Bushfire Protection Assessment

Proposed Subdivision: Jordan Springs Village 5

Prepared for
Lend Lease

19 June 2014

DOCUMENT TRACKING

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1 Property and proposal

Name:	Lend Lease		
Street or property Name:	Jordan Springs, Village 5		
Suburb, town or locality:	Jordan Springs	**Postcode:**	2747
Local Government Area:	Penrith City Council		
Type of development:	Residential subdivision		

1.1 Introduction

Lend Lease commissioned Eco Logical Australia Pty Ltd (ELA) to prepare a bushfire protection assessment (BPA) for a proposed residential subdivision at Jordan Springs known as Village 5 (hereafter referred to as the subject land).

This assessment has been prepared by the ELA Senior Bushfire Consultant Daniel Copland (FPAA BPAD-Level 3 Certified Practitioner No. BPD-L3-28853). Daniel is recognised by the NSW Rural Fire Service as a qualified bushfire consultant in bushfire risk assessment.

The bushfire protection requirements for residential subdivision throughout Jordan Springs (formerly known as the Western Precinct) have been previously determined and approved at the Precinct Plan stage as described within the report '*Bushfire Protection Assessment – St Marys Western and Central Precincts*' prepared by BES (2009). This assessment follows and builds upon the findings of the initial bushfire report.

1.2 Location and description of subject land

The subject land is located within the central northern section of the Jordan Springs residential community as shown in Figure 1. The site is bounded by the Wianamatta Regional Park to the north and east and by managed lands within the remainder of the Jordan Springs site currently under development. There is a proposed man-made lake and associated open space areas to be constructed to the south of the development area.

The subject site itself is essentially cleared featuring scattered stands of native tree cover with a regularly slashed understory.

1.3 Description of proposal

The proposal is for residential subdivision consisting of 265 residential lots and associated public roads, open space and infrastructure. The proposed development will be implemented within three separate stages, being Stages 5a, 5b and 5c. A subdivision layout plan is shown in Figure 2.

Location

Figure 1: Location of Village 5

Figure 2: Village 5 subdivision layout plan

2 Bushfire threat assessment

2.1 Assessment requirements

The subject land is identified as containing Bush Fire Prone Land by Penrith City Council. The following assessment is therefore prepared in accordance with Section 100B of the *Rural Fires Act 1997*, Clause 44 of the *Rural Fires Regulation 2008*, and '*Planning for Bush Fire Protection 2006*' (RFS 2006) herein referred to as PBP.

The assessment also adopts the recommendations approved within the Precinct Plan relating to bushfire protection described within the report '*Bushfire Protection Assessment – St Marys Western and Central Precincts'* prepared by BES (2009). This assessment follows and builds upon the findings of the initial bushfire report.

2.2 Vegetation types and slopes

The vegetation and slope have been assessed outwards from the boundaries of the proposed subdivision stages in the direction of any bushfire hazards found. In accordance with PBP the predominant vegetation class has been calculated for a distance of at least 140 metres out from the boundary of the subject land and the slope class most significantly affecting fire behaviour was determined for a distance of at least 100 metres. The predominant vegetation and effective slope assessments are shown in Figure 3 and summarised in Table 1 within the following Section 3 – Asset Protection Zones.

There are two primary areas of bushfire hazard found within 140 metres of the subdivision perimeter. The predominant hazard consists of the bushland conserved within the Regional Park adjacent the northern and eastern boundary of the subdivision. The bushland consists predominantly of Shale Plains Woodland. The bushland is on a downslope in the PBP class of 0-5 degrees.

A lesser hazard is present adjacent to the south western corner of the subject site, where the proposed riparian corridor areas flow to the proposed man-made lake (open water), currently under construction, and managed open space areas within the southern portion of Village 5. The riparian corridor vegetation has been assessed as potentially maturing into Woodland vegetation structure with an effective slope of downslope 0-5 degrees.

The adjoining areas of the Jordan Springs development are found to the west beyond the perimeter roads. These areas consist of regularly slashed areas of grassland featuring isolated stands of trees. These areas will be developed and the maintenance is to continue in the interim in order to avoid unnecessary Asset Protection Zones or building construction standards.

The vegetation classifications provided above are consistent with the bushfire assessment (BES 2009) approved as part of the Precinct Plan. Appendix 1 contains the vegetation mapping from the original assessment.

3 Asset Protection Zones (APZ)

The assessment methodology within PBP, in combination with Method 1 of AS3959-2009, has been used to determine the width of Asset Protection Zones (APZ) for the proposed subdivision. Both methodologies have been examined, with the final setback distances based on AS3959 distances to ensure that a BAL-29 outcome is achievable within the proposed lots. The lesser PBP setbacks would result in a potential BAL-40 outcome which is not considered adequate by Penrith City Council.

Table 1 below shows the APZ calculation and the location of APZs shown in Figure 3.

All proposed APZs comply with the AS3959-2009 Method 1 setbacks for BAL-29 in FDI 100, which are also in excess of the PBP Acceptable Solutions for residential subdivision.

Table 1: Asset Protection Zone assessment

Location (Refer to Figure 3)	Slope	Vegetation	PBP APZ	AS3959 and Proposed APZ	Comment
Northern and eastern boundary	Downslope >0-5º	Woodland	15 m (BAL-40 outcome)	21 m (BAL-29 outcome)	APZ will consist of public perimeter road reserve and the building setback within lots
South western corner boundary	Downslope >0-5º	Woodland (Riparian Corridor)	15 m (BAL-40 outcome)	21 m (BAL-29 outcome)	APZ will consist of public perimeter road reserve and the building setback within lots
South	Varies	Managed Open Space (future lake area)	The Precinct in this direction is to be managed open space or open water to a distance of at least 100 m so that an APZ or construction standards are not required for new dwellings within Village 5.		
West	Varies	Managed Precinct land (future subdivision)	The Precinct in this direction is to be managed to a distance of at least 100 m so that an APZ or construction standards are not required for new dwellings within Village 5. A temporary APZ is not required for those adjacent areas that have been cleared for development.		

The proposed APZs will require vegetation maintenance to achieve the performance objectives of an Inner Protection Area (IPA) as described by PBP. The following fuel management guide should be used to satisfy the performance requirements:

- No tree or tree canopy is to occur within 2 metres of future dwelling rooflines
- The presence of a few trees in the APZ is acceptable provided that they are well spread out and do not form a continuous canopy whereby single trees, or clumps of trees forming one canopy are separated by 2 to 5 metres depending on the canopy size
- Shrubs are to be limited to select and well managed garden beds that are located far enough away from future buildings so that they will not ignite the buildings by direct flame contact or radiant heat emission

- A minimal ground fuel is to be maintained to include less than 4 tonnes per hectare of fine fuel (*fine fuel* means ANY dead or living vegetation of <6 mm in diameter *e.g.* twigs less than a pencil in thickness. 4 t/ha is equivalent to a 1 cm thick layer of leaf litter).

Figure 3: Village 5 bushfire hazard analysis and Asset Protection Zones

4 Bushfire Attack Levels

4.1 BAL Assessment

Penrith City Council has requested that the Bushfire Attack Levels (BALs) under *AS 3959-2009 Construction of buildings in bushfire-prone areas* (Standards Australia 2009) be issued at time of subdivision application so that lots can have their respective BALs placed on title.

A BAL map has been prepared for Village 5 and is provided as Figure 4 on the following page. The BALs are based on the vegetation and slope assessment methodology within PBP and Table 2.4.2 of AS 3959-2009 (Method 1). All proposed APZs comply with the AS3959-2009 Method 1 setbacks for BAL-29 in FDI 100, which are also in excess of the PBP Acceptable Solutions for residential subdivision.

To prevent the need for unnecessary BALs, a temporary 100 metre APZ is required for those subdivision boundary interfaces that don't adjoin the Regional Park. Once the adjoining land is cleared for development, maintenance of a temporary APZ would no longer be required.

4.2 Streamlined residential development within bush fire prone Urban Release Areas

Under planning reforms introduced through changes to Clause 273 of the *Environmental Planning and Assessment Regulations 2000*, exemptions are available with regards to the consideration of bushfire requirements at the Development Application or Complying Development stage for future proposed individual dwellings.

The above exemptions apply within bush fire prone portions of the precinct that have received previous subdivision approval via the issue of a Bush Fire Safety Authority (BFSA) from the NSW Rural Fire Service (RFS). At the subdivision approval stage, an endorsement of the subdivision-wide Bushfire Attack Level (BAL) ratings is provided by the RFS. Once compliance with all conditions of the BFSA approval is achieved, all future dwellings are eligible for exemption from the further assessment of bushfire requirements by obtaining a Post-Subdivision BAL Certificate (PSBC).

A PSBC can be obtained via an application to the RFS or through a qualified bushfire consultant, such as Eco Logical Australia (FPAA Accredited).

A map formally identifying the Urban Release Areas is currently being finalised by the RFS.

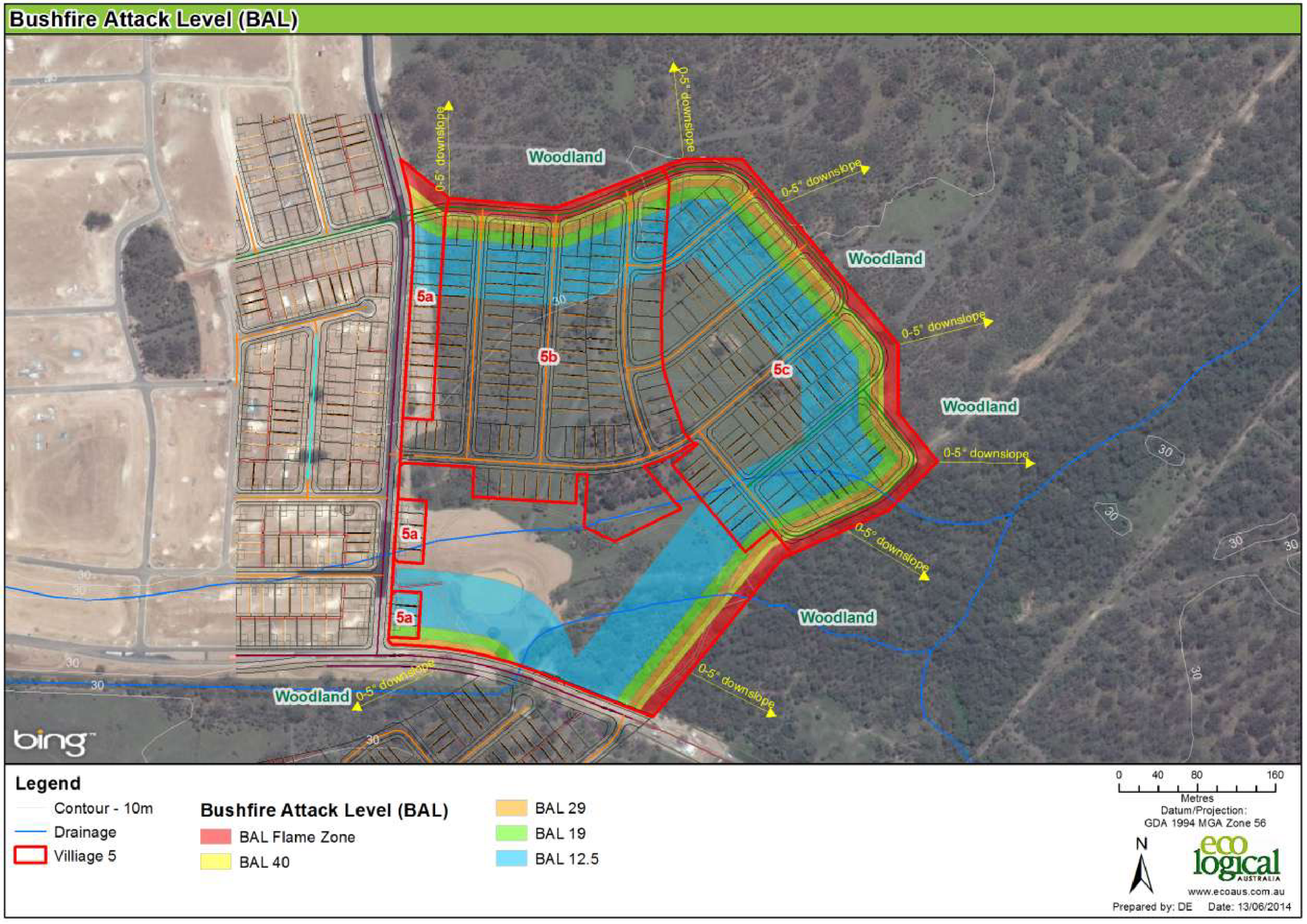

Figure 4: Village 5 Bushfire Attack Levels (BALs)

5 Access and egress

The subdivision will be accessed ultimately from five access points all leading from the surrounding Jordan Springs residential community. The proposed public road layout within the subdivision and its linkages to existing and future surrounding roads complies with PBP (refer to Figure 2).

Table 2 on the following page lists the PBP acceptable solutions and performance criteria for public roads in bushfire prone areas. The design and construction of the roads are to comply with the provisions listed within Table 2. The proposed layout shown in Figure 2 can achieve these. A public perimeter road is proposed along the interface with the bushfire hazard.

6 Utilities

6.1 Water supply

The subject land is to be serviced by reticulated water. The reticulated water supply is to comply with the following acceptable solutions within Section 4.1.3 of PBP:

- Reticulated water supply to urban subdivisions uses a ring main system for areas with perimeter roads;
- Fire hydrant spacing, sizing and pressures comply with AS 2419.1 – 2005. Where this cannot be met, the RFS will require a test report of the water pressures anticipated by the relevant water supply authority. In such cases, the location, number and sizing of hydrants shall be determined using fire engineering principles;
- Hydrants are not located within any road carriageway;
- All above ground water and gas service pipes external to the building are metal, including and up to any taps; and
- The [PBP] provisions of parking on public roads are met.

6.2 Gas and electrical supplies

In accordance with PBP, electricity should be underground wherever practicable. Where overhead electrical transmission lines are installed:

- Lines are to be installed with short pole spacing, unless crossing gullies, and
- No part of a tree should be closer to a powerline than the distance specified in "*Vegetation Safety Clearances*" issued by Ausgrid (NS179, December 2010).

Any gas services are to be installed and maintained in accordance with *AS/NZS 1596:2008 The storage and handling of LP Gas* (Standards Australia 2008).

Table 2: Performance criteria for proposed public roads*[1]

Performance Criteria	Acceptable Solutions
The intent may be achieved where:	
▪ firefighters are provided with safe all weather access to structures (thus allowing more efficient use of firefighting resources)	▪ public roads are two-wheel drive, all weather roads
▪ public road widths and design that allows safe access for firefighters while residents are evacuating an area	▪ urban perimeter roads are two-way, that is, at least two traffic lane widths (carriageway 8 metres minimum kerb to kerb), allowing traffic to pass in opposite directions. Non perimeter roads comply with Table 4.1 – Road widths for Category 1 Tanker (Medium Rigid Vehicle) ▪ the perimeter road is linked to the internal road system at an interval of no greater than 500 metres in urban areas ▪ traffic management devices are constructed to facilitate access by emergency services vehicles ▪ public roads have a cross fall not exceeding 3 degrees ▪ public roads are through roads. Dead end roads are not recommended, but if unavoidable, dead ends are not more than 200 metres in length, incorporate a minimum 12 metres outer radius turning circle, and are clearly sign posted as a dead end and direct traffic away from the hazard ▪ curves of roads (other than perimeter roads) are a minimum inner radius of six metres and minimal in number to allow for rapid access and egress ▪ the minimum distance between inner and outer curves is six metres ▪ maximum grades for sealed roads do not exceed 15 degrees and an average grade of not more than 10 degrees or other gradient specified by road design standards, whichever is the lesser gradient ▪ there is a minimum vertical clearance to a height of four metres above the road at all times
▪ the capacity of road surfaces and bridges is sufficient to carry fully loaded firefighting vehicles	▪ the capacity of road surfaces and bridges is sufficient to carry fully loaded firefighting vehicles (approximately 15 tonnes for areas with reticulated water, 28 tonnes or 9 tonnes per axle for all other areas). Bridges clearly indicated load rating
▪ roads that are clearly sign posted (with easy distinguishable names) and buildings / properties that are clearly numbered	▪ public roads greater than 6.5 metres wide to locate hydrants outside of parking reserves to ensure accessibility to reticulated water for fire suppression ▪ public roads between 6.5 metres and 8 metres wide are No Parking on one side with the services (hydrants) located on this side to ensure accessibility to reticulated water for fire suppression
▪ there is clear access to reticulated water supply	▪ public roads up to 6.5 metres wide provide parking within parking bays and located services outside of the parking bays to ensure accessibility to reticulated water for fire suppression ▪ one way only public access roads are no less than 3.5 metres wide and provide parking within parking bays and located services outside of the parking bays to ensure accessibility to reticulated water for fire suppression
▪ parking does not obstruct the minimum paved width	▪ parking bays are a minimum of 2.6 metres wide from kerb to kerb edge to road pavement. No services or hydrants are located within the parking bays ▪ public roads directly interfacing the bush fire hazard vegetation provide roll top kerbing to the hazard side of the road

*[1] PBP page 21

7 Recommendations and conclusion

7.1 Recommendations

The following recommendations have been made within this report to ensure the proposed subdivision is compliant with Section 100B of the *Rural Fires Act 1997*, Clause 44 of the *Rural Fires Regulation 2008*, and '*Planning for Bush Fire Protection 2006'* (RFS 2006):

Recommendation 1 - Asset Protection Zones are to be provided as listed in Table 1;

Recommendation 2 - Asset Protection Zone maintenance is to comply with the NSW Rural Fire Service document '*Planning for Bush Fire Protection 2006'* Inner Protection Area (IPA) performance requirements as listed in Appendix 2 Section A2.2 of PBP and guided by the fuel management principles listed in Section 3 of this report;

Recommendation 3 – The provided BAL map (refer to Figure 4) should be submitted to the NSW RFS for endorsement to enable the identified BAL ratings to be utilised for the future development of residential dwellings within the subdivision, as part of the Post-Subdivision BAL Certificate process;

Recommendation 4 - The design and construction of public roads is to comply with the acceptable solutions listed in Table 2 of this report;

Recommendation 5 - A hydrant water supply is to be installed in accordance with Australian Standard AS 2419.1 and Section 6.1 of this report;

Recommendation 6 - Electrical services should be underground and if overhead lines are used, overhanging branches should be trimmed according to "*Vegetation Safety Clearances*" issued by Ausgrid (NS179, December 2010);

Recommendation 7 - Gas services are to be installed and maintained in accordance with AS/NZS 1596:2008 (Standards Australia 2008).

7.2 Conclusion

In the author's professional opinion the bushfire protection requirements listed in this assessment provide an adequate standard of bushfire protection for the proposed development. As such, the proposed subdivision is consistent with the aim and objectives of '*Planning for Bush Fire Protection'* (RFS 2006) and appropriate for the issue of a Bush Fire Safety Authority.

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References

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NSW Rural Fire Service (RFS). 2006. *Planning for Bush Fire Protection: A Guide for Councils, Planners, Fire Authorities, Developers and Home Owners*. Australian Government Publishing Service, Canberra.

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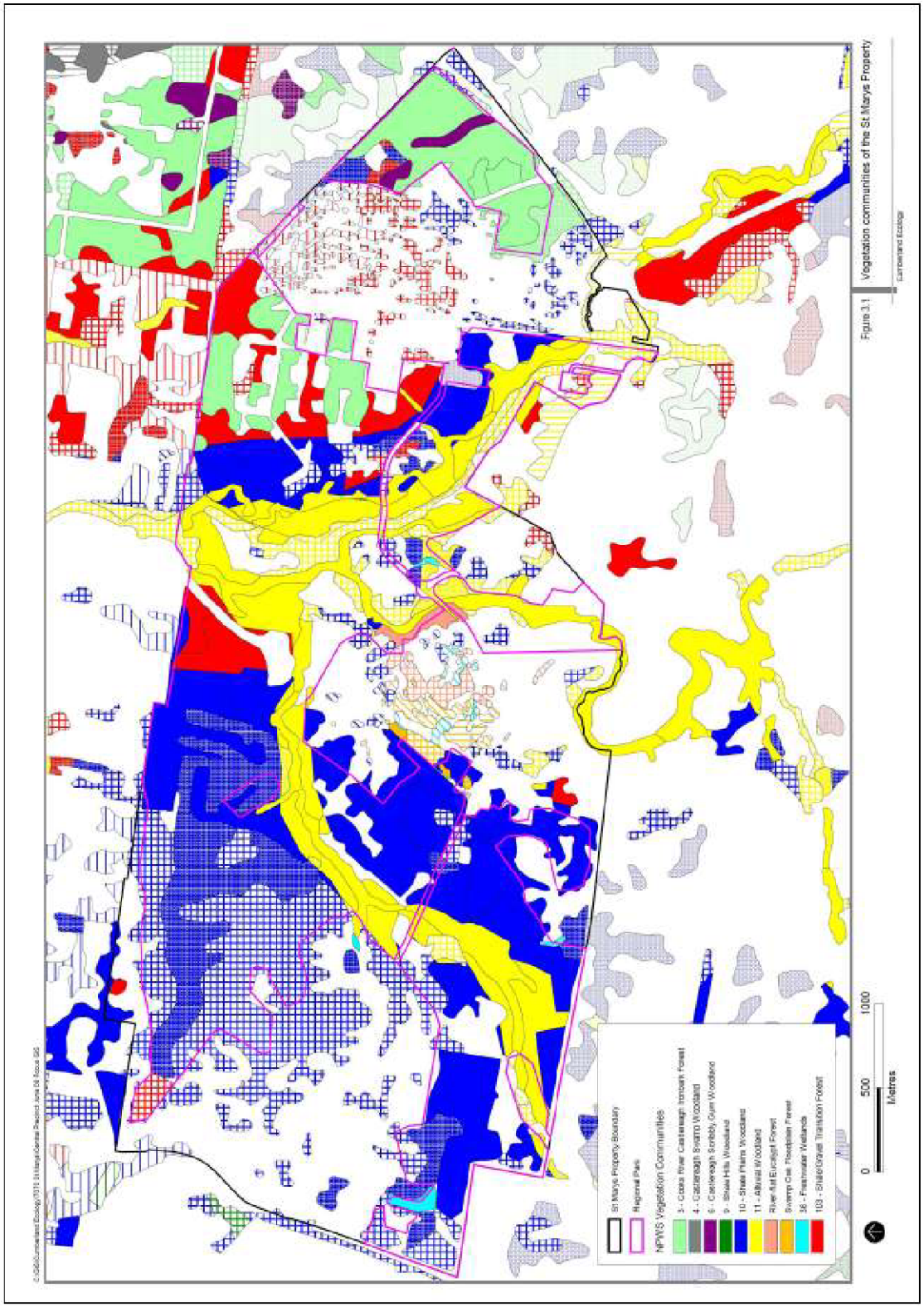
Appendix 1 - Vegetation Mapping



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