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CARSELDINE GOVERNMENT OFFICE PROJECT

FLORA AND FAUNA MANAGEMENT PLAN

Report prepared
for
Department of Public Works



**Biodiversity
Assessment**

AND MANAGEMENT PTY LTD

FAUNA AND HABITAT SPECIALISTS



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Project Author/s: Dr Jo Chambers and Alanna Main.

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Purpose of Report

Biodiversity Assessment and Management Pty Ltd has produced this report in its capacity as {consultants} for and on the request of Department of Public Works (the "**Client**") for the sole purpose of providing a Flora and Fauna Management Plan for the Carseldine Government Office Project (within Precinct 1 of the Fitzgibbon Urban Development Area) (the "**Specified Purpose**"). This information and any recommendations in this report are particular to the Specified Purpose and are based on facts, matters and circumstances particular to the subject matter of the report and the Specified Purpose at the time of production. This report is not to be used, nor is it suitable, for any purpose other than the Specified Purpose. Biodiversity Assessment and Management Pty Ltd disclaims all liability for any loss and/or damage whatsoever arising either directly or indirectly as a result of any application, use or reliance upon the report for any purpose other than the Specified Purpose.

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Signed on behalf of
Biodiversity Assessment and Management Pty Ltd

Date: 3rd December 2013



Managing Director

FLORA AND FAUNA MANAGEMENT PLAN CARSELDINE GOVERNMENT OFFICE PROJECT

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List of Abbreviations

BAAM	Biodiversity Assessment and Management Pty Ltd
BCP	Brisbane City Plan 2000
DPW	Department of Public Works
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cwth)
FBMP	Fitzgibbon Bushland Management Plan
FFMP	Flora and Fauna Management Plan
LP Act -	<i>Land Protection (Pest and Stock Route Management) Act 2002</i> (Qld)
NC Act	<i>Nature Conservation Act 1992</i> (Qld)
UDA	Fitzgibbon Urban Development Area
ULDA	Urban Land Development Authority

1.0 INTRODUCTION

1.1 PURPOSE OF THE PLAN

Biodiversity Assessment and Management Pty Ltd (BAAM) has been commissioned by Project Services to prepare a Flora and Fauna Management Plan (FFMP) for proposed works within the Carseldine Government Office Project (within Precinct 1 of the Fitzgibbon Urban Development Area (UDA)) (the subject site). **Figure 1.0** shows the proposed development plans for the subject site overlaid with the ground-truthed vegetation community mapping prepared by BAAM as part of a flora and fauna assessment of the site (BAAM 2011).

The aim of the FFMP is to ensure activities associated with development do not cause any undue negative impacts on fauna/vegetation communities or on individual fauna/flora species. The FFMP has been designed to address the management of significant flora/fauna species on the site, includes measures to minimise and mitigate impacts upon those species during all stages of development and provides strategies for rehabilitation of disturbed areas.

The FFMP forms an integral part of the conservation of the ecological values of the UDA.

1.2 BACKGROUND INFORMATION

Previous surveys conducted for the subject site (BAAM 2008a, 2011) have confirmed the presence one flora species (*Macadamia integrifolia*) listed as Vulnerable under the provisions of the *Nature Conservation Act 1992* (Qld) (NC Act) and/or the *Environment Protection and Biodiversity Conservation Act 1999* (Cwth) (EPBC Act), observed within the riparian habitats associated with Cabbage Tree Creek. It is noted however that this record is outside of the area of the proposed development.

Precinct 1, including the subject site, also supports areas of remnant vegetation as mapped under the *Vegetation Management Act 1999*.

Previous surveys conducted for the subject site (BAAM 2008a) have also confirmed that four conservation significant fauna species listed under the provisions of the NC Act, EPBC Act and/or Brisbane City Plan 2000 (BCP) occur or have the potential to occur within Precinct 1:

- Grey-headed Flying-fox *Pteropus poliocephalus* (Vulnerable EPBC Act);
- Tusked Frog *Adelotus brevis* (Vulnerable NC Act);
- Grey Goshawk *Accipiter novaehollandiae* (Near Threatened NC Act, Significant BCC);
- Squirrel Glider *Petaurus norfolcensis* (Significant BCP).

Background information relating to the distribution, ecological requirements and potential threats to these species have been addressed in BAAM (2008a). A Squirrel Glider Management and Action Plan has been prepared for the entire UDA (BAAM 2008b). Actions and recommendations within the Squirrel Glider Management and Action Plan considered relevant to development within Precinct 1 are provided in **Section 2.3** and **Table 4**.

The development plan for the proposed works within Precinct 1, together with the vegetation assessment, has been examined to assist in compiling the FFMP.

2.0 FLORA AND FAUNA MANAGEMENT PLAN

2.1 OBJECTIVES

The objectives of the FFMP are to provide:

- A consistent and uniform approach that assures the required standards of environmental protection, maintenance and habitat enhancement are achieved as defined within the Fitzgibbon Bushland Management Plan (FBMP);
- Procedures for the minimisation of disturbance to existing flora and fauna in areas to be retained;
- An integrated approach to responsible management of the site's ecology and the maintenance or enhancement of ecosystem function in retained or rehabilitated areas;
- Detailed requirements to achieve the rehabilitation outcomes in accordance with the FBMP;
- Methods of physical identification of vegetation/habitat to be retained;

- A description of all measures to be used to protect vegetation and habitat features to be retained during construction, including protective fencing;
- A description of all pruning and tree surgery works (to AS 4373/96) to maintain health and stability of trees and reduce potential hazards for future residents, where appropriate;
- Details of all measures to protect fauna and fauna habitats during clearing operations;
- A schedule of monitoring to be undertaken; and
- State and Commonwealth authorities, stakeholders and the proponent with a common focus for approvals conditions and compliance with policies and conditions.

This plan forms an integrated and coordinated approach to the management of the site's ecology.

A priority of this FFMP is to address the long-term management of vegetation and conservation significant fauna species within disturbance areas and to include measures to minimise impact on the site's ecology during all stages of the development.

2.2 MANAGEMENT STRATEGIES

This FFMP addresses the clearing and construction stages of the development as well as the occupational stage and specifically focuses on the following issues:

- Practical strategies and actions to minimise disturbance to vegetation and fauna habitats;
- Rehabilitation of the site during and post development;
- Investigation of opportunities for the enhancement of Koala and Squirrel Glider habitat and movement through the site;
- Practical strategies and actions to manage potential pest species;
- Monitoring requirements for evaluating the success of management measures and mitigation actions.
- Adhering to reporting requirements to the ULDA in relation to the monitoring and record keeping of unauthorised vegetation clearing or any fauna injuries or deaths on the site, including the need to address the

cause of these and potential mitigation measures to be employed to reduce such.

The overall intent and specific management actions for the protection of flora and fauna habitats during all stages of development are provided in **Table 4**.

The roles and responsibilities for personnel associated with the development and fauna management are provided in **Sections 3.1 to 3.3**.

2.2.1 Vegetation Clearing

Areas not required for development will be protected from vegetation clearing and disturbance through the clear marking/fencing of non-disturbance areas (**Table 4**). Vegetation clearing will be conducted in a sequential manner.

Areas where vegetation requires pruning or disturbance, but not clearing, must be clearly identified on the Plan of Operations. Any pruning will require a permit in accordance with ULDA Vegetation Management By-law. Pruning must be conducted under the guidance an appointed arborist and in accordance with Australian Standards (AS4373-2007).

For the purpose of this report the proposed works have been delineated into management areas as shown on **Figure 2.1**. A breakdown of the loss within each management area was calculated by overlaying the development footprint on the ground-truthed remnant vegetation mapping (BAAM 2011); the results of which are provided in **Table 1**. The calculation of area lost shown in **Table 1** is based on the total amount of remnant vegetation that is proposed to be cleared within each management area and does not include existing cleared areas, such as formed roads, buildings etc.

In accordance with the requirements regarding the loss of bushland presented within the FBMP, rehabilitation of retained vegetation is required to offset clearing at a rate of 2:1. Rehabilitation requirements for each vegetation community for each management section are presented in **Table 1**.

2.2.2 Interference with Retained Vegetation

Areas where vegetation requires pruning or disturbance, but not clearing, must be clearly identified on the Plan of Operations. Any pruning will require a permit in accordance with

ULDA Vegetation Management By-law. Pruning must be conducted under the guidance an appointed arborist and in accordance with Australian Standards (AS4373-2007).

The appointed arborist will supervise and approve all aspects of works that interface with any retained vegetation. Pruning will be limited

to the removal of dead wood except where required for construction access.

Dead wood should be removed from any trees that are located within six meters of any path, ramp, road, apron, seating area, hardstand, building or mechanical plant and equipment installation.

Table 1. Clearing that will be undertaken within each Management Section and rehabilitation requirement. Note: *Area lost is calculated on the area of remnant vegetation proposed to be cleared. It does not include cleared areas, such as formed roads and existing unvegetated patches.

Section	Vegetation Type (RE)	Area lost (ha)*	Rehabilitation Requirement (ha)
1	Remnant 12.5.2	0.262	0.524
1	Remnant 12.5.3 (minus formed roads)	0.010	0.020
2	Remnant 12.5.2	0.006	0.012
2	Remnant 12.5.3	0.182	0.364
3	Remnant 12.5.3	0.042	0.0826
4	Remnant 12.5.3	0.250	0.500
5	Remnant 12.5.3 (minus formed roads)	0.331	0.662
6	Remnant 12.5.3	0.149	0.298
7	Remnant 12.5.2	0.032	0.064
7	Remnant 12.5.3	0.013	0.0258
Total Rehabilitation Requirement			2.552ha

* Area lost does not include existing cleared areas.

It is proposed that a number of trees which fulfil the definition of significant vegetation (i.e. trees with a diameter at 1m above the ground of >60cm) will require removal for the proposed works. **Table 2** provides the location, species and canopy width for the identified significant vegetation and the approximate locations of these trees are shown on **Figure 2.2**.

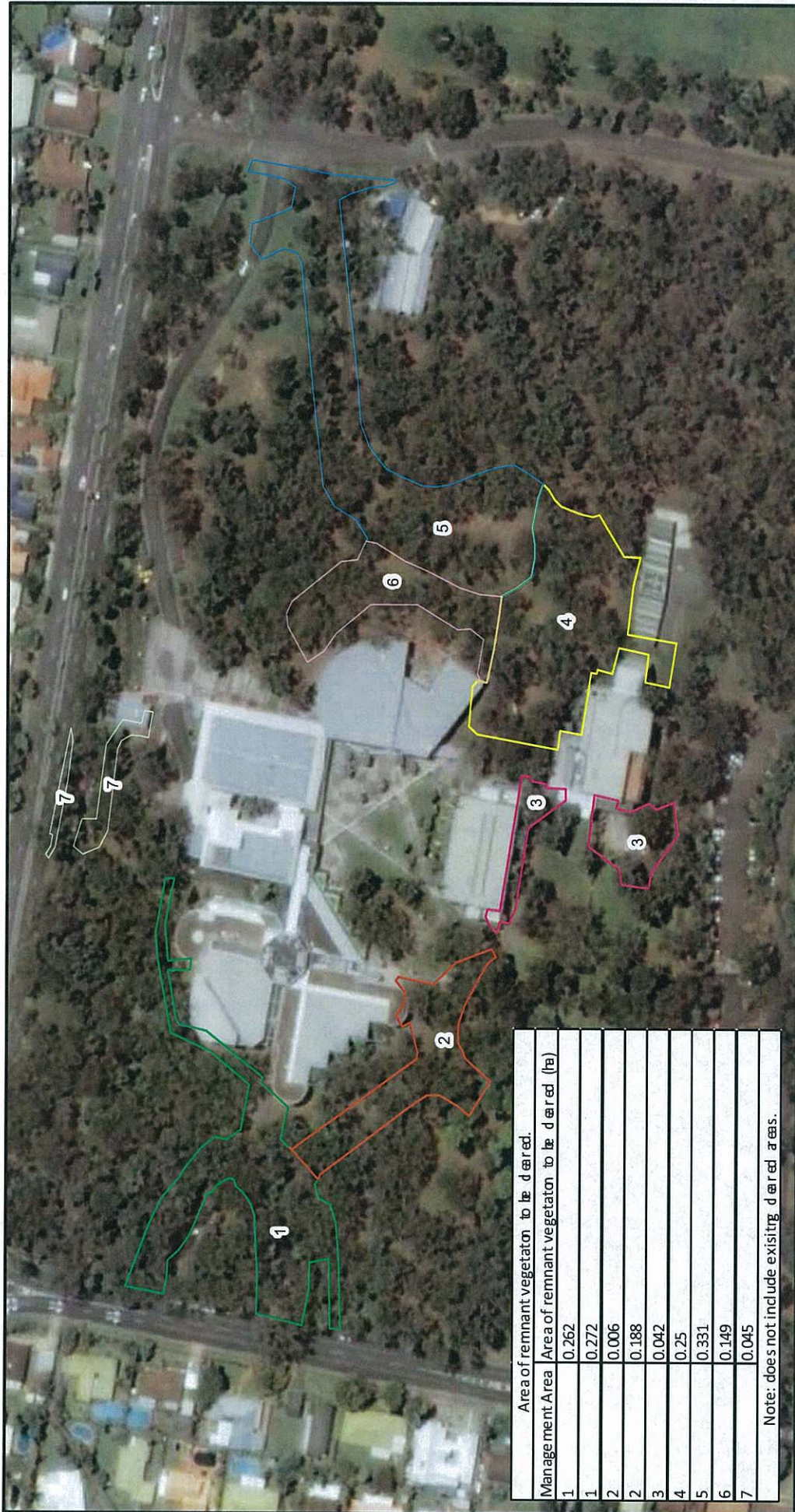
Any loss of significant vegetation is to be offset by replanting, preferably with the same species as that lost, at the ratio of 3:1 (i.e. three trees for each significant tree lost). In addition a number of the trees identified as significant

vegetation currently support hollows (**Table 2**). It is a requirement under the Squirrel Glider Management and Action Plan (BAAM 2008b), that any loss of trees supporting hollows should be compensated for by replacing each lost hollow-bearing tree with two nest boxes. **Table 3** provides details specifications for design and positioning of nest boxes.

The rehabilitation requirements for the north/south access road option and for services to the site are provided in **Addendum 1** of this FFMP, together with an updated figure which shows the full extent of the proposed works, as assessed by BAAM.

Table 2. Significant Vegetation requiring removal

Management Area	Tree No.	GPS Location	Species/Comment	Canopy Width (m)
1	5	S27.34873 E153.02237	<i>Eucalyptus microcorys</i>	15.1
1	6	S27.34877 E153.02202	<i>Eucalyptus tereticornis</i>	20
1	7	S27.34834 E153.02212	<i>Eucalyptus microcorys</i>	15.5
1	8	S27.34861 E153.02250	<i>Eucalyptus tereticornis</i>	19.1
1	48	S27.34839 E153.02320	<i>Eucalyptus microcorys</i>	12
1	49	S27.34858 E153.02291	<i>Eucalyptus microcorys</i>	11
1	50	S27.34872 E153.02277	<i>Eucalyptus racemosa</i>	12
2	4	S27.34939 E153.02308	<i>Eucalyptus microcorys</i>	9.1
2	74	S27.34941 E153.02286	<i>Eucalyptus microcorys</i>	20
2	75	S27.34930 E153.02290	<i>Eucalyptus siderophloia</i>	15
2	79	S27.34910 E153.02266	<i>Eucalyptus propinqua</i>	10
2	80	S27.34897 E153.02260	<i>Corymbia intermedia</i>	20
2	81	S27.34886 E153.02260	<i>Eucalyptus microcorys</i>	15
3	53	S27.35000 E153.02353	<i>Corymbia intermedia</i> - Hollows	11
3	52	S27.34994 E153.02354	<i>Corymbia intermedia</i>	8
4	16	S27.34972 E153.02489	<i>Eucalyptus tereticornis</i>	17
4	17	S27.34997 E153.02478	<i>Eucalyptus racemosa</i>	16
4	54	S27.34944 E153.02411	<i>Eucalyptus racemosa</i> Potential Hollows in Canopy	12
4	55	S27.34952 E153.02423	<i>Eucalyptus racemosa</i> - Hollows	6
4	56	S27.34965 E153.02419	<i>Eucalyptus camea</i> - Hollows	10
4	57	S27.34980 E153.02438	<i>Eucalyptus camea</i>	10
4	58	S27.34984 E153.02440	<i>Eucalyptus microcorys</i> - Hollows	6
5	18	S27.35020 E153.02398	<i>Eucalyptus racemosa</i>	10
5	19	S27.34945 E153.02473	<i>Corymbia intermedia</i> (<i>Ficus</i> sp. attached)	13
5	20	S27.34957 E153.02500	<i>Corymbia intermedia</i>	14
5	21	S27.34942 E153.02499	<i>Corymbia intermedia</i>	12
5	22	S27.34929 E153.02501	<i>Eucalyptus racemosa</i>	19
5	23	S27.34919 E153.02487	<i>Corymbia intermedia</i>	13
5	25	S27.34900 E153.02508	<i>Corymbia intermedia</i>	12
5	26	S27.34894 E153.02508	<i>Corymbia intermedia</i>	14
5	27	S27.34902 E153.02533	<i>Eucalyptus racemosa</i>	14
6	59	S27.34946 E153.02444	<i>Eucalyptus microcorys</i> - Hollows	10
6	60	S27.34897 E153.02469	<i>Eucalyptus microcorys</i> - Hollows	20.5
6	14	S27.34909 E153.02458	<i>Eucalyptus microcorys</i> (Lorikeets observed in hollow) - Hollows	15.5
6	12	S27.34903 E153.02463	<i>Eucalyptus siderophloia</i>	13.5
Total Number of Trees to be replanted				105



Area of remnant vegetation to be cleared	
Management Area	Area of remnant vegetation to be cleared (ha)
1	0.262
1	0.272
2	0.006
2	0.188
3	0.042
4	0.25
5	0.331
6	0.149
7	0.045

Note: does not include existing cleared areas.

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Basemap (c) 2010 Microsoft Corporation and its data suppliers

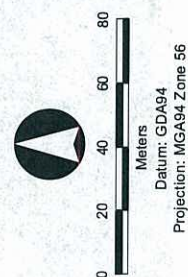
Legend

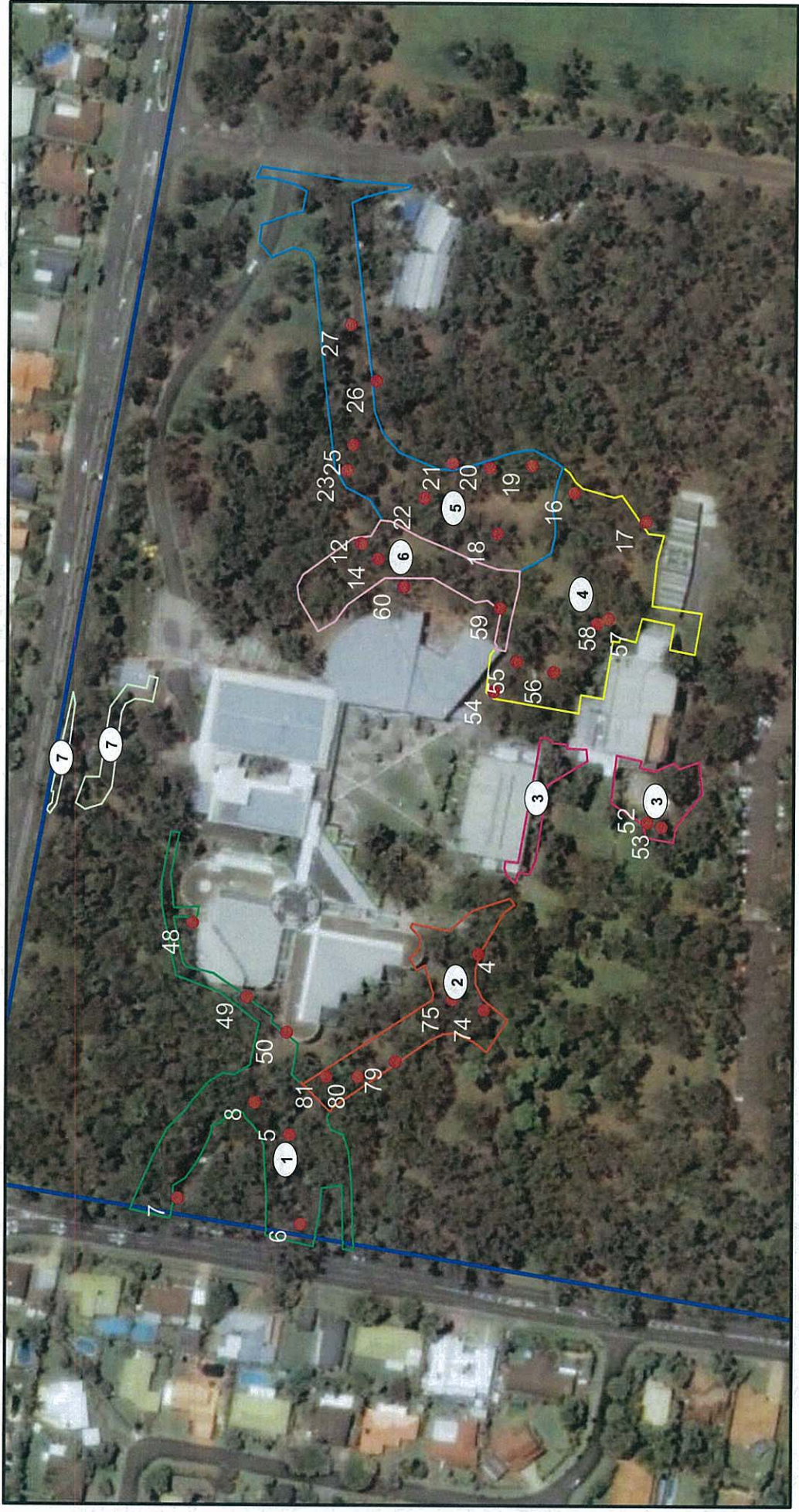
Management Area

Figure 2.1

Management Areas

Flora and Fauna Management Plan
Carseldine Government Office Project





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Basemap courtesy of Nearmap 2011

Legend

- Significant Vegetation
- Boundary of Precinct 1
- Management Areas



Datum: GDA94

Projection: MGA94 Zone 56

Figure 2.2

Location of Significant Vegetation

Flora and Fauna Management Plan
 Carseldine Government Office Project



2.2.2 Site rehabilitation

The proposed works will be concentrated mainly within already developed areas within Precinct 1, where the existing vegetation is extensively managed (i.e. continually mown). It is recommended that the existing management strategy be continued, as the presence of mowed areas greatly reduces the risk of high-fuel load bushfires. The exception to this is Management Section 7 which is currently almost entirely dominated by planted exotics, such as wild ginger, banana trees and environmental weeds, with the occasional isolated native canopy tree.

Rehabilitation of disturbed/cleared areas adjacent to existing buildings, roadways and car park areas will focus on providing supplementary feed trees for Squirrel Gliders, whilst maintaining a low risk fire hazard. A Rehabilitation Plan for each Management Section is presented in **Table 2a of Appendix 1**.

Rehabilitation opportunities outside of the development footprint have been identified and their locations are shown on **Figure 2.3** and described in **Table 3**. The rehabilitation strategy for each of the defined areas will focus on minimising the existing edge effects which are currently causing encroachment of exotic grasses and some weeds into the interior of the remnant vegetation. The dense covering of exotic grasses along the edges of retained bushland areas poses an increased risk of high-fuel load bushfire.

A Rehabilitation Plan for each identified area is presented in **Table 2b of Appendix 1**.

Table 3. Rehabilitation opportunities within retained bushland areas

Location	Available Rehabilitation Area (ha)
A. Bushland south of eastern access road RE 12.5.3	0.640
B. Non-remnant RE12.3.11	0.495
C. Remnant RE12.3.11	1.407
D. Riparian RE12.3.6	0.482
E. Adjacent to Management Section 7	0.08
Area available for Rehabilitation	3.104ha

2.2.3 Pest Management (vegetation)

Several pest weed species declared under the provisions of the Queensland *Land Protection (Pest and Stock Route Management) Act 2002* (LP Act) are known from Precinct 1. These species include but are not limited to the following species:

- Basket Asparagus Fern *Asparagus aethiopicus* – Class 3 pest;
- Climbing Asparagus Fern *Asparagus africanus* – Class 3 pest;
- Camphor laurel *Cinnamomum camphora* – Class 3 pest;
- Chinese elm *Celtis sinensis* – Class 3 pest;
- Lantana *Lantana camara* – Class 3 pest;
- Creeping Lantana *Lantana montevidensis* – Class 3 pest;
- Singapore Daisy *Sphagneticola trilobata* – Class 3 pest;
- Prickly pear *Opuntia stricta* – Class 2 pest.

These species have the potential to further invade areas of Precinct 1 that are not currently infested. It is therefore important in the overall management of the site to employ weed eradication/control techniques to maintain and enhance the ecological value of retained vegetation. Control techniques and specific information relating to each of these weed species is provided within **Appendix A of Appendix 1**.

2.3 FAUNA MANAGEMENT

2.3.1 Retained Fauna Habitat Areas

The terrestrial habitats within Precinct 1 support a mixture of mature and regrowth native vegetation as well as hollow-bearing trees that provide important fauna habitat features. The site supports species of feed trees for Grey-headed Flying-Fox, Squirrel Glider and (potentially) Koala (although no evidence of Koala usage was observed), and also provides roosting and nesting opportunities for numerous bird species.

Potential impacts, as a result of the proposed works, to fauna associated with these habitats include direct loss of habitat, including feeding and nesting resources, injury or death during clearing and construction and displacement brought about by the presence of barriers to safe movement opportunities. **Table 4** provides actions required to minimise these impacts.

With appropriate management (**Table 4**), which includes promoting the natural recruitment of Squirrel Glider feed trees (**Appendix 1**), enhancement of retained areas will provide for foraging, nesting and sheltering resources for the local fauna.

Enhancement of nearby adjacent habitats associated with Cabbage Tree Creek is considered necessary to mitigate potential impacts resulting from the expected loss of habitats within Precinct 1.

Enhancement of the site's fauna values will largely be achieved by careful flora management and weed control. However, to ensure that the existing fauna assemblages are not unduly impacted by the proposed rehabilitation works, the following factors should be considered prior to the commencement of site works:

- Exotic grasses and other dense weed growth (e.g. Lantana) provide sheltering opportunities for ground dwelling fauna species and small birds. The replacement of these areas with sufficient areas of dense, native vegetation should be ensured, utilising a progressive, mosaic (patch by patch) method;
- Large patches of weeds should not be eradicated from each rehabilitation area

until appropriate replacement native species have matured;

- Broad-scale clearing alters microhabitats and can expose native fauna to increased predation pressures. In addition, the presence of totally cleared areas may facilitate invasion by pest species such as Cane Toads. Clearing should be conducted in a staged manner, commencing in the least disturbed sections, and further clearing should not occur until the replanted vegetation becomes self sustaining;
- A structurally complex environment should be maintained to provide basking and sheltering opportunities for small terrestrial fauna species;
- Specific fauna food trees (e.g. *Eucalyptus* and *Melaleuca* species for Squirrel Gliders, Flying-Foxes and nectivorous birds) should be included within the rehabilitation plan.

At all times during rehabilitation works excessive disturbance should be avoided and quiet areas should be maintained for fauna retreat.

2.3.2 Fauna Movement Opportunities

Currently, the presence of bushland areas within Precinct 1 provides opportunities for unrestricted fauna movement within the subject site. Studies have shown that Squirrel Gliders regularly use areas within Precinct 1.

The proposed clearing within Precinct 1 is not expected to cause any undue impacts to safe fauna movements throughout the site. However, increased outdoor lighting and night traffic could disrupt nocturnal fauna movement patterns and could lead to the death or injury of fauna. Although it is anticipated that night time use of the site will only occur infrequently, it is important that a maximum speed limit of 40kph be enforced throughout Precinct 1 and that all personal are made aware of the potential presence of fauna crossing the road network and the risks posed to their safety as a result of night driving through the site.

All lighting within outdoor areas should comply with relevant Australian Standards and be of low spillage, with no or limited upward spillage, as Squirrel Gliders would regularly be attempting to glide from heights greater than that of standard light poles.

Tables 3 provide actions and recommendations designed to protect and

enhance fauna habitats to ensure safe movement options continue within the retained bushland areas. This FFMP should be referred to prior to producing the final design plans for Precinct 1.

2.3.3 Pest Management (fauna)

Two fauna pest species (cane toad and black rat) were identified during the flora and fauna surveys (BAAM 2008a). Although not observed, it is expected that feral or stray cats (i.e. ex domestic cats) would also utilise some areas within the subject site.

Whilst it is expected that the proposed works will not significantly influence the distribution and abundance of feral pests, it is important in the overall management of the site to employ achievable strategies to minimise the disturbance on native fauna by pests. This report details methods by which pest management and monitoring can be undertaken. It should be understood that effective pest management in the local landscape can only be achieved through cooperation/participation of landowners.

Strategies to manage fauna pest species in all areas associated with the development in Precinct 1 are provided in **Table 3**.

2.4 MONITORING AND REPORTING PROCEDURES

Regular monitoring to record compliance with the requirements of the FFMP is required. These monitoring events, together with their frequency, performance indicators and the person responsible for undertaking each event are outlined within **Table 3**.

All unauthorised vegetation clearing and all deaths, injuries or near-misses to native fauna species must be reported to the Superintendent during the construction phase or the Asset Manager during the operational phase immediately, or as soon as practical, after the incident has occurred.

It will be the responsibility of the Contractor (construction phase) and the Asset Manager (operational phase) to formulate a Flora and/or Fauna Incident Report Procedure. It is also the responsibility of the Superintendent and/or Asset Manager to inform the ULDA of any reported incidents involving NC Act protected species (i.e. all native species), and to promptly enforce mitigation measures to prevent further incidents.

3.0 GENERAL ENVIRONMENTAL DUTIES

The following sections provide guidelines for the responsibilities of designated personnel who are engaged to ensure compliance with this FFMP.

3.1 DEPARTMENT OF PUBLIC WORKS (PRINCIPAL)

The roles and general responsibilities of the Principal are to:

- Comply with internal Public Works policy;
- Comply with the ULDA Fitzgibbon Bushland Management Plan;
- Comply with the EPBC Act and NC Act;
- Nominate a Superintendent and Asset Manager who will represent the Principal in reviewing the performance of the contractor and staff, issue instructions and variations, and be responsible for FFMP implementation;
- Promptly notify Administrating Authority of any changes to this FFMP and its implementation, reporting or monitoring, and any breach of Administrating Authority conditions and proposed corrective action; and
- As necessary, engage the services of a qualified ecologist.

It will be the responsibility of the Principal to ensure that the contents of the FFMP are adequately communicated to all site personnel, and that they are advised of the consequences if the recommended actions are not observed.

3.2 SUPERINTENDENT

It will be the role of the Superintendent during the construction phase to ensure all incidents regarding flora and fauna are recorded and reported to the ULDA.

3.3 CONTRACTOR

The roles and responsibilities of the Contractor and appointed Environmental Management Officer/Ecologist (EMO) are to:

- Conform to Environmental Best Management Practices;
- Satisfactorily demonstrate to the Principal, and relevant authorities that appropriate measures have been implemented on-site

during development to adequately manage the risks to protected fauna, protected flora and vegetation communities, as noted in the FFMP;

- Keep records of complaints received and responses relating to the site's flora and fauna, advise the Principal of complaints and responses, investigate and (where appropriate) implement control measures as soon as possible;
- Be present at inspections and as triggered by any environmental events or incidents;
- Keep records of FFMP performance and monitoring, non-compliance and actions taken, and seek advice and attendance from the EMO/Ecologist at on-site inspections when required;
- Notify the EMO/Ecologist regarding environmental incidents with potential to cause environmental harm or nuisance and provide written details within 24 hours of occurrence;
- Report on FFMP implementation and performance to the Superintendent on completion of on-site works and following the maintenance and establishment periods; and
- Follow directions of the Principal with respect to performance of the FFMP.

3.4 CONTRACTOR'S ENVIRONMENTAL MANAGEMENT OFFICER (EMO) /ECOLOGIST

The roles and responsibilities of the EMO/Ecologist are to:

- Liaise with the Contractor to facilitate compliance with legislation, Council policy and conditions during the project;
- Conduct audit inspections as required /requested during earthworks, clearing and rehabilitation stages and other inspections as triggered by environmental events or incidents;
- Advise the Contractor on the compliance and effectiveness of the FFMP/Site Instructions and its implementation;
- Immediately contact the Contractor regarding any environmental incidents that have the potential to cause environmental harm, request written details within 24 hours of occurrence. Recommend Site Instructions for rectification/remediation to the Contractor as soon as possible;

- Issue Site Instructions (for correction of non-compliance) to the Superintendent within seven (7) days of inspections and completion of the Inspection Procedures and Checklist(s); and
- Review and advise the Contractor and of any changes to the FFMP. The Contractor will advise the Superintendent of any changes to the FFMP.

3.5 ASSET MANAGER

An Asset Manager will be appointed by the Principal to ensure compliance with the FFMP during the occupation phase. The roles and responsibilities of the Asset Manager are to:

- Keep records of complaints received and responses relating to the site's flora and fauna, advise the Principal of complaints and responses, investigate and (where appropriate) implement control measures as soon as possible;
- Be present at inspections and as triggered by any environmental events or incidents;
- Keep records of FFMP performance and monitoring and seek advice and attendance from an Ecologist at on-site inspections if required;
- Notify the Principal regarding environmental incidents with potential to cause environmental harm or nuisance and provide written details to the Principal within 24 hours of occurrence;
- Follow directions of the Principal with respect to performance of the FFMP.

Table 3: Flora and Fauna Management Plan

Overall Project Management		Aim: To ensure flora and fauna management is an integral component of development		
Performance Objective	Implementation Strategy	Performance Indicators Corrective Action	Responsibilities, Reporting and Review	Timing and Frequency
On-site establishment of procedures and responsibilities	A pre-start meeting is to be arranged by the Superintendent to clearly define roles and the approach to Flora and Fauna management. Roles will specifically include: Contractor– Establishment of protective fencing around retained bushland areas where deemed necessary. EMO/Ecologist – Assistance delineating areas to be fenced for protection of wildlife movement opportunities and individual habitat trees. Regulating Authorities – - Established compliance will be met. This FFMP is to be kept on site at all stages during construction.	All site workers are informed of their obligations with regard to Flora and Fauna protection. Pre-start meeting undertaken. Any incidents that may result in a breach of approval are reported to the Superintendent. Investigate reasons why performance indicators have not been met and ensure all relevant staff and contractors are debriefed and advised of their responsibilities. Where management methods are not achieving the desired performance indicators, the FFMP will be reviewed.	The Superintendent to liaise with the Contractor and their appointed EMO/Ecologist throughout construction. Reported by relevant staff to the respective authority (Superintendent and ULDA). Superintendent and EMO/Ecologist. Superintendent, EMO/Ecologist, DPW.	At the pre-start meeting. Within 24 hours of the incident being identified. As soon as incident has been reported. If required.
Communication of pre-start meeting outcomes	Site inductions will include the communication of Pre-Start meeting outcomes to all site workers.	All site workers are informed of their obligations with regard to Flora and Fauna protection.	Contractor and their appointed EMO/Ecologist.	Prior to commencement of vegetation and native habitat disturbance.

Performance Objective	Implementation Strategy	Performance Indicators Corrective Action	Responsibilities, Reporting and Review	Timing and Frequency
Protect fauna and vegetation communities	Clearly define all areas not directly affected by works to delineate limits of disturbance. No unauthorised disturbances should occur within defined zones (e.g. dumping of excavated soil). Retain all trees marked for retention (alive or dead). Conduct clearing in a sequential manner. No vegetation clearing is to be conducted between the hours of 6pm and 6am. Ensure a QPWS authorised fauna spotter/catcher is present during all tree clearing activities. A qualified fauna spotter will inspect potential habitat trees prior to clearing and, if required, will co-ordinate a trapping/release program.	All vegetation communities and fauna habitats identified for protection remain undisturbed outside of designated disturbance zones. Induction of site staff regarding requirements for vegetation and fauna habitat protection.	Contractor and appointed sub-contractors.	Ongoing.
			EMO/ ecologist to present the induction. Contractor to ensure all staff have completed induction.	Pre-clearing stage.
		Flag all trees to be retained.	Under the guidance of an ecologist.	Pre-clearing stage.
		Appropriate fencing/barrier to be erected to delineate no go areas.	Under the guidance of an ecologist.	Prior to commencement of ground works.
		Vegetation removal only conducted in a sequential manner between the hours of 6am and 6pm. No injury to fauna as a result of tree removal.	A qualified fauna spotter/catcher, appointed by the Contractor, is present during tree clearing.	During vegetation removal.

		If disturbance is reported outside of the designated disturbance zone, all works are to cease. Assess damage and causes within 1 week. Prevent future occurrences through re-surveying, change of clearing plan, improve temporary (barrier) fencing of no go areas, update site personnel information and training on clearing procedures. Do not commence clearing until corrective actions have been implemented.	EMO/ ecologist to recommend corrective actions and provide site direction. All relevant personnel to implement corrective actions.	Ongoing.
Long-term Maintenance of Site's Fauna Populations				
Performance Objective	Implementation Strategy	Aim: To ensure the continued presence of native fauna within the subject site		
		Performance Indicators Corrective Action	Responsibilities, Reporting and Review	Timing and Frequency
Promote safe fauna movements within and outside of the subject site.	Identify barriers to safe fauna movement and remove or modify these barriers. Monitoring of the movements and any incidents of the fauna populations will identify if there is the need for erection of fauna exclusion fencing If required fencing should be designed and located with the assistance of an ecologist.	No deaths or injuries to native fauna have been reported. Fauna are regularly observed moving between habitats throughout the subject site. If deaths, injuries or barriers to safe movement are reported, rectify causes through updating site personnel; information and training; modify development plan and/or install equipment to prevent further impediments to safe movement.	Superintendent/Contractor /Asset Manager/ EMO/ Ecologist	Ongoing.

Ensure development compensates for the loss of fauna habitats, such as hollows and food resources for Squirrel Gliders.	Where practical retain all hollow-bearing trees or relocate cleared hollows to retained bushland habitats. If not practical calculate the number of hollows lost and replace with two nest boxes for each hollow-bearing tree lost. Nest boxes should be positioned as close as practical to hollows lost, at least 4m high and in various aspects from north through to south depending on habitat characteristics (e.g. slope, aspect and vegetation), so boxes are not in direct sunlight for long periods during the hottest months of the year. Medium sized boxes (0.008 m ³) should be used – 40 x 14.5 x 14cm with a 45 cm diameter entrance hole. Nest boxes should be constructed of plywood that has been painted on the outside to improve longevity. Either rubber tubing or crimped wire should be used to attach the box to allow growth of the tree. Monitoring of nest boxes should occur as required by the ULDA, to observe usage by Squirrel Gliders and other fauna and to detect any wear and tear.	Wherever practical, works have avoided the clearing of hollow-bearing trees. If hollow-bearing trees must be cleared and it is practical to do so, they are repositioned within existing retained bushland areas. Two nest boxes have been installed in appropriate locations to compensate for the loss of each hollow-bearing tree. It is a requirement under the ULDA's Fitzgibbon Bushland Management Plan (section 4.4), that if vegetation clearing is to occur prior to rehabilitation works, then nest boxes must be installed prior to clearing. Monitoring is to be conducted at 6 months, 1 year and 2 years after installation.	Contractor/Asset Manager/Ecologist	Nest boxes to be installed prior to clearing. Monitoring to occur at 6 months, 1 year and 2 years after installation of boxes.
Aim: To ensure the continued presence of native fauna within the subject site				
Long-term Maintenance of Site's Fauna Populations	Implementation Strategy	Performance Indicators Corrective Action	Responsibilities, Reporting and Review	Timing and Frequency
Performance Objective				

Ensure development does not promote an increase in the presence of pest animals.	Prevent activities likely to promote the presence of pest species. All staff/contractors must remove any food scraps from the site. Unused building materials or rubble that could provide refuge for pest species is not to be stored on site.	All site personnel are aware of their responsibilities to keep the site clean of human refuse. No evidence of food scraps or commercial waste present within the areas of development. If waste is reported on site, Contractor/Asset Manager is to identify cause and rectify. If necessary reinforce site personnel responsibilities.	Contractor/Asset Manager and all site personnel.	Weekly inspections of development site and immediate surrounds.
Employee Participation	Encourage future site users within Precinct 1 to actively participate in protecting all native fauna and enhancing significant fauna habitats.	All employees are informed of the management strategies contained within this FFMP. This will be facilitated through the Tenant User Guide. Conduct regular information/education sessions for all employees to inform the management strategies and action contained within this FFMP. This will be facilitated through monthly tenancy management meetings with the Principal and stakeholder representatives.	DPW and tenants.	Immediately following occupation at each development phase.
VEGETATION PROTECTION/CLEARING AND DISPOSAL		Aim: To establish boundaries and protection around vegetation and individual trees to be retained		

Performance Objective	Implementation Strategy	Performance Indicators Corrective Action	Responsibilities, Reporting and Review	Timing and Frequency
Protect retained vegetation communities	Clearly define, using flagging or fencing if considered necessary, all areas not directly affected by clearing activities to delineate limits of disturbance. Protect all trees marked for retention (alive or dead) as identified during on-site establishment.	All vegetation identified for protection remains undisturbed by operational works. Induction of site staff into requirements for vegetation and tree protection. Delineate areas of disturbance. Flagging of trees to be retained,	Contractor and their appointed EMO/Ecologist EMO/ ecologist to present the induction to contractors. Contractor to ensure all staff have completed induction. Contractor, under guidance of an ecologist.	Pre-clearing stage. Pre-clearing stage. Prior to commencement of operational works.
Prevention of secondary impacts on retained vegetation communities within Precinct	Monitor retained vegetation for secondary impacts such as weed invasion from disturbed areas, compaction, altered hydrology (e.g. water-logging), scouring and erosion from runoff and dumping of spoil.	If vegetation outside of disturbance area is damaged, it is to be rehabilitated. Prevent future occurrences through re-surveying, change of clearing plan, update site personnel information and training on clearing procedures. No secondary impacts to affect the condition and long-term viability of retained vegetation communities. If a secondary impact is observed, remove the source of the impact (e.g. implement a weed control program).	Contractor and EMO/Ecologist During the occupational phase of the development, DPW is to delegate a person responsible for regular visual monitoring and reporting of potential impacts. Landscape/site maintenance staff is to conduct regular monitoring of retained vegetation and inform DPW of requirements for remediation as necessary.	Ongoing Ongoing

INDIVIDUAL TREE PROTECTION			Aim: To ensure Individual Tree Protection is an integral component of site construction	
Performance Objective	Implementation Strategy	Performance Indicators Corrective Action	Responsibilities, Reporting and Review	Timing and Frequency
Ongoing Tree Management	Retained trees are to be monitored for signs of deterioration. Advice is to be sought from a landscape architect/arborist if trees are suspected of deteriorating health and an assessment is to be made as required. Corrective actions to be prescribed by the arborist and corrective works supervised.	Trees are to remain visually healthy. Induction of landscape/site maintenance staff into requirements for maintenance and monitoring of tree health. Assess vegetation as required.	Vegetation checked by landscape architect and appointed arborist as required throughout development. DPW and ecologist to present the induction. Vegetation checked by landscape architect and appointed arborist as required	Throughout occupational phase.
Cleared vegetation management	Cleared vegetation to be used on site for rehabilitation. Fertile weed material to be removed off site. Cleared material should not be placed within 20m to the watercourse. Any logs, stumps or hollows should be incorporated into area of retained vegetation and rehabilitation areas for the creation of fauna habitat.	Stockpiled mulch to be free of weed propagules. Logs and hollows are incorporated into habitat creation where possible.	Vegetation checked by landscape architect and appointed arborist as required throughout initial construction phase. Ecologist to provide advice regarding the placement of logs etc. for habitat enhancement.	Construction activities (prior to earth works) and during earthworks.

NATIVE VEGETATION MONITORING AND MAINTENANCE			Aim: To prevent the long-term degradation of the habitat values of retained vegetation		
Performance Objective	Implementation Strategy	Performance Indicators Corrective Action	Responsibilities, Reporting and Review	Timing and Frequency	
Weed Monitoring and Control	Regular visual search for declared weeds within the retained vegetation for weed infestations (as listed within Table 5 of Appendix 1). Weed control is implemented when weed infestations are significant or an increase in declared weed species (i.e. species declared under the provisions of the LP Act) is observed.	No large weed infestations visible within retained vegetation. Weed Control is implemented to control weed infestations. Recommended weed control techniques are contained within Appendix A of Appendix 1 .	Ecologist to report to nominated DPW representative.	Bi-annual. As Required.	
REHABILITATION ACTIVITIES			Aim: To rehabilitate areas post development to reflect their pre-disturbance state		
Performance Objective	Implementation Strategy	Performance Indicators Corrective Action	Responsibilities, Reporting and Review	Timing and Frequency	
Rehabilitation	Rehabilitation is to commence prior to clearing of the native vegetation. Where this is not practical, rehabilitation of areas within the retained bushland sites is to occur prior to the initiation of tree removal. Rehabilitation works and species to be used in the rehabilitation program are provided within Appendix 1 . Signage within rehabilitation areas is to be erected to educate the employees and temporary fencing may be required to reduce incidences of unauthorised entry into the rehabilitation areas.	Rehabilitation works are undertaken in accordance with Appendix 1 . Unauthorised entry into rehabilitation areas does not occur.	Ecologist to report to nominated DPW representative.	Rehabilitation works to start prior to the commencement of vegetation removal, or as per the FBMP. Then on an as needed basis following the completion of development.	When required.
		Temporary fencing of and/or signage within rehabilitation areas is erected.	Contractor		

Significant Fauna Monitoring and Maintenance		Aim: To highlight and prevent the long-term degradation of fauna populations within retained or rehabilitated habitats, wildlife corridors and ecological reserves		
Performance Objective	Implementation Strategy	Performance Indicators Corrective Action	Responsibilities, Reporting and Review	Timing and Frequency
Ongoing fauna Monitoring and Management.	Fauna populations on site, including pest species, are to be monitored to record any significant change in abundance of species.	Native fauna populations are to remain healthy and in similar abundances and diversity as recorded prior to development, as assessed by project ecologist. No increase in the abundance of fauna pest species. If required, corrective actions are to be prescribed by the ecologist and corrective works supervised.	During the occupational phase DPW will engage competent contractors to monitor the nest box installations. An ecologist shall be appointed to conduct additional monitoring if site staff identifies any significant change in abundance of species.	Monitoring of nest boxes at 6 months, 1 year and 2 years after installation. Additional monitoring to be conducted as required.

4.0 REFERENCES

- BAAM (2008a).** *Flora and Fauna Habitat Assessment – Fitzgibbon Urban Development Authority*. Unpublished report prepared for Urban Land Development Authority.
- BAAM (2008b).** *Squirrel Glider Management and Action Plan - Fitzgibbon Urban Development Authority*. Unpublished report prepared for Urban Land Development Authority.
- BAAM (2011).** *Flora and Fauna Assessment – Precinct 1, Fitzgibbon Urban Development Area*. Unpublished report prepared for Urban Land Development Authority.

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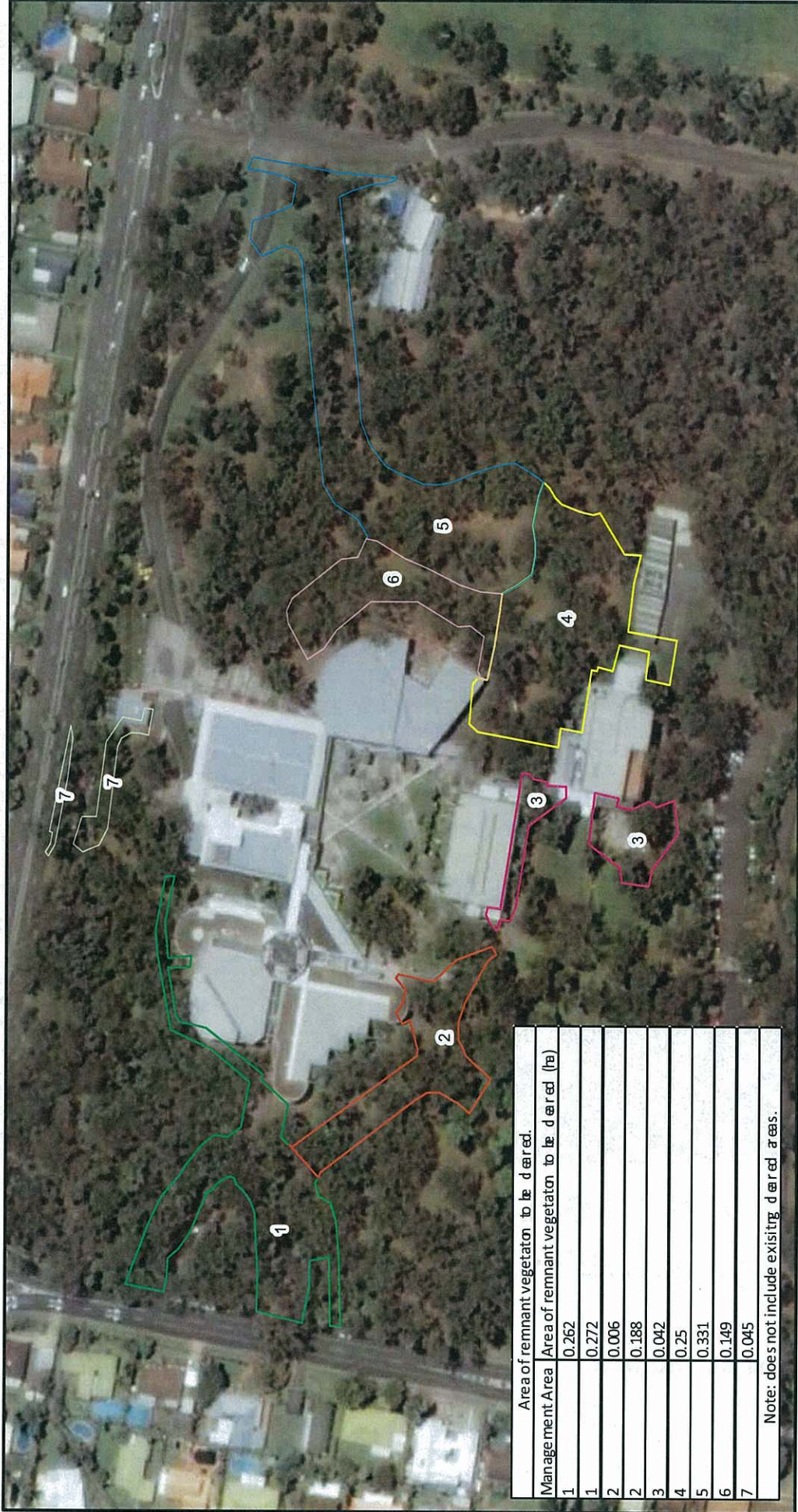
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locations;

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Area of remnant vegetation to be cleared	
Management Area	Area of remnant vegetation to be cleared (ha)
1	0.262
1	0.272
2	0.006
2	0.188
3	0.042
4	0.25
5	0.331
6	0.149
7	0.045

Note: does not include existing cleared areas.

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 Basemap (c) 2010 Microsoft Corporation and its data suppliers

Legend

Management Area



0 20 40 60 80
Meters

Datum: GDA94
 Projection: MGA94 Zone 56

Figure 1
 Management Areas

Flora and Fauna Management Plan
 Carseldine Government Office Project



153°1'30"E

Beams Road

Balcara Ave

TOTAL AREA AVAILABLE FOR REHABILITATION

LOCATION	AVAILABLE REHABILITATION AREA
A. REMNANT 12.5.3	0.64
B. NON-REMNANT RE 12.3.11	0.495
C. REMNANT RE 12.3.11	1.47
D. RIPARIAN RE 12.3.6	0.482
E. REMNANT VEGETATION	0.08

27°21'S

Dorville Road

27°21'S

A

C

D

E

B

153°1'30"E

Coordinate System: GDA 1994 MGA Zone 56
Projection: Transverse Mercator



1:3,337 at A4
0 15 30 60 90 120 Meters

Notes:

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LEGEND

Rehabilitation areas and buffers



Figure: 2

Title: Rehabilitation Areas

Project: Flora and Fauna Management Plan
Carseldine Government Office Project

Client: QLD Government

 **BAAM**
ECOLOGICAL CONSULTANTS

Drawn By: MG

Reviewed by: JC

Date: 25/03/2013

Document Location: \\BAAM-SERVER\Biodiversity\BAM\SpM\Management\BAM\Jobs\1303-1302-Carseldine Govt Project\BAM\Map\Figure 2 - Rehabilitation Areas.mxd Date: 25/03/2013 1:02:36 PM

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