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BANDING PROJECT REPORT No. 6

Scheyville National Park, New South Wales

(Abridged version – full paper can be obtained from: http://www.absa.asn.au/publication-category/aactt-full-bandings-reports/)

Aim: This site is one of six (Agnes Banks Nature Reserve (Farrell *et al.* 2012), Nurragingy Reserve (Farrell *et al.* 2015), Prospect Nature Reserve (Mowat *et al.* 2017), Windsor Downs Nature Reserve and Wianamatta Nature Reserve), in an ongoing monitoring study of the avian fauna in the north-west sector of the Cumberland Plain. Our studies are examining any changes in the avian fauna that are occurring over time.

Location: 33° 35.28' S; 150° 53.70' E. Elevation 11 metres asl. The western boundary of the park is approximately 2 km east of the small township of Pitt Town (Fig. 1).

Description: Except for the northern section which encompasses Longneck Lagoon, the park is mainly bounded by Pitt Town – Dural Road in the north, Midson Road to the east and Old Pitt Town Road to the west and south (Fig. 1) and covers an area of approximately 954 hectares. The park is surrounded by small 'hobby farms' on large semi-rural residential blocks.

The geology of the park is comprised of three sedimentary units: Rickabys Creek Gravels, Wianamatta Group shales (that underlie most of the park) and Hawkesbury Sandstone.

The park encompasses five threatened communities (Biodiversity Conservation Act 2016): Cumberland Plain Woodland, Castlereagh Scribbly Gum Woodland, Shale Gravel Transition Forest, Transitional *Melaleuca* Forest and Freshwater Wetlands on Coastal Floodplain. Mapping of these communities has been documented by Benson (1992) and Tozer (2003). The last four are listed as *threatened*.

The banding study site (~ 13 ha) (Fig. 2) is situated within the Cumberland Plain Woodland. The dominant tree species are Grey Box *Eucalyptus moluccana*, Forest Red Gum *E. tereticornis* and Narrow-leafed Ironbark *E. crebra* with an understorey of predominantly Blackthorn *Bursaria spinosa* and *Acacia* spp. Grassy areas, which were widespread at the commencement of our study, have now been overgrown by the expansion of Blackthorn thickets. Longneck Creek runs through the centre of the study site and only flows during rain periods. For most of the time it is confined to a series of deep pools, some of which have not been known to dry out even during severe drought. Small vine thickets grow along the creek line and have increased in extent over time.

Only one small section of the woodland, where Longneck Creek crosses Pitt Town – Dural Road, had been burnt just prior to our study period. No other control burning or wildfires have occurred at or near the study site during our research.

Horse riding is permitted in the park and numerous worn tracks have developed and crisscross this section of the park. As a consequence many weed species have been spread throughout the study site via horse faeces (authors' pers. obs.).

Status History: Prior to the area's dedication as a national park in 1996 it was utilised for a multitude of purposes. In colonial times it was used as a common, later in the 20th century as a farm-training establishment for boys from Britain, as a military base for training soldiers during WW2 and the Vietnam war, as a migrant hostel and by Hawkesbury Agricultural College and the Tactical Response Group for training purposes (a full list of historical usage is presented in SNPCMP 2009; Boom 2017). The national park subsumed Longneck Lagoon Wildlife Refuge and its associated Environmental Education Centre. This area has been used as a banding site since 1965 and is one of the oldest in NSW.

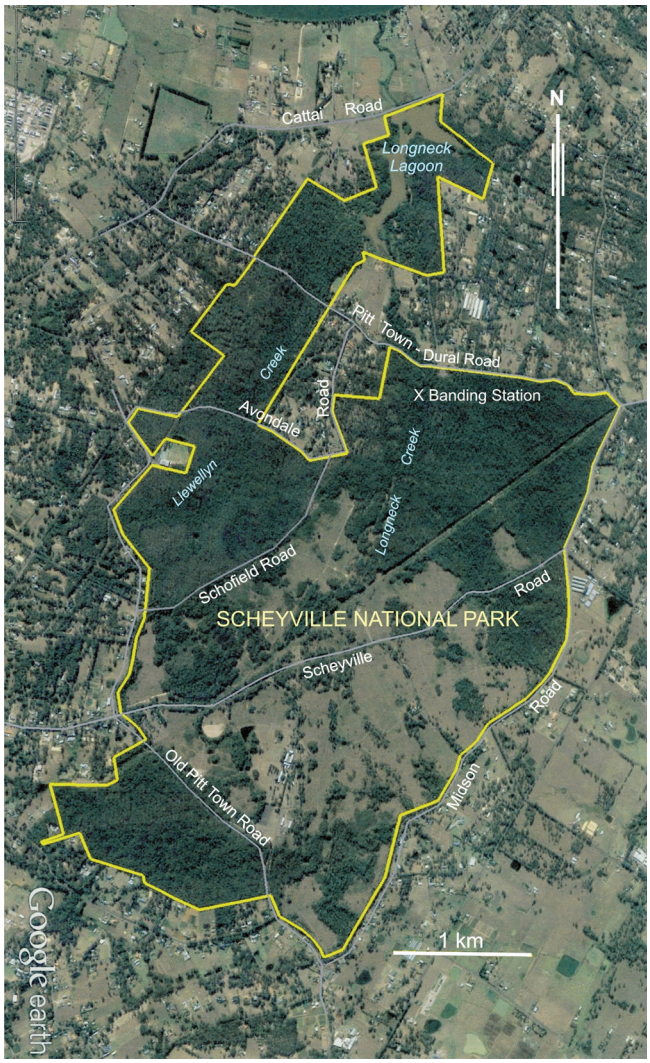

Figure 1. *Satellite image highlighting the boundaries of Scheyville National Park and the position of the banding station.*

Image courtesy of Google Earth

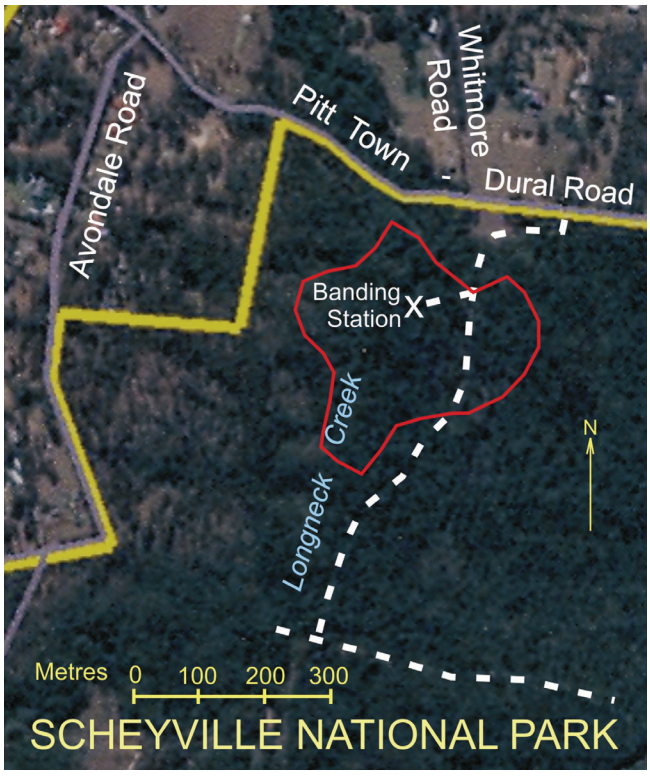

Figure 2. *Satellite image of a section of Scheyville National Park showing approximate area of study site.*

Image courtesy of Google Earth

Previous Records: Published bird lists for Scheyville National Park have appeared in the following publications: Douglas and Wilson (1985), Antcliff (1988), Kinhill Engineers Pty Ltd (1990), Roberts (1993), Egan *et al.* (1997), Fairly and Waterhouse (2005), Roberts (2009), Scheyville National Park Conservation Management Plan (2009), Patrick (2016) and Farrell *et al.* (2018).

Duration of Project: The cyclical periods that banding was carried out were August 2007 – May 2008; July 2011 – June 2012 and August 2015 – June 2016. No banding occurred on the following months due to inclement weather: February 2008, March 2012, September 2015, November 2015 and January 2016.

METHODS

Banding was carried out once every month, weather permitting, and occurred from sunrise for approximately five hours. The number and total length of nets erected varied from period to period– see Table 1 for details. Nets were usually placed in the same designated lanes within the study site but not all were utilised on each banding day. To compare study periods, the capture rates of each species were calculated as the number of birds trapped per hour per 100 metre of net erected. Incidental observation data of the birds (heard or seen) commenced in August 2007, and continued throughout the second (2011–12) and third periods (2015–16). All birds captured were individually marked with bands supplied by the Australian Bird and Bat Banding Scheme (ABBBS). Longevity data were compiled utilizing records dating back to 1965.

Table 1

Banding effort for the three study periods at Scheyville National Park.

Study periods	Average number of nets. (range)	Average total length of erected nets. (range)	Average time banding. (range)
2007–2008	12.7 (9–15)	198 m (144–234 m)	5.3 hrs (3.75–7 hrs)
2011–2012	14.6 (13–15)	238.2 m (210–246 m)	5.3 hrs (4.75–6 hrs)
2015–2016	15.1 (14–19)	235.3 m (174–291 m)	5.2 hrs (4.5–6.25 hrs)

RESULTS AND DISCUSSION

Overall a total of 108 different species was recorded (captured, sighted and/or heard) at the site – 81 during the first study period (4 months), 89 during the second (11 months) and 85 in the last (8 months). This is in comparison with 125 species recorded from 1937 to 1995 (Egan *et al.* 1997).

The total number of different species banded showed a decline from 40 in 2007–2008 to 37 in the second period and 31 in the third period. This decline can be, in part, attributed to the one-off captures of several species in the first period, which were not subsequently captured in the following two periods. There were, however, several species that were caught regularly at the beginning of the study but were not trapped after the second period.

Total capture rates for each banding visit show two peaks in March 2008 and May 2016. These can be attributed to an influx of migratory Silvereyes *Zosterops lateralis* and Yellow-faced Honeyeaters *Lichenostomus chrysops* at the banding site, in the first instance and an increase in the resident population of Bell Miners *Manorina melanophrys* in the latter.

The species showing a decline over the three periods were: Fuscous Honeyeater *Lichenostomus fuscus*, Yellow-faced Honeyeater and Golden Whistler *Pachycephala pectoralis*. While those that showed an increase were: White-browed Scubwren *Sericornis frontalis* and Bell Miner. Several species showed an increase in the second period (Superb Fairy-wren *Malurus cyaneus*, Red-browed Finch *Neochmia temporalis*, Eastern Yellow Robin *Eopsaltria australis*) but then declined in the third period.

Recaptures

Data from 1965 to 2015 were utilized to calculate the longest interval between banding and recapture. One Speckled Warbler *Chthonicola sagittata* from Scheyville holds the record at 11 years and 1 month as the oldest banded individual for this species recorded by the ABBBS. The two oldest species (Fuscous Honeyeater and Eastern Yellow Robin) were residents at the site and were caught regularly throughout this period and thus supplied ample accumulative data for comparison with those held by ABBBS. The oldest records for these species are just 2 years 10 months (Fuscous Honeyeater) and 1 year 8 months (Eastern Yellow Robin) short of the maximum record held by the ABBBS. Several other resident species: Crested Shrike-

tit *Falcunculus frontatus* (2 years 9 months), Superb Fairy-wren (2 years 2 months), Buff-rumped Thornbill *Acanthiza reguloides* (2 years 3 months) and Red-browed Finch (1 year 5 months) were all only 2 years or less than the maximum age recorded. Rufous Whistlers *Pachycephala rufiventris* are seasonal visitors to the site and some returned to the site yearly for many seasons subsequent to their banding. We were able to document 15 records longer than 5 years. Golden Whistlers were captured in all months but most had intervals between banding and recapture less than 5 years with only 5 records older than this.

Movements

Some short movements from the banding site of approximately 2 km by a Fuscous Honeyeater, Grey Shrike-thrush *Colluricincla harmonica* and Red-browed Finch and one long-distance movement by a Sacred Kingfisher *Todiramphus sanctus* that travelled approximately 1600 kilometres NNW into Queensland have previously been documented by Egan *et al.* (1997). In addition to these a Golden Whistler was documented travelling from the banding site approximately 120 kms south in 1999 (Anon 2010). No movements away from the site were recorded during the three study periods.

Migrant Species

Seventeen summer migrants were recorded at the banding site. They included: Pacific Baza *Aviceda subcristata*, Dollarbird *Eurystomus orientalis*, Sacred Kingfisher, Pallid Cuckoo *Cacomantis pallidus,* Brush Cucckoo *Cacomantis variolosus*, Horsfield's Bronze-cuckoo *Chalcites basalis*, Shining Bronze-cuckoo *Chalcites lucidus*, Eastern Koel *Eudynamys orientalis*, Channel-billed Cuckoo *Scythrops novaehollandiae*, Rufous Fantail *Rhipidura rufifrons*, Leaden Flycatcher *Myiagra rubecula*, Rufous Whistler, White-winged Triller *Lalage sueurii,* White-throated Gerygone *Gerygone albogularis*, Silvereye, Yellow-faced Honeyeater and Olive-backed Oriole *Oriolus sagittatus*. The only recorded winter migrant was the Rose Robin *Petroica rosea*.

The interplay between arrival and departure times of the Golden and Rufous Whistlers has been documented at three other sites on the Cumberland Plain (Farrell *et al.* 2012; Farrell *et al.* 2015; Mowat *et al.* 2017) with Rufous Whistlers replacing Golden Whistlers during the summer months but with some overlap recorded. At Scheyville National Park this is less evident with the Golden Whistler remaining for the greater part of the year. Two subspecies of Golden Whistlers occur in the study area with the most obvious difference being the colour of the undertail coverts - *P. p. pectoralis* (undertail coverts dull white) and *P. p. youngi* (undertail coverts yellow). Unfortunately, the subspecies was not recorded for all birds captured, so it is not known whether one of the subspecies is more predominant than the other during different seasons.

Two subspecies of Grey Fantail *Rhipidura albiscapa* have been recorded occurring at Scheyville (Higgins *et al.* 2006). *R. a. alisteri* reportedly breeds in the study area and migrates north for the winter months, and is replaced by *R. a. albiscapa* which migrates north from Tasmania (Higgins *et al.* 2006). Again, subspecies were not differentiated so this could not be verified.

Introduced species

The introduced Common Blackbird *Turdus merula* was sighted and caught during the second and third periods while the Red-whiskered Bulbul *Pycnonotus jocosus* was caught and sighted on all three periods although both in small numbers. The Spotted Dove *Streptopelia chinensis* and Common Myna *Sturnus tristis* were rarely recorded at the banding site. We believe that these four species have had minimal impact of the native bird species.

Changes in the avian community

Egan *et al.* (1997) documented the demise of a number of species that frequented the site. These included (year of last sighting at the site): Red-capped Robin *Petroica goodenovii* (1953), Hooded Robin *Melanodryas cucullata* (1973V), Zebra Finch *Taeniopygia guttata* (1975), Diamond Firetail *Stagonopleura guttata* (1977V), Flame Robin *Petroica phoenicea* (1978V), Scarlet Robin *Petroica boodang* (1980V), Black-eared Cuckoo *Chalcites osculans* (1987), Black-chinned Honeyeater *Melithreptus gularis* (1992V), Brown Treecreeper *Climacteris picumnus* (1993V), and, Yellow-rumped Thornbill *Acanthiza chrysorrhoa* (1994). To this we can add the Speckled Warbler (2004V). Seven of these (V) are now listed as vulnerable by the NSW Office of Environment and Heritage so the cause of their disappearances from our site appears not to have been confined to Scheyville but was far more widespread. Unfortunately these particular species were the key species that drew many Sydney bird watchers to the area. These local extinctions were noted by Keast (1995) and Recher (2010) who also highlighted the changing structure of bird communities across the Sydney region with an increase in large birds and a reduction in small bush birds. The Scheyville bird assemblage is slightly more complicated than this scenario but by no means is unaffected from a changing structure which is outlined below.

Capture rates show that the composition of the banded avian community has changed over the nine years of this study. The only common resident species found to have increased capture rates was the White-browed Scrubwren and the Bell Miner. The White-browed Scrubwrens' average capture rate for the first period was 0.38 and increased to 0.51 in the third period as was the average number of individuals trapped per visit (3.8 to 6.1 respectively).

Bell Miner capture rates have increase dramatically from an average of 0.28 in the first period to 0.57 in the second and 2.9 in the third period. The average number of individuals trapped per visit shows the same trend (2.6, 7.2 and 35.4 respectively) as does their percentage of the overall captured population.

Several resident species that were common in the early part of the study were found to have declined towards the end. These included the Brown Thornbill *Acanthiza pusilla* which was recorded once during the first period, fairly frequently in the second period but was neither caught nor sighted/heard during the third period.

Dusky Woodswallows *Artamus cyanopterus* were sighted regularly during the first and second periods and were trapped on three occasions but were only sighted twice during the third period. This species has recently been listed as *vulnerable* under NSW legislation.

Four finch species have previously been recorded at Scheyville National Park: Zebra, Double-barred *Taeniopygia bichenovii*, Red-browed and Diamond Firetail (Egan *et al.* 1997). Only the Double-barred and Red-browed Finches were recorded during the first study period and then the Double-barred Finches were not recorded after May 2008 leaving the Red-browed Finch as the only surviving finch at the site during the second and third periods. Their capture rates show peaks in May 2008, 2012 and 2016 which coincide with the seeding of most of the twenty different species of grasses at the site (Kinhill Engineers Pty Ltd 1990).

A disturbing trend has emerged from our current and previous data showing a decline and subsequent disappearance of the Double-barred Finch from three other sites across the N-W sector of the Cumberland Plain. They were last recorded at Agnes Banks Nature Reserve in June 2001 (Farrell *et al.* 2012), at Nurragingy Reserve in April 2002 (Farrell *et al.* 2015) and Prospect Nature Reserve in April 2007 (Mowat *et al.* 2017). Follow-up spot surveys at these sites showed that they had not returned. This species is still regularly captured and sighted at Wianamatta Nature Reserve (authors' pers. obs.) and the population there is currently being monitored.

One juvenile Brush-turkey *Alectura lathami* was sighted in April 2016. This species is known to have crossed the Hawkesbury River, their former southern distribution limit, and occupied suitable habitat in the northern and eastern suburbs of Sydney (Bastians 2017; Patrick 2016). This may be the first indication of their spread farther west onto the Cumberland Plain to Scheyville.

Superb Fairy-wrens are in the top four most captured resident species at the site and showed an increase in average capture rates of 0.83 and 1.04 in the first two periods respectively and then declined to their original rate of 0.8 in the third period. Two prominent peaks occurred in May and June in the first two periods respectively but not in the third period where there was an overall decline. This may have been the result of competition with the Variegated Fairy-wren *Malurus lamberti* which was encroaching on their particular niche. Variegated Fairy-wrens were first recorded in the study area in 1982 but were not recorded during our study until August 2011 and their capture rate fluctuated and remained low during the second period but did increase during the third period. A similar scenario occurred at Agnes Banks Nature Reserve (Farrell *et al.* 2012) where the Variegated Fairy-wren had occupied the Superb Fairy-wrens' niche.

Eastern Yellow Robins also showed a gradual decline during the course of our study. Peaks in July and August correspond to the influx of juveniles into the community.

Eight species of honeyeater were recorded during our study. Yellow-faced Honeyeaters, Silvereyes and Fuscous Honeyeaters were very prevalent during the first period but declined in the second period and at the end of the third period none of these species were trapped.

The influx of Bell Miners and their aggressive mobbing behaviour, has had a major impact on the avian fauna at the site with a reduction in the capture rates of a number of small to medium sized species which include: Eastern Yellow Robin, Silvereye, Yellow-faced Honeyeater, Fuscous Honeyeater, Dusky Woodswallow and the mid-storey foraging Brown Thornbill, although, other similar small shrub-layer species like the White-browed Scrubwren have not been affected. Utilising our capture rate and sighting data, small leaf-gleaning species (Spotted Pardalote *Pardalotus punctatus*, Yellow *Acanthiza nana* and Striated *Acanthiza lineata* thornbills) likewise don't seem to be adversely affected although Bell Miners have been seen harassing these species (authors' pers. obs.). We saw no evidence of larger species like the Eastern Whipbird *Psophodes olivaceus* and Grey Butcherbird *Cracticus torquatus* being driven off by Bell Miners. This aggressive behaviour is well known by bird watchers and has been documented by a number of researchers (e.g., Poiani 1991; Woinarski and Wykes 1983). Bell Miner feeding behaviour, that is, eating lerps and leaving psyllids to continue drawing sap from the leaves, has seen a drastic reduction in canopy foliage on the common tree species at the site. Lerps are also a major food source for other honeyeaters, especially the Fuscous Honeyeater, so not only are these honeyeaters being harassed; they are being deprived of a vital food source. This issue has been the research topic of many forestry and timber organisations (National Forum - Bell Miner Associated Dieback 2005) where Bell Miner associated eucalyptus dieback has been deemed a major problem.

The National Parks of NSW personnel at Scheyville were briefed on this troubling problem in 2016 but have yet to formulate a plan of management to address this issue. Bell Miners have now spread into an area well away from the banding site and are now located throughout the woodland bounded by Longneck Creek, Pitt Town–Dural, Midson and Scheyville Roads. The older trees along Longneck Creek are now under substantial stress. We sincerely hope that this once avian species-rich area isn't allowed to become virtually mono-specific.

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