Hume City Council: Fauna Survey 2013

FINAL REPORT

Prepared for Hume City Council

24 March 2014

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- Hume City Council: Damien Harrison and Melissa Doherty
- Department of Environment & Primary Industries for access to the Victorian Biodiversity Atlas
- Merri Creek Management Committee
- Australian Platypus Conservancy and CESAR, for Platypus records and information

The following Biosis staff were involved in this project:

- Felicity Humann, Mark Venosta, Daniel Gilmore, Sally Koehler and Marion Shadbolt assisted in the field
- James Shepherd and Sally Mitchell completed mapping

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Summary

Biosis Pty Ltd was commissioned by Hume City Council to undertake fauna surveys utilising a range of survey techniques across four council-managed reserves located between Craigieburn and Wildwood, Victoria: Mt Ridley Nature Reserve, Frog Court and Rushwood Drive, Martin Dillon Reserve and Konagaderra Reserve.

Undertaking fauna surveys of Council-managed land has been identified as a key action in the *Natural Heritage Strategy 2011-2015* (Hume City Council 2012a), with the aim of improving Hume City Council's knowledge of the distribution of fauna populations within the municipality. This information will also ultimately inform strategic planning and permit decisions related to areas of faunal habitat within the municipality.

Fauna survey methods

A variety of survey methods were deployed across the four reserves to target different faunal groups including birds, mammals, reptiles, frogs and fishes. Survey methods used during the current fauna survey program included:

- Remote cameras to target terrestrial and arboreal mammals
- Artificial shelter (roof tile) transects to target reptiles
- Diurnal bird census surveys
- Anabat bat call detectors and harp traps to target insectivorous microbats
- Nocturnal surveys to target frogs, arboreal mammals and nocturnal birds
- Aquatic survey to target semi-aquatic mammals (particularly Platypus), frogs and fishes

In order to provide a context for the study, information about fauna from each reserve was also obtained from fauna databases and other relevant sources. Terrestrial and aquatic habitat assessments were undertaken in order to describe the fauna values of each reserve.

Results

The current survey utilised a wide range of fauna survey techniques in order to record a combined total of 108 indigenous vertebrate fauna species (74 birds, 18 mammals, five reptiles, eight frogs and three fishes) and 14 introduced fauna species (seven birds, four mammals and three fish) across all four reserves. New fauna records were obtained for all reserves surveyed, and a number of significant fauna species were recorded including:

- **Growling Grass Frog *Litoria raniformis*** recorded within Deep Creek at Martin Dillon Reserve and within constructed offline wetlands located at Frog Court and Rushwood Drive
- **Tussock Skink *Pseudemoia pagenstecheri***, which was recorded at Mt Ridley Reserve and Frog Court and Rushwood Drive
- **Hardhead *Aythya australis***, which was recorded within Merri Creek at Frog Court and Rushwood Drive

All reserves have been identified as supporting potential habitat for a number of additional threatened species that were not recorded during the present survey, but have previously been recorded or have some potential to occur based on the presence of suitable habitat.

Bird surveys, nocturnal surveys, remote cameras and Anabat bat call detectors were found to be the most effective survey techniques, and resulted in the greatest number of fauna species detected across the four reserves. Harp trapping and tile transects resulted in far fewer species records.

Targeted survey for Platypus was conducted within three reserves (excluding Mt Ridley Nature Reserve) where suitable habitat existed for the species. Platypus were not detected during survey however, recent sightings and database records in close proximity to both Martin Dillon and Konagaderra Reserve on Deep Creek suggest that this species is likely to be present within these reserves. The presence of Platypus within the Merri Creek catchment at Frog Court and Rushwood Drive is less certain. Recent sightings in Merri Creek occur some 12 km downstream of the reserve. The lower Merri Creek catchment is presumed to support a small population of adult Platypus with regular sightings of both adults and transient juveniles presumed to originate from the adjacent Yarra River population. Mt Ridley Grassland Reserve was not surveyed for Platypus as no suitable habitat for the species exists.

Recommendations

The results from the current survey provide an opportunity to assess the efficacy of the fauna survey techniques used in order to refine the approach for any future fauna survey programs undertaken by Hume City Council. Future fauna survey programs should continue to utilise Anabat bat call detectors and remote cameras, which are both cost-effective techniques that were shown to be sufficient for the purpose of recording mammal species within the City of Hume. In order to increase reptile detection rates, a combination of techniques is recommended, including the use of funnel traps and drift fences.

In order for Hume City Council to gain a greater understanding of the presence and status of significant fauna populations within the wider municipality, it is recommended that strategic landscape-level targeted surveys be undertaken for a number of threatened species that are either known to occur within the broader local area or for which suitable habitat is present.

Surveying a greater number of reserves using methods that are cost-effective over the long-term will enable Hume City Council to gain a greater understanding of fauna within the municipality. This in turn may lead to priority areas being identified which would benefit from particular protection and/or management strategies. Devising a list of all reserves within the City of Hume and a rating system for prioritising survey is recommended.

In keeping with the aims of the Natural Heritage Strategy (Hume City Council 2012a), survey effort could also be expanded to include private land where permission to access properties is granted. An opportunity also exists for Hume City Council to establish and support community fauna monitoring programs at a number of key sites, including the four reserves surveyed during the current program. Surveys most suited to community members are those that do not require handling or disturbance to native fauna species and, provided appropriate training, support and supervision is required, do not require a specialist skill set (e.g. bird surveys). These include remote camera surveys for mammals, nocturnal frog surveys, and recording platypus sightings.

Community members should be encouraged to continue to report incidental fauna sightings to Hume City Council in order for them to be included in the Hume Fauna Sightings Database, however, Hume City Council should amend their current database to ensure that data fields are consistent with those that are required for submission to the Victorian Biodiversity Atlas (VBA).

1. Introduction

1.1 Project background

Biosis Pty Ltd was commissioned by Hume City Council to undertake fauna surveys utilising a range of survey techniques across four council-managed reserves located between Craigieburn and Wildwood, Victoria. Undertaking fauna surveys of Council-managed land has been identified as a key action in the *Natural Heritage Strategy 2011-2015* (Hume City Council 2012a), with the aim of improving Hume City Council's knowledge of the distribution of fauna populations within the municipality.

Hume City Council manages approximately 90 reserves that contain natural heritage values, including remnant native vegetation and habitat for fauna. The *Natural Heritage Strategy Action Plan 2011-2015* (Hume City Council 2012b) identifies a total of eight Council-managed conservation sites that were prioritised for detailed fauna survey. These include:

1. Mt Holden Reserve
2. Emu Bottom Wetlands and Emu Valley Reserves
3. Albert Road Nature Reserve
4. Sunbury Pop Festival Site
5. Mt Ridley Nature Reserve
6. Frog Court & Rushwood Drive
7. Martin Dillon Reserve
8. Konagaderra Reserve

The first four reserves were surveyed in late autumn 2012 (EHP 2012). This report presents the findings of detailed fauna surveys undertaken within the remaining four reserves in spring and summer 2013.

1.2 Scope of assessment

The objectives of this investigation are to:

- Undertake a background review of fauna data relevant to the project, including a review of relevant fauna databases and ecological reports;
- Undertake detailed surveys for mammals, birds, reptiles and amphibians using a range of survey methodologies at four Council-managed reserves;
- Assess and describe the extent and quality of different fauna habitat(s) present at each reserve;
- Provide mapping detailing survey effort and the location of significant fauna
- Consult with relevant community stakeholders where required
- Provide recommendations for future fauna survey programs.

1.3 Location of the study area

The current fauna survey program was undertaken at four Council-managed reserves located between Craigieburn and Wildwood, Victoria; Mt Ridley Nature Reserve, Frog Court & Rushwood Drive, Martin Dillon Reserve and Konagaderra Reserve (Figure 1). All reserves are located within the City of Hume and within the

management area of Melbourne Water and Port Phillip and Westernport Catchment Management Authority (PPWCMA).

1.3.1 Mt Ridley Nature Reserve

Mt Ridley Reserve encompasses approximately 70 ha of land located in Mickleham. The reserve consists of several parcels of land located along Malcolm Creek, and is broadly bounded by Mt Ridley Road to the south, crown land managed by Parks Victoria to the north, and rural residential properties to the east and west. Mt Ridley Reserve is located within the Victorian Volcanic Plain bioregion and the Yarra River Catchment area.

1.3.2 Frog Court and Rushwood Drive

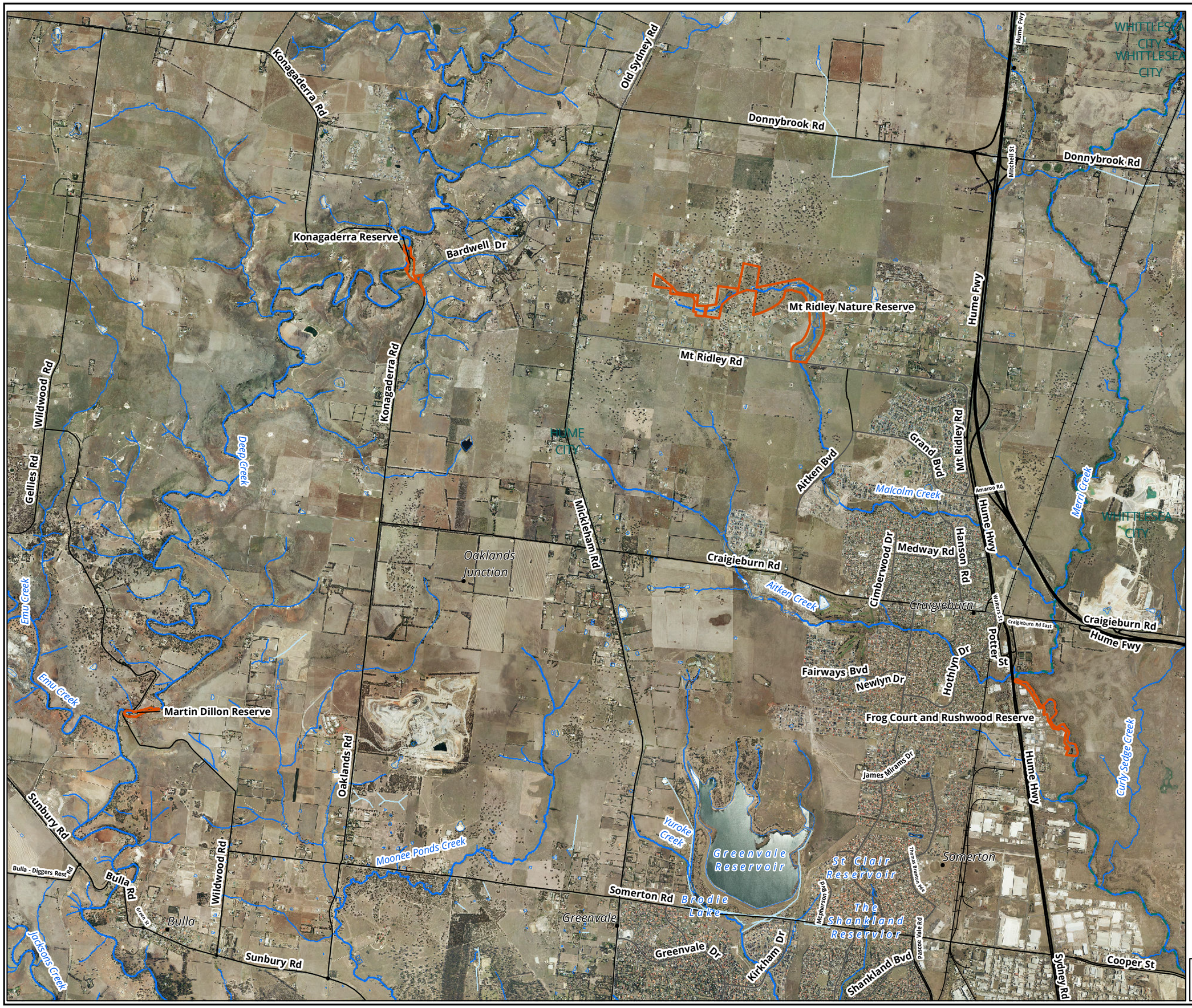
Frog Court and Rushwood Drive encompass approximately 10 ha of land located in Craigieburn. The reserve consists of a narrow linear strip of land located along Merri Creek, and is broadly bounded by Merri Creek to the east and north and industrial development to the west. The Craigieburn Grassland Nature Conservation Reserve is located on the opposite side of Merri Creek, which consists of a significant area of Plains Grassland vegetation. Frog Court and Rushwood Drive Reserve is located within the Victorian Volcanic Plain Bioregion and within the Yarra River Catchment.

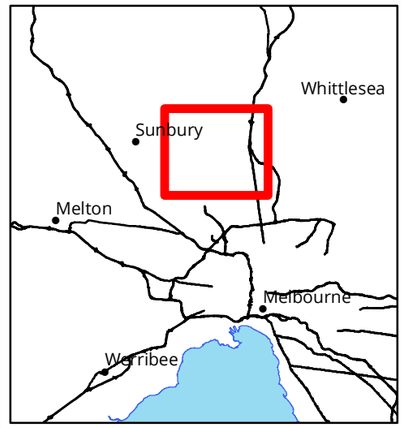
1.3.3 Martin Dillon Reserve

Martin Dillon Reserve encompasses approximately 2.6 ha of land located in Wildwood. The reserve is located immediately adjacent to Deep Creek and is broadly bounded by Wildwood Road to the west, Deep Creek to the north and east, and rural residential to the south. Martin Dillon Reserve is located within the Central Victorian Uplands bioregion and within the Maribyrnong River Catchment.

1.3.4 Konagaderra Reserve

Konagaderra Reserve encompasses approximately 5 ha of land located at Oaklands Junction. The reserve is located next to Deep Creek and is bisected by Konagaderra Road, which crosses Deep Creek at the reserve. The reserve is surrounded by rural residential land and agricultural land. Konagaderra Reserve is located within the Central Victorian Uplands bioregion and within the Maribyrnong River Catchment.





Legend

Study Area

Figure 1: Location of the four council-managed reserves surveyed, Hume City Council, Victoria

0 500 1,000 1,500 2,000 2,500

Metres

Scale: 1:50,000 @ A3

Coordinate System: GDA 1994 MGA Zone 55

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Biosis Pty Ltd

Ballarat, Brisbane, Canberra, Melbourne, Sydney, Wangaratta & Wollongong

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2. Methods

2.1 Literature and database review

In order to provide a context for the study, information about fauna from each reserve was obtained from fauna databases and other relevant sources. Fauna database searches incorporated an additional area of 500 m from the boundary of each reserve. Records from the following databases were collated and reviewed:

- Victorian Biodiversity Atlas 'VBA_FAUNA25, FAUNA100 & FAUNA Restricted' August 2012 © The State of Victoria,
- DEPI Biodiversity Interactive Map (BIM)
- BirdLife Australia, the New Atlas of Australian Birds 1998-2012 (BA)
- Melbourne Water Fish database (MWF)

Other sources of biodiversity information:

- Biosis records that have been submitted to DEPI and Melbourne Water but do not yet appear on the VBA or MWF databases
- Australian Platypus Conservancy Database
- CESAR Platypus Online database
- Hume City Council Fauna Sightings Database 2012-2013 (Hume City Council 2013)
- Merri Creek Management Committee (MCMC)

The following reports were also reviewed:

- Hume City Council Natural Heritage Strategy 2011 – 2015 (Hume City Council 2012a)
- Hume City Council Natural Heritage Strategy Action Plan 2011 – 2015 (Hume City Council 2012b)
- Hume City Council Fauna Surveying Project 2012 (EHP 2012)
- Sites of faunal significance in the western region of Melbourne (inland of the Princes Freeway) (Beardsell 1991).
- Sites of faunal and habitat significance in north east Melbourne (Beardsell 1997).

2.2 Fauna habitat assessment

2.2.1 Terrestrial habitats

In order to assist with the design of the fauna survey and to prioritise areas for the deployment of fauna survey equipment, the four reserves were investigated on 16 August 2013 to determine habitat values for fauna. During the initial site visit, the structure, quality and extent of fauna habitats present was assessed and noted. Public access and evidence of disturbance or management activities was also assessed where possible, which assisted with determining optimal locations for deploying fauna monitoring equipment such as remote cameras and Anabat units. The potential for threatened species to occur at each reserve was also assessed.

2.2.2 Aquatic habitats

Aquatic habitats were assessed by characterising biotic and abiotic habitat elements within waterways and wetlands. This included an assessment of the structural elements of the riparian zone noting cover of exotic and indigenous vegetation. The physical structure of in-stream habitats was characterised by assessing components such as substrate composition, flow regime and composition of organic debris. The presence of submerged, floating and emergent aquatic vegetation was noted, and a visual assessment of major forms of disturbance was undertaken at each reserve. In combination with field survey and a review of existing database records in the vicinity, the aquatic habitat assessment enables a more accurate prediction of presence of aquatic fauna species based on known habitat requirements.

2.3 Fauna survey techniques

A range of fauna survey techniques were utilized in order to maximize detection of all vertebrate fauna groups including frogs, reptiles, bats, arboreal and ground-dwelling mammals, diurnal and nocturnal birds, semi-aquatic mammals and fish. Survey techniques used to target these animal groups are described in further detail below.

2.3.1 Remote cameras

Remote cameras were deployed in all reserves to largely target mammal species, however this survey technique also regularly detects birds and reptiles. Remote camera survey sites consist of a remote camera unit (Reconyx HC500 or HC600) attached to a tree trunk and directed towards a bait station containing standard mammal bait (oats, peanut butter and golden syrup), which is located approximately 2 m from the remote camera in order to lure animals within the camera's sensor range. Two remote camera set ups were utilised during the current survey;

1. Terrestrial remote camera sites, which were placed approximately 20 cm above ground level in order to target ground-dwelling species
2. Arboreal remote camera sites, which were placed at least 1.5 m above ground and trained towards a branch or tree trunk in order to target arboreal mammals.

Any vegetation and litter that might obscure the view of an animal investigating the bait or cause the camera to 'false trigger' was cut back from around the bait station, where required. The remote cameras were programmed to take three photos per trigger event, with a 30 second delay between triggers. All remote cameras were set to a 'high' sensitivity level and operated continuously throughout the entire period in which they were deployed.

Plate 1: A terrestrial (left) and arboreal (right) remote camera set up

A total of seven terrestrial remote cameras and seven arboreal remote cameras were deployed across the four reserves for three to six weeks, resulting in a total of 427 camera nights. Of the 14 remote cameras deployed, 13 operated continuously during the deployment, whereas one camera failed after 5 nights. This was due to a large number of false trigger events depleting the camera batteries. Further details regarding remote camera deployments for the current survey are presented in Table 1 below.

Table 1: Remote camera deployment details for all four reserves

Reserve	Number of terrestrial remote cameras	Number of arboreal remote cameras	Total camera nights
Mt Ridley	3	3	190
Frog Court and Rushwood Drive	2	2	117*
Martin Dillon	1	1	42
Konagaderra	1	1	78
Total	**7**	**7**	**427**

**one arboreal remote camera failed after 5 nights*

Upon retrieval of the cameras, images stored on each camera's data card were downloaded for later identification of subjects. Where possible, each photograph of an animal was identified to species level. Generally identification of the species recorded was not difficult. However, in certain circumstances it was not possible to identify the animal to species level in which case it was identified to the nearest taxonomic level.

2.3.2 Artificial shelter (roof tile) transects

The placement of artificial shelter, in the form of terracotta roof tiles, is a technique widely used to survey for reptiles. While mostly used for reptiles, artificial shelter placement can also detect the presence of frogs and small ground-dwelling mammals. In order to survey for reptiles, frogs and small ground-dwelling mammals, transects of terracotta roof tiles were established across a variety of habitat types in each reserve.

Each transect consisted of 10 roof tiles spaced at approximately 5 metre intervals. A total of 14 roof tile transects were established across the four reserves. Tiles were placed across all four reserves on 16 August

2013 and allowed to remain in place undisturbed for at least four weeks prior to the first survey, in order to allow animals to become accustomed to using them as shelter sites. All tiles were then checked a total of eight times on 19 September, 4, 11 and 25 October, 19 November, 3, 10 and 18 December 2013. Tile checks were timed to coincide with a range of weather conditions and alternated between morning and afternoon in an attempt to maximise the tile micro-climates sampled and hence the number of species detected.

Table 2: Tile transect deployment details for all four reserves

Reserve	Number of tile transects	Habitats sampled	Total number of tile checks per reserve
Mt Ridley	6	Grassland (3), Grassy Woodland (2), Riparian Woodland (1)	480
Frog Court and Rushwood Drive	4	Grassland (2), Escarpment (2)	320
Martin Dillon	3	Riparian Woodland (2), Stream-bank Shrubland (1)	240
Konagaderra	3	Grassland (1), Grassy Woodland (1), Revegetation area (1)	240

2.3.3 Bird surveys

In order to survey for diurnal birds, a combination of point surveys and random search surveys were conducted at all reserves in a variety of different habitat types. For the smaller reserves, random searches radiating out from a central point (Figure 2) were conducted with the aim of recording all species of bird active within the reserve at a given time. For the larger reserves, random searches radiating out from each bird census point (Figure 2) were conducted with the aim of recording all bird species observed within a given habitat type up to a maximum of 2 ha. The random search approach used during the current survey is consistent with Birdlife Australia census survey methods. Birds were detected and identified visually and/or by calls. Bird surveys were undertaken at a variety of times throughout the day on eight separate occasions between September and December in order to maximise the number of species recorded. Bird surveys were only undertaken on days with light winds. The locations of bird surveys are displayed in Figure 2.

2.3.4 Microbat surveys

Insectivorous Microbats cannot be accurately identified visually from a distance due to their small size, nocturnal habit and flight behaviours. Identification of species at a site thus requires direct capture or indirect censusing from recordings of ultrasonic echolocation sequences. Two survey techniques were therefore utilised to survey for microbats at all reserves; Anabat bat call detectors and Harp Traps.

Anabat SD1 CF Bat Detectors (Titley Electronics) were used to record acoustic microbat calls. Detectors were housed in weatherproof containers and microphones were housed in PVC pipes directed downwards onto a Perspex reflector plate at an angle of 45º (Plate 2). Detectors were positioned adjacent to areas likely to contain concentrated bat activity, such as near flowering trees, natural flyways or waterbodies. A total of six Anabat units were deployed across the four reserves for 21 to 28 nights. This resulted in a total of 140 Anabat survey nights (Table 3).

Bat calls were analysed using the automated identification software AnaScheme, developed by Matt Gibson from Biosis (Ballarat office) and widely used in the automated analysis of microbat vocalisations within Victoria. The system allows for development of identification keys based on analysis of reference calls. The key used to analyse bat calls for this project was developed and tested by Lindy Lumsden of Arthur Rylah

Institute, Department of Environment and Primary Industries from search-phase reference call sequences of individuals released following capture and identification (Key to bats of Melbourne, dated May 2011).

Plate 2: An Anabat bat call detector placed next to Deep Creek, Martin Dillon Reserve.

Table 3: Anabat deployment details for all four reserves

Reserve	Number of Anabat units	Date deployed	Date retrieved	Total Anabat nights
Mt Ridley	2	11 October 2013	1 November 2013	42
Frog Court and Rushwood	2	4 October 2013	1 November 2013	56
Martin Dillon	1	11 October 2013	1 November 2013	21
Konagaderra	1	11 October 2013	1 November 2013	21
Total	**6**	**-**	**-**	**140**

The accuracy of the key may be limited by the breadth and quality of the reference call data on which it is constructed, including the incorporation of adequate variation of calls within species. Any calls identified by the system as significant or uncommon species are checked manually, by visual comparison with published reference calls. It is, however, often still recommended that any unexpected or uncommon species be analysed manually by a bat expert to verify the accuracy of the key in identification of such species. Refer to section 2.4.2 for further details.

In addition to Anabat bat call detectors, harp trapping was undertaken at all reserves. A harp trap consists of an extendable aluminium frame, strung with two banks of vertical nylon strings (Plate 3). Bats fly into the strings and slide into a protective canvas pouch in which they remain inactive until they are identified and released.

Plate 3: A harp trap set up at Mt Ridley Reserve

One harp trap was used at each reserve over two nights, resulting in the equivalent of two harp trap nights for each reserve. Harp traps were positioned in potential areas of concentrated bat activity, such as flight corridors or where feeding activity is concentrated close to the ground (near water-bodies or low vegetation). Harp traps were set up before dusk and were checked and dismantled after midnight on each survey night. Harp trapping was undertaken concurrently with additional nocturnal surveys, described below.

2.3.5 Nocturnal survey

In order to record nocturnal fauna species such as owls, nightjars, possums and frogs, two nights of nocturnal survey were undertaken at each reserve. Nocturnal surveys used a combination of active searching using spotlights, listening for bird and frog calls and playback of calls to elicit responses from frog, owl and nightjar species with potential to occur in the study area. Two nights of nocturnal survey and harp trapping was undertaken at each reserve. Nocturnal surveys were undertaken at Martin Dillon Reserve and Konagaderra Reserve on 26 November and 3 December 2013 and at Mt Ridley Reserve and Frog Court and Rushwood Drive reserve on 27 November and 12 December 2013. Nocturnal surveys were only undertaken during weather conditions conducive to survey (i.e. mild to warm with no wind or rain).

2.3.6 Incidental records and active searching

All vertebrate fauna species observed during the course of fieldwork were recorded and active searching for fauna was undertaken. This included direct observation, searching under rocks, logs and artificial debris, examination of tracks and scats and identifying calls. To aid active searching, a burrow-scope (See-Snake™) was used to inspect tree hollows and other cracks and crevices for sheltering fauna. Incidental records are additional to those that were obtained by methods outlined above and are included in survey results for each reserve.

2.3.7 Aquatic fauna survey

Aquatic fauna survey comprising fyke nets and box traps was conducted at each of the four reserves on 6 November 2013, with the aim of detecting semi-aquatic mammals (particularly Platypus *Ornithorhynchus anatinus*, turtles, frogs and fish. Locations of survey sites are detailed in Table 4. Targeted survey was conducted for Platypus at three reserves where suitable habitat was identified (excluding Malcolm Creek at Mt Ridley Reserve). Paired fyke nets were set facing up and downstream at these sites traversing the stream from bank to bank effectively capturing aquatic fauna moving through the survey site (Plate 4). Platypus

survey locations were selected where extended shallow riffles suitable for foraging were located in between larger refuge pools. Fyke nets were inspected at two hour intervals overnight and captured fauna recorded and released during each inspection. This method is employed by both the Australian Platypus Conservancy and CESAR for Platypus census surveys throughout Victoria. Visual inspection was also conducted for active 'nesting' burrow entrances (slides). In addition ten box traps were set at each site targeting other threatened aquatic fauna including smaller bodied fishes i.e. Yarra Pygmy Perch *Nannoperca obscura*, and Growling Grass Frog *Litoria raniformis* tadpoles. Each trap is set with a cyalume light source serving as an attractant.

Plate 4: Paired fyke nets targeting Platypus; 6 November 2013 at Martin Dillon Reserve, Bulla.

Table 4: Location of aquatic fauna survey sites within each reserve, 6 November 2013.

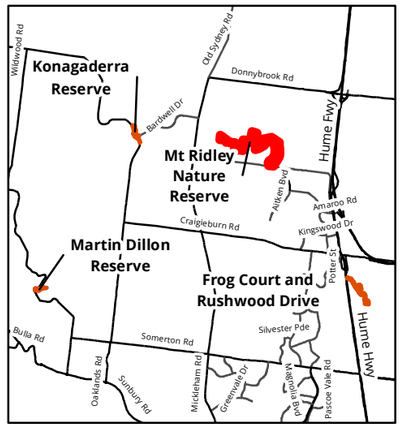
Reserve	Watercourse	Zone	Easting	Northing	Gear Type (BT = Box Trap, FN = Fyke Net)
Mt Ridley	Malcolm Creek	55	315635	5840306	BT x 10
Frog Court and Rushwood Drive	Merri Creek	55	319292	5835276	BT x 10, FN x 2
Martin Dillon	Deep Creek	55	306217	5835270	BT x 10, FN x 2
Konagaderra	Deep Creek	55	310092	5841813	BT x 10, FN x 2

2.3.8 Permits and data submission

Biosis undertakes flora and fauna assessments under the following permits and approvals:

- Research Permit/Management Authorisation and Permit to Take Protected Flora & Protected Fish issued by the Department of Environment and Primary Industries under the *Wildlife Act 1975, Flora and Fauna Guarantee Act 1988* and *National Parks Act 1975* (Permit number 10006240, expiry date 9 May 2015)
- Approvals 04.12 and 14.12 from the Wildlife and Small Institutions Animal Ethics Committee
- Permit RP1071 issued by the Department of Environment and Primary Industries (Fisheries Victoria) under the *Fisheries Act 1995*

Fauna records will be submitted to DSE for incorporation into the Victorian Biodiversity Atlas. Aquatic fauna records will also be submitted to Melbourne Water for inclusion in the Melbourne Water Fish database.



Legend

- Study Area

Fauna survey points

- Remote camera - arboreal
- Remote camera - terrestrial
- Harp trap
- Anabat
- Bird census points
- Call playback points
- Tile transects

Figure 2a: Fauna survey effort, Mt Ridley Nature Reserve, Hume City Council, Victoria

0 90 180 270 360 450

Metres

Scale: 1:9,500 @ A3

Coordinate System: GDA 1994 MGA Zone 55

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Ballarat, Brisbane, Canberra, Melbourne, Sydney, Wangaratta & Wollongong

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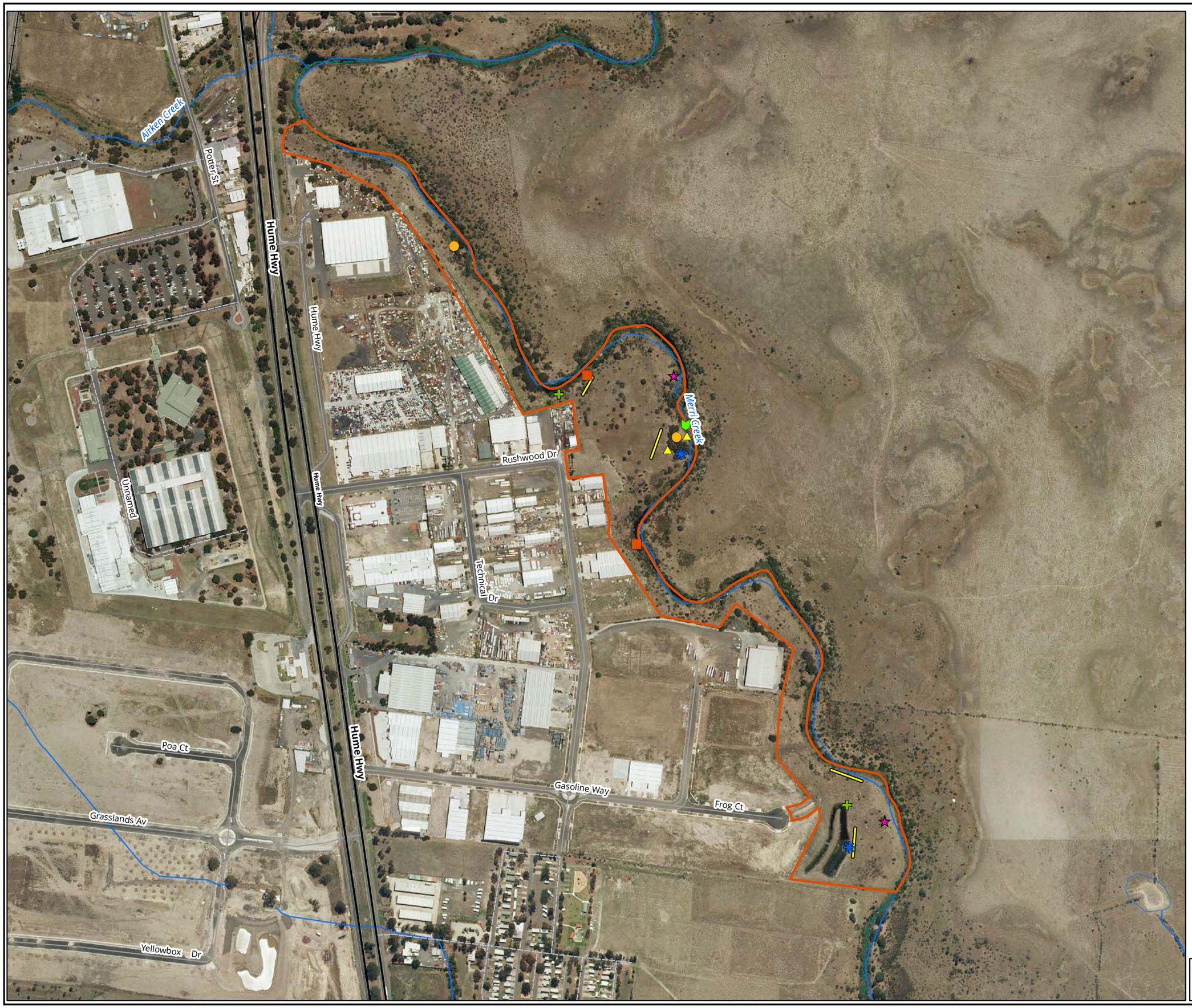

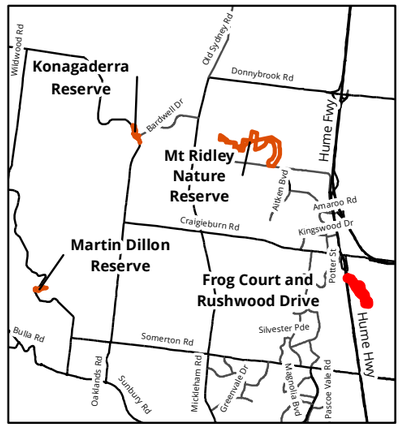

Legend

- Study Area

Fauna survey points

- Remote camera - arboreal
- Remote camera - terrestrial
- Harp trap
- Anabat
- Bird census points
- Call playback points
- Tile transects
- Aquatic survey

Figure 2b: Fauna survey effort, Frog Court and Rushwood Drive, Hume City Council, Victoria

0 50 100 150 200 250

Metres

Scale: 1:5,000 @ A3

Coordinate System: GDA 1994 MGA Zone 55

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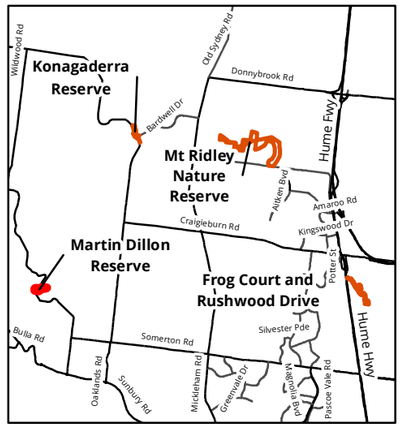

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- Study Area

Fauna survey points

- Remote camera - arboreal
- Remote camera - terrestrial
- Harp trap
- Anabat
- Bird census points
- Call playback points
- Tile transects
- Aquatic survey

Figure 2c: Fauna survey effort, Martin Dillon Reserve, Hume City Council, Victoria

0 20 40 60 80 100

Metres

Scale: 1:2,000 @ A3

Coordinate System: GDA 1994 MGA Zone 55

N

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Date: 14 February 2014,
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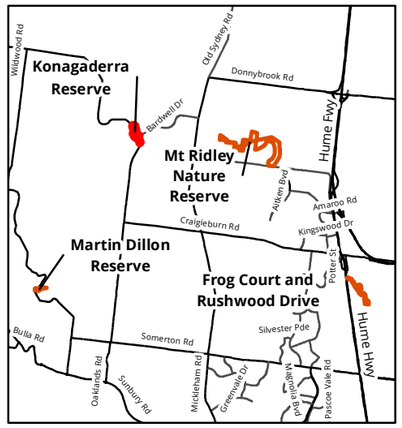

Legend

- Study Area

Fauna survey points

- Remote camera - arboreal
- Remote camera - terrestrial
- Harp trap
- Anabat
- Bird census points
- Call playback points
- Tile transects

Figure 2d: Fauna survey effort, Konagaderra Reserve, Hume City Council, Victoria

0 30 60 90 120 150

Metres

Scale: 1:3,500 @ A3

Coordinate System: GDA 1994 MGA Zone 55

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2.4 Qualifications

Ecological surveys provide a sampling of flora and fauna at a given time and season. There are a number of reasons why not all species will be detected at a site during survey, such as low abundance, patchy distribution, species dormancy, seasonal conditions, and migration and breeding behaviours. In many cases these factors do not present a significant limitation to assessing the overall biodiversity values of a site.

The current assessment was conducted over spring and early summer, which is considered an optimal time for the survey and detection of most local fauna species in these locations.

The current fauna survey was designed to maximise the number of species recorded from all fauna groups, rather than confirm presence or absence of specific cryptic or threatened species. While the fauna survey methods utilised during the current survey are often used to determine presence or absence of threatened species, the current survey may not have been conducted at the required intensity or frequency to confidently make a determination about whether a certain species is present or absent. For example, while the use of terracotta roof tiles is the standard survey technique for the nationally vulnerable Striped Legless Lizard *Delma impar*, the roof tiles used in the current survey were not deployed in the number or extent that would be required to confirm presence of this species in areas of suitable grassland habitat.

2.4.2 Anabat bat call detection

Determination of the identity of bat species using the methods employed in our surveys is a well recognised and widely applied technique, however, the method is not infallible and the following should be considered when interpreting the results presented in this report. Some taxa have calls within overlapping frequency ranges and cannot be distinguished from each other with certainty. High frequency background noise can occur and be recorded that may be in the frequency range of a particular species or may mask its calls. In such cases expert manual analysis is required to evaluate such calls and may still not provide complete certainty. In the results we obtained, the following points are relevant and some might potentially be resolved by detailed further analyses by external experts.

Ultrasonic call frequency of Victorian species of Long-eared bats (*Nyctophilus* spp.) cannot be distinguished with certainty and records shown may include more than one taxon. Hence records for the genus are pooled as *Nyctophilus* complex. Similarly, the calls of Large-footed Myotis *Myotis macropus* have a similar frequency and signature to Long-eared Bats and can often be difficult to differentiate with confidence. The calls of Eastern Bent-wing Bat *Miniopterus schreibersii oceanensis* are also known to be difficult to differentiate.

Any calls assigned to Yellow-bellied Sheathtail Bat *Saccolaimus flaviventris* are unlikely to be correct as this species is not known to occur in southern Australia in November, which is when the Anabat bat detectors were deployed during the current survey. Any calls assigned to this species are more likely to be caused by background noise within a similar frequency range. Detailed manual analysis would be required to comprehensively ascertain whether calls of the species are included but the seasonal occurrence of the species in southern Victoria indicates that this extra analysis is not warranted. This species is therefore not mentioned further within this report, and any records obtained from Anabat bat call detectors have been removed.

Any bat records that are unable to be verified with confidence are highlighted as such within the results of the current survey. Detailed further analyses by external experts would be required to verify such records, and may improve certainty about the species involved.

2.5 Mapping

Hume City Council supplied aerial photography and reserve boundaries.

Mapping was conducted using hand-held (uncorrected) GPS units (WGS84) and aerial photo interpretation. The accuracy of this mapping is therefore subject to the accuracy of the GPS units (generally ± 7 metres) and dependent on the limitations of aerial photo rectification and registration.

Mapping has been produced using a Geographic Information System (GIS).

3. Results - Mt Ridley Reserve

3.1 Fauna habitats

Terrestrial habitats within Mt Ridley reserve largely consist of mostly native grassland with several large patches of grassy woodland dominated by River Red Gum *Eucalyptus camaldulensis*. The broader reserve is divided into two management areas; the southern section including Malcolm Creek, which is managed by Hume City Council, and a large section to the north of Malcolm Creek which is currently managed by Parks Victoria. Grassland habitat varies significantly in quality, structure and species composition across the reserve. In the large section managed by Parks Victoria, former rock removal appears to have occurred in some areas, which is evident from the presence of informal stone walls and rock piles. Embedded rock remains in many areas, particularly on high points in the landscape. While a number of grassy weeds are present throughout this large area, a diversity of native grassland flora species were observed including Kangaroo Grass *Themeda triandra*, wallaby grasses *Rytidosperma* sp., spear grasses *Austrostipa* sp. and several native lilies and herbs. Grassland areas in the southern and far western sections of the reserve are largely dominated by introduced tussock grasses. A network of tracks and regularly slashed fire breaks exist throughout these areas, particularly along fence boundaries and adjacent to neighbouring properties.

Mt Ridley Reserve contains a relatively large patch of grassy woodland, which contains a large number of very large old hollow-bearing River Red Gums, as well as stags of dead trees. These features are of immense value to local fauna populations, particularly considering the context of the broader landscape, which has largely been cleared and modified for agricultural purposes. Large old trees and stags within Mt Ridley Reserve provide foraging, breeding and roosting opportunities for local birds, arboreal mammals and insectivorous microbats. A number of fauna species were directly observed utilising tree hollows for breeding including Tree Martin *Petrochelidon nigricans* and Striated Pardalote *Pardalotus striatus*. The site has been described as being of state significance due to previous records of Swift Parrot *Lathamus discolor* and Plains-wanderer *Pedionomus torquatus* (Beardsell 1991).

Plate 5: Grassy woodland containing hollow-bearing trees, Mt Ridley Reserve

Malcolm Creek within the Mt Ridley Nature Reserve consists of a series of online dams connected by marginal ephemeral stream habitat. With respect to aquatic fauna, these dams while extensive and relatively

permanent supported minimal submerged aquatic vegetation with the exception of the most downstream pool immediately upstream of Mount Ridley Road where survey was conducted. Gently sloping margins make these dams ideal habitat for wading birds that may suppress the establishment of submerged vegetation in shallower areas. This reach of Malcolm Creek provides limited habitat or opportunity for colonisation by native fish given the number of physical barriers imposed by consecutive dam walls throughout the reserve.

Plate 6: Flooded riparian margins of Malcolm Creek online dams at Mt Ridley Reserve

Ephemeral creeks and drainage lines also occur within and downstream of Mt Ridley Reserve. These were dry at the time of assessment. Some emergent aquatic vegetation and rock was evident along their length. Under dry conditions these ephemeral habitats may provide habitat for certain frog species. When inundated and connected to other waterbodies, these habitats may provide foraging and spawning habitat for aquatic fauna.

3.2 Fauna species

3.2.1 Database results

A total of 127 indigenous fauna species (94 birds, 12 mammals, 9 reptiles, 11 frogs and one invertebrate) and 12 introduced fauna species (eight birds and four mammals) have previously been recorded within a 500 metre radius of Mt Ridley Reserve. Results of the database searches for Mt Ridley Reserve are presented in Appendix 1.1 along with an indication of which of those species were recorded during the current survey.

Of all reserves surveyed during the current assessment, Mt Ridley Reserve contains the largest number of existing fauna database records. Given the large size of the reserve compared to the other three that were surveyed, it is likely that the reserve supports a number of additional species, particularly woodland birds, that are uncommon or absent from other sites. However, this large number of existing records may also be a result of increased survey effort and the presence of an active community group associated with the reserve.

Existing records suggest the presence of a diverse woodland bird community, which includes a number of species that are considered uncommon around Melbourne, and a number of species that are considered to be woodland-dependent, such as Hooded Robin *Melanodryas cucullata*, Jacky Winter *Microeca fascinans* and Little Lorikeet *Glossopsitta pusilla*. Database records also include a diversity of waterbirds, including several near-threatened and state significant species. Aquatic fauna records for Malcolm Creek catchment upstream of the Merri Creek confluence consist entirely of amphibian species. The amphibian fauna records consist of species commonly encountered within the urban fringe of Melbourne.

3.2.2 Survey results

Survey results for Mt Ridley Reserve are presented in Appendix 2 (Table A2.1). The table provides a list of species recorded within the reserve and identifies the survey technique by which the species was recorded. A total of 72 indigenous fauna species (53 birds, 13 mammals, one reptile, four frogs and one aquatic invertebrate) and nine introduced fauna species (five birds and four mammals) were recorded within Mt Ridley Reserve during the current survey program. Two additional indigenous mammal species, Eastern Bent-wing Bat and Large-footed Myotis, were possibly detected by Anabat bat call detectors deployed at the reserve, however further detailed call analysis would be required in order to confirm these uncertain records (refer to section 2.4.2 for further information). These unconfirmed records are therefore not discussed any further within this section.

Despite a total of 94 indigenous bird species previously recorded within the reserve, only 53 species were recorded during the current survey. However, of the birds recorded during the current survey, at least six appear to be new records for the reserve, including four woodland bird species (Australian Owlet-nightjar *Aegotheles cristatus*, Eastern Yellow Robin *Eopsaltria australis*, Shining Bronze-Cuckoo *Chalcites lucidus* and White-browed Scrubwren *Sericornis frontalis*) and two waterbirds (Dusky Moorhen *Gallinula tenebrosa* and Chestnut Teal *Anas castanea*). The new record of Australian Owlet-nightjar is of particular interest, as there are very few records of this hollow-dependent nocturnal species within the local area. Several individuals were heard calling at Mt Ridley Reserve during the nocturnal survey conducted on 27 November 2013.

Only one reptile species was recorded during the current survey, compared with nine reptiles that have previously been recorded within the reserve. The single species recorded, Tussock Skink *Pseudemoia pagenstecheri*, had already been recorded within the reserve, however given this species recent listing as 'vulnerable' in Victoria (DSE 2013), it is still encouraging to confirm it's presence at Mt Ridley Reserve. Reptile encounter rates were disappointingly low at Mt Ridley, with only the one individual Tussock Skink being recorded from a total of 480 tile checks.

The majority of the 16 mammal species previously recorded within Mt Ridley Reserve were detected during the current survey, with remote cameras obtaining most of these observations. Short-beaked Echidna *Tachyglossus aculeatus* (Plate 7) was confirmed to still remain present within the reserve, along with a number of more locally common species such as Eastern Grey Kangaroo *Macropus giganteus* and Common Brushtail Possum *Trichosurus vulpecula*.

Plate 7: Short-beaked Echidna detected by a remote camera at Mt Ridley Reserve

Of the bat species recorded at the reserve by Anabat bat call detectors, one (Inland Broad-nosed Bat *Scotorepens balstoni*) is a new record for the reserve and the local area. This species is widely distributed through inland Australia and central-west Victoria, with few records occurring south of the Great Divide. The introduced Black Rat *Rattus rattus* was also recorded during the current survey, and appears to be the first time this species has been recorded from the reserve.

The current survey only detected four frog species of the 11 that have been previously recorded within Mt Ridley Reserve, and therefore did not yield any new amphibian records for the reserve.

Large numbers of tadpoles of three genera (*Litoria, Limnodynastes* and Crinia) were recorded during aquatic survey and a small number of Common Yabby (Appendix 3, Table A3.1). No fishes were recorded which may account for the large numbers of tadpoles at the site. The sequence of online dams along Malcolm Creek limits, if not precludes colonisation by native fishes, however, this may be of benefit to the amphibian fauna within the reserve in its current configuration.

3.2.3 Significant and notable fauna

Tussock Skink, which is listed as vulnerable in Victoria (DSE 2013), was the only significant fauna species recorded at Mt Ridley Reserve during the current survey. The location of this record is displayed in Figure 3.

A large number of significant species have previously been recorded within the reserve, including the EPBC Act listed Plains-wanderer, Swift Parrot, Growling Grass Frog and Golden Sun Moth *Synemon plana* (Figure 3). Golden Sun Moth have also been recorded more recently in 2012 (Hume Fauna Sightings Database). While Swift Parrots are still considered highly likely to utilise remnant trees within the reserve, Plains-wanderer have not been recorded within the local area for over 25 years and grassland habitat currently appears much too dense to support this species.

Growling Grass Frog was recorded adjacent to Malcolm Creek within the Mt Ridley Grassland Reserve in 1989, however there do no appear to be any more recent records within the reserve. The species is, however, known to occur within Merri Creek, which is located 5-6km east of the reserve. There is still some potential for the species to colonise suitable wetland habitat within the reserve.

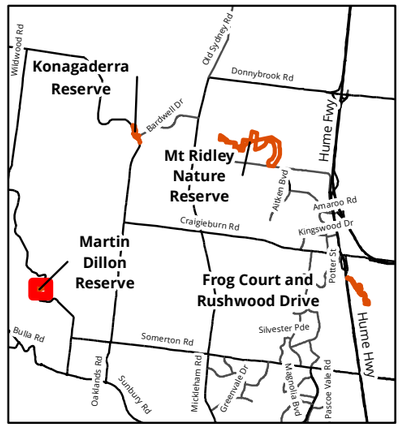
While not previously recorded from the reserve, there is also potential for the EPBC Act listed Striped Legless Lizard to occur within areas of grassland habitat in the reserve. An intensive targeted survey would be required in order to determine the presence of this species. A more intensive survey would also aid in establishing the presence or absence of the numerous other reptiles/small mammals previously recorded onsite.

A number of significant woodland and wetland birds have also been recorded within the reserve. Table 5 provides a summary of all significant species that have previously been recorded or have potential to occur within Mt Ridley Reserve.

Inland Broad-nosed Bat and Australian Owlet-nightjar were the most notable new records for Mt Ridley Reserve, as few records exist for these species within the local area.

Table 5: Summary of significant fauna recorded or most likely to occur at Mt Ridley Reserve

Species	Last record	Notes
EPBC Act listed species		
Plains-wanderer *Pedionomus torquatus*	1989	No records since 1989, habitat unlikely to support the species.
Swift Parrot *Lathamus discolor*	1990	Highly mobile species that is likely to utilise remnant trees for foraging during the winter months, when individuals migrate to mainland Australia from Tasmania.
Growling Grass Frog *Litoria raniformis*	1989	No recent records and not recorded during current survey, however potential exists for individuals to colonise suitable wetlands within the reserve from known populations in the local area.
Golden Sun Moth *Synemon plana*	2012	Population present within Mt Ridley grasslands; further survey would be required to determine extent and size of population.
Striped Legless Lizard *Delma impar*	none	Potential habitat exists on site for this species; targeted survey required to determine presence.
FFG Act listed or DSE Advisory listed as threatened		
Eastern Great Egret *Ardea modesta*	2011	Suitable wetland habitat present; species is likely to be resident or make use of habitat within the reserve on a frequent basis.
Hardhead *Aythya australis*	1989	Suitable wetland habitat present; species is likely make use of these areas within the reserve on occasion.
Hooded Robin *Melanodryas cucullata*	1990	No recent records, however potential woodland habitat is present. May still utilise these areas on occasion.
Brown Toadlet *Pseudophryne bibronii*	1990	No recent records within the reserve or local area, however some potential for the species to occur. Autumn survey would be required to confirm.
Tussock Skink *Pseudemoia pagenstecheri*	Current survey	Recorded during the current survey, likely to be present throughout the reserve were suitable tussock grassland or open grassy woodland occurs.
DSE Advisory listed as near threatened		
Emu *Dromaius novaehollandiae*	2003	A highly mobile species. Individuals are occasionally sighted in the broader area. Unlikely to be resident on site, as none were observed during the current survey and it has been approximately 10 years since the last record.
Royal Spoonbill *Platalea regia*	1989	Suitable wetland habitat present; individuals are likely to make frequent use of wetlands within the reserve.
Nankeen Night Heron *Nycticorax caledonicus*	2002	
Spotted Harrier *Circus assimilis*	1989	Suitable habitat present, however over 20 years since last record. May be present within the reserve on occasion.
Fat-tailed Dunnart *Sminthopsis crassicaudata*	1989	Suitable habitat present, however over 20 years since last record. Resident population may still be present, however targeted survey effort would be required in order to confirm this.



Legend

Study Area

Significant fauna current survey

State significance

Significant fauna (VBA)

National significance

State significance

Figure 3: Significant fauna species recorded, Mt Ridley Nature Reserve, Hume City Council, Victoria

0 110 220 330 440 550

Metres

Scale: 1:11,000 @ A3

Coordinate System: GDA 1994 MGA Zone 55

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4. Results - Frog Court and Rushwood Drive

4.1 Fauna habitats

Fauna habitat within Frog Court and Rushwood Drive Reserve largely consists of rocky escarpments, plains grassland and woodland associated with the Merri Creek corridor.

Rocky escarpment extends from the creeks edge up onto the surrounding plain along both sides of Merri Creek. The steep rock faces and cracks formed by exfoliating rocks provide excellent habitat for reptiles such as snakes and skinks. The native shrubs along the escarpment provide patches of shade which are also important for thermoregulation in reptiles. Colonies of Cunningham's Skink *Egernia cunninghami* were observed within this habitat. Upstream of this site, Merri Creek has been described as being of state significance for fauna on the basis of a population of Striped Legless Lizard found on the eastern escarpment of Merri Creek, south of the North-Eastern Railway Bridge in November 1991 (Beardsell 1997).

Plate 8: Escarpment habitat located along Merri Creek, Frog Court and Rushwood Drive

Native grassland patches are located running up from above the escarpment and sometimes from the creek edge. These important remnant grassland patches along Merri Creek once formed part of much larger areas of grassland that extended across the basalt plains into western Victoria. This habitat is dominated by grass tussocks with mostly embedded rock. Habitat management is evident in this habitat where weed control and revegetation works have been very effective, particularly near the Rushwood Drive entrance were a large area dominated by Kangaroo Grass occurs. Reptiles such as snakes and small skinks utilise this habitat, with the highest capture rates observed near the Rushwood Drive entrance. Weasel Skink *Saproscincus mustelinus*, Tussock Skink and an unidentified snake were recorded in this area.

Riparian woodland extends along the creek corridor within the reserve, and continues to the north and south of the site. The large old remnant trees present along the creek corridor provide hollows which are used by hollow dependant species such as possums, microbats and owls. Creek corridors are often used as 'flyways' for small insectivorous microbats. Previous assessments in land adjacent to the study area recorded up to five species of bat near waterways (Beardsell 1997), while the present assessment recorded up to eight species within the reserve. The habitat along the Merri Creek corridor, as well as the surrounding grassed

areas with scattered trees provide suitable foraging habitat for these and other species of insectivorous bat. Many species of woodland bird nest and forage in the riparian woodland and associated shrubby understorey.

Exotic vegetation and disturbed areas are also present within the reserve. For much of the reserve, industrial development backs immediately onto the creek corridor. Former evidence of construction work in the form of building spoil and refuse is evident in areas of the reserve directly behind industrial properties. These areas are now covered with predominately introduced vegetation, which provide limited value for local fauna species. Old construction waste and dumped building material is likely to be utilised as shelter by common indigenous reptiles, but may also be used by introduced mammals such as rats and foxes.

Plate 9: Areas of disturbance and dumped building materials, near Rushwood Drive

Merri Creek within the Frog Court and Rushwood Drive Reserve consists predominantly of deep and shallow pools connected by some extended reaches of riffle habitat with basalt bedrock and boulder dominated substrate. A moderate degree of flow was evident and in-stream habitat consisted mainly of interstitial spaces amongst coarse substrates, fringing and overhanging riparian vegetation and a small amount of coarse woody debris. A continuous strip of Floodplain Riparian Woodland vegetation consisting of River Red Gum, Silver Wattle *Acacia dealbata* and River Bottlebrush *Callistemon sieberi* and planted riparian vegetation exists along the west bank of Merri Creek interspersed with Tree Violet *Melicytus dentatus* and Sweet Bursaria *Bursaria spinosa*. Riparian vegetation cover along the eastern bank is intermittent. In-stream aquatic vegetation consists of some degraded remnants of submergent and more extensive emergent vegetation stands of native Cumbungi *Typha domingensis* and Common Reed *Phragmites australis* (Plate 3). The river provides habitat for a range of aquatic fauna including semi-aquatic mammals (Platypus and Water Rat *Hydromys chrysogaste*) and a fish community comprised of both migratory and obligate freshwater species.

This section of Merri Creek forms part of a site of state significance for fauna (Beardsell 1997). Beardsell (1997) indicates that Merri Creek supports a diverse range of herpetofauna, actively supports several raptor and other bird species, as well as several mammals including Platypus. Merri Creek is also a primary habitat link between several areas of fauna significance including Craigieburn Grasslands (nationally significant) to the south of the study area and Craigieburn East Grasslands (state significant) to the east of the study area.

Plate 10: Merri Creek approximately 650m downstream of Aitken Creek confluence

A constructed wetland is located above the escarpment near the end of Frog Court. This wetland provides breeding habitat for the threatened Growling Grass Frog which was recorded calling and observed on several occasions during the current surveys. The wetland supports emergent reeds and fringing and floating aquatic vegetation which are essential habitat components for this species. Waterbirds also utilise this habitat and Clamorous Reed Warbler *Acrocephalus strentoreus* was heard calling from the reeds.

Plate 11: Constructed wetlands near Frog Court

4.2 Fauna species

4.2.1 Database records

A total of 78 indigenous fauna species (54 birds, 4 mammals, 13 reptiles, 5 frogs, one fish and one invertebrate) and 16 introduced fauna species (10 birds, five mammals and one fish) have previously been recorded within a 500 metre radius of Frog Court and Rushwood Drive Reserve. Results of the database searches for Frog Court and Rushwood Drive Reserve are presented in Appendix 1.2 along with an indication of which of those species were recorded during the current survey.

Database searches suggest a diversity of reptile, waterbird, raptor and woodland bird species that are commonly associated with the Merri Creek corridor and associated escarpment and woodland habitats. Of the four reserves surveyed, Frog Court and Rushwood Drive Reserve appears to contain the most diverse reptile community, with 13 species appearing in database searches for the reserve.

Aquatic fauna records for the Merri Creek catchment upstream of the Edgars Creek confluence document a fish community comprised of indigenous migratory species (Short-finned Eel *Anguilla australis*, Common Galaxias *Galaxias maculatus*), translocated obligate freshwater fishes (Macquarie Perch *Macquaria australasica*) exotic cyprinid (Goldfish *Carassius auratus*, Tench *Tinca tinca*) and salmonid fishes (Rainbow Trout *Oncorhynchus mykiss*) and listed noxious species (Carp *Cyprinus carpio*, Gambusia *Gambusia holbrooki*, Oriental Weatherloach *Misgurnus anguillicaudatus*). Semi-aquatic mammals (Water Rat and Platypus) are consistently recorded along with a diverse suite of commonly encountered amphibian species. Of note is the number of records for Growling Grass Frog within the Merri Creek catchment suggesting that the Merri Creek habitat corridor is a remnant stronghold for the species within urban Melbourne. The Merri Creek population of this species meets the definition of an important population (DEWHA 2009).

4.2.2 Survey results

Survey results for Frog Court and Rushwood Drive are presented in Appendix 2 (Table A2.2). The table provides a list of species recorded within the reserve and identifies the survey technique by which the species was recorded. A total of 54 indigenous fauna species (33 birds, 12 mammals, four reptiles and five frogs) and 11 introduced fauna species (seven birds, three mammals and one fish) were recorded within Frog Court and Rushwood Drive reserve during the current survey program. One additional indigenous mammal species, Eastern Bent-wing Bat, was possibly detected by Anabat bat call detectors deployed at the reserve, however further detailed call analysis would be required in order to confirm this uncertain record (refer to section 2.4.2 for further information). This unconfirmed record is therefore not discussed any further within this section.

The current survey appears to be the first of which that has undertaken bat survey within Frog Court and Rushwood Drive, as no existing records of any microbat species appeared in database searches. The current survey therefore appears to have contributed a total of eight new records of microbats, including a number of locally common species such as White-striped Freetail Bat *Tadarida australis*, Gould's Wattled Bat *Chalinolobus gouldii* and Large Forest Bat *Vespadelus darlingtoni* as well one locally uncommon species (Inland Broad-nosed Bat). The use of remote cameras also resulted in the detection of one additional new mammal species for the reserve (Common Brushtail Possum).

The number of reptile species detected was disappointingly low compared to database records, however the current survey appears to have contributed one new reptile record for the reserve, Weasel Skink, which was recorded beneath a tile transect running along the top of rocky escarpment near Rushwood Drive (Plate 12).

Plate 12: Weasel Skink recorded at a tile transect at Frog Court and Rushwood Drive Reserve

The bird species recorded appear to be mostly consistent with those previously recorded from the reserve and commonly known to occur in the local area. Bird surveys at the reserve resulted in 12 new records for the reserve, of which six are associated with wetland habitat (Clamorous Reed Warbler, Little Grassbird *Megalurus gramineus*, Hardhead, Purple Swamphen *Porphyrio porphyrio*, Straw-necked Ibis *Threskiornis spinicollis* and Eurasian Coot *Fulica atra*) and the remainder associated with woodland or grassland (Brown Quail *Coturnix ypsilophora*, Sulphur-crested Cockatoo *Cacatua galerita*, Rufous Whistler *Pachycephala rufiventris*, Crested Shrike-tit *Falcunculus frontatus*, New Holland Honeyeater *Phylidonyris novaehollandiae* and Black-faced Cuckoo Shrike *Coracina novaehollandiae*).

One new frog record for the reserve was obtained while conducting nocturnal survey at the constructed Frog Court wetlands: A single Striped Marsh Frog *Limnodynastes peronii* which was heard calling in this location.

Abundance and diversity of aquatic fauna was uncharacteristically low with only one individual noxious fish, Oriental Weatherloach recorded. While the arrangement of fyke nets for targeted Platypus survey may preclude the capture of larger bodied fishes found in slow flowing or still deep water habitats, box traps set in low flow areas failed to detect a single small bodied fish, native or exotic. Evidence of Water Rat was also recorded where an exit tear was found in one of the fyke nets. Three Dusky Moorhen were also captured.

4.2.3 Significant and notable fauna

Significant species recorded during the current survey of Frog Court and Rushwood Drive reserve include Growling Grass Frog, Tussock Skink, and Hardhead. The locations of these records are displayed in Figure 4.

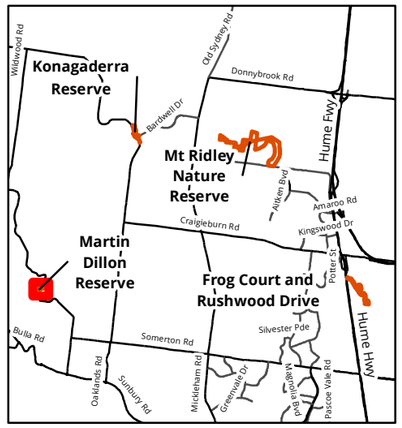
Growling Grass Frogs were recorded in the constructed wetlands at Frog Court on a number of occasions, including an adult female that was recorded during nocturnal survey on 12 December 2013 (Plate 13). The species has previously been recorded within these wetlands, and is also known to occur within Merri Creek upstream and downstream of the reserve.

Two Hardhead, which are listed as vulnerable in Victoria (DSE 2013), were recorded on one occasion within a large pool in Merri Creek, near Rushwood Drive, on 4 October 2013. This species is highly mobile and known to utilise a range of wetlands in the local area on occasion.

Tussock Skink was recorded on one occasion at a tile transect located in Kangaroo Grass-dominated grassland near Rushwood Drive on 25 October 2013. This species has already been recorded within the reserve, however given this species recent listing as 'vulnerable' in Victoria (DSE 2013), it is still encouraging to confirm it's presence at the site.

Plate 13: Adult female Growling Grass Frog recorded at the constructed wetlands at Frog Court

Platypus were not recorded during survey within the Frog Court and Rushwood Drive reserve. While suitable habitat exists for this species the nearest record for the species in Merri Creek occur some 12 km downstream of the reserve in the vicinity of Claremont Crescent, Fawkner (CESAR Platypus Online database – accessed February 2014). The lower Merri Creek catchment is presumed to support a small population of adult Platypus with regular sightings of some resident adults and transient juveniles presumed to originate from the adjacent Yarra River population (Serena and Williams, 2008; Josh Griffiths – CESAR pers. comm.)



Legend

Study Area

Significant fauna current survey

- National significance
- State significance

Significant fauna (VBA)

- National significance
- State significance

Figure 4: Significant fauna species recorded, Frog Court and Rushwood Drive, Hume City Council, Victoria

0 60 120 180 240 300

Metres

Scale: 1:6,000 @ A3

Coordinate System: GDA 1994 MGA Zone 55

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16797_F3_SigFaunaSpecies

5. Results - Martin Dillon Reserve

5.1 Fauna habitats

Fauna habitat within Martin Dillon Reserve largely consists of riparian woodland, rocky stream-bank shrubland and the Deep Creek corridor. Riparian woodland within the reserve consists mostly of River Red Gum, with several large old remnant trees and dead stags located along the banks of Deep Creek. These hollow-bearing trees provide breeding and roosting habitat for a range of hollow-dependant fauna species such as possums, owls, cockatoos and microbats. A large clearing within the reserve is dominated by weedy grasses including Chilean Needle-grass *Nassella neesiana* and Toowoomba Canary-grass *Phalaris aquatica.* No evidence of slashing to control the seeding and spread of these exotic grasses was observed. The fauna habitat value of these areas is limited. Evidence of some weed control and revegetation works was observed in the western section of the reserve, adjacent to Wildwood Road, where grassy and woody weeds are less prolific. Additional environmental weeds including African Box-thorn *Lycium ferocissimum* appear to be encroaching into the reserve from private property to the south.

A small area of rocky stream-bank shrubland habitat occurs next to Deep Creek in the eastern section of the reserve (Plate 11). This area contains a high cover of surface and embedded rock with a dense mid-storey of shrubs including River Bottlebrush. This area provides a structurally diverse ground layer which provides basking opportunities and shelter for reptiles such as Garden Skink *Lampropholis guichenoti*, which was found in large numbers during the current survey. Frog species present within Deep Creek such as Lesueur's Frog *Litoria lesueuri* are also likely to utilise these rocky banks for basking or foraging. The broader area in which Martin Dillon Reserve is located is described as being of state significance by Beardsell (1991) due to the unique natural features of the site, which have an important biogeographical affinity with northern Victoria. The reserve forms part of a habitat corridor within an otherwise cleared agricultural landscape. The site is described as a 'stepping-stone' of woodland vegetation between the Melton-Long Forest 'mallee' and the Kilmore-Lancefield gap at the foot of the Great Divide (Beardsell 1991).

Plate 14: Rocky stream-bank shrubland located at Martin Dillon Reserve

Deep Creek within the Martin Dillon Reserve consists of extended areas of riffle habitat with a cobble and boulder dominated substrate. These areas were interspersed with large shallow pools with clay and cobble dominated substrates. While minimal aquatic vegetation was present within or adjacent to riffle habitats there was a proliferation of filamentous algae recorded within these reaches. This is typically associated with elevated nutrient levels in the catchment. Riffle habitat was interspersed with shallow pools commonly found to support beds of Water Ribbons *Triglochin* spp. The riparian vegetation was relatively intact though somewhat reduced in breadth due to Wildwood Road and private property immediately adjacent to the northern bank. The river provides habitat for a range of aquatic fauna including Platypus, Water Rat and a fish community comprised of both migratory and obligate freshwater species. Both Growling Grass Frog and Lesueur's Frog were recorded at this site suggesting that suitable breeding habitat exists for both species within the reserve, however no tadpoles were detected during survey.

5.2 Fauna species

5.2.1 Database records

A total of 46 indigenous fauna species (31 birds, one mammal, three reptiles, four frogs, six fish and one invertebrate) and nine introduced fauna species (four birds and five fish) have previously been recorded within a 500 metre radius of Martin Dillon Reserve. Results of the database searches for Martin Dillon Reserve are presented in Appendix 1.3 along with an indication of which of those species were recorded during the current survey.

Database search results for Martin Dillon Reserve include mostly common local species associated with woodland habitat or Deep Creek. The limited number of records for some fauna groups is likely to be indicative of a lack of previous fauna survey effort.

Within the broader catchment area, aquatic fauna records from Deep Creek upstream of the Emu Creek confluence detail a fish community comprising indigenous migratory species (Short-finned Eel, Common Galaxias), indigenous obligate freshwater species (Australian Smelt *Retropinna semoni*), translocated obligate freshwater fishes (Macquarie Perch and Murray Cod *Maccullochella peelii*), exotic cyprinid (Goldfish, Tench) and salmonid fishes (Rainbow Trout and Brown Trout *Salmo trutta*) and listed noxious species (Carp, Gambusia, Oriental Weatherloach). Two threatened fish species have been recorded from the Deep Creek catchment; Australian Grayling *Prototroctes maraena* and Yarra Pygmy Perch. Australian Grayling is known from an old museum record (1895) upstream of the Emu Creek confluence and a more recent record at McNabs Weir (2009) within the lower Maribyrnong River catchment. Yarra Pygmy Perch have been consistently recorded in the vicinity of Lancefield between 1978 and 2006 approximately 65 kilometres upstream of Martin Dillon Reserve. Semi-aquatic mammals (Water Rat and Platypus) are consistently recorded in the vicinity of Bulla (downstream) and Darraweit Guim upstream of the reserve along with a diverse suite of commonly encountered amphibian species.

5.2.2 Survey Results

Survey results for Martin Dillon Reserve are presented in Appendix 2 (Table A2.3). The table provides a list of species recorded within the reserve and identifies the survey technique by which the species was recorded. A total of 56 indigenous fauna species (33 birds, 11 mammals, two reptiles, seven frogs and three fishes) and seven introduced fauna species (four birds, two mammals and one fish) were recorded within Martin Dillon Reserve during the current survey program. Two additional indigenous mammal species, Eastern Bent-wing Bat and Large-footed Myotis, were possibly detected by Anabat bat call detectors deployed at the reserve, however further detailed call analysis would be required in order to confirm these uncertain records (refer to section 2.4.2 for further information). These unconfirmed records are therefore not discussed any further within this section.

The current fauna survey resulted in a greater number of species recorded than what has been previously documented within Martin Dillon Reserve. Of the fauna species recorded during the current survey at the reserve, at least 35 appear to be new records. All mammals recorded during the current survey had not previously been recorded from the reserve. This included mostly microbat species, including a Little Forest Bat *Vespadelus vulturnus* recorded on 3 December 2013, which was the only bat to be captured using harp traps for the entire fauna survey program (Plate 15). The only mammal that had previously been recorded within the reserve, Platypus, was not recorded during the current survey despite a targeted effort to capture the species. Other new mammal species for the reserve include Common Brushtail Possum and Black Wallaby *Wallabia bicolor*, as well as introduced species including European Rabbit *Oryctolagus cuniculus* and Red Fox *Vulpes vulpes*. A domestic dog (collar visible) was recorded by remote camera on two occasions, between midnight and 3 am. The unusual timing of these observations suggests that a neighbouring landowner is allowing the animal to roam freely at night, which is likely to cause disturbance to native fauna within the reserve.

Plate 15: Little Forest Bat captured in a harp trap at Martin Dillon reserve

Of the 33 birds recorded during the current survey, 17 had not previously been recorded within the reserve. The majority of new bird records for the reserve consisted of locally common woodland-associated species such as Crested Shrike-tit, Fan-tailed Cuckoo *Cacomantis flabelliformis*, Spotted Pardalote *Pardalotus punctatus* and Brown Thornbill *Acanthiza pusilla*. Southern Boobook *Ninox novaeseelandiae* was also recorded within the reserve during nocturnal survey work on 6 and 26 November 2013.

A relatively high number of frog species were recorded within the reserve, of which Spotted Marsh Frog *Limnodynastes tasmaniensis*, Southern Brown Tree Frog *Litoria ewingii* and Verreaux's Tree Frog *Litoria verreauxii verreauxii* were new records, having not previously been recorded. The site supports a diverse amphibian community, particularly given the presence of a regionally significant breeding population of Lesueur's Frog within Deep Creek. This population occurs in the extreme south-western extent of the range for this species.

A juvenile Eastern Brown Snake *Pseudonaja textilis* recorded beneath a tile transect on 25 October 2013 is the first record of this reptile for the reserve. Garden Skinks were found to occur in large numbers at the reserve, particularly in the eastern section of the reserve.

Three native (Short-finned Eel, Flat-headed Gudgeon *Philypnodon grandiceps* and Common Galaxias) and one introduced fish species (Redfin *Perca fluviatilis*) were recorded from Martin Dillon Reserve (Appendix 3, Table A3.2). Two frog species were recorded during aquatic survey. An adult female Growling Grass Frog was captured in a fyke net.

5.2.3 Significant and notable fauna

Only one significant fauna species was recorded at Martin Dillon Reserve during the current survey, Growling Grass Frog, which was recorded in low numbers during the aquatic survey and opportunistically during diurnal active searching on 3 December 2013. The species also appears in database records for the site, as well as the Hume Fauna Sightings Database (2012-2013). The locations of these records are displayed in Figure 5.

No additional significant species have previously been recorded within the reserve or within a 500 m radius of the reserve boundary. Additional records of significant fauna from the broader local area include:

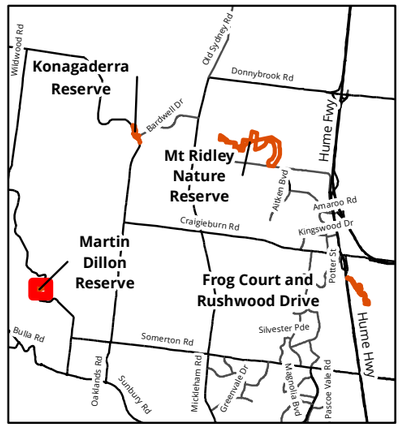
- One record of **Brown Toadlet**, from approximately 3 km north of the reserve in 1989. There are very few recent records of this species from the broader area, and it is considered unlikely to be present within Martin Dillon Reserve.
- Several scattered records of threatened woodland birds including **Brown Treecreeper *Climacteris picumnus victoriae*, Diamond Firetail *Stagonopleura guttata*, Swift Parrot, Speckled Warbler *Chthonicola sagittata*** and **Black-chinned Honeyeater *Melithreptus gularis***. Most of these records are from the late 1980's, however given Martin Dillon Reserve's location along one of the only well-connected habitat corridors remaining in the landscape, there is potential for all species to occur on occasion. Speckled Warbler and Black-chinned Honeyeater are less common in southern Victoria and are therefore considered less likely to occur.

Numerous adult male Lesueur's Frogs were heard calling and observed within the riffle habitat of Deep Creek at Martin Dillon Reserve during aquatic survey and nocturnal surveys (Plate 16). While not listed as threatened, this breeding population is considered to be of regional significance given its location at the far south-western extent of the species distribution.

Plate 16: Lesueur's Frog recorded at Martin Dillon Reserve

The Platypus is considered an iconic species of regional significance. While not recorded during survey, five individual Platypus have been recorded within Deep Creek less than 1 km upstream of Bulla in 1996-1997 and consistently observed (five records) up to 3km upstream of Bulla from 2002-2008 (Serena and Williams 2008). More recent sightings have been documented approximately 4 km upstream of Martin Dillon Reserve and 2.5 km downstream of Sunbury Road, Bulla in 2012 and 2011 respectively (CESAR Platypus Online database,

accessed February 2014). While a significant proportion of Deep Creek within Martin Dillon Reserve is expected to dry during summer, there is suitable foraging habitat during periods of flow. There is also potential refuge and permanent habitat in large pools adjacent to the reserve both up and downstream.



Legend

Study Area

Significant fauna current survey

National significance

Significant fauna (VBA)

National significance

Figure 5: Significant fauna species recorded, Martin Dillon Reserve, Hume City Council, Victoria

0 20 40 60 80 100

Metres

Scale: 1:2,000 @ A3

Coordinate System: GDA 1994 MGA Zone 55

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6. Results - Konagaderra Reserve

6.1 Fauna habitats

Fauna habitats within Konagaderra Reserve consist of riparian woodland, grassy woodland located along the steep slopes rising up to Konagaderra Road and the Deep Creek corridor. The reserve is bisected by Konagaderra Road in two locations, and to the south by an ephemeral tributary of Deep Creek. A number of large old remnant River Red Gums occur along the upper banks of Deep Creek within Konagaderra Reserve, which provide an important resource for the breeding, roosting and foraging activities of local fauna species. Riparian woodland vegetation occurs along Deep Creek beyond the reserve, and provides an important habitat link in a largely cleared and modified agricultural landscape. The understorey vegetation in the riparian zone within the reserve is almost exclusively dominated by exotic vegetation, with the exception of a small area that has been revegetated with native tussock grasses *Poa* spp. A large open area of exotic vegetation that is regularly slashed occurs between the immediate riparian zone and the steep slopes rising up to Konagaderra Road. This area is of little value to native fauna species, other than open-country adapted species such as Australian Magpie *Cracticus tibicen*. Given the extent of exotic weedy ground-storey vegetation within this reserve, it would be a good candidate for more extensive targeted weed control and revegetation, in an attempt to restore the natural understorey component of the riparian woodland present.

Plate 17: View north-west across Konagaderra reserve, towards the bridge over Deep Creek.

The steep slopes occurring along the western side of Konagaderra Road are largely dominated by Kangaroo Grass, with scattered native herbs, shrubs and trees. Some grassy weeds remain present in this area, particularly where the slopes narrow at the northern end. Despite this, the native tussock grasses and embedded rocks provide a structurally diverse ground-layer which provides basking and foraging opportunities as well as shelter for small reptiles. Garden Skinks were recorded in these areas, along with the revegetation area located on the edge of the riparian zone.

Deep Creek within Konagaderra Reserve consists of a series of deep pools with predominately clay substrates throughout. A small section of shallow riffle habitat exists underneath the Konagaderra Road Bridge consisting of coarse gravel presumably originating from road run-off. The banks of Deep Creek within the reserve are deeply incised with a patchy distribution of Water Ribbons and Common Reed throughout. The riparian margin is highly degraded presumably due to seasonal flows continuing to scour the banks further reducing macrophyte recruitment and establishment. The dominant in-stream habitat component at Konagaderra Reserve is the coarse woody debris (snags) that appear to be well distributed throughout (Plate 18).

Plate 18: Incised banks of Deep Creek, Konagaderra Reserve.

Konagaderra reserve forms part of a broader site described as being of state significance by Beardsell (1991), which also includes Martin Dillon Reserve located further downstream. The Deep Creek corridor provides a crucial remnant habitat link in a landscape that has been extensively cleared and modified for agriculture.

6.2 Fauna species

6.2.1 Database records

A total of 60 indigenous fauna species (44 birds, seven mammals, one reptile, two frogs, five fish and one invertebrate) and ten introduced fauna species (five birds, three mammals and two fish) have previously been recorded within a 500 metre radius of Konagaderra Reserve. Results of the database searches for Konagaderra Reserve are presented in Appendix 1.4 along with an indication of which of those species were recorded during the current survey.

Results of aquatic fauna database searches are as those previously presented for Deep Creek within Martin Dillon Reserve.

6.2.2 Survey results

Survey results for Konagaderra are presented in Appendix 2 (Table A2.4). The table provides a list of species recorded within the reserve and identifies the survey technique by which the species was recorded. A total of 46 indigenous fauna species (26 birds, 13 mammals, one reptile, four frogs and two fishes) and seven introduced fauna species (one bird, three mammals and three fishes) were recorded within Konagaderra Reserve during the current survey program. Two additional mammal species, Eastern Bent-wing Bat and Large-footed Myotis, were possibly detected by Anabat bat call detectors deployed at the reserve, however further detailed call analysis would be required in order to confirm these uncertain records (refer to section 2.4.2 for further information). These unconfirmed records are therefore not discussed any further within this section.

Of the fauna species recorded during the current survey at Konagaderra Reserve, at least 20 are new records for the reserve. Anabat bat call detectors identified a total of five additional microbat species for the reserve, with only two microbat species (Large Forest Bat and Southern Forest Bat *Vespadelus regulus*) having previously been recorded. Remote cameras also detected mammals not previously recorded, including Common Wombat *Vombatus ursinus* (Plate 19) and the introduced Red Fox.

Plate 19: Common Wombat recorded on remote camera at Konagaderra Reserve

There were no previous database records for any reptile species within the reserve, therefore the single species detected during the current survey, Garden Skink, is a new record for the reserve.

Of the four frog species recorded during the current survey, Southern Bullfrog *Limnodynastes dumerilii* and Verreaux's Tree Frog had not previously been recorded. Bird species recorded during the current survey represent a typical suite of bird species common to the local area, and most species observed during the current survey had been previously recorded from the reserve.

Of the 26 bird species recorded, only five did not appear in previous database records for the reserve (Brown Falcon *Falco berigora*, Southern Boobook, Horsfield's Bronze-Cuckoo *Chalcites basalis*, Rufous Whistler and Noisy Miner *Manorina melanocephala*).

The aquatic survey contributed four new fish records for the reserve including one native species (Flat-headed Gudgeon) and three exotic species (Redfin, Gambusia and Oriental Weatherloach).

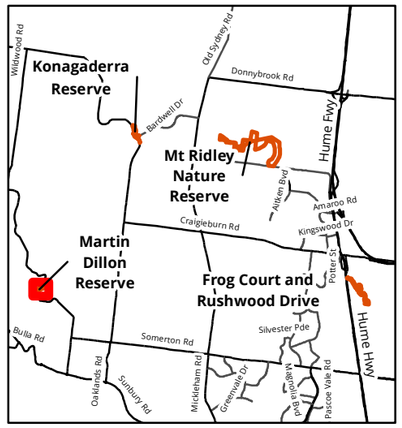
Harp trapping and active searching did not yield any new results for Konagaderra Reserve.

6.2.3 Significant and notable fauna

No significant fauna species were recorded during the current survey, and no significant fauna species appear in database records from within 500 m of the reserve. The closest existing records of significant species, according to the DEPI Biodiversity Interactive Map (DEPI 2014), include:

- A large number of recent (2008) **Golden Sun Moth** records located on private land approximately 3 km east of the reserve. This species is considered unlikely to be present within the reserve due to the lack of grassland habitat containing known larval food plants.
- Two **Growling Grass Frog** records located approximately 3 km upstream (year unknown) and 5 km downstream (1988). This species is known to occur within other sections of Deep Creek, and while individuals may occasionally move through the reserve as part of broader movements in the landscape, results of the current survey indicate that the species is unlikely to be resident or breeding within Konagaderra Reserve.
- One record of **Southern Toadlet *Pseudophryne semimarmorata***, based on a museum specimen collected at least 1.5km north-west of the reserve in 1960. There are very few recent records of this species from the broader area, and given the disturbed nature of the riparian understorey, it is considered unlikely to be present within Konagaderra reserve.
- One record of **Brown Toadlet**, also based on a museum specimen, which was collected at least 3 km east of the reserve in 1962. There are very few recent records of this species from the broader area, and given the disturbed nature of the riparian understorey, it is considered unlikely to be present within Konagaderra reserve.

While not recorded during the present survey, two Platypus have been sighted from the Konagaderra Road Bridge in 2010 (CESAR Platypus Online database, accessed February 2014). Platypus have also been recorded consistently in the vicinity of Bulla and upstream at Darraweit Guim between 2008 and 2013 (Serena and Williams 2008, Hume City Council 2013, Josh Griffiths, CESAR, pers. comm.). Platypus are therefore presumed to be transient at this site as dispersing juveniles if not as resident adults in any areas of suitable habitat (i.e. deep, permanent pools) within the reserve.



Legend

Study Area

Figure 6: Significant fauna species recorded, Konagaderra Reserve, Hume City Council, Victoria

0 40 80 120 160 200

Metres

Scale: 1:4,000 @ A3

Coordinate System: GDA 1994 MGA Zone 55

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7. Recommendations for further survey

7.1 Fauna survey techniques

The current survey utilised a wide range of fauna survey techniques in order to record a combined total of 108 indigenous vertebrate fauna species (74 birds, 18 mammals, five reptiles, eight frogs and three fishes) and 14 introduced fauna species (seven birds, four mammals and three fish) across all four reserves. The results from the current survey indicate that fauna survey techniques varied substantially in the diversity of species detected. While this is largely to do with the difference in diversity of different fauna groups (i.e. bird species diversity is typically far higher than mammal species diversity), the results from the current survey provide an opportunity to assess the efficacy of the fauna survey techniques used in order to refine the approach for any future fauna survey programs undertaken by Hume City Council. A focus on more cost-effective survey techniques, such as remote cameras and Anabat bat call detectors, would potentially allow Hume City Council to expand survey effort to cover a greater area or survey additional reserves.

Based on the results from the current survey, we recommend the following for any future fauna survey programs within the City of Hume:

- Continue to utilise Anabat bat call detectors to survey local microbats rather than using harp traps, which resulted in very poor capture rates and did not detect any additional species that were not detected by the Anabat detectors. Targeted harp trapping may still be useful if confirmation of species recorded on Anabat detectors is required.
- Consider a combination of reptile survey techniques to increase detection rates, including tile transects or grids, active searching and the use of funnel traps positioned along drift fences. Funnel traps were not utilised during the current survey, but given the low numbers of reptiles detected their use would have almost certainly increased capture rates and the number of species detected. While more intensive than tile surveys and active searching, funnel traps are still more cost-effective than other reptile survey techniques such as pitfall trapping.
- Utilise remote cameras for mammal survey as they are a cost-effective technique and sufficient for the purpose of recording mammal species within the City of Hume. Intensive and costly targeted trapping for small ground-dwelling mammals is not recommended for the local area. Hair tubes should also be avoided due to the risk of non-target reptile by-catch.

7.2 Targeted survey for significant fauna

All reserves have been identified as supporting potential habitat for a number of threatened species. In order for Hume City Council to gain a greater understanding of the presence and status of significant fauna populations within the wider municipality, it is recommended that strategic landscape-level targeted surveys be undertaken for a number of threatened species that are either known to occur within the broader local area or for which suitable habitat is present. Survey for threatened species should focus on areas that provide high quality habitat and areas that have had little to no previous targeted survey effort.

7.3 Further fauna survey within the municipality

A significant population of Yarra Pygmy Perch exists in the Deep Creek catchment in the vicinity of Lancefield in the adjoining Macedon Ranges shire. Suitable habitat exists for this species within the Konagaderra and

Martin Dillon Reserves. This species has not been recorded within the Hume City Council municipality in Deep Creek. Opportunities to survey for this species in suitable habitat on private land within the municipality should be encouraged as very little aquatic survey has been conducted. Further survey effort upstream of the Konagaderra Reserve within the municipal boundary will help to determine the likely presence of this species.

The current fauna survey program, combined with the previous fauna survey program undertaken in 2012, has resulted in detailed fauna surveys being undertaken at eight priority reserves within the City of Hume, which now meets the fauna survey target identified in the Natural Heritage Strategy (Hume 2012a). However, the number of reserves managed by Hume City Council is in the order of 90 which means that to-date only 10% of all council-managed reserves have been surveyed.

Surveying a greater number of reserves using methods that are cost-effective over the long-term will enable Hume City Council to gain a greater understanding of fauna within the municipality. This in turn may lead to priority areas being identified which would benefit from particular protection and/or management strategies. Devising a list of all reserves within the City of Hume and a rating system for prioritising survey is recommended.

In keeping with the aims of the Natural Heritage Strategy (Hume City Council 2012a), survey effort could also be expanded to include private land where permission to access properties is granted. Survey should focus initially on those properties identified with the greatest potential to support habitat for native fauna (based on aerial photos and VBA information), particularly significant species, and those most likely to contribute to landscape connectivity that may benefit from collaborative management.

7.4 Community engagement and fauna monitoring opportunities

An opportunity exists for Hume City Council to establish and support community fauna monitoring programs at a number of key sites, including the four reserves surveyed during the current program. Community involvement in monitoring will assist Hume City Council in 'raising community awareness about native fauna', one of the key objectives within the Natural Heritage Strategy (Hume City Council 2012a).

Surveys most suited to community members are those that do not require handling or disturbance to native fauna species and, provided appropriate training, support and supervision is required, do not require a specialist skill set (e.g. bird surveys). These include:

- Remote camera surveys for mammals on private land (if permitted) and in reserves. Community members would get the opportunity to deploy and retrieve cameras and go through photographs.
- Nocturnal surveys for frog species. Frog Court wetlands and Deep Creek at Martin Dillon would be potential candidates for on-going monitoring. No specialist equipment is required for survey, as long as appropriate training, support and quality assurance is provided. It is recommended that Hume City Council undertake a strategic municipality-wide approach to identify priority frog monitoring locations.
- Participation in the Melbourne Water Frog Census, a community-based monitoring program which aims to inform management of frog populations in Melbourne and raise awareness of waterway health issues. Refer to http://frogs.melbournewater.com.au/

The recording of Platypus sightings through the Platypus Online database administered by CESAR may be best promoted through community groups associated with each reserve. Consultation with CESAR will help to consolidate knowledge of distribution of Platypus within the reserve systems for the benefit of community groups, Melbourne Water and ultimately Hume City Council.

The Victorian National Parks Association (VNPA) run a series of community monitoring events as part of their grasslands threatened fauna project under the NatureWatch program. NatureWatch are monitoring Golden Sun Moth, Striped Legless Lizard and Growling Grass Frog at sites within the City of Whittlesea. They may consider expanding their program to include a site/s in the City of Hume or residents at Hume may be keen to join into monitoring at those sites outside the municipality to gain skills they can apply to monitoring within the City of Hume. Refer to link: http://vnpa.org.au/page/volunteer/naturewatch/grasslands-threatened-species-project

Community involvement in fauna survey also provides an opportunity to gather long-term datasets for a number of sites, which enables long-term changes in fauna species populations to be identified.

Community fauna records

Community members should be encouraged to continue to report incidental fauna sightings to Hume City Council in order for them to be included in the Hume Fauna Sightings Database.

Hume City Council should amend their current database to ensure that data fields are consistent with those that are required for submission to the VBA. This will ensure that the Hume Fauna Sightings Database can be submitted directly to the VBA without any delays or potential loss of data associated with incorrect or missing fields.

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Appendices

Appendix 1: Fauna database records

Notes to tables:

EPBC Act: EX - Extinct CR - Critically Endangered EN - Endangered VU - Vulnerable CD - Conservation dependent PMST – Protected Matters Search Tool	**DSE 2013:** ex - extinct cr - critically endangered en - endangered vu - vulnerable nt - near threatened dd - data deficient rx - regionally extinct
* - introduced species ** - pest species listed under the CaLP Act	**FFG Act:** L - listed as threatened under FFG Act N - nominated for listing as threatened I - determined ineligible for listing

Fauna species in these tables are listed in taxonomic order.

A1.1 Fauna database records for Mt Ridley Reserve

Table A1.1. Fauna database records for Mt Ridley Reserve

Scientific name	Common name	Status	Most recent database record	Number of database records	Recorded in current survey?
Birds					
Dromaius novaehollandiae	Emu	nt	2003	2	
Coturnix pectoralis	Stubble Quail		1989	1	
Pedionomus torquatus	Plains-wanderer	VU L cr	1989	1	
Ocyphaps lophotes	Crested Pigeon			1	X
Porphyrio porphyrio	Purple Swamphen			2	X
Fulica atra	Eurasian Coot			1	X
Tachybaptus novaehollandiae	Australasian Grebe		1989	3	
Phalacrocorax carbo	Great Cormorant		1989	2	
Phalacrocorax sulcirostris	Little Black Cormorant		1988	2	X
Microcarbo melanoleucos	Little Pied Cormorant		1989	3	X
Erythrogonys cinctus	Red-kneed Dotterel		1989	1	
Vanellus miles	Masked Lapwing		1989	4	X
Elseyornis melanops	Black-fronted Dotterel		1989	2	
Threskiornis molucca	Australian White Ibis		2004	4	X
Threskiornis spinicollis	Straw-necked Ibis		1989	2	
Platalea regia	Royal Spoonbill	nt	1989	1	
Platalea flavipes	Yellow-billed Spoonbill		2003	4	X
Ardea modesta	Eastern Great Egret	L vu Mi		1	

Scientific name	Common name	Status	Most recent database record	Number of database records	Recorded in current survey?
Egretta novaehollandiae	White-faced Heron		2002	5	X
Nycticorax caledonicus hillii	Nankeen Night Heron	nt	2002	1	
Chenonetta jubata	Australian Wood Duck		2003	5	X
Cygnus atratus	Black Swan		1989	2	
Tadorna tadornoides	Australian Shelduck		2003	3	
Anas superciliosa	Pacific Black Duck		1989	6	X
Anas gracilis	Grey Teal		1989	4	X
Malacorhynchus membranaceus	Pink-eared Duck		1989	1	X
Aythya australis	Hardhead	vu	1989	1	
Circus assimilis	Spotted Harrier	nt	1989	1	
Accipiter fasciatus	Brown Goshawk		1990	3	
Aquila audax	Wedge-tailed Eagle		2002	5	
Haliastur sphenurus	Whistling Kite		2002	1	
Elanus axillaris	Black-shouldered Kite		2004	7	
Falco longipennis	Australian Hobby		1989	2	
Falco peregrinus	Peregrine Falcon		1990	2	
Falco subniger	Black Falcon	vu	1989	1	
Falco berigora	Brown Falcon		2002	8	
Falco cenchroides	Nankeen Kestrel		2004	6	X
Ninox novaeseelandiae	Southern Boobook		1989	2	X
Tyto javanica	Pacific Barn Owl		1990	2	X
Trichoglossus haematodus	Rainbow Lorikeet			3	X

Scientific name	Common name	Status	Most recent database record	Number of database records	Recorded in current survey?
Glossopsitta porphyrocephala	Purple-crowned Lorikeet		1989	1	X
Glossopsitta pusilla	Little Lorikeet		1989	1	
Cacatua galerita	Sulphur-crested Cockatoo		1990	5	X
Cacatua sanguinea	Little Corella		1989	2	X
Cacatua tenuirostris	Long-billed Corella		1990	5	X
Eolophus roseicapillus	Galah		2003	6	X
Platycercus elegans	Crimson Rosella		1990	1	X
Platycercus eximius	Eastern Rosella		1990	6	X
Psephotus haematonotus	Red-rumped Parrot		1990	6	X
Lathamus discolor	Swift Parrot	EN L en	1990	1	
Podargus strigoides	Tawny Frogmouth		1989	1	X
Dacelo novaeguineae	Laughing Kookaburra		2003	3	X
Cacomantis pallidus	Pallid Cuckoo			1	
Chalcites basalis	Horsfield's Bronze-Cuckoo		1989	2	X
Hirundo neoxena	Welcome Swallow		2002	5	X
Petrochelidon nigricans	Tree Martin		1989	5	X
Rhipidura albiscapa	Grey Fantail			4	X
Rhipidura leucophrys	Willie Wagtail		1990	5	X
Microeca fascinans	Jacky Winter		1990	1	
Petroica boodang	Scarlet Robin		1990	1	
Petroica phoenicea	Flame Robin		1990	3	X
Melanodryas cucullata cucullata	Hooded Robin	L nt	1990	1	

Scientific name	Common name	Status	Most recent database record	Number of database records	Recorded in current survey?
Pachycephala pectoralis	Golden Whistler		1990	2	
Pachycephala rufiventris	Rufous Whistler			1	
Colluricincla harmonica	Grey Shrike-thrush		1990	1	
Grallina cyanoleuca	Magpie-lark		1989	4	X
Falcunculus frontatus	Crested Shrike-tit		1990	1	
Coracina novaehollandiae	Black-faced Cuckoo-shrike		1989	3	X
Epthianura albifrons	White-fronted Chat		1989	2	
Acanthiza chrysorrhoa	Yellow-rumped Thornbill		1989	3	X
Calamanthus fuliginosus	Striated Fieldwren		1989	1	
Cincloramphus cruralis	Brown Songlark		1989	1	
Cincloramphus mathewsi	Rufous Songlark			1	X
Megalurus gramineus	Little Grassbird			1	X
Cisticola exilis	Golden-headed Cisticola		1989	3	X
Malurus cyaneus	Superb Fairy-wren			3	X
Artamus superciliosus	White-browed Woodswallow			1	
Artamus cyanopterus	Dusky Woodswallow		1989	1	
Daphoenositta chrysoptera	Varied Sittella		1990	1	
Pardalotus punctatus	Spotted Pardalote		1990	1	
Lichenostomus penicillatus	White-plumed Honeyeater		1990	8	X
Phylidonyris novaehollandiae	New Holland Honeyeater			1	
Manorina melanocephala	Noisy Miner		1989	3	X
Anthochaera carunculata	Red Wattlebird		1989	5	X

Scientific name	Common name	Status	Most recent database record	Number of database records	Recorded in current survey?
Acanthagenys rufogularis	Spiny-cheeked Honeyeater			1	
Anthus novaeseelandiae	Australasian Pipit		1989	3	
Mirafra javanica	Horsfield's Bushlark		1989	2	
Oriolus sagittatus	Olive-backed Oriole		1989	1	X
Strepera versicolor	Grey Currawong		1990	1	
Cracticus tibicen	Australian Magpie		1990	6	X
Corvus coronoides	Australian Raven		1990	1	
Corvus mellori	Little Raven		1990	8	X
Columba livia	Rock Dove	*		2	
Pardalotus striatus	Striated Pardalote		1989	5	X
Ardea ibis	Cattle Egret	Mi	1990	1	
Turdus merula	Common Blackbird	*		1	X
Alauda arvensis	European Skylark	*	1989	4	X
Passer montanus	Eurasian Tree Sparrow	*	1990	1	
Passer domesticus	House Sparrow	*	1988	4	
Carduelis carduelis	European Goldfinch	*	1989	3	X
Sturnus tristis	Common Myna	*	1989	5	X
Sturnus vulgaris	Common Starling	*	1990	7	X
Mammals					
Tachyglossus aculeatus	Short-beaked Echidna		1989	1	X
Sminthopsis crassicaudata	Fat-tailed Dunnart	nt	1989	1	
Trichosurus vulpecula	Common Brushtail Possum		1989	2	X

Scientific name	Common name	Status	Most recent database record	Number of database records	Recorded in current survey?
Macropus giganteus	Eastern Grey Kangaroo		2004	5	X
Tadarida australis	White-striped Freetail Bat		1989	1	X
Nyctophilus geoffroyi	Lesser Long-eared Bat		1989	2	
Chalinolobus gouldii	Gould's Wattled Bat		1989	1	X
Chalinolobus morio	Chocolate Wattled Bat		1989	1	X
Vespadelus regulus	Southern Forest Bat		1989	1	X
Vespadelus vulturnus	Little Forest Bat		1989	1	X
Vespadelus darlingtoni	Large Forest Bat		1989	1	X
Mormopterus sp. 4	Southern Freetail Bat		1989	1	X
Mus musculus	House Mouse	*	1988	1	
Oryctolagus cuniculus	European Rabbit	**	1988	1	X
Lepus europeaus	European Hare	**	1989	1	X
Vulpes vulpes	Red Fox	**	1989	1	X
Reptiles					
Ctenotus robustus	Large Striped Skink		1989	1	
Tiliqua scincoides	Common Blue-tongued Lizard		2003	4	
Notechis scutatus	Tiger Snake		1989	1	
Acritoscincus duperreyi	Eastern Three-lined Skink		1989	1	
Pseudechis porphyriacus	Red-bellied Black Snake		1989	2	
Pseudonaja textilis	Eastern Brown Snake		1989	1	
Parasuta flagellum	Little Whip Snake		1989	1	
Pseudemoia pagenstecheri	Tussock Skink	vu	1989	2	X

Scientific name	Common name	Status	Most recent database record	Number of database records	Recorded in current survey?
Austrelaps superbus	Lowland Copperhead		1989	2	
Frogs					
Limnodynastes dumerilii	Southern Bullfrog		1988	1	X
Limnodynastes peronii	Striped Marsh Frog		1988	1	
Neobatrachus sudelli	Common Spadefoot Toad		1990	3	
Pseudophryne bibronii	Brown Toadlet	L en	1990	1	
Crinia parinsignifera	Plains Froglet		1988	1	
Crinia signifera	Common Froglet		2001	6	X
Litoria peronii	Peron's Tree Frog		1988	1	
Litoria raniformis	Growling Grass Frog	VU L en	1989	1	
Litoria ewingii	Southern Brown Tree Frog		1989	1	
Litoria verreauxii verreauxii	Verreaux's Tree Frog		1989	2	X
Limnodynastes tasmaniensis	Spotted Marsh Frog		1990	4	X
Invertebrates					
Synemon plana	Golden Sun Moth	CR L cr	2008	4	

A1.2 Fauna database records for Frog Court and Rushwood Drive Reserve

Table A1.2. Fauna database records for Frog Court and Rushwood Drive Reserve

Scientific name	Common name	Status	Most recent database record	Number of database records	Recorded in current survey?
Birds					
Coturnix pectoralis	Stubble Quail		1991	1	X
Turnix pyrrhothorax	Red-chested Button-quail	L vu	1991	1	
Ocyphaps lophotes	Crested Pigeon		2002	3	
Gallinula tenebrosa	Dusky Moorhen		2008	1	X
Tachybaptus novaehollandiae	Australasian Grebe		2009	3	X
Microcarbo melanoleucos	Little Pied Cormorant		1992	1	
Vanellus miles	Masked Lapwing			1	
Threskiornis molucca	Australian White Ibis		1988	1	
Platalea flavipes	Yellow-billed Spoonbill		1992	1	
Egretta novaehollandiae	White-faced Heron		1988	1	
Ardea pacifica	White-necked Heron		1992	1	
Chenonetta jubata	Australian Wood Duck		2005	1	X
Anas superciliosa	Pacific Black Duck		1991	2	X
Accipiter fasciatus	Brown Goshawk		1988	1	
Aquila audax	Wedge-tailed Eagle		2002	1	
Hieraaetus morphnoides	Little Eagle		2005	1	
Elanus axillaris	Black-shouldered Kite		2002	3	
Falco berigora	Brown Falcon		2002	5	X

Scientific name	Common name	Status	Most recent database record	Number of database records	Recorded in current survey?
Falco cenchroides	Nankeen Kestrel		2003	2	
Ninox novaeseelandiae	Southern Boobook		1988	1	
Trichoglossus haematodus	Rainbow Lorikeet			1	
Glossopsitta concinna	Musk Lorikeet			1	
Glossopsitta pusilla	Little Lorikeet		1992	1	
Cacatua tenuirostris	Long-billed Corella			1	
Eolophus roseicapilla	Galah		1988	1	
Platycercus eximius	Eastern Rosella		1992	2	
Chalcites osculans	Black-eared Cuckoo	nt		1	
Hirundo neoxena	Welcome Swallow		1988	2	X
Rhipidura albiscapa	Grey Fantail		2005	2	X
Rhipidura leucophrys	Willie Wagtail		2005	3	X
Colluricincla harmonica	Grey Shrike-thrush		1988	1	
Grallina cyanoleuca	Magpie-lark		1988	3	X
Epthianura albifrons	White-fronted Chat		1991	2	
Acanthiza nana	Yellow Thornbill		1988	1	
Acanthiza pusilla	Brown Thornbill		2005	2	X
Acanthiza chrysorrhoa	Yellow-rumped Thornbill		1991	3	X
Sericornis frontalis	White-browed Scrubwren		2005	2	X
Cincloramphus cruralis	Brown Songlark		1991	2	
Cincloramphus mathewsi	Rufous Songlark		2002	1	
Cisticola exilis	Golden-headed Cisticola		2005	2	X

Scientific name	Common name	Status	Most recent database record	Number of database records	Recorded in current survey?
Malurus cyaneus	Superb Fairy-wren		2005	5	X
Zosterops lateralis	Silvereye		2005	2	X
Lichenostomus virescens	Singing Honeyeater		1995	2	
Lichenostomus penicillatus	White-plumed Honeyeater		2005	3	X
Anthochaera carunculata	Red Wattlebird			2	
Acanthagenys rufogularis	Spiny-cheeked Honeyeater		1992	1	
Anthus novaeseelandiae	Australasian Pipit		1991	1	
Mirafra javanica	Horsfield's Bushlark		1991	1	
Pardalotus striatus	Striated Pardalote		1988	1	
Taeniopygia guttata	Zebra Finch		1992	1	
Neochmia temporalis	Red-browed Finch		2005	4	X
Cracticus tibicen	Australian Magpie		2005	4	X
Corvus coronoides	Australian Raven		2005	1	X
Corvus mellori	Little Raven		2005	4	X
Columba livia	Rock Dove	*	2005	1	
Streptopelia chinensis	Spotted Turtle-dove	*		2	X
Turdus merula	Common Blackbird	*	2005	3	X
Alauda arvensis	European Skylark	*	1991	1	
Passer montanus	Tree Sparrow	*		1	
Passer domesticus	House Sparrow	*	2005	4	X
Carduelis carduelis	European Goldfinch	*	2005	4	X
Carduelis chloris	European Greenfinch	*	1988	1	X

Scientific name	Common name	Status	Most recent database record	Number of database records	Recorded in current survey?
Sturnus tristis	Common Myna	*	2005	3	X
Sturnus vulgaris	Common Starling	*	2005	5	X
Mammals					
Tachyglossus aculeatus	Short-beaked Echidna		2008	2	
Wallabia bicolor	Black Wallaby		2008	3	X
Macropus giganteus	Eastern Grey Kangaroo		2005	1	X
Hydromys chrysogaster	Water Rat		1988	1	X
Rattus rattus	Black Rat	*	1988	1	X
Mus musculus	House Mouse	*	2005	2	
Oryctolagus cuniculus	European Rabbit	**	2008	3	X
Lepus europeaus	European Hare	**	1991	1	
Vulpes vulpes	Red Fox	**	2009	6	X
Reptiles					
Christinus marmoratus	Marbled Gecko		1988	1	
Ctenotus robustus	Large Striped Skink		2002	2	
Egernia cunninghami	Cunningham's Skink		2000	1	X
Lampropholis guichenoti	Garden Skink		2008	1	X
Lerista bougainvillii	Bougainville's Skink		2002	5	
Tiliqua scincoides	Common Blue-tongued Lizard		2002	3	
Notechis scutatus	Tiger Snake		1988	1	
Acritoscincus duperreyi	Eastern Three-lined Skink		1988	1	
Pseudonaja textilis	Eastern Brown Snake		1991	1	

Scientific name	Common name	Status	Most recent database record	Number of database records	Recorded in current survey?
Parasuta flagellum	Little Whip Snake		2002	5	
Pseudemoia pagenstecheri	Tussock Skink	vu	1988	1	X
Austrelaps superbus	Lowland Copperhead		1925	1	
Eulamprus tympanum tympanum	Southern Water Skink		2008	3	
Frogs					
Limnodynastes dumerilii	Southern Bullfrog		2005	2	X
Limnodynastes tasmaniensis	Spotted Marsh Frog		2008	4	X
Crinia signifera	Common Froglet		2008	8	X
Litoria ewingii	Southern Brown Tree Frog		2005	2	
Litoria raniformis	Growling Grass Frog	VU L en	2009	13	X
Fishes					
Anguilla australis	Short-finned Eel		2001	1	
Gambusia holbrooki	Eastern Gambusia	*	2001	1	
Invertebrates					
Cherax destructor destructor	Common Yabby	dd	2001	1	

A1.3 Fauna database records for Martin Dillon Reserve

Table A1.3. Fauna database records for Martin Dillon Reserve

Scientific name	Common name	Status	Most recent database record	Number of database records	Recorded in current survey?
Birds					
Aquila audax	Wedge-tailed Eagle		2004	4	X
Haliastur sphenurus	Whistling Kite		2003	1	
Falco berigora	Brown Falcon		1990	1	X
Cacatua galerita	Sulphur-crested Cockatoo		1990	1	X
Eolophus roseicapillus	Galah		1990	1	X
Platycercus eximius	Eastern Rosella		1990	1	X
Psephotus haematonotus	Red-rumped Parrot		1990	1	X
Dacelo novaeguineae	Laughing Kookaburra		1990	1	X
Todiramphus sanctus	Sacred Kingfisher		1990	1	X
Cuculus pallidus	Pallid Cuckoo		1990	1	
Hirundo neoxena	Welcome Swallow		1990	1	X
Petrochelidon nigricans	Tree Martin		1990	1	
Rhipidura albiscarpa	Grey Fantail		1990	1	
Rhipidura leucophrys	Willie Wagtail		1990	1	X
Petroica phoenicea	Flame Robin		2003	1	
Grallina cyanoleuca	Magpie-lark		1990	1	X
Acanthiza lineata	Striated Thornbill		1990	1	
Acanthiza nana	Yellow Thornbill		1990	1	

Scientific name	Common name	Status	Most recent database record	Number of database records	Recorded in current survey?
Acanthiza chrysorrhoa	Yellow-rumped Thornbill		1990	1	
Megalurus gramineus	Little Grassbird		1990	1	
Acrocephalus stentoreus	Clamorous Reed Warbler	Mi	1990	1	
Cisticola exilis	Golden-headed Cisticola		1990	1	
Malurus cyaneus	Superb Fairy-wren		1990	1	X
Artamus cyanopterus	Dusky Woodswallow		1990	1	X
Daphoenositta chrysoptera	Varied Sittella		1990	1	
Lichenostomus penicillatus	White-plumed Honeyeater		1990	1	X
Oriolus sagittatus	Olive-backed Oriole		1990	1	
Strepera versicolor	Grey Currawong		1990	1	
Cracticus tibicen	Australian Magpie		1990	1	X
Corvus mellori	Little Raven		1990	1	X
Pardalotus striatus	Striated Pardalote		1990	1	X
Passer montanus	Tree Sparrow	*	1990	1	
Passer domesticus	House Sparrow	*	1990	1	X
Acridotheres tristis	Common Myna	*	1990	1	
Sturnus vulgaris	Common Starling	*	1990	1	X
Mammals					
Ornithorhynchus anatinus	Platypus		1988	1	
Reptiles					
Egernia cunninghami	Cunningham's Skink		2002	1	
Lampropholis guichenoti	Garden Skink		1988	1	X

Scientific name	Common name	Status	Most recent database record	Number of database records	Recorded in current survey?
Eulamprus tympanum tympanum	Southern Water Skink		1988	1	
Frogs					
Limnodynastes dumerilii	Southern Bullfrog		2003	1	X
Crinia signifera	Common Froglet		1988	1	X
Litoria lesueuri	Lesueur's Frog		1988	1	X
Litoria raniformis	Growling Grass Frog	VU L en	2003	3	X
Fishes					
Anguilla australis	Short-finned Eel		1989	4	X
Salmo trutta	Brown Trout	*	1989	4	
Retropinna semoni	Australian Smelt		2005	5	
Galaxias maculatus	Common Galaxias		2005	3	X
Galaxias olidus	Mountain Galaxias		2005	1	
Carassius auratus	Goldfish	*	1989	1	
Cyprinus carpio	Carp	*	1981	3	
Misgurnus anguillicaudatus	Oriental Weatherloach	*	2005	1	
Nannoperca australis	Southern Pygmy Perch		2005	2	
Perca fluviatilis	Redfin	*	2005	1	X
Philypnodon grandiceps	Flat-headed Gudgeon		2005	5	X
Invertebrates					
Paratya australiensis	Freshwater Shrimp		2005	3	

A1.4 Fauna database records for Konagaderra Reserve

Table A1.4. Fauna database records for Konagaderra Reserve

Scientific name	Common name	Status	Most recent database record	Number of database records	Current survey?
Birds					
Microcarbo melanoleucos	Little Pied Cormorant		1989	1	
Vanellus miles	Masked Lapwing		1987	1	
Anas superciliosa	Pacific Black Duck		1989	1	
Accipiter fasciatus	Brown Goshawk		1988	2	
Aquila audax	Wedge-tailed Eagle		1988	1	
Falco cenchroides	Nankeen Kestrel		1987	1	
Cacatua galerita	Sulphur-crested Cockatoo		1988	1	X
Eolophus roseicapillus	Galah		1989	4	X
Platycercus elegans	Crimson Rosella			3	
Platycercus eximius	Eastern Rosella		2000	4	
Psephotus haematonotus	Red-rumped Parrot		1989	3	
Dacelo novaeguineae	Laughing Kookaburra		2002	3	
Todiramphus sanctus	Sacred Kingfisher		1987	1	
Hirundo neoxena	Welcome Swallow		1987	4	X
Petrochelidon nigricans	Tree Martin		1987	1	X
Petrochelidon ariel	Fairy Martin			1	
Rhipidura albiscapa	Grey Fantail		1988	2	X
Rhipidura leucophrys	Willie Wagtail		2002	4	X

Scientific name	Common name	Status	Most recent database record	Number of database records	Current survey?
Myiagra inquieta	Restless Flycatcher		1988	2	
Eopsaltria australis	Eastern Yellow Robin		2002	2	X
Pachycephala pectoralis	Golden Whistler			1	
Colluricincla harmonica	Grey Shrike-thrush		2000	4	X
Grallina cyanoleuca	Magpie-lark		1988	3	X
Falcunculus frontatus	Crested Shrike-tit			1	X
Coracina novaehollandiae	Black-faced Cuckoo-shrike		1987	1	X
Acanthiza nana	Yellow Thornbill		1987	1	
Acanthiza pusilla	Brown Thornbill		1989	4	X
Acanthiza chrysorrhoa	Yellow-rumped Thornbill		2000	5	X
Sericornis frontalis	White-browed Scrubwren		2000	5	X
Cincloramphus mathewsi	Rufous Songlark		1987	1	
Cisticola exilis	Golden-headed Cisticola		1988	1	
Malurus cyaneus	Superb Fairy-wren		2000	4	X
Artamus cyanopterus	Dusky Woodswallow		1987	1	
Pardalotus punctatus	Spotted Pardalote		1987	2	
Zosterops lateralis	Silvereye		1988	1	
Lichenostomus penicillatus	White-plumed Honeyeater		1989	7	X
Anthochaera carunculata	Red Wattlebird		2000	6	X
Anthus novaeseelandiae	Australasian Pipit		1987	1	
Neochmia temporalis	Red-browed Finch		1988	1	
Strepera graculina	Pied Currawong		1988	1	

Scientific name	Common name	Status	Most recent database record	Number of database records	Current survey?
Cracticus tibicen	Australian Magpie		2000	9	X
Corvus mellori	Little Raven		1989	6	X
Pardalotus striatus	Striated Pardalote		1988	3	X
Turdus merula	Common Blackbird	*		1	X
Passer montanus	Eurasian Tree Sparrow	*	1987	1	
Passer domesticus	House Sparrow	*	1988	2	
Carduelis carduelis	European Goldfinch	*	1988	3	
Chloris chloris	Common Greenfinch	*		1	
Sturnus vulgaris	Common Starling	*	1988	1	
Mammals					
Trichosurus vulpecula	Common Brushtail Possum		2002	3	X
Pseudocheirus peregrinus	Common Ringtail Possum		1988	1	X
Wallabia bicolor	Black Wallaby		2003	2	X
Chalinolobus gouldii	Gould's Wattled Bat		1989	1	X
Chalinolobus morio	Chocolate Wattled Bat		1989	1	X
Vespadelus regulus	Southern Forest Bat		1989	1	X
Vespadelus darlingtoni	Large Forest Bat		1989	1	X
Rattus rattus	Black Rat	*	1988	1	X
Mus musculus	House Mouse	*	1988	1	
Oryctolagus cuniculus	European Rabbit	**	1988	1	X
Reptiles					
Eulamprus tympanum tympanum	Southern Water Skink		1988	1	

Scientific name	Common name	Status	Most recent database record	Number of database records	Current survey?
Frogs					
Crinia signifera	Common Froglet		1988	1	**X**
Litoria ewingii	Southern Brown Tree Frog		1988	1	**X**
Fishes					
Anguilla australis	Short-finned Eel		2005	3	**X**
Salmo trutta	Brown Trout	*	1968	1	
Retropinna semoni	Australian Smelt		2005	1	
Galaxias maculatus	Common Galaxias		2005	1	
Galaxias olidus	Mountain Galaxias		2005	1	
Cyprinus carpio	Carp	*	1968	1	
Nannoperca australis	Southern Pygmy Perch		2005	1	
Invertebrates					
Paratya australiensis	Freshwater Shrimp		2005	2	

Appendix 2: Fauna species recorded

Notes to tables:

EPBC Act: EX - Extinct CR - Critically Endangered EN - Endangered VU - Vulnerable CD - Conservation dependent PMST – Protected Matters Search Tool	**DSE 2013:** ex - extinct cr - critically endangered en - endangered vu - vulnerable nt - near threatened dd - data deficient rx - regionally extinct
* - introduced species ** - pest species listed under the CaLP Act	**FFG Act:** L - listed as threatened under FFG Act N - nominated for listing as threatened I - determined ineligible for listing

Fauna species in these tables are listed in taxonomic order.

A2.1 Fauna species recorded and survey methods used, Mt Ridley Reserve

Table A2.1. Fauna species recorded and survey methods used, Mt Ridley Reserve.

Common name	Scientific name	Status	Survey method used									
			Anabat	Box trap	Bird survey	Camera - arboreal	Camera - terrestrial	Fyke net	Harp trap	Nocturnal	Incidental	Tile transect
Birds												
Crested Pigeon	*Ocyphaps lophotes*				X						X	
Dusky Moorhen	*Gallinula tenebrosa*										X	
Purple Swamphen	*Porphyrio porphyrio*				X							
Eurasian Coot	*Fulica atra*				X							
Little Black Cormorant	*Phalacrocorax sulcirostris*				X							
Little Pied Cormorant	*Microcarbo melanoleucos*				X							
Masked Lapwing	*Vanellus miles*				X						X	
Australian White Ibis	*Threskiornis molucca*										X	
Yellow-billed Spoonbill	*Platalea flavipes*				X						X	
White-faced Heron	*Egretta novaehollandiae*				X						X	
Australian Wood Duck	*Chenonetta jubata*				X						X	
Pacific Black Duck	*Anas superciliosa*				X	X						
Chestnut Teal	*Anas castanea*										X	
Grey Teal	*Anas gracilis*				X							
Pink-eared Duck	*Malacorhynchus membranaceus*				X							

Common name	Scientific name	Status	Survey method used									
			Anabat	Box trap	Bird survey	Camera - arboreal	Camera - terrestrial	Fyke net	Harp trap	Nocturnal	Incidental	Tile transect
Nankeen Kestrel	*Falco cenchroides*				X							
Southern Boobook	*Ninox novaeseelandiae*									X	X	
Pacific Barn Owl	*Tyto javanica*									X		
Rainbow Lorikeet	*Trichoglossus haematodus*				X							
Purple-crowned Lorikeet	*Glossopsitta porphyrocephala*										X	
Sulphur-crested Cockatoo	*Cacatua galerita*				X					X		
Little Corella	*Cacatua sanguinea*				X							
Long-billed Corella	*Cacatua tenuirostris*				X						X	
Galah	*Eolophus roseicapillus*				X						X	
Crimson Rosella	*Platycercus elegans*				X							
Eastern Rosella	*Platycercus eximius*				X							
Red-rumped Parrot	*Psephotus haematonotus*				X							
Tawny Frogmouth	*Podargus strigoides*									X		
Australian Owlet-nightjar	*Aegotheles cristatus*									X		
Laughing Kookaburra	*Dacelo novaeguineae*				X							
Horsfield's Bronze-Cuckoo	*Chalcites basalis*				X							
Shining Bronze-Cuckoo	*Chalcites lucidus*										X	
Welcome Swallow	*Hirundo neoxena*				X							
Tree Martin	*Petrochelidon nigricans*				X							

Common name	Scientific name	Status	Survey method used									
			Anabat	Box trap	Bird survey	Camera - arboreal	Camera - terrestrial	Fyke net	Harp trap	Nocturnal	Incidental	Tile transect
Grey Fantail	*Rhipidura albiscapa*				X							
Willie Wagtail	*Rhipidura leucophrys*				X						X	
Flame Robin	*Petroica phoenicea*										X	
Eastern Yellow Robin	*Eopsaltria australis*				X							
Magpie-lark	*Grallina cyanoleuca*				X						X	
Black-faced Cuckoo-shrike	*Coracina novaehollandiae*				X							
Yellow-rumped Thornbill	*Acanthiza chrysorrhoa*				X							
White-browed Scrubwren	*Sericornis frontalis*				X							
Rufous Songlark	*Cincloramphus mathewsi*				X							
Little Grassbird	*Megalurus gramineus*				X							
Golden-headed Cisticola	*Cisticola exilis*				X							
Superb Fairy-wren	*Malurus cyaneus*				X							
White-plumed Honeyeater	*Lichenostomus penicillatus*				X							
Noisy Miner	*Manorina melanocephala*				X							
Red Wattlebird	*Anthochaera carunculata*				X							
Olive-backed Oriole	*Oriolus sagittatus*				X							
Australian Magpie	*Cracticus tibicen*				X		X			X		
Little Raven	*Corvus mellori*				X							
Striated Pardalote	*Pardalotus striatus*				X							

Common name	Scientific name	Status	Survey method used									
			Anabat	Box trap	Bird survey	Camera - arboreal	Camera - terrestrial	Fyke net	Harp trap	Nocturnal	Incidental	Tile transect
Common Blackbird	*Turdus merula*	*					X					
European Skylark	*Alauda arvensis*	*			X							
European Goldfinch	*Carduelis carduelis*	*			X							
Common Myna	*Sturnus tristis*	*			X		X				X	
Common Starling	*Sturnus vulgaris*	*			X		X					
Mammals												
Short-beaked Echidna	*Tachyglossus aculeatus*						X					
Common Brushtail Possum	*Trichosurus vulpecula*					X	X			X		
Eastern Grey Kangaroo	*Macropus giganteus*					X	X				X	
Gould's Wattled Bat	*Chalinolobus gouldii*		X									
Chocolate Wattled Bat	*Chalinolobus morio*		X									
Southern Freetail Bat	*Mormopterus* sp. 4		X									
White-striped Freetail Bat	*Tadarida australis*		X									
Unidentified Long-eared Bat	*Nyctophilus spp*		X									
Inland Broad-nosed Bat	*Scotorepens balstoni*		X									
Large Forest Bat	*Vespadelus darlingtoni*		X									
Southern Forest Bat	*Vespadelus regulus*		X									
Little Forest Bat	*Vespadelus vulturnus*		X									
White-striped Freetail Bat	*Tadarida australis*									X		

Common name	Scientific name	Status	Survey method used									
			Anabat	Box trap	Bird survey	Camera - arboreal	Camera - terrestrial	Fyke net	Harp trap	Nocturnal	Incidental	Tile transect
Black Rat	*Rattus rattus*	*				X						
European Rabbit	*Oryctolagus cuniculus*	**									X	
European Hare	*Lepus europeaus*	**					X				X	
Red Fox	*Vulpes vulpes*	**			X		X			X		
Reptiles												
Tussock Skink	*Pseudemoia pagenstecheri*	*vu*										X
Frogs												
Southern Bullfrog	*Limnodynastes dumerilii*									X	X	
Marsh Frog Tadpoles	*Limnodynastes sp.*			X								
Spotted Marsh Frog	*Limnodynastes tasmaniensis*									X	X	
Common Froglet	*Crinia signifera*				X					X	X	
Common Froglet tadpoles	*Crinia signifera*			X								
Verreaux's Tree Frog	*Litoria verreauxii verreauxii*									X		
Tree Frog Tadpoles	*Litoria sp.*			X								
Aquatic invertebrates												
Yabby	*Cherax destructor*			X								

A2.2 Fauna species recorded and survey methods used, Frog Court and Rushwood Drive Reserve

Table A2.2. Fauna species recorded and survey methods used, Frog Court and Rushwood Drive Reserve.

Common name	Scientific name	Status	Survey method used									
			Anabat	Box trap	Bird survey	Camera - arboreal	Camera - terrestrial	Fyke net	Harp trap	Nocturnal	Incidental	Tile transect
Birds												
Stubble Quail	*Coturnix pectoralis*				X							
Brown Quail	*Coturnix ypsilophora*				X							
Dusky Moorhen	*Gallinula tenebrosa*				X			X				
Purple Swamphen	*Porphyrio porphyrio*				X							
Eurasian Coot	*Fulica atra*				X							
Australasian Grebe	*Tachybaptus novaehollandiae*				X							
Straw-necked Ibis	*Threskiornis spinicollis*				X							
Australian Wood Duck	*Chenonetta jubata*				X							
Pacific Black Duck	*Anas superciliosa*				X							
Hardhead	*Aythya australis*	vu			X							
Brown Falcon	*Falco berigora*										X	
Sulphur-crested Cockatoo	*Cacatua galerita*				X							
Welcome Swallow	*Hirundo neoxena*				X							
Grey Fantail	*Rhipidura albiscapa*				X							
Willie Wagtail	*Rhipidura leucophrys*				X							

Common name	Scientific name	Status	Survey method used									
			Anabat	Box trap	Bird survey	Camera - arboreal	Camera - terrestrial	Fyke net	Harp trap	Nocturnal	Incidental	Tile transect
Rufous Whistler	*Pachycephala rufiventris*				X						X	
Magpie-lark	*Grallina cyanoleuca*				X							
Crested Shrike-tit	*Falcunculus frontatus*										X	
Black-faced Cuckoo-shrike	*Coracina novaehollandiae*				X						X	
Brown Thornbill	*Acanthiza pusilla*				X							
Yellow-rumped Thornbill	*Acanthiza chrysorrhoa*				X						X	
White-browed Scrubwren	*Sericornis frontalis*				X		X				X	
Little Grassbird	*Megalurus gramineus*				X						X	
Clamorous Reed Warbler	*Acrocephalus stentoreus*	Mig			X						X	
Golden-headed Cisticola	*Cisticola exilis*				X						X	
Superb Fairy-wren	*Malurus cyaneus*				X		X				X	
Silvereye	*Zosterops lateralis*				X						X	
White-plumed Honeyeater	*Lichenostomus penicillatus*				X							
New Holland Honeyeater	*Phylidonyris novaehollandiae*				X							
Red-browed Finch	*Neochmia temporalis*				X		X				X	
Australian Magpie	*Cracticus tibicen*				X							
Australian Raven	*Corvus coronoides*				X							
Little Raven	*Corvus mellori*				X							
Raven sp.	*Corvus* sp.				X	X						

Common name	Scientific name	Status	Survey method used									
			Anabat	Box trap	Bird survey	Camera - arboreal	Camera - terrestrial	Fyke net	Harp trap	Nocturnal	Incidental	Tile transect
Spotted Turtle-Dove	*Streptopelia chinensis*	*			X		X					
Common Blackbird	*Turdus merula*	*			X	X	X				X	
House Sparrow	*Passer domesticus*	*			X							
European Goldfinch	*Carduelis carduelis*	*			X						X	
European Greenfinch	*Carduelis chloris*	*			X							
Common Myna	*Sturnus tristis*	*			X							
Common Starling	*Sturnus vulgaris*	*			X							
Mammals												
Common Brushtail Possum	*Trichosurus vulpecula*					X	X					
Black Wallaby	*Wallabia bicolor*				X	X	X				X	
Eastern Grey Kangaroo	*Macropus giganteus*				X	X				X		
Gould's Wattled Bat	*Chalinolobus gouldii*		X									
Chocolate Wattled Bat	*Chalinolobus morio*		X									
Southern Freetail Bat	*Mormopterus* sp. 4		X									
White-striped Freetail Bat	*Tadarida australis*		X									
Inland Broad-nosed Bat	*Scotorepens balstoni*		X									
Large Forest Bat	*Vespadelus darlingtoni*		X									
Southern Forest Bat	*Vespadelus regulus*		X									
Little Forest Bat	*Vespadelus vulturnus*		X									

Common name	Scientific name	Status	Survey method used									
			Anabat	Box trap	Bird survey	Camera - arboreal	Camera - terrestrial	Fyke net	Harp trap	Nocturnal	Incidental	Tile transect
Black Rat	*Rattus rattus*	*				X	X					
Water Rat	*Hydromys chrysogaster*							X				
European Rabbit	*Oryctolagus cuniculus*	**								X		
Red Fox	*Vulpes vulpes*	**				X	X				X	
Reptiles												
Cunningham's Skink	*Egernia cunninghami*				X		X				X	
Garden Skink	*Lampropholis guichenoti*										X	X
Weasel Skink	*Saproscincus mustelinus*											X
Unidentified elapid	Unidentified elapid						X					X
Tussock Skink	*Pseudemoia pagenstecheri*	vu										X
Frogs												
Southern Bullfrog	*Limnodynastes dumerilii*				X					X	X	
Striped Marsh Frog	*Limnodynastes peronii*									X		
Spotted Marsh Frog	*Limnodynastes tasmaniensis*									X	X	
Common Froglet	*Crinia signifera*									X	X	X
Growling Grass Frog	*Litoria raniformis*	VU, en, L								X	X	
Fishes												
Oriental Weatherloach	*Misgurnus anguillicaudatus*	*						X				

A2.3 Fauna species recorded and survey methods used, Martin Dillon Reserve

Table A2.3. Fauna species recorded and survey methods used, Martin Dillon Reserve.

Common name	Scientific name	Status	Survey method used									
			Anabat	Box trap	Bird survey	Camera - arboreal	Camera - terrestrial	Fyke net	Harp trap	Nocturnal	Incidental	Tile transect
Birds												
Australian Wood Duck	*Chenonetta jubata*				X							
Pacific Black Duck	*Anas superciliosa*				X							
Wedge-tailed Eagle	*Aquila audax*										X	
Brown Falcon	*Falco berigora*				X							
Southern Boobook	*Ninox novaeseelandiae*									X	X	
Sulphur-crested Cockatoo	*Cacatua galerita*				X							
Long-billed Corella	*Cacatua tenuirostris*				X							
Galah	*Eolophus roseicapillus*				X							
Crimson Rosella	*Platycercus elegans*				X							
Eastern Rosella	*Platycercus eximius*				X							
Red-rumped Parrot	*Psephotus haematonotus*				X							
Laughing Kookaburra	*Dacelo novaeguineae*				X							
Sacred Kingfisher	*Todiramphus sanctus*				X							
Fan-tailed Cuckoo	*Cacomantis flabelliformis*				X							
Horsfield's Bronze-Cuckoo	*Chalcites basalis*				X							

Common name	Scientific name	Status	Survey method used									
			Anabat	Box trap	Bird survey	Camera - arboreal	Camera - terrestrial	Fyke net	Harp trap	Nocturnal	Incidental	Tile transect
Welcome Swallow	*Hirundo neoxena*				X							
Willie Wagtail	*Rhipidura leucophrys*				X							
Grey Shrike-thrush	*Colluricincla harmonica*				X							
Magpie-lark	*Grallina cyanoleuca*				X							
Crested Shrike-tit	*Falcunculus frontatus*				X							
Black-faced Cuckoo-shrike	*Coracina novaehollandiae*				X						X	
Brown Thornbill	*Acanthiza pusilla*				X							
White-browed Scrubwren	*Sericornis frontalis*				X							
Superb Fairy-wren	*Malurus cyaneus*				X		X				X	
Dusky Woodswallow	*Artamus cyanopterus*				X							
Spotted Pardalote	*Pardalotus punctatus*				X							
Silvereye	*Zosterops lateralis*				X							
White-plumed Honeyeater	*Lichenostomus penicillatus*				X						X	
Noisy Miner	*Manorina melanocephala*				X							
Red Wattlebird	*Anthochaera carunculata*				X							
Australian Magpie	*Cracticus tibicen*				X							
Little Raven	*Corvus mellori*				X							
Striated Pardalote	*Pardalotus striatus*				X							

Common name	Scientific name	Status	Survey method used									
			Anabat	Box trap	Bird survey	Camera - arboreal	Camera - terrestrial	Fyke net	Harp trap	Nocturnal	Incidental	Tile transect
Common Blackbird	*Turdus merula*	*			X		X					
House Sparrow	*Passer domesticus*	*			X							
European Goldfinch	*Carduelis carduelis*	*			X							
Common Starling	*Sturnus vulgaris*	*			X							
Mammals												
Common Brushtail Possum	*Trichosurus vulpecula*						X					
Black Wallaby	*Wallabia bicolor*						X					
Gould's Wattled Bat	*Chalinolobus gouldii*		X									
Chocolate Wattled Bat	*Chalinolobus morio*		X									
Southern Freetail Bat	*Mormopterus* sp. 4		X									
White-striped Freetail Bat	*Tadarida australis*		X							X		
Unidentified Long-eared Bat	*Nyctophilus spp*		X									
Inland Broad-nosed Bat	*Scotorepens balstoni*		X									
Large Forest Bat	*Vespadelus darlingtoni*		X									
Southern Forest Bat	*Vespadelus regulus*		X									
Little Forest Bat	*Vespadelus vulturnus*		X						X			
European Rabbit	*Oryctolagus cuniculus*	**									X	
Red Fox	*Vulpes vulpes*	**					X					

Common name	Scientific name	Status	Survey method used									
			Anabat	Box trap	Bird survey	Camera - arboreal	Camera - terrestrial	Fyke net	Harp trap	Nocturnal	Incidental	Tile transect
Dog	*Canis lupus familiaris*	*domestic*					X					
Reptiles												
Garden Skink	*Lampropholis guichenoti*											X
Eastern Brown Snake	*Pseudonaja textilis*											X
Frogs												
Southern Bullfrog	*Limnodynastes dumerilii*									X	X	
Spotted Marsh Frog	*Limnodynastes tasmaniensis*										X	
Common Froglet	*Crinia signifera*									X	X	
Southern Brown Tree Frog	*Litoria ewingii*									X		
Lesueur's Frog	*Litoria lesueuri*										X	
Growling Grass Frog	*Litoria raniformis*	*VU, en, L*						X			X	
Verreaux's Tree Frog	*Litoria verreauxii verreauxii*									X		
Fishes												
Short-finned Eel	*Anguilla australis*							X				
Common Galaxias	*Galaxias maculatus*							X				
Redfin	*Perca fluviatilis*	*						X				
Flat-headed Gudgeon	*Philypnodon grandiceps*			X				X				

A2.4 Fauna species recorded and survey methods used, Konagaderra Reserve

Table A2.4. Fauna species recorded and survey methods used, Konagaderra Reserve.

Common name	Scientific name	Status	Survey method used									
			Anabat	Box trap	Bird survey	Camera - arboreal	Camera - terrestrial	Fyke net	Harp trap	Nocturnal	Incidental	Tile transect
Birds												
Brown Falcon	*Falco berigora*				X							
Southern Boobook	*Ninox novaeseelandiae*									X	X	
Sulphur-crested Cockatoo	*Cacatua galerita*				X					X		
Long-billed Corella	*Cacatua tenuirostris*				X							
Galah	*Eolophus roseicapillus*				X							
Horsfield's Bronze-Cuckoo	*Chalcites basalis*				X							
Welcome Swallow	*Hirundo neoxena*				X							
Tree Martin	*Petrochelidon nigricans*				X							
Grey Fantail	*Rhipidura albiscapa*				X							
Willie Wagtail	*Rhipidura leucophrys*				X		X					
Eastern Yellow Robin	*Eopsaltria australis*				X							
Rufous Whistler	*Pachycephala rufiventris*				X							
Grey Shrike-thrush	*Colluricincla harmonica*				X							
Magpie-lark	*Grallina cyanoleuca*				X							
Crested Shrike-tit	*Falcunculus frontatus*				X							

Common name	Scientific name	Status	Survey method used									
			Anabat	Box trap	Bird survey	Camera - arboreal	Camera - terrestrial	Fyke net	Harp trap	Nocturnal	Incidental	Tile transect
Black-faced Cuckoo-shrike	*Coracina novaehollandiae*				X							
Brown Thornbill	*Acanthiza pusilla*				X							
Yellow-rumped Thornbill	*Acanthiza chrysorrhoa*				X							
White-browed Scrubwren	*Sericornis frontalis*				X		X					
Superb Fairy-wren	*Malurus cyaneus*				X							
White-plumed Honeyeater	*Lichenostomus penicillatus*				X						X	
Noisy Miner	*Manorina melanocephala*				X							
Red Wattlebird	*Anthochaera carunculata*				X						X	
Australian Magpie	*Cracticus tibicen*				X						X	
Little Raven	*Corvus mellori*				X							
Striated Pardalote	*Pardalotus striatus*				X							
Common Blackbird	*Turdus merula*	*			X		X					
Mammals												
Common Brushtail Possum	*Trichosurus vulpecula*						X			X		
Common Ringtail Possum	*Pseudocheirus peregrinus*									X		
Common Wombat	*Vombatus ursinus*						X					
Black Wallaby	*Wallabia bicolor*						X				X	
Gould's Wattled Bat	*Chalinolobus gouldii*		X									
Chocolate Wattled Bat	*Chalinolobus morio*		X									

Common name	Scientific name	Status	Survey method used									
			Anabat	Box trap	Bird survey	Camera - arboreal	Camera - terrestrial	Fyke net	Harp trap	Nocturnal	Incidental	Tile transect
Southern Freetail Bat	*Mormopterus* sp. 4		X									
White-striped Freetail Bat	*Tadarida australis*		X								X	
Unidentified Long-eared Bat	*Nyctophilus* spp		X									
Inland Broad-nosed Bat	*Scotorepens balstoni*		X									
Large Forest Bat	*Vespadelus darlingtoni*		X									
Southern Forest Bat	*Vespadelus regulus*		X									
Little Forest Bat	*Vespadelus vulturnus*		X									
Black Rat	*Rattus rattus*	*					X					
European Rabbit	*Oryctolagus cuniculus*	**									X	
Red Fox	*Vulpes vulpes*	**					X					
Reptiles												
Garden Skink	*Lampropholis guichenoti*										X	X
Frogs												
Southern Bullfrog	*Limnodynastes dumerilii*									X		
Common Froglet	*Crinia signifera*									X	X	
Southern Brown Tree Frog	*Litoria ewingii*									X		
Verreaux's Tree Frog	*Litoria verreauxii verreauxii*									X		
Fishes												
Short-finned Eel	*Anguilla australis*							X				

Common name	Scientific name	Status	Survey method used									
			Anabat	Box trap	Bird survey	Camera - arboreal	Camera - terrestrial	Fyke net	Harp trap	Nocturnal	Incidental	Tile transect
Oriental Weatherloach	*Misgurnus anguillicaudatus*	*						X				
Gambusia	*Gambusia holbrooki*	*		X								
Redfin	*Perca fluviatilis*	*						X				
Flat-headed Gudgeon	*Philypnodon grandiceps*			X								

Appendix 3: Aquatic fauna survey results

Notes to table:

Ex – Exotic / introduced species

D - Diadromous species – species which migrate between fresh and salt water at specific parts of their lifecycle (includes anadromous, catadromous and amphidromous species)

O – Obligate freshwater species

E - Euryhaline species – species which are capable of occurring in marine and freshwater environments (typically estuarine species and marine vagrants).

N - Declared noxious species under the *Fisheries Act 1995*

P - Present – abundance not recorded (e.g. exit tear in fyke nets indicative of Water Rat capture.)

Table A3.1. Aquatic fauna survey results.

Scientific name	Common name	Notes	Mt Ridley	Frog Court and Rushwood Drive	Martin Dillon	Konagaderra
Fishes						
Anguilla australis	Southern Shortfin Eel	D			13	5
Galaxias maculatus	Common Galaxias	D			14	
Philypnodon grandiceps	Flat-headed Gudgeon	D			7	
Perca fluviatilis	Redfin	Ex, O			1	8
Gambusia holbrooki	Eastern Gambusia	Ex, N, O				1
Misgurnus anguillacaudatus	Oriental Weatherloach	Ex, N, O		1		4
Decapod Crustacea						
Cherax destructor	Common Yabby	O	4			
Mammals						
Hydromys chrysogaster	Water Rat	E		P		
Frogs						
Litoria raniformis	Growling Grass Frog	O			1 (Adult female)	
Litoria lesueuri	Lesueur's Frog	O			2 (Adult males)	
Litoria sp.	tadpole	O	120			
Limnodynastes sp.	tadpole	O	85			
Crinia sp.	tadpole	O	32			