

Common name	Scientific name	Threatened flora species surveys			Results	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)
		Survey method (transects or grids)	Timing of survey – within recommended period? (BAM-C / TBDC)			
					No. People = 1 <u>SAT Technique</u> Wednesday 1 <sup>st</sup> May Total hours = 3 No. people = 1	
Cumberland Plain Land Snail	<i>Meridolum comeovirens</i>	Litter Search	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<u>Litter Search</u> Wednesday 1 <sup>st</sup> May Total hours = 1.5 No. people = 1	None observed No
	<i>Grevillea juniperina</i> subsp. <i>Juniperina</i>	Transect search	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<u>Transect Search</u> Friday 10 <sup>th</sup> May Total hours = 2 No. people = 1	None observed No
	<i>Persoonia nutans</i>	Transect search	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<u>Transect Search</u> Friday 10 <sup>th</sup> May Total hours = 2 No. people = 1	None observed No
	<i>Pimelea spicata</i>	Transect search	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<u>Transect Search</u> Friday 10 <sup>th</sup> May + Fri 21 <sup>st</sup> June + Thu 4 <sup>th</sup> July Total hours = 12 No. people = 1	None observed No
	<i>Micromyrtus minutiflora</i>	Transect search	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<u>Transect Search</u> Friday 10 <sup>th</sup> May Total hours = 2 No. people = 1	None observed No

**Table 5-4 Targeted surveys previously conducted in the locality**

Common name	Scientific name	Surveys conducted by	Location	Effort	Timing	Results
Microbats		Ecological (2022)	Redbank Southern Valley Site	Three detectors were set to passively record ultrasonic microbat calls from 30 minutes before sunset to 30 minutes after sunrise at three different locations for a total of 18 survey nights.	29 March 2021 – 6 April 2021	<u>Definite calls:</u> Large-eared Pied Bat Eastern Coastal Free-tailed Bat Large Bent-winged Bat Southern Myotis Greater Broad-nosed Bat <u>Potential calls:</u> Eastern Cave Bat Eastern False Pipistrelle Little Bent-winged Bat
Microbats		Molino Stewart (2018)	Redbank Southern Valley Site	One Anabat was deployed for three survey nights.	6 <sup>th</sup> and 9 <sup>th</sup> September 2018	Large-eared Pied Bat Eastern Coastal Free-tailed Bat
Squirrel Glider	<i>Petaurus norfolcensis</i>	Ecological (2022)	Redbank Southern Valley Site	Hollow-bearing tree inspection by a suitably qualified climbing arborist; Remote cameras; Hair tape.	<u>Hollow inspection:</u> 20 May and 18 June 2021. <u>Remote cameras:</u> 1 June – 18 June 2021. <u>Hair tape:</u> 20 May – 18 June 2021.	No fauna was observed using the hollows and no hair was collected on tape
Arboreal Mammals		Molino Stewart (2018)	Redbank Southern Valley Site	Spotlighting and search for scratch marks within trees.	6 <sup>th</sup> and 9 <sup>th</sup> September 2018	No fauna observed
Koala	<i>Phascolarctos cinereus</i>	Ecological (2022)	Redbank Southern Valley Site	SAT searches were undertaken in patches of PCT 849 within the site boundary.	14 <sup>th</sup> April 2021	No scats observed
Koala	<i>Phascolarctos cinereus</i>	Molino Stewart (2018)	Redbank Southern Valley Site	Scat searches beneath eucalypts.	6 <sup>th</sup> and 9 <sup>th</sup> September 2018	No scats observed

Common name	Scientific name	Surveys conducted by	Location	Effort	Timing	Results
Cumberland Plain Land Snail	<i>Meridolum comeovirens</i>	Ecological (2022)	Redbank Southern Valley Site	Searches targeted areas of most appropriate habitat, i.e. around the base of Eucalyptus spp. within the site boundary.	29 <sup>th</sup> March 2021	No shells or live specimen observed
Cumberland Plain Land Snail	<i>Meridolum comeovirens</i>	Molino Stewart (2018)	Redbank Southern Valley Site	Snail and shell searches conducted beneath eucalypts.	6 <sup>th</sup> and 9 <sup>th</sup> September 2018	No shells or live specimen observed
Flora		Molino Stewart (2018)	Redbank Southern Valley Site	Random meander within patches of native vegetation.	6 <sup>th</sup> and 9 <sup>th</sup> September 2018	No threatened specimen observed
Frogs		Molino Stewart (2018)	Redbank Southern Valley Site	Spotlighting and call playback for five person hours over two nights.	6 <sup>th</sup> and 9 <sup>th</sup> September 2018	None
Diurnal birds		Molino Stewart (2018)	Redbank Southern Valley Site	Bird species were recorded between 4pm and 6pm.	6 <sup>th</sup> and 9 <sup>th</sup> September 2018	No threatened species observed

## 5.7 Presence of Candidate Species Credit Species

Table 5-5 identifies species determined to be present within the subject land in accordance with BAM Subsection 5.2.4 based on:

- assumed presence within the subject land
- an important habitat map (for dual credit species)
- targeted threatened species surveys, or
- an expert report

**Table 5-5 Candidate species credit species**

Common name	Scientific name	Listing status		Method used to determine presence	Further assessment required? (BAM Subsections 5.2.5 and 5.2.6)
		BC Act	EPBC Act		
Green and Golden Bell Frog	<i>Litoria aurea</i>	Endangered	Vulnerable	Assumed presence	Yes (see Section 10)
Square-tailed Kite	<i>Lophoictinia isura</i>	Vulnerable	-	Assumed presence	No
Southern Myotis	<i>Myotis macropus</i>	Vulnerable	-	Surveyed	No
Matted Bush-pea	<i>Pultenaea pedunculata</i>	Endangered	-	Assumed presence	No

**Table 5-6 Species credit species included in the assessment**

Common name	Scientific name	Species presence	Geographic limitations	Area of habitat within subject site (ha)	Area of impacted habitat (ha)	Biodiversity risk weighting	Species polygon justification
Green and Golden Bell Frog	<i>Litoria aurea</i>	Assumed presence	Semi-permanent/ephemeral wet areas within 1 km of wet areas. Within 1 km of swamps or waterbodies.	18.3	14.8	2.00	The species polygon boundary should align with aquatic habitats linked directly to the record and a buffer, incorporating the PCTs with which the species is associated, of 200 metres radius from the top of bank. The polygon should include minimum 50 metre wide corridors of native and non-native vegetated



							areas linking the available waterbodies, where relevant. Terrestrial habitat consists of grassy areas and vegetation no higher than woodlands.
Square-tailed Kite	<i>Lophoictinia isura</i>	Assumed presence	Nest trees	8.9	7.72	1.50	The Square-tailed Kite will forage around suburban trees and shrubs, and nest in urban bushland. It builds a large stick platform in a living tree, in open forest or woodland or near edges or openings in forest.
Southern Myotis	<i>Myotis macropus</i>	Surveyed	Hollow-bearing trees.  Waterbodies with permanent pools/stretches 3 m or wider, including rivers, large creeks, billabongs, lagoons, estuaries, dams and other waterbodies, on or within 200 m of the site.	6.3	5.85	2.00	The NSW survey guide for 'Species credit' threatened bats and their habitats (OEH 2018) specify that the species polygon for Southern Myotis should incorporate associated PCTs within 200 m of water bodies.
Matted Bush-pea	<i>Pultenaea pedunculata</i>	Assumed presence	Nil	8.9	7.72	2.00	NSW populations are generally among woodland vegetation. On the Cumberland Plain the species is recorded from Cumberland Plain Woodlands.

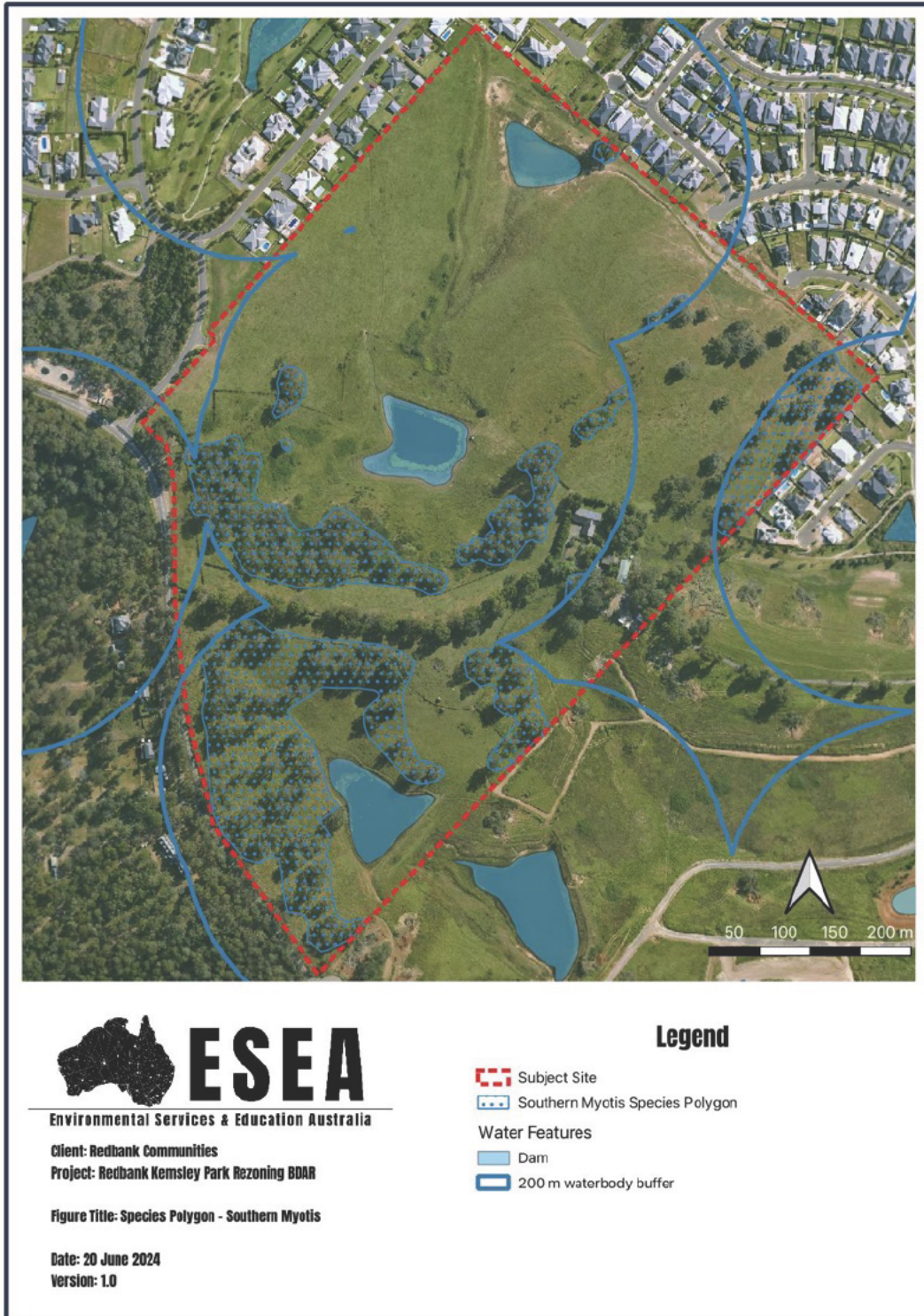


Figure 5-3 Species Polygon - Southern Myotis





Figure 5-4 Species Polygon - Green and Golden Bell Frog



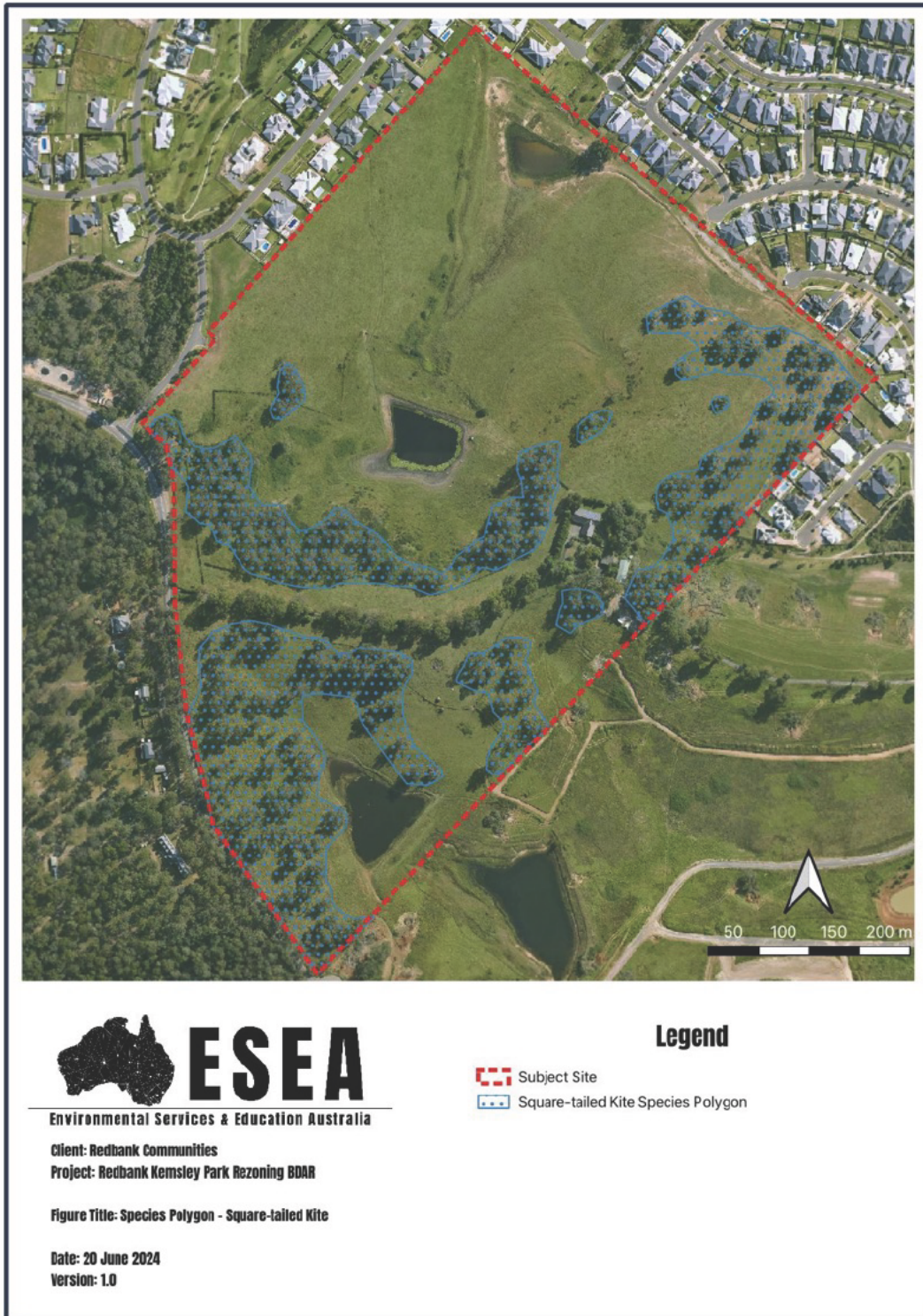


Figure 5-5 Species Polygon - Square-tailed Kite



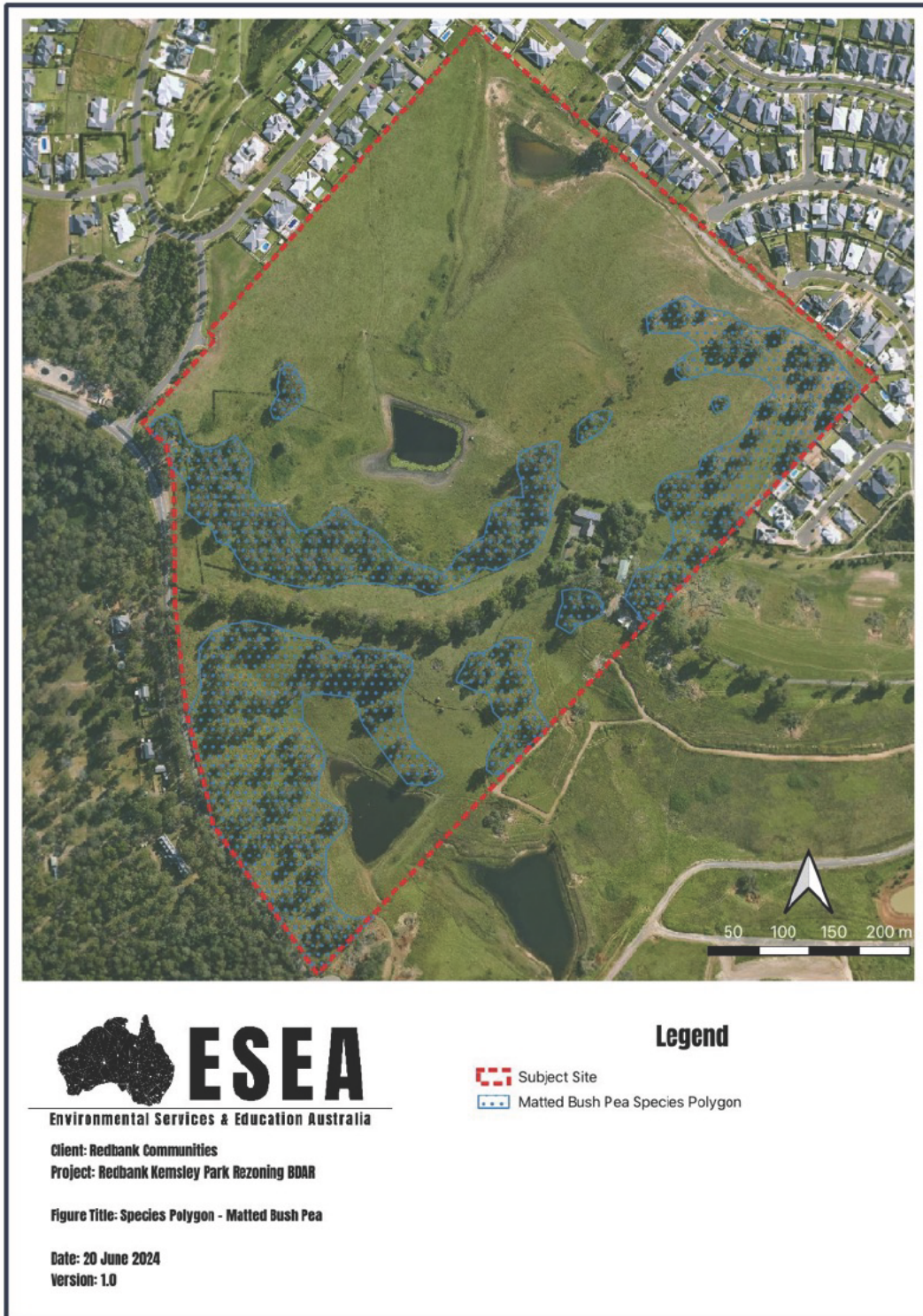


Figure 5-6 Species Polygon - Matted Bush Pea

## 6 IDENTIFYING PRESCRIBED IMPACTS

**Table 6-1 Identification of prescribed additional biodiversity impact entities**

Feature	Present	Description of feature characteristics and location	Threatened entities that use, are likely to use, or are part of the habitat feature.
Karst, caves, crevices, cliffs, rocks or other geological features of significance	<input type="checkbox"/> Yes / <input checked="" type="checkbox"/> No	The subject site does not contain any geological features of significance.	N/A
Human-made structures	<input checked="" type="checkbox"/> Yes / <input type="checkbox"/> No	The subject site contains one residential dwelling and several sheds. All human-made structures are in good condition and continue to be used / maintained.	Nil
Non-native vegetation	<input checked="" type="checkbox"/> Yes / <input type="checkbox"/> No	Non-native vegetation, particularly exotic pasture, was dominant throughout the subject site and was not identified as potential habitat for any threatened species.	Nil
Habitat connectivity	<input checked="" type="checkbox"/> Yes / <input type="checkbox"/> No	The subject site is largely cleared, and connectivity is limited. Some connectivity for highly mobile species may be present between the scattered trees and dams present within the subject site. Tracts of native vegetation present along the southern boundaries may also provide some connectivity for highly mobile species. These areas of vegetation are separated from the subject site by fences and Grose Vale Road.	Highly mobile, threatened birds and bats that are likely to use native vegetation and dams within the development site (mostly while foraging) were included as ecosystem credit species.
Waterbodies, water quality and hydrological processes	<input checked="" type="checkbox"/> Yes / <input type="checkbox"/> No	The subject site contains a mapped network of watercourses and three dams. The proposed development would remove these dams	Species with waterbodies as habitat constraints, include: - Southern Myotis. Dams present within the subject site may provide occasional foraging habitat for the Southern Myotis. Similar habitat for this species would still be present within the assessment area in the form of dams, the Hawkesbury River and Redbank Creek.
Wind turbine strikes (wind farm development only)	<input type="checkbox"/> Yes / <input checked="" type="checkbox"/> No	This prescribed impact is not relevant to the proposed development.	N/A
Vehicle strikes	<input checked="" type="checkbox"/> Yes / <input type="checkbox"/> No	It is considered highly unlikely for fauna other than highly mobile species to be present within the subject site. Therefore, the proposed development would be unlikely to result in vehicle strike during construction or during operation as a residential subdivision.	Nil



## 7 AVOID AND MINIMISE IMPACTS

### 7.1 Avoid and Minimise Direct and Indirect Impacts

#### 7.1.1 Project location

The BAM requires locating and designing a project to avoid and minimise direct and indirect impacts on biodiversity values and prescribed biodiversity impacts.

Most of the subject site (23.4 ha) consists of exotic vegetation within cleared grazing pasture which lacks biodiversity values. An additional 1.28 ha of the subject site consists of planted native and exotic species occurring within a planted driveway grove. This area also lacks any biodiversity value and does not contain any fauna habitat features.

The subject site contains 8.6 ha of remnant native vegetation that is consistent with PCT 3320 - Cumberland Shale Plain Woodland in poor or degraded condition. This occurs within three distinct patches with vegetation integrity scores of 19.1, 14.1 and 18.2 respectively. The proposed development would remove 7.72 ha of Cumberland Plain Woodland, a TEC that is highly cleared (93%) and an entity of risk of an SAIL. Patches of the TEC are degraded and isolated. The majority of impacts (4.35 ha) are proposed for Zone 1 - PCT 3320 in poor condition, which has a low vegetation integrity score of 19.1. An additional 2.34 ha of native vegetation is proposed for removal from Zone 2 (vegetation integrity score of 14.1), and 1.03 ha from Zone 3 (vegetation integrity score of 22.7)

The development site does not contain nest trees or caves. No caves were identified within 2 km of the site during a desktop assessment.

#### 7.1.2 Project design

The development has been designed in a way that avoids and minimises impacts. This includes the creation of open space corridors, zoned RE1 – Public Recreation, which form an integral part of the design and character of the precinct. These corridors would include native vegetation and waterbodies and would provide connectivity between other stages of the Redbank release area.

The proposed development will be designed to allow for approximately 300 lots whilst retaining 5.21 ha of land within open space corridors. These areas will be subject to environmental management works including weeding and native species replanting using locally endemic species. The open space corridors will encapsulate Stream O, as well as Dams 3, 5, and 11.

Of the retained area, 1.2 ha is native vegetation consistent with PCT 3320 - Cumberland Shale Plain Woodland, the majority of which (1.15 ha) occurs within Zone 3. A small section within Zone 1 is also being retained. This makes up approximately 0.05 ha.

The retained patches of native vegetation will contribute to connectivity throughout the landscape and will form a connectivity corridor between remnant native vegetation to the south of the development area, with native vegetation along Redbank Creek.

In total, the proposed development would remove 7.72 ha of Cumberland Plain Woodland, a Critically Endangered ecological community that is an entity at risk of an SAIL. Patches of this ecological community are already in a degraded and isolated state. The proposed development would avoid direct impacts on 1.2 ha of the ecological community.

The proposed development would remove habitat for several threatened species, including:

- Green and Golden Bell Frog (14.8 ha),



- Square-tailed Kite (7.72 ha),
- Southern Myotis (5.85 ha), and
- Matted Bush-pea (7.72 ha)

Green and Golden Bell Frog, Southern Myotis and Matted Bush-pea are species credit species with a high biodiversity risk weighting (2.00). Square-tailed Kite has a moderate biodiversity risk weighting (1.50).

The proposed development would avoid direct impacts on some areas of habitat for these species by retaining habitat in open space zoned RE1 – Public Recreation.

- Green and Golden Bell Frog (~3.45 ha retained)
- Square-tailed Kite (~1.10 ha retained)
- Southern Myotis (~1.10 ha retained)
- Matted Bush-pea (~1.10 ha retained)

## 7.2 Avoid and Minimise Prescribed Impacts

### 7.2.1 Project location

Habitat connectivity and waterbodies were identified as prescribed impacts.

The location of the project does not interfere with corridors connecting different areas of habitat, migratory flight paths to important habitat, or preferred local movement pathways. Given that the subject site is already substantially degraded, connectivity is limited and only available for highly mobile species. The subject site is not known to form part of important or preferred flight paths for migratory birds.

Corridors considered in the broader context of the entire Redbank subdivision would improve connectivity throughout the landscape (Appendix D).

### 7.2.2 Project design

Dams 3, 5 and 11, and Stream O will all be retained within open space corridors, zoned RE1 – Public Recreation. These dams and streams provide foraging habitat for Southern Myotis and Green and Golden Bell Frog. The unshaded grassy areas surrounding these waterbodies also provide potential habitat for Green and Golden Bell Frog.

Additional areas of open space will retain 1.2 ha of remnant native canopy vegetation that is consistent with PCT 3320 – Cumberland Shale Plain Woodland. This remnant woodland provides roosting habitat for Southern Myotis and potential nesting habitat for Square-tailed Kite. It is also potential habitat for Mattered Bush Pea.

Given that the development site is substantially degraded, connectivity is limited and only available for highly mobile species. About 1.2 ha of native vegetation would be retained. Corridors of connectivity will still be available through proposed areas of open space. Corridors considered in the broader context of the entire Redbank subdivision would improve connectivity throughout the landscape.

## 8 IMPACT ASSESSMENT

### 8.1 Direct Impacts

The direct impacts of the development on native vegetation, threatened ecological communities, and threatened species habitat are outlined in Table 8-1 and Table 8-2.

#### 8.1.1 Residual direct impacts

**Table 8-1 Residual direct impacts**

Direct impact (Describe the impact on PCT/TEC/EC or threatened species and their habitat)	BC Act status	EPBC Act status	SAIL entity	Project phase/timing of impact (e.g. construction, operation, rehabilitation)	Extent (ha, number of individuals)
Removal of native vegetation – PCT 3320; Cumberland Plain Woodland in the Sydney Basin Bioregion	Endangered	-	Yes	Construction	7.72
Removal of habitat for Green and Golden Bell Frog	Endangered	Vulnerable	False	Construction	14.8
Removal of habitat for Square-tailed Kite	Vulnerable		False	Construction	7.72
Removal of habitat for Southern Myotis	Vulnerable		False	Construction	5.85
Removal of habitat for Matted Bush Pea	Endangered		False	Construction	7.72

**Table 8-2 Change in vegetation integrity score**

Vegetation zone	PCT ID	Management zone	Area of impact (ha)	Before development			After development			Change		
				Composition	Structure	Function	VI score	Composition	Structure	Function	VI score	Change in VI score
Zone 1: PCT 3320 Poor	3320	1	4.35	8.9	22.0	35.6	19.1	0	0	0	0	-19.1
Zone 2: PCT 3320 Poor	3320	2	2.34	4.9	19.2	29.5	14.1	0	0	0	0	-14.1
Zone 3: PCT 3320 degraded	3320	3	1.03	8.4	31.8	43.8	22.7	0	0	0	0	-22.7

Vegetation zone	PCT ID	Management zone	Area of impact (ha)	Before development			After development			Change		
				Composition	Structure	Function	VI score	Composition	Structure	Function	VI score	Change in VI score
Planted native and exotic cover	N/A	4	1.28	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Exotic	N/A	5	23.40	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

## 8.2 Indirect Impacts

Indirect impacts associated with the proposal are summarised in Table 8-3.

**Table 8-3 Indirect impacts of the proposed development**

Indirect impact (Describe impact, e.g. transport of weeds and pathogens from the site to adjacent vegetation)	Impacted entities (PCT/threatened entity and their habitats and where relevant, EPBC Act listing)	Extent (ha or zone reference)	Frequency	Duration (long-term/ short-term/ medium-term)	Project phase/ timing of impact (e.g. construction, operation, rehabilitation)	Consequences
Inadvertent impacts on adjacent habitat or vegetation (accidental damage or removal of vegetation or habitat)	PCT 3320 Cumberland Plain Woodland in the Sydney Basin Bioregion	Connective vegetation to the south of the subject site	Occasionally during construction period	Potentially long-term impacts	Construction – sporadic through construction period	Low
Reduced viability of adjacent habitat due to edge effects	PCT 3320 Cumberland Plain Woodland in the Sydney Basin Bioregion	Connective vegetation to the south of the subject site	Daily during construction and operation	Potentially long-term impacts	Construction and operation	Moderate
Transport of weeds and pathogens from the site to adjacent vegetation	PCT 3320 Cumberland Plain Woodland in the Sydney Basin Bioregion	Connective vegetation to the south of the subject site	Daily during construction and operation	Potentially long-term impacts	Construction and operation	Moderate
Reduced viability of adjacent habitat due to noise, dust or light spill	PCT 3320 Cumberland Plain Woodland in the Sydney Basin Bioregion	Connective vegetation to the south of the subject site	Daily during construction period	Potentially long-term impacts	Construction and operation	Low
Potentially increased soil salinity caused by runoff during construction works	Subject site	Entire subject site	During heavy rainfall or storm events	Short term	Construction	Low

Indirect impact (Describe impact, e.g. transport of weeds and pathogens from the site to adjacent vegetation)	Impacted entities (PCT/threatened entity and their habitats and where relevant, EPBC Act listing)	Extent (ha or zone reference)	Frequency	Duration (long-term/ short-term/ medium-term)	Project phase/ timing of impact (e.g. construction, operation, rehabilitation)	Consequences
Fertiliser drift	PCT 3320 Cumberland Plain Woodland in the Sydney Basin Bioregion	Connective vegetation to the south of the subject site	Daily during construction period and operation	Potentially long-term impacts	Construction and operation	Low
Wood collection	PCT 3320 Cumberland Plain Woodland in the Sydney Basin Bioregion	Connective vegetation to the south of the subject site	Potential to occur at any time during operation phase	Potentially long-term impacts	Operation period	Low
Increase in predators	PCT 3320 Cumberland Plain Woodland in the Sydney Basin Bioregion	Connective vegetation to the south of the subject site	Potential to occur at any time during operation phase	Potentially long-term impacts	Operation period	Moderate

### 8.3 Mitigating and Managing Direct and Indirect Impacts

Measures proposed to mitigate and manage impacts at the subject site before, during and after construction are outlined in Table 8-4.

**Table 8-4 Measures proposed to mitigate and manage impacts**

Measure	Risk before mitigation	Risk after mitigation	Action	Outcome	Timing	Responsibility
Timing works to avoid critical life cycle events such as breeding or nursing.	Moderate	Low	Carry out pre-clearing surveys to ensure fauna is not present prior to clearing.	Impacts to fauna during nesting / nursing avoided.	During clearing works	Project manager / contractor
Instigating clearing protocols including pre-clearing surveys, daily surveys and staged clearing, the presence of a trained ecological or licensed wildlife handler during clearing events.	Moderate	Low	Pre-clearance survey of trees to be removed and identification/location of active nests by a suitably qualified ecologist.	Any fauna utilising habitat within the subject site will be identified and managed to ensure clearing works minimise	During clearing works	Project manager / ecologist

				the likelihood of injuring resident fauna.		
Installing artificial habitats for fauna in adjacent retained vegetation and habitat or human made structures to replace the habitat resources lost and encourage animals to move from the impacted site, e.g. nest boxes.	High	Low	Nest boxes should be installed in the retained vegetation to replace hollows removed at a minimum ratio of 1:1 (i.e. one nest box for each hollow removed). Boxes should be chosen to match the likely target species of each hollow. Boxes should be installed prior to clearing works to allow fauna to move/be relocated to nest boxes prior to removal of hollow-bearing trees and be maintained and monitored for five years.	Provide fauna with compensatory roosting/nesting habitat to replace removed hollow-bearing trees.	Prior to clearing works	Project manager / ecologist
Clearing protocols that identify vegetation to be retained, prevent inadvertent damage and reduce soil disturbance, for example, removal of native vegetation by chain-saw, rather than heavy machinery, is preferable in situations where partial clearing is proposed.	High	Low	Boundaries of the impact area to be clearly delineated with fencing, retained areas marked with "No Go" signage.  Both patches of native vegetation to be retained part of larger patches in which some trees are proposed for removal. These trees should be removed by chain-saw to reduce disturbance to vegetation to be retained.	Protection of retained vegetation. Reduction of soil disturbance where partial clearing is proposed.	During clearing works	Project manager
Sediment barriers or sedimentation ponds to control the quality of water released from the site into the receiving environment.	Moderate	Low	Install sediment barriers and erosion control during and post construction to prevent runoff into adjacent streams/dams. Maintain controls throughout construction and undertake weekly inspections. Detailed stormwater controls should be designed and implemented during the DA stage which manages quality and quantity of stormwater into the	Control of erosion, sedimentation and runoff of contaminated substances into adjacent vegetation and waterbodies.	Throughout life of project	Project Manager



			adjacent vegetation and aquatic habitats.			
Noise barriers or daily/seasonal timing of construction and operational activities to reduce impacts of noise.	Low	Very Low	Daily timing of construction activities is recommended in accordance with Table 1 of Interim Noise Guidelines (2009).	Noise impacts associated with the development will be managed to minimise disturbance to fauna during construction.	During construction	Project manager / contractor
Light shields of daily / seasonal timing of construction and operational activities to reduce impacts of light spill.	Low	Very Low	Conduct construction works during daylight hours. Lights should operate on a timer system during construction.	Avoid light disturbance to native fauna during construction and operation.	Throughout life of project	Project manager / contractor
Adaptive dust monitoring programs to control air quality.	Low	Very Low	Dust management controls should be implemented during construction. Dust is unlikely to be a long-term and significant issue during the operational phase.	Control dust and maintain air quality during construction.	During construction	Project manager / contractor
Hygiene protocols to prevent the spread of weeds or pathogens between infected areas and uninfected areas.	Medium	Low	Vehicles, machinery and building refuse should remain only within the subject site and disposed of at an appropriate waste management facility. Weed management to be undertaken where required. Vehicles should be washed down before entering and exiting the site to prevent the spread of weeds to or from the site boundary. In particular, machinery work on or nearby dams are required to be washed down in order to prevent the potential spread of chytrid fungus into the subject site.	Prevent spread of disease to/from the site.	During construction	Project manager / contractor
Staff training and site briefing to communicate environmental features	Low	Very Low	All staff working on the development will undertake an environmental induction as part of their site	All staff entering the site are fully aware of all environmental aspects	To occur for all staff entering / working at the site and when	Project manager / all staff

to be protected and measures to be implemented.			familiarisation. Site briefings should be updated based on phase of the work.	relating to the development and know what to do in case of any environmental emergencies.	environmental issues become apparent	
Making provision for the ecological restoration, rehabilitation and/or ongoing maintenance of retained native vegetation habitat on or adjacent to the subject site.	Medium	Low	Ongoing maintenance should be undertaken to ensure retained vegetation is not degraded over time as a result of edge effects and weed incursion. Planted vegetation should include Cumberland Plain Woodland species.	Ongoing maintenance of retained vegetation.	Following construction	Project manager

#### 8.4 Mitigating Prescribed Impacts

The measures proposed to mitigate and manage prescribed biodiversity impacts resulting from dam removal during construction are outlined in Table 8-5.

**Table 8-5 Mitigation measures for prescribed biodiversity impacts**

Measure	Risk before mitigation	Risk after mitigation	Action	Outcome	Timing	Responsibility
Implementing a dam dewatering procedure	Moderate	Low	During dewatering, an aquatic ecologist should be on site to handle aquatic fauna. A suitable aquatic fauna handling procedure is provided below.	Impacts of fauna minimised	Prior / during dam dewatering	Project manager / aquatic ecologist
Providing for the ecological restoration, rehabilitation and/or ongoing maintenance of retained native	Moderate	Low	During operation, any retained native vegetation should be maintained and improved through restoration and rehabilitation	Retained habitat can continue to provide connectivity for highly mobile species	Throughout the life of the project	Project manager



vegetation within the subject site						
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## 9 SERIOUS AND IRREVERSIBLE IMPACTS

### 9.1 Assessment for Serious and Irreversible Impacts on Biodiversity Values

The development has one candidate Serious and Irreversible Impacts (SAIL) values as outlined in Table 9-1 as listed in the Threatened Biodiversity Data Collection. Detailed consideration of whether impacts on this TEC is included in Table 9-2.

**Table 9-1 Entities at risk of an SAIL**

Common name	Scientific name	Reason for inclusion in assessment
Cumberland Plain Woodland in the Sydney Basin Bioregion	N/A	TEC subject to removal of 7.72 ha

**Table 9-2 Additional impact assessment provisions for TECs at risk of an SAIL**

Criteria	Data / information	Data sources	Details of data deficiency, assumptions, and reasons for low confidence in information.
Current total geographic extent (ha) of the TEC in NSW	Cumberland Plain Woodland is highly restricted to the Sydney Basin Bioregion. According to the TSSC Final Determination, it was estimated to occur within an extent of 2,810 km <sup>2</sup> . The total extent of Cumberland Plain Woodland was estimated to be ~8.8% of the community's pre-European distribution by Tozer in 2003 based on aerial photography from 1998.	NSW Threatened Species Scientific Committee Final Determination Cumberland Plain Woodland in the Sydney Basin Bioregion	
Estimated reduction in geographic extent of the TEC since 1970	An update of Tozer's (2003) map, based on interpretation of imagery flown in January-March 2007 shows that the extent of Cumberland Plain Woodland east of the Hawkesbury – Nepean River had declined by 442±46 ha, a reduction of 5.2±0.6% in 9 years (NSW Scientific Committee & Simpson 2008). These estimates indicate that the geographic distribution of the community has undergone a very large reduction over a time frame appropriate to the life cycle and habitat characteristics of its component species.	NSW Threatened Species Scientific Committee Final Determination Cumberland Plain Woodland in the Sydney Basin Bioregion	
Extent of reduction in ecological function, describing the degree of environmental degradation or disruption to biotic processes (Principle 2)			
<p>The extent of reduction in ecological function for the TEC is also found in the TEC Final Determination, as follows:</p> <ul style="list-style-type: none"> <li>■ The community structure has changed such that almost all of the remaining Cumberland Plain Woodland is considered to be regrowth forest and woodland from past clearing activities.</li> <li>■ Species composition has changed such that remnants are largely degraded by weed invasion and regrowth stands with high densities of saplings or shrubs may suppress ground flora.</li> </ul>			

<ul style="list-style-type: none"> <li>Ecological processes have been disrupted by the chemical and structural modification associated with agricultural land uses and more recent expansion of urban land uses which the Cumberland Plain has historically been subjected to.</li> <li>The TEC has been identified as severely fragmented.</li> </ul>			
Evidence of restricted geographic distribution (Principle 3) based on the TEC's geographic range in NSW			
Extent of occurrence (ha)	Cumberland Plain Woodland is highly restricted to the Sydney Basin Bioregion. According to the TSSC Final Determination, it was estimated to occur within an extent of 2,810 km <sup>2</sup> and is known from the Auburn, Bankstown, Baulkham Hills, Blacktown, Camden, Campbelltown, Fairfield, Hawkesbury, Holroyd, Liverpool, Parramatta, Penrith and Wollondilly LGAs. These locations are all subject to threats to the TEC, including weed invasion and clearing of native vegetation	NSW Threatened Species Scientific Committee Final Determination Cumberland Plain Woodland in the Sydney Basin Bioregion	
Area of occupancy (ha)	Using map data from Tozer (2003), Cumberland Plain Woodland was estimated to occur within an extent of occurrence of 2810 km <sup>2</sup> , and an area of occupancy of just under 2 100 km <sup>2</sup> (210,000 ha) based on 2 x 2 km grid cells, the spatial scale recommended by IUCN (2008) for assessing areas of occupancy for species.	NSW Threatened Species Scientific Committee Final Determination Cumberland Plain Woodland in the Sydney Basin Bioregion	
Impact on the geographic extent of the TEC (Principles 1 and 3)			
Area of TEC to be impacted by the proposal (ha)	7.72 ha	This report	
Area of TEC to be impacted by the proposal as a % of the current geographic extent in NSW (%)	0.000037%	This report	Based on Tozer (2003) estimate of Cumberland Plain Woodland extent of occurrence.
Direct/indirect impacts likely as a result of the proposal to contribute to loss of flora/fauna species characteristic of the TEC (BAM Subsection 9.1.1(4.a.ii.))	<p>The proposed impact will result in the loss of potential habitat for several threatened species that are assumed to be present within the subject site, and one threatened species that is known to occur within the subject site. These include:</p> <p>Green and Golden Bell Frog (assumed present)</p> <p>Square-tailed Kite (assumed present)</p> <p>Southern Myotis (known to occur)</p> <p>Matted Bush-pea (assumed present)</p> <p>The proposed development is not considered likely to result in a significant negative impact on any of these species, as the subject area contains only a small, degraded portion of potential habitat that is not</p>	This report	

	considered high-quality potential habitat. In addition, native vegetation is being retained within open space public recreation zoned areas which form connectivity corridors between surrounding patches of higher quality native vegetation within the surrounding area.		
Impacts likely to contribute to further environmental degradation or disruption of biotic processes (Principle 2)			
Remaining extent of isolated areas of TEC (ha)	1.2 ha of Cumberland Plain Woodland will be retained within open space RE1 – Public Recreation zoned areas.	This report	
Average distance between remaining remnants – remnant is retained (m)	Retained vegetation within the subject site is separated by surrounding patches of native vegetation only by Grose Vale Road at the east of the subject site, and may be further isolated by the construction of Road01, as per the Redbank Subdivision Layout Plans. The greatest distance of separation from nearby patches of native vegetation would be approximately 60 m.		
Estimated maximum dispersal distance of species associated with the TEC (km)	Credit species assumed as being present within the subject site generally are highly mobile species i.e., Square-tailed Kite has a home range of roughly 50 km <sup>2</sup>  Species with lower dispersal distance include the Green and Golden Bell Frog and Matted Bush Pea. Green and Golden Bell Frog will be able to move between areas of suitable habitat through open space connectivity corridors which connect through to Redbank Creek.	NSW Scientific Committee Square-tailed Kite <i>Lophoictinia isura</i> Review of Current Information	

## 10 SIGNIFICANT IMPACT ASSESSMENT

The EPBC Act establishes a regime for assessing and regulating the environmental impact of activities (including development) where Matters of National Environmental Significance (MNES) may be affected. Under the EPBC Act, any action which has, will have, or is likely to have a significant impact on a matter of MNES is defined as a “controlled action”, and requires approval from the Minister.

The process includes undertaking an Assessment of Significance for listed threatened species and ecological communities that represent an MNES that may be impacted as a result of the proposed action. The Significant Impact Guidelines published by DAWE (2009a) provide overarching guidance on determining whether an action is likely to have a significant impact on an MNES.

The following MNES were assessed in accordance with the Significant Impact Guidelines:

- *Litoria aurea* (Green and Golden Bell Frog)
- *Pteropus poliocephalus* (Grey-headed Flying-fox)
- *Lathamus discolor* (Swift Parrot)

### 10.1 *Litoria aurea* (Green and Golden Bell Frog)

This species is assumed to be present within the subject site due to suitable habitat being present.

**Table 10-1 Significant Impact Assessment for Green and Golden Bell Frog**

Criteria	Question	Response
An action is likely to have a significant impact on an endangered species if there is a real chance or possibility that it will:		
1	lead to a long-term decrease in the size of a population	<p>Green and Golden Bell Frog inhabit marshes, dams and stream-sides, particularly those containing bullrushes (<i>Typha sp.</i>) or spikerushes (<i>Eleocharis sp.</i>). Optimum habitat includes water-bodies that are unshaded, free of predatory fish such as Plague Minnow (<i>Gambusia holbrooki</i>), have a grassy area nearby and diurnal sheltering sites available. Some sites, particularly in the Greater Sydney region occur in highly disturbed areas. Green and Golden Bell Frogs need various habitats for different aspects of their life cycle including foraging, breeding, over-wintering and dispersal. Terrestrial habitat consists of grassy areas and vegetation no higher than woodlands.</p> <p>The species is not known to occur within the subject site, and has not been previously recorded in proximity to the subject site. However, the species' presence must be assumed based on the presence of potentially suitable habitat. No targeted surveys have been conducted for this species. The proposed works are not considered likely to result in the death or injury of any Green and Golden Bell Frogs.</p>
2	reduce the area of occupancy of the species	<p>The Green and Golden Bell Frog is not known to occupy the development site but is assumed to be present based on suitable habitat being present.</p> <p>The development action would affect 14.8 ha of potentially suitable habitat for Green and Golden Bell Frog, the majority of which is terrestrial habitat comprising un-shaded exotic groundcover. Area to be removed as part of the proposed development are terrestrial habitat on the outer boundary of the species polygon / suitable habitat area.</p> <p>Approximately 3.5 ha of potential habitat for the species will be retained within RE1 – Public Recreation zoned open space as part of the proposed development. This will include the three dams. The open area will also</p>



		encapsulate open terrestrial land surrounding these dams, which is the highest quality area of potential habitat for the species within the development site. The retained open space areas will provide a connectivity corridor between the dams, allowing for movement and connectivity for the species.
3	fragment an existing population into two or more populations	<p>The species is not known to occur within the subject site, and has not been previously recorded in proximity to the subject site. However, the species' presence must be assumed based on the presence of potentially suitable habitat. No targeted surveys have been conducted for this species.</p> <p>The proposed development is not considered likely to result in the fragmentation of any existing population. The proposed development seeks to retain 3.8 ha of the suitable habitat for the species within RE1 – Public Recreation Zoned open space area. This will include the three dams. The open area will also encapsulate open terrestrial land surrounding these dams, which is the highest quality area of potential habitat for the species within the development site. The retained open space areas will provide a connectivity corridor between the dams, allowing for movement and connectivity for the species.</p>
4	adversely affect habitat critical to the survival of a species	<p>The proposed development is not considered likely to affect habitat critical to the survival of the species. The species is not known to occur within the subject site and has not been previously recorded in proximity to the subject site. However, the species' presence must be assumed based on the presence of potentially suitable habitat. No targeted surveys have been conducted for this species.</p> <p>The development action would affect 14.8 ha of potentially suitable habitat for Green and Golden Bell Frog, the majority of which is terrestrial habitat comprising un-shaded exotic groundcover. Area to be removed as part of the proposed development are terrestrial habitat on the outer boundary of the species polygon / suitable habitat area.</p> <p>The proposed development seeks to retain 3.8 ha of the suitable habitat for the species within RE1 – Public Recreation Zoned open space area. This will include the three dams. The open area will also encapsulate open terrestrial land surrounding these dams, which is the highest quality area of potential habitat for the species within the development site. The retained open space areas will provide a connectivity corridor between the dams, allowing for movement and connectivity for the species.</p>
5	disrupt the breeding cycle of a population	The proposed action would not disrupt the breeding cycle of the Green and Golden Bell Frog given that 3.8 ha of suitable habitat for the species is proposed to be retained within RE1 – Public Recreation Zoned open space area. This will include the three dams. The open space will also encapsulate open terrestrial land surrounding these dams, which is the highest quality area of potential habitat for the species within the development site.
6	modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	<p>The development action would affect 14.8 ha of potentially suitable habitat for Green and Golden Bell Frog, the majority of which is terrestrial habitat comprising un-shaded exotic groundcover. Area to be removed as part of the proposed development are terrestrial habitat on the outer boundary of the species polygon / suitable habitat area.</p> <p>The proposed development seeks to retain 3.8 ha of the suitable habitat for the species within RE1 – Public Recreation Zoned open space area. This will include the three dams. The open area will also encapsulate open terrestrial land surrounding these dams, which is the highest quality area of potential habitat for the species within the development site. The retained open space areas will provide a connectivity corridor between the dams, allowing for movement and connectivity for the species.</p> <p>The proposed development will enhance potential habitat for the species via the management and improvement of waterbodies within the subject site.</p>

		This will include replanting with native aquatic species, and management of surrounding terrestrial grassland.
7	result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat	The proposed action is unlikely to result in the establishment of an invasive species that is harmful to the Green and Golden Bell Frog.
8	introduce disease that may cause the species to decline	Green and Golden Bell Frog may be impacted by Chytrid fungus. Chytrid fungus is transferred by direct contact between frogs and tadpoles or through exposure to infected water. The disease may not kill frogs immediately, and they can swim or hop to other areas before they die, spreading fungal spores to new ponds and streams. Wet or muddy boots and tyres, fishing, camping, gardening or frog-survey equipment may also be contributing to the spread of the disease.  The risk of disease transmission is extremely low and rare, therefore the proposed action would not increase the incidence of this disease.
9	interfere with the recovery of the species	The proposed development will enhance potential habitat for the species via the management and improvement of waterbodies within the subject site. This will include replanting with native aquatic species, and management of surrounding terrestrial grassland.
Conclusion	Is there likely to be a significant impact	The proposed action is unlikely to have a significant impact on the Green and Golden Bell Frog for the following reasons: <ul style="list-style-type: none"> <li>■ No individuals are likely to be harmed during the proposed works and the species is not considered highly likely to occur within the subject site. Species presence is assumed due to the presence of suitable habitat and lack of targeted species surveys.</li> <li>■ An abundance of potential habitat would still be available within the surrounding locality.</li> <li>■ The proposed action would retain 3.8 ha of connective potential habitat for the species.</li> <li>■ The proposed development will enhance potential habitat for the species via the management and improvement of waterbodies within the subject site. This will include replanting with native aquatic species, and management of surrounding terrestrial grassland.</li> </ul>

## 10.2 *Pteropus poliocephalus* (Grey-headed Flying Fox)

This species was not identified within the development site during surveys; however, vegetation within the development site has the potential to provide occasional seasonal foraging habitat. No camps were identified within the development site. The closest Grey-headed Flying-fox camp is located approximately 4.1 km to the south at Yarramundi. Significant Impact Criteria are applied in Table 10-2.

**Table 10-2 Significant Impact Assessment for Grey-headed Flying Fox**

Criteria	Question	Response
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:		
1	lead to a long-term decrease in the size of a population	No roosting habitat (camps) will be affected by the proposed development.



		<p>The development action would affect 7.72 ha of native vegetation, which comprises marginal foraging habitat for the Grey-headed Flying-fox.</p> <p>The Grey-headed Flying-fox is recorded as travelling long distances (up to 20 km) on feeding forays. Given the proximity of similar habitat within the assessment area and the retention of 1.8 ha of native vegetation within the development site, the removal of this potential foraging habitat would not lead to the long-term decrease in the size of an important population of Grey-headed Flying-fox.</p> <p>The closest known Grey-headed Flying-fox camp is located approximately 4.1 km to the south.</p>
2	reduce the area of occupancy of the species	<p>The proposed action would affect 7.72 ha of potential foraging habitat for this species.</p> <p>The Grey-headed Flying-fox is not known to occupy the development site in the form of a camp but may occasionally forage within the development site, the nearest known camp is located 4.1 km to the south.</p> <p>About 1.8 ha of native vegetation would be retained within the development site. The Grey-headed Flying-fox is recorded as travelling long distances on feeding forays and could utilise similar foraging habitat outside of the development site.</p>
3	fragment an existing population into two or more populations	<p>According to the National Recovery Plan for the Grey-headed Flying-fox 2021, "the Grey-headed Flying-fox is considered to be a single, mobile population with individuals distributed across Queensland, New South Wales, Victoria, South Australia, Tasmania and the ACT."</p> <p>The proposed action would not fragment an existing important population into two or more populations.</p> <p>The nearest camp is 4.1 km away. There is an abundance of foraging habitat available within 20 km, therefore reduction by 7.72 ha would not fragment habitat for the nearest camp.</p>
4	adversely affect habitat critical to the survival of a species	<p>The National Recovery Plan for the Grey-headed Flying-fox 2021 identifies 'a continuous temporal sequence of productive foraging habitats, linked by migration corridors or stopover habitats, and suitable roosting habitat within nightly commuting distance of foraging areas' as habitat critical to the survival of the species.</p> <p>The proposed action would affect 7.72 ha of native vegetation, some of which may represent habitat critical survival to this species. However, this impact is considered unlikely to have an adverse effect given that the species is recorded as travelling long distances (20 km) on feeding forays and similar habitat is available adjacent to the development site.</p>
5	disrupt the breeding cycle of a population	<p>The proposed action would not disrupt the breeding cycle of the Grey-headed Flying-fox given that no camps would be affected by the proposed action and suitable foraging habitat is available adjacent to the development site. Therefore, the nearest known camp would not be isolated from foraging habitat.</p>
6	modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	<p>The proposed action would remove 7.72 ha of vegetation, including marginal foraging habitat for the Grey-headed Flying-fox. It is unlikely that the extent of this vegetation removal would cause the species to decline because suitable habitat is available adjacent to the development site.</p>
7	result in invasive species that are harmful to a critically endangered or endangered species becoming established in the	<p>The proposed action is unlikely to result in the establishment of an invasive species that is harmful to the Grey-headed Flying-fox.</p>

	endangered or critically endangered species' habitat	
8	introduce disease that may cause the species to decline	Grey-headed Flying-fox are reservoirs for the Australian bat lyssavirus, Hendra Virus and Menangle virus, which can cause clinical disease and mortality in Grey-headed Flying- fox. The risk of disease transmission is extremely low and rare, therefore the proposed action would not increase the incidence of this disease.
9	interfere with the recovery of the species	The proposed action would remove suitable foraging habitat for this species; however, this would not interfere substantially with recovery objectives listed in the National Recovery Plan for the Grey-headed Flying-fox 2021. The proposed action would not affect any camps and suitable foraging habitat is available adjacent to the development site.
Conclusion	Is there likely to be a significant impact	<p>The proposed action is unlikely to have a significant impact on the Grey-headed Flying-fox for the following reasons:</p> <ul style="list-style-type: none"> <li>■ No camps would be removed by the proposed action.</li> <li>■ An abundance of foraging habitat would still be available within 20 km of the nearest Nationally Important camp.</li> <li>■ The proposed action would retain 1.8 ha of connective native vegetation.</li> </ul>

### 10.3 *Lathamus discolor* (Swift Parrot)

This species was not identified within the development site during surveys; however, vegetation within the development site has the potential to provide occasional seasonal foraging habitat. BAM Important Areas for the species are mapped approximately 1.35 km to the north of the site boundary. Significant Impact Criteria are applied in Table 10-3.

**Table 10-3 Significant Impact Assessment for Swift Parrot**

Criteria	Question	Response
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:		
1	lead to a long-term decrease in the size of a population	<p>A 'population of a species' refers to a population, or collection of local populations, that occurs within a particular bioregion. The proposed works would remove 7.72 ha of native vegetation, containing potential foraging habitat for the Swift Parrot.</p> <p>No breeding habitat would be impacted as part of the proposed works. Given that the species is highly mobile and can continue to access foraging habitat retained within the development site and surrounds, the proposed works would not lead to a long-term decrease in populations of the species.</p>
2	reduce the area of occupancy of the species	<p>The proposed action would reduce the area of occupancy of the species through the direct removal of 7.72 ha of potential foraging habitat. More foraging habitat would be retained within the subject land and similar habitat is available adjacent to the development site.</p> <p>No breeding habitat would be removed.</p>
3	fragment an existing population into two or more populations	The proposed action would remove 7.72 ha of potential foraging habitat for the species to use seasonally and sporadically. No breeding habitat would be removed. Subsequently, the proposed works would not fragment populations of the species.
4	adversely affect habitat critical to the survival of a species	The National Recovery Plan for the Swift Parrot identifies critical habitat as those with a "level of site fidelity or possessing phenological characteristics

		likely to be of importance to the Swift Parrot, or are otherwise identified by the recovery team”.
		The proposed works would not impact critical habitat for the species because the development site has not been identified as having site fidelity or been identified by the recovery team.
5	disrupt the breeding cycle of a population	The Swift Parrot breeds only in Tasmania.
6	modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The proposed action would remove 7.72 ha of potential foraging habitat available for the species within the development site. The highly mobile species would still be able to access foraging habitat retained within the development site and surrounds.
7	result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat	The proposed action is unlikely to result in the establishment of an invasive species that is harmful to the Swift Parrot.
8	introduce disease that may cause the species to decline	Psittacine Beak and Feather Disease may cause the species to decline. This spread through food sharing, excrement, feather and skin particles. The proposed action would reduce the area of occupancy of the species and is therefore unlikely to introduce the disease.
9	interfere with the recovery of the species	One threat activity identified within the National Recovery Plan for the Swift Parrot 2011 is relevant to the proposed development, habitat loss and alteration.  The proposed action would remove 7.72 ha of potential foraging habitat for this species. However, this threat is considered minimal given that similar habitat would still be available for the highly mobile species within and adjacent to the site boundary, therefore not fragmenting foraging habitat or movement corridors.
Conclusion	Is there likely to be a significant impact	No. The proposed activity is unlikely to have a significant impact on the Swift Parrot for the following reasons: <ul style="list-style-type: none"> <li>■ No breeding habitat would be removed by the proposed action.</li> <li>■ No habitat mapped under the Important Areas Map would be removed by the proposed action.</li> <li>■ Similar foraging habitat for this highly mobile species is available adjacent to the development site and throughout the region.</li> </ul>

## 11 IMPACT SUMMARY

### 11.1 Determine an Offset Requirement for Impacts

#### 11.1.1 Impacts on native vegetation and TECs or ECs (ecosystem credits)

Table 11-1 identifies impacts that require an offset (as per BAM Subsection 9.2.1(1.)).

**Table 11-1 Impacts that require an offset – ecosystem credits**

Vegetation Zone	PCT name	TEC	Total area (ha)	Impact area (ha)	Current VI score	Future VI score	Change in VI score	Biodiversity risk weighting	Number of ecosystem credits required
Zone 1	3320 - Cumberland Shale Plains Woodland	Cumberland Plain Woodland in the Sydney Basin Bioregion (Critically Endangered, BC Act)	4.4	4.35	19.1	0	-19.1	2.5	52
Zone 2	3320 - Cumberland Shale Plains Woodland	Cumberland Plain Woodland in the Sydney Basin Bioregion (Critically Endangered, BC Act)	2.4	2.34	14.1	0	-14.1	2.5	0
Zone 3	3320 - Cumberland Shale Plains Woodland	Cumberland Plain Woodland in the Sydney Basin Bioregion (Critically Endangered, BC Act)	2.1	1.03	22.7	0	-22.7	2.5	12

### 11.1.2 Impacts on threatened species and their habitats (species credits)

**Table 11-2 Impacts that require an offset – species credits**

Common name	Scientific name	BC Act status	EPBC Act status	Loss of habitat (ha) or individuals	Biodiversity weighting risk	Number of species credits required
Green and Golden Bell Frog	<i>Litoria aurea</i>	Endangered	Vulnerable	24.5	2.00	30
Square-tailed Kite	<i>Lophoictinia isura</i>	Vulnerable	-	7.72	1.50	52
Southern Myotis	<i>Myotis macropus</i>	Vulnerable	-	5.85	2.00	57
Matted Bush Pea	<i>Pultenaea pedunculata</i>	Endangered	-	7.72	2.00	69

### 11.2 Impacts That Do Not Need Further Assessment

Offsets for impacts to planted native vegetation are not required. Impacts to dams are considered under prescribed impacts, which also do not require offsets.



## 12 BIODIVERSITY CREDIT REPORT

The following tables present information required on the ecosystem and species credits and matching credit profiles. The BAM-C credit report identifies the numbers and classes of biodiversity credits required to be retired in accordance with the like-for-like requirements of the offset rules. The BDAR must be submitted to the decision-maker within 14 days of the date the BAM-C credit report is finalised. The full credit report is provided in Appendix C.

### 12.1 Ecosystem Credits

**Table 12-1 Ecosystem credit class and matching credit profile**

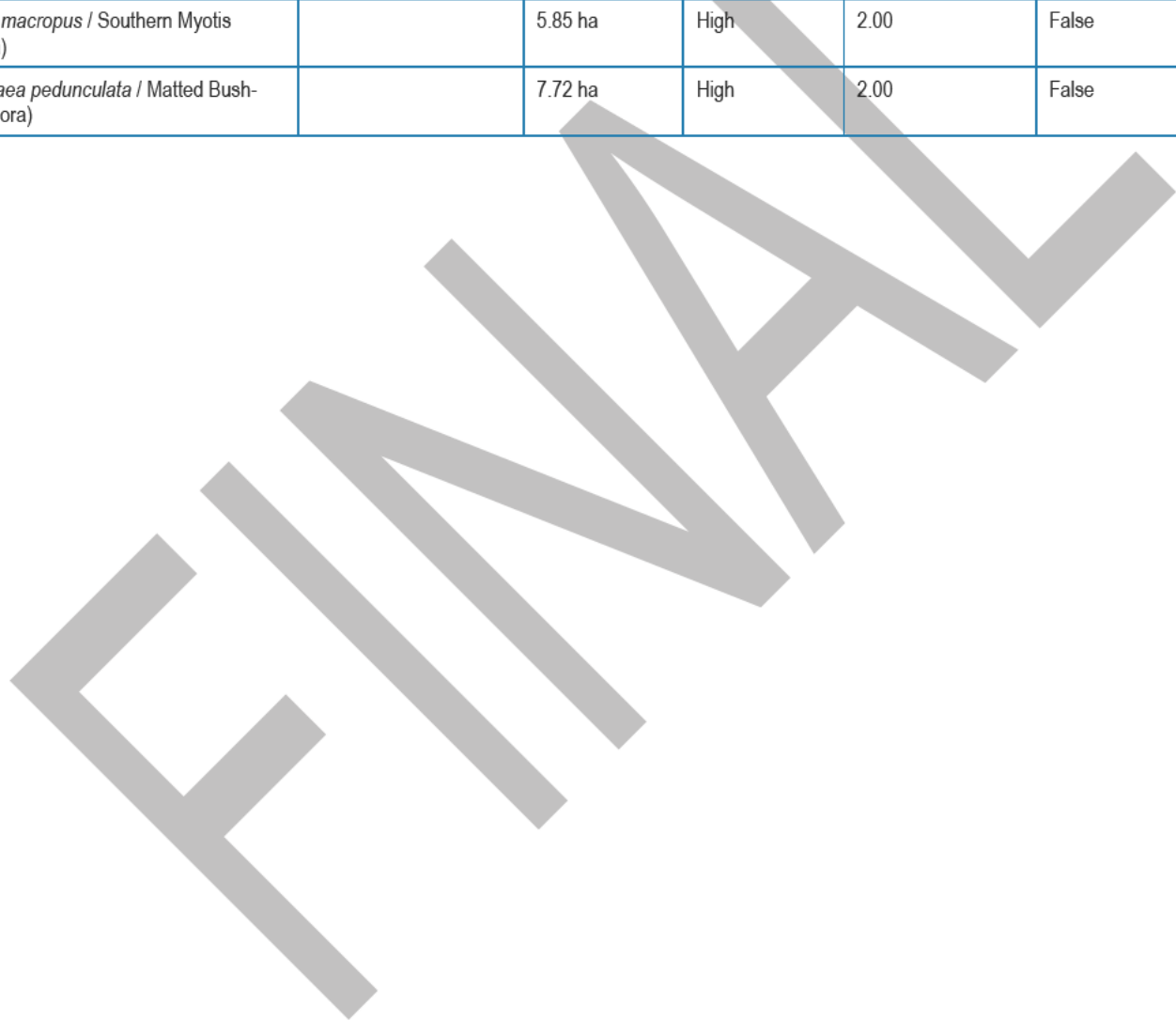
Ecosystem credit	Attributes shared with matching credits							
	PCT name	Vegetation zone name	Vegetation integrity loss	Area (Ha)	Sensitivity to loss	Biodiversity risk weighting	Potential SAIL	Ecosystem credits
	3320 - Cumberland Shale Plains Woodland	Zone 1	-19.1	4.35	Very high sensitivity to loss	2.5	True	52
	3320 - Cumberland Shale Plains Woodland	Zone 2	-14.1	2.34	Very high sensitivity to loss	2.5	True	0
	3320 - Cumberland Shale Plains Woodland	Zone 3	-22.7	1.03	Very high sensitivity to loss	2.5	True	12
<b>Total</b>								<b>64</b>

### 12.2 Species Credits

**Table 12-2 Species credits**

Species credit	Attributes shared with matching credits						
	Species name	Habitat condition (vegetation integrity) loss	Area / Count	Sensitivity to loss	Biodiversity risk weighting	Potential SAIL	Species credits
	<i>Litoria aurea</i> / Green and Golden Bell Frog (Fauna)	-	24.5 ha	High	2.00	False	30
	<i>Lophoictinia isura</i> / Square-tailed Kite (Fauna)		7.72 ha	Moderate	1.50	False	52

Species credit	Attributes shared with matching credits						
	Species name	Habitat condition (vegetation integrity) loss	Area / Count	Sensitivity to loss	Biodiversity risk weighting	Potential SAIL	Species credits
	<i>Myotis macropus</i> / Southern Myotis (Fauna)		5.85 ha	High	2.00	False	57
	<i>Pultenaea pedunculata</i> / Matted Bush-pea (Flora)		7.72 ha	High	2.00	False	69





## 13 CONCLUSION

Environmental Services & Education Australia (ESEA) was engaged by Redbank Communities to prepare a BDAR to meet the requirements of the *Biodiversity Assessment Method 2020* and to accompany the Gateway Planning Proposal for the rezoning of Redbank's Expansion Area (Kemsley Park), located at 322 Grose Vale Road, Grose Vale NSW 2753 (Lot 260 DP1237271).

Redbank Communities intends to lodge a Gateway Planning Proposal with Hawkesbury City Council to rezone 'Kemsley Park' from RU4 – Rural to residential zoning. Redbank subsequently intends to lodge a development application for approximately 300 residential lots, connecting to and completing Redbank's master-planned community.

The subdivision development application would remove vegetation present within the site. Additional works would include cut and fill bulk earthworks; subdivision into approximately 300 lots; construction of local roads extending from the approved road network; civil works including lot benching; creation of inter-allotment drainage and construction of retaining walls; extension of utility services; and landscaping and public domain works. Temporary infrastructure would be required during construction, including construction park-up areas, stockpiles, storage zones, and temporary construction buildings.

Native vegetation within the development site was identified as being representative of PCT 3320 - Cumberland Shale Plains Woodland and met the criteria to be considered Cumberland Plain Woodland in the Sydney Basin Bioregion – a critically endangered ecological community and candidate SAI entity under the *NSW Biodiversity Conservation Act 2016*.

This vegetation present within the subject site is considered to provide habitat for several threatened species, including the Green and Golden Bell Frog, Square-tailed Kite, Southern Myotis, and Matted Bush-pea. Whilst Southern Myotis has been recorded as present within the subject site during targeted species assessments, the Green and Golden Bell Frog, Square-tailed Kite, and Matted Bush-pea have been assumed present using the precautionary principle based on the presence of suitable habitat and lack of targeted surveys conducted during the appropriate survey periods.

Significant Impact Criteria were applied for relevant ecosystem credit species included in this assessment and listed as MNES under the EPBC Act. It was concluded that the proposed action would not result in a significant impact to either the Green and Golden Bell Frog, Grey-headed Flying-fox, or Swift Parrot.

The ecosystem and species credit requirements to offset the impacts of the proposed development are outlined below.

**Table 13-1 Ecosystem Credits**

Ecosystem credit	Attributes shared with matching credits							
	PCT name	Vegetation zone name	Vegetation integrity loss	Area (Ha)	Sensitivity to loss	Biodiversity risk weighting	Potential SAIL	Ecosystem credits
	3320 - Cumberland Shale Plains Woodland	Zone 1	19.1	4.35	Very high sensitivity to loss	2.5	True	52
	3320 - Cumberland Shale Plains Woodland	Zone 2	14.1	2.34	Very high sensitivity to loss	2.5	True	0
	3320 - Cumberland Shale Plains Woodland	Zone 3	22.7	1.03	Very high sensitivity to loss	2.5	True	15
<b>Total</b>								<b>67</b>

**Table 13-2 Species Credits**

Species credit	Attributes shared with matching credits						
	Species name	Habitat condition (vegetation integrity) loss	Area / Count	Sensitivity to loss	Biodiversity risk weighting	Potential SAIL	Species credits
	<i>Litoria aurea</i> / Green and Golden Bell Frog (Fauna)	-	24.5 ha	High	2.00	False	66
	<i>Lophoictinia isura</i> / Square-tailed Kite (Fauna)		7.72 ha	Moderate	1.50	False	50
	<i>Myotis macropus</i> / Southern Myotis (Fauna)		5.85 ha	High	2.00	False	57
	<i>Pultenaea pedunculata</i> / Matted Bush-pea (Flora)		7.72 ha	High	2.00	False	66

## 14 REFERENCES

- Department of Agriculture, Water and the Environment (2009). Advice to the Minister for the Environment, Heritage and the Arts from the Threatened Species Scientific Committee (the Committee) on an Amendment to the List of Threatened Ecological Communities under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act). Available: <http://www.environment.gov.au/biodiversity/threatened/communities/pubs/112-listing-advice.pdf>
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## APPENDIX A - SPECIES LIST

**APPENDIX A**

## FAUNA

Species	Common name	Notes
<i>Gymnorhina tibicen</i>	Australian Magpie	
<i>Manorina melanocephala</i>	Australian Noisy Miner	
<i>Corvus coronoides</i>	Australian Raven	
<i>Geopelia humeralis</i>	Bar-shouldered Dove	
<i>Elanus axillaris</i>	Black-shouldered Kite	
<i>Turdus merula</i>	Common Blackbird	
<i>Crinia signifera</i>	Common Eastern Froglet	
<i>Acridotheres tristis</i>	Common Myna	
<i>Micronomus norfolkensis</i>	Eastern Coastal Free-tail Bat	Threatened
<i>Eudynamys orientalis</i>	Eastern Koel	
<i>Eopsaltria australis</i>	Eastern Yellow Robin	
<i>Cracticus torquatus</i>	Grey Butcherbird	
<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat	Threatened
<i>Myotis adversus</i>	Large-footed Myotis	
<i>Vespadelus vulturus</i>	Little Forest Bat	
<i>Grallina cyanoleuca</i>	Magpie Lark	
<i>Vanellus miles</i>	Masked Lapwing	
<i>Strepera graculina</i>	Pied Currawong	
<i>Trichoglossus moluccanus</i>	Rainbow Lorikeet	
<i>Litoria verreauxii</i>	Whistling Tree Frog	
<i>Lichenostomus chrysops</i>	Yellow-faced honeyeater	

## FLORA

Species	Common name	Native / Introduced
<i>Austrostipa</i> sp.	Speargrass	Native
<i>Axonopus fissifolius</i>	Common Carpetgrass	Introduced
<i>Bidens pilosa</i>	Cobbler's Pegs	Introduced
<i>Bursaria spinosa</i>	Sweet Bursaria	Native
<i>Cenchrus clandestinus</i>	Kikuyu	Introduced
<i>Chloris gayana</i>	Rhodes Grass	Introduced
<i>Commelina cyanea</i>	Scurvy Weed	Native
<i>Commelina diffusa</i>	Climbing Dayflower	Introduced
<i>Cynodon dactylon</i>	Couch Grass	Introduced
<i>Cyperus eragrostis</i>	Nutgrass	Introduced
<i>Cyperus mindorensis</i>	White-head Spike Sedge	Introduced
<i>Dactylis glomerata</i>	Cock's Foot	Introduced
<i>Desmodium varians</i>	Slender Trick-Trefoil	Introduced
<i>Dichondra repens</i>	Kidneyweed	Native
<i>Einadia nutans</i>	Climbing Saltbush	Native
<i>Eleusine indica</i>	Wiregrass	Introduced
<i>Ehrharta erecta</i>	Panic Veldtgrass	Introduced
<i>Eucalyptus crebra</i>	Narrow-leaved Ironbark	Native
<i>Eucalyptus tereticornis</i>	Forest Red Gum	Native
<i>Glycine microphylla</i>	Small-leaf Glycine	Native
<i>Glycine tabacina</i>	Variable Glycine	Introduced
<i>Imperata cylindrica</i>	Cogon Grass	Introduced
<i>Juncus effusus</i>	Soft Rush	Introduced
<i>Lantana camara</i>	Lantana	Weed of National Significance
<i>Lysimachia foemina</i>	Blue Pimpernel	Introduced
<i>Malva parviflora</i>	Dwarf Mallow	Introduced
<i>Microlaena stipoides</i>	Weeping Grass	Native
<i>Modiola caroliniana</i>	Carolina Bristlemallow	Introduced
<i>Oeosporangium</i> sp.		Introduced
<i>Oplismenus hirtellus</i>	Basket Grass	Native
<i>Oxalis corniculata</i>	Creeping Woodsorrel	Introduced
<i>Paspalum dilatatum</i>	Dallis Grass	Introduced
<i>Phleum pratense</i>	Common Cat's Tail	Introduced
<i>Plantago lanceolata</i>	Ribwort Plantain	Introduced
<i>Rumex crispus</i>	Curly Dock	Introduced
<i>Senecio madagascariensis</i>	Fireweed	Weed of National Significance
<i>Setaria parviflora</i>	Marsh Bristlegrass	Introduced
<i>Sida rhombifolia</i>	Arrow-leaf Sida	Introduced
<i>Solanum linnaeanum</i>	Devil's Apple	Introduced
<i>Solanum sisymbriifolium</i>	Sticky Nightshade	Introduced
<i>Sporobolus indicus</i>	Smut Grass	Introduced
<i>Stellaria media</i>	Checkweed	Introduced
<i>Stenotaphrum secundatum</i>	Buffalo Grass	Introduced
<i>Tagetes minuta</i>	Southern Cone Marigold	Introduced
<i>Taraxacum officinale</i>	Common Dandelion	Introduced
<i>Trifolium dubium</i>	Lesser Trefoil	Introduced
<i>Trifolium repens</i>	White Clover	Introduced
<i>Verbena bonariensis</i>	Purpletop	Introduced

## APPENDIX B- FIELD SURVEY SHEETS

DRAFT



Numbers <sup>1-8</sup> on this page correlate with the numbers and explanatory notes on page 3

Site sheet #	1 of	Date	/ /	Survey name		Plot identifier	
Recorders					IBRA region		Veg zone ID
<sup>1</sup> Datum		Coordinate system	<input type="checkbox"/> Projected <input type="checkbox"/> Geographic	MGA zone		<sup>1</sup> X coordinate	<sup>1</sup> Y coordinate
Location description		descriptive notes to locate site without grid reference					
<sup>1</sup> Plot dimensions	For composition & structure (400m <sup>2</sup> ): 20 m x 20 m For function (1000m <sup>2</sup> ): 20 m x 50 m				<sup>1</sup> Orientation of midline from 0 m point	Magnetic °	Photo #

Datum: AGD66, WGS84, GDA94, GDA2020 or Other (specify). MGA Zone (for Projected coordinate. system only): 56 (Coastal NSW), 55 (Central NSW or 54 (Western NSW). X/Y coordinate: Long/Lat (for Projected coordinate. system), Easting/Northing (for geographic coordinate. system)

Vegetation integrity							
Composition and structure sum values may be completed after entering data into available tools. It is not required while in the field							
Composition (400 m <sup>2</sup> plot)		Structure (400 m <sup>2</sup> plot)			Function (1000 m <sup>2</sup> plot)		
Total count of native plant species (richness) in each growth form group (not individual plants within each growth form)	Trees (TG)	Sum values	Sum of <sup>2</sup> foliage cover of native plant species by growth form group	Trees (TG)	Sum values (%) (may sum to >100%)	<sup>3</sup> Tree stem size class (DBH)	If data are to be used as more appropriate local data i.e. to generate local benchmarks, stems must be counted
	Shrubs (SG)			Shrubs (SG)		80 + cm	Count
	Grasses etc. (GG)			Grasses etc. (GG)		50 – 79 cm	Count (best practice)/tick. If <sup>8</sup> large tree benchmark size ≥ 50 cm, count
	Forbs (FG)			Forbs (FG)		30 – 49 cm	Count (best practice)/tick. If <sup>8</sup> large tree benchmark size ≥ 30 cm, count
	Ferns (EG)			Ferns (EG)		20 – 29 cm	Count (best practice)/tick. If <sup>8</sup> large tree benchmark size ≥ 20 cm, count
	Other (OG)			Other (OG)		10 – 19 cm	Count (best practice)/tick
						5 – 9 cm	Count (best practice)/tick
Total high threat weed cover				%	<sup>5</sup> Length of fallen logs	Tally space	Total m
					<sup>6</sup> Hollow bearing trees	Tick	

Vegetation integrity - function cont. (five 1 m <sup>2</sup> plots)	<sup>7</sup> Litter cover (%)					Bare ground cover (%)					Cryptogam cover (%)					Rock cover (%)				
Subplot score (% in each)	a	b	c	d	e	a	b	c	d	e	a	b	c	d	e	a	b	c	d	e
Average of the 5 subplots																				

These attributes require consideration of site observations and may be completed after field work:

Vegetation class		<sup>8</sup> Large tree benchmark size	20/ 30/ 50/ 80 DBH	Confidence	H/ M/ L
Plant community type (PCT)			EEC	Tick	Confidence H/ M/ L

Physiography and site features that may help in determining PCT and management zone (optional) or for BioNet systematic flora survey purposes:

Morphological type		Landform element		Landform pattern		Microrelief	
Lithology		Soil surface texture		Soil colour		Soil depth	
Slope		Aspect		Site drainage		Distance to nearest water and type	

Disturbance	Severity code	Age code	Brief site description or other notes											
Clearing (inc. logging)														
Cultivation (inc. pasture)														
Soil erosion														
Firewood / CWD removal														
Grazing (id. native/stock)														
Fire damage														
Storm damage			Emergents heights			Upper stratum heights			Middle stratum heights			Lower stratum heights		
Weediness			Top	Mid	Bottom	Top	Mid	Bottom	Top	Mid	Bottom	Top	Mid	Bottom
Other			m	m	m	m	m	m	m	m	m	m	m	m

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

<b>400 m<sup>2</sup> floristics plot:</b>	<b>Survey name</b>	<b>Plot identifier</b>	<b>Recorders</b>
<b>Date</b>	/ /		

<b>GF code</b>	<b>Species name</b> Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	<b>N, HTW or non-HTW</b>	<b><sup>2</sup> Foliage cover</b>	<b>Abundance</b>	<b>Voucher</b>
1					
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Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

**GF Code:** see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

**<sup>2</sup> Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m. Note the top 3 dominant native species within each GF group.

**Abundance:** Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).

Numbers <sup>1-8</sup> on this page correlate with the numbers and explanatory notes on page 3

Site sheet #	1 of	Date	/ /	Survey name		Plot identifier	
Recorders					IBRA region		Veg zone ID
<sup>1</sup> Datum		Coordinate system	<input type="checkbox"/> Projected <input type="checkbox"/> Geographic	MGA zone		<sup>1</sup> X coordinate	<sup>1</sup> Y coordinate
Location description		descriptive notes to locate site without grid reference					
<sup>1</sup> Plot dimensions	For composition & structure (400m <sup>2</sup> ): 20 m x 20 m For function (1000m <sup>2</sup> ): 20 m x 50 m				<sup>1</sup> Orientation of midline from 0 m point	Magnetic °	Photo #

Datum: AGD66, WGS84, GDA94, GDA2020 or Other (specify). MGA Zone (for Projected coordinate. system only): 56 (Coastal NSW), 55 (Central NSW or 54 (Western NSW). X/Y coordinate: Long/Lat (for Projected coordinate. system), Easting/Northing (for geographic coordinate. system)

Vegetation integrity							
Composition and structure sum values may be completed after entering data into available tools. It is not required while in the field							
Composition (400 m <sup>2</sup> plot)		Structure (400 m <sup>2</sup> plot)			Function (1000 m <sup>2</sup> plot)		
Total count of native plant species (richness) in each growth form group (not individual plants within each growth form)	Trees (TG)	Sum values	Sum of <sup>2</sup> foliage cover of native plant species by growth form group	Trees (TG)	Sum values (%) (may sum to >100%)	<sup>3</sup> Tree stem size class (DBH)	If data are to be used as more appropriate local data i.e. to generate local benchmarks, stems must be counted
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	Grasses etc. (GG)			Grasses etc. (GG)		50 – 79 cm	Count (best practice)/tick. If <sup>8</sup> large tree benchmark size ≥ 50 cm, count
	Forbs (FG)			Forbs (FG)		30 – 49 cm	Count (best practice)/tick. If <sup>8</sup> large tree benchmark size ≥ 30 cm, count
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	Other (OG)			Other (OG)		10 – 19 cm	Count (best practice)/tick
						5 – 9 cm	Count (best practice)/tick
Total high threat weed cover				%	<sup>5</sup> Length of fallen logs	Tally space	Total m
					<sup>6</sup> Hollow bearing trees	Tick	

Vegetation integrity - function cont. (five 1 m <sup>2</sup> plots)	<sup>7</sup> Litter cover (%)					Bare ground cover (%)					Cryptogam cover (%)					Rock cover (%)				
Subplot score (% in each)	a	b	c	d	e	a	b	c	d	e	a	b	c	d	e	a	b	c	d	e
Average of the 5 subplots																				

These attributes require consideration of site observations and may be completed after field work:

Vegetation class		<sup>8</sup> Large tree benchmark size	20/ 30/ 50/ 80 DBH	Confidence	H/ M/ L
Plant community type (PCT)			EEC	Tick	Confidence H/ M/ L

Physiography and site features that may help in determining PCT and management zone (optional) or for BioNet systematic flora survey purposes:

Morphological type		Landform element		Landform pattern		Microrelief	
Lithology		Soil surface texture		Soil colour		Soil depth	
Slope		Aspect		Site drainage		Distance to nearest water and type	

Disturbance	Severity code	Age code	Brief site description or other notes											
Clearing (inc. logging)														
Cultivation (inc. pasture)														
Soil erosion														
Firewood / CWD removal														
Grazing (id. native/stock)														
Fire damage														
Storm damage			Emergents heights			Upper stratum heights			Middle stratum heights			Lower stratum heights		
Weediness			Top	Mid	Bottom	Top	Mid	Bottom	Top	Mid	Bottom	Top	Mid	Bottom
Other			m	m	m	m	m	m	m	m	m	m	m	m

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

<b>400 m<sup>2</sup> floristics plot:</b>	<b>Survey name</b>	<b>Plot identifier</b>	<b>Recorders</b>
<b>Date</b>	/ /		

<b>GF code</b>	<b>Species name</b> Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	<b>N, HTW or non-HTW</b>	<b><sup>2</sup> Foliage cover</b>	<b>Abundance</b>	<b>Voucher</b>
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Numbers <sup>1-8</sup> on this page correlate with the numbers and explanatory notes on page 3

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Recorders					IBRA region		Veg zone ID
<sup>1</sup> Datum		Coordinate system	<input type="checkbox"/> Projected <input type="checkbox"/> Geographic	MGA zone		<sup>1</sup> X coordinate	<sup>1</sup> Y coordinate
Location description		descriptive notes to locate site without grid reference					
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Vegetation integrity							
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	Other (OG)			Other (OG)		10 – 19 cm	Count (best practice)/tick
						5 – 9 cm	Count (best practice)/tick
Total high threat weed cover				%	<sup>5</sup> Length of fallen logs	Tally space	Total m
					<sup>6</sup> Hollow bearing trees	Tick	

Vegetation integrity - function cont. (five 1 m <sup>2</sup> plots)	<sup>7</sup> Litter cover (%)					Bare ground cover (%)					Cryptogam cover (%)					Rock cover (%)				
Subplot score (% in each)	a	b	c	d	e	a	b	c	d	e	a	b	c	d	e	a	b	c	d	e
Average of the 5 subplots																				

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Physiography and site features that may help in determining PCT and management zone (optional) or for BioNet systematic flora survey purposes:

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Slope		Aspect		Site drainage		Distance to nearest water and type	

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Weediness			Top	Mid	Bottom	Top	Mid	Bottom	Top	Mid	Bottom	Top	Mid	Bottom
Other			m	m	m	m	m	m	m	m	m	m	m	m

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

<b>400 m<sup>2</sup> floristics plot:</b>	<b>Survey name</b>	<b>Plot identifier</b>	<b>Recorders</b>
<b>Date</b>	/ /		

<b>GF code</b>	<b>Species name</b> Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	<b>N, HTW or non-HTW</b>	<b><sup>2</sup> Foliage cover</b>	<b>Abundance</b>	<b>Voucher</b>
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**GF Code:** see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

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Recorders					IBRA region		Veg zone ID
<sup>1</sup> Datum		Coordinate system	<input type="checkbox"/> Projected <input type="checkbox"/> Geographic	MGA zone		<sup>1</sup> X coordinate	<sup>1</sup> Y coordinate
Location description		descriptive notes to locate site without grid reference					
<sup>1</sup> Plot dimensions	For composition & structure (400m <sup>2</sup> ): 20 m x 20 m For function (1000m <sup>2</sup> ): 20 m x 50 m				<sup>1</sup> Orientation of midline from 0 m point	Magnetic °	Photo #

Datum: AGD66, WGS84, GDA94, GDA2020 or Other (specify). MGA Zone (for Projected coordinate. system only): 56 (Coastal NSW), 55 (Central NSW or 54 (Western NSW). X/Y coordinate: Long/Lat (for Projected coordinate. system), Easting/Northing (for geographic coordinate. system)

Vegetation integrity							
Composition and structure sum values may be completed after entering data into available tools. It is not required while in the field							
Composition (400 m <sup>2</sup> plot)		Structure (400 m <sup>2</sup> plot)			Function (1000 m <sup>2</sup> plot)		
Total count of native plant species (richness) in each growth form group (not individual plants within each growth form)	Trees (TG)	Sum values	Sum of <sup>2</sup> foliage cover of native plant species by growth form group	Trees (TG)	Sum values (%) (may sum to >100%)	<sup>3</sup> Tree stem size class (DBH)	If data are to be used as more appropriate local data i.e. to generate local benchmarks, stems must be counted
	Shrubs (SG)			Shrubs (SG)		80 + cm	Count
	Grasses etc. (GG)			Grasses etc. (GG)		50 – 79 cm	Count (best practice)/tick. If <sup>8</sup> large tree benchmark size ≥ 50 cm, count
	Forbs (FG)			Forbs (FG)		30 – 49 cm	Count (best practice)/tick. If <sup>8</sup> large tree benchmark size ≥ 30 cm, count
	Ferns (EG)			Ferns (EG)		20 – 29 cm	Count (best practice)/tick. If <sup>8</sup> large tree benchmark size ≥ 20 cm, count
	Other (OG)			Other (OG)		10 – 19 cm	Count (best practice)/tick
						5 – 9 cm	Count (best practice)/tick
Total high threat weed cover				%	<sup>5</sup> Length of fallen logs	Tally space	Total m
					<sup>6</sup> Hollow bearing trees	Tick	

Vegetation integrity - function cont. (five 1 m <sup>2</sup> plots)	<sup>7</sup> Litter cover (%)					Bare ground cover (%)					Cryptogam cover (%)					Rock cover (%)				
Subplot score (% in each)	a	b	c	d	e	a	b	c	d	e	a	b	c	d	e	a	b	c	d	e
Average of the 5 subplots																				

These attributes require consideration of site observations and may be completed after field work:

Vegetation class		<sup>8</sup> Large tree benchmark size	20/ 30/ 50/ 80 DBH	Confidence	H/ M/ L
Plant community type (PCT)			EEC	Tick	Confidence H/ M/ L

Physiography and site features that may help in determining PCT and management zone (optional) or for BioNet systematic flora survey purposes:

Morphological type		Landform element		Landform pattern		Microrelief	
Lithology		Soil surface texture		Soil colour		Soil depth	
Slope		Aspect		Site drainage		Distance to nearest water and type	

Disturbance	Severity code	Age code	Brief site description or other notes											
Clearing (inc. logging)														
Cultivation (inc. pasture)														
Soil erosion														
Firewood / CWD removal														
Grazing (id. native/stock)														
Fire damage														
Storm damage			Emergents heights			Upper stratum heights			Middle stratum heights			Lower stratum heights		
Weediness			Top	Mid	Bottom	Top	Mid	Bottom	Top	Mid	Bottom	Top	Mid	Bottom
Other			m	m	m	m	m	m	m	m	m	m	m	m

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

<b>400 m<sup>2</sup> floristics plot:</b>	<b>Survey name</b>	<b>Plot identifier</b>	<b>Recorders</b>
<b>Date</b>	/ /		

<b>GF code</b>	<b>Species name</b> Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	<b>N, HTW or non-HTW</b>	<b><sup>2</sup> Foliage cover</b>	<b>Abundance</b>	<b>Voucher</b>
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

**GF Code:** see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

**<sup>2</sup> Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m. Note the top 3 dominant native species within each GF group.

**Abundance:** Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).



## APPENDIX C – BAMC CREDIT REPORT

**FINAL**

## Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00049699/BAAS17054/24/00049700	Redbank Expansion Area Kemsley Park	14/03/2024
Assessor Name	Report Created	BAM Data version *
Kat Duchatel	10/07/2024	67
Assessor Number	BAM Case Status	Date Finalised
BAAS17054	Open	To be finalised
Assessment Revision	Assessment Type	BOS entry trigger
0	Part 4 Developments (General)	BOS Threshold: Biodiversity Values Map and area clearing threshold

\* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

## Ecosystem credits for plant communities types (PCT), ecological communities & threatened species habitat

Zone	Vegetation zone name	TEC name	Current Vegetation integrity score	Change in Vegetation integrity (loss / gain)	Area (ha)	Sensitivity to loss (Justification)	Species sensitivity to gain class	BC Act Listing status	EPBC Act listing status	Biodiversity risk weighting	Potential SAI	Ecosystem credits
<b>Cumberland Shale Plains Woodland</b>												
1	3320_Classname1	Cumberland Plain Woodland in the Sydney Basin Bioregion	19.1	19.1	4.4	Biodiversity Conservation Act listing status	High Sensitivity to Gain	Critically Endangered Ecological Community	Not Listed	2.50	True	52

2	3320_Classname101	Cumberland Plain Woodland in the Sydney Basin Bioregion	14.1	14.1	2.3	Biodiversity Conservation Act listing status	High Sensitivity to Gain	Critically Endangered Ecological Community	Not Listed	2.50	True	0
3	3320_Classname102	Cumberland Plain Woodland in the Sydney Basin Bioregion	22.7	22.7	1	Biodiversity Conservation Act listing status	High Sensitivity to Gain	Critically Endangered Ecological Community	Not Listed	2.50	True	15
											<b>Subtotal</b>	<b>67</b>
											<b>Total</b>	<b>67</b>

## Species credits for threatened species

Vegetation zone name	Habitat condition (Vegetation Integrity)	Change in habitat condition	Area (ha)/Count (no. individuals)	Sensitivity to loss (Justification)	Sensitivity to gain (Justification)	BC Act Listing status	EPBC Act listing status	Potential SAIL	Species credits
<b><i>Litoria aurea / Green and Golden Bell Frog ( Fauna )</i></b>									
3320_Classname1	19.1	19.1	2	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Vulnerable	False	19
3320_Classname102	22.7	22.7	1	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Vulnerable	False	11

								<b>Subtotal</b>	<b>30</b>
<b><i>Lophoictinia isura / Square-tailed Kite ( Fauna )</i></b>									
3320_Classname1	19.1	19.1	4.4	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Vulnerable	Not Listed	False	31
3320_Classname101	14.1	14.1	2.3	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Vulnerable	Not Listed	False	12
3320_Classname102	22.7	22.7	1	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Vulnerable	Not Listed	False	9
								<b>Subtotal</b>	<b>52</b>
<b><i>Myotis macropus / Southern Myotis ( Fauna )</i></b>									
3320_Classname1	19.1	19.1	4.4	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	41
3320_Classname101	14.1	14.1	0.5	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	4

3320_Classname102	22.7	22.7	1	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	12
								<b>Subtotal</b>	<b>57</b>
<b><i>Pultenaea pedunculata / Matted Bush-pea ( Flora )</i></b>									
3320_Classname1	19.1	19.1	4.4	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Endangered	Not Listed	False	41
3320_Classname101	14.1	14.1	2.3	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Endangered	Not Listed	False	16
3320_Classname102	22.7	22.7	1	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Endangered	Not Listed	False	12
								<b>Subtotal</b>	<b>69</b>





# BAM Biodiversity Credit Report (Like for like)

## Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00049699/BAAS17054/24/00049700	Redbank Expansion Area Kemsley Park	14/03/2024
Assessor Name	Assessor Number	BAM Data version *
Kat Duchatel	BAAS17054	67
Proponent Names	Report Created	BAM Case Status
	10/07/2024	Open
Assessment Revision	Assessment Type	Date Finalised
0	Part 4 Developments (General)	To be finalised
BOS entry trigger	* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.	
BOS Threshold: Biodiversity Values Map and area clearing threshold		

## Potential Serious and Irreversible Impacts

Name of threatened ecological community	Listing status	Name of Plant Community Type/ID
Cumberland Plain Woodland in the Sydney Basin Bioregion	Critically Endangered Ecological Community	3320-Cumberland Shale Plains Woodland
Species		
<b>Nil</b>		

## BAM Biodiversity Credit Report (Like for like)

### Additional Information for Approval

PCT Outside Ibra Added

None added

PCTs With Customized Benchmarks

PCT

No Changes

Predicted Threatened Species Not On Site

Name

**Calyptorhynchus lathami lathami** / South-eastern Glossy Black-Cockatoo

**Pandion cristatus** / Eastern Osprey

### Ecosystem Credit Summary (Number and class of biodiversity credits to be retired)

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	HBT Cr	No HBT Cr	Total credits to be retired
3320-Cumberland Shale Plains Woodland	Cumberland Plain Woodland in the Sydney Basin Bioregion	7.7	0	67	67

## BAM Biodiversity Credit Report (Like for like)

3320-Cumberland Shale Plains Woodland	Like-for-like credit retirement options					
	Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region
	Cumberland Plain Woodland in the Sydney Basin Bioregion This includes PCT's: 3319, 3320	-	3320_Classname1	No	52	Cumberland, Burragorang, Pittwater, Sydney Cataract, Wollemi and Yengo. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
	Cumberland Plain Woodland in the Sydney Basin Bioregion This includes PCT's: 3319, 3320	-	3320_Classname101	No	0	Cumberland, Burragorang, Pittwater, Sydney Cataract, Wollemi and Yengo. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
Cumberland Plain Woodland in the Sydney Basin Bioregion This includes PCT's: 3319, 3320	-	3320_Classname102	No	15	Cumberland, Burragorang, Pittwater, Sydney Cataract, Wollemi and Yengo. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.	

### Species Credit Summary

## BAM Biodiversity Credit Report (Like for like)

Species	Vegetation Zone/s	Area / Count	Credits
<b>Litoria aurea</b> / Green and Golden Bell Frog	3320_Classname1, 3320_Classname102	3.0	30.00
<b>Lophoictinia isura</b> / Square-tailed Kite	3320_Classname1, 3320_Classname101, 3320_Classname102	7.7	52.00
<b>Myotis macropus</b> / Southern Myotis	3320_Classname1, 3320_Classname101, 3320_Classname102	5.9	57.00
<b>Pultenaea pedunculata</b> / Matted Bush-pea	3320_Classname1, 3320_Classname101, 3320_Classname102	7.7	69.00

### Credit Retirement Options

Like-for-like credit retirement options

<b>Litoria aurea</b> / Green and Golden Bell Frog	Spp	IBRA subregion
	<b>Litoria aurea</b> / Green and Golden Bell Frog	Any in NSW
<b>Lophoictinia isura</b> / Square-tailed Kite	Spp	IBRA subregion
	<b>Lophoictinia isura</b> / Square-tailed Kite	Any in NSW
<b>Myotis macropus</b> / Southern Myotis	Spp	IBRA subregion
	<b>Myotis macropus</b> / Southern Myotis	Any in NSW



## BAM Biodiversity Credit Report (Like for like)

<b>Pultenaea pedunculata / Matted Bush-pea</b>	Spp	IBRA subregion
	<b>Pultenaea pedunculata / Matted Bush-pea</b>	Any in NSW



## Proposal Details

<b>Assessment Id</b>	Proposal Name	BAM data last updated *
00049699/BAAS17054/24/00049700	Redbank Expansion Area Kemsley Park	14/03/2024
Assessor Name	Assessor Number	BAM Data version *
Kat Duchatel	BAAS17054	67
Proponent Name(s)	Report Created	BAM Case Status
	10/07/2024	Open
Assessment Revision	Assessment Type	Date Finalised
0	Part 4 Developments (General)	To be finalised
BOS entry trigger	* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.	
BOS Threshold: Biodiversity Values Map and area clearing threshold		

## Potential Serious and Irreversible Impacts

Name of threatened ecological community	Listing status	Name of Plant Community Type/ID
Cumberland Plain Woodland in the Sydney Basin Bioregion	Critically Endangered Ecological Community	3320-Cumberland Shale Plains Woodland
Species		
Nil		

## Additional Information for Approval

PCT Outside Ibra Added  
None added

# BAM Biodiversity Credit Report (Variations)

## PCTs With Customized Benchmarks

PCT

No Changes

## Predicted Threatened Species Not On Site

Name

**Calyptrorhynchus lathami lathami** / South-eastern Glossy Black-Cockatoo

**Pandion cristatus** / Eastern Osprey

## Ecosystem Credit Summary (Number and class of biodiversity credits to be retired)

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	HBT Cr	No HBT Cr	Total credits to be retired
3320-Cumberland Shale Plains Woodland	Cumberland Plain Woodland in the Sydney Basin Bioregion	7.7	0	67	67.00

### 3320-Cumberland Shale Plains Woodland

#### Like-for-like credit retirement options

Class	Trading group	Zone	HBT	Credits	IBRA region
Cumberland Plain Woodland in the Sydney Basin Bioregion This includes PCT's: 3319, 3320	-	3320_Class name1	No	52	Cumberland, Burragorang, Pittwater, Sydney Cataract, Wollemi and Yengo. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

## BAM Biodiversity Credit Report (Variations)

	Cumberland Plain Woodland in the Sydney Basin Bioregion This includes PCT's: 3319, 3320	-	3320_Classname101	No	0	Cumberland, Burragorang, Pittwater, Sydney Cataract, Wollemi and Yengo. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
	Cumberland Plain Woodland in the Sydney Basin Bioregion This includes PCT's: 3319, 3320	-	3320_Classname102	No	15	Cumberland, Burragorang, Pittwater, Sydney Cataract, Wollemi and Yengo. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

### Species Credit Summary

Species	Vegetation Zone/s	Area / Count	Credits
<b>Litoria aurea</b> / Green and Golden Bell Frog	<b>3320_Classname1,</b> <b>3320_Classname102</b>	3.0	30.00
<b>Lophoictinia isura</b> / Square-tailed Kite	<b>3320_Classname1,</b> <b>3320_Classname101,</b> <b>3320_Classname102</b>	7.7	52.00
<b>Myotis macropus</b> / Southern Myotis	<b>3320_Classname1,</b> <b>3320_Classname101,</b> <b>3320_Classname102</b>	5.9	57.00
<b>Pultenaea pedunculata</b> / Matted Bush-pea	<b>3320_Classname1,</b> <b>3320_Classname101,</b> <b>3320_Classname102</b>	7.7	69.00

### Credit Retirement Options    Like-for-like options

## BAM Biodiversity Credit Report (Variations)

<b>Litoria aurea/</b> Green and Golden Bell Frog	Spp		IBRA region
	<b>Litoria aurea</b> /Green and Golden Bell Frog		Any in NSW
	<b>Variation options</b>		
	Kingdom	Any species with same or higher category of listing under Part 4 of the BC Act shown below	IBRA region
Fauna	Endangered	Cumberland, Burragorang, Pittwater, Sydney Cataract, Wollemi and Yengo. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.	
<b>Lophoictinia isura/</b> Square-tailed Kite	Spp		IBRA region
	<b>Lophoictinia isura</b> /Square-tailed Kite		Any in NSW
	<b>Variation options</b>		
	Kingdom	Any species with same or higher category of listing under Part 4 of the BC Act shown below	IBRA region
Fauna	Vulnerable	Cumberland, Burragorang, Pittwater, Sydney Cataract, Wollemi and Yengo. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.	

## BAM Biodiversity Credit Report (Variations)

<b>Myotis macropus/</b> Southern Myotis	Spp		IBRA region
	<b>Myotis macropus/Southern Myotis</b>		Any in NSW
	<b>Variation options</b>		
	Kingdom	Any species with same or higher category of listing under Part 4 of the BC Act shown below	IBRA region
	Fauna	Vulnerable	Cumberland, Burragorang, Pittwater, Sydney Cataract, Wollemi and Yengo. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
<b>Pultenaea pedunculata/</b> Matted Bush-pea	Spp		IBRA region
	<b>Pultenaea pedunculata/Matted Bush-pea</b>		Any in NSW
	<b>Variation options</b>		
	Kingdom	Any species with same or higher category of listing under Part 4 of the BC Act shown below	IBRA region
	Flora	Endangered	Cumberland, Burragorang, Pittwater, Sydney Cataract, Wollemi and Yengo. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.





# BAM Vegetation Zones Report

## Proposal Details

Assessment Id	Assessment name	BAM data last updated *
00049699/BAAS17054/24/00049700	Redbank Expansion Area Kemsley Park	14/03/2024
Assessor Name	Report Created	BAM Data version *
Kat Duchatel	10/07/2024	67
Assessor Number	Assessment Type	BAM Case Status
BAAS17054	Part 4 Developments (General)	Open
Assessment Revision	Date Finalised	BOS entry trigger
0	To be finalised	BOS Threshold: Biodiversity Values Map and area clearing threshold

\* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

## Vegetation Zones

#	Name	PCT	Condition	Area	Minimum number of plots	Management zones
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## BAM Vegetation Zones Report

1	3320_Classname1	3320-Cumberland Shale Plains Woodland	Classname1	4.35	2	
2	3320_Classname101	3320-Cumberland Shale Plains Woodland	Classname101	2.34	2	
3	3320_Classname102	3320-Cumberland Shale Plains Woodland	Classname102	1.03	1	

# BAM Predicted Species Report

## Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00049699/BAAS17054/24/00049700	Redbank Expansion Area Kemsley Park	14/03/2024
Assessor Name	Report Created	BAM Data version *
Kat Duchatel	10/07/2024	67
Assessor Number	Assessment Type	BAM Case Status
BAAS17054	Part 4 Developments (General)	Open
Assessment Revision	BOS entry trigger	Date Finalised
0	BOS Threshold: Biodiversity Values Map and area clearing threshold	To be finalised

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**Threatened species reliably predicted to utilise the site. No surveys are required for these species. Ecosystem credits apply to these species.**

Common Name	Scientific Name	Vegetation Types(s)
Black Falcon	Falco subniger	3320-Cumberland Shale Plains Woodland
Black-chinned Honeyeater (eastern subspecies)	Meliphaga gularis gularis	3320-Cumberland Shale Plains Woodland
Black-necked Stork	Ephippiorhynchus asiaticus	3320-Cumberland Shale Plains Woodland
Brown Treecreeper (eastern subspecies)	Climacteris picumnus victoriae	3320-Cumberland Shale Plains Woodland
Diamond Firetail	Stagonopleura guttata	3320-Cumberland Shale Plains Woodland
Dusky Woodswallow	Artamus cyanopterus cyanopterus	3320-Cumberland Shale Plains Woodland
Eastern Coastal Free-tailed Bat	Micronomus norfolkensis	3320-Cumberland Shale Plains Woodland
Eastern False Pipistrelle	Falsistrellus tasmaniensis	3320-Cumberland Shale Plains Woodland
Flame Robin	Petroica phoenicea	3320-Cumberland Shale Plains Woodland
Gang-gang Cockatoo	Callocephalon fimbriatum	3320-Cumberland Shale Plains Woodland

Greater Broad-nosed Bat	Scoteanax rueppellii	3320-Cumberland Shale Plains Woodland
Grey-headed Flying-fox	Pteropus poliocephalus	3320-Cumberland Shale Plains Woodland
Large Bent-winged Bat	Miniopterus orianae oceanensis	3320-Cumberland Shale Plains Woodland
Little Bent-winged Bat	Miniopterus australis	3320-Cumberland Shale Plains Woodland
Little Eagle	Hieraaetus morphnoides	3320-Cumberland Shale Plains Woodland
Little Lorikeet	Glossopsitta pusilla	3320-Cumberland Shale Plains Woodland
Regent Honeyeater	Anthochaera phrygia	3320-Cumberland Shale Plains Woodland
Rosenberg's Goanna	Varanus rosenbergi	3320-Cumberland Shale Plains Woodland
Scarlet Robin	Petroica boodang	3320-Cumberland Shale Plains Woodland
Speckled Warbler	Chthonicola sagittata	3320-Cumberland Shale Plains Woodland
Spotted Harrier	Circus assimilis	3320-Cumberland Shale Plains Woodland
Spotted-tailed Quoll	Dasyurus maculatus	3320-Cumberland Shale Plains Woodland
Square-tailed Kite	Lophoictinia isura	3320-Cumberland Shale Plains Woodland
Swift Parrot	Lathamus discolor	3320-Cumberland Shale Plains Woodland
Turquoise Parrot	Neophema pulchella	3320-Cumberland Shale Plains Woodland
Varied Sittella	Daphoenositta chrysoptera	3320-Cumberland Shale Plains Woodland
White-bellied Sea-Eagle	Haliaeetus leucogaster	3320-Cumberland Shale Plains Woodland
White-throated Needle-tail	Hirundapus caudacutus	3320-Cumberland Shale Plains Woodland
Yellow-bellied Sheath-tail-bat	Saccolaimus flaviventris	3320-Cumberland Shale Plains Woodland

### Threatened species Manually Added

None added

### Threatened species assessed as not within the vegetation zone(s) for the PCT(s)

Common Name	Scientific Name	Plant Community Type(s)
Eastern Osprey	Pandion cristatus	3320-Cumberland Shale Plains Woodland

## BAM Predicted Species Report

South-eastern Glossy Black-Cockatoo	<i>Calyptorhynchus lathami lathami</i>	3320-Cumberland Shale Plains Woodland
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### Threatened species assessed as not within the vegetation zone(s) for the PCT(s)

Refer to BAR for detailed justification

Common Name	Scientific Name	Justification in the BAM-C
Eastern Osprey	<i>Pandion cristatus</i>	Refer to BAR
South-eastern Glossy Black-Cockatoo	<i>Calyptorhynchus lathami lathami</i>	Habitat constraints



## Proposal Details

Assessment Id 00049699/BAAS17054/24/00049700	Proposal Name Redbank Expansion Area Kemsley Park	BAM data last updated * 14/03/2024
Assessor Name Kat Duchatel	Report Created 10/07/2024	BAM Data version * 67
Assessor Number BAAS17054	Assessment Type Part 4 Developments (General)	BAM Case Status Open
Assessment Revision 0	Date Finalised To be finalised	BOS entry trigger BOS Threshold: Biodiversity Values Map and area clearing threshold

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## List of Species Requiring Survey

Name	Presence	Survey Months
<b><i>Acacia pubescens</i></b> Downy Wattle	No (surveyed)	<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input checked="" type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Sep <input type="checkbox"/> Oct <input type="checkbox"/> Nov <input type="checkbox"/> Dec <input type="checkbox"/> Survey month outside the specified months?
<b><i>Eucalyptus benthamii</i></b> Camden White Gum	No (surveyed)	<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input checked="" type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Sep <input type="checkbox"/> Oct <input type="checkbox"/> Nov <input type="checkbox"/> Dec <input type="checkbox"/> Survey month outside the specified months?

## BAM Candidate Species Report

<p><b><i>Eucalyptus glaucina</i></b> Slaty Red Gum</p>	<p>No (surveyed)</p>	<table border="1"> <tr> <td><input type="checkbox"/> Jan</td> <td><input type="checkbox"/> Feb</td> <td><input type="checkbox"/> Mar</td> <td><input type="checkbox"/> Apr</td> </tr> <tr> <td><input checked="" type="checkbox"/> May</td> <td><input type="checkbox"/> Jun</td> <td><input type="checkbox"/> Jul</td> <td><input type="checkbox"/> Aug</td> </tr> <tr> <td><input type="checkbox"/> Sep</td> <td><input type="checkbox"/> Oct</td> <td><input type="checkbox"/> Nov</td> <td><input type="checkbox"/> Dec</td> </tr> </table> <p><input type="checkbox"/> Survey month outside the specified months?</p>	<input type="checkbox"/> Jan	<input type="checkbox"/> Feb	<input type="checkbox"/> Mar	<input type="checkbox"/> Apr	<input checked="" type="checkbox"/> May	<input type="checkbox"/> Jun	<input type="checkbox"/> Jul	<input type="checkbox"/> Aug	<input type="checkbox"/> Sep	<input type="checkbox"/> Oct	<input type="checkbox"/> Nov	<input type="checkbox"/> Dec
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<p><b><i>Grevillea juniperina subsp. juniperina</i></b> Juniper-leaved Grevillea</p>	<p>No (surveyed)</p>	<table border="1"> <tr> <td><input type="checkbox"/> Jan</td> <td><input type="checkbox"/> Feb</td> <td><input type="checkbox"/> Mar</td> <td><input type="checkbox"/> Apr</td> </tr> <tr> <td><input checked="" type="checkbox"/> May</td> <td><input checked="" type="checkbox"/> Jun</td> <td><input type="checkbox"/> Jul</td> <td><input type="checkbox"/> Aug</td> </tr> <tr> <td><input type="checkbox"/> Sep</td> <td><input type="checkbox"/> Oct</td> <td><input type="checkbox"/> Nov</td> <td><input type="checkbox"/> Dec</td> </tr> </table> <p><input type="checkbox"/> Survey month outside the specified months?</p>	<input type="checkbox"/> Jan	<input type="checkbox"/> Feb	<input type="checkbox"/> Mar	<input type="checkbox"/> Apr	<input checked="" type="checkbox"/> May	<input checked="" type="checkbox"/> Jun	<input type="checkbox"/> Jul	<input type="checkbox"/> Aug	<input type="checkbox"/> Sep	<input type="checkbox"/> Oct	<input type="checkbox"/> Nov	<input type="checkbox"/> Dec
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<p><b><i>Litoria aurea</i></b> Green and Golden Bell Frog</p>	<p>Yes (assumed present)</p>	<table border="1"> <tr> <td><input type="checkbox"/> Jan</td> <td><input type="checkbox"/> Feb</td> <td><input type="checkbox"/> Mar</td> <td><input type="checkbox"/> Apr</td> </tr> <tr> <td><input type="checkbox"/> May</td> <td><input type="checkbox"/> Jun</td> <td><input type="checkbox"/> Jul</td> <td><input type="checkbox"/> Aug</td> </tr> <tr> <td><input type="checkbox"/> Sep</td> <td><input type="checkbox"/> Oct</td> <td><input type="checkbox"/> Nov</td> <td><input type="checkbox"/> Dec</td> </tr> </table> <p><input type="checkbox"/> Survey month outside the specified months?</p>	<input type="checkbox"/> Jan	<input type="checkbox"/> Feb	<input type="checkbox"/> Mar	<input type="checkbox"/> Apr	<input type="checkbox"/> May	<input type="checkbox"/> Jun	<input type="checkbox"/> Jul	<input type="checkbox"/> Aug	<input type="checkbox"/> Sep	<input type="checkbox"/> Oct	<input type="checkbox"/> Nov	<input type="checkbox"/> Dec
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<p><b><i>Lophoictinia isura</i></b> Square-tailed Kite</p>	<p>Yes (assumed present)</p>	<table border="1"> <tr> <td><input type="checkbox"/> Jan</td> <td><input type="checkbox"/> Feb</td> <td><input type="checkbox"/> Mar</td> <td><input type="checkbox"/> Apr</td> </tr> <tr> <td><input type="checkbox"/> May</td> <td><input type="checkbox"/> Jun</td> <td><input type="checkbox"/> Jul</td> <td><input type="checkbox"/> Aug</td> </tr> <tr> <td><input type="checkbox"/> Sep</td> <td><input type="checkbox"/> Oct</td> <td><input type="checkbox"/> Nov</td> <td><input type="checkbox"/> Dec</td> </tr> </table> <p><input type="checkbox"/> Survey month outside the specified months?</p>	<input type="checkbox"/> Jan	<input type="checkbox"/> Feb	<input type="checkbox"/> Mar	<input type="checkbox"/> Apr	<input type="checkbox"/> May	<input type="checkbox"/> Jun	<input type="checkbox"/> Jul	<input type="checkbox"/> Aug	<input type="checkbox"/> Sep	<input type="checkbox"/> Oct	<input type="checkbox"/> Nov	<input type="checkbox"/> Dec
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<p><b><i>Meridolum corneovirens</i></b> Cumberland Plain Land Snail</p>	<p>No (surveyed)</p>	<table border="1"> <tr> <td><input type="checkbox"/> Jan</td> <td><input type="checkbox"/> Feb</td> <td><input type="checkbox"/> Mar</td> <td><input type="checkbox"/> Apr</td> </tr> <tr> <td><input checked="" type="checkbox"/> May</td> <td><input type="checkbox"/> Jun</td> <td><input type="checkbox"/> Jul</td> <td><input type="checkbox"/> Aug</td> </tr> <tr> <td><input type="checkbox"/> Sep</td> <td><input type="checkbox"/> Oct</td> <td><input type="checkbox"/> Nov</td> <td><input type="checkbox"/> Dec</td> </tr> </table> <p><input type="checkbox"/> Survey month outside the specified months?</p>	<input type="checkbox"/> Jan	<input type="checkbox"/> Feb	<input type="checkbox"/> Mar	<input type="checkbox"/> Apr	<input checked="" type="checkbox"/> May	<input type="checkbox"/> Jun	<input type="checkbox"/> Jul	<input type="checkbox"/> Aug	<input type="checkbox"/> Sep	<input type="checkbox"/> Oct	<input type="checkbox"/> Nov	<input type="checkbox"/> Dec
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<p><b><i>Micromyrtus minutiflora</i></b> Micromyrtus minutiflora</p>	<p>No (surveyed)</p>	<table border="1"> <tr> <td><input type="checkbox"/> Jan</td> <td><input type="checkbox"/> Feb</td> <td><input type="checkbox"/> Mar</td> <td><input type="checkbox"/> Apr</td> </tr> <tr> <td><input checked="" type="checkbox"/> May</td> <td><input type="checkbox"/> Jun</td> <td><input type="checkbox"/> Jul</td> <td><input type="checkbox"/> Aug</td> </tr> <tr> <td><input type="checkbox"/> Sep</td> <td><input type="checkbox"/> Oct</td> <td><input type="checkbox"/> Nov</td> <td><input type="checkbox"/> Dec</td> </tr> </table> <p><input type="checkbox"/> Survey month outside the specified months?</p>	<input type="checkbox"/> Jan	<input type="checkbox"/> Feb	<input type="checkbox"/> Mar	<input type="checkbox"/> Apr	<input checked="" type="checkbox"/> May	<input type="checkbox"/> Jun	<input type="checkbox"/> Jul	<input type="checkbox"/> Aug	<input type="checkbox"/> Sep	<input type="checkbox"/> Oct	<input type="checkbox"/> Nov	<input type="checkbox"/> Dec
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## BAM Candidate Species Report

<p><b><i>Myotis macropus</i></b> Southern Myotis</p>	<p>Yes (surveyed) *Survey months are outside of the months specified in Bionet.</p>	<table border="1"> <tr> <td><input type="checkbox"/> Jan</td> <td><input type="checkbox"/> Feb</td> <td><input type="checkbox"/> Mar</td> <td><input checked="" type="checkbox"/> Apr</td> </tr> <tr> <td><input checked="" type="checkbox"/> May</td> <td><input type="checkbox"/> Jun</td> <td><input type="checkbox"/> Jul</td> <td><input type="checkbox"/> Aug</td> </tr> <tr> <td><input type="checkbox"/> Sep</td> <td><input type="checkbox"/> Oct</td> <td><input type="checkbox"/> Nov</td> <td><input type="checkbox"/> Dec</td> </tr> </table> <p><input checked="" type="checkbox"/> Survey month outside the specified months?</p>	<input type="checkbox"/> Jan	<input type="checkbox"/> Feb	<input type="checkbox"/> Mar	<input checked="" type="checkbox"/> Apr	<input checked="" type="checkbox"/> May	<input type="checkbox"/> Jun	<input type="checkbox"/> Jul	<input type="checkbox"/> Aug	<input type="checkbox"/> Sep	<input type="checkbox"/> Oct	<input type="checkbox"/> Nov	<input type="checkbox"/> Dec
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<p><b><i>Pandion cristatus</i></b> Eastern Osprey</p>	<p>No (surveyed)</p>	<table border="1"> <tr> <td><input type="checkbox"/> Jan</td> <td><input type="checkbox"/> Feb</td> <td><input type="checkbox"/> Mar</td> <td><input type="checkbox"/> Apr</td> </tr> <tr> <td><input type="checkbox"/> May</td> <td><input type="checkbox"/> Jun</td> <td><input type="checkbox"/> Jul</td> <td><input type="checkbox"/> Aug</td> </tr> <tr> <td><input checked="" type="checkbox"/> Sep</td> <td><input type="checkbox"/> Oct</td> <td><input type="checkbox"/> Nov</td> <td><input type="checkbox"/> Dec</td> </tr> </table> <p><input type="checkbox"/> Survey month outside the specified months?</p>	<input type="checkbox"/> Jan	<input type="checkbox"/> Feb	<input type="checkbox"/> Mar	<input type="checkbox"/> Apr	<input type="checkbox"/> May	<input type="checkbox"/> Jun	<input type="checkbox"/> Jul	<input type="checkbox"/> Aug	<input checked="" type="checkbox"/> Sep	<input type="checkbox"/> Oct	<input type="checkbox"/> Nov	<input type="checkbox"/> Dec
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<p><b><i>Persoonia nutans</i></b> Nodding Geebung</p>	<p>No (surveyed)</p>	<table border="1"> <tr> <td><input type="checkbox"/> Jan</td> <td><input type="checkbox"/> Feb</td> <td><input type="checkbox"/> Mar</td> <td><input type="checkbox"/> Apr</td> </tr> <tr> <td><input checked="" type="checkbox"/> May</td> <td><input type="checkbox"/> Jun</td> <td><input type="checkbox"/> Jul</td> <td><input type="checkbox"/> Aug</td> </tr> <tr> <td><input type="checkbox"/> Sep</td> <td><input type="checkbox"/> Oct</td> <td><input type="checkbox"/> Nov</td> <td><input type="checkbox"/> Dec</td> </tr> </table> <p><input type="checkbox"/> Survey month outside the specified months?</p>	<input type="checkbox"/> Jan	<input type="checkbox"/> Feb	<input type="checkbox"/> Mar	<input type="checkbox"/> Apr	<input checked="" type="checkbox"/> May	<input type="checkbox"/> Jun	<input type="checkbox"/> Jul	<input type="checkbox"/> Aug	<input type="checkbox"/> Sep	<input type="checkbox"/> Oct	<input type="checkbox"/> Nov	<input type="checkbox"/> Dec
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<p><b><i>Petaurus norfolcensis</i></b> Squirrel Glider</p>	<p>No (surveyed)</p>	<table border="1"> <tr> <td><input type="checkbox"/> Jan</td> <td><input type="checkbox"/> Feb</td> <td><input type="checkbox"/> Mar</td> <td><input checked="" type="checkbox"/> Apr</td> </tr> <tr> <td><input checked="" type="checkbox"/> May</td> <td><input type="checkbox"/> Jun</td> <td><input type="checkbox"/> Jul</td> <td><input type="checkbox"/> Aug</td> </tr> <tr> <td><input type="checkbox"/> Sep</td> <td><input type="checkbox"/> Oct</td> <td><input type="checkbox"/> Nov</td> <td><input type="checkbox"/> Dec</td> </tr> </table> <p><input type="checkbox"/> Survey month outside the specified months?</p>	<input type="checkbox"/> Jan	<input type="checkbox"/> Feb	<input type="checkbox"/> Mar	<input checked="" type="checkbox"/> Apr	<input checked="" type="checkbox"/> May	<input type="checkbox"/> Jun	<input type="checkbox"/> Jul	<input type="checkbox"/> Aug	<input type="checkbox"/> Sep	<input type="checkbox"/> Oct	<input type="checkbox"/> Nov	<input type="checkbox"/> Dec
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<p><b><i>Phascolarctos cinereus</i></b> Koala</p>	<p>No (surveyed)</p>	<table border="1"> <tr> <td><input type="checkbox"/> Jan</td> <td><input type="checkbox"/> Feb</td> <td><input type="checkbox"/> Mar</td> <td><input checked="" type="checkbox"/> Apr</td> </tr> <tr> <td><input checked="" type="checkbox"/> May</td> <td><input type="checkbox"/> Jun</td> <td><input type="checkbox"/> Jul</td> <td><input type="checkbox"/> Aug</td> </tr> <tr> <td><input type="checkbox"/> Sep</td> <td><input type="checkbox"/> Oct</td> <td><input type="checkbox"/> Nov</td> <td><input type="checkbox"/> Dec</td> </tr> </table> <p><input type="checkbox"/> Survey month outside the specified months?</p>	<input type="checkbox"/> Jan	<input type="checkbox"/> Feb	<input type="checkbox"/> Mar	<input checked="" type="checkbox"/> Apr	<input checked="" type="checkbox"/> May	<input type="checkbox"/> Jun	<input type="checkbox"/> Jul	<input type="checkbox"/> Aug	<input type="checkbox"/> Sep	<input type="checkbox"/> Oct	<input type="checkbox"/> Nov	<input type="checkbox"/> Dec
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<p><b><i>Pimelea spicata</i></b> Spiked Rice-flower</p>	<p>No (surveyed)</p>	<table border="1"> <tr> <td><input type="checkbox"/> Jan</td> <td><input type="checkbox"/> Feb</td> <td><input type="checkbox"/> Mar</td> <td><input type="checkbox"/> Apr</td> </tr> <tr> <td><input checked="" type="checkbox"/> May</td> <td><input type="checkbox"/> Jun</td> <td><input type="checkbox"/> Jul</td> <td><input type="checkbox"/> Aug</td> </tr> <tr> <td><input type="checkbox"/> Sep</td> <td><input type="checkbox"/> Oct</td> <td><input type="checkbox"/> Nov</td> <td><input type="checkbox"/> Dec</td> </tr> </table> <p><input type="checkbox"/> Survey month outside the specified months?</p>	<input type="checkbox"/> Jan	<input type="checkbox"/> Feb	<input type="checkbox"/> Mar	<input type="checkbox"/> Apr	<input checked="" type="checkbox"/> May	<input type="checkbox"/> Jun	<input type="checkbox"/> Jul	<input type="checkbox"/> Aug	<input type="checkbox"/> Sep	<input type="checkbox"/> Oct	<input type="checkbox"/> Nov	<input type="checkbox"/> Dec
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<b><i>Pultenaea pedunculata</i></b> Matted Bush-pea	Yes (assumed present)	<input type="checkbox"/> Jan	<input type="checkbox"/> Feb	<input type="checkbox"/> Mar	<input type="checkbox"/> Apr
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		<input type="checkbox"/> Survey month outside the specified months?			

### Threatened species Manually Added

None added

### Threatened species assessed as not on site

Refer to BAR for detailed justification

Common name	Scientific name	Justification in the BAM-C
Barking Owl	<i>Ninox connivens</i>	Habitat constraints
Brown Pomaderris	<i>Pomaderris brunnea</i>	Habitat degraded
Bush Stone-curlew	<i>Burhinus grallarius</i>	Habitat degraded Habitat constraints
<i>Deyeuxia appressa</i>	<i>Deyeuxia appressa</i>	Habitat degraded
<i>Dillwynia tenuifolia</i>	<i>Dillwynia tenuifolia</i>	Refer to BAR
Eastern Pygmy-possum	<i>Cercartetus nanus</i>	Habitat degraded
Gang-gang Cockatoo	<i>Callocephalon fimbriatum</i>	Habitat degraded Habitat constraints
Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	Habitat constraints
<i>Hibbertia puberula</i>	<i>Hibbertia puberula</i>	Refer to BAR
Large Bent-winged Bat	<i>Miniopterus orianae oceanensis</i>	Habitat constraints
Large-eared Pied Bat	<i>Chalinolobus dwyeri</i>	Habitat constraints
Little Bent-winged Bat	<i>Miniopterus australis</i>	Habitat constraints
Little Eagle	<i>Hieraaetus morphnoides</i>	Refer to BAR
<i>Marsdenia viridiflora</i> R. Br. subsp. <i>viridiflora</i> population in the Bankstown, Blacktown, Camden, Campbelltown, Fairfield, Holroyd, Liverpool and Penrith local government areas	<i>Marsdenia viridiflora</i> subsp. <i>viridiflora</i> - endangered population	Refer to BAR

Masked Owl	<i>Tyto novaehollandiae</i>	Habitat constraints
<i>P. prunifolia</i> in the Parramatta, Auburn, Strathfield and Bankstown Local Government Areas	<i>Pomaderris prunifolia</i> - endangered population	Refer to BAR
<i>Pimelea curviflora</i> var. <i>curviflora</i>	<i>Pimelea curviflora</i> var. <i>curviflora</i>	Habitat degraded
Powerful Owl	<i>Ninox strenua</i>	Habitat constraints
<i>Pultenaea parviflora</i>	<i>Pultenaea parviflora</i>	Habitat degraded
Regent Honeyeater	<i>Anthochaera phrygia</i>	Habitat constraints
South-eastern Glossy Black-Cockatoo	<i>Calyptorhynchus lathami lathami</i>	Habitat degraded Habitat constraints
Southern Greater Glider	<i>Petauroides volans</i>	Habitat degraded
Swift Parrot	<i>Lathamus discolor</i>	Habitat constraints
Sydney Plains Greenhood	<i>Pterostylis saxicola</i>	Habitat degraded
Tadgell's Bluebell in the local government areas of Auburn, Bankstown, Baulkham Hills, Canterbury, Hornsby, Parramatta and Strathfield	<i>Wahlenbergia multicaulis</i> - endangered population	Refer to BAR
White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>	Habitat constraints