

**Avifaunal communities of the River to River Corridors Project
study area: October 2010 survey report**
for
River to River Corridors Project



InSight Ecology

January 2011

Avifaunal communities of the River to River Corridors Project study area: October 2010 survey report

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for

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January 2011

This is Report 2 in a series for the River to River Corridors Project - a joint initiative of the City of Ryde, Hunters Hill Council, Sydney Metropolitan Catchment Management Authority, local flora and fauna conservation organisations, Bushcare groups and local residents, with funding from the NSW Environmental Trust.

Recommended citation: InSight Ecology, 2011. Avifaunal communities of the River to River Corridors Project study area: October 2010 survey report. Report by InSight Ecology for River to River Corridors Project (City of Ryde and Hunters Hill Council, Sydney).

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Photographs: Front cover (from top, then left to right down panel) –Lane Cove River from footbridge at end of Magdala Road; eucalypt gully forest in Lane Cove National Park (NP) between Lane Cove River and Delhi Road; recent riparian revegetation at Riverglade Reserve, Hunters Hill; Powerful Owl *Ninox strenua*; older eucalypt forest in Lane Cove NP near site shown in second photograph above; Gladesville bridge over Parramatta River, from Betts Park at Huntleys Point. All of these photographs were taken by InSight Ecology.

Acknowledgements

This study was conducted under Section 132C of the National Parks and Wildlife (NPW) Act 1974 and Clause 22 of the NPW Regulation 2002, using Scientific Licence S11505 issued to Dr Andrew Huggett by NSW Department of Environment, Climate Change and Water (DECCW).

This study is part of the River to River Corridors Project which is funded by the NSW Environmental Trust, City of Ryde, Sydney Metropolitan Catchment Management Authority, and Hunters Hill Council. The project is managed by Sam Cappelli (City of Ryde) and his team. A Community Reference Group has also been established.

This report and the survey upon which it is based benefited from discussions with and information from a range of people and organisations in the Ryde-Hunters Hill district. They include Gith Strid-Nwulaeke and Kristin Gabriel (City of Ryde), Jacqui Vollmer (Hunters Hill Council), Adam Smith and Fiona Morrison (City of Ryde), Bev Debrincat and Kurtis Lindsay (Habitat Network and Ryde Hunters Hill Small Bird Project – Kurtis also for his field assistance), Cathy Merchant (Ryde-Hunters Hill Flora and Fauna Protection Society), and Andrew Duffy (NPWS Lane Cove National Park). Historical bird data was obtained from NSW Atlas of Wildlife (DECCW), Australian Museum Fauna Database, Bird Atlases I and II (Birds Australia), and experienced local amateur ornithologists.

Permission to access publicly and privately owned land in the study area was obtained from NSW Department of Environment, Climate Change and Water, City of Ryde, Hunters Hill Council, Holy Cross College Ryde, and Catholic Theological Union (for access to Villa Maria property, Hunters Hill). Rachel Danos and Michael McCormack of Holy Cross College Ryde were particularly supportive of the survey and overall project.

The support and enthusiasm of these organisations, groups and individuals is gratefully acknowledged.

Executive summary

Urban landscapes are complex interacting systems driven by constant change and re-adjustment. The urbanisation of Sydney has removed, fragmented and substantially modified habitat for native plants and animals. In inner zones such as Ryde-Hunters Hill these effects have been largely historical with the last phase of large-scale clearing of native vegetation occurring over 60 years ago. In outer areas, however, habitat continues to be lost or degraded as Sydney sprawls west, north-west and south-west.

As a consequence, episodes of local extinctions of biota have occurred and are still happening. Species unable to move through parts of their former ranges now surrounded by a hostile matrix of sealed surfaces and unsuitable habitat have become isolated within increasingly small and pressured bushland remnants. For birds, these have been species dependent on ground and shrub cover and food and breeding resources provided by a diversity of quality habitats. In Ryde-Hunters Hill district, the extinction of bush birds such as Spotted Quail-thrush, Eastern Bristlebird, Speckled Warbler, Superb Lyrebird, Rockwarbler and White-fronted Chat – the latter a saltmarsh specialist now confined to just two small populations in Sydney – are cases in point. Other bushland bird species appear to be currently in population decline, placing them at risk of local extinction over time.

A total of 1,928 individual birds from 35 families, 68 species and 15 foraging guilds were recorded during the survey in the River to River Corridors Project study area. Bushland remnants accounted for 86.7% (59) of all bird species recorded in the survey - only two of these species were introduced from overseas. Thirteen foraging guilds occurred in bushland remnants and included native insectivores, nectarivores/insectivores, granivores, carnivores, omnivores and frugivores.

Bird communities of the study area are a mix of remnant indigenous forest species and ubiquitous native and introduced urban birds. Lane Cove River valley and its tributaries - Buffalo Creek, Kitty's Creek, and to a lesser extent, Tarban Creek - exert a strong influence over the structure and composition of these communities. Remnant sandstone and shale forest habitats along these zones still support small breeding populations of indigenous birds that have disappeared from much of urban Sydney, e.g. Eastern Yellow Robin, Golden Whistler, White-throated Treecreeper, Eastern Whipbird and Striated Thornbill. Importantly, these habitats also function as corridors for the movement of migratory birds such as flycatchers, cuckoos and honeyeaters.

In contrast, the urban bird component is characterised by more individual birds but fewer species. Urban neighbourhood sites supported 809 birds from 23 different species including 5 introduced taxa. Bushland remnant sites returned 633 birds from 59 species, with only 2 introduced species. Ground granivores (e.g. Rock Dove, Spotted Dove, Crested Pigeon), omnivores (e.g. Common Myna, Common Starling, Pied Currawong and Australian Raven) and ground insectivores (e.g. Magpie-lark, Australian Magpie, Superb Fairy-wren) were the main urban neighbourhood and open parkland guilds present. Revegetated parkland and small forest remnants (Riverglade Reserve, Mallee Reserve, Betts Park) supported small, isolated

populations of Variegated Fairy-wren, White-browed Scrubwren, and Yellow Thornbill. Individuals of Eastern Yellow Robin were recorded at Betts Park and Tarban Creek Reserve. The indigenous urban-adaptees Noisy Miner, Rainbow Lorikeet, and Red Wattlebird were the most abundant birds recorded during the survey, together with the introduced Common Myna, Spotted Dove and Rock Dove.

Managing Ryde-Hunter Hill's avifauna and their habitat requires knowledge of how birds utilise greenspace and interact with each other and their environment at different spatial and temporal scales. This study will supply new ecological data to help understand and manage these interactions for long-term conservation outcomes. This will include monitoring and evaluation of the performance of proposed new corridor plantings as bird habitat.

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1. Introduction

1.1 Project background

The importance of retaining and integrating viable habitat for biodiversity with human living space has been recognised worldwide (Secretariat of the Convention on Biological Diversity 2006; UNEP Convention on Biological Diversity 2007; Natural Resource Management Ministerial Council 2010). Central to this is a need to understand how biota interacts and functions in complex urban ecosystems, a task that has not yet been accomplished (McDonald et al. 2008; Pickett et al. 2011). Knowledge of how animals utilise different types and configurations of greenspace is essential to guide ecologically sustainable urban planning and design (Commonwealth of Australia 2005; Pickett and Cadenasso 2006; Alberti 2010).

In Sydney, there has been substantial investment in the revegetation of riparian zones, residential streets, parks and housing estates, major transport arteries, and former industrial sites over the past 30-40 years (NSW Department of Planning 2005, 2010). However, there has been little attention paid to determining whether this work is facilitating or hindering the movement and conservation of native fauna and their habitat in these landscapes. For instance, Sydney's inner-west councils have rehabilitated and revegetated tracts of native vegetation along the Cooks River (Cooks River Foreshores Working Group 2006). Similar work has been undertaken by City of Ryde and Hunters Hill Council in the study area at Mallee Reserve and along Tarban Creek at Riverglade Reserve (Ryde Flora and Fauna Study 2006-2008; Hunters Hill Council 2009). While these efforts are addressing soil erosion, urban water quality management, and habitat protection and restoration objectives, their contribution to facilitating the movement and dispersal of native fauna has not been properly assessed.

Associated with this is a pressing need to establish functional wildlife corridors in suburban Sydney. These aim to allow area- and dispersal-limited species to move between isolated patches of habitat to forage and reproduce. This project studies local bird communities to inform the design and implementation of two key wildlife corridors in Ryde-Hunters Hill district over the period 2010-2013.

1.2 Objectives

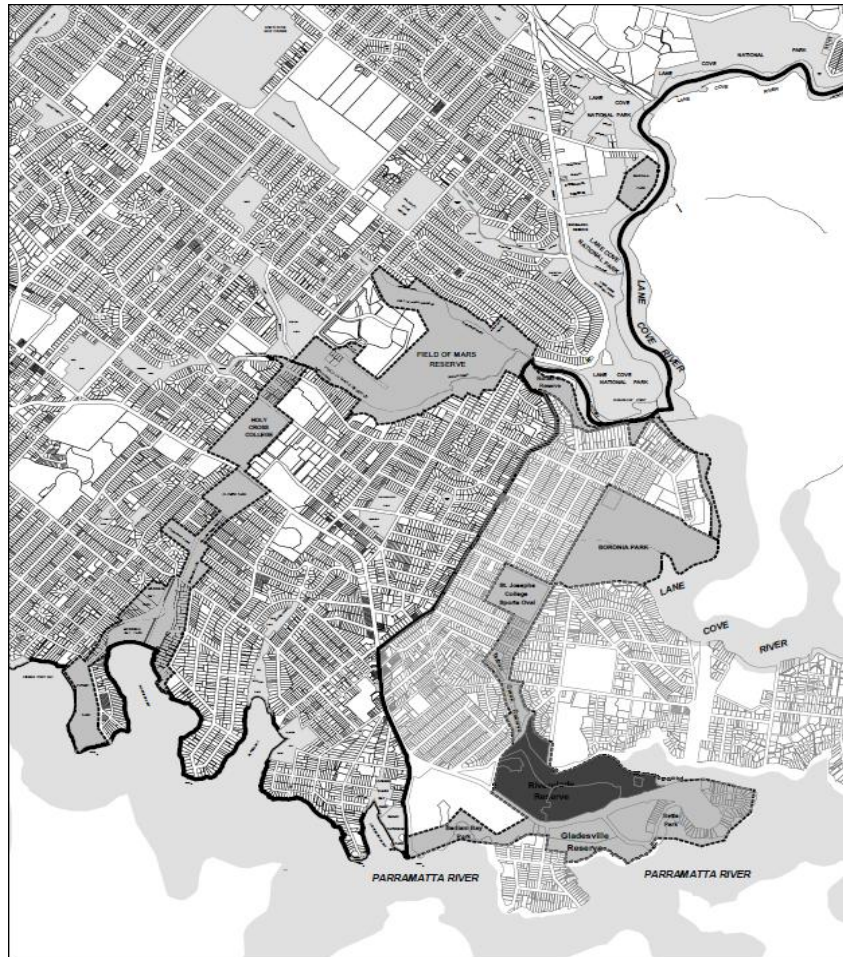
The River to River Corridors Project will:

- Describe the composition, structure and habitat requirements of bird communities in different greenspace types in the study area (defined in Figure 1)
- Re-connect two corridors for bushland birds and other fauna based on data obtained from the baseline bird surveys and other studies, best-practice habitat rehabilitation techniques, and effective community participation.
- Enhance the connectivity and condition of existing urban bushland along both corridors
- Promote community involvement in and ownership of the corridors, especially their monitoring and maintenance over time.

This document reports on the results of an avifaunal survey of the study area conducted in October 2010. This is the first in a set of four replicated field investigations of the avifauna of this area. Specifically, this report:

- Describes the relative abundance, species richness, composition, and habitat use of bird communities in 4 different types of greenspace sampled during the survey;
- Provides baseline data to help inform the selection of corridor planting sites and provide key reference points for later assessment of corridor performance over time;
- Enhances current knowledge of the biology and ecology of birds of bushland remnants and open urban landscapes in Sydney.

Figure 1: Location of River to River Corridors Project study area (courtesy City of Ryde)



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Overview of all proposed corridors & links

Currently Funded Section

Date: 28/05/2009

Map 1 (A4)

Scale: 1:25000 approx.

CONTRIBUTOR

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2. Methods

2.1 Literature review

A review of existing information on the avifauna and habitats of the study area was undertaken prior to the commencement of the field survey. This included unpublished reports of past fauna surveys (e.g. Ryde Flora and Fauna Study 2006-08), existing reserve management plans, and maps and reports of bush regeneration and habitat restoration projects conducted in the study area. Bird Atlases I and II (Birds Australia), Atlas of NSW Wildlife (DECCW), and Australian Museum's Fauna Database were also reviewed for records of bird species in the study area.

2.2 Field survey

2.2.1 Selection of sites

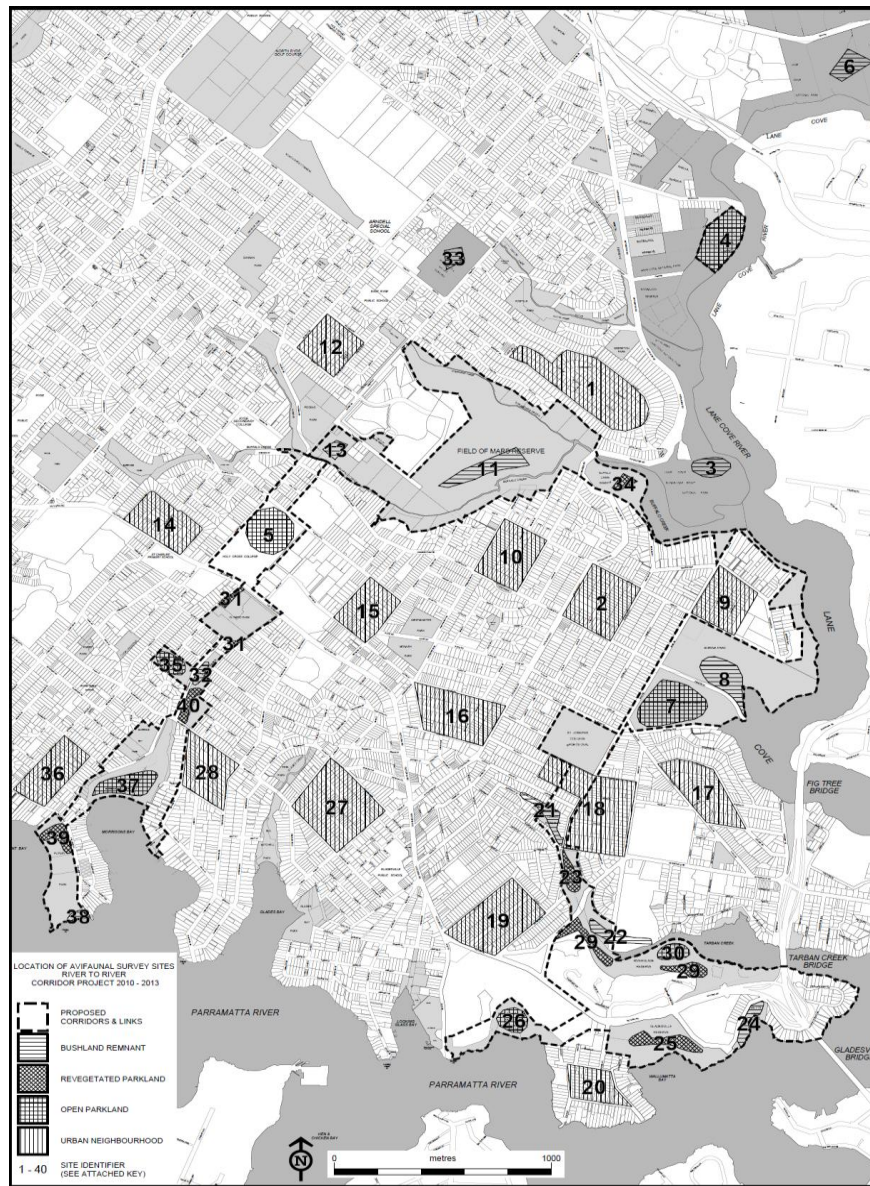
Inspections of the study area were undertaken in March 2008 and October 2010. A sampling design was developed based on the results of these visits, previous bird surveys of western Sydney greenspace undertaken by InSight Ecology, and discussions with City of Ryde and Hunters Hill Council staff.

A total of 4 greenspace types were surveyed in the study area. These included bushland remnant, revegetated parkland, open parkland, and urban neighbourhood. Bushland remnant sites comprised mainly remnant indigenous vegetation characteristic of Sydney's formerly extensive forest and woodland that existed prior to intensive urban development. The main bushland remnants occur in Lane Cove NP, Field of Mars Wildlife Refuge, Wallumatta NR and Boronia Park Reserve. The latter reserve contains the endangered ecological community (EEC) of Sydney Turpentine Ironbark Forest (STIF), open forest on exposed sandstone slopes (Sydney peppermint, red bloodwood and smooth-barked apple) and sandstone gully forest (blackbutt, blueberry ash and black wattle). Wallumatta NR supports sandstone-shale transition eucalypt forest while Tarban Creek Reserve contains a small pocket of open eucalypt forest on sandstone. Small isolated remnants were also surveyed at Betts Park, Putney Point and Mallee Reserve, the latter supporting a STIF EEC. Revegetated parkland sites consisted of mostly native tree, shrub and ground cover species planted in blocks or strips at Buffalo Creek, Tarban Creek, Riverglade and Gladesville Reserves and Putney, Olympic and Bremner Parks. These were typically bush regeneration or beautification projects undertaken by City of Ryde, Hunters Hill Council and volunteer Bushcare groups. Open parkland sites featured areas dominated by open grassed and paved surfaces with some narrow rows or isolated beds of planted indigenous and exotic vegetation. These typified open recreational space and included several parks with playgrounds, picnic areas, sporting ovals, car parks, and facilities. Urban neighbourhood sites were blocks of usually four residential streets featuring sealed surfaces (roads, streets and footpaths), mown verges of planted and mostly established native and exotic trees and shrubs, overhead powerlines, and houses with or without planted native and exotic shrubs, trees and garden beds in their yards.

A total of 40 sites were surveyed for birds in the study area (Figure 2). Of these, 11 were bushland remnant, 7 revegetated parkland, 7 open parkland, and 15 urban neighbourhood sites. These include:

- 1 Moncrieff Drive, East Ryde (urban neighbourhood = UN)
- 2 Blaxland Street, Boronia Park (UN)
- 3 Lane Cove National Park at Sugarloaf Point (bushland remnant = BR)
- 4 Magdala Park, East Ryde (open parkland = OP)
- 5 Holy Cross College, Ryde (OP with planted boundary)
- 6 Lane Cove National Park north (BR)
- 7 Boronia Park (OP)
- 8 Boronia Park (BR)
- 9 Park Road, Boronia Park (UN)
- 10 Westminster Road, Gladesville (UN)
- 11 Field of Mars Wildlife Refuge A (BR)
- 12 Badajoz Road, Ryde (UN)
- 13 Field of Mars Wildlife Refuge B (BR)
- 14 Beazley Street, Ryde (UN)
- 15 Monash Road, Gladesville (UN)
- 16 Eltham Street, Gladesville (UN)
- 17 Abigail Street, Hunters Hill (UN)
- 18 Mary Street, Hunters Hill (UN)
- 19 Hillcrest Avenue, Hunters Hill (UN)
- 20 Kelly Street, Henley (UN)
- 21 Tarban Creek Reserve, Gladesville (BR)
- 22 Tarban Creek north bank including Villa Maria property, Hunters Hill (BR)
- 23 Tarban Creek Reserve, Gladesville (revegetated parkland =RP)
- 24 Betts Park, Huntleys Point (BR)
- 25 Gladesville Reserve, Henley/Huntleys Point (RP)
- 26 Bedlam Bay Regional Park, Gladesville/Henley (OP with woody weed edge)
- 27 Western Crescent, Gladesville (UN)
- 28 Tennyson Road, Gladesville (UN)
- 29 Riverglade Reserve, Huntleys Cove (RP)
- 30 Riverglade Reserve, Huntleys Cove (OP)
- 31 Olympic Park, Ryde (RP)
- 32 Mallee Reserve, Ryde/Gladesville (BR)
- 33 Wallumatta Nature Reserve, North Ryde (BR)
- 34 Buffalo Creek Reserve, Hunters Hill (RP)
- 35 Tyagarah Reserve, Ryde (OP)
- 36 Stanley Street, Putney (UN)
- 37 Morrison Bay Park, Putney (OP)
- 38 Putney Point, Putney (BR)
- 39 Putney Park, Putney (RP)
- 40 Bremner Park, Gladesville (RP)

Figure 2: Location of avifaunal survey sites in the study area (courtesy City of Ryde)



2.2.2 Survey methods

Terrestrial bird species were surveyed at each site in the study area. Aquatic bird species were also recorded at some sites. In bushland remnants and larger parkland sites the area search technique (Loyn 1987; InSight Ecology 2008) was deployed. This involved the surveyor steadily walking a loop route in which different forward and return legs, separated where possible by a distance of at least 100 metres, were taken through the main habitats present at each site. In urban neighbourhood sites, a block defined by usually 4 streets was walked, at a steady pace, along footpaths so that each route enclosed the entire sampled block without duplication of the course taken. The area of each of these blocks varied between approximately 5 and 10 ha, depending on allotment size and configuration and street width and length. Single line transects were walked in smaller sites (ie. Riverglade Reserve, Putney Point, Putney Park,

Mallee Reserve, Bremner Park and Olympic Park) where it was not feasible to deploy the area search method.

All area searches and block walks avoided recording the same bird twice, particularly flocking, communally-living, and fast or very frequently moving species such as Noisy Miner, Rainbow Lorikeet, Welcome Swallow, Galah and Common Starling. Particular care was taken in some parkland sites where, due to the small size of the reserve, forward and return search legs occurred within 100 metres of each other. This also helped to avoid committing the same error with more sedentary species such as Masked Lapwing, Australian Magpie, Magpie-lark, and Grey Butcherbird that often employ stalking or “sit-and-wait” foraging strategies.

All birds observed or heard at a site or along a line transect were recorded, including individuals flying over the site. Data recorded included the species present, number of individuals observed, sampling period, date, time and location of record, greenspace type, behaviour (ie. foraging/feeding, breeding, calling, mobbing, resting, flying), use of habitat, and other relevant information such as age, species composition and condition of remnants, revegetation and urban neighbourhood vegetation, weather, and bird interactions (eg. predation, predator avoidance, mating/mate pursuits). Using nomenclature consistent with Christidis and Boles (2008), these data were entered into a MS Excel spreadsheet in taxonomic order. The location of each surveyed site and relevant observation points were recorded in a hand-held Garmin GPS60®. All observations were made by the same experienced observer (A.H.) using a pair of Zeiss 10x40BT® binoculars fixed to a Pro-Harness® chest-strap. The survey was undertaken over an 11-day period in spring (October 12-22) 2010. Surveys were generally conducted in peak morning (0700-1030 hours) and afternoon (1600-1830 hours) bird foraging periods (survey sessions) on each survey day. No surveying occurred in windy or wet weather. Three or 15% of total survey time (19 sessions) was lost to wet and/or windy weather. This was offset by including additional sessions within the 11-day sampling window.

A total of 24.75 hours was spent on surveying birds in the study area. Bushland remnant sites were surveyed more intensively than other greenspace types - for 10.6 hours (57 minutes per site) or 42.7% of the total survey effort. Urban neighbourhood sites, in contrast, were surveyed for a total of 7.3 hours (29 minutes per site) representing 29.6% of the total survey effort. Revegetated parkland sites were surveyed for 3.9 hours (33 minutes per site) or 15.8% of the total effort. Open parkland sites were surveyed for 2.9 hours (25 minutes per site) or 11.8% of total survey time.

This variance in proportionate survey effort between remnant bushland and parkland and urban neighbourhood sites was not considered to significantly affect the results obtained or their interpretation. Bushland remnants often provide a broader and more complex suite of bird habitats and thus support taxonomically richer avian assemblages than revegetated and developed sites. Thus, they may require more survey effort per unit area to obtain an accurate sample of bird abundance, species richness, community structure and habitat use.

To aid reading, this report generally presents the common names of birds. Their scientific names are provided in the appendices.

2.3 Habitat assessment

A suite of habitat attributes were recorded at representative sites in each greenspace type in the study area. These included dominant plant species and community present, height of main tree species present, habitat condition and connectivity (remnants and revegetation), vegetation structure (in bush remnants and revegetated parkland), bird use of habitats present, estimated age and species composition of plantings (in revegetated parkland and urban blocks), type of urban neighbourhood habitats (ie. street verge, built structures, front- and rear-yard vegetation), and extent and type of disturbance (i.e. presence of weeds, feral and domestic animals, evidence of predation, level of human incursion). Attributes of landscape context were also noted for selected sites in different greenspace types, i.e. distance of planted or remnant vegetation to nearest neighbouring vegetation patch, position in the local and regional landscape, pattern of vegetation distribution, and edge type and size.

A photographic library of vegetation types, habitats, landscapes and cultural features (where applicable) present at each site was compiled using a Canon PowerShot SX210 IS® 14x zoom digital camera. This included a set of 1,627 images of the study area which was edited and catalogued using Microsoft Office Picture Manager 2007® software. Some of these images are presented in this report. All images, data and related material were stored on a standard 500GB ATA HDD backed up to a 500GB external HDD.

2.4 Data analysis

Three key attributes of bird communities were selected for analysis from data collected at each site in each greenspace type in the study area. These were relative abundance, species richness, and composition of foraging guilds (as a key indicative component of bird community structure). A total of 40 replicates of greenspace type were used in analyses undertaken for this report. These were stratified across the surveyed sites and included 11 bushland remnant, 7 revegetated parkland, 7 open parkland, and 15 urban neighbourhood sites. Assignment of species recorded in the surveys to foraging guilds was based on existing knowledge and published data, especially from the authoritative “Handbook of Australian, New Zealand and Antarctic Birds (Volumes 1-7)” (various editors, see References). Bird use of habitat was analysed qualitatively from habitat attribute information collected during the surveys at representative sites within each greenspace type.

Bird survey data were examined for the total, mean, standard error and standard deviation from the mean for each greenspace type and for the overall study area using Microsoft Excel 2007® and SigmaPlot Version 11.2® (Systat Software, Inc. 2009), with the results presented in graphical and tabular form. Survey effort was calculated by greenspace type and for the study period. Conservation significance was assessed by comparing survey results with historical data for the study area and utilising expert ornithological knowledge.

3. Results

3.1 Relative abundance

A total of 1,928 individual birds were recorded during the survey in the study area (Appendix 1). Forty-two percent (809 birds, mean 1.91, standard deviation [sd] 4.96) of these birds were recorded in urban neighbourhood sites. Bushland remnants accounted for 32.8% (633 birds, mean 1.49, sd 3.12) of the total. Revegetated parkland sites provided 11% of the total (212 birds, 0.49, sd 1.68). Open parkland contributed 14.3% of all birds recorded (275 birds, mean 0.65, sd 2.44). Figure 3 shows this variation in relative abundance of birds between the different greenspace types. Figure 4 depicts the mean number of birds recorded in each greenspace type.

Figure 3: Total number of birds recorded by greenspace type, October 2010

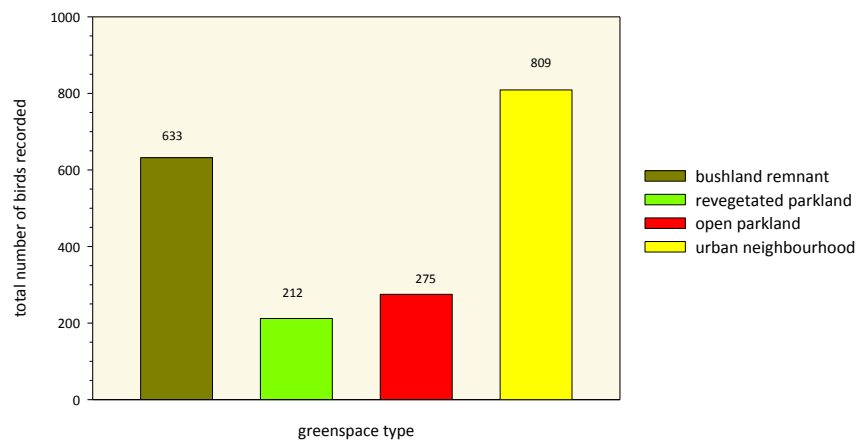
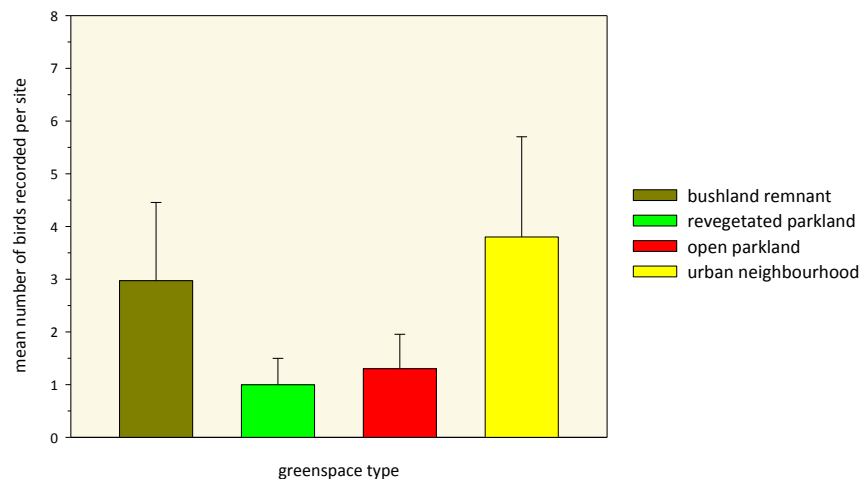


Figure 4: Mean number of birds recorded by greenspace type, October 2010 (per site, with standard error shown)



The most abundant bird species recorded across all greenspace types surveyed in the study area were Noisy Miner (436 individuals – Plate 1), Rainbow Lorikeet (328 – Plate 2), the introduced Common Myna (112), Pied Currawong (76), Red Wattlebird (61), Welcome Swallow (61), Spotted Dove (introduced - 60), Rock Dove (introduced - 59), White-browed Scrubwren (59 – Plate 3), Silvereeye (53), Australian Magpie (44) and Crested Pigeon (40). Bushland remnant sites were populated most abundantly by Rainbow Lorikeet (99 individuals), Noisy Miner (66), Silvereeye (44), White-browed Scrubwren (35), Pied Currawong (27), Variegated Fairy-wren (26 – Plate 4), Striated Thornbill (25) and Red-browed Finch (23). Revegetated parkland sites were dominated by Noisy Miner (64), Rainbow Lorikeet (24) and White-browed Scrubwren (18). Open parkland sites supported mostly Welcome Swallow (37), Noisy Miner (23), Rainbow Lorikeet (21), Rock Dove (19), Long-billed Corella (19) and Common Myna (16). Urban neighbourhood sites were the domain of Noisy Miner (283), Rainbow Lorikeet (184), Common Myna (87), Spotted Dove (55), Rock Dove (38), Red Wattlebird (36) and Pied Currawong (33). No House Sparrow and only a small number of Common Starling (6) were recorded during the survey. The other introduced species, Red-whiskered Bulbul, was detected mainly in bushland remnants along privet-infested creeks and forest edges (20).

The least abundant bird species recorded across all greenspace types surveyed in the study area were small-medium insectivores dependent on larger, contiguous tracts of quality forest, shrub and groundcover habitats. In the study area these habitats exist mostly within Lane Cove River NP, Field of Mars Wildlife Refuge, and Boronia Park. These included the migratory Rufous Fantail (1 bird), Shining Bronze-Cuckoo (1), Leaden Flycatcher (3) and Black-faced Monarch (4 birds – Plate 5), the moist gully and dense ground and understorey resident Eastern Whipbird (6), shrub-foraging residents Golden Whistler (3 – Plate 6), Rufous Whistler (2) and White-throated Treecreeper (12), nomadic/partial-migrants Brown Gerygone (8) and Grey Fantail (1), and the canopy-foraging Striated Pardalote (1). The sedentary ground insectivore Eastern Yellow Robin was recorded in low numbers (17) in 6 bushland remnants. The Grey Shrike-thrush was not recorded during the survey. Least abundant non-passerines recorded were the threatened Powerful Owl (2), migratory Sacred Kingfisher (4), Australian Brush-turkey (1), Tawny Frogmouth (1), Yellow-tailed Black-Cockatoo (3) and Australian King-Parrot (8).

Plate 1: Noisy Miner foraging in street verge callistemon, Eltham Street urban neighbourhood (UN) site



Plate 2: Rainbow Lorikeets at nest hollow, Lane Cove NP north bushland remnant (BR) site



Plate 3: White-browed Scrubwren – recorded at 6 BR, 3 revegetated parkland (RP) and 1 open parkland (OP) sites during the survey (B&B Wells)



Plate 4: Male Variegated Fairy-wren in weedy ground-cover, Mallee Reserve BR site



Plate 5: Black-faced Monarch at Sugarloaf Point, Lane Cove NP (Barrie Ayres) (shown below)



Plate 6: Adult male Golden Whistler (en. wikipedia.org)



3.2 Bird species richness

A total of 68 bird species from 35 families were recorded during the survey in the study area (Appendix 1). This included 62 terrestrial and 6 aquatic species. Five of these terrestrial species have been introduced to Australia – Rock Dove, Spotted Dove, Red-whiskered Bulbul, Common Starling and Common Myna. Three other exotics, European Goldfinch, House Sparrow and Common Blackbird, were not recorded during the survey.

Bushland remnants accounted for 86.7% (59 out of 68) of all bird species recorded during the survey. Small native forest insectivores and a large forest owl dependent on larger contiguous tracts of quality forest and woodland were recorded only at the two Lane Cove NP sites, Field of Mars Wildlife Refuge, and Boronia Park. They included Golden Whistler, Rufous Whistler, Black-faced Monarch, Leaden Flycatcher, Rufous Fantail, Striated Pardalote, Shining Bronze-Cuckoo, Powerful Owl, White-throated Treecreeper and Eastern Whipbird. Revegetated parkland sites supported 31 species or 45.6% of all avifauna recorded in the survey. Some native ground- and shrub-foraging insectivores such as White-browed Scrubwren, Superb Fairy-wren and Yellow

Thornbill were detected at these sites. The invasive Noisy Miner occurred at low-moderate levels in both revegetated parkland and bushland remnant sites. Open parkland supported 27 species (39.7%) of all avifauna recorded during the survey. Birds of open areas such as the introduced Rock Dove, Spotted Dove and Common Myna, native Crested Pigeon, Magpie-lark and Australian Magpie characterised these sites. Welcome Swallow often foraged in the airspace above these sites. Urban neighbourhood sites were dominated by Noisy Miner, Rainbow Lorikeet and Common Myna and were the least diverse, accounting for 33.8% (23 species) of all avifauna surveyed. Figures 5 and 6 display this variation in total and mean bird species richness between the four greenspace types in the study area.

Figure 5: Total number of bird species recorded by greenspace type, October 2010

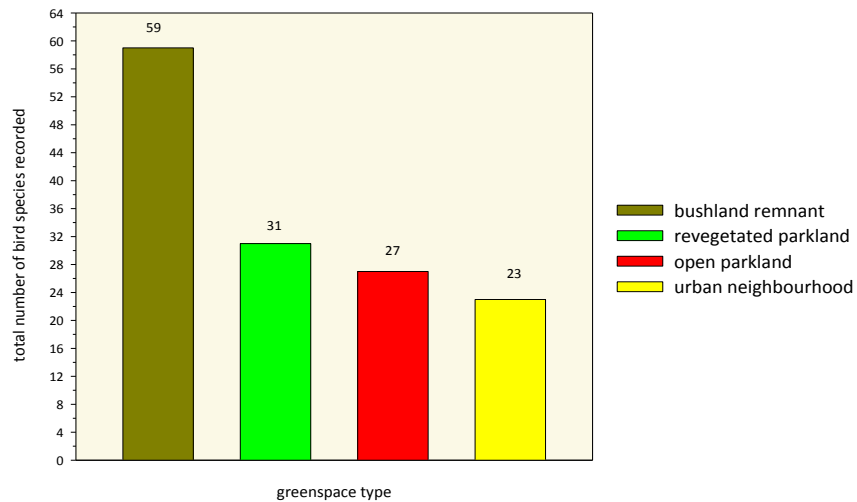
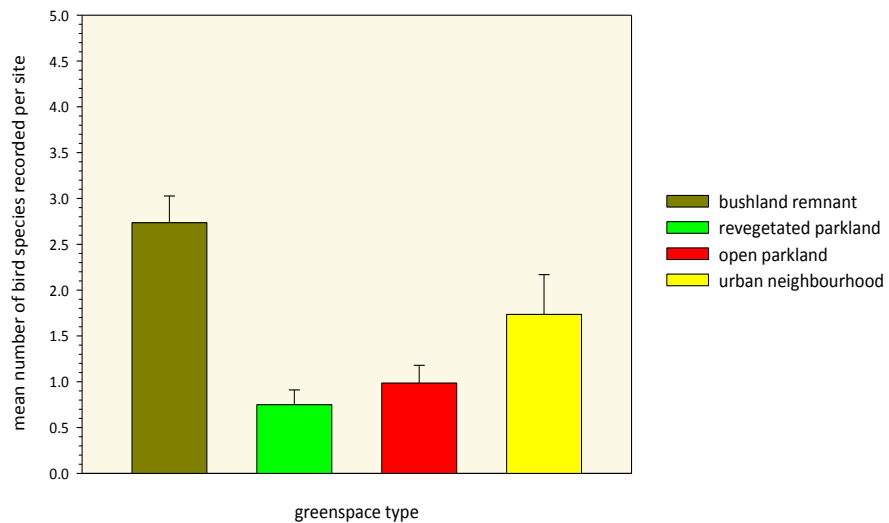


Figure 6: Mean number of bird species recorded by greenspace type, October 2010 (per site, with standard error shown)



3.3 Bird community structure and habitat

3.3.1 Composition of bird foraging guilds

Foraging guild composition is a key indicative component of bird community structure (Ford 1989; Wiens 1989; Mills 2007). A total of 15 bird foraging guilds were recorded in the study area (Figure 7). These included 12 terrestrial and 3 aquatic guilds.

The main terrestrial guilds comprised ground insectivores (14.7% of all guilds recorded across all greenspace types), shrub insectivores (14.7%), ground granivores (11.7%), omnivores (10.3%), canopy insectivores (8.8%), nectarivores/insectivores (8.8%), and carnivores (7.3%). The main ground insectivorous species recorded were White-browed Scrubwren, Australian Magpie, Variegated Fairy-wren and Superb Fairy-wren. Key shrub insectivores were Brown Thornbill, Yellow Thornbill and Brown Gerygone. Ground granivores were commonly represented by Spotted Dove, Rock Dove, Crested Pigeon, Galah and Long-billed Corella. Omnivores commonly included Common Myna, Pied Currawong, Silvereye and Australian Raven. Canopy insectivores included Spotted Pardalote, Black-faced Cuckoo-shrike, White-throated Treecreeper and Striated Thornbill. Noisy Miner and Red Wattlebird were the main nectarivores/insectivores recorded while relatively well represented carnivores included Laughing Kookaburra and Grey Butcherbird.

Bushland remnant sites supported taxonomically richer assemblages of birds particularly ground insectivores, shrub insectivores, canopy insectivores, nectarivores/insectivores and carnivores than did the other greenspace types (Figure 7). Many of these guilds included species that were not recorded or recorded in substantially lower numbers in the more open greenspace types. Ground granivores were relatively evenly distributed across each greenspace type. Revegetated parkland sites recorded reasonably diverse ground insectivore, nectarivore/insectivore and omnivore taxa. Open parkland and urban neighbourhood sites supported a slightly more diverse omnivorous guild and ground granivore taxa comparable to bushland remnant and revegetated parkland sites.

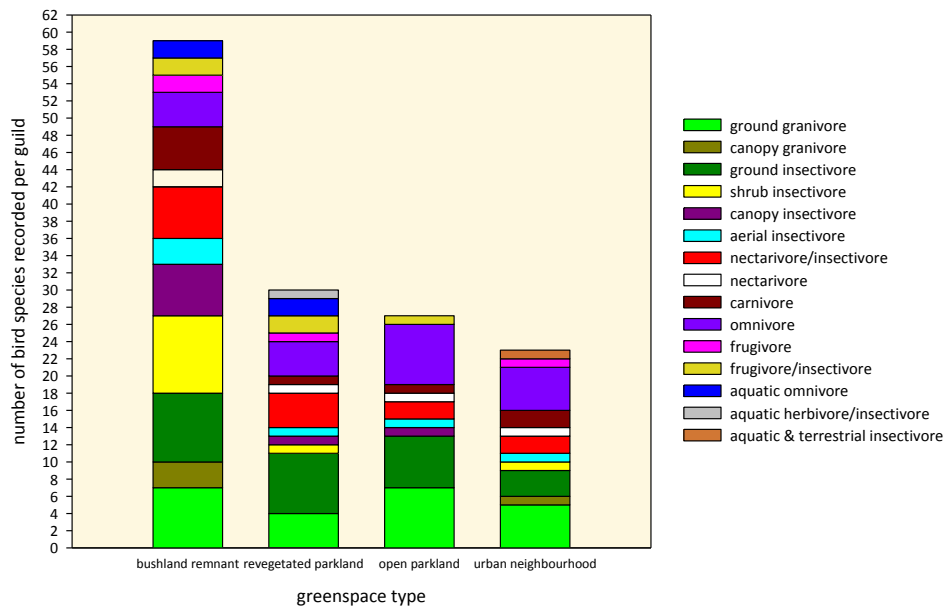
The three aquatic guilds were recorded in bushland remnant and revegetated parkland sites (aquatic omnivores Chestnut Teal and Pacific Black Duck). Revegetated parkland also supported one aquatic herbivore/insectivore (Purple Swamphen). The White-faced Heron, an aquatic and terrestrial insectivore, was recorded in one urban neighbourhood site (Badajoz Road).

3.3.2 Bird habitats and their use

A range of bird habitats were recorded in each greenspace type during the survey in the study area. Bushland remnants were a mixture of larger generally contiguous patches of sandstone slope and gully forest, allocasuarina woodland and mangroves along Lane Cove River, Kittys Creek, Buffalo Creek and Boronia Creek and smaller (0.1-2 ha) isolated patches of Sydney Turpentine Ironbark Forest along Tarban Creek, Parramatta River foreshore and Mallee Reserve. These remnants are part of a once more extensive indigenous forest and woodland that occurred prior to Sydney's urbanisation (see Benson and Howell 1990a, 1994). These patches contain ground cover, shrub and canopy layer habitats for insectivorous, granivorous,

frugivorous, omnivorous and nectarivorous birds. The core group of forest- and woodland-dependent endemics were all recorded in the larger remnants within Lane Cove NP, Field of Mars Wildlife Refuge and Boronia Creek Reserve. These included Eastern Yellow Robin, Brown Thornbill, Striated Thornbill, Eastern Whipbird, Powerful Owl, White-throated Treecreeper, Golden Whistler, Rufous Whistler, Brown Goshawk, Australian King-Parrot, Sacred Kingfisher, Shining Bronze-Cuckoo, Brown Gerygone, Grey Fantail and the migratory Rufous Fantail, Leaden Flycatcher and Black-faced Monarch. Other habitats occurring in the remnants were grass swards and rushes in Lane Cove NP near Buffalo Creek Reserve, a small number of standing dead trees (stags) in Tarban Creek Reserve, rock shelves and outcrops, fallen logs, and aquatic habitats (pools, running water and fringing vegetation) along Boronia, Kittys, Buffalo and Tarban Creeks.

Figure 7: Composition of foraging guilds by greenspace type, October 2010



Revegetated parkland sites provided a narrower suite of bird habitats than bushland remnants. The quality of these sites varied according to the age, size, floristic composition, areal extent and distance of the plantings from bushland remnants. Older (10-40 year-old) native mixed species plantings provided more layers of potential bird foraging, shelter and nesting habitat than younger plantings. Older planted sites surveyed included Putney Park, Olympic Park, Gladesville Reserve (oval and west), Riverglade Reserve (east) and Tarban Creek Reserve. Younger sites sampled were at Riverglade Reserve (west), Gladesville Reserve (east), Mallee Reserve, Bremner Park and Buffalo Creek Reserve. Older plantings offered a greater selection of perches, foraging microhabitat such as decorticated bark, leaf rolls and fallen debris, and potential breeding habitat for some indigenous and introduced passerines. In contrast, younger (ca. 3-6 year-old) indigenous plantings comprised fewer foraging, roosting and breeding opportunities, often consisting of only one canopy layer and some ground cover such as *Lomandra longifolia* clumps. A small group of native ground and shrub insectivores were recorded in older planted sites and included Superb Fairy-wren, Variegated Fairy-wren, White-browed Scrubwren, Yellow Thornbill, Willie Wagtail and Australian Brush-turkey. Nectarivores/insectivores also occurred – Yellow-faced Honeyeater, Little Wattlebird, Red

Wattlebird and Noisy Miner. Tree hollows, stags, fallen decaying logs and in-situ rock substrates were generally rare or absent from revegetated parkland sites.

Open parkland habitats were structurally simpler than their revegetated counterparts. They included grassed open space, weed-infested stormwater drains and drainage lines, built structures (e.g. playgrounds, picnic amenities), isolated individual or single rows of planted trees, and air space. Magdala Park, Boronia Park (ovals), Riverglade Reserve (oval), Bedlam Bay Regional Park (oval) and Tyagarah Reserve typified open parkland habitats sampled in the study area. Holy Cross College and Morrison Bay Park sites contained a mixture of open playing fields, built structures and narrow planted strips of *allocasuarina*, tallowwood and other eucalypts, usually fringing ovals or canals. Birds of open parkland habitats were a mix of hardy indigenous and introduced species able to forage, roost, shelter and/or successfully breed in these more open environments. They included ground granivores - Spotted Dove, Rock Dove, Crested Pigeon, Galah, Sulphur-crested Cockatoo, Little Corella and Long-billed Corella, ground insectivores - Australian Magpie, Magpie-lark, Willie Wagtail, Masked Lapwing, canopy and aerial insectivores - Black-faced Cuckoo-shrike and Welcome Swallow, nectarivores/insectivores - Noisy Miner and Red Wattlebird, a nectarivore - Rainbow Lorikeet, omnivores - Common Myna, Australian Raven, Australian White Ibis, Pied Currawong, Common Starling and Silvereye, a carnivore - Laughing Kookaburra and a frugivore/insectivore - Red-whiskered Bulbul.

Urban neighbourhood sites provided a range of novel and often floristically diverse habitats for bird species able to forage, roost, and, in some cases, breed in built-up residential areas. These habitats included sealed surfaces - roads, streets, gutters, footpaths, mown and vegetated street verge - with brush box *Lophostemon confertus* as the dominant native street tree, commonly pruned to a maximum height of 5-16 m, built structures - houses, fences, roof-mounted antennae, powerlines, streetlight poles, stormwater drains and home gardens comprising usually exotic and some indigenous shrubs with dense foliage and nectar-rich flowers to 3 m, and up to 30 m tall indigenous (e.g. eucalypts, paperbarks, silky oak *Grevillea robusta*, *allocasuarina*) and exotic (e.g. jacaranda, date palm, poplar, oak, cypress) trees in the front and rear yards of properties. Birds of these habitats were similar to those of open parkland sites. Typically they included ground granivores - Rock Dove, Spotted Dove, Crested Pigeon, Galah and Sulphur-crested Cockatoo, ground insectivores - Australian Magpie, Magpie-lark, Superb Fairy-wren and Willie Wagtail, a migratory frugivore - Eastern Koel, nectarivores/insectivores - Noisy Miner and Red Wattlebird, a nectarivore - Rainbow Lorikeet, omnivores - Australian White Ibis, Common Myna, Common Starling, Australian Raven and Pied Currawong, and the carnivorous Grey Butcherbird and Laughing Kookaburra. Supplementary feeding in backyards might help account for the presence of both of these carnivores.

Plates 7-24 show a sample of the diverse range of habitats and microhabitats utilised by birds surveyed in the study area.

Plate 7: Ground-to-canopy stratification of bird habitat in Field of Mars bushland remnant site



Plate 8: Complexity of canopy, tree hollow, bark, shrub & ground habitats in Boronia Park bushland remnant site



Plate 9: Exposed sandstone outcrops provide refuge for a range of fauna, Lane Cove NP (Sugarloaf Point) bushland remnant site



Plate 10: Fallen tree branches, dense shrubs and grasses provide foraging, nesting and shelter resources for understorey birds and reptiles, Betts Park bushland remnant



Plate 11: Recently planted section in Riverglade Reserve will augment riparian habitat for birds and other fauna



Plate 12: Red-browed Finch foraging in seeding grasses along creek edge of planted strip shown in Plate 11



Plate 13: Older planted eucalypts, poplars and she-oaks provide some nest sites and foraging resources for lorikeets, noisy miners and others, Tarban Creek Reserve



Plate 14: Stratified younger native plantings at Bremner Park site are providing food, nest and shelter sites for some bird and reptile species



Plate 15: Sporting fields at Holy Cross College open parkland site supplied seed and tubers for Galah, Rock Dove, corellas and other birds



Plate 16: Crested Pigeons foraging for seed on the mown surface of Morrison Bay open parkland site



Plate 17: Flowering grevillea in street verge, Moncrieff Drive urban neighbourhood (UN) site



Plate 18: Rainbow Lorikeet foraging in grevillea flowers at site shown in Plate 17



Plate 19: Noisy Miner nesting in a macadamia in the front garden of a house at Moncrieff Drive UN site



Plate 20: White-faced Heron with a skink in the front garden of a house at Badajoz Road UN site



Plate 21: Established native street trees (brush box and tallowwood) in road verge, Abigail Street UN site



Plate 22: Established exotic street trees (elm and oak) in road verge, Mary Street UN site (St Joseph's at left)



Plate 23: Street verge paperbark with nest box at right centre, Hillcrest Avenue UN site



Plate 24: Mown lawn street verge with lawn and low maintenance exotic front yards, Stanley Street UN site



3.4 Breeding activity

A total of 111 records of direct and indirect bird breeding activity involving 35 species were obtained during the survey in the study area. Direct evidence of reproductive activity included nesting, nest construction, provisioning of young as nestlings or fledglings, and mating. Indirect

evidence involved territory calling, nest site inspection, active territory defence including pursuits to repel intruders, and mate pursuits. Calling for a prospective mate was not included since it could not be established if this activity led to successful pairings and mating. These records produced a total of 186 nestlings, fledglings and juvenile birds.

Bird species recorded breeding during the survey were Spotted Dove, Crested Pigeon, Australian White Ibis, Brown Goshawk, Masked Lapwing, Long-billed Corella, Sulphur-crested Cockatoo, Rainbow Lorikeet, Australian King-parrot, Eastern Koel, Channel-billed Cuckoo, Laughing Kookaburra, Sacred Kingfisher, Dollarbird, Superb Fairy-wren, Variegated Fairy-wren, White-browed Scrubwren, Brown Gerygone, Striated Thornbill, Brown Thornbill, Noisy Miner, Red Wattlebird, Black-faced Cuckoo-shrike, Golden Whistler, Grey Butcherbird, Australian Magpie, Pied Currawong, Willie Wagtail, Australian Raven, Eastern Yellow Robin, Welcome Swallow, Red-whiskered Bulbul, Common Starling, Common Myna and Red-browed Finch (Appendix 1 and Plates 25-30).

Most of observed bird breeding activity occurred in bushland remnant and urban neighbourhood sites, with some records from older revegetated parkland sites. The larger bushland reserves – Field of Mars, Lane Cove NP and Boronia Park Reserve produced more breeding records across a greater range of bird species than did the smaller remnants. Only the more resilient species such as Noisy Miner, Red Wattlebird, Superb Fairy-wren and Spotted Dove were able to breed in the small bushland remnants. Some birds - Crested Pigeon, Spotted Dove, the parasitic Eastern Koel, Noisy Miner, Common Starling and Common Myna - bred in urban neighbourhood shrubs and street trees.

Plate 25: An active Crested Pigeon nest was detected in a densely foliated shrub at right of picture in Park Road UN site (bird shown in inset – Sebastiaan Hoogh)

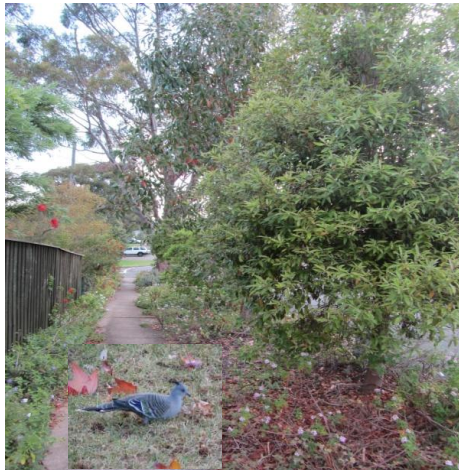


Plate 26: Chestnut Teal pair with fledgling in Buffalo Creek at Field of Mars bushland remnant site (Site 11)



Plate 27: Adult male Brush Turkey raking debris to build a mound, Buffalo Creek Reserve RP site



Plate 28: Early stage Brush Turkey mound construction at Buffalo Creek Reserve RP site (progress after 30 mins)



Plate 29: Sacred Kingfisher nest entrance in old termite mound in eucalypt, Field of Mars BR (Site 13)



Plate 30: Active Brown Goshawk nest in 25 m tall *Angophora costata* in Wallumatta NR bushland remnant site



3.5 Conservation significance of avifauna

No bird species of international conservation significance were recorded during the survey in the study area. However, 21 species listed under either or all three international conservation agreements – China-Australia Migratory Bird Agreement (CAMBA), Japan-Australia Migratory Bird Agreement (JAMBA) and Republic of Korea-Australia Migratory Bird Agreement (ROKAMBA) – have been recorded in or near the study area over the past 27 years (see InSight Ecology 2010). These are intercontinental migratory waders that arrive in spring in Australia and depart in autumn for their northern Asian breeding grounds, thus avoiding the northern hemisphere winter. They also include White-throated Needletail, Fork-tailed Swift, White-bellied Sea-Eagle, Cattle Egret, Eastern Great Egret, Crested Tern, Common Tern and Oriental Cuckoo.

No bird species listed as endangered or vulnerable under the national Environment Protection and Biodiversity Conservation Act (1999) were recorded during the survey in the study area.

However, 5 species listed under this legislation have been previously recorded in or near the study area. These include Swift Parrot (endangered, E1 listing), Eastern Bristlebird (E1), Regent Honeyeater (E1), Crested Shrike-tit (vulnerable), and White-fronted Chat (nominated for listing as vulnerable in September 2010). Three of these species - Eastern Bristlebird, Crested Shrike-tit and White-fronted Chat – have gone or are likely to have gone extinct in the study area (see InSight Ecology 2010). A further two species - Cotton Pygmy-goose and Black-necked Stork – are listed as endangered with NSW under the NSW Threatened Species Conservation (TSC) Act (1995). These birds have been recorded in Lane Cove River valley in the last 14 years (InSight Ecology 2010) but were not detected during the 2010 survey. Therefore, a total of 7 nationally and NSW threatened bird species have been recorded in or near the study area.

A suite of 18 indigenous bird species of regional and local conservation significance were recorded during the survey in the study area. These included 16 ground, shrub and canopy insectivores, one nocturnal insectivore (Tawny Frogmouth), and one carnivore (Brown Goshawk). The most significant of these species in conservation terms within the highly urbanised Sydney landscape are the ground-foraging Eastern Yellow Robin, Eastern Whipbird, Variegated Fairy-wren and Superb Fairy-wren, the shrub insectivores Brown Gerygone, Grey Fantail, Rufous Fantail, Striated Thornbill, Yellow Thornbill, Golden Whistler, Leaden Flycatcher and Black-faced Monarch, the bark-gleaning White-throated Treecreeper, and the canopy insectivore Striated Pardalote.

4. Discussion

4.1 Bird assemblages of the study area – patterns and processes

4.1.1 Bird responses to changes in Sydney’s greenspace

Over the past 223 years, Sydney’s native vegetation cover has been systematically removed and converted to housing for what are now more than 4 million people. All that remains are some small, highly fragmented patches that are experiencing further decline in habitat condition from invasive species and edge impacts. Today’s pattern of habitat distribution, size, connectivity and condition in the study area generally reflects this broad-scale process of change to the configuration, composition and continuity of habitats across the Sydney region. It is a process characteristic of the impact of broad-scale landscape change on biodiversity across cities in Australia (e.g. Perth - Recher and Serventy 1991; How and Dell 2000; Adelaide - Tait et al. 2005; Melbourne - van der Ree 2004, White et al. 2005; Sydney - Benson and Howell 1990b; Flannery 1999; Brisbane - Garden et al. 2006) and worldwide (see UNEP Convention on Biological Diversity 2007).

Counteracting this landscape-scale process of extensive habitat loss, fragmentation and modification, have been episodes of revegetation, mostly on publicly owned land over at least the past three decades. At the local and regional scale, this has introduced an array of indigenous and exotic vegetation into this landscape. Coupled with earlier plantings along streets, on private properties and in parks, these activities have shaped the type, amount, quality and condition of habitats available to birds and other fauna. In effect, there has been an incremental transformation of this landscape, especially in Sydney’s inner-west, south and

north-west, from one of mainly sealed surfaces with minimal vegetation cover to a complex mosaic of ribbons, patches and conduits of green interwoven with 'red-roof suburbia'.

Bird assemblages have responded to these changes over time by either adapting, colonising or disappearing from habitats in this landscape. A cohort of medium to large bodied indigenous and introduced birds dominates the native and exotic vegetation planted in parks, along streets, and in the front- and rear-yards of houses across the study area and other districts. These are opportunistic, highly adaptable and often aggressive species that survive, reproduce, and have ultimately colonised these novel urban habitats. These include Noisy Miner, Rainbow Lorikeet, Red Wattlebird, Crested Pigeon, Australian Raven, Australian Magpie, Magpie-lark, Grey Butcherbird and Pied Currawong. The introduced species are the ground-foraging granivores, Spotted Dove and Rock Dove, and the ubiquitous omnivores, Common Myna and Common Starling.

Bird assemblages in the smaller, highly isolated bushland remnants of the study area are much less taxonomically and functionally diverse than those occupying the larger contiguous remnants (Lane Cove River valley and its tributaries – Buffalo, Kittys, and Boronia Creeks). The smaller remnants at Betts Park, Tarban Creek, Putney Point, Mallee Reserve and Wallumatta NR support only a relatively small number of resilient species which are the residual of what were once, prior to intensive urbanisation, much richer guilds. Historical records confirm the incremental loss of small woodland and forest ground and shrub insectivores and nectarivores/insectivores from these and other small Sydney bushland remnants (Blakers et al. 1984; Barrett et al. 2003). Species now apparently extinct from these smaller, isolated remnants include mostly forest and some grassland dependent endemics - Grey Shrike-thrush, Crested Shrike-tit, Varied Sittella, Spotted Quail-thrush, Yellow-tufted Honeyeater, Speckled Warbler, Jacky Winter (despite some more recent reports), Little Grassbird, Diamond Firetail and Australasian Pipit. Small numbers of the ground-foraging insectivore Eastern Yellow Robin still occur in small isolated remnants such as Betts Park and Tarban Creek Reserve.

Other native ground-foraging insectivores - White-browed Scrubwren, Variegated Fairy-wren and Superb Fairy-wren - seem to be maintaining small breeding populations in weedy undergrowth of Mallee Reserve, Tarban Creek, and Bedlam Bay Regional Park. In the larger remnants of Field of Mars Wildlife Refuge, Lane Cove NP and Boronia Park Reserve, birds that have gone locally extinct over the past 50 or more years include Superb Lyrebird, Rockwarbler, Eastern Bristlebird, Crested Shrike-tit, Pheasant Coucal, Eastern Barn Owl, Noisy Pitta, White-fronted Chat, and the introduced Nutmeg Mannikin and Common Greenfinch. Powerful Owls, however, appear to be expanding their Sydney urban population with Lane Cove River forest providing key roosting, nesting and foraging habitat.

4.1.2 The Noisy Miner conquest

The most abundant and successful of the 'urban adaptees' is the Noisy Miner, followed by the Rainbow Lorikeet, Spotted Dove and Red Wattlebird. The Noisy Miner is a colony-living 'honeyeater' that aggressively protects food sources and breeding territories, repelling intruders and competitors through mobbing behaviour. It has rapidly colonised almost all urban greenspace types and their habitat niches across Sydney over at least the past decade (see Higgins et al. 2001; Parsons et al. 2003; French et al. 2005; Parsons et al. 2006). In doing so,

Noisy Miners may have either pushed out other species or taken over habitat niches vacated by species during earlier rounds of extinction, although further work is needed to confirm this.

In the study area, species that may have been adversely affected by the Noisy Miner could include smaller honeyeaters such as Yellow-faced Honeyeater, Eastern Spinebill and White-plumed Honeyeater, small shrub and canopy-foraging insectivores – Striated Pardalote, Brown Thornbill, Golden Whistler, Striated Thornbill and Brown Gerygone, and the once-common introduced House Sparrow and Common Blackbird. Neither of these two latter species was recorded during the survey. Competition for food and nest sites from Spotted Dove, Common Myna and Common Starling, predation by Grey Butcherbird, Pied Currawong and Australian Raven and mammalian carnivores, and a reduction in the amount of suitable nest sites may have been other key factors implicated in the recent decline of these two species across suburban Sydney. It is also feasible that the surprisingly low numbers of Willie Wagtail recorded in this study may reflect these combined pressures of competition from Noisy Miners and predation by avian and mammalian carnivores, although further work would be needed to confirm this. The Willie Wagtail is an indigenous, open-nesting, ground-foraging insectivore usually considered to be resilient and well adapted to urban life.

Habitats offering open canopies, nectar-rich plants such as grevillea cultivars, banksia, callistemon, strelitzia and camellia, dense foliage supplying nest sites and insects (e.g. eucalypts, paperbark, camellia and brush box – especially pruned brush box street trees that produce prolific flowers and attract insects and have many multiple branches with dense foliage), supplementary food and water supplies (often from houses and parks), and plenty of edge habitat have contributed to the success of the Noisy Miner in Sydney and other highly urbanised landscapes such as Melbourne (see, for example, White et al. 2005) and Brisbane (see Catterall 2004; Garden et al. 2006). Where these conditions are less favourable, such as in the more closed and continuous canopies of Lane Cove NP and Field of Mars Wildlife Refuge, Noisy Miners are absent or confined to the edges. Strategic management of urban greenspace for biodiversity conservation should, if possible, utilise this knowledge of Noisy Miner ecology.

The broadening of Noisy Miner diet to include grain-based food scraps available from outdoor café tables, rubbish bins and footpaths (A.H. pers obs) suggests that this species is fast acquiring omnivore status in suburban Sydney. Consequently, Noisy Miners are able to directly compete for food with the introduced Common Myna and Common Starling, although nest site preferences differ markedly between these species. Co-existence rather than exclusion, however, seems the more likely long-term outcome for these three species in this landscape.

In these ways, Noisy Miners may be viewed as potential ‘engineers’ of structural change in Sydney’s urban bird communities. Their ability to readily breed in and thus rapidly colonise urban habitats, broaden their diet and adapt their foraging strategy, and potentially displace other indigenous and exotic species, from within and possibly outside their foraging guild, has established the Noisy Miner as the dominant bird species in suburban Sydney. This has important implications for the strategic conservation management of other avifauna and their habitat, and indeed overall biodiversity values, in Ryde-Hunters Hill and neighbouring LGAs.

4.2 Urban greenspace as bird habitat in the study area

4.2.1 Habitat connectivity: the importance of greenspace networks

The bushland remnants of the study area provide a diverse suite of habitats for bird assemblages that are richer in species composition and community structure than many of their counterparts in nearby local government areas such as Canada Bay, Strathfield, Auburn and Burwood. They support insectivores which can be considered to be at risk of local extinction given the high level of habitat fragmentation and isolation in this landscape and pressure on key foraging, refuge and breeding resources from competitors, predators and humans. Alleviation of this pressure warrants continued conservation action in the study area, as does the protection of remnants against threats and improvement of the condition of their habitats.

The impetus for reducing pressure on these resources is already available in parts of the study area. A combination of established allocasuarina, paperbark, eucalypt and shrub-based other plantings along Tarban Creek at Riverglade Reserve, in Boronia Park Reserve and at Gladesville Reserve will, in time, establish denser understorey vegetation to help reduce the attractiveness of these areas for Noisy Miner invasion. Although, for this to be effective dense understorey plantings are needed across a larger scale and should be strategically integrated with existing bushland patches. Best-practice bush regeneration of existing dense ground cover vegetation in Mallee Reserve is also needed to minimise any impact of weed removal on small breeding Variegated Fairy-wren, White-browed Scrubwren and possibly Superb Fairy-wren populations.

Enhancing and re-establishing habitat connectivity in the study area for particularly dispersal-limited avifauna is the focus of the River to River Corridors Project. This will target key points within the two identified potential wildlife corridors with strategic revegetation and habitat rehabilitation and protection activities. Later reports will discuss this work in more detail.

4.2.2 Revegetated parkland: valuable bird habitat or Noisy Miner utopia?

Revegetated parkland provided foraging, and in some cases, breeding habitat for 11% of all birds recorded and 45.6% of all bird species observed during the survey. However, most of these species were aggressive, invasive or predatory birds - Noisy Miner, Rainbow Lorikeet, Red Wattlebird, Pied Currawong, and Grey Butcherbird. These species are commonly associated with structurally simpler, more open canopy habitats characterised by substantial amounts of edge and flowering tall trees and shrubs.

Only a small suite of remaining woodland/forest species appeared able to exploit the food, shelter and nesting resources of revegetated parkland. This was largely because of the high numbers of edge-affiliated species present, particularly Noisy Miner and, to a lesser extent, Red Wattlebird and the young age of many plantings. The latter species has become a relatively recent colonist of this type of greenspace in Sydney. Other factors included the number of nest predators present (Grey Butcherbird, Pied Currawong, Australian Raven), stage of growth (many stands were less than 10 years old), narrow width and moderate-high angularity of stands, lack of stand structural complexity, poor habitat condition (weed-invaded, fire-affected), minimal or little connectivity between revegetation patches, and frequent disturbance by humans, cats and dogs.

The real value of Ryde-Hunters Hill's revegetated parkland lies in its potential to connect highly isolated remnants, riparian habitat and urban neighbourhood vegetation across the local landscape. In doing so, plantings will contribute to restoring habitat linkages and potential wildlife corridors at the local *and* regional scale. If focus is given to increasing the structural complexity of habitats - especially creating denser understorey plantings to exclude Noisy Miners - and the variety of microhabitats while also improving their condition, then these plantings should help restore a level of ecological function to the study area. More direct interventions may also need to be considered.

4.2.3 Urban neighbourhood habitats: looking beyond footpath and fence

Ryde and particularly Hunters Hill are older established Sydney suburbs. Successive phases of planting of native and introduced vegetation have occurred along the streets and in residential front- and rear-yards since this time, culminating in the insertion and maintenance of brush box, paperbark tea-tree, elms and oaks as the main street tree species. As a result, urban neighbourhoods are well foliated and appear to provide food and suitable foraging, nesting and refuge habitats for a range of birds, bats and insects. Proximity to, and some connections with, old established parks and newer, bush-regenerated open space could theoretically enhance these functions.

The ornithological and ecological reality, however, is that urban neighbourhood habitats in the study area mostly cater for a cohort of resilient, urban-adapted species. With the exception of Superb Fairy-wren, the small bush birds are excluded from these sites. This reflects the lack of structural complexity of habitats available for exploitation by these smaller species. Competitive and predatory interactions between species and disturbance and predation by cats, rats and dogs are also implicated. Supplementary feeding and water provisioning of birds by residents and planting of grevillea, callistemon and other high nectar-producing species in gardens have also favoured the colonisation of urban neighbourhood habitats by larger birds, especially the Noisy Miner and Red Wattlebird and regular visitation by the carnivorous Laughing Kookaburra and Grey Butcherbird. Landscape attributes such as distance from nearest remnant or revegetation patch and poor habitat connectivity may also be factors that have contributed to this dearth of small native birds.

There is a need to view urban neighbourhood habitats as more than just streetscape vegetation, without devaluing the contribution of street trees to the structure of Australian urban bird communities (see Young et al. 2007). The role and function of front- and rear-yard habitats in providing viable foraging, breeding and shelter habitat for birds need to be properly understood. These habitats include mown lawns, cultivated garden beds, planted ground cover, shrubs and trees, individual remnant trees, and garden ornaments such as ponds, fountains and birdbaths. How do these habitats function to facilitate the movement of small birds into and through urban neighbourhoods? Would they perform better in this role if species such as the Noisy Miner and Pied Currawong were present in fewer numbers? What specific actions would represent best value for money and effort invested in helping to re-connect previously isolated Eastern Yellow Robin, White-browed Scrubwren, Variegated Fairy-wren and/or Superb Fairy-wren populations? These are examples of the types of questions that need to be addressed

prior to planning and implementing bush revegetation for small birds on publicly and privately owned urban neighbourhood habitats.

Potential therefore exists to provide suitable habitat to attract some small bush birds back into Ryde-Hunters Hill's urban neighbourhood. The building blocks of interstitial or 'stepping stone' habitat are there, at least for species capable of foraging in, moving through, and possibly breeding in planted garden hedges, shrubs and lawns such as the Superb Fairy-wren and possibly White-browed Scrubwren. However, a long-term (10 years +) community-based program is needed to plan and implement the strategic revegetation of key parts of this landscape for other bushland bird species. This is one of the key goals of the current initiative but will require further funding beyond the life of this project.

4.3 Conservation targets – focusing management action

A cornerstone of best-practice ecosystem management involves identifying and protecting, through strategic intervention, species, communities and habitats of conservation significance. Several opportunities exist to enhance current biodiversity conservation management activities and protect bird communities and their habitats in the study area. The emphasis is on protecting small bush birds because they appear to have declined markedly in Australian urban landscapes over the past two decades (Recher and Serventy 1991; Sewell and Catterall 1998; Barrett et al. 2003; Parsons et al. 2006). However, other bird species with intermediate sensitivities to the loss of habitat size, shape, connectivity and condition would be also benefited by these actions.

Protection of the condition and ecological integrity of the three key larger bushland remnants in the study area against degrading impacts should be of high priority and continued to be pursued through existing bushland management plans. This will require reduction of threats to birds and other fauna posed by feral and domestic cats, rats, dogs and foxes, weed reduction and management, fire protection, and management of human incursions such as rubbish dumping and trailbike use. Strategic planting and best-practice bush regeneration will be needed to improve the ecological condition and, where feasible, the connectivity of smaller bushland remnants.

The restoration of riparian habitats and strategic revegetation of parkland are other opportunities to improve the quality, connectivity and functional value of these greenspace types for small bush birds in the study area. Here the emphasis is on improving the structural complexity and floristic diversity of local indigenous plantings (including denser plantings), widening revegetation strips to reduce the amount of edge habitat for the Noisy Miner and other invasive species, filling gaps between plantings to improve connectivity at the local and landscape scales, and considering direct control of Noisy Miner numbers.

Conservation targets in urban neighbourhood and open parkland habitats should complement those pursued in adjoining revegetated parkland and bush remnants. These focus on targeting the linkage of 'stepping stones' or 'corridors' for small birds through new and existing strategic plantings in streets and home gardens, adoption of small bird-friendly practices - garden re-design, pet management (especially cat and dog control), reduction of watering points and reduction of supplementary feeding, and coordination with adjoining councils as part of the

larger and interconnected urban landscape. Later work in this project will discuss specific actions to help achieve these outcomes.

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Appendix

Appendix 1: All individual birds recorded by InSight Ecology during the 12-22 October 2010 survey of the study area
* introduced species

Record No.	Common Name	Scientific Name	Date	Time	Site No.	Site Name	Bushland Remnant	Revegetated Parkland	Open Parkland	Urban Neighbourhood	Behaviour	Comments
1	Australian Brush-turkey	Alectura lathami	211010	0950-1020	34	Buffalo Creek Reserve	0	1	0	0	preparing mound	observed raking new mound under older planted section abutting creek & beside sealed path
2	Chestnut Teal	Anas castanea	181010	1645-1735	24	Betts Park	1	0	0	0	foraging in storm-water retention pond	
3	Chestnut Teal	Anas castanea	201010	0925-1000	29	Riverglade Reserve	0	6	0	0	foraging	in creek
4	Pacific Black Duck	Anas superciliosa	201010	0745-0915	22	Tarban Creek Reserve - north bank (including Villa Maria)	1	0	0	0	foraging	in creek pool
5	Pacific Black Duck	Anas superciliosa	201010	0925-1000	29	Riverglade Reserve	0	4	0	0	foraging	wet areas/creek
6	Pacific Black Duck	Anas superciliosa	211010	0950-1020	34	Buffalo Creek Reserve	0	1	0	0	foraging	along grass/ck edge
7	Rock Dove *	Columba livia	131010	1610-1700	5	Holy Cross College	0	0	19	0		
8	Rock Dove *	Columba livia	151010	1030-1115	12	Badajoz Road	0	0	0	2		
9	Rock Dove *	Columba livia	171010	1015-1040	16	Eltham Street	0	0	0	1		
10	Rock Dove *	Columba livia	171010	1605-1625	17	Abigail Street	0	0	0	2		
11	Rock Dove *	Columba livia	191010	1745-1815	28	Tennyson Road	0	0	0	31	foraging	supplementary feeding issue at 6 Teemer St (pics)
12	Rock	Columba livia	201010	0925-	29	Riverglade	0	2	0	0		

Record No.	Common Name	Scientific Name	Date	Time	Site No.	Site Name	Bushland Remnant	Revegetated Parkland	Open Parkland	Urban Neighbourhood	Behaviour	Comments
	Dove *			1000		Reserve						
13	Rock Dove *	<i>Columba livia</i>	211010	1710-1750	36	Stanley Street	0	0	0	2	foraging	
14	Spotted Dove *	<i>Streptopelia chinensis</i>	121010	1805-1835	2	Blaxland Street	0	0	0	2		
15	Spotted Dove *	<i>Streptopelia chinensis</i>	131010	1610-1700	5	Holy Cross College	0	0	1	0		
16	Spotted Dove *	<i>Streptopelia chinensis</i>	151010	1030-1115	12	Badajoz Road	0	0	0	7		
17	Spotted Dove *	<i>Streptopelia chinensis</i>	171010	0910-0940	14	Beazley Street	0	0	0	10	bred	total 4 juveniles
18	Spotted Dove *	<i>Streptopelia chinensis</i>	171010	0945-1005	15	Monash Road	0	0	0	5	nesting	in frontyard Golden Cypress
19	Spotted Dove *	<i>Streptopelia chinensis</i>	171010	1015-1040	16	Eltham Street	0	0	0	6	nesting	in frontyard cypress
20	Spotted Dove *	<i>Streptopelia chinensis</i>	171010	1605-1625	17	Abigail Street	0	0	0	3		
21	Spotted Dove *	<i>Streptopelia chinensis</i>	171010	1710-1740	19	Hillcrest Avenue	0	0	0	7	nesting	
22	Spotted Dove *	<i>Streptopelia chinensis</i>	181010	1755-1845	25	Gladesville Reserve	0	1	0	0		
23	Spotted Dove *	<i>Streptopelia chinensis</i>	191010	1710-1740	27	Western Crescent	0	0	0	12		
24	Spotted Dove *	<i>Streptopelia chinensis</i>	191010	1745-1815	28	Tennyson Road	0	0	0	3	nesting	in exotic cypress row
25	Spotted Dove *	<i>Streptopelia chinensis</i>	201010	1735-1840	32	Mallee Reserve	3	0	0	0	nesting	
26	Crested Pigeon	<i>Ocyphaps lophotes</i>	121010	1705-1750	1	Moncrieff Drive	0	0	0	2		
27	Crested Pigeon	<i>Ocyphaps lophotes</i>	131010	1610-1700	5	Holy Cross College	0	0	2	0		
28	Crested Pigeon	<i>Ocyphaps lophotes</i>	141010	1805-1830	9	Park Road	0	0	0	2	nesting	nest in street verge exotic shrub
29	Crested Pigeon	<i>Ocyphaps lophotes</i>	141010	1835-1855	10	Westminster Road	0	0	0	2		
30	Crested Pigeon	<i>Ocyphaps lophotes</i>	151010	1030-1115	12	Badajoz Road	0	0	0	1		
31	Crested Pigeon	<i>Ocyphaps lophotes</i>	171010	0910-0940	14	Beazley Street	0	0	0	2		
32	Crested Pigeon	<i>Ocyphaps lophotes</i>	171010	1015-1040	16	Eltham Street	0	0	0	1		
33	Crested Pigeon	<i>Ocyphaps lophotes</i>	181010	1645-1735	24	Betts Park	1	0	0	0		

Record No.	Common Name	Scientific Name	Date	Time	Site No.	Site Name	Bushland Remnant	Revegetated Parkland	Open Parkland	Urban Neighbourhood	Behaviour	Comments
34	Crested Pigeon	Ocyphaps lophotes	191010	1710-1740	27	Western Crescent	0	0	0	2		
35	Crested Pigeon	Ocyphaps lophotes	191010	1745-1815	28	Tennyson Road	0	0	0	4	foraging	on lawn corner Tennyson & Teemer (pics)
36	Crested Pigeon	Ocyphaps lophotes	201010	1735-1840	32	Mallee Reserve	1	0	0	0		
37	Crested Pigeon	Ocyphaps lophotes	211010	1710-1750	36	Stanley Street	0	0	0	1		
38	Crested Pigeon	Ocyphaps lophotes	211010	1800-18355	37	Morrison Bay Park	0	0	19	0	foraging, mating	in one group near canal centre - supplementary feeding likely
39	Tawny Frogmouth	Podargus strigoides	141010	0745-0855	6	Lane Cove NP north	1	0	0	0	roosting	
40	White-faced Heron	Egretta novaehollandiae	151010	1030-1115	12	Badajoz Road	0	0	0	2	one foraging in front garden Quarry Rd	pics taken
41	Australian White Ibis	Threskiornis molucca	121010	1805-1835	2	Blaxland Street	0	0	0	6	flyover	
42	Australian White Ibis	Threskiornis molucca	131010	1610-1700	5	Holy Cross College	0	0	1	0		
43	Australian White Ibis	Threskiornis molucca	141010	1615-1635	7	Boronia Park Ovals 2&3	0	0	1	0		
44	Australian White Ibis	Threskiornis molucca	171010	0910-0940	14	Beazley Street	0	0	0	9	breeding	nesting in palms Royal Ryde Rehab Centre gardens
45	Australian White Ibis	Threskiornis molucca	201010	1005-1025	30	Riverglade Reserve	0	0	1	0	foraging	on freshly mown oval
46	Brown Goshawk	Accipiter fasciatus	131010	0715-0800	3	Lane Cove NP - Sugarloaf Point	2	0	0	0	flyover/foraging	
47	Brown Goshawk	Accipiter fasciatus	141010	0745-0855	6	Lane Cove NP north	1	0	0	0		
48	Brown Goshawk	Accipiter fasciatus	211010	0730-0830	33	Wallumatta Nature Reserve	1	0	0	0	nesting	25m up top A. costata @ WNR03
49	Purple Swamphen	Porphyrio porphyrio	201010	0925-1000	29	Riverglade Reserve	0	2	0	0	foraging	in artificial wetland beside creek
50	Purple Swamphen	Porphyrio porphyrio	201010	0925-1000	29	Riverglade Reserve	0	2	0	0	foraging	

Record No.	Common Name	Scientific Name	Date	Time	Site No.	Site Name	Bushland Remnant	Revegetated Parkland	Open Parkland	Urban Neighbourhood	Behaviour	Comments
51	Masked Lapwing	Vanellus miles	131010	1610-1700	5	Holy Cross College	0	0	5	0	bred with 3 fledglings	total 3 young
52	Masked Lapwing	Vanellus miles	181010	1755-1845	25	Gladesville Reserve	0	2	0	0	breeding	on old bowling green of Henley club
53	Masked Lapwing	Vanellus miles	211010	1800-18355	37	Morrison Bay Park	0	0	1	0	foraging	
54	Silver Gull	Chroicocephalus novaehollandiae	201010	1005-1025	30	Riverglade Reserve	0	0	1	0	foraging	on freshly mown oval
55	Yellow-tailed Black-Cockatoo	Calyptorhynchus funereus	151010	0730-0840	11	Field of Mars Wildlife Refuge A	3	0	0	0	calling, flying	
56	Galah	Eolophus roseicapillus	131010	0715-0800	3	Lane Cove NP - Sugarloaf Point	4	0	0	0		
57	Galah	Eolophus roseicapillus	131010	1610-1700	5	Holy Cross College	0	0	4	0		
58	Galah	Eolophus roseicapillus	141010	1700-1800	8	Boronia Park bushland	2	0	0	0		
59	Galah	Eolophus roseicapillus	151010	1030-1115	12	Badajoz Road	0	0	0	2		
60	Long-billed Corella	Cacatua tenuirostris	131010	1610-1700	5	Holy Cross College	0	0	2	0		
61	Long-billed Corella	Cacatua tenuirostris	151010	0730-0840	11	Field of Mars Wildlife Refuge A	2	0	0	0	likely nesting	
62	Long-billed Corella	Cacatua tenuirostris	211010	1800-18355	37	Morrison Bay Park	0	0	17	0		
63	Little Corella	Cacatua sanguinea	141010	1615-1635	7	Boronia Park Ovals 2&3	0	0	1	0		
64	Little Corella	Cacatua sanguinea	201010	0745-0915	22	Tarban Creek Reserve - north bank (including Villa Maria)	1	0	0	0	calling	
65	Little Corella	Cacatua sanguinea	201010	1735-1840	32	Mallee Reserve	1	0	0	0		
66	Little Corella	Cacatua sanguinea	211010	1800-18355	37	Morrison Bay Park	0	0	5	0		
67	Little Corella	Cacatua sanguinea	221010	0810-0830	38	Putney Point	2	0	0	0	calling	

Record No.	Common Name	Scientific Name	Date	Time	Site No.	Site Name	Bushland Remnant	Revegetated Parkland	Open Parkland	Urban Neighbourhood	Behaviour	Comments
68	Sulphur-crested Cockatoo	Cacatua galerita	121010	1705-1750	1	Moncrieff Drive	0	0	0	1		
69	Sulphur-crested Cockatoo	Cacatua galerita	121010	1805-1835	2	Blaxland Street	0	0	0	2		
70	Sulphur-crested Cockatoo	Cacatua galerita	131010	0930-0945	4	Magdala Park	0	0	2	0		
71	Sulphur-crested Cockatoo	Cacatua galerita	131010	1610-1700	5	Holy Cross College	0	0	6	0		
72	Sulphur-crested Cockatoo	Cacatua galerita	141010	0745-0855	6	Lane Cove NP north	1	0	0	0		
73	Sulphur-crested Cockatoo	Cacatua galerita	181010	0950-1015	23	Tarban Creek Reserve (mid)	0	3	0	0		
74	Sulphur-crested Cockatoo	Cacatua galerita	201010	0745-0915	22	Tarban Creek Reserve - north bank (including Villa Maria)	2	0	0	0	possible nesting	near older blackbutt hollows
75	Rainbow Lorikeet	Trichoglossus haematodus	121010	1705-1750	1	Moncrieff Drive	0	0	0	18		
76	Rainbow Lorikeet	Trichoglossus haematodus	121010	1805-1835	2	Blaxland Street	0	0	0	17		
77	Rainbow Lorikeet	Trichoglossus haematodus	131010	0715-0800	3	Lane Cove NP - Sugarloaf Point	2	0	0	0		
78	Rainbow Lorikeet	Trichoglossus haematodus	131010	1610-1700	5	Holy Cross College	0	0	2	0		
79	Rainbow Lorikeet	Trichoglossus haematodus	141010	0745-0855	6	Lane Cove NP north	14	0	0	0	nesting	
80	Rainbow Lorikeet	Trichoglossus haematodus	141010	1615-1635	7	Boronia Park Ovals 2&3	0	0	4	0		
81	Rainbow Lorikeet	Trichoglossus haematodus	141010	1700-1800	8	Boronia Park bushland	22	0	0	0	nesting	
82	Rainbow Lorikeet	Trichoglossus haematodus	141010	1805-1830	9	Park Road	0	0	0	3		

Record No.	Common Name	Scientific Name	Date	Time	Site No.	Site Name	Bushland Remnant	Revegetated Parkland	Open Parkland	Urban Neighbourhood	Behaviour	Comments
83	Rainbow Lorikeet	Trichoglossus haematodus	141010	1835-1855	10	Westminster Road	0	0	0	13		
84	Rainbow Lorikeet	Trichoglossus haematodus	151010	0730-0840	11	Field of Mars Wildlife Refuge A	12	0	0	0	nesting	
85	Rainbow Lorikeet	Trichoglossus haematodus	151010	1030-1115	12	Badajoz Road	0	0	0	14		
86	Rainbow Lorikeet	Trichoglossus haematodus	171010	0800-0855	13	Field of Mars Wildlife Refuge B	5	0	0	0	nesting	
87	Rainbow Lorikeet	Trichoglossus haematodus	171010	0910-0940	14	Beazley Street	0	0	0	11		
88	Rainbow Lorikeet	Trichoglossus haematodus	171010	0945-1005	15	Monash Road	0	0	0	18	foraging	in street verge callistemon
89	Rainbow Lorikeet	Trichoglossus haematodus	171010	1015-1040	16	Eltham Street	0	0	0	10		
90	Rainbow Lorikeet	Trichoglossus haematodus	171010	1605-1625	17	Abigail Street	0	0	0	10		
91	Rainbow Lorikeet	Trichoglossus haematodus	171010	1630-1700	18	Mary Street	0	0	0	11		
92	Rainbow Lorikeet	Trichoglossus haematodus	171010	1710-1740	19	Hillcrest Avenue	0	0	0	20	foraging in eucalypts & callistemon street verge	
93	Rainbow Lorikeet	Trichoglossus haematodus	171010	1750-1810	20	Kelly Street	0	0	0	11		
94	Rainbow Lorikeet	Trichoglossus haematodus	181010	0900-0945	21	Tarban Creek Reserve (upper)	3	0	0	12	bred	
95	Rainbow Lorikeet	Trichoglossus haematodus	181010	0950-1015	23	Tarban Creek Reserve (mid)	0	6	0	0	bred	feeding 1 fledgling
96	Rainbow Lorikeet	Trichoglossus haematodus	181010	1645-1735	24	Betts Park	2	0	0	0		
97	Rainbow Lorikeet	Trichoglossus haematodus	181010	1755-1845	25	Gladesville Reserve	0	4	0	0		
98	Rainbow Lorikeet	Trichoglossus haematodus	191010	1630-1640	26	Bedlam Bay Park (oval)	0	0	5	0		

Record No.	Common Name	Scientific Name	Date	Time	Site No.	Site Name	Bushland Remnant	Revegetated Parkland	Open Parkland	Urban Neighbourhood	Behaviour	Comments
99	Rainbow Lorikeet	Trichoglossus haematodus	191010	1745-1815	28	Tennyson Road	0	0	0	9		
100	Rainbow Lorikeet	Trichoglossus haematodus	201010	0745-0915	22	Tarban Creek Reserve - north bank (including Villa Maria)	32	0	0	0	breeding	in blackbutt/ angophora costata hollows
101	Rainbow Lorikeet	Trichoglossus haematodus	211010	0730-0830	33	Wallumatta Nature Reserve	7	0	0	0		
102	Rainbow Lorikeet	Trichoglossus haematodus	211010	0950-1020	34	Buffalo Creek Reserve	0	3	0	0		
103	Rainbow Lorikeet	Trichoglossus haematodus	211010	1635-1650	35	Tyagarah Reserve	0	0	2	0		
104	Rainbow Lorikeet	Trichoglossus haematodus	211010	1710-1750	36	Stanley Street	0	0	0	7	calling, foraging	
105	Rainbow Lorikeet	Trichoglossus haematodus	211010	1800-18355	37	Morrison Bay Park	0	0	8	0	foraging	in fringing eucalypts
106	Rainbow Lorikeet	Trichoglossus haematodus	221010	0955-1025	40	Bremner Park	0	11	0	0	foraging	in callistemon rows
107	Australian King-Parrot	Alisterus scapularis	151010	1030-1115	12	Badajoz Road	0	0	0	1	flyover	
108	Australian King-Parrot	Alisterus scapularis	171010	0910-0940	14	Beazley Street	0	0	0	2	flyover S across Vic Rd	
109	Australian King-Parrot	Alisterus scapularis	201010	0745-0915	22	Tarban Creek Reserve - north bank (including Villa Maria)	3	0	0	0	nest site inspection	2 males, 1 females near older blackbutt hollows
110	Australian King-Parrot	Alisterus scapularis	221010	0810-0830	38	Putney Point	2	0	0	0	perching	mobbed by miners
111	Crimson Rosella	Platycercus elegans	141010	0745-0855	6	Lane Cove NP north	4	0	0	0		
112	Crimson Rosella	Platycercus elegans	141010	1700-1800	8	Boronia Park bushland	2	0	0	0		
113	Crimson Rosella	Platycercus elegans	151010	0730-0840	11	Field of Mars Wildlife Refuge A	4	0	0	0		
114	Eastern Koel	Eudynamys	121010	1705-	1	Moncrieff	0	0	0	2		

Record No.	Common Name	Scientific Name	Date	Time	Site No.	Site Name	Bushland Remnant	Revegetated Parkland	Open Parkland	Urban Neighbourhood	Behaviour	Comments
		orientalis		1750		Drive						
115	Eastern Koel	Eudynamys orientalis	121010	1805-1835	2	Blaxland Street	0	0	0	1		
116	Eastern Koel	Eudynamys orientalis	131010	0715-0800	3	Lane Cove NP - Sugarloaf Point	3	0	0	0	mate-calling	
117	Eastern Koel	Eudynamys orientalis	141010	0745-0855	6	Lane Cove NP north	1	0	0	0		
118	Eastern Koel	Eudynamys orientalis	171010	0800-0855	13	Field of Mars Wildlife Refuge B	2	0	0	0	mate-calling	2 males
119	Eastern Koel	Eudynamys orientalis	171010	0910-0940	14	Beazley Street	0	0	0	1	mate-calling	
120	Eastern Koel	Eudynamys orientalis	171010	1630-1700	18	Mary Street	0	0	0	1	call only	
121	Eastern Koel	Eudynamys orientalis	171010	1710-1740	19	Hillcrest Avenue	0	0	0	1	mate-calling	in backyard trees no. 23 Hillcrest Av
122	Eastern Koel	Eudynamys orientalis	171010	1750-1810	20	Kelly Street	0	0	0	1	mate-calling	in old fig 20 Dick Street
123	Eastern Koel	Eudynamys orientalis	181010	0950-1015	23	Tarban Creek Reserve (mid)	0	1	0	0	mate-calling	
124	Eastern Koel	Eudynamys orientalis	181010	1755-1845	25	Gladesville Reserve	0	1	0	0	mate-calling	
125	Eastern Koel	Eudynamys orientalis	191010	1710-1740	27	Western Crescent	0	0	0	1	mate-calling	
126	Eastern Koel	Eudynamys orientalis	201010	0745-0915	22	Tarban Creek Reserve - north bank (including Villa Maria)	3	0	0	0	nest-searching, mate pursuits	2 males, 1 female
127	Eastern Koel	Eudynamys orientalis	211010	0950-1020	34	Buffalo Creek Reserve	0	1	0	0		
128	Eastern Koel	Eudynamys orientalis	211010	1710-1750	36	Stanley Street	0	0	0	1	mate-calling	
129	Channel-billed Cuckoo	Scythrops novaehollandiae	131010	0715-0800	3	Lane Cove NP - Sugarloaf Point	2	0	0	0	mate-calling	
130	Channel-billed Cuckoo	Scythrops novaehollandiae	181010	1755-1845	25	Gladesville Reserve	0	1	0	0		
131	Channel-billed Cuckoo	Scythrops novaehollandiae	201010	1705-1730	31	Olympic Park	0	1	0	0	nest-searching	mobbed by miners & currawong in 12m

Record No.	Common Name	Scientific Name	Date	Time	Site No.	Site Name	Bushland Remnant	Revegetated Parkland	Open Parkland	Urban Neighbourhood	Behaviour	Comments
		iae										tall large fig
132	Shining Bronze-Cuckoo	Chalcites lucidus	141010	0745-0855	6	Lane Cove NP north	1	0	0	0	mate-calling	
133	Fan-tailed Cuckoo	Cacomantis flabelliformis	121010	1705-1750	1	Moncrieff Drive	0	0	0	1		on powerline above front garden
134	Powerful Owl	Ninox strenua	141010	1700-1800	8	Boronia Park bushland	2	0	0	0	roosting	1 adult and 1 sub-adult, 5 m up in gully pittosporum at BPBR02
135	Laughing Kookaburra	Dacelo novaeguineae	131010	0930-0945	4	Magdala Park	0	0	1	0		
136	Laughing Kookaburra	Dacelo novaeguineae	151010	0730-0840	11	Field of Mars Wildlife Refuge A	1	0	0	0		
137	Laughing Kookaburra	Dacelo novaeguineae	151010	1030-1115	12	Badajoz Road	0	0	0	2		
138	Laughing Kookaburra	Dacelo novaeguineae	171010	0800-0855	13	Field of Mars Wildlife Refuge B	2	0	0	0	nesting	nesting in old tree termite mound
139	Laughing Kookaburra	Dacelo novaeguineae	181010	0900-0945	21	Tarban Creek Reserve (upper)	1	0	0	0		
140	Laughing Kookaburra	Dacelo novaeguineae	181010	1645-1735	24	Betts Park	1	0	0	0		
141	Laughing Kookaburra	Dacelo novaeguineae	201010	0745-0915	22	Tarban Creek Reserve - north bank (including Villa Maria)	1	0	0	0		
142	Laughing Kookaburra	Dacelo novaeguineae	201010	1735-1840	32	Mallee Reserve	4	0	0	0	mate-pursuits	
143	Sacred Kingfisher	Halcyon sancta	131010	0715-0800	3	Lane Cove NP - Sugarloaf Point	1	0	0	0		
144	Sacred Kingfisher	Halcyon sancta	171010	0800-0855	13	Field of Mars Wildlife Refuge B	2	0	0	0	mate-pursuits	

Record No.	Common Name	Scientific Name	Date	Time	Site No.	Site Name	Bushland Remnant	Revegetated Parkland	Open Parkland	Urban Neighbourhood	Behaviour	Comments
145	Sacred Kingfisher	<i>Halcyon sancta</i>	201010	0745-0915	22	Tarban Creek Reserve - north bank (including Villa Maria)	1	0	0	0	mate-calling	
146	Dollarbird	<i>Eurystomus orientalis</i>	131010	0715-0800	3	Lane Cove NP - Sugarloaf Point	3	0	0	0	likely courtship/breeding	
147	Dollarbird	<i>Eurystomus orientalis</i>	141010	1700-1800	8	Boronia Park bushland	3	0	0	0	pre-nesting	inspecting blackbutt potential nest hollow
148	Dollarbird	<i>Eurystomus orientalis</i>	151010	0730-0840	11	Field of Mars Wildlife Refuge A	2	0	0	0	likely breeding	
149	Dollarbird	<i>Eurystomus orientalis</i>	201010	0745-0915	22	Tarban Creek Reserve - north bank (including Villa Maria)	2	0	0	0	nesting	in older blackbutt on lower slope along creek
150	White-throated Treecreeper	<i>Cormobates leucophaea</i>	131010	0715-0800	3	Lane Cove NP - Sugarloaf Point	2	0	0	0		
151	White-throated Treecreeper	<i>Cormobates leucophaea</i>	141010	0745-0855	6	Lane Cove NP north	4	0	0	0		
152	White-throated Treecreeper	<i>Cormobates leucophaea</i>	141010	1700-1800	8	Boronia Park bushland	1	0	0	0	call	
153	White-throated Treecreeper	<i>Cormobates leucophaea</i>	151010	0730-0840	11	Field of Mars Wildlife Refuge A	4	0	0	0		
154	White-throated Treecreeper	<i>Cormobates leucophaea</i>	171010	0800-0855	13	Field of Mars Wildlife Refuge B	1	0	0	0		
155	Superb Fairy-wren	<i>Malurus cyaneus</i>	131010	0715-0800	3	Lane Cove NP - Sugarloaf Point	4	0	0	0		
156	Superb Fairy-wren	<i>Malurus cyaneus</i>	181010	1645-1735	24	Betts Park	7	0	0	0	bred (total 1 young)	2 groups: 1st (1 adult pair) calling in frontyard garden No. 2 Huntleys Point Rd and second grp (2 adult males, 2 adult females, 1 juv

Record No.	Common Name	Scientific Name	Date	Time	Site No.	Site Name	Bushland Remnant	Revegetated Parkland	Open Parkland	Urban Neighbourhood	Behaviour	Comments
												male) in dense Phragmites, lantana bracken fern in gully etc opposite No. 2 and just in Betts Pk
157	Superb Fairy-wren	Malurus cyaneus	181010	1755-1845	25	Gladesville Reserve	0	5	0	0	bred	with 3 juveniles
158	Superb Fairy-wren	Malurus cyaneus	191010	1645-1655	26	Bedlam Bay Park (E weedy edge)	0	0	5	0	bred	3 groups, in site 2 (oval and woody weed shrub surrounds) total = 6 young
159	Superb Fairy-wren	Malurus cyaneus	201010	0745-0915	22	Tarban Creek Reserve - north bank (including Villa Maria)	4	0	0	0	bred	
160	Superb Fairy-wren	Malurus cyaneus	201010	0925-1000	29	Riverglade Reserve	0	4	0	0	bred	along creek
161	Variegated Fairy-wren	Malurus lamberti	131010	0715-0800	3	Lane Cove NP - Sugarloaf Point	2	0	0	0		
162	Variegated Fairy-wren	Malurus lamberti	141010	0745-0855	6	Lane Cove NP north	7	0	0	0	bred	family group (total 2 young)
163	Variegated Fairy-wren	Malurus lamberti	151010	0730-0840	11	Field of Mars Wildlife Refuge A	10	0	0	0	bred	3 groups (total 6 young)
164	Variegated Fairy-wren	Malurus lamberti	201010	0925-1000	29	Riverglade Reserve	0	4	0	0	bred	(1 young)
165	Variegated Fairy-wren	Malurus lamberti	201010	1735-1840	32	Mallee Reserve	7	0	0	0	bred	2 groups: 4 (3 adult males, 2 females); 3 (adult male and female, 2 juv females) in dense weedy ground cover along drainage line (total 2 young)
166	White-browed Scrubwren	Sericornis frontalis	131010	0715-0800	3	Lane Cove NP - Sugarloaf Point	2	0	0	0		
167	White-browed Scrubwren	Sericornis frontalis	141010	0745-0855	6	Lane Cove NP north	8	0	0	0	calling, bred	2 groups of 4 each (total 4 young)

Record No.	Common Name	Scientific Name	Date	Time	Site No.	Site Name	Bushland Remnant	Revegetated Parkland	Open Parkland	Urban Neighbourhood	Behaviour	Comments
168	White-browed Scrubwren	<i>Sericornis frontalis</i>	151010	0730-0840	11	Field of Mars Wildlife Refuge A	9	0	0	0	nesting & bred with young	3 groups: 1 nesting obs carrying insects to nest at FOMA02, other 2 groups with fledged young (total 4 young)
169	White-browed Scrubwren	<i>Sericornis frontalis</i>	171010	0800-0855	13	Field of Mars Wildlife Refuge B	4	0	0	0	bred	with 2 fledged young
170	White-browed Scrubwren	<i>Sericornis frontalis</i>	181010	1645-1735	24	Betts Park	6	0	0	0	bred	2 groups: 1st of 1 adult pair calling in frontyard gardens Nos. 2 & 4 Huntleys Point Rd and in dense Phragmites, lantana etc opposite in Betts Pk; 2nd of 4 birds - 1 adult pair and 2 juvs (1 male, 1 female) = total 2 young
171	White-browed Scrubwren	<i>Sericornis frontalis</i>	181010	1755-1845	25	Gladesville Reserve	0	8	0	0	bred	2 groups: 3 in first and 5 in second (with fledged young) nr isolated eucs (total 3 young)
172	White-browed Scrubwren	<i>Sericornis frontalis</i>	191010	1645-1655	26	Bedlam Bay Park (eastern weedy edge)	0	0	6	0	bred	2 groups of 3 birds each including 1 juv each (total 2 young)
173	White-browed Scrubwren	<i>Sericornis frontalis</i>	201010	0745-0915	22	Tarban Creek Reserve - north bank (including Villa Maria)	4	0	0	0	possibly bred	in dense weedy layers creekside
174	White-browed Scrubwren	<i>Sericornis frontalis</i>	201010	0925-1000	29	Riverglade Reserve	0	8	0	0	bred	2 groups with 2 fledglings each along creek (total 4 young) and in phragmites/dianella of planted eastside stormwater basin

Record No.	Common Name	Scientific Name	Date	Time	Site No.	Site Name	Bushland Remnant	Revegetated Parkland	Open Parkland	Urban Neighbourhood	Behaviour	Comments
175	White-browed Scrubwren	<i>Sericornis frontalis</i>	201010	1735-1840	32	Mallee Reserve	2	0	0	0	territory-calling	one adult male, one adult female on west side of footbridge in dense privet and weedy groundcover
176	White-browed Scrubwren	<i>Sericornis frontalis</i>	211010	0950-1020	34	Buffalo Creek Reserve	0	2	0	0	foraging	
177	Brown Gerygone	<i>Gerygone mouki</i>	141010	0745-0855	6	Lane Cove NP north	1	0	0	0	mate-calling	
178	Brown Gerygone	<i>Gerygone mouki</i>	151010	0730-0840	11	Field of Mars Wildlife Refuge A	3	0	0	0		
179	Brown Gerygone	<i>Gerygone mouki</i>	171010	0800-0855	13	Field of Mars Wildlife Refuge B	4	0	0	0	bred	2 adults feeding 2 fledglings
180	Striated Thornbill	<i>Acanthiza lineata</i>	131010	0715-0800	3	Lane Cove NP - Sugarloaf Point	2	0	0	0		
181	Striated Thornbill	<i>Acanthiza lineata</i>	141010	0745-0855	6	Lane Cove NP north	9	0	0	0	bred, with fledglings/ juveniles	3 young birds
182	Striated Thornbill	<i>Acanthiza lineata</i>	141010	1700-1800	8	Boronia Park bushland	5	0	0	0	breeding, foraging	breeding pr nr BPBR01 (trackside)
183	Striated Thornbill	<i>Acanthiza lineata</i>	151010	0730-0840	11	Field of Mars Wildlife Refuge A	5	0	0	0		
184	Striated Thornbill	<i>Acanthiza lineata</i>	171010	0800-0855	13	Field of Mars Wildlife Refuge B	4	0	0	0	bred	with young in canopy (3 fledglings)
185	Yellow Thornbill	<i>Acanthiza nana</i>	131010	0715-0800	3	Lane Cove NP - Sugarloaf Point	1	0	0	0		
186	Yellow Thornbill	<i>Acanthiza nana</i>	141010	1700-1800	8	Boronia Park bushland	3	0	0	0		
187	Yellow Thornbill	<i>Acanthiza nana</i>	151010	0730-0840	11	Field of Mars Wildlife Refuge A	4	0	0	0		
188	Yellow Thornbill	<i>Acanthiza nana</i>	211010	0950-1020	34	Buffalo Creek Reserve	0	3	0	0	foraging	along Buffalo Ck mangrove & north path margin

Record No.	Common Name	Scientific Name	Date	Time	Site No.	Site Name	Bushland Remnant	Revegetated Parkland	Open Parkland	Urban Neighbourhood	Behaviour	Comments
189	Brown Thornbill	<i>Acanthiza pusilla</i>	131010	0715-0800	3	Lane Cove NP - Sugarloaf Point	2	0	0	0		
190	Brown Thornbill	<i>Acanthiza pusilla</i>	141010	0745-0855	6	Lane Cove NP north	3	0	0	0	likely bred	
191	Brown Thornbill	<i>Acanthiza pusilla</i>	141010	1700-1800	8	Boronia Park bushland	2	0	0	0	territory/ nest defence	
192	Brown Thornbill	<i>Acanthiza pusilla</i>	151010	0730-0840	11	Field of Mars Wildlife Refuge A	5	0	0	0		
193	Brown Thornbill	<i>Acanthiza pusilla</i>	171010	0800-0855	13	Field of Mars Wildlife Refuge B	2	0	0	0		
194	Spotted Pardalote	<i>Pardalotus punctatus</i>	131010	0715-0800	3	Lane Cove NP - Sugarloaf Point	3	0	0	0		
195	Spotted Pardalote	<i>Pardalotus punctatus</i>	141010	0745-0855	6	Lane Cove NP north	5	0	0	0	mate-calling	
196	Spotted Pardalote	<i>Pardalotus punctatus</i>	141010	1700-1800	8	Boronia Park bushland	2	0	0	0	mate-calling	
197	Spotted Pardalote	<i>Pardalotus punctatus</i>	151010	0730-0840	11	Field of Mars Wildlife Refuge A	4	0	0	0		
198	Spotted Pardalote	<i>Pardalotus punctatus</i>	171010	0800-0855	13	Field of Mars Wildlife Refuge B	2	0	0	0		
199	Spotted Pardalote	<i>Pardalotus punctatus</i>	181010	1755-1845	25	Gladesville Reserve	0	1	0	0	mate-calling	
200	Spotted Pardalote	<i>Pardalotus punctatus</i>	201010	0745-0915	22	Tarban Creek Reserve - north bank (including Villa Maria)	1	0	0	0		
201	Striated Pardalote	<i>Pardalotus striatus</i>	141010	1700-1800	8	Boronia Park bushland	1	0	0	0	mate-calling	
202	Eastern Spinebill	<i>Acanthorhynchus tenuirostris</i>	131010	0715-0800	3	Lane Cove NP - Sugarloaf Point	1	0	0	0		
203	Eastern Spinebill	<i>Acanthorhynchus tenuirostris</i>	141010	0745-0855	6	Lane Cove NP north	2	0	0	0		

Record No.	Common Name	Scientific Name	Date	Time	Site No.	Site Name	Bushland Remnant	Revegetated Parkland	Open Parkland	Urban Neighbourhood	Behaviour	Comments
204	Eastern Spinebill	<i>Acanthorhynchus tenuirostris</i>	151010	0730-0840	11	Field of Mars Wildlife Refuge A	7	0	0	0		
205	Yellow-faced Honeyeater	<i>Lichenostomus chrysops</i>	151010	0730-0840	11	Field of Mars Wildlife Refuge A	1	0	0	0		
206	Yellow-faced Honeyeater	<i>Lichenostomus chrysops</i>	181010	1755-1845	25	Gladesville Reserve	0	2	0	0	foraging	in planted flowering yellow bloodwood beside trail
207	Noisy Miner	<i>Manorina melanocephala</i>	121010	1705-1750	1	Moncrieff Drive	0	0	0	24	nesting & 2 fledglings	active nest in frontyard macadamia (total 2 young)
208	Noisy Miner	<i>Manorina melanocephala</i>	121010	1805-1835	2	Blaxland Street	0	0	0	25	bred	3 groups fledged young (total 6)
209	Noisy Miner	<i>Manorina melanocephala</i>	131010	0715-0800	3	Lane Cove NP - Sugarloaf Point	5	0	0	0		
210	Noisy Miner	<i>Manorina melanocephala</i>	131010	0930-0945	4	Magdala Park	0	0	4	0		
211	Noisy Miner	<i>Manorina melanocephala</i>	131010	1610-1700	5	Holy Cross College	0	0	9	0	bred with 9 juveniles	7 in planted TW fronting Cressy & Higginbotham rds (total 9 young)
212	Noisy Miner	<i>Manorina melanocephala</i>	141010	1615-1635	7	Boronia Park Ovals 2&3	0	0	2	0	nesting	
213	Noisy Miner	<i>Manorina melanocephala</i>	141010	1805-1830	9	Park Road	0	0	0	10	nesting & with 3 fledged young	total 3 young
214	Noisy Miner	<i>Manorina melanocephala</i>	141010	1835-1855	10	Westminster Road	0	0	0	9	nesting	nesting in street verge & front garden shrubs
215	Noisy Miner	<i>Manorina melanocephala</i>	151010	0730-0840	11	Field of Mars Wildlife Refuge A	2	0	0	0		
216	Noisy Miner	<i>Manorina melanocephala</i>	151010	1030-1115	12	Badajoz Road	0	0	0	23	bred	9 juveniles
217	Noisy Miner	<i>Manorina melanocephala</i>	171010	0910-0940	14	Beazley Street	0	0	0	19	bred & nesting	at least 3 groups with fledged dependent young (total 6); nesting in

Record No.	Common Name	Scientific Name	Date	Time	Site No.	Site Name	Bushland Remnant	Revegetated Parkland	Open Parkland	Urban Neighbourhood	Behaviour	Comments
												umbrella tree outside 11 Beazley St (pics)
218	Noisy Miner	Manorina melanocephala	171010	0945-1005	15	Monash Road	0	0	0	10	nesting (second)	nesting in backyard eucalypts & street verge callistemon & brush box (total 2 fledglings)
219	Noisy Miner	Manorina melanocephala	171010	1015-1040	16	Eltham Street	0	0	0	25	bred	2 groups included dependent fledglings (total 4); chasing off Spotted Dove & Common Myna
220	Noisy Miner	Manorina melanocephala	171010	1605-1625	17	Abigail Street	0	0	0	21	bred	2 groups with fledged young (total 4)
221	Noisy Miner	Manorina melanocephala	171010	1630-1700	18	Mary Street	0	0	0	27	bred	2 groups with recently fledged young (total 4)
222	Noisy Miner	Manorina melanocephala	171010	1710-1740	19	Hillcrest Avenue	0	0	0	29	bred	3 groups with fledged young in front garden Lillipilli (total 6)
223	Noisy Miner	Manorina melanocephala	171010	1750-1810	20	Kelly Street	0	0	0	19	bred	2 groups with fledglings (total 4)
224	Noisy Miner	Manorina melanocephala	181010	0900-0945	21	Tarban Creek Reserve (upper)	12	0	0	0	bred	2 dependent young along creek (total 2)
225	Noisy Miner	Manorina melanocephala	181010	0950-1015	23	Tarban Creek Reserve (mid)	0	10	0	0	bred	2 groups with dependent young (total 3)
226	Noisy Miner	Manorina melanocephala	181010	1645-1735	24	Betts Park	13	0	0	0	bred	2 groups with fledglings (total 2)
227	Noisy Miner	Manorina melanocephala	181010	1755-1845	25	Gladesville Reserve	0	12	0	0	bred	2 groups with fledglings (total 3)
228	Noisy Miner	Manorina melanocephala	191010	1710-1740	27	Western Crescent	0	0	0	24	bred	3 grps with fledglings (total 5)
229	Noisy Miner	Manorina melanocephala	191010	1745-1815	28	Tennyson Road	0	0	0	10	bred	1 group of fledged young (total 2)

Record No.	Common Name	Scientific Name	Date	Time	Site No.	Site Name	Bushland Remnant	Revegetated Parkland	Open Parkland	Urban Neighbourhood	Behaviour	Comments
230	Noisy Miner	Manorina melanocephala	201010	0745-0915	22	Tarban Creek Reserve - north bank (including Villa Maria)	3	0	0	0	bred, foraging	with 1 fledged young along creek
231	Noisy Miner	Manorina melanocephala	201010	0925-1000	29	Riverglade Reserve	0	8	0	0	bred	2 groups of fledglings (total 4)
232	Noisy Miner	Manorina melanocephala	201010	1705-1730	31	Olympic Park	0	8	0	0	bred, foraging	incl 2 fledglings
233	Noisy Miner	Manorina melanocephala	201010	1735-1840	32	Mallee Reserve	5	0	0	0	bred	incl 1 fledgling
234	Noisy Miner	Manorina melanocephala	211010	0730-0830	33	Wallumatta Nature Reserve	26	0	0	0	bred, nesting	2 groups of fledglings (total 3), 1 active nest @ WNR02
235	Noisy Miner	Manorina melanocephala	211010	0950-1020	34	Buffalo Creek Reserve	0	4	0	0		
236	Noisy Miner	Manorina melanocephala	211010	1635-1650	35	Tyagarah Reserve	0	0	4	0		
237	Noisy Miner	Manorina melanocephala	211010	1710-1750	36	Stanley Street	0	0	0	8	bred	incl 1 fledgling
238	Noisy Miner	Manorina melanocephala	211010	1800-18355	37	Morrison Bay Park	0	0	4	0		
239	Noisy Miner	Manorina melanocephala	221010	0855-0935	39	Putney Park	0	12	0	0	bred	incls 3 grps of fledged young (total 5)
240	Noisy Miner	Manorina melanocephala	221010	0955-1025	40	Bremner Park	0	10	0	0	bred	incls 3 fledglings (total 4)
241	Little Wattlebird	Anthochaera chrysoptera	151010	0730-0840	11	Field of Mars Wildlife Refuge A	1	0	0	0		
242	Little Wattlebird	Anthochaera chrysoptera	201010	0745-0915	22	Tarban Creek Reserve - north bank (including Villa Maria)	2	0	0	0		
243	Little Wattlebird	Anthochaera chrysoptera	201010	0925-1000	29	Riverglade Reserve	0	3	0	0	foraging	in planted callistemon

Record No.	Common Name	Scientific Name	Date	Time	Site No.	Site Name	Bushland Remnant	Revegetated Parkland	Open Parkland	Urban Neighbourhood	Behaviour	Comments
244	Red Wattlebird	<i>Anthochaera carunculata</i>	121010	1805-1835	2	Blaxland Street	0	0	0	2		
245	Red Wattlebird	<i>Anthochaera carunculata</i>	131010	0715-0800	3	Lane Cove NP - Sugarloaf Point	3	0	0	0	mate-pursuits	
246	Red Wattlebird	<i>Anthochaera carunculata</i>	141010	0745-0855	6	Lane Cove NP north	1	0	0	0		
247	Red Wattlebird	<i>Anthochaera carunculata</i>	151010	0730-0840	11	Field of Mars Wildlife Refuge A	3	0	0	0	mate-calling	
248	Red Wattlebird	<i>Anthochaera carunculata</i>	151010	1030-1115	12	Badajoz Road	0	0	0	2		
249	Red Wattlebird	<i>Anthochaera carunculata</i>	171010	0800-0855	13	Field of Mars Wildlife Refuge B	4	0	0	0	nesting, foraging (in flowering turpentine)	chased off 2 Koels
250	Red Wattlebird	<i>Anthochaera carunculata</i>	171010	0910-0940	14	Beazley Street	0	0	0	5		
251	Red Wattlebird	<i>Anthochaera carunculata</i>	171010	1015-1040	16	Eltham Street	0	0	0	2		
252	Red Wattlebird	<i>Anthochaera carunculata</i>	171010	1710-1740	19	Hillcrest Avenue	0	0	0	2		
253	Red Wattlebird	<i>Anthochaera carunculata</i>	191010	1645-1655	26	Bedlam Bay Park (E weedy edge)	0	0	2	0		
254	Red Wattlebird	<i>Anthochaera carunculata</i>	191010	1710-1740	27	Western Crescent	0	0	0	23	foraging in callistemon	
255	Red Wattlebird	<i>Anthochaera carunculata</i>	201010	0745-0915	22	Tarban Creek Reserve - north bank (including Villa Maria)	3	0	0	0	territory-calling & bred	with 2 recent fledglings
256	Red Wattlebird	<i>Anthochaera carunculata</i>	201010	1735-1840	32	Mallee Reserve	2	0	0	0	foraging	
257	Red Wattlebird	<i>Anthochaera carunculata</i>	211010	0950-1020	34	Buffalo Creek Reserve	0	3	0	0	foraging	
258	Red Wattlebird	<i>Anthochaera carunculata</i>	211010	1635-1650	35	Tyagarah Reserve	0	0	1	0	foraging	in isolated eucalypt near playground

Record No.	Common Name	Scientific Name	Date	Time	Site No.	Site Name	Bushland Remnant	Revegetated Parkland	Open Parkland	Urban Neighbourhood	Behaviour	Comments
259	Red Wattlebird	<i>Anthochaera carunculata</i>	221010	0810-0830	38	Putney Point	1	0	0	0	calling	
260	Red Wattlebird	<i>Anthochaera carunculata</i>	221010	0955-1025	40	Bremner Park	0	2	0	0	foraging	
261	New Holland Honeyeater	<i>Phylidonyris novaehollandiae</i>	151010	0730-0840	11	Field of Mars Wildlife Refuge A	2	0	0	0		
262	Noisy Friarbird	<i>Philemon corniculatus</i>	141010	0745-0855	6	Lane Cove NP north	1	0	0	0		
263	Eastern Whipbird	<i>Psophodes olivaceus</i>	131010	0715-0800	3	Lane Cove NP - Sugarloaf Point	2	0	0	0		
264	Eastern Whipbird	<i>Psophodes olivaceus</i>	141010	0745-0855	6	Lane Cove NP north	3	0	0	0		
265	Eastern Whipbird	<i>Psophodes olivaceus</i>	151010	0730-0840	11	Field of Mars Wildlife Refuge A	1	0	0	0	call (male)	
266	Black-faced Cuckoo-shrike	<i>Coracina novaehollandiae</i>	131010	0930-0945	4	Magdala Park	0	0	3	0		
267	Black-faced Cuckoo-shrike	<i>Coracina novaehollandiae</i>	151010	0730-0840	11	Field of Mars Wildlife Refuge A	3	0	0	0	bred	1 juvenile with adults
268	Black-faced Cuckoo-shrike	<i>Coracina novaehollandiae</i>	171010	0800-0855	13	Field of Mars Wildlife Refuge B	2	0	0	0		
269	Black-faced Cuckoo-shrike	<i>Coracina novaehollandiae</i>	201010	0745-0915	22	Tarban Creek Reserve - north bank (including Villa Maria)	1	0	0	0		
270	Golden Whistler	<i>Pachycephala pectoralis</i>	141010	0745-0855	6	Lane Cove NP north	3	0	0	0	territory calling	2 young males + adult male
271	Rufous Whistler	<i>Pachycephala rufiventris</i>	131010	0715-0800	3	Lane Cove NP - Sugarloaf Point	1	0	0	0		
272	Rufous Whistler	<i>Pachycephala rufiventris</i>	151010	0730-0840	11	Field of Mars Wildlife Refuge A	1	0	0	0		female
273	Olive-backed Oriole	<i>Oriolus sagittatus</i>	141010	0745-0855	6	Lane Cove NP north	1	0	0	0	mate-calling	

Record No.	Common Name	Scientific Name	Date	Time	Site No.	Site Name	Bushland Remnant	Revegetated Parkland	Open Parkland	Urban Neighbourhood	Behaviour	Comments
274	Olive-backed Oriole	Oriolus sagittatus	201010	0745-0915	22	Tarban Creek Reserve - north bank (including Villa Maria)	1	0	0	0		
275	Grey Butcherbird	Cracticus torquatus	121010	1805-1835	2	Blaxland Street	0	0	0	1	calling	
276	Grey Butcherbird	Cracticus torquatus	131010	0715-0800	3	Lane Cove NP - Sugarloaf Point	3	0	0	0		with 1 juvenile
277	Grey Butcherbird	Cracticus torquatus	141010	1835-1855	10	Westminster Road	0	0	0	1		
278	Grey Butcherbird	Cracticus torquatus	171010	0800-0855	13	Field of Mars Wildlife Refuge B	1	0	0	0	calling	
279	Grey Butcherbird	Cracticus torquatus	171010	1015-1040	16	Eltham Street	0	0	0	1	calling	
280	Grey Butcherbird	Cracticus torquatus	181010	0900-0945	21	Tarban Creek Reserve (upper)	3	0	0	0	bred	2 adults with 1 juvenile
281	Grey Butcherbird	Cracticus torquatus	201010	0745-0915	22	Tarban Creek Reserve - north bank (including Villa Maria)	2	0	0	0	nesting	
282	Grey Butcherbird	Cracticus torquatus	211010	0730-0830	33	Wallumatta Nature Reserve	2	0	0	0	calling	
283	Grey Butcherbird	Cracticus torquatus	221010	0855-0935	39	Putney Park	0	1	0	0	calling	
284	Australian Magpie	Cracticus tibicen	121010	1805-1835	2	Blaxland Street	0	0	0	5		with 1 fledged young
285	Australian Magpie	Cracticus tibicen	131010	0930-0945	4	Magdala Park	0	0	15	0	foraging with 6 juveniles	bred locally (total 6 young)
286	Australian Magpie	Cracticus tibicen	131010	1610-1700	5	Holy Cross College	0	0	2	0		
287	Australian Magpie	Cracticus tibicen	141010	1615-1635	7	Boronia Park Ovals 2&3	0	0	4	0	foraging with 2 juveniles	bred locally (total 2)
288	Australian Magpie	Cracticus tibicen	151010	1030-1115	12	Badajoz Road	0	0	0	1		
289	Australian Magpie	Cracticus tibicen	171010	0910-0940	14	Beazley Street	0	0	0	2		

Record No.	Common Name	Scientific Name	Date	Time	Site No.	Site Name	Bushland Remnant	Revegetated Parkland	Open Parkland	Urban Neighbourhood	Behaviour	Comments
290	Australian Magpie	Cracticus tibicen	171010	1630-1700	18	Mary Street	0	0	0	1		
291	Australian Magpie	Cracticus tibicen	171010	1710-1740	19	Hillcrest Avenue	0	0	0	1		
292	Australian Magpie	Cracticus tibicen	171010	1750-1810	20	Kelly Street	0	0	0	2	foraging	with 1 juvenile
293	Australian Magpie	Cracticus tibicen	181010	1755-1845	25	Gladesville Reserve	0	2	0	0		
294	Australian Magpie	Cracticus tibicen	191010	1630-1640	26	Bedlam Bay Park (oval)	0	0	2	0		on site 2 (oval)
295	Australian Magpie	Cracticus tibicen	191010	1745-1815	28	Tennyson Road	0	0	0	1		
296	Australian Magpie	Cracticus tibicen	211010	1710-1750	36	Stanley Street	0	0	0	1	foraging	1 juvenile
297	Australian Magpie	Cracticus tibicen	221010	0810-0830	38	Putney Point	1	0	0	0	foraging	
298	Australian Magpie	Cracticus tibicen	221010	0855-0935	39	Putney Park	0	3	0	0	foraging	
299	Pied Currawong	Strepera graculina	121010	1705-1750	1	Moncrieff Drive	0	0	0	8		
300	Pied Currawong	Strepera graculina	121010	1805-1835	2	Blaxland Street	0	0	0	2		
301	Pied Currawong	Strepera graculina	131010	0715-0800	3	Lane Cove NP - Sugarloaf Point	4	0	0	0	mate-calling	
302	Pied Currawong	Strepera graculina	141010	0745-0855	6	Lane Cove NP north	2	0	0	0		
303	Pied Currawong	Strepera graculina	141010	1615-1635	7	Boronia Park Ovals 2&3	0	0	1	0		
304	Pied Currawong	Strepera graculina	141010	1700-1800	8	Boronia Park bushland	10	0	0	0	breeding, foraging	
305	Pied Currawong	Strepera graculina	141010	1805-1830	9	Park Road	0	0	0	1		
306	Pied Currawong	Strepera graculina	141010	1835-1855	10	Westminster Road	0	0	0	4		
307	Pied Currawong	Strepera graculina	151010	0730-0840	11	Field of Mars Wildlife Refuge A	3	0	0	0		
308	Pied Currawong	Strepera graculina	151010	1030-1115	12	Badajoz Road	0	0	0	6		
309	Pied Currawong	Strepera graculina	171010	0910-0940	14	Beazley Street	0	0	0	2	foraging	

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310	Pied Currawong	Strepera graculina	171010	1605-1625	17	Abigail Street	0	0	0	2		
311	Pied Currawong	Strepera graculina	171010	1630-1700	18	Mary Street	0	0	0	4		
312	Pied Currawong	Strepera graculina	171010	1750-1810	20	Kelly Street	0	0	0	2		
313	Pied Currawong	Strepera graculina	181010	0900-0945	21	Tarban Creek Reserve (upper)	1	0	0	0		
314	Pied Currawong	Strepera graculina	181010	1645-1735	24	Betts Park	1	0	0	0		
315	Pied Currawong	Strepera graculina	181010	1755-1845	25	Gladesville Reserve	0	3	0	0		
316	Pied Currawong	Strepera graculina	191010	1630-1640	26	Bedlam Bay Park (oval)	0	0	2	0		site 1 (trackside)
317	Pied Currawong	Strepera graculina	191010	1645-1655	26	Bedlam Bay Park (E weedy edge)	0	0	1	0	foraging	site 2 (oval)
318	Pied Currawong	Strepera graculina	201010	0745-0915	22	Tarban Creek Reserve - north bank (including Villa Maria)	2	0	0	0		
319	Pied Currawong	Strepera graculina	201010	0925-1000	29	Riverglade Reserve	0	1	0	0		
320	Pied Currawong	Strepera graculina	201010	1705-1730	31	Olympic Park	0	2	0	0		
321	Pied Currawong	Strepera graculina	201010	1735-1840	32	Mallee Reserve	1	0	0	0	foraging	
322	Pied Currawong	Strepera graculina	211010	0730-0830	33	Wallumatta Nature Reserve	2	0	0	0	foraging	
323	Pied Currawong	Strepera graculina	211010	0950-1020	34	Buffalo Creek Reserve	0	1	0	0		
324	Pied Currawong	Strepera graculina	211010	1710-1750	36	Stanley Street	0	0	0	2		
325	Pied Currawong	Strepera graculina	221010	0810-0830	38	Putney Point	1	0	0	0		
326	Pied Currawong	Strepera graculina	221010	0855-0935	39	Putney Park	0	2	0	0	predation attempt	on BT or RT Possum in nest 6m MB Fig (pics)
327	Pied Currawong	Strepera graculina	221010	0955-1025	40	Bremner Park	0	3	0	0	foraging, calling	

Record No.	Common Name	Scientific Name	Date	Time	Site No.	Site Name	Bushland Remnant	Revegetated Parkland	Open Parkland	Urban Neighbourhood	Behaviour	Comments
328	Rufous Fantail	Rhipidura rufifrons	141010	1700-1800	8	Boronia Park bushland	1	0	0	0		
329	Grey Fantail	Rhipidura albiscapa	151010	0730-0840	11	Field of Mars Wildlife Refuge A	1	0	0	0		
330	Willie Wagtail	Rhipidura leucophrys	131010	0930-0945	4	Magdala Park	0	0	1	0		
331	Willie Wagtail	Rhipidura leucophrys	171010	0800-0855	13	Field of Mars Wildlife Refuge B	2	0	0	0	nesting	
332	Willie Wagtail	Rhipidura leucophrys	181010	1755-1845	25	Gladesville Reserve	0	1	0	0		
333	Willie Wagtail	Rhipidura leucophrys	201010	0745-0915	29	Riverglade Reserve	0	2	0	0	nesting	along creek and edge
334	Willie Wagtail	Rhipidura leucophrys	201010	1005-1025	30	Riverglade Reserve	0	0	1	0	foraging	on freshly mown oval
335	Willie Wagtail	Rhipidura leucophrys	211010	1800-18355	37	Morrison Bay Park	0	0	1	0	foraging	
336	Australian Raven	Corvus coronoides	121010	1705-1750	1	Moncrieff Drive	0	0	0	3		
337	Australian Raven	Corvus coronoides	121010	1805-1835	2	Blaxland Street	0	0	0	2		
338	Australian Raven	Corvus coronoides	131010	0715-0800	3	Lane Cove NP - Sugarloaf Point	2	0	0	0		
339	Australian Raven	Corvus coronoides	131010	1610-1700	5	Holy Cross College	0	0	18	0		scavenging from school rubbish bins
340	Australian Raven	Corvus coronoides	141010	0745-0855	6	Lane Cove NP north	1	0	0	0	nesting	on nest
341	Australian Raven	Corvus coronoides	151010	0730-0840	11	Field of Mars Wildlife Refuge A	3	0	0	0		
342	Australian Raven	Corvus coronoides	171010	0800-0855	13	Field of Mars Wildlife Refuge B	2	0	0	0		
343	Australian Raven	Corvus coronoides	171010	1605-1625	17	Abigail Street	0	0	0	2		
344	Australian Raven	Corvus coronoides	171010	1630-1700	18	Mary Street	0	0	0	1		
345	Australian Raven	Corvus coronoides	191010	1745-1815	28	Tennyson Road	0	0	0	1		

Record No.	Common Name	Scientific Name	Date	Time	Site No.	Site Name	Bushland Remnant	Revegetated Parkland	Open Parkland	Urban Neighbourhood	Behaviour	Comments
346	Australian Raven	<i>Corvus coronoides</i>	211010	0950-1020	34	Buffalo Creek Reserve	0	3	0	0	foraging	
347	Leaden Flycatcher	<i>Myiagra rubecula</i>	131010	0715-0800	3	Lane Cove NP - Sugarloaf Point	2	0	0	0	mate-calling	
348	Leaden Flycatcher	<i>Myiagra rubecula</i>	141010	1700-1800	8	Boronia Park bushland	1	0	0	0	foraging	adult female
349	Black-faced Monarch	<i>Monarcha melanopsis</i>	131010	0715-0800	3	Lane Cove NP - Sugarloaf Point	1	0	0	0	mate-calling	
350	Black-faced Monarch	<i>Monarcha melanopsis</i>	151010	0730-0840	11	Field of Mars Wildlife Refuge A	3	0	0	0	mate-calling	2 adult males, 1 adult female
351	Magpie-lark	<i>Grallina cyanoleuca</i>	131010	0715-0800	3	Lane Cove NP - Sugarloaf Point	2	0	0	0		
352	Magpie-lark	<i>Grallina cyanoleuca</i>	131010	0930-0945	4	Magdala Park	0	0	2	0	foraging	
353	Magpie-lark	<i>Grallina cyanoleuca</i>	131010	1610-1700	5	Holy Cross College	0	0	2	0	foraging	
354	Magpie-lark	<i>Grallina cyanoleuca</i>	181010	1645-1735	24	Betts Park	1	0	0	0		
355	Magpie-lark	<i>Grallina cyanoleuca</i>	191010	1630-1640	26	Bedlam Bay Park (oval)	0	0	2	0	foraging	site 1 (trackside)
356	Magpie-lark	<i>Grallina cyanoleuca</i>	211010	1800-18355	37	Morrison Bay Park	0	0	3	0	foraging	
357	Eastern Yellow Robin	<i>Eopsaltria australis</i>	131010	0715-0800	3	Lane Cove NP - Sugarloaf Point	4	0	0	0	bred, foraging	incl 1 juvenile, thus likely bred nearby
358	Eastern Yellow Robin	<i>Eopsaltria australis</i>	141010	0745-0855	6	Lane Cove NP north	2	0	0	0	bred & territory calling	male & female with 1 recent fledgling at LCNPN02 gully/old trail
359	Eastern Yellow Robin	<i>Eopsaltria australis</i>	141010	1700-1800	8	Boronia Park bushland	2	0	0	0	territory calling	
360	Eastern Yellow Robin	<i>Eopsaltria australis</i>	151010	0730-0840	11	Field of Mars Wildlife Refuge A	3	0	0	0	feeding recently fledged young	2 adults with 1 (and likely another nearby) fledgling (total 2)
361	Eastern Yellow Robin	<i>Eopsaltria australis</i>	151010	0730-0840	11	Field of Mars Wildlife Refuge A	3	0	0	0	bred	1 recent fledgling with 2 adults

Record No.	Common Name	Scientific Name	Date	Time	Site No.	Site Name	Bushland Remnant	Revegetated Parkland	Open Parkland	Urban Neighbourhood	Behaviour	Comments
362	Eastern Yellow Robin	<i>Eopsaltria australis</i>	171010	0800-0855	13	Field of Mars Wildlife Refuge B	1	0	0	0	foraging	observed along track at FOMC04
363	Eastern Yellow Robin	<i>Eopsaltria australis</i>	181010	1645-1735	24	Betts Park	1	0	0	0	mate-calling	heard SW section of remnant nr water's edge
364	Eastern Yellow Robin	<i>Eopsaltria australis</i>	201010	0745-0915	22	Tarban Creek Reserve - north bank (including Villa Maria)	1	0	0	0	mate-calling	call only 0800
365	Silvereye	<i>Zosterops lateralis</i>	131010	0715-0800	3	Lane Cove NP - Sugarloaf Point	3	0	0	0		
366	Silvereye	<i>Zosterops lateralis</i>	141010	1700-1800	8	Boronia Park bushland	15	0	0	0	foraging, calling	
367	Silvereye	<i>Zosterops lateralis</i>	151010	0730-0840	11	Field of Mars Wildlife Refuge A	3	0	0	0	foraging	
368	Silvereye	<i>Zosterops lateralis</i>	171010	0800-0855	13	Field of Mars Wildlife Refuge B	10	0	0	0		
369	Silvereye	<i>Zosterops lateralis</i>	191010	1645-1655	26	Bedlam Bay Park (E weedy edge)	0	0	4	0	foraging	in honeysuckle
370	Silvereye	<i>Zosterops lateralis</i>	201010	0745-0915	22	Tarban Creek Reserve - north bank (including Villa Maria)	6	0	0	0	foraging, calling	
371	Silvereye	<i>Zosterops lateralis</i>	201010	1735-1840	32	Mallee Reserve	3	0	0	0	foraging	
372	Silvereye	<i>Zosterops lateralis</i>	211010	0950-1020	34	Buffalo Creek Reserve	0	5	0	0	foraging	
373	Silvereye	<i>Zosterops lateralis</i>	221010	0810-0830	38	Putney Point	4	0	0	0	calling	
374	Welcome Swallow	<i>Hirundo neoxena</i>	121010	1805-1835	2	Blaxland Street	0	0	0	2	foraging	
375	Welcome Swallow	<i>Hirundo neoxena</i>	131010	0930-0945	4	Magdala Park	0	0	11	0	foraging	
376	Welcome Swallow	<i>Hirundo neoxena</i>	131010	1610-1700	5	Holy Cross College	0	0	1	0	foraging	

Record No.	Common Name	Scientific Name	Date	Time	Site No.	Site Name	Bushland Remnant	Revegetated Parkland	Open Parkland	Urban Neighbourhood	Behaviour	Comments
377	Welcome Swallow	Hirundo neoxena	141010	0745-0855	6	Lane Cove NP north	1	0	0	0	foraging	
378	Welcome Swallow	Hirundo neoxena	171010	0910-0940	14	Beazley Street	0	0	0	3	foraging	
379	Welcome Swallow	Hirundo neoxena	171010	0945-1005	15	Monash Road	0	0	0	3	foraging	
380	Welcome Swallow	Hirundo neoxena	181010	0900-0945	21	Tarban Creek Reserve (upper)	2	0	0	0	foraging	
381	Welcome Swallow	Hirundo neoxena	181010	1645-1735	24	Betts Park	1	0	0	0	foraging	
382	Welcome Swallow	Hirundo neoxena	181010	1755-1845	25	Gladesville Reserve	0	2	0	0	foraging	
383	Welcome Swallow	Hirundo neoxena	191010	1630-1640	26	Bedlam Bay Park (oval)	0	0	3	0	foraging	
384	Welcome Swallow	Hirundo neoxena	201010	1005-1025	30	Riverglade Reserve	0	0	2	0	foraging	
385	Welcome Swallow	Hirundo neoxena	201010	1705-1730	31	Olympic Park	0	5	0	0	foraging	
386	Welcome Swallow	Hirundo neoxena	211010	1635-1650	35	Tyagarah Reserve	0	0	3	0	foraging	
387	Welcome Swallow	Hirundo neoxena	211010	1710-1750	36	Stanley Street	0	0	0	3	foraging	
388	Welcome Swallow	Hirundo neoxena	211010	1800-18355	37	Morrison Bay Park	0	0	17	0	courtship, foraging	
389	Welcome Swallow	Hirundo neoxena	221010	0955-1025	40	Bremner Park	0	2	0	0	foraging	
390	Red-whiskered Bulbul *	Pycnonotus jocosus	131010	0715-0800	3	Lane Cove NP - Sugarloaf Point	2	0	0	0	mate-calling	
391	Red-whiskered Bulbul *	Pycnonotus jocosus	141010	0745-0855	6	Lane Cove NP north	3	0	0	0	mate-calling	
392	Red-whiskered Bulbul *	Pycnonotus jocosus	141010	1700-1800	8	Boronia Park bushland	2	0	0	0	foraging	
393	Red-whiskered Bulbul *	Pycnonotus jocosus	151010	0730-0840	11	Field of Mars Wildlife Refuge A	3	0	0	0	mate-calling	
394	Red-whiskered Bulbul *	Pycnonotus jocosus	171010	0800-0855	13	Field of Mars Wildlife Refuge B	4	0	0	0	likely nesting along creek	

Record No.	Common Name	Scientific Name	Date	Time	Site No.	Site Name	Bushland Remnant	Revegetated Parkland	Open Parkland	Urban Neighbourhood	Behaviour	Comments
395	Red-whiskered Bulbul *	<i>Pycnonotus jocosus</i>	191010	1645-1655	26	Bedlam Bay Park (E weedy edge)	0	0	7	0	courtship	in flowering privet
396	Red-whiskered Bulbul *	<i>Pycnonotus jocosus</i>	201010	0745-0915	22	Tarban Creek Reserve - north bank (including Villa Maria)	3	0	0	0	mate-calling	
397	Red-whiskered Bulbul *	<i>Pycnonotus jocosus</i>	201010	0925-1000	29	Riverglade Reserve	0	1	0	0	foraging	
398	Red-whiskered Bulbul *	<i>Pycnonotus jocosus</i>	201010	1735-1840	32	Mallee Reserve	3	0	0	0	foraging	
399	Common Starling *	<i>Sturnus vulgaris</i>	131010	0930-0945	4	Magdala Park	0	0	2	0	foraging on ground	
400	Common Starling *	<i>Sturnus vulgaris</i>	171010	0910-0940	14	Beazley Street	0	0	0	2	breeding pair	
401	Common Starling *	<i>Sturnus vulgaris</i>	201010	1005-1025	30	Riverglade Reserve	0	0	2	0		
402	Common Myna*	<i>Sturnus tristis</i>	121010	1705-1750	1	Moncrieff Drive	0	0	0	2		
403	Common Myna*	<i>Sturnus tristis</i>	121010	1805-1835	2	Blaxland Street	0	0	0	8	bred	2 juveniles
404	Common Myna*	<i>Sturnus tristis</i>	131010	0930-0945	4	Magdala Park	0	0	4	0		
405	Common Myna*	<i>Sturnus tristis</i>	131010	1610-1700	5	Holy Cross College	0	0	2	0		
406	Common Myna*	<i>Sturnus tristis</i>	141010	1835-1855	10	Westminster Road	0	0	0	6	bred	2 juveniles
407	Common Myna*	<i>Sturnus tristis</i>	151010	1030-1115	12	Badajoz Road	0	0	0	12	bred	2 juveniles
408	Common Myna*	<i>Sturnus tristis</i>	171010	0910-0940	14	Beazley Street	0	0	0	14	bred	2 juveniles
409	Common Myna*	<i>Sturnus tristis</i>	171010	0945-1005	15	Monash Road	0	0	0	5		
410	Common Myna*	<i>Sturnus tristis</i>	171010	1015-1040	16	Eltham Street	0	0	0	5		
411	Common Myna*	<i>Sturnus tristis</i>	171010	1605-1625	17	Abigail Street	0	0	0	3		
412	Common Myna*	<i>Sturnus tristis</i>	171010	1710-1740	19	Hillcrest Avenue	0	0	0	16	bred	2 juveniles
413	Common	<i>Sturnus tristis</i>	191010	1710-	27	Western	0	0	0	7		

Record No.	Common Name	Scientific Name	Date	Time	Site No.	Site Name	Bushland Remnant	Revegetated Parkland	Open Parkland	Urban Neighbourhood	Behaviour	Comments
	Myna*			1740		Crescent						
414	Common Myna*	<i>Sturnus tristis</i>	201010	0745-0915	22	Tarban Creek Reserve - north bank (including Villa Maria)	2	0	0	0		
415	Common Myna*	<i>Sturnus tristis</i>	201010	0925-1000	29	Riverglade Reserve	0	7	0	0	foraging	
416	Common Myna*	<i>Sturnus tristis</i>	201010	1005-1025	30	Riverglade Reserve	0	0	10	0	foraging	on freshly mown lawn
417	Common Myna*	<i>Sturnus tristis</i>	211010	1710-1750	36	Stanley Street	0	0	0	9	bred	
418	Red-browed Finch	<i>Neochmia temporalis</i>	131010	0715-0800	3	Lane Cove NP - Sugarloaf Point	8	0	0	0		
419	Red-browed Finch	<i>Neochmia temporalis</i>	141010	0745-0855	6	Lane Cove NP north	8	0	0	0	nesting	pr building nest in shrub at LCNPN05
420	Red-browed Finch	<i>Neochmia temporalis</i>	151010	0730-0840	11	Field of Mars Wildlife Refuge A	3	0	0	0		
421	Red-browed Finch	<i>Neochmia temporalis</i>	171010	0800-0855	13	Field of Mars Wildlife Refuge B	2	0	0	0		
422	Red-browed Finch	<i>Neochmia temporalis</i>	201010	0745-0915	22	Tarban Creek Reserve - north bank (including Villa Maria)	2	0	0	0	foraging	
423	Red-browed Finch	<i>Neochmia temporalis</i>	201010	0925-1000	29	Riverglade Reserve	0	3	0	0	foraging	