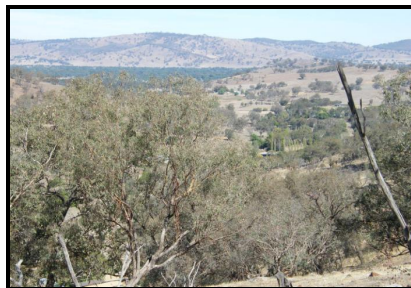


SPLITTERS CREEK BIODIVERSITY STUDY

Report to the Murray Catchment Management Authority of New South Wales

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Ecotone Wildlife & Habitat Assessments.

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1.0 INTRODUCTION

Ecotone Wildlife and Habitat Assessments was engaged by the New South Wales Murray Catchment Management Authority to undertake a biodiversity study of the Splitters Creek watershed, Albury. This report documents the results of a literature review, flora and fauna survey and discrepancies in existing vegetation mapping. The information contained in this report will be integrated into the Splitters Creek watershed plan and will assist in identifying assets and processes threatening biodiversity in the area.

1.1 Study area

Spliters Creek watershed is located approximately 8 km west of the township of Albury, NSW and covers approximately 29 sq km. Land tenure includes approximately two-thirds freehold agricultural and residential land and the remainder is mostly public land. Broad vegetation types include Dry Foothill-forest, Grassy Box-gum woodland and River Red Gum forest. Splitters Creek bisects the study area and terminates on the southern side of the Riverina Highway before entering the water table on the Murray River floodplain.

1.2 Study objectives and aims

The primary objective of the study is to provide an assessment of the status of the biodiversity within the Splitters Creek watershed. Results from the study are intended to enable biodiversity conservation issues to be integrated into the Splitters Creek watershed management plan.

This report addresses the following main aims:

- locate and review existing reports on the flora and fauna of the watershed and surrounding area;
- collate and evaluate flora and fauna records held by local residents;
- conduct field surveys to establish an inventory of flora and fauna (excluding fish and aquatic organisms);
- conduct targeted surveys for threatened species previously unrecorded in the watershed;
- identify and report assets and significant threats to biodiversity;
- identify and amend errors in existing vegetation maps.

1.3 Qualifications and experience of consultant

Damian Michael (Ecotone Wildlife and Habitat Assessments) holds a Bachelors Degree in Applied Science (Honours) – Ecosystem Management & Ecology (2001), Charles Sturt University, Albury. He is undertaking a Doctoral degree and is currently employed as a Senior Research Officer, Wildlife Ecologist and Herpetologist with the Fenner School of Environment and Society, The Australian National University. He has authored and co-authored over 30 scientific publications on biodiversity conservation in peer-reviewed, national and international journals and is co-author of 'Woodlands: a disappearing landscape' and 'Wildlife on farms: how to conserve native animals' (CSIRO Publishing). Damian has conducted over 20 wildlife surveys and threatened species habitat assessments as a consultant in the Albury local government area and the South-west Slopes bioregion of NSW. (NSW NPWS license number: S12604).

2.0 METHODOLOGY

2.1 Literature review and desktop study

Flora and fauna present and likely to occur in the Splitters Creek watershed was compiled from the New South Wales National Parks and Wildlife Service (NSW NPWS) wildlife atlas database (now DECC), published scientific papers, unpublished reports, draft management plans, field observations and unpublished records from local residents and other species lists available from the Albury City Council (ACC), and Wonga Wetlands staff. In reviewing and interpreting the species contained in these literature sources, erroneous and questionable records were excluded from the final species list in this report. Taxonomic name changes where applicable were also amended and updated.

2.2 Site selection and stratification

Field survey sites were selected based on inspection of aerial maps, site reconnaissance and knowledge of prior works and threatened species locations within the study area. Survey sites represented a range of broad vegetation types (e.g. River Red Gum forest, Box-gum woodland and Dry Foot-hill forest), topographic positions (e.g. ridge, slopes, valleys and floodplain) and consisted of approximately 300 metre transects. GPS recordings were taken at the beginning and end of each transect and marked on an aerial photograph. All surveys were conducted on clear days and nights to maximise fauna detection.

2.3 Recording of flora and fauna

Location records of non-threatened flora and fauna recorded during the surveys were aggregated to each survey site. The locations of all threatened species encountered during the survey or gathered from conversations with local residents were recorded using a hand held Global Positioning System (Garmin *Etrex* AGD 66). Location records of known threatened species contained in the NSW NPWS wildlife atlas database were not included in this report as they are freely accessible online. Additional records of threatened species known to occur in the study area but not currently registered with the NSW NPWS wildlife atlas were included. Scientific names of species mentioned in this report are listed in Appendix 1-5 and exotic species are denoted by an asterisk throughout the tables.

2.4 Biodiversity surveys

One of the aims of the study was to conduct targeted surveys for threatened species not previously detected within the catchment. Therefore, it was necessary to undertake a literature review before the appropriate survey methodology could be developed to maximise the species inventory and increase the likelihood of detecting threatened species. Based on the results of the literature review the following methodology was employed at each site on the 6th, 7th, 8th and 23rd April, 2009.

Herpetofauna (reptiles & frogs)

- Reptiles and frogs were actively searched for by inspecting surface rocks, fallen timber, exfoliating bark, leaf litter and other ground debris 25 metres either side of the transect line. The search area

encompassed 1.5 hectares. Each site was surveyed for approximately 60 minutes depending on available habitat.

- Evidence of reptiles such as, sloughed skins, burrow systems and egg-shells were recorded.
- Nocturnal surveys (using a hand-held spotlight) were conducted on selected sites.
- Additional herpetofauna species seen incidentally whilst travelling between sites are included in Appendix 1 and 2.

Mammals

- Mammals were surveyed incidentally along each transect during the day and during spotlighting transects commencing one hour after sunset. Selected sites were surveyed for between 30 – 60 minutes depending on available habitat.
- Any scats located along each transect and during the study were identified using Triggs (1996).
- Bats were not specifically surveyed in this study due to the time and effort required to adequately survey this group of animals. This included the threatened Large-footed Myotis, due to the difficulty of installing 'harp traps' over waterways (the species preferred foraging area) and the unreliability of 'ANABAT' call detection equipment in being able to accurately distinguish the species from other bat species with similar calls. All bat species, including the Large-footed Myotis, have been recorded adjacent to the study area at Horseshoe Lagoon and therefore, considering Horseshoe Lagoon is part of the Wonga Wetlands system, it was deemed highly likely that the same species occur in similar habitat within the watershed, particularly Cookes and Bagnall's lagoon.
- Additional mammal species seen incidentally whilst travelling between sites are included in Appendix 3.

Birds

- Birds were surveyed by recording each species seen or heard 50 metres either side of each transect line. The search area encompassed 3 hectares. Birds observed flying over the site (hence not specifically using the site) were recorded but not included in abundance totals in Table 6. Each site was surveyed for approximately 60 minutes.
- 3 x 10 minute call play-back sessions using pre-recorded calls were conducted for owls and nocturnally detectable birds following each spotlight survey.
- Additional bird species seen incidentally whilst travelling between sites are included in Appendix 4.

Flora

- All native plant species encountered 25 metres either side of each transect line were recorded. Noxious and environmental weeds of significance were recorded and reported at each site. Widespread agricultural species, e.g. clovers and exotic annual grasses were recorded but are not reported for each site. Instead, these species are documented in the final species list in Appendix 5.
- Additional plant species seen incidentally whilst travelling between sites are included in Appendix 5.

Vegetation error mapping

- Discrepancies in vegetation type and extent of cover between aerial maps and field surveys were noted and delineated on an aerial map for inclusion in future mapping projects.

3.0 RESULTS

3.1 Literature review, community records and desktop study

3.1.1 Literature review.

The literature review revealed a diverse array of flora and fauna studies had been conducted within and adjacent to the Splitlers Creek watershed (Table 1). Four surveys involved vegetation assessments, although plant species list were only available from two sources (Nature Conservation Trust and Riparian Management Services). One study involved an honours thesis on the wetland avifauna of Wonga wetlands, four studies involved snake and lizard surveys, one study involved turtle surveys and regular bat surveys had been conducted in Wonga Wetlands by the Charles Sturt University (Table 1). A further two studies had been conducted in areas adjacent to the study area. Studies from other parts of the Albury Local Government Area (LGA) (e.g. Black Range, Red Hill, Thurgoona and Norske Skog Paper Mill) were not reviewed or incorporated in this report.

Table 1. Biodiversity studies and field surveys undertaken in the Splitlers Creek watershed.

Survey type	Data source	Summary information
Studies entirely within or incorporating parts of the Splitlers Creek watershed		
Vegetation	CSIRO (2009) Andre Zerger, Damian Wall	Biometric plots conducted in the watershed. No floristic lists available.
Vegetation	DLWC – Judy Frankenburg	Wetlands surveys. No data available
Vegetation	Nature Conservation Trust (2008) Plan of management for “Caladenia Ridge” Lot 2 DP1124998 Centaur Road, Lavington.	Crimson Spider Orchid recorded from ‘Caladenia ridge’ Lot 2. DP 1124998. Preliminary flora surveys
Vegetation	Riparian Management Services (2007) Wonga Wetlands vegetation map.	Vegetation map of exotic and native wetland plants in Wonga wetlands.
Avifauna	Alexander, T. (2001) Avifaunal biodiversity of Wonga wetlands, Albury, NSW. Unpublished Honours Thesis. Charles Sturt University, Albury.	Wetland bird surveys of Wonga Wetlands. 65 total species – including species listed in bilateral migratory bird agreements.
Avifauna	Wonga Wetlands Bird List. Compiled by Iain Taylor CSU for Wonga Wetlands.	Avifauna species list. 154 total species – including species listed under bilateral migratory bird agreements and EPBC Act (1999).
Reptiles	Michael, D.R. (2004) Distribution, habitat preferences and conservation status of reptiles in the Albury-Wodonga region. <i>The Victorian Naturalist</i> . 121 (5), 180-193.	29 reptile species recorded in Albury LGA. Survey areas include Nail Can Hill.
Reptiles	Michael, D.R. (2007a) A reptile survey on Nail Can Hill Flora and Fauna Reserve – summary of October 2007 results. Unpublished summary report to GHD, Wodonga.	Reptile surveys – Pink-tailed Worm Lizard recorded at Waterview Lookout, Crown Land Reserve.
Reptiles	Michael, D.R. (2007b) A range extension for the Yellow-faced Whip Snake <i>Demansia psammophis</i> in south-eastern NSW and an addition to the herpetofauna of the Albury-Wodonga region. <i>Herpetofauna</i> . 37 (2), 81-82.	Reptile surveys – Pink-tailed Worm Lizard recorded at Waterview Lookout, Crown Land Reserve.

Survey type	Data source	Summary information
Reptiles	Michael, D.R. (2008) A Survey and Habitat Appraisal for the Pink-tailed Worm Lizard (<i>Aprasia parapulchella</i> : Pygopodidae) on private property – Splitters Creek Road (Lot 1), Nail Can Hill Range, Albury. Unpublished summary report to the Nature Conservation Trust, NSW.	Approximately 10 ha of potential Pink-tail Worm Lizard habitat identified. Pair of Turquoise Parrots recorded.
Reptiles	Hodges, K. (2008) Unpublished PhD data.	56 Macquarie Turtles and 1 Snake-necked Turtle recorded from Bagnall's lagoon, Wonga Wetlands.
Bats	Klomp, N. & Grabham, C. Annual bat surveys of Wonga Wetlands/ Horseshoe Lagoon. CSU, Albury.	9 species recorded. The threatened Large-footed Myotis NSW TSC Act (1995) recorded from Horseshoe Lagoon adjacent to study area.
Biodiversity	Riverina Institute TAFE NSW (2003) Nail Can Hill Community Biodiversity Survey Report. Unpublished report for Albury City Council and Bungambrawatha Creek Care Group.	Approximately 14 sites surveyed in Splitters Creek watershed. A number of threatened species recorded.
Studies adjacent to Splitters Creek watershed		
Reptiles	Michael, D.R. and Herring, M.W. (2005) Habitat of the Pink-tail Worm-lizard <i>Aprasia parapulchella</i> in Albury, NSW. <i>Herpetofauna</i> . 35 (2), 103-111.	Description of Pink-tail Worm Lizard habitat on Nail Can Hill.
Biodiversity	Davidson, I. (2000) Biodiversity values of the Hamilton Valley. Unpublished report for Albury-Wodonga Development Corporation and Albury City Council.	Area north of Splitters Creek watershed surveyed. 125 native plants, 77 bird species, including several listed under NSW TSC Act (1995).

3.1.2 Community records

Flora and fauna species lists were obtained from Alec and Joan Howitt. Additional records were obtained informally in conversation with other landholders (David Bartram, David Ryan and Tony Tinlin). These records were evaluated and included in the total species lists contained in Appendix 1-5. Notable records provided by local residents that were not included in any other information source included:

- 1) a number of sightings of Squirrel Gliders caught in barbed-wire fences;
- 2) historical (1970's) record of White-brow Babblers;
- 3) Swift Parrot sightings;
- 4) observations of Wombat activity;
- 5) one Inland Carpet Python road kill and another seen in garden, and;
- 5) a potential record of road-killed Bandy Bandy on the Riverina Highway.

3.1.3 Desktop study

The NSW NPWS wildlife atlas database contained records of 49 threatened flora and fauna species in the “upper slopes” CMA sub-region. A secondary database search of the Albury “LGA” revealed 24 threatened flora and fauna species. Species not likely to occur in the LGA (based on lack of suitable habitat) were excluded from the upper slopes list, and additional species not registered in the wildlife atlas for the Albury LGA were included to produce a list of 35 threatened species and one threatened ecological vegetation community known or likely to occur in the Splitters Creek watershed (Table 2).

Species known to occur in the study area include: one threatened ecological community, four plants, one reptile, one frog, twelve birds and one arboreal marsupial (Table 2). A further seven species are likely to occur in the study area based on the proximity of the nearest record to the study area (generally < 5 km) and/or presence of suitable habitat. Of these six species the presence of the Spotted-tailed Quoll in the Albury LGA has not been verified by experts. A further nine species are unlikely to occur in the study area due to the lack of suitable habitat and/or distance to the nearest record in the LGA (Table 2). These species include: 1) Bush Stone Curlew, 2) Glossy Black Cockatoo, 3) Striped Legless Lizard, 4) Grey Falcon, 5) Southern Bell Frog, 6) Powerful Owl, 7) Koala, 8) Grey-crowned Babbler, and 9) Silky Swainson Pea.

Table 2. Threatened flora and fauna known and likely to occur in the Spliters Creek watershed.

Sources include: literature from Table 1, DECC (NSW NPWS wildlife atlas), local resident's personal observations and records from this study. (Legal status is based on NSW TSC Act (1995): Vul = vulnerable, End = endangered).

Common name	Scientific name	Legal Status	Known or likelihood	Year of last record	Source
River Swamp Wallaby Grass	<i>Amphibromus fluitans</i>	Vul	Known	1996	DECC
Pink-tailed Worm Lizard	<i>Aprasia parapulchella</i>	Vul	Known	2007	D. Michael (2007b)
Australasian Bittern	<i>Botaurus poiciloptilus</i>	Vul	Known	1994	DECC
Bush Stone Curlew	<i>Burhinus grallarius</i>	End	Unlikely resident	NA	
Crimson Spider Orchid	<i>Caladenia concolor</i>	End	Known	2008	NCT (N. Jones)
Gang-gang Cockatoo	<i>Callocephalon fimbriatum</i>	Vul	Known	2008	D. Michael pers. obs.
Glossy Black-cockatoo	<i>Calyptorhynchus lathami</i>	Vul	Unlikely vagrant	NA	
Brown Treecreeper	<i>Climacteris picumnus</i>	Vul	Known	2009	This study, DECC
Sloane's Froglet	<i>Crinia sloanei</i>	Vul	Known	1994	DECC
Spotted-tailed Quoll	<i>Spotted-tailed Quoll</i>	Vul	Likely vagrant	Crematorium 2004	DECC
Striped Legless Lizard	<i>Delma impar</i>	Vul	Unlikely resident	NA	
Grey Falcon	<i>Falco hypoleucos</i>	Vul	Unlikely vagrant	NA	
Painted Honeyeater	<i>Grantiella picta</i>	Vul	Likely vagrant	West Albury 2004	D. Michael pers. obs.
Brolga	<i>Grus rubicunda</i>	Vul	Likely vagrant	Thurgoona 1998	D. Michael pers. obs.
Swift Parrot	<i>Lathamus discolor</i>	End	Known	2005	A. Howitt pers. com.
Southern Bell Frog	<i>Litoria raniformis</i>	End	Unlikely	NA	
Hooded Robin	<i>Melanodryas cucullata</i>	Vul	Known	2009	This study
Black-chinned Honeyeater	<i>Meliphreptus gularis</i>	Vul	Known	2003	D. Michael pers. obs.
Large-footed Myotis	<i>Myotis macropus</i>	Vul	Likely resident	NA	C. Grabham pers com
Turquoise Parrot	<i>Neophema pulchella</i>	Vul	Known	2008	D. Michael pers. obs.
Barking Owl	<i>Ninox connivens</i>	Vul	Known	2008	Albury City Council
Powerful Owl	<i>Ninox strenua</i>	Vul	Unlikely vagrant	No LGA records	
Blue-billed Duck	<i>Oxyura australis</i>	Vul	Known	Wonga wetland 2001	T. Alexander (2001)
Squirrel Glider	<i>Petaurus norfolcensis</i>	Vul	Known	2009	This study, DECC
Koala	<i>Phascolarctos cinereus</i>	Vul	Unlikely vagrant	LGA records	
Austral Pillwort	<i>Pilularia novaehollandiae</i>	End	Known	Wonga wetlands	DECC (1994)
Superb Parrot	<i>Polytelis swainsonii</i>	Vul	Likely vagrant	records < 20 km 2008	D. Michael pers. obs.
Grey Crowned Babbler	<i>Pomatostomus temporalis</i>	Vul	Unlikely resident	North Albury 1996	
Speckled Warbler	<i>Pyrrholaemus sagittatus</i>	Vul	Known	2009	This study, DECC
Painted Snipe	<i>Rostratula banghalensis</i>	End	Likely vagrant	Rutherglen 2006	D. Michael pers. obs.
Woolly Ragwort	<i>Senecio garlandii</i>	Vul	Known	Black Range	I. Davidson pers. com

Diamond Firetail	<i>Stagonopleura guttata</i>	Vul	Known	2009	This study
Freckled Duck	<i>Stictonetta naevosa</i>	Vul	Known	Wonga wetlands	M. Herring pers. com.
Silky Swainson Pea	<i>Swainsona sericea</i>	Vul	Unlikely	Historic record 1916	
Regent Honeyeater	<i>Xanthomyza phrygia</i>	End	Likely vagrant	West Albury 1994	DECC
Box-Gum Woodland		End	Known	2009	This study, DECC

3.2 Location of survey sites.

A total of 16 sites were surveyed for flora and fauna (Table 3). These sites encompassed NSW State Forest tree plantations situated on the Murray floodplain, private property and crown land reserves and reflect areas with the greatest likelihood of detecting threatened and locally significant species (see Appendix 6 for map of survey sites). The high conservation value of Wonga Wetlands for threatened species, migratory birds and biodiversity in general is well established. Likewise, significant areas of the Nail Can Hill Flora and Fauna Reserve within the study area have also been subject to previous surveys and the results are documented (Table 1). Therefore, instead of revisiting areas previously surveyed, this study placed greater emphasis on unsurveyed areas, and areas with the greatest likelihood of increasing the knowledge of threatened species habitat distributions within the watershed.

Table 3. GPS locations, vegetation type and description of survey sites in the Splitlers Creek watershed, April 2009.

Site No.	Start GPS	End GPS	Vegetation type	Site description
1	0486079 6006962	0485969 6006823	Flooded Gum	12 year old plantation
2	0484922 6007827	0484968 6008006	River Red Gum	12 year old plantation
3	0485420 6008132	0485452 6007007	River Red Gum	12 year old plantation
4	0485219 6006878	0485168 6007029	River Red Gum	12 year old plantation
5	0485479 6006771	0485549 6006866	Flooded Gum	12 year old plantation
6	0485933 6007035	0485880 6007126	River Red Gum	12 year old plantation
7	0486575 6010298	0486653 6010220	Box Gum woodland	Rocky upper slope, regrowth stand
8	0486697 6010269	0486776 6010385	Box Gum woodland	Rocky lower slope, regrowth stand
9	0486969 6010476	0486733 6010459	Box Gum woodland	Rocky creek / gully, mature trees
10	0483943 6010155	0484328 6010092	Box Gum woodland	Dwight's Hill, grassy slope, mature remnant
11	04885550 6011837	0485814 6011751	Box Gum woodland	Grassy & rocky slope, regrowth + remnant
12	0485884 6011989	0485667 6012012	Box Gum woodland	Grassy lower slope, regrowth + remnant
13	0485596 6013085	0485944 6013382	Box Gum woodland	Rocky creek / gully, remnant
14	0486125 6013281	0486359 6013210	Box Gum woodland	Rocky ridge, regrowth mallee forms
15	0486303 6013160	0486074 6013184	Dry Foothill Forest	Rocky hill – mid slope, remnant + regrowth
16	0487313 6013270	0486943 6013031	Dry Foothill Forest	Rocky gorge, remnant + regrowth

3.3 Biodiversity survey results

A total of 77 fauna and 81 flora species were recorded during the biodiversity surveys. These included: four frogs, six reptiles (Table 4), 13 mammals (Table 5), 52 birds (Table 6), and 81 plants (Table 7). The number of species recorded during this study was significantly low compared with the number of species actually known to occur in the study area (see Appendix 1-5 for a complete species list).

There are several reasons why this study failed to detect many threatened species and high numbers of species in general:

- 1) The timing of the surveys was outside the period for detecting international migratory birds, flowering orchids and cryptozoic (ground-dwelling) legless lizards.
- 2) Most summer birds had already migrated to northern parts of Australia.
- 3) Most winter altitudinal bird migrants were yet to arrive.
- 4) Drought conditions over the past few years may have had an impact on native vegetation growth and breeding success of native fauna.

Despite the seasonal and climatic limitations, field surveys conducted during this study revealed many significant findings. These include:

- 1) An additional record of the threatened Squirrel Glider and evidence that a significant population exists within the watershed.
- 2) The first confirmed observations of the locally uncommon Yellow-footed Antechinus and Bibron's Toadlet.
- 3) The widespread presence of threatened Pink-tailed Worm Lizard habitat.
- 4) A number of observations of threatened bird species, including the Brown Treecreeper, Speckled Warbler and a single sighting of the threatened Hooded Robin.
- 4) The discovery of a multi-aged remnant Ironbark *Eucalyptus sideroxylon* vegetation community (discussed in detail in section 4.2.6).

It is strongly recommended that future field surveys be undertaken between August and November. This period is the most opportune time for detecting threatened orchids and reptiles. The following section documents the results of the flora and fauna surveys.

3.3.1 Herpetofauna

A total of 57 individuals of 12 species, representing four frogs, one turtle, one gecko and six skinks were recorded during the study (Table 4). This represents 33% of the frogs and 28.5% of the reptile species known to occur within the study area (Appendix 1 & 2). Boulenger's Skink was the most abundant (35% of observations) followed by the Rainbow and Wall skinks (14% and 10.5% respectively). Sites 7 and 13 were the most species rich. However, overall herpetofauna species richness and abundance was low (Table 4).

Informal conversations with local residents revealed significant information on a number of additional species. One landholder had sighted the locally uncommon Burton's Legless Lizard as well as the threatened Pink-tailed Worm Lizard on the property in previous years (Alec Howitt pers. comm. 2009). This property contained abundant suitable habitat capable of supporting viable populations of both species. Another landholder accidentally ran over an Inland Carpet Python on the Spliters Creek Road in 2008, and another landholder adjacent to the road killed individual may have also encountered a python whilst clearing garden vegetation during Autumn 2004 (T. Tinlin pers. comm.). These records represent the first for the species on Nail Can Hill since the 1960's and suggests an extant population may exist in the Albury LGA (see Michael and Lindenmayer 2008 for other records of Carpet Pythons in the SWS).

Table 4. Species richness and abundance of herpetofauna recorded during April 2009.

Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total
Snake-necked Turtle			1														1
Common Froglet	1	2											1				4
Plains Froglet	1												1			1	3
Bibron's Toadlet													1				1
Peron's Treefrog			1														1
Marbled Gecko							1										1
Rainbow Skink	1		1				1			2	1					2	8
Wall Skink							2	2					1		1		6
Striped Skink							1	1				2					4
Crevice Skink							1		1				2			1	5
Garden Skink		3															3
Boulenger's Skink				1				1		2	2	2	3	1	6	2	20
Species richness	3	2	3	1	0	0	5	3	1	2	2	2	6	1	2	4	12
Total abundance	3	5	4	1	0	0	6	4	1	4	3	3	9	1	7	6	57

3.3.2 Mammals

A total of 53 individuals of 13 species, representing eight native and five introduced mammal species were recorded during the study (Table 5). This represents 44% of the native mammals and 55.5% of the introduced mammals known to occur within the study area (Appendix 3). The Eastern Grey Kangaroo was the most abundant mammal species (53% of observations) followed by the White-striped Mastiff Bat. Bat activity was observed on most sites during spotlight surveys, although individual species could not be identified without the aid of traps. Sites 2 and 4 were the most species rich. However, mammal species richness and abundance was generally low (Table 5).

Informal conversations with local residents revealed significant information on the distribution and abundance of the Squirrel Glider. As many as four landholders reported finding Squirrel Gliders caught in barbed-wire fencing within the past 5-10 years. Most of these sightings originate from a few core areas, such as, along the mid to upper reaches of Spliters Creek and adjoining properties, and along Waterview

Road on the Murray floodplain. One individual was observed feeding in the Red Gum plantation adjacent to the Murray River during this study. A single Yellow-footed Antechinus was also observed during the day near the same location and it is likely that the Red Gum and Flooded Gum plantations provide valuable habitat for both species. Other significant records reported by local residents include observations of Wombat tunnels in the northern and eastern parts of the watershed.

Table 5. Species richness and abundance of mammal species recorded during April 2009.

Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total
Echidna										1							1
Yellow-footed Antechinus				1													1
Squirrel Glider				1													1
Ring-tailed Possum	2	1															3
Brush-tailed Possum							1										1
Grey Kangaroo		3	2	5	1	3		4			2		6			3	28
Black Wallaby		1		1		1											3
White-striped Mastiff	1	1			1		1			1							5
House Mouse*													1				1
Red Fox*				1						1							2
Feral Cat*			1														1
Rabbit*	2															1	3
Hare*		1						1			1						3
Species richness	3	5	2	5	2	2	2	2	0	3	2	0	2	0	0	2	13
Total abundance	4	7	3	9	2	4	2	5	0	3	3	0	7	0	0	4	53

3.3.3 Birds

A total of 473 individuals (excluding those recorded flying over the sites) of 52 species, representing 51 native and one introduced bird species were recorded during the study (Table 5). This represents 28% of the bird species known to occur within the study area (Appendix 4). The White-plumed Honeyeater, Superb Fairy-wren, Australian Magpie, Red-browed Finch, Pied Currawong, Silvereye and Grey Fantail were the most abundant bird species (altogether totalling 42% of all observations). Sites 1 – 6 were the most species rich and contained almost twice the number of bird species and two – three times more individuals than Box-gum woodland and Dry Foothill-forest sites. However, bird species richness and abundance was low due to the seasonal timing of the surveys (Table 5).

The large difference in species richness between floodplain and elevated hill sites may be due to the plantations being irrigated, as well as providing structurally suitable habitat for small insectivorous birds. Different species were also associated with plantation sites and hill sites. The Eastern Yellow Robin, Red-capped Robin, Red-browed Finch, Grey Fantail and Golden Whistler were more common in the plantation and the Hooded Robin, Speckled Warbler, Brown Treecreeper and Scarlet Robin were associated with Box-Gum/Dry Foothill-forest sites.

Informal conversations with local residents revealed significant information on a number of species. The White-browed Babbler was once recorded in the 1970's but has not been recorded again. A pair of Swift Parrots was seen feeding on eucalypt blossom on a property approximately 6 years ago (A. Howitt pers. comm.).

Table 6. Species richness and abundance of bird species recorded during April 2009.

Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total
Australian Magpie	2	2		2	3	4	3	4			7	3		5	2	1	38
Australian Raven		2										2					4
Black-faced Cuckoo-shrike			1											1	1		3
Brown Goshawk			1														1
Brown-headed Honeyeater				2	4											2	8
Brown Treecreeper								2	2	4		1	4		6		19
Crested Shrike-tit	1																1
Crimson Rosella	2				8												10
Common Blackbird*			1						1								2
Common Bronzewing									1								1
Diamond Firetail							2										2
Double-barred Finch																3	3
Dusky Woodswallow										13							13
Eastern Rosella	2	2			7					2	2	2			4	3	24
Eastern Yellow Robin		1			1	5											7
Fairy Martin			2														2
Galah		2				3					3					2	10
Golden Whistler		3		1	2	1										1	8
Great Cormorant			7														7
Grey Fantail	4	3	2	3	3	2										1	18
Grey Shrike-thrush	1	1		1		1			1	1		1	1			1	9
Hooded Robin													1				1
Kookaburra	1			1	1						1						4
Little Lorikeet					3												3
Long-billed Corella		80															80
Magpie-lark			1		2					2	2						7
Mistletoebird																1	1
Pied Butcherbird										1							1
Pied Currawong	2		1								3	13	4				23
Red-browed Finch	7		4	3	8	4											26
Red-capped Robin	2	2		4		2											10
Red-kneed Dotterel			2														2
Red-rumped Parrot						3											3
Red Wattlebird	5																5
Restless Flycatcher					2						1						3
Rufous Whistler				1													1
Scarlet Robin													2				2

Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total
Silvereye	7		3	4	2	8											24
Speckled Warbler									1				2				3
Straw-necked Ibis			13														13
Striated Pardalote					1												1
Striated Thornbill		5		6	4												15
Sulphur Crested Cockatoo	2	1	1	2													6
Superb Fairy-wren	10	4	4		3	2			4			3					30
Welcome Swallow			2							2							4
White-browed Scrubwren		7	4		6												17
White-plumed Honeyeater	6	2	2	2	2	3	2			7	3	2	4		2	3	40
White-throated Treecreeper		1	1		1	1											4
Weebill	5			3		8			3								19
Willie Wagtail		1	1					1		1	1					1	6
Whistling Kite			1			1											2
Yellow Rosella	1	1		2	5	7						1					17
Species richness	17	18	20	15	20	16	3	3	7	9	9	9	7	2	5	11	52
Total abundance	60	40	42	37	67	55	7	7	13	33	23	28	18	6	15	19	473

3.3.4 Plants

A total of 81 plant species were recorded, of which 52 (65%) were native species. This represents 30% of the known number of plant species that have been recorded in the study area (Appendix 5). The plantation sites were the least species rich, due to the enclosed canopies and thick layer of leaf litter and ground debris. The exception was site 1., this followed a road and hence was exposed to more sunlight. Sites 13 and 16 were the most species rich. Both of these sites were creek lines and contained areas of moist soil and rock pools with small amounts of water. The actual number of plants species across all sites is likely to be much higher during the spring months. Almost no native species were observed in flower during this study due to the drought conditions.

Table 7. Presence of native and exotic plants recorded during April 2009.

Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Asparagus*										✓						
Austral Crane's-bill	✓								✓							✓
Austral Bear's Ear																✓
Bathurst Burr*						✓										
Black Wattle*										✓						
Blackberry*	✓	✓			✓	✓			✓							
Blackberry Nightshade*	✓					✓										✓
Blakely's Red Gum							✓	✓		✓	✓		✓	✓	✓	✓
Box Mistletoe												✓				
Cherry Ballart													✓	✓	✓	
Cherry Plum*					✓				✓	✓						

Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Common Raspwort							✓				✓	✓	✓	✓	✓	✓
Common Reed		✓	✓													
Cotton Fireweed													✓			
Daphne Heath													✓		✓	✓
Date Palm*										✓						
Desert Ash*										✓						
Drooping Mistletoe												✓				✓
Drooping Sheoke							✓	✓	✓				✓		✓	
European Olive*										✓			✓			
Fig*	✓															
Fleabane*		✓														
Flooded Gum*	✓				✓											
Golden Wattle									✓							
Grey Guinea Flower													✓	✓		
Hill Fireweed															✓	✓
Hill Wallaby Grass								✓						✓	✓	
Inkweed*	✓															
Kangaroo Grass										✓	✓					✓
Kurrajong										✓		✓		✓		✓
Lesser Joyweed	✓		✓													
Lightwood							✓			✓	✓	✓	✓		✓	✓
Long-leaved Box										✓						✓
Many-flowered Mat-rush								✓		✓	✓					✓
Mugga Ironbark															✓	
Mulga Fern							✓	✓			✓	✓		✓		✓
Noogoora Burr*	✓															
Narrawa Burr							✓									
Narrow-leaved Hopbush									✓				✓			✓
Native Geranium									✓				✓			✓
Paspalum*	✓		✓	✓												
Paterson's Curse*	✓			✓		✓										
Peppercorn Tree*											✓					
Phalaris*	✓															
Pinrush									✓			✓				
Plumed Spear Grass											✓		✓			
Prickly Lettuce*	✓															
Purple Coralpea								✓								
Purpletop*	✓	✓														
Quaking Grass*		✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Red Box									✓						✓	✓
Red Stringybark										✓	✓		✓		✓	✓
Red-leg Grass							✓	✓			✓	✓	✓			
Ribwort*	✓			✓		✓				✓						
Rigid Panic											✓	✓				

Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Rock Fern							✓	✓			✓		✓	✓	✓	✓
Rock Isotome							✓	✓	✓				✓			✓
Rice Flower													✓			
River Red Gum	✓	✓	✓	✓		✓										
Sharp Buttercup*	✓															
Silver Wattle									✓				✓			✓
Small-leaved Bush-pea													✓	✓		
Smooth Flax-lily								✓								
Spear Grass										✓	✓	✓				
Spear Thistle*	✓	✓		✓												
Soursob*	✓															
St. John's Wort*										✓	✓		✓			✓
Sticky Everlasting							✓	✓	✓							
Sweet Briar *	✓								✓							✓
Sweet Bursaria																✓
Tall Rush			✓	✓												
Twiggy Mullein*													✓			
Yellow Rush-lily							✓									
Wattle Mat-rush													✓			✓
Wheat Grass										✓						
Wild Tobacco*	✓			✓	✓											
Wiregrass							✓	✓				✓	✓			
White Box									✓	✓	✓	✓	✓	✓	✓	✓
White Cedar*										✓						
White Cypress Pine								✓				✓				
White-top Wallaby Grass					✓					✓	✓	✓				
Species richness	20	7	5	7	5	7	13	14	15	20	17	15	25	11	13	27

3.4 Location of threatened species

Five threatened species were recorded during the field surveys in this study (Table 8). Additional location records of some of the species detected in this study, as well as records of other threatened species not detected in this study were obtained during a review of the literature. All of these records, along with the GPS location, date of each sighting and additional information for each record is listed in Table 8.

Table 8. Location of threatened flora and fauna in Splitlers Creek watershed.

(Note: # = records not currently registered in the NSW wildlife atlas database but obtained during the literature review. Records of threatened species contained in the NSW wildlife atlas database are not included in this table)

Species	GPS location	Area	Date	Comments
Pink-tailed Worm Lizard #	0488317 6010734	Water View Lookout	Oct 2007	One individual recorded (D. Michael pers. obs.)
Crimson Spider Orchid #	0487911 6012759	Calandenia Ridge	Spring 2007	One individual recorded (N. Jones pers. comm.)
Gang-gang Cockatoo #	0487911 6013007	Nail Can Hill	June 2008	Approx 6 recorded (D. Michael pers. obs.)
Gang-gang Cockatoo #	0486588 6010515	"Nerrina"	2006	Occasional observations (A. Howitt pers. comm.)
Brown Treecreeper	0486763 6008300	Wonga Wetlands	28.3.2009	4 individuals recorded behind main office buildings

Species	GPS location	Area	Date	Comments
Brown Treecreeper	0484328 6010092	Dwight's Hill	6.4.2009	Four individuals recorded on Riverina Highway
Brown Treecreeper	0486776 6010385	Crown Land Reserve	6.4.2009	Two individuals recorded near lower slope
Brown Treecreeper	0486733 6010459	Crown Land Reserve	6.4.2009	Two individuals recorded along Bretton creek
Brown Treecreeper	0485526 6011935	"Rochhurst"	7.4.2009	One individual observed in tree near house
Brown Treecreeper	0485596 6013085	Lot 6 DP 877013	7.4.2009	Four individuals along creek
Brown Treecreeper	0486202 6013215	Romero Fire trail	7.4.2009	Up to six individuals on hilltop
Swift Parrot #	0486588 6010515	"Nerrina"	2006	A pair seen near house (A. Howitt pers. comm.)
Hooded Robin #	0486588 6010515	"Nerrina"	2007	Often seen near house. (A. Howitt pers. comm.)
Hooded Robin	0486042 6013525	Lot 6 DP 877013	7.4.2009	One seen along creek near Hume boundary
Black-chinned Honeyeater #	0488222 6011798	Nail Can Hill	2003	Five seen on Nail Can Hill (D. Michael pers. obs.)
Turquoise Parrot #	0487464 6014109	Lot 1.	2008	Pair seen feeding (D. Michael pers. obs.)
Turquoise Parrot #	0486588 6010515	"Nerrina"	- 2008	Regularly sighted (A. Howitt pers. comm.)
Blue-billed Duck #	0486777 6008099	Wonga Wetlands	2001	Occasionally on wetlands (M. Herring pers. comm.)
Squirrel Glider #	0486588 6010515	"Nerrina"	- 2006	One sighted near house (A. Howitt pers. comm.)
Squirrel Glider #	0485526 6011935	"Rochhurst"	2005/2006	One injured & two dead (D. Bartram pers. comm.)
Squirrel Glider #	0485799 6012566	T. Fraser	2009	One found dead near house (D. Ryan pers. comm.)
Squirrel Glider #	0486590 6012823	D. Ryan	2006	Three seen on Splitlers Creek (D. Ryan pers. comm.)
Squirrel Glider #	0487277 6008046	Waterview Road	2007	One dead (J. Hawking pers. comm.)
Squirrel Glider	0485142 6006859	NSW State Forest	6.4.2009	One seen feeding in plantation
Squirrel Glider #	0486835 6012811	Tony Tinlin	1997	Young handed to Albury vet (T. Tinlin pers. comm.)
Speckled Warbler	0486733 6010459	Crown Reserve	6.4.2009	One seen along creek, often seen by A. Howitt
Speckled Warbler	0485944 6013382	Lot 6 DP 877013	7.4.2009	Two seen along creek
Woolly Ragwort #	0489154 6012773	Lot 2 "Caladenia"	2003	One plant recorded (P. Scannell pers. comm.)
Diamond Firetail	0486653 6010220	"Nerrina"	6.4.2009	One heard calling, often near house (A. Howitt)
Freckled Duck #	0486777 6008099	Wonga Wetlands	Post 2000	One record from Wonga (M. Herring pers. comm.)

3.5 Threatened species habitat requirements

The ecological habitat requirements of some species found in the watershed are documented in the scientific literature, or have been the subject of intensive post-graduate research studies (e.g. Pink-tailed Worm Lizard, Squirrel Glider and Barking Owl). However, for many species, basic ecological requirements are poorly understood. This may be because many of these species are naturally rare and a paucity of records has prevented detailed statistical habitat modelling from being undertaken. However, it is possible to define the habitat requirements of most species in broad terms (Table 9). Appraisal of threatened species habitat in the watershed revealed the area contained abundant suitable habitat for the following eleven species: 1) Pink-tailed Worm Lizard, 2) Crimson Spider Orchid, 3) Brown Treecreeper, 4) Hooded Robin, 5) Black-chinned Honeyeater, 6) Large-footed Myotis, 7) Turquoise Parrot, 8) Barking Owl, 9) Squirrel Glider, 10) Speckled Warbler, and 11) Diamond Firetail. Predicted distribution maps for these species, including known location records, are provided in Appendix 8. Furthermore, the study area contained suitable foraging habitat for the Swift Parrot, Regent Honeyeater and Superb Parrot. Their potential occurrence in the study area is determined by the distribution of flowering eucalypts during the species associated seasonal activity in southern NSW. Therefore, predicted distribution maps for these and poorly known species were not mapped.

Table 9. Broad habitat requirements of threatened species known and potentially occurring in the Splitters Creek watershed.

Common name	Scientific name	Broad habitat requirements
River Swamp Wallaby Grass	<i>Amphibromus fluitans</i>	Permanent and ephemeral creeks, lagoons
Pink-tailed Worm Lizard	<i>Aprasia parapulchella</i>	Dinner-plate sized surface rocks, <i>Iridomyrmex</i> (small black) ant species
Australasian Bittern	<i>Botaurus poiciloptilus</i>	Dense stands of Cumbungi and Common Reed along lagoons
Bush Stone Curlew	<i>Burhinus grallarius</i>	Open woodlands with fallen timber and low native grass
Crimson Spider Orchid	<i>Caladenia concolor</i>	Microhabitat not known
Gang-gang Cockatoo	<i>Callocephalon fimbriatum</i>	Large areas of vegetation, hollow-bearing trees
Glossy Black-cockatoo	<i>Calyptrorhynchus lathamii</i>	Large areas of Drooping Sheoke, hollow-bearing trees
Brown Treecreeper	<i>Climacteris picumnus</i>	Hollow-bearing trees, fallen timber
Sloane's Froglet	<i>Crinia slonei</i>	Open expanses of still water, lagoons
Spotted-tailed Quoll	<i>Spotted-tailed Quoll</i>	Rocky gorges, and tree lined gullies
Striped Legless Lizard	<i>Delma impar</i>	Lowland native and secondary grasslands
Painted Honeyeater	<i>Grantiella picta</i>	Flowering eucalypts and mistletoe
Brolga	<i>Grus rubicunda</i>	Wetlands, open farmland, stubble crops
Swift Parrot	<i>Lathamus discolor</i>	Large areas of flowering White Box trees
Southern Bell Frog	<i>Litoria raniformis</i>	Permanent water bodies, wetlands
Hooded Robin	<i>Melanodryas cucullata</i>	Open woodlands with complex structured vegetation and low branches.
Black-chinned Honeyeater	<i>Meliphreptus gularis</i>	Large mature trees and large areas of flowering eucalypts
Large-footed Myotis	<i>Myotis macropus</i>	Open expanses of water, lagoons, river systems
Turquoise Parrot	<i>Neophema pulchella</i>	Hollow-bearing trees, stumps and native grass
Barking Owl	<i>Ninox connivens</i>	Large hollow-bearing tree, high density of possums or waterbirds
Powerful Owl	<i>Ninox strenua</i>	Large hollow-bearing tree, high density of possums
Blue-billed Duck	<i>Oxyura australis</i>	Wetlands
Squirrel Glider	<i>Petaurus norfolcensis</i>	Large hollow-bearing trees, wattle thickets
Koala	<i>Phascolarctos cinereus</i>	Large area of forest
Austral Pillwort	<i>Pilularia novaehollandiae</i>	Wetlands
Superb Parrot	<i>Polytelis swainsonii</i>	Large flowering eucalypt trees, hollows
Grey Crowned Babbler	<i>Pomatostomus temporalis</i>	Open woodlands with regeneration, cypress pine stands
Speckled Warbler	<i>Pyrrholaemus sagittatus</i>	Shrubby understorey
Painted Snipe	<i>Rostratula banghalensis</i>	Reed lined wetlands
Woolly Ragwort	<i>Senecio garlandii</i>	Rocky areas, particularly at the base of rock shelves and cliffs
Diamond Firetail	<i>Stagonopleura guttata</i>	Open grassy woodlands, native grasses
Freckled Duck	<i>Stictonetta naevosa</i>	Wetlands
Regent Honeyeater	<i>Xanthomyza phrygia</i>	Large flowering eucalypt trees, introduced eucalypts

3.6 Vegetation error mapping

Discrepancies in vegetation mapping were marked on an aerial photograph for inclusion in future mapping projects (Appendix 7). The major errors identified were a result of vegetation cover not being comprehensively mapped and interpretation of the boundaries between Riverine forest / woodland, Box-gum woodland and Dry Foothill-forest vegetation types. There was some difficulty in assigning foot-hill vegetation to a particular vegetation type in the Splitters Creek watershed. This was because two of the dominant overstorey species associated with Box-gum Woodland - White Box and Blakely's Red Gum, also occur on the slopes with Red Stringybark, which is one of the dominant overstorey species associated Dry Foothill-forest. In addition, some areas mapped as Dry Foothill-forest are entirely comprised of stunted

Blakely's Red Gum (Note: they may however be Tumbledown Gum *Eucalyptus dealbata* and can only be verified by seeds which were not available). Hence, the amount of Box-gum woodland corrected in this study may be conservative, as other northern facing slopes not surveyed may contain Box-gum woodland species. Therefore, to comprehensively and accurately map the vegetation occurring along all of the valleys, slopes, ridges and plateaux located in the north-eastern parts of the watershed dozens of additional vegetation plots will be necessary. This was beyond the scope of this study.

4.0 DISCUSSION

This study has revealed a diverse and rich biodiversity within the Spliters Creek watershed. The number of threatened species, as well as the total number of plant and animals species documented in this study, highlights the high conservation value of the watershed. Few places exist in the Murray River catchment management area that support as many threatened species as the Spliters Creek watershed. The main reason for such high species diversity is due to the collective influence many different environments can have on total biodiversity in any given area. For example, a different set of species are found in Wonga Wetlands throughout the year compared with those found on the Nail Can Hill range. Collectively, these structurally different environments are the key reason the watershed is biologically rich and diverse. In the following sections, key assets and associated threats to biodiversity are discussed.

4.1 Assets and threats

Spliters Creek watershed has a number of assets of importance, in particular, high biological diversity and a large number of threatened species. In the following section these and additional assets are discussed in detail, significant threats are identified and specific recommendations are made.

4.1.1 Biodiversity of Nail Can Hill and adjoining land parcels

The Nail Can Hill Flora and Fauna Reserve, crown land reserves and adjoining land parcels are managed by the Department of Lands, the Albury City Council as well as private landholders (Fig 4). These hills are important for the following main reasons:

- They contain significant areas of a threatened ecological vegetation community known as White Box, Yellow Box, Blakely's Red Gum Woodland.
- They are the most significant area of continuous native vegetation in the Albury LGA.
- The vegetation community, plant species and geology is unique to the Murray River catchment area.
- They contain threatened plants such as the Woolly Ragwort and Crimson Spider Orchid.
- They contain the largest known population of the threatened Pink-tailed Worm Lizard in NSW.
- They contain significant habitat for threatened birds, including the Brown Treecreeper, Hooded Robin, Speckled Warbler, Barking Owl and Turquoise Parrot.



Figure 4. Nail Can Hill Flora and Fauna Reserve and adjoining foothills are an important environment for threatened plants and the Pink-tailed Worm Lizard. Pictured is typical Pink-tail Worm Lizard habitat.

Threats: The main threats to the biodiversity of this area include:

- Disturbance to reptile habitat and ground cover vegetation by feral pigs and goats. Pigs and evidence of their substantial diggings were observed during a survey of Lot 1 in 2008 (D. Michael pers. obs). Goats have been seen in the ranges by a number of landholders.
- Disturbance to reptile habitat and ground cover vegetation by off-road bikes and mountain bikes.
- Predation on reptiles, birds and small mammals by foxes, feral and domestic cats.
- Removal of surface rocks.
- Firewood collection.
- Overgrazing vegetation and seedling suppression by livestock.
- Soil erosion and disturbance caused by track construction and fire breaks
- Noxious and environmental weed infestations.
- Barbed-wire entangling wildlife, including gliders, wallabies, kangaroos and bats.
- Inappropriate development resulting in native vegetation clearing.

Recommendations:

- Develop and implement a co-ordinated pest control program targeting feral pigs, goats, foxes and feral cats.
- Educate landholders about responsible pet ownership.
- Encourage local government to adopt a cat curfew policy.
- Encourage landholders to report illegal off-road bike activity.
- Educate landholders on the impact of bush rock removal and firewood collection.
- Educate landholders on sustainable grazing methods.
- Develop a barbed-wire removal program.

- Control environmental and noxious weeds.
- Limit construction of new tracks and trails. Ensure any new trails avoid Pink-tailed Worm Lizard and Crimson Spider Orchid habitat. Ensure erosion and sediment control is undertaken if new tracks are to be created.
- Ensure ecologically sustainable design and development is adhered to for any new housing development. Comprehensive flora and fauna surveys, at the appropriate times of the year, should be undertaken prior to any development approval.
- Avoid placing infrastructure and housing developments in locations that would result in clearing native vegetation.
- Encourage the use of native plant species in home landscaping designs.

4.1.2 State Forests hardwood plantation

The NSW State Forests manage 80 ha of irrigated Flooded and River Red Gum plantations situated on the Murray floodplain (Fig 1). These plantations are important for the following reasons:

- They filter water from the Albury sewerage treatment ponds and run off from the Spliters Creek water catchment.
- They support an abundant suite of small insectivorous bird species that are comparatively less common on the Albury ranges. Some of which include, the Red-capped Robin, Brown-headed Honeyeater, Red-browed Finch, Superb Fairy Wren, Silvereye and Striated Thornbill.
- They support mammal and reptile species that are comparatively less common on the Albury ranges, such as the Black Wallaby, Yellow-footed Antechinus, Ring-tailed Possum and Garden Skink.
- They provide significant foraging habitat for the threatened Squirrel Glider.
- They provide a population source enabling species to disperse into the surrounding landscape.
- They provide an ideal release site for rehabilitated species because of water availability, distance from roads, access to hollows and adequate cover.
- They may play a significant role in sequestering carbon in the catchment.



Figure 1. Flooded Gum and River Red Gum plantations support abundant small insectivorous birds, Yellow-footed Antechinus, Black Wallaby, Garden Skinks and Squirrel Gliders. Note the size difference between the two tree species. This structural difference is an important determinant of what fauna species they support.

Threats: The main threats to the biodiversity of this environment are:

- Harvesting of the plantation. The loss of these plantations would have significant short and long-term negative impacts on the abundance of species that utilise the area, including the threatened Squirrel Glider.
- Blackberry infestation. Blackberry thickets in these plantations provide a seed source that can be spread by birds to other parts of the watershed and further downstream via the Murray River.

Recommendations:

- Ensure the plantations are not harvested or only partially harvested and replacement stands planted.
- Undertake a noxious and environmental weed control program, specifically target Blackberries.
- Undertake a Fox baiting program.

4.1.3 Wonga Wetlands

The Albury City Council manages the Wonga Wetlands situated on the Murray floodplain (Fig 2). The wetlands are important for the following reasons:

- They filter water from the Albury sewerage treatment ponds and run-off from the Spliters Creek water catchment.
- They are an important stopover and foraging environment for international migratory wading birds.
- They contain numerous large hollow-bearing trees and support high densities of arboreal marsupials.
- They contain significant populations of the Platypus.

- They contain significant populations of the Broad-shelled Turtle.
- They contain a number of records of threatened species, including the Squirrel Glider, Australasian Bittern, Sloane's Froglet, Brown Treecreeper, Barking Owl, Austral Pillwort and Swamp Wallaby Grass.



Figure 2. Cook's Lagoon is one of the main natural lagoons in Wonga Wetlands and supports species such as the Platypus, Broad-shelled Turtle and a range of waterbirds. Over the last few years over a dozen Broad-shelled Turtle road killed individuals have been recorded along the Riverina Highway adjacent to Wonga Wetlands. Note the fully formed egg and ovarian follicles near the head.

Threats: The main threats to the biodiversity of the wetlands are:

- Noxious and environmental weeds which compete with native species and choke wetlands.
- Predation by the pest animals, primarily the fox, on turtles and their eggs.
- Barbed-wire fencing which can entangle Squirrel Gliders. Squirrel Gliders have been found entangled in barbed-wire fencing along Waterview Road. Preliminary measures have since been taken to prevent this from occurring in one area.
- Road-killed wildlife. Turtles, especially the Broad-shelled Turtle are hit by traffic along the Riverina Highway adjacent to the wetlands. These events are common following summer rainfall and mostly involve females carrying eggs.

Recommendations:

- Prevent new infestations of noxious and environmental weeds and control existing weed infestations.
- Develop a pest animal control program.
- Develop a barbed-wire removal program and in the interim, fences bisecting Glider flight paths should be covered with plastic poly-pipe.

- Install signage along the Riverina Highway adjoining the wetlands alerting road users to a turtle crossing.
- Regularly check that road culverts are cleared of silt and debris to allow for turtle movements under the road.

4.1.4 Dwight's Hill roadside corridor

Dwight's Hill roadside is managed by the Albury City Council and is situated on the western side of Spliters Creek watershed along the Riverina Highway (Fig 3). The area is important for the following reasons:

- It contains high densities of large hollow-bearing trees and natural regrowth.
- It is an excellent example of high quality grassy Box-gum woodland in the watershed.
- It contains an area of Kangaroo Grass suitable for seed collection.
- It supports a population of the threatened Brown Treecreeper.
- It forms part of an important habitat corridor linking vegetation with Wonga Wetlands.



Figure 3. Dwight's Hill roadside remnant grassy Box-gum woodland supports large hollow-bearing trees, patches of Kangaroo Grass, Brown treecreepers and a range of native wildflowers. Road kill is common along this stretch of road. Pictured is a road kill Echidna found during the study.

Threats: The main threats to the biodiversity of this area include:

- Invasion by woody weeds such as the Date Palm, European Olive, Asparagus and introduced Black Wattle.
- Road-killed wildlife. Due to the high traffic, collisions with native fauna are a common event along this stretch of the road (D. Michael, pers. obs).

Recommendations:

- Remove all noxious, environmental weeds and non-indigenous wattle species.
- Revegetate the understorey with local species such as Bursaria, Kangaroo Thorn and Golden Wattle to improve structure and habitat value.
- Install road signage along the Riverina Highway depicting this area as a wildlife crossing.

4.2.5 Splitters Creek riparian vegetation corridor

Splitters Creek and associated riparian vegetation is owned and managed by private landholders (Fig 5). The corridor begins in the Albury Hills and terminates on the Murray floodplain. This vegetation corridor is important for the following reasons:

- The mid to upper sections of Splitters Creek support a significant population of Squirrel Gliders
- It has the potential to facilitate movement by native fauna from the hills to the floodplain.
- It may provide significant seasonal habitat for the locally rare Carpet Python.
- It provides suitable habitat for threatened Brown Treecreepers.
- The vegetation along the creek helps prevent erosion and enhances water quality.



Figure 5. Splitters Creek riparian corridor and adjacent properties support populations of the threatened Squirrel Glider.

Threats: The main threats to biodiversity of this area include:

- Barbed-wire fencing which can entangle Squirrel Gliders. A number of landholders along Splitters Creek north of Odewahn Road reported finding gliders caught in fences or found dead on their properties over the last five years.
- Predation by feral and domestic cats. It is likely that domestic cats are responsible for some of the glider fatalities.
- Road killed wildlife. A Carpet Python was accidentally killed in a collision with a vehicle near the fire shed in 2008.
- Discontinuous vegetation along the corridor. Breaks in the vegetation corridor cause gliders to cross open ground, making them more susceptible to predation by pest animals.
- Damage to streambank vegetation from unrestricted stock access.

Recommendations:

- Develop a barbed-wire removal program. In the interim, fences bisecting obvious Glider flight paths should be covered with plastic poly-pipe. Glider flight paths along the creek typically span 40 m - 60 m and contain areas with large, hollow-bearing trees, wattle species and introduced native species such as Spotted Gum, Yellow-scented Gum and Ribbon Gum. Barbed-wire fencing that bisects these types of habitat should be immediately covered with plastic poly-pipe.
- Encourage responsible pet ownership and conduct education campaign to encourage landholders to keep cats indoors at night.
- Install nest boxes, specifically designed for gliders, along Splitters Creek to compensate for lack of den sites due to low numbers of hollow bearing trees in this area. Nest boxes can be an important conservation tool, as well as an engaging social activity.
- Rabbit burrows should only be ripped during winter months when pythons are least likely to be sheltering in them. In the absence of native ground-dwelling mammals, pythons rely almost entirely on introduced species such as mice and rabbits. They also spend significant amounts of time sheltering in rabbit burrows during the summer months and will usually migrate into hilly areas during the winter months, where they shelter in rock crevices or tree hollow and logs.
- Fence both sides of creek to allow for revegetation and to provide control over stock access. Allow only short-term light grazing for fuel reduction and weed control purposes.
- Revegetate cleared sections of the creek with local plant species to increase connectivity. Include species such as Silver Wattle and Apple Box which provide habitat for Squirrel Gliders.

4.2.6 Multi-aged Mugga Ironbark community

The discovery of a multi-aged Mugga Ironbark community was surprising as the nearest known populations are in Chiltern-Mount Pilot National Park, Victoria, approximately 25 km to the south-west. The stand was located within site 15 (GPS 0486202 6013215) and consisted of approximately 150 tree stems spread over a 5 ha area along a rocky ridge line. At least 10 trees measured greater than 80 cm diameter at breast height (DBH) and contained large dead branches with hollow-bearing cavities (Fig 6). These trees may be in excess of 150-180 years old. A second cohort of trees measured between 20 cm – 30 cm DBH and was found growing on old, mining spoil dumps. The combination of old growth trees with hollows, post mining regenerated trees and recently regenerated saplings, suggest this patch of Ironbarks represents a remnant community situated between the Chiltern and the NSW Ladysmith populations. The stand of trees is important for the following reasons:

- Ironbark trees often flower during winter months and are an important food source for threatened species, including Painted and Regent Honeyeaters, Swift Parrots and Squirrel Gliders.
- The numerous cavities provide den-sites for Squirrel Gliders and shelter sites for Carpet Pythons.
- It is the only known stand of remnant Ironbark trees in the entire Murray River catchment.



Figure 6. Old growth Mugga Ironbark trees found growing in Spliters Creek watershed. Note the dead branches, cavities and the size of the clipboard in relation to the trunk diameter on the right.

Threats: The main threats to this stand of trees are:

- Overgrazing and seedling suppression by livestock and rabbits.
- Natural senescence of the mature trees.

Recommendations:

- Minimise grazing. Allow only short-term light grazing for fuel reduction and weed control purposes.
- Educate landholders on sustainable grazing methods.
- Fence-off the Ironbark stand and monitor seedling recruitment.
- Ensure that dead, hollow-bearing trees are left standing as they will continue to provide important den-sites for Squirrel Gliders and other hollow-dependant fauna.

4.2.7 Gorges and rocky valleys

Gorges and rocky valleys are common in the northern parts of the watershed. Here, steep-sided valleys are lined by basalt and boulder strewn creek beds and support moist seepages, small waterfalls, rock pools, rock platforms and rock shelves (Fig 7). These areas are important for the following reasons:

- They provide a moist environment for mesic-adapted plants such as Necklace Fern, Blanket-leaf Fern, sedges and other species that require cool, damp micro-environments.
- They provide habitat for frog species such as Bibron's Toadlet, Smooth Toadlet and the Wrinkled Toadlet.

- They provide a relatively undisturbed environment with numerous rock crevices and large hollow-bearing trees suitable for the Inland Carpet Python.
- The rock pools provide an important source of water for fauna.



Figure 7. Steep-sided gorges, waterfalls and rock pools provide important habitat for small ground-dwelling frogs such as Bibron's Toadlet.

Threats: The main threats to this environment are:

- Unrestricted stock access and overgrazing.
- Stock causing erosion to the creek bank.
- Pollution of the rock pools by animal faeces.
- Disturbance to moist soil areas by livestock (moist soil areas near creek flats are an important habitat used by ground-dwelling frogs for shelter, breeding and egg-laying sites).
- Noxious and environmental weed infestation, in particular Sweet Briar.
- Bush rock removal and firewood collection.

Recommendations:

- Avoid overgrazing sensitive creek areas and where possible restrict stock access during periods of heavy rain and during the spring frog breeding season.
- Develop a noxious and environmental weed control program.
- Educate landholders on the impact of bush rock removal and firewood collection.

5.0 SUMMARY AND FINAL RECOMMENDATIONS

This study has identified Splitters Creek watershed to be of exceptionally high conservation value and a biologically important asset within the Albury Local Government Area, as well as the Murray River catchment management area in general. The watershed contains many different environments, spanning the Murray floodplain to the Nail Can Hill range, and supports a high number of threatened species, a rich biological diversity and incorporates many different geological features. The watershed is a stronghold for migratory birds and a number of threatened species, including the Barking Owl, Brown Treecreeper and Squirrel Glider. The watershed also contains many areas of potentially suitable Pink-tailed Worm Lizard habitat. Future surveys during spring months will be required to establish the presence of these and other threatened species in the area. A summary of recommendations to ameliorate threats to the Splitters Creek biodiversity include:

- Removal of barbed-wire fencing. Short-term actions could include covering glider flight paths with plastic poly-pipe.
- Educate landholders on the benefit of responsible pet ownership and encourage landholders and local government to adopt cat curfews.
- Encourage landholders to erect nest boxes that are specifically designed for Squirrel Gliders.
- Educate landholders on the impact of bush rock removal; in particular 'plate-sized' surface rocks used by the Pink-tailed Worm Lizard.
- Noxious and environmental weed control along the 'Dwights Hill' roadside vegetation corridor and Wonga Wetlands.
- Pest animal control, particularly targeting pigs, goats and feral cats in the ranges and foxes on the floodplain.
- Limit the construction of tracks and fire trails in vegetated parts of the study area and ensure adequate erosion and sediment control is installed.
- Limit urban development and encourage native plant species to be used in future landscaping.
- Revegetate understorey on Dwight's Hill, Riverina Highway and overstorey along Splitters Creek.
- Encourage landholders to report sightings of native species, particularly gliders and Carpet Pythons to the NSW National Parks and Wildlife Service.

A number of landholders within the Splitters Creek watershed showed concern and a genuine interest in biodiversity conservation and land degradation issues during this study. Many of these landholders have begun addressing some of the land management problems associated with soil erosion and native vegetation cover through tree planting programs. Future tree planting programs should be guided by the latest scientific information available to maximise the use by native species (see Munroe *et al.* 2007; Lindenmayer *et al.* in press). With the continued support of landholders it will be possible to address many of the threats identified in this report.

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Appendix 1. Frog species known and potentially occurring in the Splitlers Creek watershed, including information on conservation status in the watershed, core distribution and year of last record.

Common Name	Scientific Name	Status in Watershed	Core Distribution	This Study	Source	Year
Myobatrachidae						
Common Froglet	<i>Crinia signifera</i>	Common resident	Wonga Wetlands	Yes	1, 2	2009
Plains Froglet	<i>Crinia parainsignifera</i>	Common resident	Wonga Wetlands	Yes	1, 2, 3	2009
Sloane's Froglet	<i>Crinia sloanei</i>	Uncommon resident	Wonga Wetlands		1, 3	2001
Banjo Frog	<i>Lymnodynastes dumerilii</i>	Common resident	Wonga Wetlands		2, 3	2008
Barking Marsh Frog	<i>Lymnodynastes fletcheri</i>	Potential resident	NA		NA	NA
Giant Pobblebonk	<i>Lymnodynastes interioris</i>	Uncommon resident	Wonga Wetlands		1, 3	1994
Spotted Marsh Frog	<i>Lymnodynastes tasmaniensis</i>	Common resident	Wonga Wetlands		1, 2, 3	2009
Painted Burrowing Frog	<i>Neobatrachus sudelli</i>	Uncommon resident	Wonga Wetlands		2	2003
Bibron's Toadlet	<i>Pseudophryne bibroni</i>	Uncommon resident	Wonga Wetlands	Yes	3	2009
Smooth Toadlet	<i>Uperoleia laevigata</i>	Uncommon resident	Wonga Wetlands		1, 2	2003
Wrinkled Toadlet	<i>Uperoleia rugosa</i>	Uncommon resident	Wonga Wetlands		4	2008
Hylidae						
Brown Tree Frog	<i>Litoria ewingii</i>	Common resident	Wonga Wetlands		3	1994
Plains Brown Tree Frog	<i>Litoria paraewingii</i>	Potential resident	NA		NA	NA
Peron's Tree Frog	<i>Litoria peronii</i>	Common resident	Wonga Wetlands	Yes	1	2009
Sources: 1) D. Michael unpublished data; 2) Nail Can Hill Community Biodiversity Survey (2003); 3) NSW NPWS wildlife atlas 4) P. Scannell pers. comm.						

Appendix 2. Reptile species known and potentially occurring in the Spliters Creek watershed, including information on conservation status in the watershed, core distribution and year of last record.

Common Name	Scientific Name	Status in Watershed	Core Distribution	This Study	Source	Year
Cheluidae						
Broad-shelled Turtle	<i>Chelodina expansa</i>	Uncommon resident	Wonga wetlands	Yes	1,4	2009
Snake-necked Turtle	<i>Chelodina longicollis</i>	Common resident	Wonga wetlands	Yes	3,4	2009
Macquarie Turtle	<i>Emydura macquarii</i>	Common resident	Wonga wetlands	Yes	4	2009
Gekkonidae						
Marbled Gecko	<i>Christinus marmoratus</i>	Common resident	Residential, Nail Can Hill	Yes	2	2009
Eastern Stone Gecko	<i>Diplodactylus vittatus</i>	Potential resident	NA		NA	NA
Pygopodidae						
Pink-tailed Worm Lizard	<i>Aprasia parapulchella</i>	Uncommon resident	Nail Can Hill		5	2007
Olive Legless Lizard	<i>Delma inornata</i>	Common resident	Residential, Nail Can Hill		5	2006
Burton's Legless Lizard	<i>Lialis burtonis</i>	Uncommon resident	Residential, Nail Can Hill		5	2004
Scincidae						
Rainbow Skink	<i>Carlia tetradactyla</i>	Common resident	Residential, Nail Can Hill	Yes	5	2009
Wall Skink	<i>Cryptoblepharus carnabyi</i>	Uncommon resident	Residential, Nail Can Hill	Yes	2	2009
Striped Skink	<i>Ctenotus robustus</i>	Common resident	Residential, Nail Can Hill	Yes	2	2009
Copper-tailed Skink	<i>Ctenotus taeniolatus</i>	Uncommon resident	Nail Can Hill		2	2003
Cunningham's Skink	<i>Egernia cunninghami</i>	Potential resident	NA		NA	NA
Crevice Skink	<i>Egernia striolata</i>	Uncommon resident	Residential, Nail Can Hill	Yes	2	2009
Heatwole's Water Skink	<i>Eulamprus heatwolei</i>	Common resident	Wonga wetlands		1	2007
Three-toed Skink	<i>Hemiergis decresiensis</i>	Uncommon resident	Nail Can Hill		2	2003
Garden Skink	<i>Lampropholis guichenoti</i>	Uncommon resident	Wonga wetlands	Yes	1	2009
Bougainville's Skink	<i>Lerista bougainvillii</i>	Potential resident	NA		NA	NA
Dwarf Skink	<i>Menetia greyii</i>	Common resident	Residential, Nail Can Hill		5	2007
Boulenger's Skink	<i>Morethia boulengeri</i>	Common resident	Residential, Nail Can Hill	Yes	2	2003
Common Blue-tongue	<i>Tiliqua scincoides</i>	Common resident	Residential, Nail Can Hill		2	2003
Agamidae						
Jacky Lizard	<i>Amphibolurus muricatus</i>	Uncommon resident	Nail Can Hill		5	2008
Nobbi Dragon	<i>Amphibolurus nobbi</i>	Common resident	Nail Can Hill		2	2003
Bearded Dragon	<i>Pogona barbata</i>	Uncommon resident	Residential, Nail Can Hill		5	2005
Varanidae						
Lace Monitor	<i>Varanus varius</i>	Common resident	Residential, Nail Can Hill		5	2008
Typhlopidae						
Woodland Blindsnake	<i>Ramphotyphlops proximus</i>	Potential resident	NA		NA	NA
Pythonidae						
Inland Carpet Python	<i>Morelia spilota mectalei</i>	Rare resident	Murray, Nail Can Hill		6	2008
Elapidae						
Yellow-faced Whip Snake	<i>Demansia psammophis</i>	Potential resident	NA		NA	NA
Eastern Tiger Snake	<i>Notechis scutatus</i>	Uncommon resident	Wonga wetlands		3	1994
Dwyer's Snake	<i>Parasuta dwyeri</i>	Uncommon resident	Nail Can Hill		NA	NA
Red-bellied Black Snake	<i>Pseudechis porphyriacus</i>	Common resident	Wonga wetlands		3	2004
Eastern Brown Snake	<i>Pseudonaja textilis</i>	Common resident	Residential, Nail Can Hill		5	2008
Eastern Bandy Bandy	<i>Vermicella annulata</i>	Uncommon resident	Nail Can Hill		6	2004
Sources: 1) D. Michael unpublished data; 2) Nail Can Hill Community Biodiversity Survey (2003); 3) NSW NPWS wildlife atlas 4) K. Hodges pers. comm.; 5) D. Michael published data; 6) local residents personal observations						

Appendix 3. Mammal species known and potentially occurring in the Spliters Creek watershed, including information on conservation status in the watershed, core distribution and year of last record.

Common Name	Scientific Name	Status in Watershed	Core Distribution	This Study	Source	Year
Ornithorhynchidae						
Platypus	<i>Ornithorhynchus anatinus</i>	Common resident	Wonga wetlands		1,3	2008
Tachyglossidae						
Echidna	<i>Tachyglossus aculeatus</i>	Common resident	Widespread	Yes	1,5	2009
Dasyuridae						
Spotted-tailed Quoll	<i>Dasyurus maculatus</i>	Potential vagrant	NA		3	2002
Brush-tailed Phascogale	<i>Phascogale tapoatafa</i>	Unlikely resident	NA		NA	NA
Yellow-footed Antechinus	<i>Antechinus flavipes</i>	Uncommon resident	Nail Can Hill	Yes	3	2009
Vombatidae						
Wombat	<i>Vombatus ursinus</i>	Uncommon resident	Nail Can Hill		5	NA
Peturidae						
Sugar Glider	<i>Petaurus breviceps</i>	Uncommon resident	Wonga wetlands		3	1994
Squirrel Glider	<i>Petaurus norfolcensis</i>	Uncommon resident	Residential	Yes	3,5	2009
Pseudocheiridae						
Common Ringtail Possum	<i>Pseudocheirus peregrinus</i>	Common resident	Widespread	Yes	3,5	2009
Acrobatidae						
Feathertail Glider	<i>Acrobates pygmaeus</i>	Potential resident	NA		NA	NA
Phalangeridae						
Common Brushtail Possum	<i>Trichosurus vulpecula</i>	Common resident	Widespread	Yes	2	2000
Macropodidae						
Grey Kangaroo	<i>Macropus giganteus</i>	Common resident	Widespread	Yes	1,5	2009
Black Wallaby	<i>Wallabia bicolor</i>	Common resident	Wonga wetlands	Yes	2,5	2009
Pteropodidae						
Little Red Flying Fox	<i>Pteropus scapulatus</i>	Uncommon	Wonga wetlands		5	2005
Molossidae						
Little Mastiff Bat	<i>Mormopterus planiceps</i>	Uncommon	Wonga wetlands		3,4	2007
White-striped Mastiff	<i>Nyctinomus australis</i>	Common	Widespread	Yes	1,3	2009
Vespertilionidae						
Lesser Long-eared Bat	<i>Nyctophilus geoffroyi</i>	Common	Nail Can Hill		4	2008
Gould's Wattled Bat	<i>Chalinolobus gouldii</i>	Common	Wonga wetlands		3,4	2007
Chocolate Wattled Bat	<i>Chalinolobus morio</i>	Common	Wonga wetlands		3,4	1994
Large-footed Myotis	<i>Myotis macropus</i>	Potential resident	NA		NA	NA
Inland Broad-nosed Bat	<i>Scotorepens balstoni</i>	Uncommon	Wonga wetlands		3	1994
Southern Forest Bat	<i>Vespadelus regulus</i>	Common	Wonga wetlands		3,4	2007
Large Forest Bat	<i>Vespadelus darlingtoni</i>	Uncommon	Wonga wetlands		4	2007
Little Forest Bat	<i>Vespadelus vulturnus</i>	Common	Wonga wetlands		3,4	2007
Muridae						
Water-rat	<i>Hydromys chrysogaster</i>	Common resident	Wonga wetlands		3	2005
House Mouse	<i>Mus musculus</i> *	Common resident	Widespread	Yes	3	2009
Black Rat	<i>Rattus rattus</i> *	Uncommon resident	Wonga wetlands		3	2001
Canidae						
Red Fox	<i>Vulpes vulpes</i> *	Common resident	Widespread	Yes	1,2,3,5	2009
Felidae						
Feral Cat	<i>Felis catus</i> *	Uncommon resident	Widespread	Yes	5	2009
Leporidae						
Rabbit	<i>Oryctolagus cuniculus</i> *	Common resident	Widespread	Yes	1,5	2009
Hare	<i>Lepus capensis</i> *	Common resident	Widespread	Yes	1,5	2009
Suidae						

Common Name	Scientific Name	Status in Watershed	Core Distribution	This Study	Source	Year
Feral Pig	<i>Sus scrofa</i> *	Uncommon vagrant	Nail Can Hill		1	2008
Bovidae						
Feral Goat	<i>Capra hircus</i> *	Uncommon resident	Nail Can Hill		1,5	2007
Cervidae						
Unidentified Deer	<i>Cervus</i> sp.*	Uncommon vagrant	Nail Can Hill		3	2006
Sources: 1) D. Michael unpublished data; 2) Nail Can Hill Community Biodiversity Survey (2003); 3) NSW NPWS wildlife atlas; 4) C. Grabham unpublished data 5) local residents personal observations						

Appendix 4. Avifauna species known and potentially occurring in the Spliters Creek watershed, including information on conservation status in the watershed, core distribution and year of last record.

Common Name	Scientific Name	Status in Watershed	Core Distribution	This Study	Source	Year
Phasianidae						
Stubble Quail	<i>Coturnix pectoralis</i>	Potential vagrant	NA		NA	NA
Brown Quail	<i>Coturnix ypsilophora</i>	Common resident	Wonga wetlands		4,6	
Turnicidae						
Painted Button-quail	<i>Turnix varia</i>	Uncommon resident	Nail Can Hill		4	
Pelecanidae						
Australian Pelican	<i>Pelecanus conspicillatus</i>	Common resident	Wonga wetlands	Yes	3,4	2009
Anhingidae						
Darter	<i>Anhinga melanogaster</i>	Common resident	Wonga wetlands	Yes	3,4	2009
Phalacrocoracidae						
Pied Cormorant	<i>Phalacrocorax varius</i>	Common resident	Wonga wetlands		3,6	
Little Pied Cormorant	<i>Microcarbo melanoleucos</i>	Common resident	Wonga wetlands	Yes	3,4	2009
Great Cormorant	<i>Phalacrocorax carbo</i>	Common resident	Wonga wetlands	Yes	3,4	2009
Little Black Cormorant	<i>Phalacrocorax sulcirostris</i>	Common resident	Wonga wetlands	Yes	3,4	2009
Podicepsidae						
Great Crested Grebe	<i>Podiceps cristatus</i>	Common resident	Wonga wetlands		3,4	
Hoary-headed Grebe	<i>Poliiocephalus poliocephalus</i>	Common resident	Wonga wetlands		3,4	
Australasian Grebe	<i>Tachybaptus novaehollandiae</i>	Common resident	Wonga wetlands	Yes	3,4,6	2009
Anatidae						
Magpie Goose	<i>Anseranus semipalmata</i>	Uncommon vagrant	Wonga wetlands		4	
Black Swan	<i>Cygnus atratus</i>	Common resident	Wonga wetlands	Yes	3,4	2009
Australian Shelduck	<i>Tadorna tadornoides</i>	Common resident	Wonga wetlands		3,4	
Pacific Black Duck	<i>Anas superciliosa</i>	Common resident	Wonga wetlands	Yes	4,6	2009
Grey Teal	<i>Anas gracilis</i>	Common resident	Wonga wetlands	Yes	3,4	2009
Chestnut Teal	<i>Anas castanea</i>	Common resident	Wonga wetlands		3,4	
Australasian Shoveler	<i>Anas rhynchotis</i>	Common resident	Wonga wetlands		3,4	
Pink-eared Duck	<i>Malacorhynchus membranaceus</i>	Common resident	Wonga wetlands		3,4	
Hardhead	<i>Aythya australis</i>	Common resident	Wonga wetlands	Yes	3,4	2009
Wood Duck	<i>Chenonetta jubata</i>	Common resident	Wonga wetlands	Yes	2,3,4,6	2009
Freckled Duck	<i>Stictonetta naevosa</i>	Potential vagrant	NA		NA	NA
Blue-billed Duck	<i>Oxyrua australis</i>	Uncommon resident	Wonga wetlands		3,4	
Musk Duck	<i>Biziura lobata</i>	Common resident	Wonga wetlands		3,4	
Rallidae						
Buff-banded Rail	<i>Gallirallus philippensis</i>	Uncommon resident	Wonga wetlands		4	
Lewin's Rail	<i>Rallus pectoralis</i>	Uncommon resident	Wonga wetlands		4	
Baillon's Crake	<i>Porzana pusilla</i>	Uncommon resident	Wonga wetlands		3,4	
Australian Spotted Crake	<i>Porzana fluminea</i>	Uncommon resident	Wonga wetlands		1,4	
Spotless Crake	<i>Porzana tabuensis</i>	Uncommon resident	Wonga wetlands		4	
Black-tailed Native Hen	<i>Gallinula ventralis</i>	Uncommon resident	Wonga wetlands		3,4	
Dusky Moorhen	<i>Gallinula tenebrosa</i>	Common resident	Wonga wetlands	Yes	3,4	2009
Purple Swampphen	<i>Porphyrio porphyrio</i>	Common resident	Wonga wetlands	Yes	3,4	2009
Eurasian Coot	<i>Fulica atra</i>	Common resident	Wonga wetlands	Yes	3,4	2009
Ardeidae						
White-necked Heron	<i>Ardea pacifica</i>	Common resident	Wonga wetlands	Yes	3,4,6	2009
White-faced Heron	<i>Egretta novaehollandiae</i>	Common resident	Wonga wetlands	Yes	3,4,6	2009
Cattle Egret	<i>Ardea ibis</i>	Common resident	Wonga wetlands		3,4	
Great Egret	<i>Ardea alba</i>	Common resident	Wonga wetlands		3,4	
Little Egret	<i>Egretta garzetta</i>	Uncommon resident	Wonga wetlands	Yes	3,4	2009

Common Name	Scientific Name	Status in Watershed	Core Distribution	This Study	Source	Year
Intermediate Egret	<i>Ardea intermedia</i>	Common resident	Wonga wetlands		4	
Nankeen Night Heron	<i>Nycticorax caledonicus</i>	Uncommon resident	Wonga wetlands		3,4	
Little Bittern	<i>Ixobrychus minutus</i>	Uncommon resident	Wonga wetlands		4	
Australasian Bittern	<i>Botaurus poicilopilus</i>	Uncommon resident	Wonga wetlands		5	
Platalidae						
Glossy Ibis	<i>Plegadis falcinellus</i>	Uncommon vagrant	Wonga wetlands		4	
Australian White Ibis	<i>Threskiornis molucca</i>	Common resident	Wonga wetlands	Yes	2,3,4,6	2009
Straw-necked Ibis	<i>Threskiornis spinicollis</i>	Common resident	Residential	Yes	3,4,6	2009
Royal Spoonbill	<i>Platalea regia</i>	Common resident	Wonga wetlands		4	
Yellow-billed Spoonbill	<i>Platalea flavipes</i>	Common resident	Wonga wetlands	Yes	4,6	2009
Scolopacidae						
Wood Sandpiper	<i>Tringa glareola</i>	Uncommon migrant	Wonga wetlands		3,4	
Marsh Sandpiper	<i>Tringa stagnatilis</i>	Uncommon migrant	Wonga wetlands		3,4	
Latham's Snipe	<i>Gallinago hardwickii</i>	Common migrant	Wonga wetlands		4	
Sharp-tailed Sandpiper	<i>Calidris acuminata</i>	Uncommon migrant	Wonga wetlands		4	
Red-necked Stint	<i>Calidris ruficollis</i>	Uncommon migrant	Wonga wetlands		3,4	
Charadriidae						
Masked Lapwing	<i>Vanellus miles</i>	Common resident	Residential	Yes	3,4,6	2009
Red-kneed Dotterel	<i>Erythronyx cinctus</i>	Common resident	Wonga wetlands	Yes	3,4	2009
Red-caped Plover	<i>Charadrius ruficapillus</i>	Uncommon migrant	Wonga wetlands		3,4	
Black-fronted Dotterel	<i>Elsyornis melanops</i>	Common resident	Wonga wetlands		4,6	
Recurvirostridae						
Black-winged Stilt	<i>Himantopus himantopus</i>	Common migrant	Wonga wetlands		3,4	
Red-necked Avocet	<i>Recurvirostra novaehollandiae</i>	Common migrant	Wonga wetlands		1	
Laradidae						
Silver Gull	<i>Larus novaehollandiae</i>	Common resident	Wonga wetlands		3,4	
Whiskered Tern	<i>Chlidonias hybrida</i>	Uncommon vagrant	Wonga wetlands		3,4	
Caspian Tern	<i>Sterna caspia</i>	Uncommon vagrant	Wonga wetlands		4	
Accipitridae						
Black-shouldered Kite	<i>Elanus axillaris</i>	Common resident	Widespread		3,4,6	
Black Kite	<i>Milvus migrans</i>	Common resident	Widespread		2,4	
Whistling Kite	<i>Haliastur sphenurus</i>	Common resident	Wonga wetlands	Yes	2,3,4,6	2009
White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>	Uncommon resident	Wonga wetlands		3,4	
Wedge-tailed Eagle	<i>Aquila audax</i>	Common resident	Widespread	Yes	3,4,6	2009
Little Eagle	<i>Hieraaetus morphnoides</i>	Uncommon resident	Widespread	Yes	3,4	2009
Brown Goshawk	<i>Accipiter fasciatus</i>	Common resident	Widespread	Yes	3,4,6	2009
Collared Sparrowhawk	<i>Accipiter cirrocephalus</i>	Common resident	Nail Can Hill		4	
Grey Goshawk	<i>Accipiter novaehollandiae</i>	Uncommon vagrant	Wonga wetlands		3,4	
Swamp Harrier	<i>Circus approximans</i>	Uncommon resident	Wonga wetlands		3,4	
Falconidae						
Peregrine Falcon	<i>Falco peregrinus</i>	Uncommon resident	Widespread		3,4,6	
Australian Hobby	<i>Falco longipennis</i>	Common resident	Widespread		3,4,6	
Brown Falcon	<i>Falco berigora</i>	Common resident	Residential	Yes	3,4	2009
Nankeen Kestrel	<i>Falco cenchroides</i>	Common resident	Residential	Yes	3,4,6	2009
Columbidae						
Spotted Turtle-Dove	<i>Streptopelia chinensis*</i>	Common resident	Residential	Yes	1	2009
Peaceful Dove	<i>Geopelia striata</i>	Common resident	Nail Can Hill	Yes	1,6	2009
Common Bronzewing	<i>Phaps chalcoptera</i>	Common resident	Nail Can Hill	Yes	1,6	2009
Crested Pigeon	<i>Ocyphaps lophotes</i>	Common resident	Residential	Yes	1,6	2009
Cacatuidae						
Yellow-tailed Black Cockatoo	<i>Calyptorhynchus funereus</i>	Uncommon vagrant	Widespread		6	2003
Gang-gang Cockatoo	<i>Callocephalon fimbriatum</i>	Uncommon resident	Nail Can Hill		1,5,6	
Galah	<i>Eolophus roseicapillus</i>	Common resident	Widespread	Yes	4,6	2009

Common Name	Scientific Name	Status in Watershed	Core Distribution	This Study	Source	Year
Long-billed Corella	<i>Cacatua tenuirostris</i>	Uncommon resident	Residential	Yes	4	2009
Little Corella	<i>Cacatua sanguinea</i>	Uncommon resident	Residential		4,6	
Sulphur-crested Cockatoo	<i>Cacatua galerita</i>	Common resident	Residential	Yes	4,6	2009
Psittacidae						
Rainbow Lorikeet	<i>Trichoglossus haematodus</i>	Potential vagrant	Residential		NA	NA
Musk Lorikeet	<i>Glossopsitta concinna</i>	Potential vagrant	Residential		NA	NA
Little Lorikeet	<i>Glossopsitta pusilla</i>	Common resident	Nail Can Hill	Yes	4,6	2009
King Parrot	<i>Alisterus scapularis</i>	Potential vagrant	NA		NA	NA
Superb Parrot	<i>Polytelis swainsonii</i>	Potential vagrant	NA		NA	NA
Cockatiel	<i>Nymphicus hollandicus</i>	Uncommon vagrant	Widespread		4	
Budgerigar	<i>Melopsittacus undulatus</i>	Potential vagrant	NA		NA	NA
Swift Parrot	<i>Lathamus discolor</i>	Uncommon migrant	Nail Can Hill		6	2003
Crimson Rosella	<i>Platycercus elegans</i>	Common resident	Widespread	Yes	4,6	2009
Yellow Rosella	<i>Platycercus elegans flaveolus</i>	Common resident	Wonga wetlands	Yes	4,6	2009
Eastern Rosella	<i>Platycercus eximius</i>	Common resident	Widespread	Yes	2,4,6	2009
Red-rumped Parrot	<i>Psephotus haematonotus</i>	Common resident	Residential	Yes	4,6	2009
Turquoise Parrot	<i>Neophema pulchella</i>	Uncommon resident	Nail Can Hill		1,4,6	
Cuculidae						
Pallid Cuckoo	<i>Cacomantis pallidus</i>	Uncommon migrant	Widespread		1	
Fan-tailed Cuckoo	<i>Cacomantis flabelliformis</i>	Uncommon migrant	Nail Can Hill		4	
Horsfield's Bronze-Cuckoo	<i>Chalcites basalis</i>	Common migrant	Nail Can Hill		2	
Shining Bronze-Cuckoo	<i>Chalcites lucidus</i>	Uncommon migrant	Nail Can Hill		2	
Common Koel	<i>Eudynamys scolopacea</i>	Potential migrant	NA		NA	NA
Strigidae						
Southern Boobook	<i>Ninox novaeseelandiae</i>	Common resident	Widespread	Yes	4,6	2009
Barking Owl	<i>Ninox connivens</i>	Uncommon resident	Wonga wetlands		4	
Tytonidae						
Barn Owl	<i>Tyto alba</i>	Common resident	Residential		1	2008
Podargidae						
Tawny Frogmouth	<i>Podargus strigoides</i>	Common resident	Nail Can Hill	Yes		2009
Aegothelidae						
Australian Owlet-nightjar	<i>Aegotheles cristatus</i>	Common resident	Nail Can Hill	Yes	6	2009
Apodidae						
White-throated Needletail	<i>Hirundapus caudacutus</i>	Uncommon vagrant	Widespread	Yes	1	2009
Alcedinidae						
Azure Kingfisher	<i>Ceyx azureus</i>	Uncommon resident	Wonga wetlands		3,4	
Laughing Kookaburra	<i>Dacelo novaeguineae</i>	Common resident	Widespread	Yes	4,6	2009
Red-backed Kingfisher	<i>Todiramphus pyrrhopygius</i>	Uncommon vagrant	Wonga wetlands		4	
Sacred Kingfisher	<i>Todiramphus sanctus</i>	Common migrant	Nail Can Hill		3,4,6	
Meropidae						
Rainbow Bee-eater	<i>Merops ornatus</i>	Common migrant	Wonga wetlands		3,4,6	
Coraciidae						
Dollarbird	<i>Eurystomus orientalis</i>	Uncommon migrant	Wonga wetlands		3,4,6	
Neosittidae						
Varied Sittella	<i>Daphoenositta chrysoptera</i>	Uncommon resident	Nail Can Hill		2	
Climacteridae						
White-throated Treecreeper	<i>Cormobates leucophaea</i>	Uncommon resident	Wonga wetlands	Yes	2,4	2009
Brown Treecreeper	<i>Climacteris picumnus</i>	Uncommon resident	Nail Can Hill	Yes	4,6	2009
Maluridae						
Superb Fairy-wren	<i>Malurus cyaneus</i>	Common resident	Widespread	Yes	2,4,6	2009
Pardalotidae						
Spotted Pardalote	<i>Pardalotus punctatus</i>	Common resident	Wonga wetlands		2,4	
Striated Pardalote	<i>Pardalotus striatus</i>	Common resident	Widespread	Yes	4,6	2009

Common Name	Scientific Name	Status in Watershed	Core Distribution	This Study	Source	Year
White-browed Scrubwren	<i>Sericornis frontalis</i>	Common resident	Wonga wetlands	Yes	4,6	2009
Speckled Warbler	<i>Chthonicola sagittata</i>	Uncommon resident	Nail Can Hill	Yes	2	2009
Weebill	<i>Smicronis brevirostris</i>	Common resident	Nail Can Hill	Yes	2,4	2009
White-throated Gerygone	<i>Gerygone albogularis</i>	Common resident	Nail Can Hill		4	
Western Gerygone	<i>Gerygone fusca</i>	Common resident	Nail Can Hill		2,4,6	
Brown Thornbill	<i>Acanthiza pusilla</i>	Common resident	Wonga wetlands		4	
Yellow Thornbill	<i>Acanthiza nana</i>	Common resident	Nail Can Hill		4,6	
Striated Thornbill	<i>Acanthiza lineata</i>	Common resident	Nail Can Hill	Yes	2,4	2009
Buff-rumped Thornbill	<i>Acanthiza reguloides</i>	Common resident	Nail Can Hill		2,4	
Yellow-rumped Thornbill	<i>Acanthiza chrysorrhoa</i>	Common resident	Residential	Yes	4	2009
Southern Whiteface	<i>Aphelocephala leucopsis</i>	Uncommon resident	Residential			
Meliphagidae						
Red Wattlebird	<i>Anthochaera carunculata</i>	Common resident	Widespread	Yes	4,6	2009
Noisy Friarbird	<i>Philemon corniculatus</i>	Common migrant	Widespread		2,4,6	
Little Friarbird	<i>Philemon citreogularis</i>	Uncommon migrant	Wonga wetlands		4	
Regent Honeyeater	<i>Anthochaera phrygia</i>	Potential vagrant	NA		NA	NA
Blue-faced Honeyeater	<i>Entomyzon cyanotis</i>	Common resident	Residential	Yes	4,6	2009
Noisy Miner	<i>Manorina melanocephala</i>	Common resident	Widespread	Yes	4	2009
Yellow-faced Honeyeater	<i>Lichenostomus chrysops</i>	Common resident	Nail Can Hill	Yes	2	2009
Yellow-tufted Honeyeater	<i>Lichenostomus melanops</i>	Potential resident	NA		NA	NA
Fuscous Honeyeater	<i>Lichenostomus fuscus</i>	Common resident	Nail Can Hill		2,4,6	
White-plumed Honeyeater	<i>Lichenostomus pencillatus</i>	Common resident	Widespread	Yes	2,4,6	2009
Black-chinned Honeyeater	<i>Melithreptus gularis</i>	Uncommon resident	Nail Can Hill		2,4	
Brown-headed Honeyeater	<i>Melithreptus brevirostris</i>	Common resident	Nail Can Hill	Yes	2	2009
White-naped Honeyeater	<i>Melithreptus lunatus</i>	Potential migrant	NA		NA	NA
Painted Honeyeater	<i>Grantiella picta</i>	Potential vagrant	NA		NA	NA
Eastern Spinebill	<i>Acanthorhynchus tenuirostris</i>	Common resident	Residential		4,6	
Crimson Chat	<i>Epthianura tricolor</i>	Potential vagrant	NA		NA	NA
White-fronted Chat	<i>Epthianura albifrons</i>	Potential migrant	NA		NA	NA
Cinclosomatidae						
Spotted Quail-thrush	<i>Cinclosoma punctatum</i>	Potential resident	NA		NA	NA
Pomatostomidae						
White-browed Babbler	<i>Pomatostomus superciliosus</i>	Uncommon resident	Nail Can Hill		6	
Petroicidae						
Flame Robin	<i>Petroica phoenicea</i>	Common migrant	Residential		4	
Scarlet Robin	<i>Petroica boodang</i>	Common migrant	Nail Can Hill	Yes	2,4	2009
Red-capped Robin	<i>Petroica goodenovii</i>	Uncommon resident	Nail Can Hill	Yes	4	2009
Hooded Robin	<i>Melanodryas cucullata</i>	Uncommon resident	Nail Can Hill	Yes	6	2009
Eastern Yellow Robin	<i>Eopsaltria australis</i>	Uncommon resident	Nail Can Hill	Yes	2,4,6	2009
Jacky Winter	<i>Microeca fascinans</i>	Common migrant	Residential	Yes	2,4,6	2009
Pachycephalidae						
Crested Shrike-tit	<i>Falcunculus frontatus</i>	Uncommon resident	Wonga wetlands	Yes	2,4,6	2009
Grey Shrike-thrush	<i>Colluricincla harmonica</i>	Common resident	Nail Can Hill	Yes	2,4,6	2009
Golden Whistler	<i>Pachycephala pectoralis</i>	Uncommon migrant	Nail Can Hill	Yes	2,4	2009
Rufous Whistler	<i>Pachycephala rufiventris</i>	Common migrant	Nail Can Hill		2,4	
Dicruridae						
Grey Fantail	<i>Rhipidura albiscapa</i>	Uncommon migrant	Wonga wetlands	Yes	2,4,6	2009
Willie Wagtail	<i>Rhipidura leucophrys</i>	Common resident	Widespread	Yes	2,4,6	2009
Leaden Flycatcher	<i>Myiagra rubecula</i>	Potential migrant	NA		NA	NA
Restless Flycatcher	<i>Myiagra inquieta</i>	Common migrant	Widespread	Yes	2,4,6	2009
Magpie-lark	<i>Grallina cyanoleuca</i>	Common resident	Widespread	Yes	2,4,6	2009
Oriolidae						
Olive-backed Oriole	<i>Oriolus sagittatus</i>	Common migrant	Nail Can Hill		2,4,6	

Common Name	Scientific Name	Status in Watershed	Core Distribution	This Study	Source	Year
Campephagidae						
Black-faced Cuckoo-shrike	<i>Coracina novaehollandiae</i>	Common resident	Widespread	Yes	2,4,6	2009
White-winged Triller	<i>Lalage sueurii</i>	Common migrant	Widespread		4,6	
Artamidae						
White-breasted Woodswallow	<i>Artamus leucorhynchus</i>	Uncommon vagrant	Wonga wetlands		4	
Masked Woodswallow	<i>Artamus personatus</i>	Potential migrant	NA		NA	NA
White-browed Woodswallow	<i>Artamus superciliosus</i>	Common vagrant	Widespread		4	
Dusky Woodswallow	<i>Artamus cyanopterus</i>	Common resident	Nail Can Hill	Yes	4,6	2009
Grey Butcherbird	<i>Cracticus torquatus</i>	Common resident	Residential	Yes	6	2009
Pied Butcherbird	<i>Cracticus nigrogularis</i>	Uncommon resident	Residential		1	
Australian Magpie	<i>Cracticus tibicen</i>	Common resident	Widespread	Yes	2,4,6	2009
Pied Currawong	<i>Strepera graculina</i>	Common migrant	Widespread	Yes	2,4,6	2009
Corvidae						
Australian Raven	<i>Corvus coronoides</i>	Common resident	Residential	Yes	2,4,6	2009
Little Raven	<i>Corvus mellori</i>	Potential vagrant	NA		NA	NA
Corcoracidae						
White-winged Chough	<i>Corcorax melanorhamphos</i>	Uncommon resident	Residential	Yes	2,6	2009
Hirundinidae						
White-backed Swallow	<i>Cheramoeca leucosterna</i>	Uncommon vagrant	Residential		6	
Welcome Swallow	<i>Hirundo neoxena</i>	Common resident	Widespread	Yes	2,4,6	2009
Tree Martin	<i>Petrochelidon nigricans</i>	Common resident	Nail Can Hill	Yes	4	2009
Fairy Martin	<i>Petrochelidon ariel</i>	Uncommon resident	Wonga wetlands	Yes	4,6	2009
Motacillidae						
Richard's Pipit	<i>Anthus novaeseelandiae</i>	Common migrant	Residential	Yes	4	
Alaudidae						
Singing Bushlark	<i>Mirafrja javanica</i>	Potential migrant	NA		NA	NA
Rufous Songlark	<i>Cincloramphus mathewsi</i>	Common migrant	Nail Can Hill		6	
Brown Songlark	<i>Cincloramphus cruralis</i>	Potential migrant	NA		NA	NA
Sylviidae						
Clamorous Reed Warbler	<i>Acrocephalus stentoreus</i>	Common migrant	Wonga wetlands	Yes	4	2009
Golden-headed Cisticola	<i>Cisticola exilis</i>	Uncommon resident	Wonga wetlands		4	
Little Grassbird	<i>Magalurus gramineus</i>	Uncommon resident	Wonga wetlands		4	
Passeridae						
House Sparrow	<i>Passer domesticus*</i>	Common resident	Residential	Yes	4,6	2009
Fringillidae						
European Greenfinch	<i>Carduelis chloris</i>	Uncommon resident	Wonga wetlands		1	
European Goldfinch	<i>Carduelis carduelis</i>	Common resident	Widespread	Yes	4,6	2009
Ploceidae						
Double-barred Finch	<i>Taeniopygia bichenovii</i>	Uncommon resident	Residential	Yes	4,6	2009
Zebra Finch	<i>Taeniopygia guttata</i>	Potential vagrant	NA		NA	NA
Red-browed Finch	<i>Neochmia temporalis</i>	Common resident	Wonga wetlands	Yes	4,6	2009
Diamond Firetail	<i>Stagonopleura guttata</i>	Uncommon resident	Residential	Yes	6	2009
Dicaeidae						
Mistletoebird	<i>Dicaeum hirundinaceum</i>	Common resident	Widespread		4,6	
Zosteropidae						
Silvereye	<i>Zosterops lateralis</i>	Common resident	Residential	Yes	2,4	2009
Muscicapidae						
Common Blackbird	<i>Turdus merula*</i>	Common resident	Residential	Yes	4,6	2009
Sturnidae						
Common Starling	<i>Sturnus vulgaris*</i>	Common resident	Residential	Yes	4,6	2009
Sources: 1) D. Michael unpublished data; 2) Nail Can Hill Community Biodiversity Survey (2003); 3) T. Alexander (2001) honours thesis; 4) I. Taylor - Wonga wetlands bird list; 5) NSW NPWS wildlife atlas; 6) local residents personal observations.						

Appendix 5. Plant species known to occur in the Splitlers Creek watershed.

Common Name	Scientific Name	Core Distribution	This Study
GYMNOSPERMS			
ADIANTACEAE			
Rock fern	<i>Cheilanthes austrotenuifolia</i>	Ranges	Yes
Mulga Fern	<i>Cheilanthes sieberi</i>	Ranges	Yes
CASUARINACEAE			
Drooping Sheoke	<i>Allocasuarina verticillata</i>	Ranges	Yes
CUPRESSACEAE			
White Cypress Pine	<i>Callitris glaucophylla</i>	Ranges	Yes
MONOCOTYLEDONS			
CENTROLEPIDACEAE			
Hairy centrolepis	<i>Centrolepis strigosa</i>	Ranges	
CRASSULACEAE			
Dense stonecrop	<i>Crassula colorata</i>	Ranges	
CYPERACEA			
Tussock Sedge	<i>Carex appressa</i>	Floodplain	
Round-clum Sedge	<i>Carex tereticaulis</i>	Floodplain	
Umbrella Sedge	<i>Cyperus eragrostis</i> *	Floodplain	Yes
Variable Flat Sedge	<i>Cyperus difformis</i>	Floodplain	
Tall Spike Rush	<i>Eleocharis sphacelata</i>	Floodplain	Yes
Variable Sword-sedge	<i>Lepidosperma laterale</i>	Ranges	Yes
Common bog rush	<i>Schoenus apogon</i>	Floodplain	Yes
DROSERACEAE			
Pale Sundew	<i>Drosera peltata</i>	Ranges	
HYPOXIDACEAE			
Yellow Star	<i>Hypoxis glabella</i>	Ranges	
Golden Weathergrass	<i>Hypoxis hygrometrica</i>	Ranges	
IRIDACEAE			
Onion Grass	<i>Romulea rosea</i> *	Widespread	Yes
JUNCACEAE			
Tall Rush	<i>Juncus australis</i>	Floodplain	Yes
Rush	<i>Juncus amabilis</i>	Floodplain	
Giant Rush	<i>Juncus ingens</i>	Floodplain	Yes
Pinrush	<i>Juncus filicaulis</i>	Ranges	Yes
Common Rush	<i>Juncus usitatus</i>	Floodplain	
Common Woodrush	<i>Luzula densiflora</i>	Ranges	
LENTIBULARIACEAE			
Bladderworts	<i>Utricularia dichotoma</i>	Widespread	
LILIACEA			
Pale Vanilla-lily	<i>Arthropodium milleflorum</i>	Ranges	
Small Vanilla-lily	<i>Arthropodium minus</i>	Ranges	
Nodding Chocolate-lily	<i>Dichopogon fimbriatus</i>	Ranges	
Chocolate Lily	<i>Dichopogon strictus</i>	Ranges	
Milkmaids	<i>Burchardia umbellata</i>	Widespread	
Yellow Bulbine-lily	<i>Bulbine bulbosa</i>	Ranges	
Yellow Rush-lily	<i>Tricoryne elatior</i>	Ranges	
Pink Sun Orchid	<i>Thelymitra rubra</i>	Ranges	
Twining Fringe-lily	<i>Thysanotus patersonii</i>	Ranges	
Common Fringe-lily	<i>Thysanotus tuberosus</i>	Ranges	
Early Nancy	<i>Wurmbea dioica</i>	Widespread	

Common Name	Scientific Name	Core Distribution	This Study
LINACEAE			
Native Flax	<i>Linum marginale</i>	Ranges	
OPHIOGLOSSACEAE			
Adder's Tongue	<i>Ophioglossum lusitanicum</i>	Ranges	
ORCHIDACEAE			
Blue Caladenia	<i>Caladenia caerulea</i>	Ranges	
Pink Fingers	<i>Caladenia carnea</i>	Ranges	
Crimson Spider Orchid	<i>Caladenia concolor</i>	Ranges	
Hooded Orchid	<i>Caladenia cucullata</i>	Ranges	
Dusky Caladenia	<i>Caladenia fuscata</i>	Ranges	
Purple Beard Orchid	<i>Calochilus robertsonii</i>	Ranges	
Slaty Helmet Orchid	<i>Corybas incurvus</i>	Ranges	
Small Gnat Orchid	<i>Cyrtostylis reniformis</i>	Ranges	
Leopard Orchid	<i>Diuris pardina</i>	Ranges	
Donkey Orchid	<i>Diuris sulphurea</i>	Ranges	
Wax Lip Orchid	<i>Glossodia major</i>	Ranges	
Slender Onion Orchid	<i>Microtis parviflora</i>	Ranges	
Common Onion Orchid	<i>Microtis unifolia</i>	Ranges	
Pointed Greenhood	<i>Pterostylis acuminata</i>	Ranges	
Blunt Greenhood	<i>Pterostylis curta</i>	Ranges	
Nodding Greenhood	<i>Pterostylis nutans</i>	Ranges	
Maroon Hood	<i>Pterostylis pedunculata</i>	Ranges	
Plain Sun Orchid	<i>Thelymitra nuda</i>	Ranges	
Slender Sun Orchid	<i>Thelymitra pauciflora</i>	Ranges	
Salmon Sun Orchid	<i>Thelymitra rubra</i>	Ranges	
PHORMIACEAE			
Smooth Flax-lily	<i>Dianella longifolia</i>	Ranges	Yes
Spreading Fax-lily	<i>Dianella revolutea</i>	Ranges	Yes
POACEA			
Hairgrass	<i>Aira sp.*</i>	Widespread	
Sweet vernal grass	<i>Anthoxanthum odoratum*</i>	Ranges	
Wiregrass	<i>Aristida ramosa</i>	Ranges	Yes
Kerosene grass	<i>Aristida behriana</i>	Ranges	
White-top Wallaby Grass	<i>Austrodanthonia caespitosa</i>	Widespread	Yes
Hill Wallaby Grass	<i>Austrodanthonia eriantha</i>	Ranges	Yes
Small-fowered Wallaby-grass	<i>Austrodanthonia setacea</i>	Widespread	
Plumed Spear-grass	<i>Austrostipa densifolia</i>	Ranges	Yes
Spear-grass	<i>Austrostipa scabra</i>	Widespread	Yes
Bearded Oats	<i>Avena barbata*</i>	Agricultural	
Wild Oats	<i>Avena fatua*</i>	Widespread	Yes
Red-leg Grass	<i>Bothriochloa macra</i>	Ranges	Yes
Quaking-grass	<i>Briza maxima*</i>	Ranges	Yes
Shivery grass	<i>Briza minor*</i>	Ranges	
Great Brome	<i>Bromus diandrus*</i>	Widespread	
Soft Brome	<i>Bromus hordeaceus*</i>	Floodplain	
Prarie Grass	<i>Bromus unioloides*</i>	Widespread	Yes
Umbrella Grass	<i>Chloris truncata</i>	Widespread	
Couch	<i>Cynodon dactylon*</i>	Widespread	Yes
Plume grass	<i>Dichelachne crinata</i>	Ranges	
Annual Veldt Grass	<i>Ehrharta longiflora*</i>	Widespread	Yes
Wheat grass	<i>Elymus scabra</i>	Ranges	Yes
Yorkshire Fog	<i>Holcus lanatus*</i>	Floodplain	Yes

Common Name	Scientific Name	Core Distribution	This Study
Barley grass	<i>Hordeum leporinum</i> *	Agricultural	
Red-anther Wallaby Grass	<i>Joycea pallida</i>	Ranges	
Rye-grass	<i>Lolium rigidum</i> *	Agricultural	
Weeping grass	<i>Microlaena stipoides</i>	Widespread	
Hairy Panic	<i>Panicum effusum</i>	Widespread	
Paspalum	<i>Paspalum dilatatum</i> *	Floodplain	Yes
Water Couch	<i>Paspalum distichum</i>	Floodplain	Yes
Kikuyu	<i>Pennisetum clandestinum</i> *	Widespread	Yes
Phalaris	<i>Phalaris aquatica</i> *	Floodplain	Yes
Winter Grass	<i>Poa annua</i> *	Widespread	
River Tussock Grass	<i>Poa labillardieri</i>	Floodplain	Yes
Cane Grass	<i>Phragmites australis</i>	Floodplain	Yes
Kangaroo grass	<i>Themeda triandra</i>	Ranges	
Rats tail fescue	<i>Vulpia myuros</i> *	Agricultural	
Squirrel tail fescue	<i>Vulpia bromoides</i> *	Agricultural	
TYPHACEAE			
Cumbungi	<i>Typha orientale</i>	Floodplain	Yes
DICOTYLEDONS			
AMARANTHACEAE			
Lesser Joyweed	<i>Alternanthera denticulata</i>	Floodplain	Yes
ANACARDIACEAE			
Pepper tree	<i>Schinus areira</i> *	Widespread	
APIACEAE			
Native Carrot	<i>Duacus glochidiatus</i>	Ranges	
Stinking Pennywort	<i>Hydrocotyle laxifolia</i>	Widespread	Yes
Date Palm	<i>Phoenix dactylifera</i> *	Roadside	Yes
ASPARAGACEAE			
Asparagus	<i>Asparagus officinalis</i> *	Roadside	Yes
ASTERACEAE			
Cape weed	<i>Arctotheca calendula</i> *	Widespread	Yes
Dogwood	<i>Cassinia arculeata</i>	Ranges	Yes
Slender thistle	<i>Carduus pycnocephalus</i> *	Agricultural	
Common Sneezeweed	<i>Centipeda cunninghamii</i>	Floodplain	
Star Thistle	<i>Centaurea calcitrapa</i> *	Agricultural	
Spear thistle	<i>Cirsium vulgare</i> *	Widespread	Yes
Feabane	<i>Conyza bonariensis</i> *	Widespread	Yes
Austral Bear's Ears	<i>Cymbonotus presissianus</i>	Ranges	
Flatweed	<i>Hypochoeris radicata</i> *	Widespread	Yes
Prickly Lettuce	<i>Lactuca serriola</i> *	Widespread	Yes
Yam Daisy	<i>Microseris lanceolata</i>	Ranges	
Jersey cudweed	<i>Pseudognaphalium luteoalbum</i>	Widespread	
Woolly Ragwort	<i>Senecio garlandii</i>	Ranges	
Cotton Fireweed	<i>Senecio quadridentatus</i>	Widespread	Yes
Hill Fireweed	<i>Senecio hispidulus</i>	Ranges	
Variegated thistle	<i>Silybum marianum</i> *	Agricultural	
Sow thistle	<i>Sonchus oleraceus</i> *	Agricultural	
Yellow hawkweed	<i>Tolpis umbellata</i> *	Agricultural	
Noogoora Burr	<i>Xanthium occidentale</i> *	Floodplain	Yes
Bathurst Burr	<i>Xanthium spinosum</i> *	Floodplain	Yes
Sticky Everlasting	<i>Xerochyrsum viscosum</i>	Ranges	Yes
AIZOACEAE			

Common Name	Scientific Name	Core Distribution	This Study
Hairy Carpet Weed	<i>Glinus lotiodes</i>	Floodplain	Yes
BORAGINACEAE			
Austral Hound's Tongue	<i>Cynoglossum australe</i>	Ranges	
Sweet Hound's Tongue	<i>Cynoglossum suaveolens</i>	Ranges	
Paterson's Curse	<i>Echium plantagineum</i> *	Widespread	Yes
CAMPANULACEAE			
Rock isotome	<i>Isotoma axillaries</i>	Ranges	Yes
Tufted Bluebell	<i>Wahlenbergia communis</i>	Ranges	
Tall Bluebell	<i>Wahlenbergia stricta</i>	Ranges	
CARYOPHYLLACEAE			
Proliferous pink	<i>Petrohagia nanteulii</i> *	Ranges	
Common Chickweed	<i>Stellaria media</i> *	Widespread	Yes
CHENOPODIACEAE			
Small Crumbweed	<i>Chenopodium pumilio</i>	Floodplain	Yes
CLUSIACEAE			
Native St. Johns Wort	<i>Hypericum gramineum</i>	Ranges	
St. John's Wort	<i>Hypericum perforatum</i> *	Widespread	Yes
CRASSULACEAE			
Stone Crop	<i>Crassula sieberi</i>	Ranges	
CONVOLVULACEAE			
Cuscuta campestris	<i>Golden Dodder</i> *	Floodplain	
DILLENIACEAE			
Grey Guinea-flower	<i>Hibbertia obtusifolia</i>	Ranges	Yes
Erect Guinea-flower	<i>Hibbertia riparia</i>	Ranges	
EPACRIDACEAE			
Daphne Heath	<i>Brachyloma daphnoides</i>	Ranges	Yes
Beard Heath	<i>Leucopogon virgatus</i>	Ranges	
Urn Heath	<i>Melichrus urceolatus</i>	Ranges	Yes
FABACEAE			
Hop Bitter-pea	<i>Daviesia latifolia</i>	Ranges	
Showy Parrot-pea	<i>Dillwynia sericea</i>	Ranges	Yes
Montpellier broom	<i>Genista monspessulana</i> *	Floodplain	
Puple Coral-pea	<i>Hardenburgia violacea</i>	Ranges	Yes
Common Hovea	<i>Hovea linearis</i>	Ranges	
Austral Indigo	<i>Indigofera australis</i>	Ranges	
Handsome Flat Pea	<i>Platylobium formosum</i>	Ranges	
Small-leaved Bush-pea	<i>Pultenaea foliolosa</i>	Ranges	
False Acacia	<i>Roninia pseudoacacia</i> *	Agricultural	
FABOIDACEAE			
Twinning Glycine	<i>Glycine clandestina</i>	Ranges	
Variable Glycine	<i>Glycine tabicina</i>	Ranges	
Narrow-leaved clover	<i>Trifolium angustifolium</i> *	Widespread	
Haresfoot clover	<i>Trifolium arvense</i> *	Widespread	
Yellow suckling clover	<i>Trifolium dubium</i> *	Widespread	
Subterranean clover	<i>Trifolium subterraneum</i> *	Widespread	
GENTIANACEAE			
Common Centuary	<i>Centuarium erythracea</i> *	Widespread	
GERANIACEAE			
Common Stork's-bill	<i>Erodium cicutarium</i> *	Widespread	
Common Cranes-bill	<i>Geranium retrorsum</i>	Ranges	
Austral Crane's-bill	<i>Geranium solanderi</i>	Ranges	
Wild Geranium	<i>Pelargonium australe</i>	Ranges	

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HALORAGACEAE			
Raspwort	<i>Gonocarpus elatus</i>	Ranges	Yes
Common Raspwort	<i>Gonocarpos tetragynus</i>	Ranges	
Tall Raspwort	<i>Haloragis heterophylla</i>	Ranges	
Common Water-milfoil	<i>Myriophyllum propinquum</i>	Floodplain	Yes
LAMIACEAE			
Horehound	<i>Marrubium vulgare</i> *	Widespread	Yes
Mint	<i>Menta</i> spp.	Floodplain	
LAURACEAE			
Dodder Laurel	<i>Cassytha melantha</i>	Ranges	
LORANTHACEA			
Drooping Mistletoe	<i>Amyema pendula</i>	Widespread	Yes
Box Mistletoe	<i>Amyema miqueliana</i>	Widespread	
Creeping Mistletoe	<i>Amyema</i> sp.	Widespread	
LYTHRACEAE			
Lesser loosestrife	<i>Lythrum hyssopifolia</i>	Floodplain	
MARTYNIACEAE			
Yellow Devil's Claw	<i>Ibecella lutea</i> *	Agricultural	
MALACEAE			
Apple tree	<i>Malus x domestica</i> *	Widespread	
MELIACEAE			
White Cedar	<i>Melia azedarach</i> *	Roadside	Yes
MIMOSOIDEAE			
Gold Dust Wattle	<i>Acacia acinacea</i>	Ranges	
Cootamundra Wattle	<i>Acacia baileyana</i> *	Widespread	
Silver Wattle	<i>Acacia dealbata</i>	Floodplain	Yes
Spreading Wattle	<i>Acacia genistifolia</i>	Ranges	
Ploughshare Wattle	<i>Acacia gunnii</i>	Ranges	
Lightwood	<i>Acacia implexa</i>	Ranges	Yes
Black Wattle	<i>Acacia mearnsii</i> *	Agricultural	Yes
Golden Wattle	<i>Acacia pycnatha</i>	Widespread	
Hedge Wattle	<i>Acacia paradoxa</i>	Widespread	
Red-stem Wattle	<i>Acacia rubida</i>	Ranges	
Varnish Wattle	<i>Acacia verniciflua</i>	Ranges	
MORACEAE			
Fig	<i>Ficus carica</i> *	Floodplain	
Osage Orange	<i>Maclura pomifera</i> *	Floodplain	Yes
MYRTACEAE			
White Box	<i>Eucalyptus albens</i>	Widespread	Yes
Blakely's Red Gum	<i>Eucalyptus blakelyi</i>	Ranges	Yes
Apple Box	<i>Eucalyptus bridgesiana</i>	Floodplain	Yes
River Red Gum	<i>Eucalyptus camuldulensis</i>	Floodplain	Yes
Lemon-scented Gum	<i>Eucalyptus citriodora</i> *	Residential	Yes
Tumbledown Gum	<i>Eucalyptus dealbata</i>	Ranges	
Long-leaved Box	<i>Eucalyptus goniocalyx</i>	Ranges	Yes
Flooded Gum	<i>Eucalyptus grandis</i>	Floodplain	Yes
Red Stringy Bark	<i>Eucalyptus macrorhynca</i>	Ranges	Yes
Spotted Gum	<i>Eucalyptus maculata</i> *	Residential	Yes
Yellow Box	<i>Eucalyptus melliodora</i>	Floodplain	Yes
Red Box	<i>Eucalyptus polyanthemus</i>	Ranges	Yes
Ironbark	<i>Eucalyptus sideroxylon</i> *	Ranges/residential	Yes
Ribbon Gum	<i>Eucalyptus viminalis</i> *	Residential	Yes

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River Bottlebrush	<i>Callistemon sieberi</i>	Floodplain	Yes
Burgan	<i>Kunzea ericoides</i> *	Floodplain	
Prickly Tea-tree	<i>Leptospermum continentale</i>	Floodplain	
River Tea-tree	<i>Leptospermum obovatum</i>	Floodplain	
Bracelet Honey-Myrtle	<i>Melaleuca armillaris</i> *	Agricultural	Yes
OLEACEAE			
Desert Ash	<i>Fraxinus angustifolia</i> *	Agricultural	
Broadleaf privet	<i>Ligustrum lucidum</i> *	Agricultural	
European Olive	<i>Olea europea</i> *	Agricultural	Yes
ONAGRACEAE			
Hoary Willow-herb	<i>Epilobium hirtigerum</i>	Floodplain	Yes
Water Primrose	<i>Ludwigia peploides</i>	Floodplain	Yes
OROBANCHACEAE			
Broomrape	<i>Orobanche sp.</i>	Ranges	
OXALIDACEAE			
Grassland wood sorrel	<i>Oxalis perennans</i>	Widespread	Yes
Soursob	<i>Oxalis pes-caprae</i> *	Floodplain	
PHYLLANTHACEAE			
Small Proanthra	<i>Poranthera microphylla</i>	Ranges	
PHYTOLACCACEAE			
Inkweed	<i>Phytolacca octandra</i> *	Floodplain	Yes
PITTOSPORACEAE			
Sweet Bursaria	<i>Bursaria spinosa</i>	Widespread	
PLANTAGINACEAE			
Ribwort	<i>Plantago lanceolata</i> *	Widespread	Yes
Native Plantain	<i>Plantago varia</i>	Widespread	
POLYGONACEAE			
Sheep sorrel	<i>Acestosella vulgaris</i> *	Widespread	
Slender Knotweed	<i>Persicaria decipiens</i>	Floodplain	
Pale Knotweed	<i>Persicaria lapathifolium</i>	Floodplain	Yes
Creeping Knotweed	<i>Persicaria prostrata</i>	Floodplain	Yes
Slender dock	<i>Rumex brownii</i>	Floodplain	Yes
Curled dock	<i>Rumex crispus</i> *	Floodplain	Yes
PORTULACACEAE			
Common Pigweed	<i>Portulaca oleracea</i>	Floodplain	Yes
PRIMULACEAE			
Scarlet Pimpernel	<i>Anagallis arvensis</i> *	Floodplain	
PROTEACEAE			
Cats Claw Grevillea	<i>Grevillea alpina</i>	Ranges	Yes
Woolly Grevillea	<i>Grevillea lanigera</i>	Ranges	
Rosmary Grevillea	<i>Grevillea rosmarinifolia</i>	Agricultural	Yes
Hairy Geebung	<i>Persoonia rigida</i>	Ranges	
RANUNCULACEAE			
Common Buttercup	<i>Ranunculus lappaceus</i>	Agricultural	
Sharp Buttercup	<i>Ranunculus muricatus</i> *	Floodplain	Yes
ROSACEA			
Australian Piert	<i>Aphanes australiana</i>	Agricultural	
Sweet Briar	<i>Rosa rubiginosa</i> *	Widespread	
Blackberry	<i>Rubus fruticosus</i> *	Floodplain	Yes
Cherry Plum	<i>Prunus cerasifera</i> *	Agricultural	Yes
Plum tree	<i>Prunus nigra</i> *	Agricultural	
RUBIACEAE			

Common Name	Scientific Name	Core Distribution	This Study
Bedstraw	<i>Gallium aparine</i> *	Floodplain	
Native Cleaver	<i>Gallium gaudochaudii</i>	Ranges	
SALICACEAE			
Weeping Willow	<i>Salix babylonica</i> *	Floodplain	Yes
Crack Willow	<i>Salix fragilis</i> *	Floodplain	Yes
Tortured Willow	<i>Salix matsundana</i> *	Floodplain	Yes
Black Willow	<i>Salix nigra</i> *	Floodplain	
SANTALACEAE			
Cherry Ballart	<i>Exocarpus cupressiformis</i>	Ranges	Yes
SAPINDACEAE			
Box Elder	<i>Acer negundo</i> *	Floodplain	
Narrow-leaved Hopbush	<i>Dodonea viscosa angustissima</i>	Ranges	Yes
SCROPHULARIACEAE			
Pelisser's Toadflax	<i>Linaria pelisserana</i> *	Ranges	
Red Bartsia	<i>Parentucelli latifolia</i> *	Agricultural	
Twiggy Mullein	<i>Verbascum virgatum</i> *	Ranges	Yes
SIMAROUBACEAE			
Tree of Heaven	<i>Ailanthus altissima</i> *	Widespread	
STACKHOUSIACEAE			
Creamy Candles	<i>Stachhousia monogyna</i>	Ranges	
STERCULIACEAE			
Kurrajong	<i>Brachychiton populneus</i>	Ranges	Yes
SOLANACEAE			
Narrawa Burr	<i>Solanum cinereum</i>	Ranges	Yes
Wild Tobacco Bush	<i>Solanum mauritianum</i> *	Floodplain	Yes
Blackberry nightshade	<i>Solanum nigrum</i> *	Floodplain	Yes
THYMELAEACEAE			
Rice-Flower	<i>Pimelea humilis</i>	Ranges	Yes
Slender Rice Flower	<i>Pimelea linifolia</i>	Ranges	
ULMACEAE			
Nettle tree	<i>Celtis australis</i> *	Agricultural	
VIOLACEAE			
Tree Violet	<i>Melicytus dentatus</i>	Floodplain	
VERBENACEAE			
Lippia	<i>Lippia nodifolia</i> *	Floodplain	
Purpletop	<i>Verbena bonariensis</i> *	Floodplain	Yes
XANTHORRHOEACEAE			
Short-flowered Mat-rush	<i>Lomandra bracteata</i>	Ranges	
Wattle Mat-rush	<i>Lomandra filiformis</i>	Widespread	Yes
Many-flowered Mat-rush	<i>Lomandra multiflora</i>	Ranges	
Sources include: Nail Can Hill Community Biodiversity Survey; NCT Caladenia Ridge plant list; Albury City Council plant list for Nail Can Hill; Joan Howitt unpublished plant list; NSW NPWS atlas; D. Michael unpublished data; Rick James Riparian Management Services.			

