 -0.004 ± 0.02; PC2, 0.004 ± 0.02).
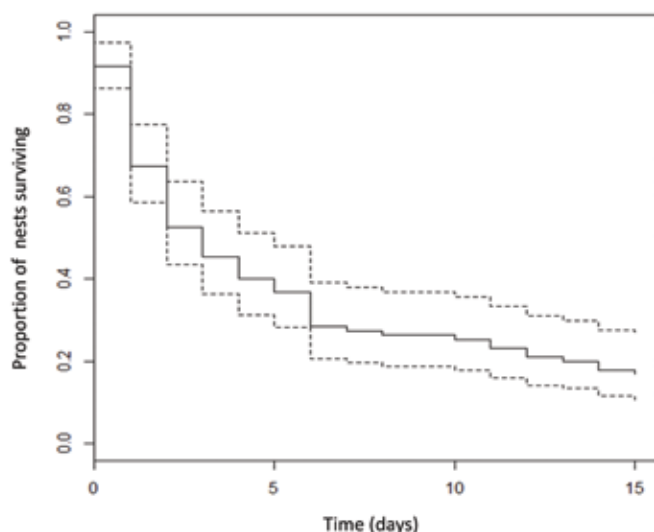
Figure 3: Kaplan-Meier survival curve of clutch survival of 94 nests. The dotted lines represent 95% confidence intervals.

DISCUSSION

This study found no influence of the presence of rural towns on predator assemblage, clutch survival or the time-to-first visit by potential egg predators. Generalist avian egg predators were the most common egg predators and visited artificial nests in all landscapes irrespective of the presence of towns. Interestingly, the White-winged Chough (*Corcorax melanorhamphos*) was a more frequent egg predator than corvids which have been identified as a major egg predator across many landscapes worldwide (DeGregorio et al. 2016; Ekanayake et al. 2015). High rates of artificial clutch depredation were detected across all landscapes, and more than half of the deployed nests were visited by potential egg predators within the first three days of exposure. Although elevated rates of depredation may be associated with the use of artificial nests (Major & Kendal 1995; Zanette 2002; Thompson & Burhans 2004), the high incidence of generalist avian predators observed at artificial nests and the speed at which they located nests raises concerns for depredation rates of real nests, and warrants further study.

Our study suggests that generalist avian egg predators (primarily Little Ravens and White-winged Choughs) are common egg predators in Box-Ironbark forests of Central Victoria. This is not surprising considering their reputation as egg predators elsewhere, especially ravens (Gardner 1998; Marzluff et al. 2007; Ekanayake et al. 2015). However, our hypothesis that these predators would occur more frequently (and have greater impact on nest success of woodland birds) in landscapes near towns was not supported by the results of the study. It is possible that Little Ravens and White-winged Choughs are equally abundant in town-centred landscapes and agricultural landscapes due to an abundance of food resources in both, and that any effect of small rural towns on their abundance

is minimal. Alternatively, if prominent egg predators are superabundant in rural towns, their activity may be concentrated in towns and therefore not result in increased clutch predation rates (relative to agricultural landscapes) in surrounding forests. Surveys of avifauna in the mosaic of habitats present in the landscape would elucidate this.

Perhaps more surprising than the lack of landscape-scale effect was the lack of local-scale and nest-crypsis effects on clutch depredation. Habitat characteristics were highly variable between sites, both with respect to shrub cover and height, and tree stem density (3 to 49 trees per site). Nest crypsis also varied, with detection distances of between 3.6 and 75 m between sites. The lack of influence of these variables on detection of artificial nests highlights the efficiency at which generalist egg predators are able to locate food resources and the possible abundance and widespread distribution of such predators in Box-Ironbark forests.

Our study raises concern for the reproductive success of woodland birds in Box-Ironbark forests of Central Victoria (Major et al. 1999; Debus 2006; Robertson et al. 2014). Box-Ironbark forest is of high conservation significance, with its component tree species providing year-round flowering, and thus food resources for many species of birds and animals. Many bird species, including the endangered Regent Honeyeater (*Anthochaera phrygia*), are more abundant in Box-Ironbark than elsewhere (Oliver et al. 1999). However, these forests in Central Victoria have become highly fragmented and structurally degraded, due primarily to the history of gold exploration and habitat clearance in the region (MacNally et al. 2000). Our study suggests that a consequence of this may be a greater abundance and widespread distribution of generalist egg predators throughout the region. Further research to quantify this and to determine depredation of real nests is warranted.

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Appendix A: Averaged incubation periods, clutch sizes, nest and egg dimensions, for the 11 model species (Higgins & Peter 2002; Higgins et al. 2006).

Common name	Scientific name	Incubation period (days)	Clutch size	Nest dimensions (external) (diameter x depth) (cm)	Egg dimensions (height x width) (mm)
Varied Sitella	*Daphoenositta chrysoptera*	18	3	5.4 x 7.6	17 x 13
Scarlet Robin	*Petroica boodang*	15	3	7.7 x 6.4	18 x 14
Red-capped Robin	*Petroica goodenovii*	13.5	2	6.1 x 5.9	16 x 13
Eastern Yellow Robin	*Eopsaltria australis*	16	2	8.4 x 6.8	22 x 16
Jacky Winter	*Microeca fascinans*	17	2	6.1 x 3.4	20 x 15
Eastern Shrike-tit	*Falcunculus frontatus*	18	3	7.6 x 9.3	24 x 17
Golden Whistler	*Pachycephala pectoralis*	16.4	2	11.8 x 7.7	24 x 17
Rufous Whistler	*Pachycephala rufiventris*	13.4	2	9.0 x 5.7	28 x 20
Grey Fantail	*Rhipidura albiscapa*	14	2	6.4 x 7.6	16 x 13
Willie Wagtail	*Rhipidura leucophrys*	14	3	7.3 x 5.4	21 x 16
Restless Flycatcher	*Myiagra inquieta*	17	3	8.4 x 5.8	21 x 16
Average		15.6	2.4	7.6 x 6.5	21 x 15