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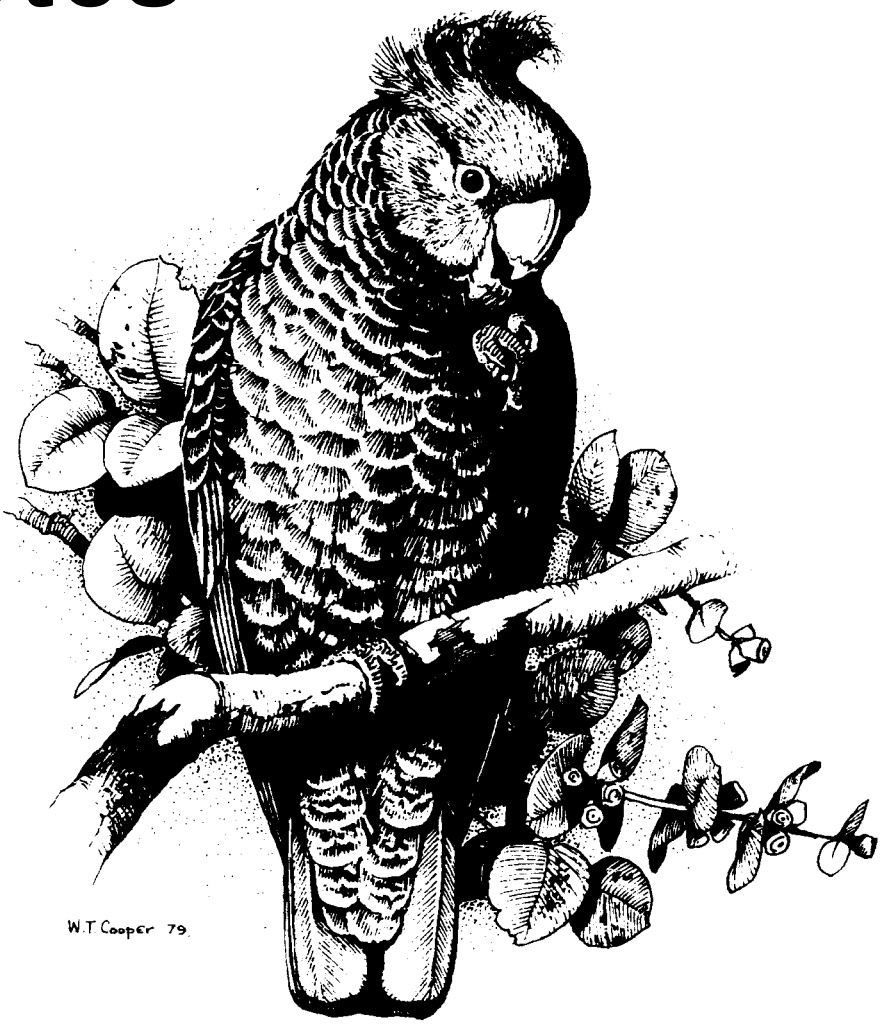

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A STATISTICAL ANALYSIS OF TRENDS IN DETECTION RATES OF WOODLAND BIRDS IN THE ACT, 1998 TO 2004

Prepared for Canberra Ornithologists Group (COG) and Environment ACT by

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1. HISTORY OF PROJECT

Much of the native woodland vegetation in south-eastern Australia has been cleared or substantially modified since European settlement. Recent mapping has estimated that 45% of the ACT and NSW Southern Tablelands region supported grassy ecosystems pre-1750, and that this had been reduced to 13% cover by 2000 (Fallding 2002). Two thirds of this remaining native vegetation is box-gum grassy woodland.

Yellow Box-Red Gum *Eucalyptus melliodora-E. blakelyi* Grassy Woodland has been declared an endangered ecological community in the ACT. This community (and other lowland woodland) supports ten bird species that are listed as threatened in the ACT or NSW, and many other bird species that appear to be declining. About one third of the threatened community in the ACT is protected in nature reserves. Some of the rest has various degrees of protection under other Territory Plan land use categories and as Designated Areas under the National Capital Plan, and a small amount is under urban use. The remaining third is on land identified as Broadacre Rural or Plantation Forestry land (ACT Government 2004). Management methods (grazing, weed control, fire hazard reduction) differ for these land use categories, and this affects the type, quality and regeneration of bird habitats.

One of the goals of the ACT Lowland Woodland Conservation Strategy (ACT Government 2004) is to 'Conserve in perpetuity, viable, wild populations of all Lowland Woodland flora and fauna species in the ACT and support regional and national efforts towards conservation of these species'. Some of the Key Actions identified in this report relate to threatened and declining woodland birds, and the need for more information on their distribution, abundance, ecology and conservation requirements.

hi 1998-99, Environment ACT made the first of a series of grants to COG to carry out monitoring of bird species and numbers at lowland grassy woodland sites in the ACT. A working group, including COG members and professionals working in wildlife research, designed the survey.

With continuing support from Environment ACT, quarterly surveys were being carried out at 128 monitoring sites in 13 areas by 2005 (Table 1). A habitat assessment was carried out for each monitoring site, describing the structure of the vegetation and other habitat features (see Form A attached).

COG received funding for the analysis by Ross Cunningham of Statwise Pty Ltd of data collected up to 2001. This work compared the abundance of birds in reserve and leasehold areas, and included detailed analysis of records for ten woodland bird species (Cunningham 2003). A progress report for the project was prepared using data collected between 2001 and 2003, with discussion of threatened species records and preliminary habitat descriptions for some species (Rowell 2004, 2004a).

Since the previous reports of this survey, new sites have been added to the project at Goorooyarroo Reserve in Gungahlin, Kama in Belconnen and in the Naas Valley. This gives good coverage of grassy woodlands in the ACT, both geographically and in the range of woodland quality and tenure types. The northern woodlands which extend almost uninterrupted from Hall to Newline Quarry will now be well-surveyed, and comparisons will be possible of bird populations and habitats across several different management regimes.

Several other recommendations arising out of the previous reports have been implemented. These include:

- continuing the surveys with the methods as modified in 2003
- restarting Majura Field Firing Range surveys in 2005
- replacing Lambrigg with new Naas site (in spring 2005)
- surveys carried out over two days if necessary, in order to survey early in the day
- production of habitat database for use in longitudinal analysis of bird detection trends against habitat data.

2. METHODS

For this report, Ross Cunningham has undertaken a statistical analysis of data on 63 species in the Woodland data set that appear in more than 1% of the 147 surveys undertaken at 132 sites in 13 areas between September 1998 and June 2004. He has produced longitudinal profiles of the probability of detection for these species and has also assessed whether profiles differed between land tenure classes and classes of a selection of habitat variables. The association between habitat variables and tenure was also assessed.

The smoothed trend was determined using a regression spline, the seasonal component by a second order harmonic, and the 'linear' trend by fitting a straight line. The scale for analysis was logistic and so the linear line on the natural scale will be slightly curved. Statistical adjustments have been made to correct for the lack of balance in the data set, due to the changing numbers of sites being surveyed during the period. The contribution that each survey area has made to the data set is shown in Table 2. The model is a special case of a general statistical framework for analysis known as generalized linear mixed models (GLMM).

Graphs of temporal trends in detection rates for species which occur in more than 1% of surveys are included at the end of this report.

Table 1: Site tenure and history of survey

Site	Tenure	First surveyed	Comments
Mulligan's Flat (MUL)	Nature reserve	1996	Survey methodology changed in 1998 to match COG Woodland Bird survey. 24 sites, not all woodland.
Majura Field Firing Range (MJF)	Defence land	spring 1998-Dec 2000, restarted June 2005	Break in surveys due to problems with access. 10 sites, not all woodland, reduced to 8 sites in 2005.
Castle Hill (CAS)	Rural lease	Sept 1998	Grazed by sheep. Extra surveys Feb, Apr, Oct 2000.
Gooroo (GOO)	Rural lease, became Nature Reserve in early 2004	Sept 1998	Pasture improvement at some sites.
Mt Majura (MAJ)	Nature reserve and buffer between houses and reserve	Sept 1998	North-western end of Mt Ainslie-Mt Majura Reserve.
Red Hill (RED)	Nature reserve	Sept 1998	8 sites burnt or part-burnt, light to moderate burns, December 2001. Extra habitat surveys in March, June 2002.
Symonston (SYM)	Rural lease, Nature Reserve, hills/ridge/buffer	Sept 1998	Sites 1-9 grazed. Sites 7-9 surveyed first year only, replaced by 10-12 (East O'Malley) Sep 2000. 10-12 lost to housing, replaced by 13-15 in new NR in June 2004.
Hall/Gold Ck (HAL)	Rural lease	June 2000	Lightly grazed.
Newline Quarry(NLN)	Rural agistment	July 2000	Grazed by sheep, cattle. Some pasture improvement.
Tuggeranong Hill (TUG)	Nature reserve, hills/ridge/buffer	Sept 2000	Preliminary bird survey in Aug 2000. Sites 8 and 9 cleared for housing between June and Sep 2001 surveys, not replaced.
Lambrigg (LAM)	Rural lease	Dec 2001-Mar 2003	Sites 1, 2, and 9 withdrawn after Dec 2001 survey. New sites 10-12 first surveyed in Mar 2003. All sites (3-8, 10-12) burnt (moderate to hot burn) in Jan 2003. All sites withdrawn after Mar 2003 survey.

Table 2. History of Woodland Bird Survey, showing contribution of each survey area to the data set.

Season of survey	Year		Number of sites surveyed in each area											
			CAS	CMP	GOO	GOS	HAL	LAM	MAJ	MJF	MUL	NLN	RED	SYM	TUG
Spr	1998	9	-	9	-	-	-	9	10	24	-	9	9	-	
Sum	1998	9	-	9	-	-	-	9	10	24	-	9	9	-	
Aut	1999	9	-	9	-	-	-	9	10	24	-	9	9	-	
Win	1999	9	-	9	-	-	-	9	-	24	-	9	9	-	
Spr	1999	9	-	9	-	-	-	9	-	24	-	9	9	-	
Sum	1999	9		9	-	-	-	9	10	24	-	9	9	-	
Aut	2000	9	-	9	-	-	-	9	10	24	-	9	9	-	
Win	2000	9	-	9	-	9	-	9	10	24	9	9	9	-	
Spr	2000	9	-	9	-	9	-	9	10	24	9	9	9	9	
Sum	2000	9	-	9	-	9	-	9	10	24	9	9	9	9	
Aut	2001	9	-	9	-	9	-	9	-	24	9	9	9	9	
Win	2001	9	-	9	-	9	-	9	-	24	9	9	9	9	
Spr	2001	9	-	9	-	9	-	9	-	24	9	9	9	7	
Sum	2001	9	-	9	-	9	9	9	-	24	9	9	9	7	
Aut	2002	9	-	9	-	9	9	-	-	24	9	9	9	7	
Win	2002	9	-	9	-	9	9	9	-	24	9	9	9	7	
Spr	2002	9	-	9	-	9	9	9	-	24	9	9	9	7	
Sum	2002	9	-	9	-	9	9	9	-	24	9	9	9	7	
Aut	2003	9	-	9	-	9	9	9	-	24	9	9	9	7	
Win	2003	9	9	9	-	9	-–	9	-	24	9	9	9	7	
Spr	2003	9	9	9	-	9	-	9	-	24	9	9	9	7	
Sum	2003	9	-	9	-	9	-	9	-	24	9	9	9	7	
Aut	2004	9	9	9	-	9	-	9	-	24	9	9	7	7	
Win	2004	9	9	9	9	9	-	9	-	24	9	9	9	7	

3. RESULTS AND COMMENTS

Of the 63 most commonly recorded species, three were waterbirds (Australasian Grebe, Australian Wood Duck, Pacific Black Duck). The wood duck often nests in large tree hollows in forest and woodland, but most records in the data set were of ducks on dams rather than at nest hollows. The waterbirds were removed from the data analysis, as they are not primarily woodland species.

3.1 Threatened species and 'species of interest'

Among the 60 species which occur in more than 1% of the woodland surveys are some that are listed as threatened in the ACT, or are of interest because they are believed to be declining in local or regional woodlands. This number of records allows an analysis to be done of longitudinal trends in detection rates. These species are Brown Treecreeper,

Dusky Woodswallow, Hooded Robin, Varied Sittella and White-winged Triller. Trends for these species are discussed in section 3.6.1 below.

Several other species of interest were not recorded at a sufficient rate to allow trends to be analysed. Some of these species have limited habitat in the northern ACT, and more information is available about them from other parts of their range. Such species are Superb Parrot, Regent Honeyeater, Painted Honeyeater and Flame Robin.

A third group of species appears in low numbers in the Woodland Survey, despite the presence of apparently suitable habitat. These include the Varied Sittella, Diamond Firetail and Jacky Winter. The Woodland Bird Survey either does not provide sufficient information to analyse population trends in these uncommon species, or the analysis does not show a clear trend (Varied Sittella). More useful information may be gained about such species by targeted surveys.

3.2 Types of trends in detection rates

The statistical data on longitudinal trends is included as Table 7. Annotated graphs showing these data with various representations of trends are also provided. The 1998/99 data for many species is markedly different (higher, lower or variable detection rates) from subsequent data. Examples are Australian King-Parrot, Brown Treecreeper, Crested Pigeon, Dusky Woodswallow, Eastern Spinebill, Grey Currawong, Magpie Lark, Scarlet Robin, Tree Martin, White-plumed Honeyeater, White-throated Treecreeper, Willie Wagtail and Yellow-rumped Thornbill. The reason for this is not clear, and it may be an artifact of the types of sites surveyed early in the project. This variance in early (and possibly less reliable) survey data may influence the trend in detection rates for some species.

Another more pervasive influence can be seen for species which are more commonly recorded in spring than winter, or vice versa. The initial survey in the period analysed took place in spring, whereas the last survey in the analysis is a winter one. This may result in an apparent change in detection rate, where examination of the graphs suggests otherwise. For example, the linear trend lines on the graph for the Grey Fantail (more often recorded in spring than in winter) suggests a decline in detection rate, but there appears to have been little actual change in the detection rate between winter 1999 and winter 2004.

3.3 Linear longitudinal trends in detection rates

Of the 60 most commonly recorded species (excluding waterbirds), the longitudinal analyses (1998-2004) showed significant declines ($P<0.01$) in probability of detection for eight species. A further nine species showed possible declines ($P=0.01$-0.5) over the same period (Table 4). These groups include resident and migratory birds, native and exotic species, hole-nesters, and ground and canopy feeders. A number are common species which are usually considered to have coped well with habitat change in the past.

Table 3. Summary of records of threatened species and 'species of interest'.

Species and status	Records	Areas recorded	Notes
Regent Honeyeater *Xanthomyza phrygia* Endangered in ACT	1	GOO Nov 98	Rare visitor to ACT
Superb Parrot *Polytelis swainsonii* Vulnerable in ACT	1	GOO Oct 02	Also GOO Dec 04, outside site.
Swift Parrot *Lathamus discolor* Vulnerable in ACT	0	-	**14** at MAJ Mar 05, outside site
Brown Treecreeper *Climacteris picumnus* Vulnerable in ACT	81	CAS, LAM, , MAJ, NLN	Most records from CAS, NLN, LAM (all leasehold), rarely at MAJ. GOS is new site (Reserve).
Painted Honeyeater *Grantiella picta* Vulnerable in ACT	3	MUL Nov 02	Rarely recorded in ACT
Hooded Robin *Melandryas cucullata* Vulnerable in ACT	33	CAS, GOO, HAL, LAM, MJF, MUL, NLN	Several sites at GOO, less often recorded elsewhere.
Varied Sittella *Daphoenositta chrysoptera* Vulnerable in ACT	34	CAM, GOO, HAL, MAJ, MJF, MUL, NLN, RED, SYM, TUG	Widespread but uncommon on survey sites. Seen more in Reserves.
Flame Robin *Petroica phoenicea* `watching brief in ACT	5	GOS, HAL, MAJ, NAS, TUG	Also MUL Sep04, outside site.
Crested Shrike-tit *Falcunculus frontatus* `watching brief in ACT	*11*	CAS, CMP, LAM, MUL, NLN	Also GOO Dec02, outside site.
White-winged Triller *Lalage sueurii* Vulnerable in ACT	48	CAM, CAS, GOO, HAL, LAM, MAJ, MJF, MUL, NLN, SYM, TUG	Wide-ranging visitor in drought years.
Dusky Woodswallow *Artamiis cyanopterus* `watching brief in ACT	78	CAS, HAL, , LAM, MJF, , TUG RED SYM,	Most common at CAS and LAM (discontinued), both leaseholds near Murrumbidgee River.
Diamond Firetail *Stagonopleura giittata* `watching brief in ACT, Vulnerable in NSW	18	CAS, GOO, HAL , LAM, MJF, NLN	Most (10) records from LAM, a discontinued site, few in reserves. Also occurs at new NAS site.
Jacky Winter *Microeca fascinans*	10	GOO, LAM, NLN, TUG	Few records, LAM discontinued.

A decline in the detection rate for a species at woodland survey sites could mean that the population is declining, but could also be due to temporary movements from woodlands to other habitats such as gardens during drought, or into forests regenerating after fire.

An overview of the status of Australia's birds prepared for Birds Australia (SOAB, Olsen *et al.* 2005) reviewed data from two nationwide Atlas survey periods and from various regional studies. The SOAB report noted that 13% of Australian woodland bird species were declining, and that this figure rose to 24% for ground feeding woodland bird species. The ACT report in the SOAB was prepared in August 2005 from a preliminary inspection of the Woodland Survey data. It was based on data for 61 woodland birds from 142 monitoring points at 13 locations, collected between spring 1998 and winter 2004, which provided the following trends:

- 18 species (29%) showed clear declines in detection rates, including Eastern Rosella, Red-rumped Parrot, Willie Wagtail, Superb Fairy-wren, Grey Currawong, and the introduced Common Starling and Common Myna — mainly ground feeders. Others are summer migrants such as the Noisy Friarbird, Dusky Woodswallow and Black-faced Cuckoo-shrike

- 4 species *(7%)* showed increases in detection rate; these include Speckled Warbler, Common Bronzewing and Golden Whistler
- 10 species (16%) had stable detection rates; these include Weebill, Rufous Whistler, Laughing Kookaburra, Crimson Rosella, Australian Magpie, Western Gerygone, White-throated Gerygone and Scarlet Robin
- the remaining 29 species (48%) showed irregular patterns of detection or indistinct trends (mostly declines); this group includes Red Wattlebird, Grey Fantail, Pied Currawong, as well as the two ACT threatened species Hooded Robin and Brown Treecreeper.

(from Olsen *et al. 2005)*

Table 4: Species showing decline in detection rate, September 1998 to June 2004.

Species	Decline in detection rate
P < 0.01	
Eastern Rosella	10%
Tree Martin	18%
Willie Wagtail	17%
Black-faced Cuckoo-shrike	20%
White-plumed Honeyeater	14%
Noisy Friarbird	23%
Grey Currawong	20%
Common Starling	14%
P = 0.01 — 0.05	
Red-rumped Parrot	10%
Grey Fantail	9%
Superb Fairy-wren	11%
Dusky Woodswallow	14%
Mistletoebird	19%
Spotted Pardalote	*7%*
Olive-backed Oriole	26%
Striated Pardalote	5%
Common Myna	*15%*

Only three species showed a significant increase in detection rate (P<0.01), and none were in the possible increase group (P=0.01-0.5) (Table 5).

Table 5: Species showing increase in detection rate, September 1998 to June 2004

Species	Increase in detection rate
P < 0.01	
Golden Whistler	26%
***Speckled Warbler**	**19%**
Yellow-faced Honeyeater	7%

* listed in NSW as vulnerable

The probability of detection for some species changed little for most of the period. These include Australian Magpie, Crimson Rosella, Noisy Miner, Rufous Whistler, Scarlet Robin, Striated Pardalote, Sulphur-crested Cockatoo and Weebill.

3.4 Other trends in detection rates

A regular seasonal cycle in probability of detection is seen in many species, both resident and migratory. The detection rates for many species varied during the period, without showing a significant pattern or unidirectional trend. These data are best displayed in the graphs showing the variation in detection rates over the period.

3.4.1 Drought

Examination of the graphs for a number of species shows an apparent decline in the probability of detection in recent years (2001-2004). This may be due to the effects of the prolonged drought on bird populations, perhaps compounded for some species by the loss of forest habitat in the January 2003 fires. Recently declining detection rates were found in the Buff-rumped Thornbill, Common Starling, Dusky Woodswallow, Grey Currawong, Hooded Robin, Nankeen Kestrel, Tree Martin and White-throated Treecreeper, all primarily insect eaters. Two species which showed an apparent increase in detection rate during the drought were the Galah and Crested Pigeon. These species eat seeds of both native and exotic plants. An increase in the detection rate could be due to birds moving onto the tablelands from the inland during drought.

Some of the survey sites had more or less permanent water (dams) within 50 metres. Most of these sites are on leasehold land. Bird numbers at these sites may have been elevated during the drought, and the presence of water in dry times may be of overriding importance, obscuring the effects of other habitat parameters.

3.4.2 Bushfires

A number of species showed a marked decrease in detection rates in the last two surveys in this data set (autumn and winter 2004). These were almost exclusively species which prefer to nest in the forested ranges and overwinter in the lowland woodlands: Brown Thornbill, Golden Whistler, Grey Shrike-thrush, Silvereye, Sulphur-crested Cockatoo, White-eared Honeyeater, White-naped Honeyeater and Yellow-faced Honeyeater (and possibly Scarlet Robin). It is likely that the decrease in detection rates in the woodlands in autumn and winter 2004 is due to the

extensive loss of breeding habitat in the January 2003 fires. The decline was not seen in the season immediately following the fires, suggesting that the birds had already moved to the lowlands when the forests burnt. The COG Annual Bird Report for the year ending June 2004 also reported that a 'surprising number of honeyeater species' (including those above) and the Golden Whistler were not recorded as breeding in the Canberra district in the spring following the bushfires (COG 2005).

The detection rate for Noisy Miners also fell sharply at this time. This is a species of open woodland, with little eucalypt regeneration or shrub cover. Much less of this habitat was affected by the bushfires, which makes it more difficult to explain the fall in detection rate. It would be interesting to analyse other COG records for this species in 2004 to see if Miners had spread into previously dense woodland or forest areas which had been opened up by the fires. This could account for lower numbers being recorded in the woodland surveys, or it could be the cumulative effect of several drought seasons.

Some species also showed a decreased detection rate in the spring and summer period following the fires. This could be due to loss of birds or habitat in the fires, and/or the cumulative effects of the prolonged drought. These species include the Pallid Cuckoo, Leaden Flycatcher, Black-faced Cuckoo-shrike and Grey Shrike-thrush.

3.5 Effects of land tenure and habitat variables

3.5.1 Background

The designations of 'leasehold' and `reserve' are intended to help in the examination of the effects of past and current grazing by stock, and other management differences between the land tenures. However, the intensity of grazing on leased land varies considerably, and length of time since last grazing in reserves also varies. For example, Mulligans Flat was leasehold land just before the start of bird surveys there, but has now been ungrazed by domestic stock for about 8 years, while numbers of kangaroos have increased. The Majura Training Area (MJF, Field Firing Range) has been ungrazed for a similar period and is managed somewhat like a reserve, but appears in the analyses as leasehold land. Goorooyarroo Reserve (GOS) was grazed until early 2004, when it changed from leasehold to reserved land, and Gooroo (GOO) was formerly leasehold but is now also part of Goorooyarroo Reserve. Limited grazing is used in part of Goorooyarroo to control exotic grasses.

There are probably other general differences between leasehold and reserve land in the ACT. Much of the reserved woodland is on the lower slopes of hills and ridges, while leasehold land takes up the valley floors. The effects of land management will therefore overlie existing differences in soil depth, fertility and moisture, which will also affect the plant and animal populations. Leasehold land also contains permanent water sources for stock, which may favour some bird species.

Some of Ross Cunningham's analyses of habitat variables against tenure help to explore this complex situation (see species treatments below). The graphs of these analyses are interspersed with the species graphs at the end of this report. Collection of some other habitat variables for the survey sites would also be useful. This should include information on tree diameter, site topography, distance to nearest water source and grazing history. Patch size and connectivity have not yet been considered, and these attributes are probably best assessed from recent aerial photography and Environment ACT vegetation community mapping.

One further consideration should be taken into account when examining habitat measures and detection rate trends during the period of this survey. Each survey site has been allocated one set of averaged habitat measures, derived from two or more habitat surveys. This will not be an accurate reflection of the habitat condition at a number of sites, where the structure will have changed due to fire, drought, grazing, tenure change etc. It was decided to use one averaged habitat 'snapshot' to enable analyses to be done for the current period, but habitat surveys should continue to be undertaken to measure changes, and all these surveys would be available for future analyses.

3.5.2 Some characteristics of leasehold and reserve land

Habitat surveys for 48 leased and 84 reserve sites were analysed. This showed that, compared to reserves, leasehold sites tended to have less eucalypt regeneration and fewer large shrubs, and were more likely to have an exotic-dominated ground layer and poor tree health. These differences could be due to the effects of grazing and pasture improvement.

Leasehold sites were also somewhat more likely to have a high number of tree hollows and mistletoes. This did not appear to be due to a higher density of mature trees, but could be related to poorer tree health, to less frequent fires on leased land, or to differences in the tree species composition. It is known, for example, that Yellow Box has been selectively removed from some leasehold land, and that the rate of hollow formation varies from species to species. Mistletoes can become more abundant with habitat fragmentation, as they thrive on the edges of clearings (Watson 2004).

Further (non-statistical) inspection of the mistletoe data showed that higher mistletoe numbers were correlated with sites where a species of box was the dominant tree (Yellow Box, Red Box or Apple Box). All the sites with more than 20 mistletoes were dominated by a species of box, compared to only 50% of sites with no mistletoe. This may be because the mistletoe species parasitic on Red and Yellow Box in the ACT *(Amyema miquellii)* is more common than *Muellerina eucalyptoides* which occurs on Blakely's Red Gum (Burbidge and Gray 1970). It was not determined whether box species were more common on leased land. Apple Box is often found on deeper better-watered soils, which are more likely to be under leasehold.

3.6 Case studies

In this section a selection of species are discussed in taxonomic order (with the threatened group discussed separately). Table 6 contains brief comments on all species analysed, illustrated by the graphs.

3.6.1 Threatened species and species of interest

Brown Treecreeper

Detection rates for this species have been low but fairly stable since 1999, with peaks in summer and winter. The probability of detection was higher on leasehold land than in reserves, and also where trees were healthy rather than affected by dieback (as measured by canopy loss). Interestingly, healthy trees were more likely to be found in reserves, so the leasehold sites where this species occurs may be a subset that varies from the usual habitat parameters for leasehold land. However, there is also a positive correlation between tree hollows and treecreepers, and tree hollows and leasehold sites. This may be a reflection of tree age/size on sites containing Brown Treecreepers.

Hooded Robin

Small populations of Hooded Robins occur consistently at or around particular monitoring points in some survey areas, but are not widespread in those areas. Detections of this more sedentary species also appeared to increase slightly during the drought and decline sharply after the bushfires, but there is no easily explained trend. The tenure graph shows differing non-linear trends for reserve and leasehold land, but detections declined under both tenures in 2003-2004. Many of the survey records come from the northern woodlands which extend from Hall to Newline Quarry. Given the relatively low number of records and apparent recent decline, this species warrants more targeted surveys in this area.

White-winged Triller

This species is usually only recorded in the summer surveys, and the detection rate varies from year to year. There are often more records in the ACT area when the inland is affected by drought.

Dusky Woodswallow

The analysis suggests a slight decline in the detection rate for this mobile species, but the graph could also show an irregular pattern, with an increase during the drought followed by a decline after the January 2003 bushfires. The species was more frequently recorded near the Murrumbidgee River corridor, an area where many trees were lost in the fires.

Varied Sittella

The detection rate for this species is mostly low, usually with a peak in spring. Records were unusually low in the five surveys following the January 2003 bushfires, but there were more records in the last survey (winter 2004). It was recorded more frequently in reserves than on leased land. Many woodlands in ACT reserves adjoin sclerophyll forest, a habitat also used by this species.

Diamond Firetail

Ten of the 18 records in the survey period were at Lambrigg (LAM, a discontinued site), and few were found in reserves. The species occurs at the new NAS site, but the low number of records

and restricted distribution in the surveys overall suggests that this species warrants more targeted study. It is noted that since early 2003, Diamond Firetails have been reported at a number of other locations around Canberra, including some burned and cleared pine forest areas near urban fringes, as well as in Goorooyarroo and Callum Brae Nature Reserves.

3.6.2 Other species

Crimson Rosella, Eastern Rosella, Red-rumped Parrot, Sulphur-crested Cockatoo and Galah

Detection rates for Crimson Rosella were high and relatively steady throughout the survey period, with a possible increase in spring 2003 (following the bushfires) and a decline in the following winter. This may be due to more birds breeding in the woodlands after the loss of forest, and lower numbers overwintering in the lowland woodlands due to the overall loss of forest breeding/feeding habitat in the region. If a greater number of Crimson Rosellas are seeking nest hollows in woodland, they may come into direct competition with smaller species which nest mainly in woodland, such as Eastern Rosellas and Red-rumped Parrots.

Eastern Rosellas showed a steady decline in detection rate, while Red-rumped Parrots declined until 2003 but showed a slight increase in 2004. Both are species of more open woodlands, and may compete with native and feral species for nest hollows (Pell and Tidemann 1997). However, detection rates for Nankeen Kestrels, Common Starlings and Common Mynas also declined during the survey period, suggesting that they may be under the same pressures as the small parrots. This could be due to an overall shortage of nest hollows in the woodlands or increased competition for them, or depletion of their foods in the ground layer due to drought and/or overgrazing.

The detection rate for Galahs declined from 1998 to 2001, and increased from 2001 to 2004. The recent increase could be associated with Galahs moving to escape drought further inland, which could increase competition for nest hollows in ACT woodlands, to the detriment of smaller hollow-nesting species.

Sulphur-crested Cockatoos were detected at a fairly steady rate throughout the survey period, with a possible decline in winter 2004.

Superb Fairy-wren

The detection rate has declined steadily for this species, with a steeper drop in 2004. Detailed long-term population studies of Superb Fairy-Wrens in the Australian National Botanic Gardens by ANU researchers show a similar decline (Michael Double, pers. comm.). The Botanic Gardens is a partially irrigated site where the effects of the drought should not have been as great.

Speckled Warbler

This ground-feeding and low-nesting species is listed as vulnerable in NSW. There has been a statistically significant increase in the detection rate for this species in the ACT woodland survey area. The previous report on this survey (Rowell 2004, 2004a) showed that this species was widespread but uncommon, and associated with fairly complex

habitat structure. There were 120 sightings of Speckled Warblers, in 11 of the 13 areas surveyed. The data which has been collected during this survey on distribution and habitat of the species could be analysed in more detail, with reference to recent research on the species in the ACT by Dr Janet Gardner.

Buff-rumped and Yellow-rumped Thorn bills

There was a marked seasonal variation in the detection rate of Buff-rumped Thornbills, with a regular peak in spring. The probability of detection was higher in reserves than on leased land, but the correlation was not as marked in the later stages of the drought. Before 2003, there was also a strong correlation with a tussocky complex ground layer, which non-statistical analysis showed was most often dominated by native plant species (in turn shown by statistical analysis to be associated with reserve sites). During the drought, the detection rate in this vegetation type declined. The structure of the ground layer under the different tenures may have converged during the recent drought due to overgrazing by both stock and kangaroos, but such a change in habitat structure is not captured by the single habitat assessment. Birds could also tend to stay in leasehold areas containing dams during the drought. This supposition is supported by a significant correlation between leasehold land and a ground layer described as 'short-medium height, medium density, fairly even'. The detection rate of Buff-rumped Thornbills on this ground cover type did not decline.

Yellow-rumped Thornbills showed quite a different pattern. There was no seasonal regularity in the detection rate, which increased in 2003 and declined dramatically in 2004. Examination of the trends by land tenure showed that this change took place on leased land, whereas detections in reserves showed a continuous decline. It is possible that the species moved to grazed areas with dams during the drought, but were unable to breed there due to the lack of eucalypt regeneration and shrub cover. The causes of the variation need further investigation by tenure, site and seasonal conditions.

Foliage gleaners/canopy feeders vs ground feeders

Several small canopy feeding species show relatively stable detection rates. These include White-throated Gerygone, Western Gerygone, Weebill, Striated Thornbill, Spotted Pardalote and Striated Pardalote. This is in contrast to several other small species that feed mainly on the ground or in lower vegetation layers (Willie Wagtail, Buff-rumped Thornbill, Superb Fairy-wren, Red-browed Finch).

Noisy Friarbird

This species was consistently more likely to be detected in reserves than on leased land, but the detection rate declined for both tenures during the survey period.

Noisy Miner

Noisy Miners were significantly more likely to occur on sites with little or no eucalypt regeneration and few or no tall shrubs. This vegetation structure is strongly correlated with grazed sites.

Rufous Whistler

The longitudinal detection rate for this species appears fairly stable. They were more likely to be detected on leased land

early in the survey period, but the detection rate declined more steeply on leased land during the drought (2001-2004).

White-winged Chough
The detection rate for this species increased during the drought. Analysis of numbers of birds recorded per site could show whether this was due to fragmentation of groups in the face of reduced resources. During the drought, the detection rate was stable on sites where tree health was moderate, but increased where tree health was good (associated with reserves). Choughs were mostly absent from areas where tree health was poor (probably grazed woodlands).

Common Myna and Common Starling
The detection rate for both species declined between 2001 and 2004. Starlings were more likely to be detected on leased land, but the detection rate for both land tenures declined after 2001, and there was an extra drop in Starling records in winter 2004. The results for both species could be due to the effect of the drought on survival and breeding. For both species there was a more marked reduction on sites where there were no mistletoes. It is not clear what has caused this. 38 survey sites have no mistletoes, including all 9 sites at Red Hill, and 18 of the 24 Mulligans Flat sites, 9 of the 18 being open forest rather than woodland.

4. CONCLUSIONS

4.1 Prediction Inference

A feature of data for most species is large inherent variability in the observed detection data, and evidence of large inter-year as well as large intra-year variability in detection rates. For these reasons, inferences relating to long-term trends based on simple linear effects may not be useful. Further, given the fact that prediction is inherently more difficult than estimation of trends (see Appendix 1) it is unlikely that precise (direct) prediction of long term outcomes will be possible. However, close inspections of long-term patterns summarised in the graphs provide useful information for indirectly assessing long-term trends. Clearly, the longer the period of survey the more confident indirect prediction will be.

4.2 Implications of trends

Results for individual species may vary, but it is notable that many more species showed a decline in detection rates than an increase. As discussed above, a broad range of species had declining detection rates, including resident and migratory species, native and exotic species, hole-nesters, and ground and canopy feeders. A number are common species which are usually considered to have adapted well to modified and simplified habitats. Even the fact that the same decline is seen in records of two feral species is of concern, as these species are opportunistic and adaptable.

The trends for many species show recent changes which are probably associated with the recent drought and severe bushfires. The increased rainfall in 2005 will affect the breeding and survival of birds, and future analyses may show differences in how quickly different species recover. Recovery from the effects of the January 2003 bushfires can also be charted. The Woodland Bird

Survey is providing data that will be useful in developing management guidelines for woodlands in reserves and on leasehold land in the ACT. The data can also be very valuable in adding detail to broader regional studies such as those being carried out by NSW Department of Environment and Conservation on the woodland birds of the sheep-wheat belt.

5. RECOMMENDATIONS FOR FUTURE INVESTIGATIONS AND ANALYSES

- Future analyses should be carried out using data from a period that begins and ends with the same season. This will reduce error in the linear trend for species that have a strong seasonal variation in occurrence or detection. If the whole data set is to be analysed, this could start with spring 1998 and finish with spring 2005. The statistician should be consulted about the reliability of the data in the first year of surveys, which are often at odds with the following series of surveys. It would also be desirable for the January 2003 bushfires to be marked on the horizontal axis of all the graphs showing trends in detection rates, as the fires appear to have had a significant effect on the trend for many species.
- The broad designations of 'leasehold' and 'reserve' are not the best descriptors of the condition of the woodlands for the purposes of statistical analysis. In future analyses, it would be better to use other parameters such as density of woodland, amount of eucalypt regrowth or shrub cover and structure/quality of ground layer which result (in part) from the grazing history of a site (as was done for some species in the current analyses). A measure of time since grazing and the intensity of recent grazing could also be included.
- Some habitat variables can change significantly after drought or bushfire. Immediate post-fire habitat reassessments at Red Hill and Lambrigg generally gave lower scores (due to loss of mature canopy, eucalypt regeneration, shrub layers, hollows and mistletoes) but single values have been used for habitat variables in the analyses, as though they were fixed for the survey period. It will therefore be necessary to carry out the habitat assessments again soon for each survey site, to allow these data to be updated for future analyses. It would be desirable for the surveys to be carried out by one person (using the quantitative data sheet) for consistency, preferably in spring 2006 or autumn 2007.
- Species of concern which appear in low numbers in the Woodland Survey despite the presence of apparently suitable habitat warrant more targeted surveys. These include:
  - Brown Treecreeper
  - Hooded Robin
  - Varied Sittella
  - Southern Whiteface
  - Diamond Firetail
  - Jacky Winter
  - Double-barred Finch.

  The current survey does not provide sufficient information to detect population trends in these species.

Sites known to contain these species could be selected from the COG database and added to the survey. If sites were added to the existing survey, it would be possible to minimise the volunteer input needed by reducing the number of surveys to one or two per year for the new sites, but doing them in season(s) appropriate for the detection of the target species. The data could then presumably be analysed with the target species records from the existing sites for the same season(s).

- There are sufficient sightings of Speckled Warblers, (120, in 11 of the 13 areas surveyed) to allow the habitat and distribution data to be analysed in more detail, with reference to recent research on the species in the ACT. This is not a priority species for further work within the woodland project.

- Other data in the survey and habitat database could be analysed separately, and may yield valuable insights into the condition of local woodlands. An example is data on tree hollows and hollow-nesting species, which come under particular pressure in woodlands managed for agriculture, and in areas subject to fire.

6. REFERENCES

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This report provides a statistical analysis, interpretation and discussion of COG 's Woodland Bird Survey. It covers the period from September 1998 to June 2004 and follows on from, updates, and expands on an earlier progress report. Prepared originally in April 2006 for COG and Environment ACT, it is republished here to make it available to the COG membership and general public. The text is essentially unchanged, however tables have been reformatted to fit the Canberra Bird Notes page size, and the map has been omitted. Limited copies of the original report may be available through COG 's Publications Officer.

Table 6. Summary of trends for species which occurred in more than 1% of surveys.
(`Unclear' trend = irregular detection rates, recent decline following stability, other non-linear trends which may be clarified by analysis of further surveys)

Species	Trends in detection rate (**Bold** = ACT threatened species)	Indicative Trend
Common Bronzewing	Detection rate steady, then increased during drought and after bushfires.	Increase
Crested Pigeon	Detection rate steady, then increased in 2004 (late drought, post-bushfires).	Stable
Nankeen Kestrel	Steady decline, possible increase late drought/after bushfires.	Decrease
Sulphur-cr Cockatoo	Detection rate high and steady, decrease autumn and winter 2004.	Unclear
Galah	Decline 1998-2001, increase during drought (2002-2004). Possibly birds moving from inland.	Unclear
Australian King-Parrot	Altitudinal migrant, forest-nesting. Slight steady increase, also noted in Garden Bird Survey.	Increase
Crimson Rosella	Detection rate fairly steady, possible decrease winter 2004.	Stable
Eastern Rosella	High detection rate, steady decline throughout survey period.	Decrease
Red-rumped Parrot	Decline 1998-2002, slight increase 2003-2004.	Decrease
Laughing Kookaburra	Detection rate varies slightly.	Unclear
Pallid Cuckoo	Steady increase until 2003, reduced detections in spring 2004 (Possibly late drought or post-fire effect).	Unclear
Welcome Swallow	Detection rate variable, possible slight decline	Unclear
Tree Martin	Detection rate variable, possible slight decline	Unclear
Grey Fantail	Analysis suggests decline, but detection rate possibly steady. Increased during drought where ground cover sparse.	Unclear
Willie Wagtail	Slight decline, with possible increase in winter 2004. Marked decline where eucalypt regeneration dense, slight increase where absent. See text discussion for Superb Fairy-wren.	Unclear
Leaden Flycatcher	Low numbers in spring/summer 2003, possible effect of Jan 03 bushfires.	Unclear
Scarlet Robin	Steady, but low numbers winter 2004. Possibly due to reduced breeding in forests post-bushfire.	Stable
Hooded Robin	**Detection rate irregular, with sharp decline in 2003-2004.**	**Unclear**
Golden Whistler	Steady increase in overwintering birds until 2004, then steep decline. Possibly due to lack of forest breeding areas post-fire.	Unclear
Rufous Whistler	High and relatively steady spring and summer detection rate. May have declined on leased land during drought.	Stable
Grey Shrike-thrush	Variable, with a steep decline 2003-04 (possible post-fire effect).	Unclear
Magpie-lark	Relatively steady detection rate.	Stable
Black-faced Cuckoo-shrike	Variable detection rate, with decrease in spring 2003 (possible post-fire effect).	Unclear
White-winged Triller	**Variable detection rate, high numbers summer 2003/04 — possibly due to inland drought.**	**Unclear**
White-throated Gerygone	Irregular, with lower numbers in summer 2000-01 and 2003-04. Very similar to Western Gerygone.	Unclear
Western Gerygone	As for White-throated Gerygone.	Unclear
Weebill	High steady detection rate, lowest in autumn and highest in winter.	Stable
Striated Thornbill	Detection rate fairly steady, with seasonal variation.	Stable
Brown Thornbill	Variable detection rate, peaks in winter. Steep decline 2004 — possibly due to loss of forest breeding habitat in bushfires.	Unclear

Buff-rumped Thornbill	Possible decline during drought. Associated with reserves, and native ground layer before drought.	Unclear
Yel-rumped Thornbill	Irregular detection rate, without clear seasonal effects. See text for discussion.	Unclear
Speckled Warbler	Irregular but apparently increasing detection rate. Widespread in survey area.	Unclear
Superb Fairy-wren	Steady decline, steeper in 2004.	Decrease
Dusky Woodswallow	Detection rates stable since 1999, higher on leasehold land than in reserves (see text).	Unclear
Varied Sittella	**Detections mostly low but variable, possible decline after bushfires. More often in reserves than leasehold.**	**Unclear**
Brown Treecreeper	**Detection rate low but fairly stable since 1999, more frequent on leasehold land than in reserves.**	**Unclear**
Wh-thr Treecreeper	Non-linear trend, with apparent decline since 2001.	Unclear
Mistletoebird	Possible slight decline in overall detection rate. Fewer records and greater decline in leasehold areas.	Decrease
Spotted Pardalote	Non-linear pattern. Winter/spring peaks, summer troughs. Low winter numbers in 2003, high in 2004.	Unclear
Striated Pardalote	Analysis suggests slight decline, may be stable. Spr and Aut peaks.	Unclear
Silvereye	Non-linear trend, with autumn peaks. Near failure of autumn migration in 2004.	Unclear
White-naped Honeyeater	Irregular detection. Absent summer, peaks autumn/spring (migration). Few autumn/04, possibly reduced breeding post-fire	Unclear
Br-head Honeyeater	Detection rate low, trend non-linear.	Unclear
Eastern Spinebill	Irregular, possibly relatively stable. Numbers high autumn 2004, low winter 2004.	Unclear
Yellow-faced Honeyeater	Peaks in autumn, spring (migration). High spring/03, low in following autumn. Possibly less breeding in ranges after fires.	Unclear
White-eared Honeyeater	Non-linear trend. Peaks of overwintering birds in lowlands, very high in winter following bushfires, but low in the next winter (2004). Possibly reduced breeding in ranges following fires.	Unclear
Wh-plumed Honeyeater	Possible slight decline in detection rate.	Unclear
Noisy Miner	Detection rate high and stable, until steep decline in autumn/winter 2004.	Stable
Red Wattlebird	Non-linear trend. Possible slight increase 2001-2004.	Unclear
Noisy Friarbird	Declining detection rate. More records from reserves, but declining under both tenures.	Decrease
Red-browed Finch	Non-linear trend. Apparent decline during drought.	Unclear
Double-barred Finch	Low detection rate, mainly on leased land. Increase in records from reserves in 2003-04.	Unclear
Olive-backed Oriole	Summer visitor, irregular numbers, apparent decline during drought.	Decrease
White-winged Chough	Increasing detection rate 2001-2004. Positive correlation with good tree health (see text).	Increase
Pied Currawong	Non-linear trend. Apparent decline in detection rate in winter 2004.	Unclear
Grey Currawong	Declining detection rate. Unclear trend following drought and fire.	Decrease
Grey Butcherbird	Fairly steady detection rate.	Stable
Australian Magpie	Detection rate stable.	Stable
Australian Raven	Steadily increasing detection rate, possible decline in winter 2004.	Increase
Common Myna	Steady decline in detection rate 2000-2004. Possible drought effect	Decrease
Common Starling	More common on leased land. Detection rate down 2001-2004 in both tenures, steeper in 2004. Possible drought effect.	Decrease

Table 7. Overal1 % change (based on the adjusted linear fit) in the odds of detection for species which occur in more than 1% of surveys, associated observed significance level (p-value) and approximate 95 % Confidence Intervals (bold figures are P < 0.05).

			95% Confidence Interval	
Species	**%Change**	**p-value**	**Lower Bound**	**Upper Bound**
Common Bronzewing	19.36	0.09	-3.19	47.16
Crested Pigeon	-0.86	0.93	-18.14	20.07
Australasian Grebe	6.16	0.69	-21.37	43.33
Australian Wood Duck	5.67	0.46	-9.12	22.87
Pacific Black Duck	-6.56	0.58	-26.93	19.48
Nankeen Kestrel	-8.52	0.52	-30.61	20.60
Sulphur-crested Cockatoo	2.21	0.65	-7.32	12.73
Galah	-3.25	0.39	-10.46	4.55
Australian King-Parrot	12.41	0.24	-7.76	36.99
Crimson Rosella	-0.93	0.77	-7.14	5.70
Eastern Rosella	-9.01	**7.23E-03**	-15.18	-2.39
Red-rumped Parrot	-15.52	**0.03**	-27.81	-1.14
Laughing Kookaburra	-5.89	0.46	-20.16	10.92
Pallid Cuckoo	10.02	0.53	-19.04	49.51
Welcome Swallow	-6.71	0.66	-31.64	27.32
Tree Martin	-24.42	**1.56E-03**	-36.67	-9.81
Grey Fantail	-7.98	**0.02**	-14.26	-1.23
Willie Wagtail	-22.93	**1.16E-03**	-34.34	-9.54
Leaden Flycatcher	-12.36	0.21	-29.14	8.39
Scarlet Robin	-0.93	0.89	-13.02	12.83
Hooded Robin	-18.57	0.15	-38.90	8.52
Golden Whistler	28.62	**1.98E-03**	9.33	51.31
Rufous Whistler	2.58	0.61	-7.06	13.23
Grey Shrike-thrush	2.02	0.79	-12.46	18.90
Magpie-lark	-9.80	0.13	-21.42	3.54
Black-faced Cuckoo-shrike	-22.49	**1.80E-06**	-30.31	-13.79
White-winged Triller	-10.48	0.48	-34.54	22.41
White-throated Gerygone	-8.32	0.17	-19.12	3.93
Western Gerygone	-5.02	0.56	-20.40	13.33
Weebil1	1.14	0.74	-5.45	8.19
Striated Thornbil1	6.60	0.19	-3.39	17.63
Brown Thornbil1	-4.66	0.54	-18.50	11.54
Buff-rumped Thornhil1	-6.85	0.07	-13.88	0.76
Yellow-rumped Thornbil1	-4.40	0.41	-14.19	6.52
Speckled Warbler	23.24	**3.79E-03**	6.69	42.37
Superb Fairy-wren	-8.52	**0.03**	-15.65	-0.79

Species	%Change	p-value	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Dusky Woodswallow	-21.16	**4.69E-02**	-37.94	0.14
Varied Sittella	-14.21	0.27	-34.97	13.18
Brown Treecreeper	-10.14	0.41	-30.62	16.39
White-throated Treecreeper	0.39	0.94	-9.15	10.94
Mistletoebird	-12.44	**0.04**	-23.22	-0.14
Spotted Pardalote	-8.67	0.05	-16.84	0.29
Silvereye	8.91	0.27	-6.58	26.98
White-naped Honeyeater	-22.13	0.11	-43.19	6.73
Brown-headed Honeyeater	8.44	0.38	-9.67	30.19
Eastern Spinebill	5.16	0.66	-16.49	32.43
Yellow-faced Honeyeater	16.39	**7.48E-03**	3.91	30.36
White-eared Honeyeater	3.85	0.65	-12.06	22.65
White-plumed Honeyeater	-19.48	**3.57E-04**	-28.67	-9.11
Noisy Miner	2.24	0.62	-6.45	11.74
Red Wattlebird	-6.31	0.18	-15.07	3.35
Noisy Friarbird	-21.57	**1.52E-05**	-29.89	-12.27
Red-browed Finch	-7.91	0.55	-29.95	21.06
Olive-backed Oriole	-21.65	**0.03**	-37.36	-1.98
White-winged Chough	12.65	0.13	-3.93	32.09
Pied Currawong	7.11	0.17	-3.13	18.42
Grey Currawong	-23.54	**9.63E-03**	-37.84	-5.94
Grey Butcherbird	7.98	0.45	-12.01	32.51
Australian Magpie	1.58	0.64	-5.02	8.64
Australian Raven	7.18	0.24	-4.74	20.60
Striated Pardalote	-6.81	**0.04**	-12.90	-0.29
Common Myna	-13.65	**0.03**	-24.49	-1.25
Common Starling	-26.75	**3.30E-09**	-34.04	-18.66

APPENDIX 1: Discussion of prediction and estimation of trends

By Ross Cunningham

The complicated mean and dependence structure in the models fitted to the bird detection data complicate discussion of the nature and form of prediction inference. Since the issues are all already present in much simpler models, it makes sense to simplify the context. Thus for simplicity we consider the very simple problem in which observed data $Y_1,...,Y_n$ are distributed as independent Gaussian random variables with unknown mean μ and known variance σ^2. In this context, the nature and form of prediction inference is considered by comparing it to classical inference for μ. Essentially the mathematical underpinning is provided to show that ***prediction is inherently more difficult than estimation and valid prediction inferences have to reflect this fact.*** It is worth emphasising that changing the model and introducing extra complexity
change the form of inference but not the conceptual issues underlying it.

Most statistical inference is concerned with estimating the mean μ. The usual approach is to use the sample mean

$$\overline{Y} = n^{-1}\sum_{i=1}^{n} Y_i$$

as the estimator of μ. The sample mean can be shown to satisfy

$E(\overline{Y} - \mu) = 0$ and $E(\overline{Y} - \mu)^2 = \sigma^2 / n$.

In addition , the sample mean has a Gaussian distribution so that

$U_\mu = n^{1/2}(\overline{Y} - \mu)/\sigma$ has a standard Gaussian distribution. By expressing probability statements about U_μ in terms of μ, we obtain the well known 95% confidence interval for μ of the form

$[\overline{Y} - 1.96\sigma / n^{1/2}, \overline{Y} + 1.96\sigma / n^{1/2}]$.

Now suppose we want to predict the value of an observation Y_k, $k > n$, which has the same distribution as $Y_1,...,Y_n$ and which is independent of $Y_1,...,Y_n$. Essentially, we need to replace μ by Y_k in the discussion leading to the above confidence interval.

However, μ is fixed and Y_k is random so now we find

$E(\overline{Y} - \mu) = 0$ and $E(\overline{Y} - \mu)^2 = \sigma^2 / n + \sigma^2 = \sigma^2(1/n + 1)$. The different form of the second expression is the key to understanding the difference between confidence

and prediction inference. In the prediction case, $U_\mu = (\overline{Y} - Y_k)/\sigma(1/n+1)^{1/2}$ has a standard Gaussian distribution so expressing probability statements about U_μ in terms of Y_k, we obtain the well known 95% prediction interval for Y_k of the form $[\overline{Y} - 1.96\sigma/(1/n+1)^{1/2}, \overline{Y} + 1.96\sigma/(1/n+1)^{1/2}$.

Since $\sigma > 0$, we see that the prediction interval is wider than the confidence interval for μ. In addition, as n increases we see that the 95% confidence interval tend to the point $\overline{Y}$, namely μ, while the prediction interval tend to $[\mu - 1.96\sigma, \mu + 1.96\sigma]$. In other words, with a large sample as is the case here, we can estimate μ accurately but we can never predict Y_k exactly. This is very important and explains why prediction intervals are observably wider than confidence intervals and much wider when n is large and the model does not account for much of the variation in $Y_1, \ldots, Y_n$.

***Form* A: COG Woodland Bird Survey: Sub-site Habitat Complexity Assessment**

Site **I Sub-site** **I Date** **I Observer**

	0	**1**	**2**	**Score**
1. Tree canopy >6m tall, % cover	<1%	1-10% >40%	11-40%	
2. Eucalypt regeneration <6m tall, % cover	<1% >50%	1-10% 26-50%	11-25%	
3. Number of tree species (>6m) (indicate species if known, and proportion)	1	2-3	4 or more	
4. Gross tree health: % of eucalypt canopy (al1 age classes) with significant leaf damage or loss	>50%	10-50%	<10%	
5. Tall shrubs/smal1 non-eucalypt trees (2-6m), % cover (indicate species if known)	<1% >50%	1-10% 26-50%	11-25%	
6.Shrubs 0.5-2m, % cover (indicate species if known)	<1% >50%	1-10% 26-50%	11-25%	
7. Fil1 in **only** if al1 shrub cover (0.5-6m) >20%:	0-25%	>25%		
8. Ground layer (if you wish, make notes on main grass species, level of grazing, bare ground, major weeds etc on back of sheet)	tal1 and dense **or** short and very sparse	short/medium height and density, fairly even	Patchy, tussocky, **or** with many sub-shrubs, varying height/density	
9. % of ground layer that is native	<10%	10-50%	>50%	
10. Log/branch/stump, % cover	<1%	1-10%	>10%	
11. Number of tree hollows	0	1-5	>5	
12. Number of mistletoes	0 >40	1-5 21-40	6-20	
TOTAL				

NOTES: Indicate other relevant features of site, e.g. proximity to water source, cleared land, exotic vegetation, houses, gardens, rubbish tip; isolated woodland patch, erosion, other damage/disturbance etc.

GRAPHS

The following graphs show the results of statistical analysis of data on 60 species that appeared in more than 1% of the surveys between September 1998 and June 2004. They illustrate:

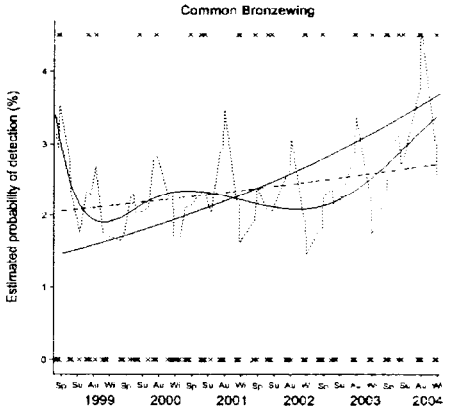
- Temporal trends in detection rates
- Association between habitat variables and tenure
- Differing profiles between reserve and leasehold land. In the tenure graphs, the red/brown dotted line denotes reserve land, and the solid black line denotes leasehold land.

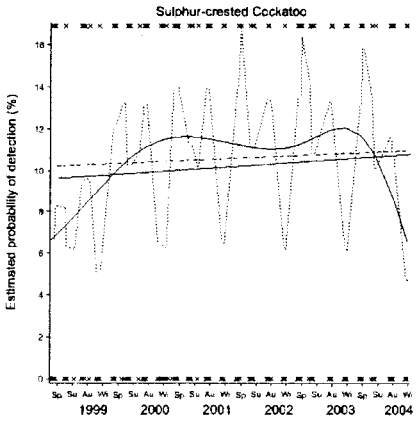
Editorial comment

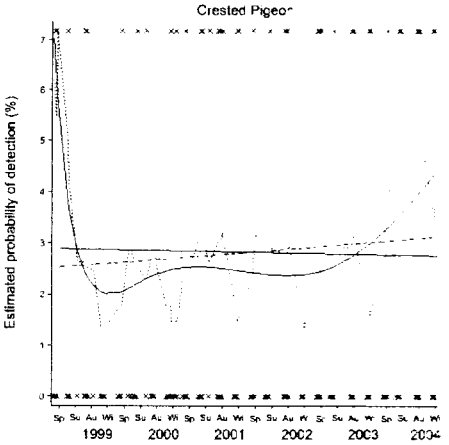
As Canberra Bird Notes is printed in black and white, some of the distinctness of certain curves by the use of colour in the original graphs is unfortunately lost. The use of variously dotted, dashed and solid lines should, however, still make the different lines in the graphs identifiable.

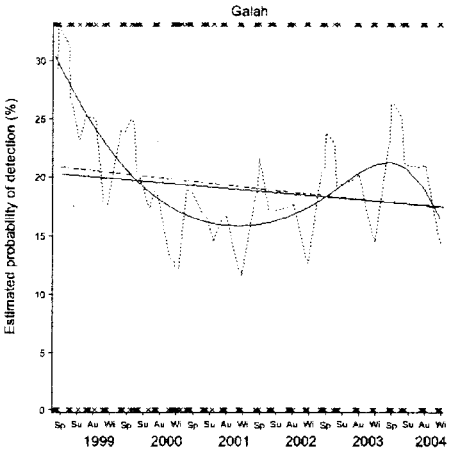
The graphs are presented in the same order as they occur in the original report. This follows a taxonomic order that differs to the standard taxonomic sequence of Christidis and Boles (1994) normally adopted by Canberra Bird Notes. The same is true of the discussion of species in the body of the report, and in Table 6 and Table 7. Also in keeping with the original report, scientific names of bird species are not included (except in Table3), however, all species are referred to by their common names as recommended in Christidis and Boles.

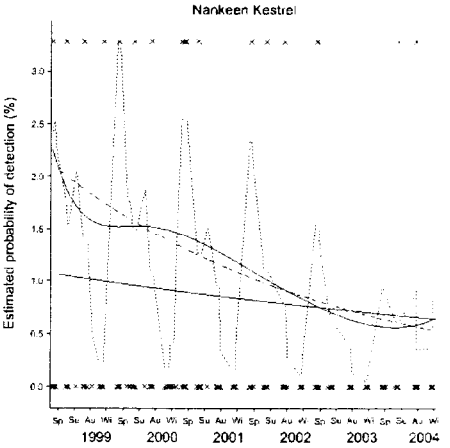
Christidis L and Boles WE (1994). The Taxonomy and species of Birds of Australia and its Territories. RAOU Monograph 2. RAOU, Melbourne.

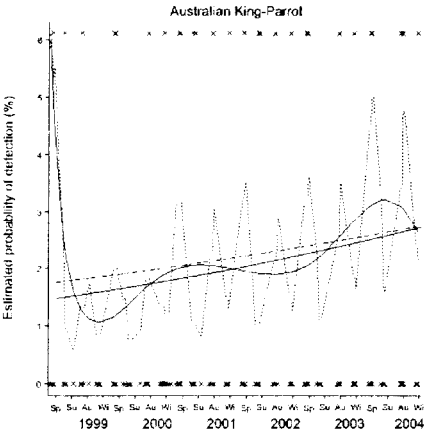

Common Bronzewing
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

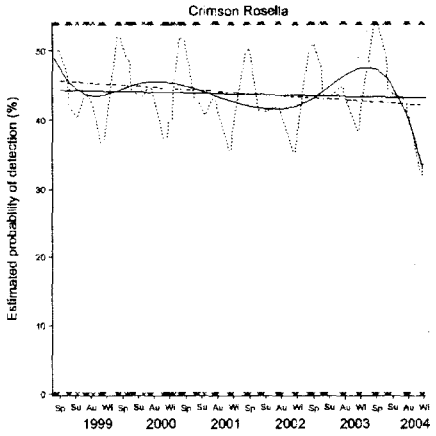

Sulphur-crested Cockatoo
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

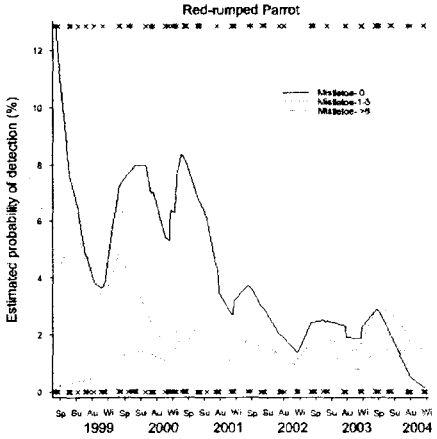

Crested Pigeon
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

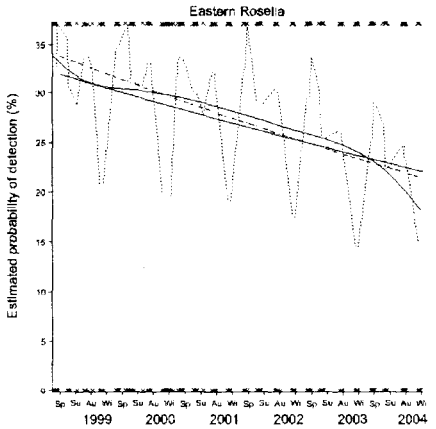

Galah
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

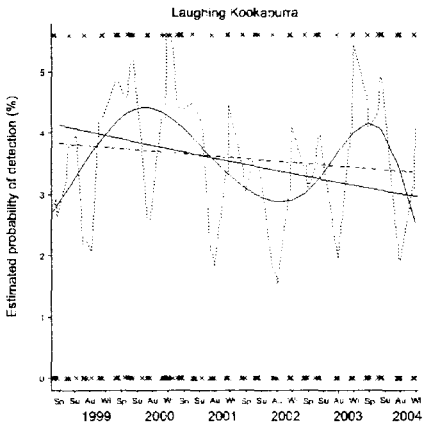

Nankeen Kestrel
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

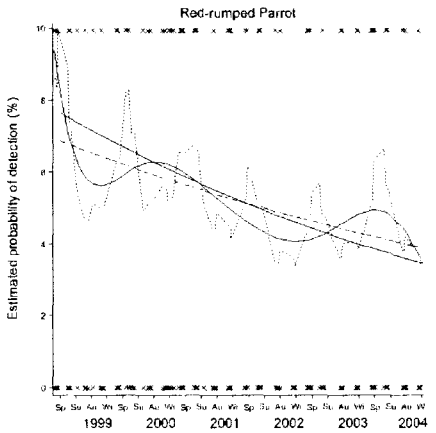

Australian King-Parrot
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

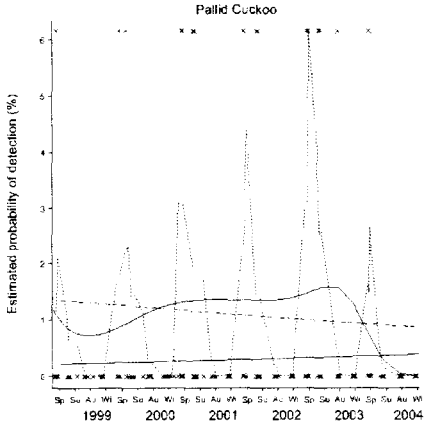

Crimson Rosella
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

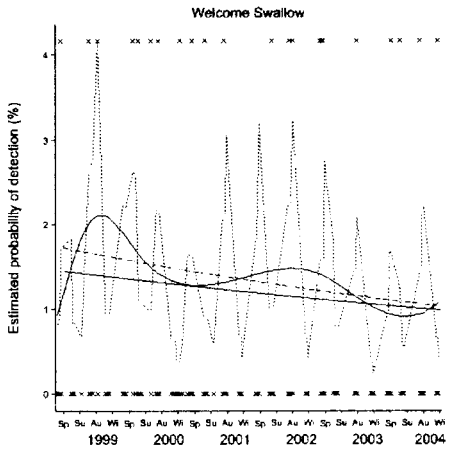

Red-rumped Parrot
Estimatec probability of detection (%)
1999
2000
2001
2002
2003
2004

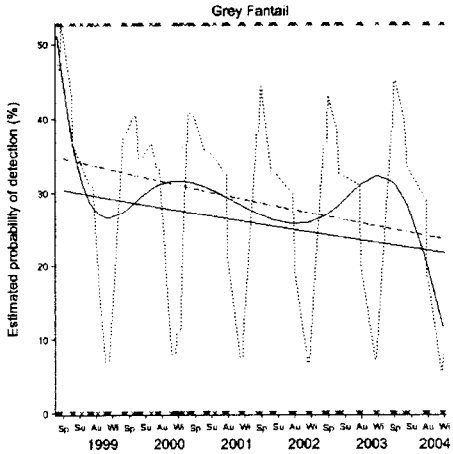

Eastern Rosella
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

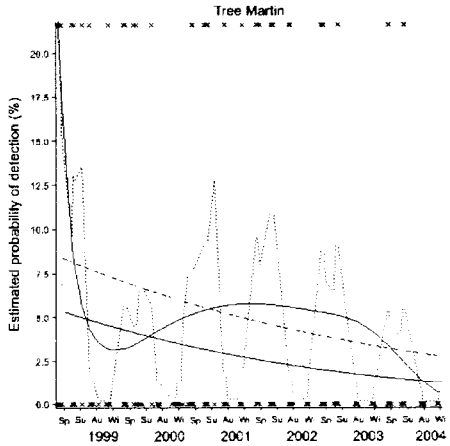

Laughing Kookaburra
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

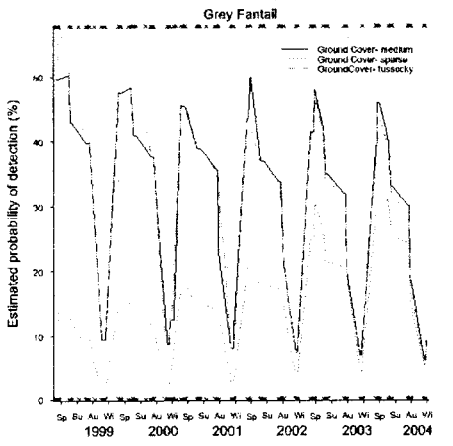

Red-rumped Parrot
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

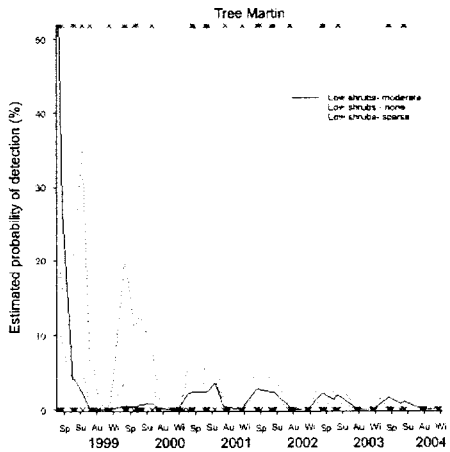

Pallid Cuckoo
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

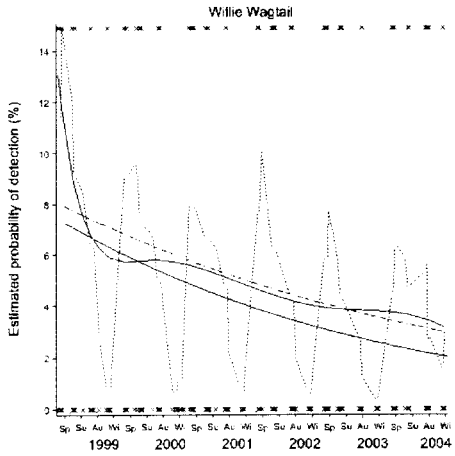

Welcome Swallow
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

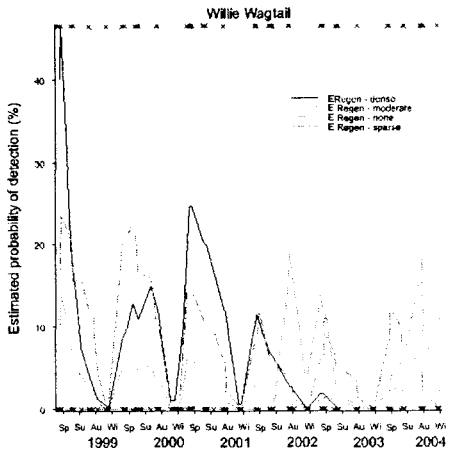

Grey Fantail
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

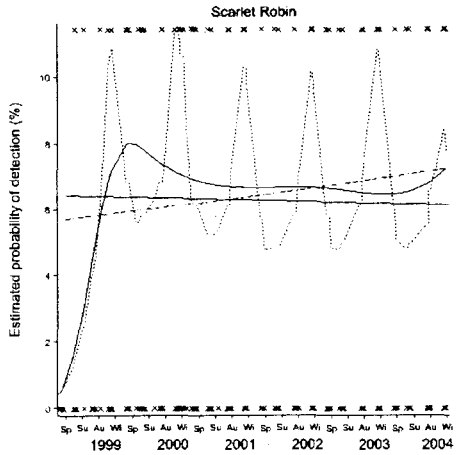

Tree Martin
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

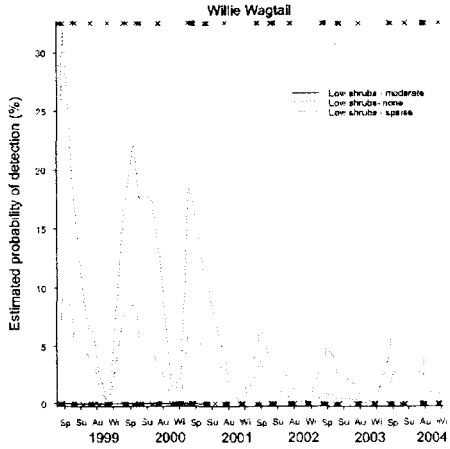

Grey Fantail
Ground Cover- medium
Ground Cover- sparse
GroundCover- tussocky
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

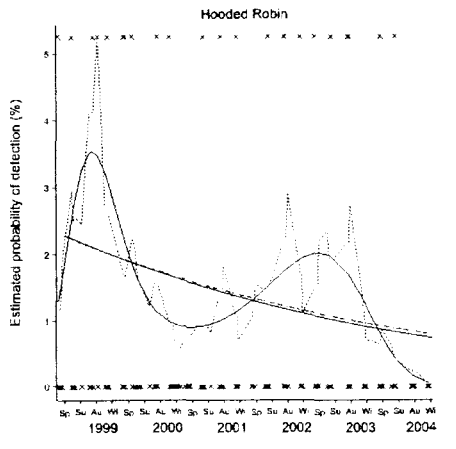

Tree Martin
Low shrubs- moderate
Low shrubs - none
Low shrubs- sparse
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

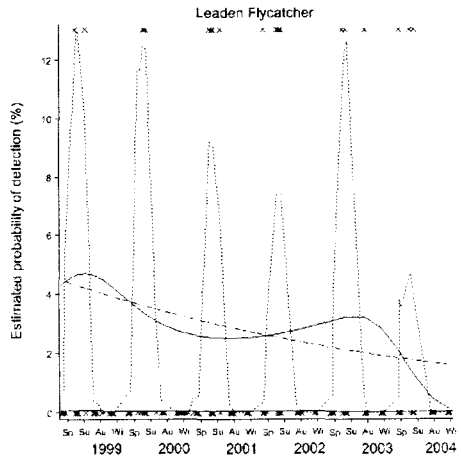

Willie Wagtail
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

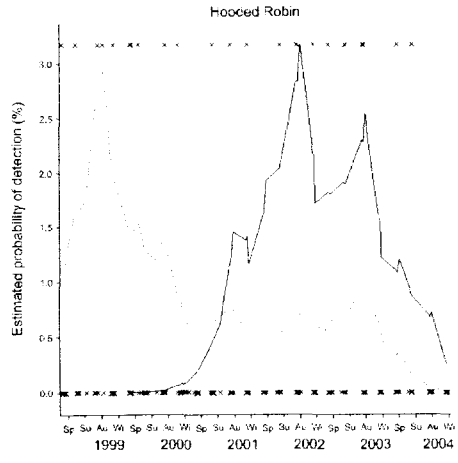

Willie Wagtail
Estimated probability of detection (%)
E Regen - dense
E Regen - moderate
E Regen - none
E Regen - sparse
1999
2000
2001
2002
2003
2004

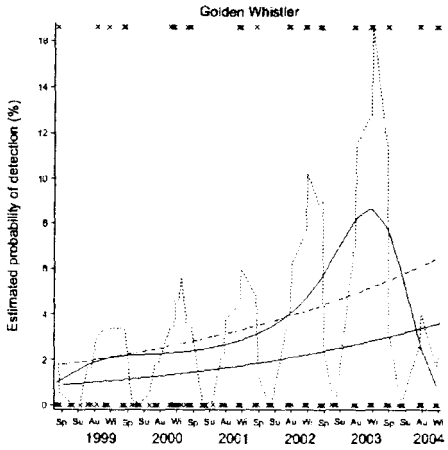

Scarlet Robin
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

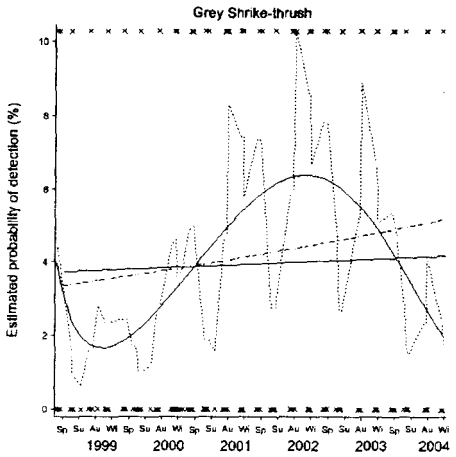

Willie Wagtail
Estimated probability of detection (%)
Low shrubs - moderate
Low shrubs - none
Low shrubs - sparse
1999
2000
2001
2002
2003
2004

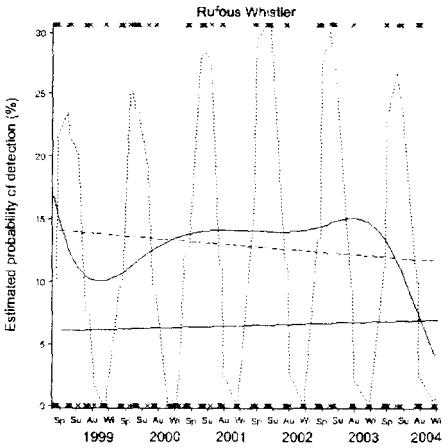

Hooded Robin
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

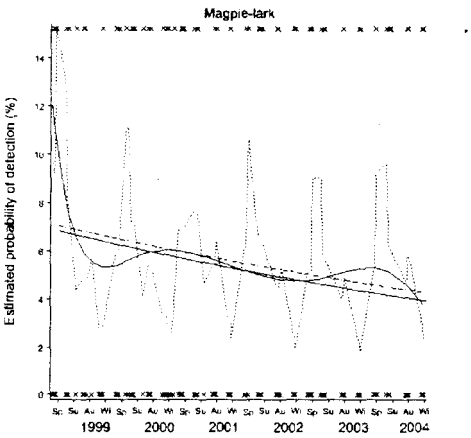

Leaden Flycatcher
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

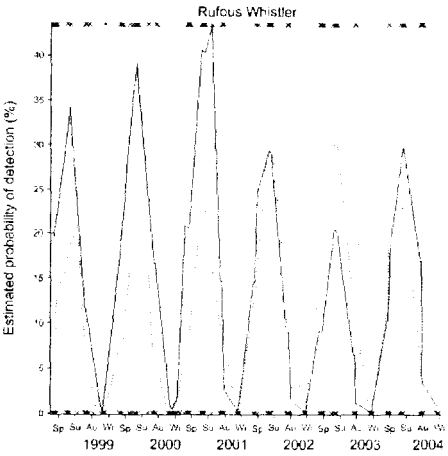

Hooded Robin
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

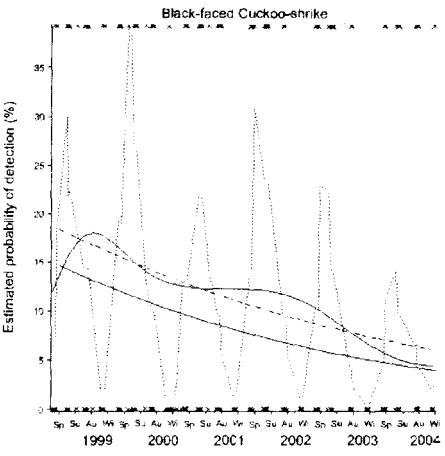

Golden Whistler
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

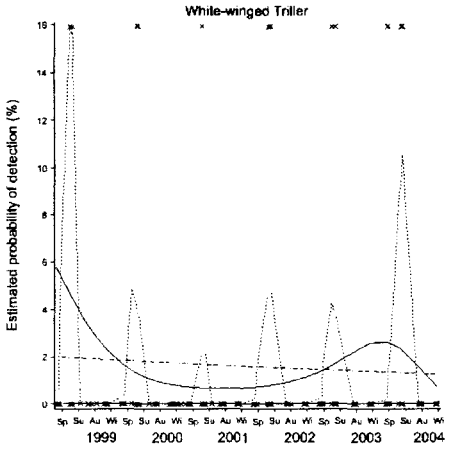

Grey Shrike-thrush
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

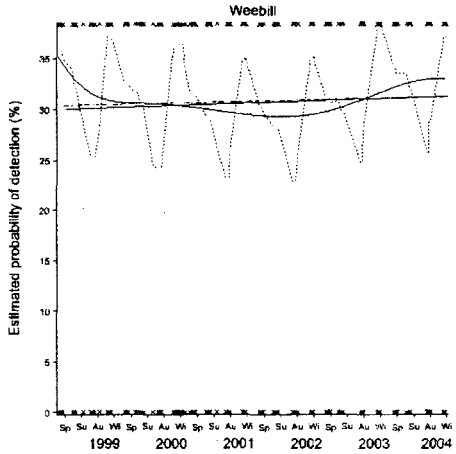

Rufous Whistler
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

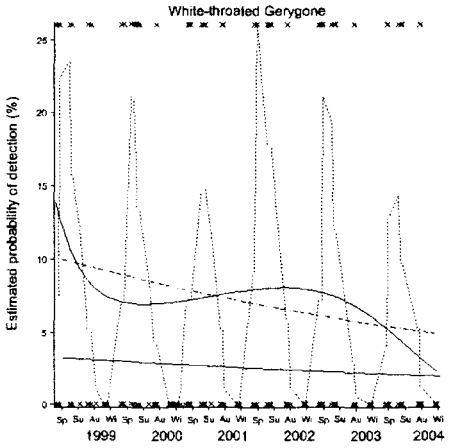

Magpie-lark
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

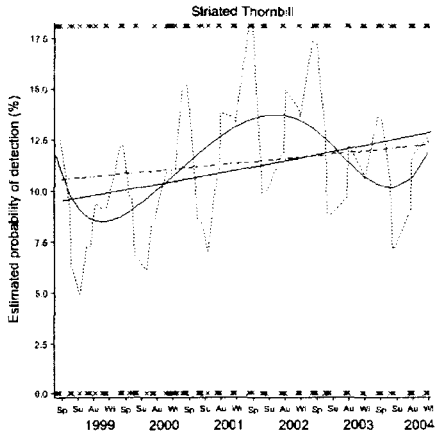

Rufous Whistler
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

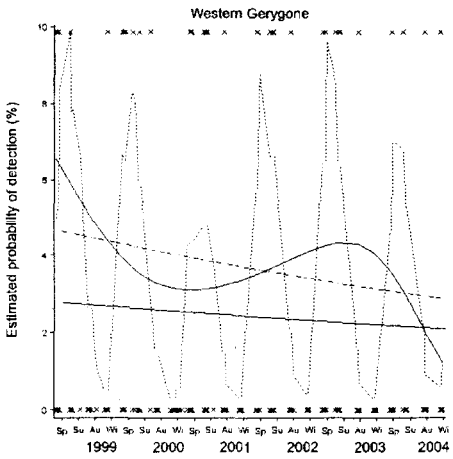

Black-faced Cuckoo-shrike
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

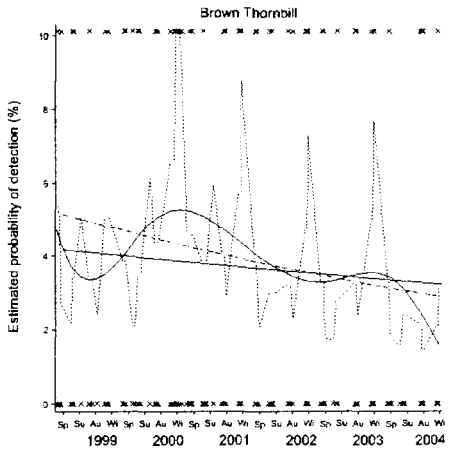

White-winged Triller
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

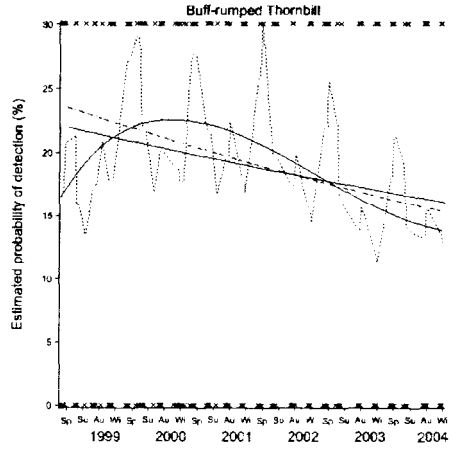

Weebill
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

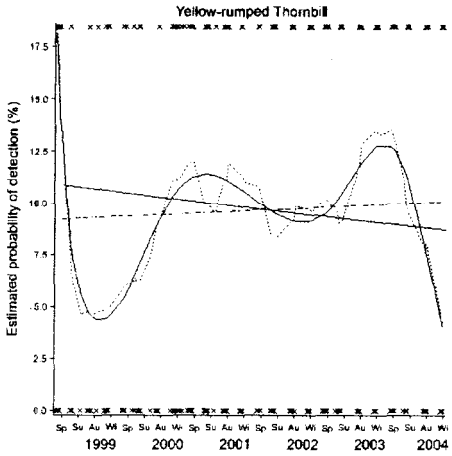

White-throated Gerygone
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

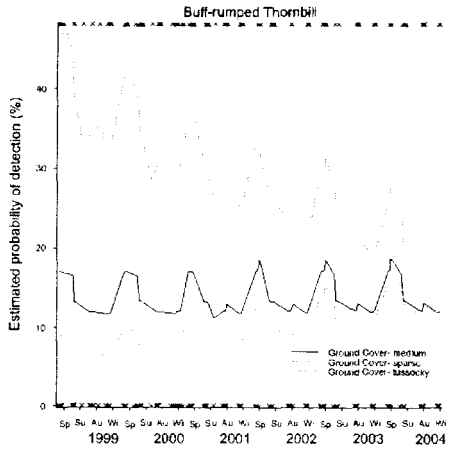

Striated Thornbill
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

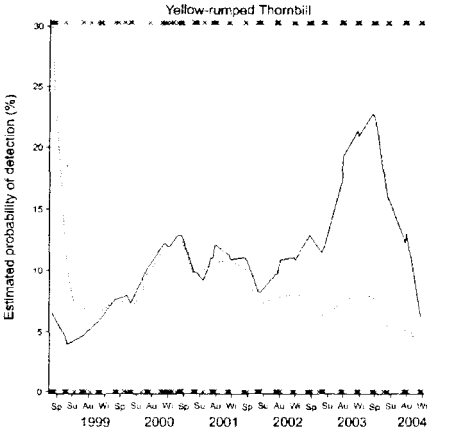

Western Gerygone
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

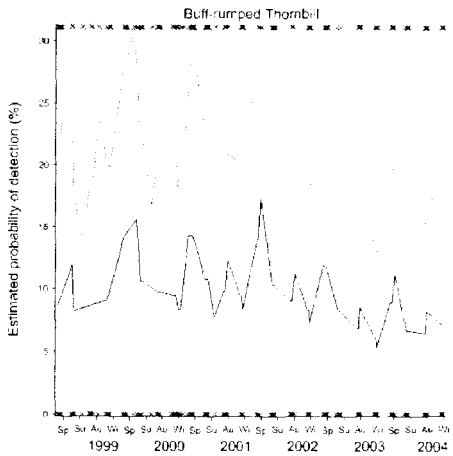

Brown Thornbill
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

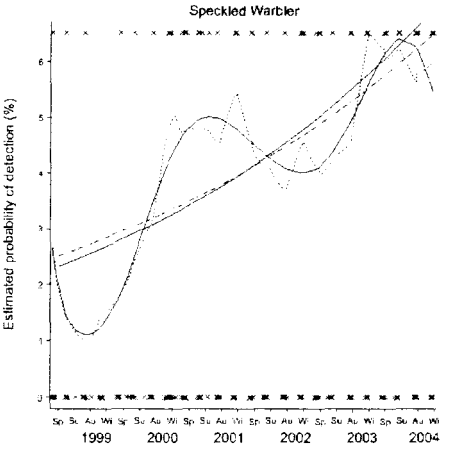

Buff-rumped Thornbill
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

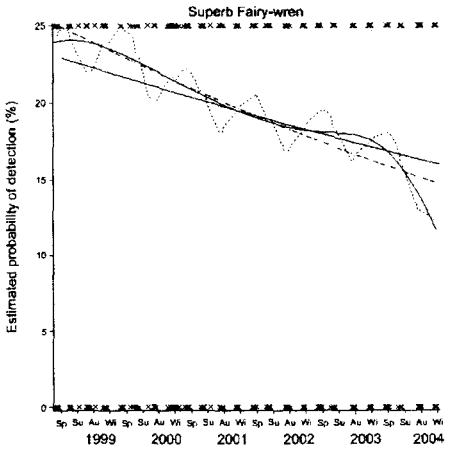

Yellow-rumped Thornbill
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

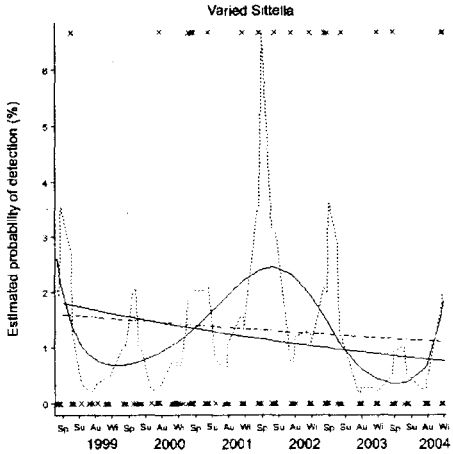

Buff-rumped Thornbill
Estimated probability of detection (%)
Ground Cover- medium
Ground Cover- sparse
Ground Cover- tussocky
1999
2000
2001
2002
2003
2004

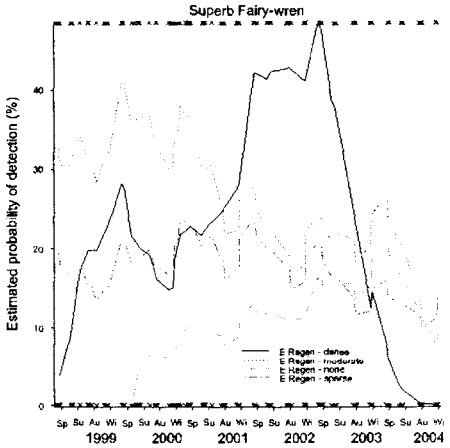

Yellow-rumped Thornbill
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

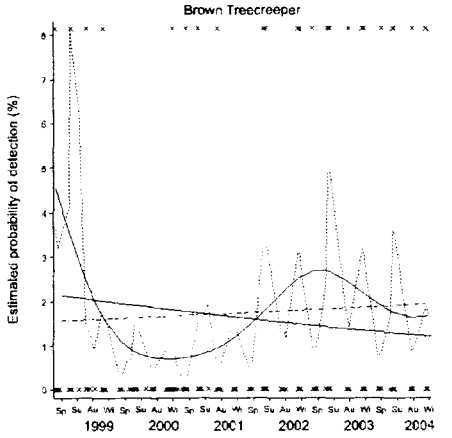

Buff-rumped Thornbill
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

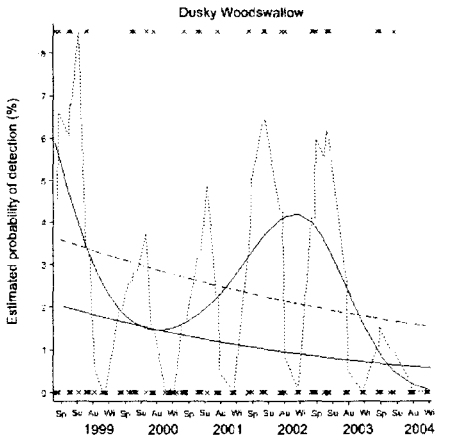

Speckled Warbler
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

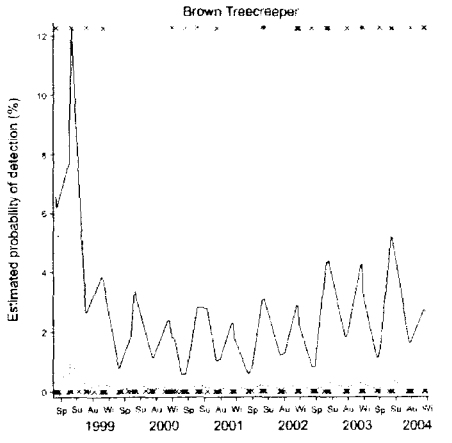

Superb Fairy-wren
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

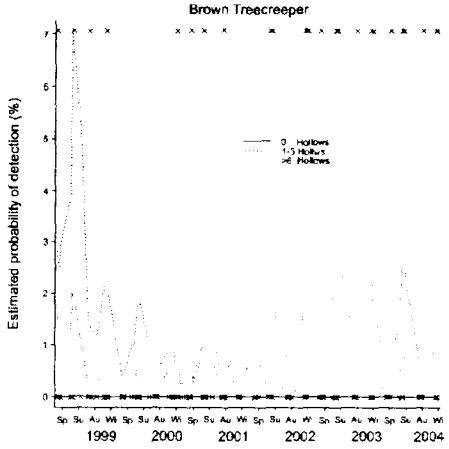

Varied Sittella
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

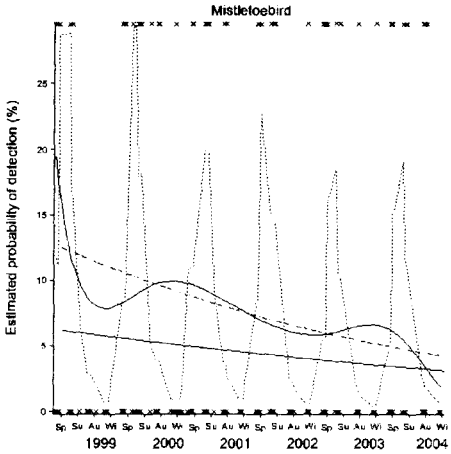

Superb Fairy-wren
Estimated probability of detection (%)
E Regen - dense
E Regen - moderate
E Regen - none
E Regen - sparse
1999
2000
2001
2002
2003
2004

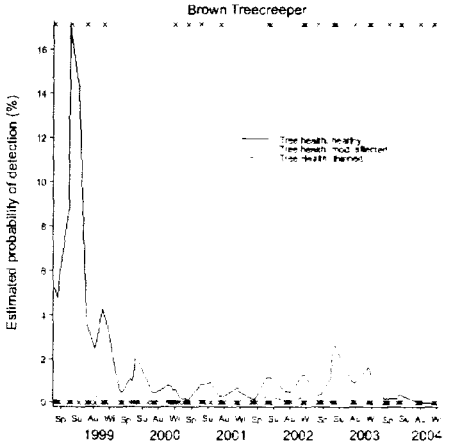

Brown Treecreeper
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

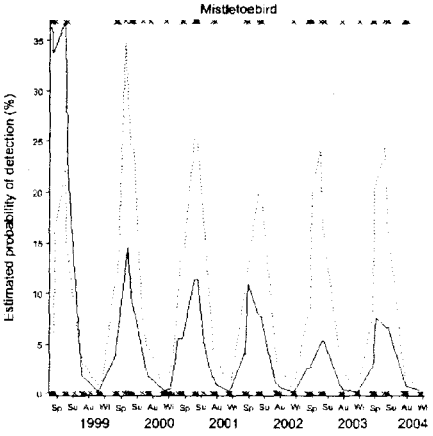

Dusky Woodswallow
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

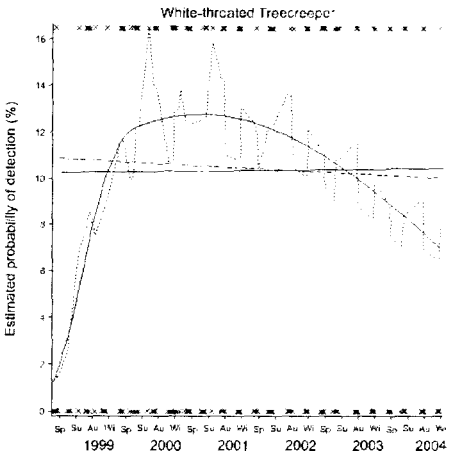

Brown Treecreeper
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

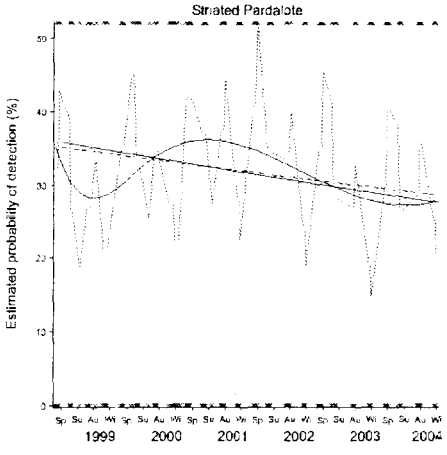

Brown Treecreeper
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

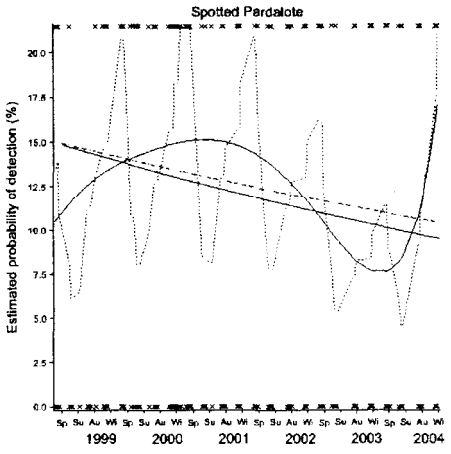

Mistletoebird
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

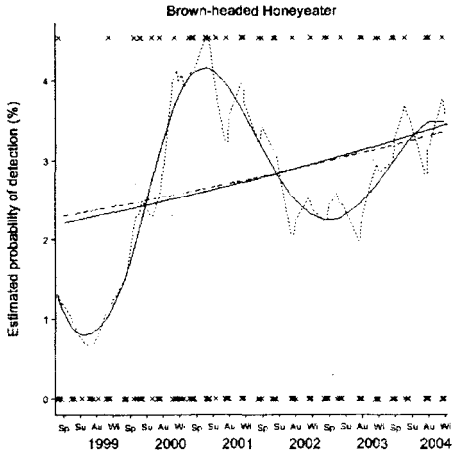

Brown Treecreeper
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

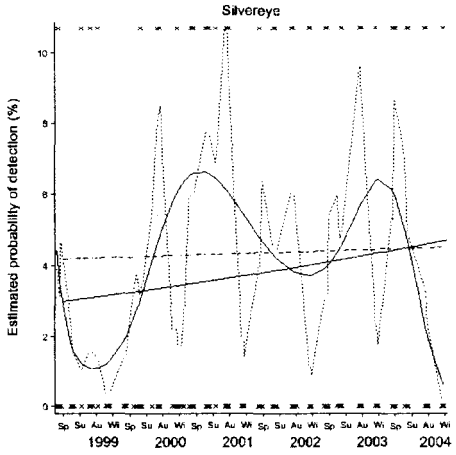

Mistletoebird
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

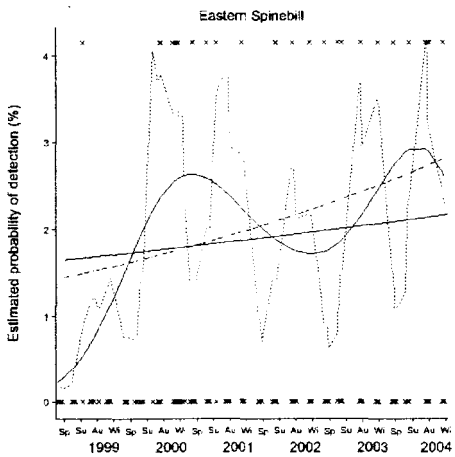

White-throated Treecreeper
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

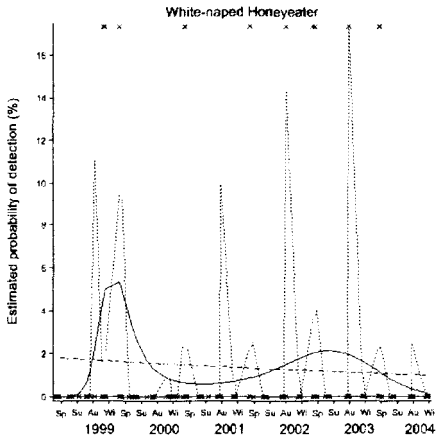

Striated Pardalote
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

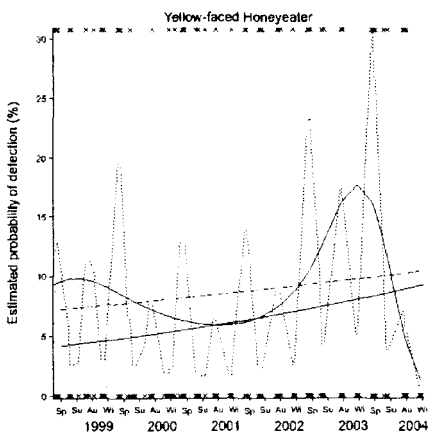

Spotted Pardalote
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

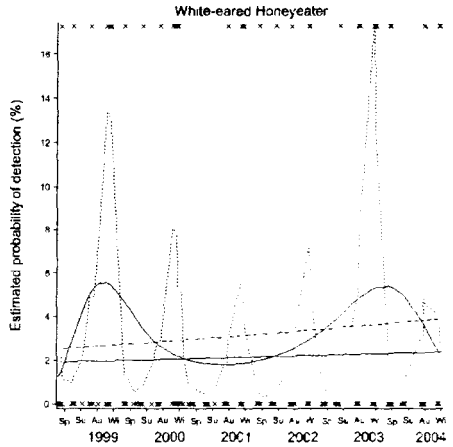

Brown-headed Honeyeater
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

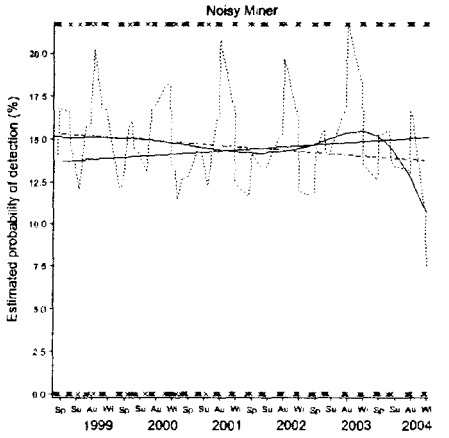

Silvereye
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

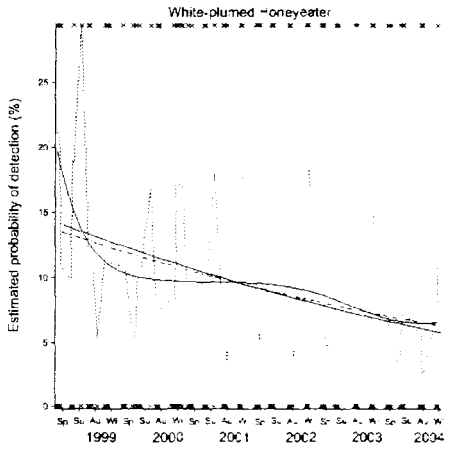

Eastern Spinebill
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

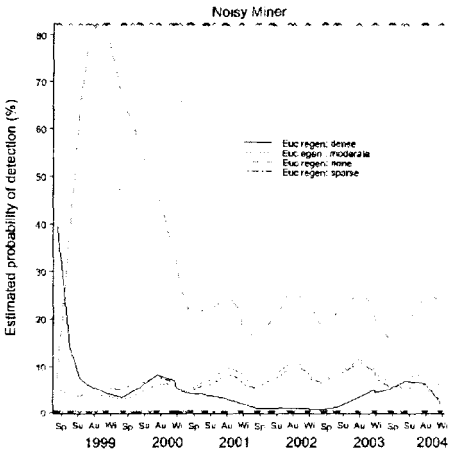

White-naped Honeyeater
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

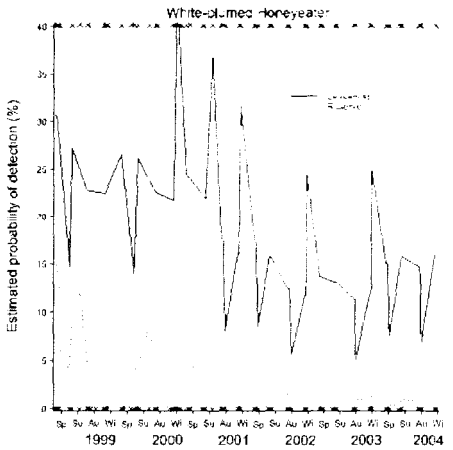

Yellow-faced Honeyeater
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

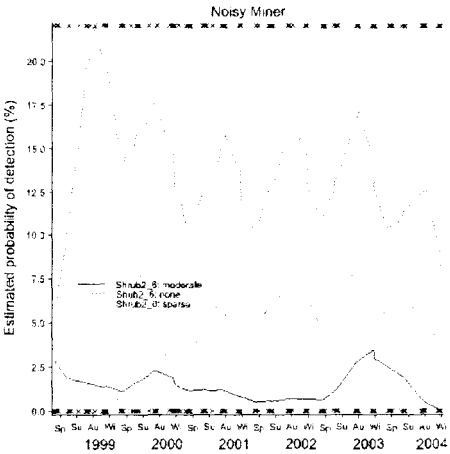

White-eared Honeyeater
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

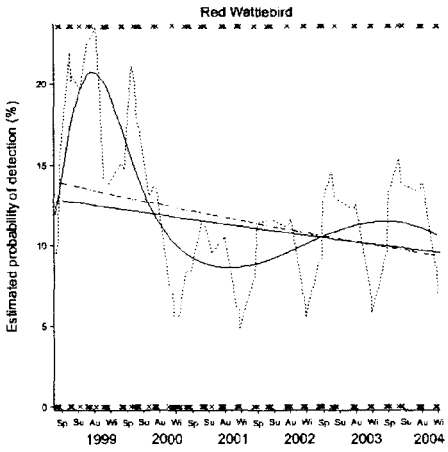

Noisy Miner
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

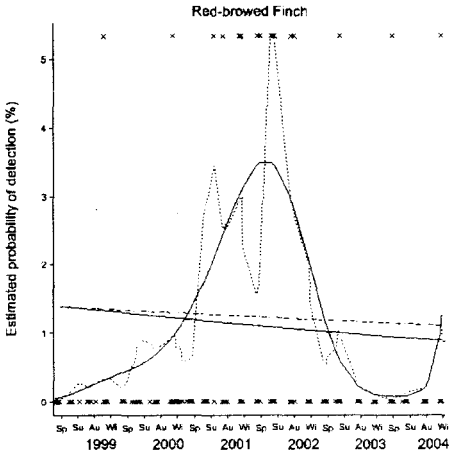

White-plumed Honeyeater
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

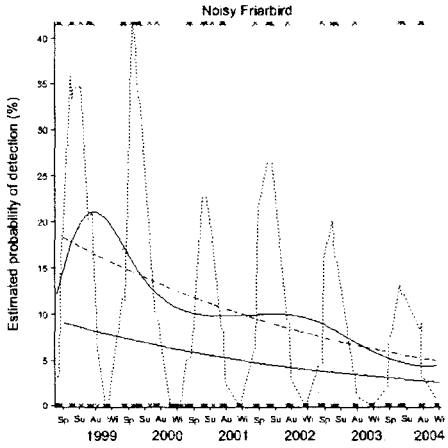

Noisy Miner
Estimated probability of detection (%)
Euc regen: dense
Euc regen: moderate
Euc regen: none
Euc regen: sparse
1999
2000
2001
2002
2003
2004

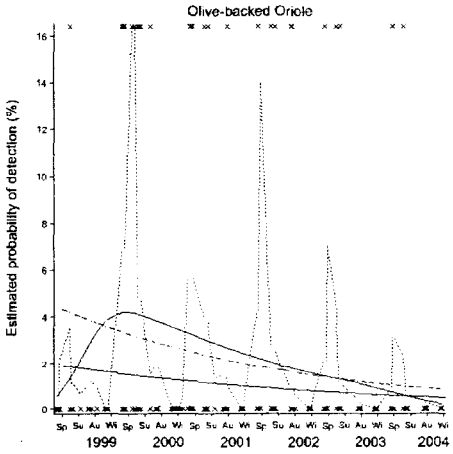

White-plumed Honeyeater
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

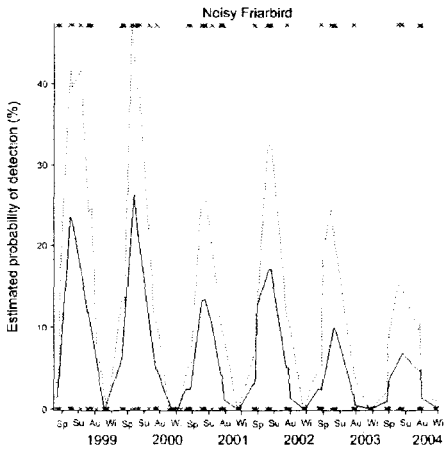

Noisy Miner
Estimated probability of detection (%)
Shrub2_6: moderate
Shrub2_6: none
Shrub2_6: sparse
1999
2000
2001
2002
2003
2004

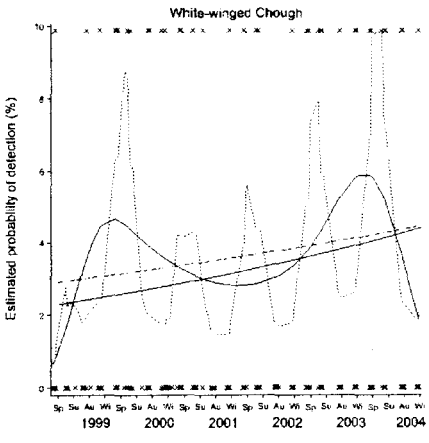

Red Wattlebird
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

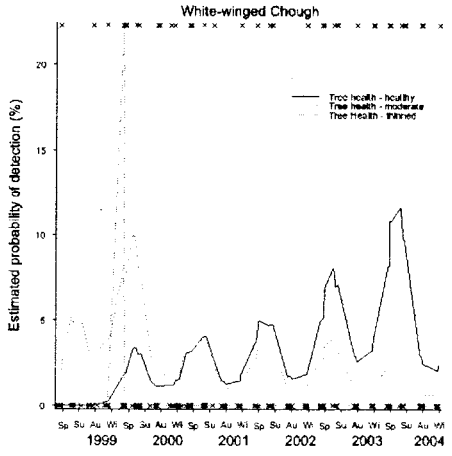

Red-browed Finch
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

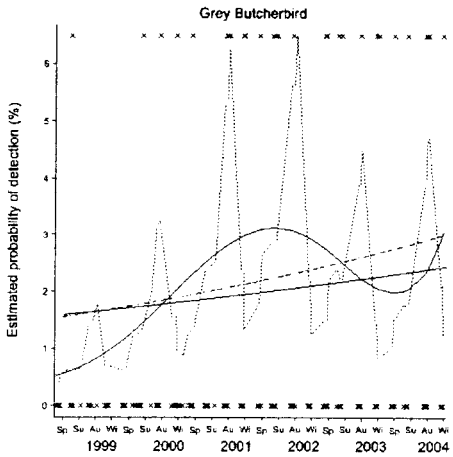

Noisy Friarbird
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

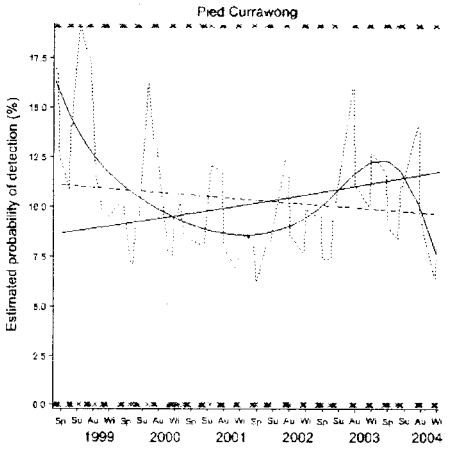

Olive-backed Oriole
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

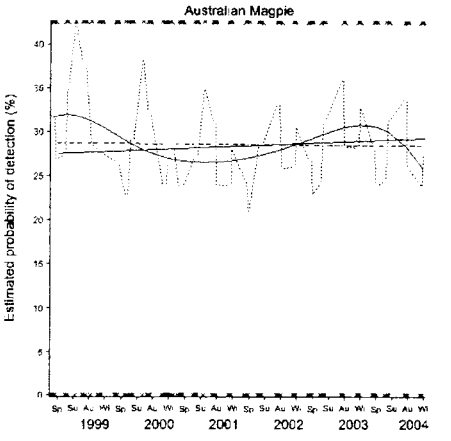

Noisy Friarbird
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

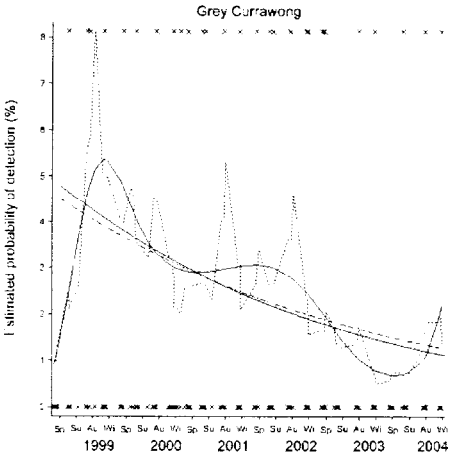

White-winged Chough
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

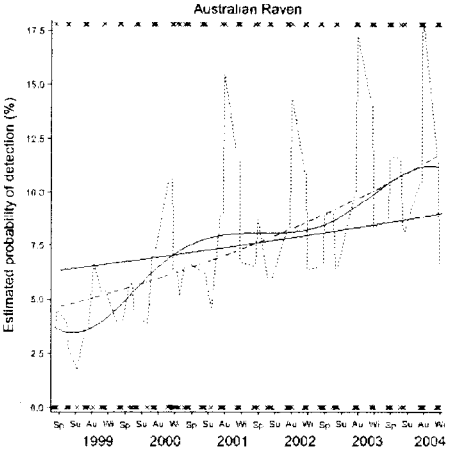

White-winged Chough
Estimated probability of detection (%)
Tree health - healthy
Tree health - moderate
Tree health - thinned
1999
2000
2001
2002
2003
2004

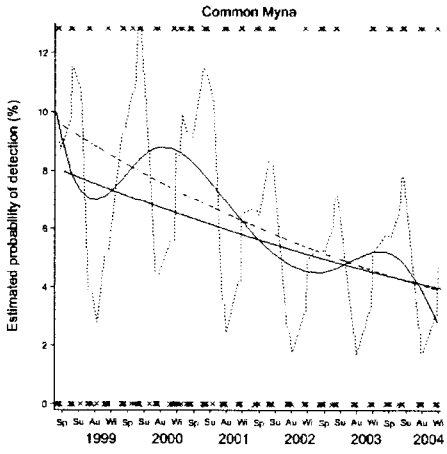

Grey Butcherbird
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

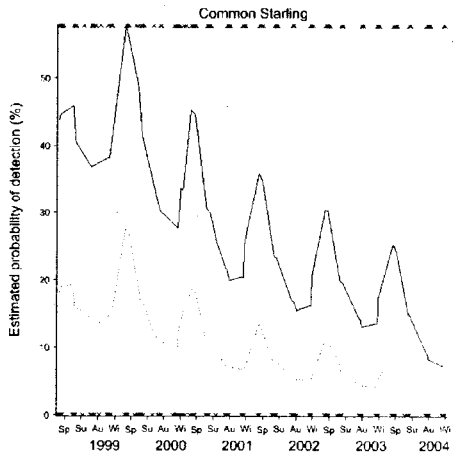

Pied Currawong
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

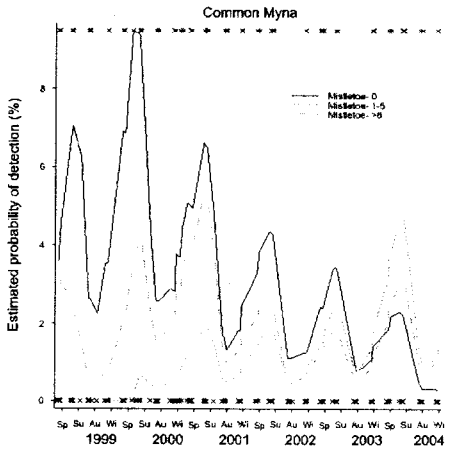

Australian Magpie
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

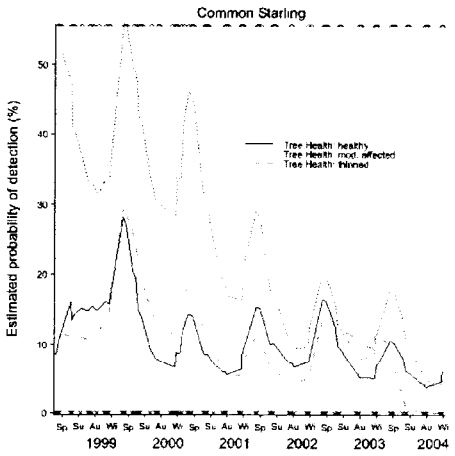

Grey Currawong
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

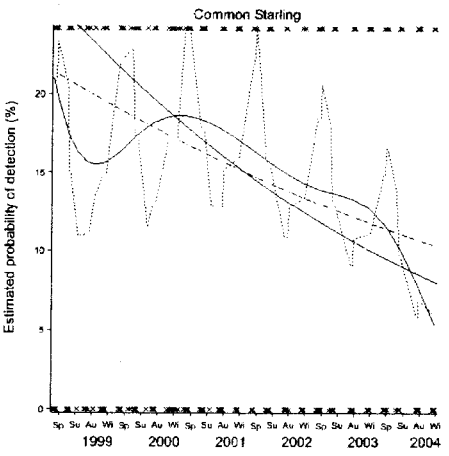

Australian Raven
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004

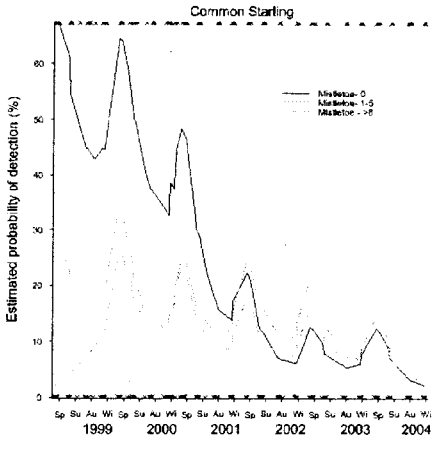

Common Myna
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004


Common Starling
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004


Common Myna
Estimated probability of detection (%)
Mistletoe- 0
Mistletoe- 1-5
Mistletoe- >5
1999
2000
2001
2002
2003
2004


Common Starling
Estimated probability of detection (%)
Tree Health: healthy
Tree Health: mod. affected
Tree Health: thinned
1999
2000
2001
2002
2003
2004


Common Starling
Estimated probability of detection (%)
1999
2000
2001
2002
2003
2004


Common Starling
Estimated probability of detection (%)
Mistletoe- 0
Mistletoe- 1-5
Mistletoe - >5
1999
2000
2001
2002
2003
2004

AUSTRALIAN KING-PARROTS BREEDING WITHIN THE CANBERRA NATURE PARK

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Abstract *Australian King-Parrots are now common in Canberra. However, despite the lack of any obvious breeding exodus, there are as yet no definitive records of the species breeding within the ACT. Several recent observations indicate that the parrots may be breeding in Canberra's dry sclerophyll woodlands. This article provides detailed observations of several pairs of King-Parrots in the Bruce Ridge and Black Mountain area of Canberra, that indicate that the birds are at least attempting to breed within the area.*

Not so many years ago the Australian King-Parrot *Alisterus scapularis* was an uncommon sight in the Canberra suburbs, being restricted to a few localities within the city. The bird is now to be found commonly throughout the suburban area and their increase has been well documented (COG 2000, Veerman 2002) with the Canberra Ornithologists Group now defining its abundance as common.

Their presence appears to be ubiquitous, they are recorded throughout the year (COG 2000. Veerman 2002) and there does not appear to be a major breeding exodus of the population. Yet to date there has not been any definitive recorded observations of the Australian King-Parrot breeding within the ACT. Despite the COG status of the species as a 'Breeding Resident', Davey (2002) noted the lack of breeding records within the ACT and in particular within the Canberra Nature Park. In addition he noted a recent observation of a female Australian King-Parrot entering a tree hollow within the Black Mountain Reserve and raised the possibility of parrots breeding within the dry sclerophyll woodland of the Canberra Nature Park.

Since November 2002 regular bird surveys have been conducted at Bruce Ridge and at the Black Mountain Reserve adjacent to Caswell Drive (see Davey 2004) in association with the Gungahlin Drive Extension (GDE) road-works. Australian King-Parrots are regularly recorded from both sites. This note reports on the *ad hoc* observations that would indicate that the birds are breeding within the area. **I** have provided detailed observations because of the lack of information within the literature. For instance, in the Handbook of Australian, New Zealand and Antarctic Birds (Higgins 1999), in both the 'Social Organisation' and the 'Social Behaviour' sections, details are described as 'poorly known' whilst the section on 'Breeding' notes that details are 'not well known and no studies'.

During 2003, pairs of Australian King-Parrots were observed inspecting tree hollows at various locations on Bruce Ridge and Black Mountain Reserve. Typically a female would be observed

entering or emerging from a tree hollow whilst the male remained on station nearby. Although pairs were observed inspecting hollows throughout the year, all but two observations were between September and January. For instance, in early October a female was observed emerging from a tree hollow (Kp3) and a week later at five other sites pairs were defending (Kp5, Kp3), or females seen entering and emerging from hollows (Kpl, Kp2, Kp4). On 15 November at another site (Kp7) a male was observed on station as a female appeared from a hollow and continued to inspect other hollows.

Trees were felled and chipped within the GDE corridor alongside the Bruce Ridge site during June 2004. Along Caswell Drive the felling occurred in August 2004. During the May and November 2004 and January 2005 surveys Australian King-Parrots were observed on four occasions inspecting or visiting tree hollows. In 2005 the birds were observed during the May, September and November GDE surveys at three locations. Between 20 and 24 September 2005 the author and Malcolm Fyfe conducted a series of transect-based surveys covering an area bordering the eastern edge of the GDE. Along Bruce Ridge the area covered was 8.4 ha whilst along Caswell Drive the area was 16.8 ha. On this occasion activity was observed at four sites, in particular an area adjacent to the GDE on Bruce Ridge where activity had been observed in the past. In this area activity had been seen in eight trees over the past two years. One of the trees was approximately 5 m from the edge of the cleared corridor of the GDE. Between September and early November 2005 this particular area was surveyed on an *ad hoc* basis. By early November it became evident that a pair of Australian King-Parrots was interested in one of the eight trees and from 7 November through to 16 January this study area was visited regularly by the author.

On 10 September 2005 an Australian King-Parrot had been seen looking out of a tree hollow (Kp5) within the study area. The tree was situated 28 m from the cleared corridor. On 23 September a female was seen entering a hollow in a tree (Kp8) adjacent to the cleared corridor of the GDE and 18 m from Kp5. On this occasion a pair arrived at Kp8, the female entered and the male remained on station. Within a couple of minutes a male that had been on station at Kp5 arrived and after much aggression between the two both returned to their respective stations. The next evening there were no signs of Australian King-Parrots within the area.

The next visit to the area was on the afternoon of 12 October and again there were no initial signs of Australian King-Parrots but within 20 minutes a male appeared from the opposite side of the cleared corridor in the direction of Calvary Hospital and landed at Kp5, calling softly. A female appeared from the hollow and both flew off further into the woodland on Bruce Ridge. The birds had not returned 30 minutes later. The next morning at 6:50 h a pair arrived at a different tree hollow (Kpl). This tree was 35 m from Kp5 and Kp8 and 50 m from the edge of the corridor. The male called softly to the female before and after she entered the hollow. Within a minute three other pairs had arrived and all were squabbling over the various hollows in the tree. At one stage two

females were seen emerging from the same hollow whilst one female was down a hollow for at least 15 minutes. By 7:17 h the area was quiet with no birds visible. By 7:21 h the four pairs had returned and again started to squabble at Kpl. By 7:25 h all birds had once again flown off from view but by 7:52 h birds were again squabbling over the hollows and this continued until I left the area at 8:00 h.

During a short visit to the area on 20 October a lone male was seen on station at Kpl. During a return visit on the morning of 7 November a male was again found on station at Kp1 when a female appeared from one of the hollows 10-12 m above the ground. After joining the male she preened and both flew off together over the cleared corridor in the direction of Calvary Hospital. A male was also observed on station at Kp5.

From then until 16 January I visited the area on 19 occasions. On 10 and 21 November a male was observed on station at Kpl. In addition to this male, on the 21' there were two pairs flying around the area. In both cases the females were making soft 'chick-chick-chick' sounding calls as they appeared to be chased about by the males. At 9:00 h a lone female flew in and was seen to look into a hollow at Kp8 but she flew off without entering. On 23 November there were no birds about but on scraping the base of Kpl a female appeared, perched at the entrance and returned down the hollow 10 minutes later. There was no sign of any birds during a 45-minute early morning visit to the area two days later.

On 5 December, after arriving on site at 9:00 h to find a male on station at Kpl, a female appeared from one of the hollows. Both started 'chattering' softly to each other and then flew off, perched in a tree 30 m away and five minutes later returned where the female perched on the lip of the hollow and preened before re-entering the hollow. Within 5 minutes the male flew off and did not reappear over the next 30 minutes.

There were no birds visible in the area on 7 December. I scraped the base of Kpl and a female appeared from one of the hollows. She remained perched on the rim of the hollow preening for the next 30 minutes before she disappeared back down the hollow. She was not disturbed by cyclists as they peddled by within 10 m of the tree.

From 7 December to 20 December the behaviour of the pair was similar with the male flying in, calling the female out of the hollow and both leaving the area together, although on occasions the female was outside the hollow waiting for the male to arrive. During this period the male was never observed entering the hollow.

On arrival at the area on 28 December a pair of Sulphur-crested Cockatoos *Cacatua galerita* were behaving in an unusual manner with much noise, head-bobbing, perching on the rim of hollow entrance and tearing away bark, peering into the hollows or apparently listening. This behaviour continued for about 15 minutes after which time the birds flew to a nearby tree and appeared to lose interest. From this date until 9 January the behaviour of the Australian King-Parrot pair appeared to change.

Typically, the pair would fly in together, the female entering the hollow whilst the male remained on station often at the rim of the hollow. After periods of 1-2 minutes the female would reappear and the pair would fly off together. The female would enter the hollow either forwards or backwards. On 9 January the female remained in the hollow for 10 minutes. During this period both birds were very defensive of the area, together chasing any nearby or passing Australian King-Parrots and looking into other nearby hollows. On 7 January at a tree (Kp 11) 160 m from Kp 1 and 32 m from the edge of the cleared corridor a pair was seen to behave in a similar manner; flying in, female entering the hollow for a short period then both flying off together.

From 11 to 16 January, despite daily visits of between one and two hours, no further activity was seen except for one occasion on the 14th when a lone male flew in. For seven minutes he looked into the various hollows at Kpl calling softly and then flew off silently out of sight.

Throughout the period of these observations there was much activity with earth moving and general machinery noise associated with the construction of the GDE. No further activity was observed from Kp5 and Kp8 after 21 October. Although observing for a few hours at the start of the day on unmarked birds cannot provide all the information to determine sequence of events, and although no young were observed at either Kp1 or Kp11, there is evidence to suggest that the Australian King-Parrots had every intention to reproduce within the area.

From 7 November, and possibly earlier, a pair had taken up residence within Kpl with the male often found on station and the female spending time within the hollow tree. From 5 December through to 20 December the female was resident in the hollow with the male elsewhere, the female only leaving the hollow on return of the male. From 28 December through to 9 January the pair visited the hollow for short periods only, with only the female entering the hollow.

The incubation and fledging periods of the Australian King-Parrot are three weeks and four weeks respectively (Higgins 1999). From the behaviour of the pair at Kpl it would appear that eggs were laid around the beginning of December, with incubation occurring over the next three weeks, followed by approximately two weeks of feeding by the female but the chicks never fledged. The odd behaviour of a male bird at the hollow on 14 January could suggest that something happened to the female. It is surprising that the male did not continue to care for the young, unless both female and young perished within the hollow at the same time.

All of the trees inspected by the Australian King-Parrots on Bruce Ridge and Black Mountain were similar to those described by Forshaw (1992) who states that the birds are regular occupants of open woodlands and that the 'nest is a hollow limb or hole in tree, usually in the trunk of a tall standing forest. Most nesting hollows are very deep, the eggs being at or near ground level.'

The trees were all alive and usually contained more than one hollow. The hollows were 10-12 m above the ground

and although the entrance varied in diameter from a tight squeeze to easy access for an adult Australian King-Parrot the diameter was too small for a Sulphur-crested Cockatoo. An estimate of the hollow depth was made by `knocking' on the trunk of the tree and all that were consistently visited appeared to be hollow down to or near to the tree base; a very uncommon and limiting resource within the area. This suggests that the birds have not started to utilise a new type of nesting resource but still prefer to nest in a traditional type of site, despite the scarcity of such a resource.

Although no detailed observations were obtained there is evidence to suggest that pairs of Australian King-Parrots have been interested in tree hollows within the study area since at least 2003. With the clearing of the trees for the GDE adjacent to the site during June 2004 the Australian King-Parrot has continued to show interest and has attempted to breed within the area. Whether this will continue remains to be seen.

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ODD OBS

Richard's Pipit imitating call of Stubble Quail

At about 10:00 h on 23 January 2006 **I** was at a site in Goorooyarroo Nature Reserve in the north of the ACT doing reptile surveys. While working I heard calls of Stubble Quail *Coturnix pectoralis* and Richard's Pipit *Anthus novaeseelandiae* in the area. This was nothing unusual as both species had been widespread in the reserve during the three or so months I had been participating in fauna surveys there. However, after a while I became aware that the quail call seemed to be coming immediately after that of the pipit, almost as if it was calling in response. Also the calls seemed to be coming from the same place. Curious, I wandered towards where **I** thought the calls were coming from and found a pipit perched two to three metres up in a dead tree. After watching it for a minute or so it was apparent that this bird was the source of both calls. I thought this was unusual, as I had never heard of pipits as vocal mimics. There was no mistaking the distinctive `pippy-wheat' call of the Stubble Quail; to my ear the pipit's rendition was identical to the real thing. The pipit called in this manner for at least five minutes.

A search through my books and an enquiry to COG's email list produced nothing to indicate that vocal mimicry by pipits had been reported before in Australia. I then started looking through some older literature and discovered that it was in fact quite well documented. Alec Chisholm published much on vocal mimicry in Australian birds from the 1930s to 1960s, and the earliest of his papers **I** could find (Chisholm 1932) contained a short entry noting the pipit as an occasional mimic of several bird species, including ravens, Australian Magpie *Gymnorhina tibicen*, Skylark *Alauda arvensis* and plover (probably Masked Lapwing *Vanellus miles)*. Mentions of pipits in later papers by the same author contained much the same information although one (Chisholm 1946) led me to a short note by Bourke (1943) that detailed an observation of a pipit imitating eight different species while singing a few metres from the author, who was in a photographic hide at the time. Species imitated were Red-rumped Parrot *Psephotus haematonotus*, Yellow-rumped Thorn bill *Acanthiza chrysorrhoa*, Zebra Finch *Taeniopygia guttata*, Australian Magpie, Black-fronted Dotterel *Elseyornis melanops*, Willie Wagtail *Rhipidura leucophrys*, Brown Treecreeper *Climacteris picumnus* and White-browed Woodswallow *Artamus superciliosus*. None of these accounts mentions Stubble Quail. **I** could not find anything published more recently, although my literature search was not exhaustive.

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Brown Quail in an odd spot

In recent times I've become quite used to flushing out Brown Quail *Coturnix ypsilophora* in the grasslands around Lake Ginninderra, two or three of them clattering out from underfoot and gliding back into the long grass a dozen or so metres away. The two likely locations are the grasslands around Rocky Knoll on Ginninderra Peninsula (particularly just south of the knoll), where they have also been reported by John Layton and Barbara Allan, and the grassy area north of Beissel Street on the western shore of the lake.

But on 20 May 2006 I came across a small group taking refuge in rather more atypical terrain. We (my wife, the dog and me) had almost completed our circuit of the lake and were walking along Emu Bank towards the car park just off Beissel Street at the southwest corner of Lake Ginninderra. At that point, the lake is bounded by a stone-covered embankment that forms a rather ugly square-shaped lagoon much favoured as a drop-off point for surplus supermarket trolleys. At the very southwest corner of this idyllic spot, just a stone's throw from Belconnen Mall and only metres from a busy road (Emu Bank), the dog started sniffing around a deep pile of leaves blown up against a bank below a small stand of trees. I went over to see what had sparked her interest and saw two brown bodies picking their way through the leaves. Until the first stuck its head up, I had assumed they were water rats or something, so I was quite shocked to see that they were actually Brown Quail. Not wanting to disturb them, we dragged the dog away and headed back to the car.

I went back a few minutes later and spotted seven Brown Quail now out of the leaves and foraging around on the paving. As I approached, they again trotted back into the cover of the leaves, which did provide excellent camouflage (except for the loud rustling noises whenever they moved). Given that it was around dusk on a rather chilly evening, it seemed at least possible that the quail were planning to spend the night huddled under the blanket of leaves.

So why were these quail so far from their normal habitat? Were they displaced by construction work on the eastern shore as Barbara suggested, or just misguided? Whatever the reason, they were no longer there two days later when I went back to check.

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BOOK REVIEW

Wedge-tailed Eagle, by Penny Olsen. Illustrations by Humphrey Price-Jones. Photographs by Peter Merritt. CSIRO Publishing, Melbourne, 2005. ISBN: 0643091653. Australian Natural History Series

Wedge-tailed Eagle provides a comprehensive account of Australia's largest true or 'booted' eagle and has been written by one of the foremost authorities on raptors. The format of the Australian Natural History Series is ideal for the author's style of writing which she describes as discursive rather than scientific. The 111 pages are crammed full of detailed knowledge sourced from personal experience and a comprehensive knowledge of the literature. Yet Penny's writing style is also able to express her admiration and respect for the subject matter. It is unusual to find someone whose personal knowledge is based on the study of both captive and wild birds and this book highlights the value that both types of study can provide to a full understanding of the ecology of the Wedge-tailed Eagle.

The book is well illustrated with line drawings by Humphrey Price-Jones and excellent photography by Peter Merritt. For those wishing to delve further into the subject a detailed bibliography is provided. It is unfortunate that the publisher mis-spelt the author's name on the spine of the book but few other typographical errors were noted by the reviewer.

The first chapter reflects on the author's personal dealings over a period of 26 years with a pair of captive birds that were unable to be returned to the wild. The following three chapters concern the relationships that the Aboriginal peoples had with the Wedge-tailed Eagle, early records from the time of European settlement and taxonomy. The author highlights the detailed powers of observation of the Aborigines and the incorporation of these observations into their societies and into their myths and legends. For instance, the interactions between Wedge-tailed Eagles and various corvid species appear to have --been particularly important in many aspects of Aboriginal culture. The chapter on taxonomy details the many differences between eagles and kites (feathered legs, feeble calls, consuming skin of prey) and notes that the Wedge-tailed Eagle, Gurney's Eagle, Golden Eagle and Verreaux's Eagle together form a super-species, each replacing the other geographically.

Chapter 5 'The eagle's country' discusses distribution, habitat and movement patterns. Here occasional statements of 'fact' may have benefitted from further detail. For instance, it is not clear whether the statement that males tend to return to the natal area is based on banding returns of the Wedge-tailed Eagle, on returns from other eagle species or because the males of most species tend to do this.

`Eagle specifics'- Chapter 6 concerns identification, interactions with other species, plumage, moult and feather care, calls and morphometric characters such as size, wing and tail and feet and bill

measurements. It is a chapter that highlights the author's detailed knowledge of both captive and wild birds and provides a good example of her discursive rather than scientific writing and for me brings life to the species.

The next chapter 'Flight and sight' at lasts put to bed the notion that eagles can read the *Canberra Times* from 500 m with one eye shut and a wing tied behind their back. The secret is not in visual acuity but in the detection of movement. If you have stayed awake at night wondering why the Wedge-tailed Eagle has a wedged tail then this is the chapter for you.

Chapters 8 and 9 cover 'Reproduction' (territory and nest density. courtship, mate choice and fidelity, the eagle's nest, time to breed and reproductive success) and 'From egg to adult' (egg laying, incubation weights and plumage development) and manages to answer a question that has worried me as I wander the corridors of power (between the kitchen and the tool shed): the conundrum of whether a female chick fledges at the same time or later than a male sibling.

The final two chapters deal with diet and threats. The former goes a long way to explain why the Wedge-tailed Eagle is, after Man, Australia's top predator with its ability to take the young of all medium to large species and by hunting cooperatively can take prey- up to ten times its own body weight. Although I was not surprised to read about the lack of impact caused by the Wedge-tailed Eagle to the livestock industry I was surprised to read that the author suggests that the 'number of lambs taken recently justifies the removal of eagles'(p. 85). This statement, if not a misprint, requires further explanation for depending on the reader the word 'removal' could have different meanings.

In summary, this book is an essential read for anyone interested in ornithology or ecology and highlights how far we have come to at last understanding the true role of Australia's top predator within the Australian landscape.

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COLUMNISTS' CORNER

More uses of birds: when the Roberts cease from Hawking, and the Russells Crowe no more

You do not need Stentoreus to tell you that the list of bird-related activities is long, varied and growing. Watching, counting, ticking, hunting, photographing, book-collecting, T-shirt buying, reading, breeding, feeding ... Stentoreus must confess to having once collected postage stamps with birds on them.

Now two events in the January quarter have underlined the importance of birds as a rich field for the trivia enthusiast. One was the visit to Canberra of Dr David Bird, a Canadian scientist and compiler of that trivia store-house *The Bird Almanac: The Ultimate Guide to Essential Facts and Figures of the World's Birds.* The other was the latest round in the COG Bird Quiz series.

A year or so ago a COG member took part in a quiz on ABC TV known as *The Einstein Factor,* taking 'Australian Birds' as his special subject. He won his first round, but in the next one seemed to fall victim to a certain vagueness in the questions. Giving the name of the Beatles' second film is rather more straightforward than answering 'What Australian bird lays the pointiest egg?'

On the COG chatline one member recently questioned the answer given in a magazine quiz to 'How many species of eagles occur in Australia?' The subsequent chatline exchanges showed surprising room for disagreement not only on the meaning of 'eagles' but on the meaning of 'occurs' and 'Australia'. To be honest, questions such as 'What is Australia's rarest bird?' call for a wild stab at what the questioner is most likely to think the answer is.

In successive COG quizzes (there have been at least three), questions like *What bird is known as a `grinnell'?* have been predictable. The person who will do best at these is probably not the person who has spent their formative years on Norfolk Island where `grinnell' is on everyone's lips, but the person who has taken a pre-quiz glance through the 1969 CSIRO 'Index of Australian Bird Names'.

At the recent quiz, a question was put which Stentoreus, a keen quiz observer, understands to have gone as follows: `List as many "famous" people as you can whose names are incidentally those of birds, like Christopher Wren, Bob Hawke, Andrew Peacock, Russell Crowe.'

One might quibble that 'famous' is a quality on which different umpires might take different views, but to dwell on that would be to risk missing the rolling vistas of trivia opened up by the question. First, you will notice that neither 'Hawke' nor 'Crowe' (nor `Peacock' for that matter) is an authorised species name. It seems that colloquial names and homophones, perhaps obsolete names, are acceptable, and why not plurals?

There are some nice Strine homophones that should earn points: 'seagull' as in George Segal, the noted actor; 'lory' as

in Bill Lawry (cricketer, and, appropriately, pigeon-fancier, and excitable commentator who gave us the useful chatline phrase `it's all happening at - !', coincidentally, both cricketer and bird being variably pronounced `LAW-ry' and `LORRY'); `loon' as in John Lewin (remembered in ' Loon's Honeyeater'); and so many younger people these days pronounce 'Friar Tuck' as 'Friar DUCK'.

Clearly, to do at all well at this you need to know a lot of words that are used as bird names. Some are reasonably familiar: 'crane', 'finch', 'drake', `martin', 'reeve', 'bunting', 'heron', `weaver' and 'whistler' come to mind. However, nobody has said that the bird names, unlike the famous people, need to be well known. If, as seems a good idea from past tournaments, you have made yourself familiar with the CSIRO list, you will also have available: 'barker', `spinks' (Leon, who shares this name with both the Chaffinch and the Jacky Winter, defeated Mahomet Ali to become the lightest ever world heavyweight champion), 'monk', `kelly', `grundy', 'piper' — and the kookaburra aliases, including 'jack' and 'john'. (Do not even think of suggesting Andrew Johns is not famous.)

I have a little book of British-breeding-bird names that provides `allan', `cooper', 'miller', `phillip' and "ruddock' — even a 'ran' (a Neville Wran homophone — although `wran' also qualifies as a form of 'wren'). Don't forget 'corby', Schapelle being in a famousness class of her own.

The New Holland Dictionary of Names makes the point that far from being *incidental* most people/bird names came from a nickname arising from a direct connection with the bird — perhaps an occupational one or a shared characteristic. Bill Hawke might have looked a bit hawk-like, and John Crowe might have caught crows. The same book provides a few more useful names, including corbett from the French for a small crow, which allows us Jim, the big-game hunter, Gentleman Jim, another famous pugilist, and Ronnie, the comedian, who makes a neat pair with Ronnie Barker.

A niggling worry is whether the judges will know all the bird names they'll need to know to do a fair job of judging. They will of course know that Sir Richard Fairey at one time had produced more than half the aircraft in use by the RAF, but will they know that `fairy' is a bird name?

My *Chambers Biographical Dictionary* lists 20 people called `martin' (and one `marten'). Frankly, although there is one saint and five popes, and they all have some claim to famousness, I wouldn't allow any of them except Kingsley Martin, the British newspaper editor. However, I would add Mary Martin (singer), Steve Martin and Dean Martin (actors), Johnny Martin and Damien Martyn, who both played test cricket for Australia, and Mick, the sturdy North Melbourne full-back. And maybe Ray Martin, the television personality; *he's* been around a *long* time. As the memory is stimulated, I think I can get a dozen legitimate `martins'. One David was a popular governor of NSW, and another, I think, a novelist, and Billy Martin was an ill-tempered manager of the New York Yankees who was always in the news.

Chambers Biographical lists ten people called 'miller' (and one `millar'). These are a better lot. I would allow Arthur (playwright), Glenn (bandleader), Henry (author), and of course the ultra-famous Keith (aka Nugget). Apart from those, I would certainly try the judges with Mick (Victorian police commissioner), and I think Ann was an actress or singer of some standing. At this point, I take a peek into my Aussie *Who's Who,* and find 33 allegedly famous 'millers' and 5 `millars'. There's *George* Miller, producer, director etc of 'Babe' (Golden Globe winner), 'Dead Calm', 'Mad Max' etc. Well if Crowey is going to be there, this guy just has to be up there with him. Brains ahead of looks, I say. Hang on! There's *Harry* Miller, the theatrical promoter. Want *famous,* do you? — what about *notorious?*

Now for `john'. Well, there's the famous apostle, and what about John the Baptist? Here's an interesting point: there were 21 'John' popes and two anti-popes, although in there was a non-existent 'Pope John XV', who confused the numbering. Of the other possibilities, some might go for Barry John, Welsh rugby player, and Elton John, on the assumption adopted names are OK, and of course King John.

Now what would be a good score for three minutes of serious thinking and scribbling? Ten, do you think? They're not trying. An on-the-ball team that immediately grasped the question and its possibilities should get at least 50. Indeed, 90 is possible, this being roughly the limit of average human writing speed, although 100 is theoretically achievable if the shorthand 'Pope John I-XXIII' is counted as at least ten. A strict judge might give that only one, but a more generous judge, ignorant of the problem with `XV', might even award the full 23.

A. stentoreus

Birding in cyberspace, Canberra-style

University-controlled tests have shown that birders fall into two categories: those willing to get up before dawn and be in place, bins poised, as the sun rises (typically people interested in bush birds) and those who prefer to linger *au lit,* professing greater interest in, say, the all-day-accessible water birds. Your columnist admits to falling somewhere between those extremes, having on some occasions remained in his sleeping bag as the sun rose, all the while taking careful (mental) notes of the birds calling outside the tent, with the genuine intention of adding those species to his survey records. It was interesting, then, to follow the discussion on Birding-Aus, the national birding information dissemination and discussion list, on **the first bird call of the day.**

A contributor named Lee posed the question:

> When I was on Fraser Island for Bird Week a few weeks ago I noticed that the first bird to start calling each morning was the Eastern Yellow Robin. Last weekend at the Bunya Mountains, again, the first call of the day was the Eastern Yellow Robin.
>
> Just curious if anyone else notices which birds in their areas are the always the first to call each day and if it's the same ones each day?
>
> Here in suburbia it's always Rainbow Lorikeets or Little Wattlebirds.

Peter Ewin replied to Lee, advising:

> I find Eastern Yellow Robins giving their 'pip-pip-pip' cal1 are one of the first birds to cal1 at most sites and this call is also one of the last in the evening...I have heard both White-throated Nightjar and Southern Boobooks call after EYR in the pre-dawn dark. Other early risers in SE Australia are Laughing Kookaburra, Australian Magpie and Pied Currawong.

Another correspondent stated that 'Up here at Maleny it's invariably the Eastern Yellow Robin', whereas a Brisbane contributor said that '**I** think crows might be the first to call here... Early risers, are crows'. Mick Roderick had a different observation, pointing out that '**I** have found that the EY Robins are the first to call during the "day proper", just on first light, but consistently I have found that if Kookaburras are in the area they beat the EY Robins by up to an hour, well before dawn'. The clincher came, though, from Glenn McRae: 'The genus of the Eastern Yellow Robin, I think, says it all. *Eopsaltria* literally means "Dawn Singer'. Probably you already knew that, but I didn't!

Most readers will have some degree of familiarity with the book, indexed by the National Library of Australia (NLA) as **Gould, J 1848, *The birds of Australia: in seven volumes,*** published by the author, London. My office calendar for this year is titled *John and Elizabeth Gould's Birds of Australia,* acknowledging that it was far from all John's work. But this book is exceedingly rare, not something that we all have to hand for ready reference. That was, until the NLA's digitising program began to produce its gems, one of which is this book in full text, from cover to cover (literally!). Clicking on http://nla.gov.au/nla.aus-f4773 will take you to it. Yes, all seven volumes plus the supplement are there. My 2006 calendar's June bird is *Platycercus pennantii,* Pennant's Parakeet. We now call it the Crimson Rosella. Clicking on the page illustrating the bird (it is page 51) enlarges it. Clicking on the navigation arrow at the foot of the page takes us to page 52 which is an image of Gould's page discussing this species. The NLA's rare books and journals digitising project is a quite wonderful service from one of Australia's finest cultural institutions.

We've all heard lawyer jokes, so what about **birder humour?** Well there are a number of web sites dedicated to this, one being Bruce Bowman's Birding Humor page http://www-personal.umich.edu/~bbowman/birds/humor/index.html. It's funny what some people find funny. What about this one, under the heading 'bird terminology':

> Bins...There were some Brits staying at a lodge I was at in Costa Rica. One said to another, 'Don't forget your bins.' They were at the breakfast table, so I assumed it had something to do with the hot cross buns or marmalade or tea.

But there is some really good stuff there, including the now-classic Birding-Aus posts by Melbourne birder Pat O'Malley, *New Field Guide* to the birds of Australia that **I** mentioned in a 2004 column in this series.

Birds and feathers: much can be said on the topic. One aspect discussed on Birding-Aus **I** found particularly interesting. (Do skip to the next section now if you already understand the various mechanisms by which birds change colours.) Evan Beaver from Lapstone in the Blue Mountains of NSW

wrote:

> When a bird comes into breeding plumage what actually must happen? Are feathers like hair, in that once they're grown the colour can't be changed? In which case, for a change to breeding plumage the feathers must be shed, and then a new one grown in its place, or do they grow the new feathers before the old ones fal1 out?...I'm mostly wondering because there's a Crested Pigeon that comes to visit every morning, and its colour seems to be slowly changing, becoming more vivid and contrasting, and I'm wondering if I'm imagining it.

A substantive response was provided by Chris Corben. Chris pointed out that `The new feathers grow from the same follicles that contained the old feathers. The new feather basically pushes the old feather out', and explained further:

> Birds can change into 'breeding plumage' either by growing in new feathers or simply through wear of the old feathers. The former is illustrated by a Curlew Sandpiper, which replaces most of its grey and white plumage with feathers which are largely black and red. The latter is illustrated by a male House Sparrow, which gets its black throat when the pale tips of the feathers wear off. Strictly speaking, there is no change in plumage in the case of the Sparrow, just a change in appearance due to wear.
>
> Some birds do both. An interesting case is the Red-necked Stint which moults grey feathers into black and rufous feathers with broad grey tips. So initially there is little change in overal1 colour until the pale tips wear off, revealing the bright colour underneath. This is even true of its red throat, since the new red feathers have broad white tips which have to wear off before the red becomes visible.

Eremaea Birds is a relatively recent addition to the many birding sites in cyberspace, provided at http://www.eremaea.com by Melbourne-based birders and data base designers Margaret Alcorn and Richard Alcorn. They advise that the site (and their company) is named after 'the Eremaean Biogeographical Region, the vast and magical desert region of the Australian outback'. Considerable interest is developing in its advanced data base resources, described thus: 'A free personal birding records database and world-wide bird atlas' and 'Eremaea Birds offers you a comprehensive personal birding records database and a global bird atlas built from all observers' records'. Although the site is relatively new, it is possible that birders worldwide may find it the ants' pants and submit significant numbers of observations. When I last checked, Eremaea Birds contained 250,345 bird observations of 3,647 species at 4,835 sites in 116 regions submitted by 41 observers, an encouraging start.

The site has a number of interesting features for you to explore, but I was particularly intrigued by its Birdlines: `moderated web sites for posting interesting and unusual observations'. The Victorian branch of Birds Australia (http://www.babblersnest.com) sponsors `Birdline Victoria' at Eremaea Birds, providing a facility for people to report interesting and unusual Victorian bird observations. Of course, this function is well served for the Canberra region by COG's email discussion and announcement list, CanberraBirds (http://www.canberrabirds.org.au/discuss .htm.), and the well-established process of reporting bird observations on COG's

data collection forms. The Eremaea Birds site lists five 'hotspots in the ACT with most of its records being from 1994 and 1995.

The previous contribution in this series highlighted Sean Dooley's book *The big twitch: one man, one continent and a race against time - a true story about birdwatching* and discussed the art and science of twitching. What a prelude that was to the twitchers' delight, the **Grey-headed Lapwing in northern NSW.** The birding community was alerted to it by Mike Carter (the person with the longest Australia bird list) on Birding-Aus on 24 Jun 2006, when he wrote:

> A Grey-headed Lapwing was seen and photographed by Brett & Karen Davis on 19 June at 11.45 at Burren Junction, NSW. It was seen near a grain silo from the highway just west of the town which is roughly half way between Narrabri and Walgett, 50km W of Wee Waa. It had a growth on the right foot but flew strongly. This is a new bird for Australia!!!! See you there!

A beautiful photograph of this Asian bird is on the Birding in India and South Asia web site (http://www.birding.in/) at http://www.birding.in/birds/Ciconiiformes/Charadriidae/grey-headed_lapwing.htm.

At the time of writing various teams of twitchers are heading for Burren Junction from all parts of Australia. This town, one pub and one store in size, is 684.98 km or 8 hours 8 minutes driving from Canberra, according to the online mapping and directions facility at www.whereis.com.au. **I** wonder what the locals are making of all the excitement?

Many of us have observed bird species interacting, e.g. dawn-singers or Pilotbirds feeding at the feet of lyrebirds, or Red-rumped Parrots feeding on seeds spilled by cockatoos in a tree above. What about **bird-platypus interactions,** though? One of these was described on Birding-Aus by Vikki Gibson, who wrote:

> readers may be interested to hear about a bird/platypus interaction we saw while visiting Eungella National Park in 2004. (One thing we noticed about the local platypus was they weren't shy like others we've encountered; perhaps because the drought dried up much of the waterway and forced them to be less secretive.) Anyway, we were watching a platypus happily bobbing around on the surface and diving for food, with its every move closely followed—literally—by a little black cormorant, who dived down, followed the platypus around under the water, and popped back up on the surface beside the platypus. We managed to get the little opportunist on video, and I reckon it deserves to win Funniest Home Videos!

A number of interesting additional examples were provided by Birding-Aus subscribers. One mentioned an underwater film shown on ABC-TV some time ago depicting Little Pied Cormorants following platypuses as they (the platypuses) dislodged stones from the bottom and stirred up food for the birds. Canberra birder John Leonard drew attention to the British ducks, advising that 'in Britain it is quite common to see dabbling ducks (Mallard, Shoveller) opportunistically following diving ducks (Tufted Duck, Pochard) around and feeding on whatever the diving ducks' activities bring to the surface'.

Graham Buchan reported observing both

Great and Little Egrets following groups of Little Black Cormorants feeding in the shallows. 'They are seen dashing to pick off smaller fish disturbed and missed by the Cormorants or are standing still necks outstretched at 45 degrees to suddenly lunge into the water and come up with a tiny flapping fish. A White-Faced Heron sometimes also joins in.' I'm sure that the editors of CBN would welcome your 'Odd Obs' of these types of interactions between Canberra region birds of various species.

To conclude on a topical note, I draw attention to the **Birds Australia Statement on Avian Influenza: 6 June 2006**, online at http://www.birdsaustralia.com.au/downloads/BA_statement_avainflu_jun06.pdf. (Your columnist's colleagues who work professionally in this area are convinced that we will have a pandemic of influenza in humans derived from avian influenza, and it will most affect the people least able to cope with it: the poor living in developing countries.) Birds Australia is to be congratulated for providing clear, well reasoned information on this topic, as much misinformation is circulating, especially about the role of migratory birds in the spread of the H5N1 strain and its possible impact on human populations.

The six-page statement describes the current outbreaks of avian influenza in Indonesia, Europe and other parts of the world and provides general information from Birdlife International about the issue including the following fact:

> There is no evidence that H5N1 infections in humans have been acquired from wild birds. Human infections have occurred in people who have been closely associated with poultry. The risk to human health from wild birds is extremely low and can be minimised by avoiding contact with sick or dead birds. However, there is a possibility that this virus could develop into one that might be transmitted from human to human. If this happens, then it is most likely to happen in South-east Asia, from where it could then spread rapidly around the world (p. 3).

The Statement goes on to discuss the risk of migrating birds bringing avian influenza to Australia (concluding that the risk is very low), noting that the most likely way the virus would reach here is through the importation of infected live birds or poultry products. It concludes with advice to people who are in direct contact with migratory birds and information about Birds Australia's ongoing activities with respect to avian influenza. A useful initiative from Birds Australia for which they should be commended.

T. alba

RARITIES PANEL NEWS AND ENDORSED LIST 67

This collection of endorsed “unusuals" contains many of the species which are either present in our region but are rarely reported, others which occur here from time to time, and two vagrants. All reports which were presented for appraisal on this occasion were endorsed. The Panel thanks those COG members who encourage the first person to observe an "unusual" to report it formally, whether that person is a member or not - but takes this opportunity to remind all persons that what is required is a report of what is seen or not seen, not an assertion as to the identity of the bird. The increased use of digital photographs is encouraged, even though the Panel is aware the camera can lie. The Panel also encourages members to continue to report unusual species on COG's chat line, not so much as a twitching opportunity but so that others can attempt to confirm the sighting. But do not assume that because a bird has had chat line coverage that someone has actually submitted an unusual bird report form (available under "forms" on our website www.canberrabirds.org.au) - do your own! After the report has been assessed by the Panel, and endorsed, all records of the same species in the same location in the same timeframe will be regarded as if endorsed and published as COG records - but please do not always rely on others to complete the form - the habit of taking field notes is a most useful exercise.

The Panel wonders how much more widely spread crakes and rails might prove to be in our region, if an equal amount of attention were addressed to suitable habitat elsewhere.

After previous anecdotal and unendorsed reports of Musk Lorikeets in southern suburbs, it is good to be able to confirm their presence. As Wilson (1999) stated in his *Birds of the ACT: two centuries of change*, they do turn up from time to time, though we are on the edge of their distribution.

The Brown Gerygone records are interesting, with members of the Panel surmising that the species could be more common in the ACT than previously thought. Being the archetypal "small brown birds", they may be overlooked. The Panel urges readers to keep an eye out for their prominent white eyebrow, plain white throat and breast, and regular calling, usually described as "which-isit", in locations offering their preferred damp habitat. Check out the excellent photos on our photogallery.

Two records were most surprising. The rather conspicuous, loud, and relatively unmistakeable Blue-faced Honeyeater at the ANU appears to have been the first record of this species in our region since being listed by Mathews in his 1943 publication. It normally occurs well to the north and west of the ACT. And we have yet another lone babbler in the ACT, this time a White-browed Babbler. It is unclear whether it reached the ACT of its own volition. The species was presumed extinct in the ACT by Wilson (1999).

ENDORSED LIST 67

Intermediate Egret *Ardea intermedia*
1; 17 Feb 06; Alastair Smith; Jerrabomberra Wetlands NP GrL14
Black Kite *Milvus migrans*
1; 4 Mar 06; Kevin Windle; Fyshwick Sewage Ponds GrL14
Grey Goshawk *Accipiter novaehollandiae*
1; 2 May 06; Martyn Moffat; Jerrabomberra Wetlands NP GrL 14
1; 3 May 06; Alastair Smith; Jerrabomberra Wetlands NP GrL14
Black Falcon *Falco subniger*
1; 16 Feb 06; Steve Holliday; Gorooyarroo NR GrM11
Lewin's Rail *Rallus pectoralis*
1; 17 Feb, 28 Feb & 6 Mar 06; Alastair Smith; Jerrabomberra Wetlands NP GrL14
1; 24 Feb 06; Steve Holliday; Jerrabomberra Wetlands NP GrL14
Spotless Crake *Porzana tabuensis*
2; 29 May 06; Geoffrey Dabb; Jerrabomberra Wetlands NP GrL14
Long-billed Corella *Cacatua tenuirostris*
1; 27 Jun 06; Geoffrey Dabb; Sturt Ave Narrabundah GrL15
Musk Lorikeet *Glossopsitta concinna*
2-4; 10-24 May 06; Adam Fitzgerald; Chapman Oval GrJ 15
2; 14 May 06; Alastair Smith; Chapman Oval GrJ 15
2; 14 May 06; Sue Lashko; Chapman Oval GrJ15
Fork-tailed Swift *Apus pacificus*
10+; 23 Dec 06; Julian Reid; Dutton St Dickson GrL 13
Brown Gerygone *Gerygone mouki*
2; 17 May 06; Marnix Zwankhuizen; Westbourne Woods GrJ 14
6; 5 Jun 06; Tom Green; Marble Arch GrY24
Little Friarbird *Philemon citreogularis*
1; 20 May 06; Rosemary Bell; Ellery Cct Acton GrK13
Blue-faced Honeyeater *Entomyzon cyanotis*
1; 3 May 06; Tony Martin-Jones; ANU GrK13
1; 20 May 06; Alastair Smith; ANU GrK13
Pink Robin *Petroica rodinogaster*
1; 28 May 06; Alastair Smith; ANBG GrK13
White-browed Babbler *Pomatostomus superciliosus*
1; 21 Feb 06; Nicki Taws; Aranda paddocks GrJ 13
Black-faced Monarch *Monarcha melanopsis*
1 (dead); 1 Apr 06; David Cook; Wamboin GrQ12
Spangled Drongo *Dicrurus bracteatus*
1; 20 Apr 06; Chris Davey; Bardsley Place Holt GrI12

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Please note that the views expressed in the articles published in *Canberra Bird Notes* are those of the authors. They do not necessarily represent the views of the Canberra Ornithologists Group. Responses to the views expressed in CBN articles are always welcomed and will be considered for publication as letters to the editors.

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