MIDCOAST
TOWN PLANNING

Our Ref: P00423_L2_SEE_V1.docx
19 March 2024

The General Manager
MidCoast Council
PO Box 482
Taree NSW 2430

Dear Sir,

SUBJECT: STATEMENT OF ENVIRONMENTAL EFFECTS
PROJECT: 6 LOT SUBDIVISION
595 THE BRANCH LANE, THE BRANCH, LOT 3 DP 800185

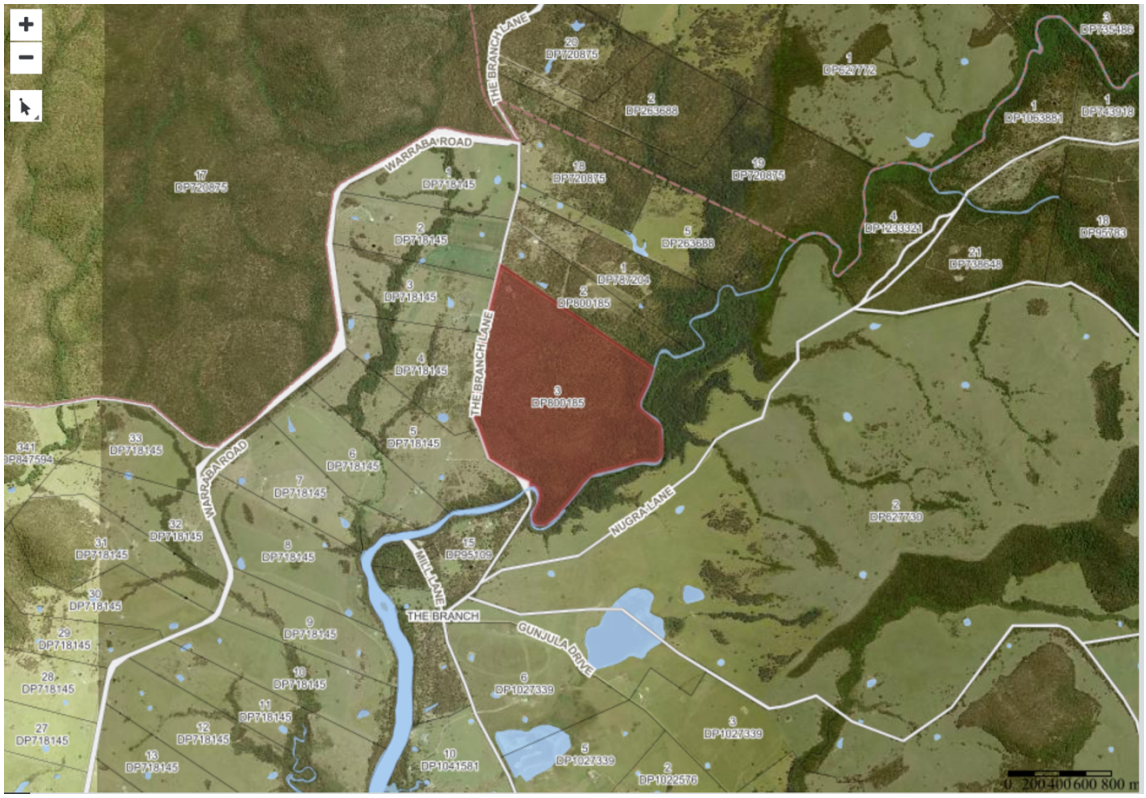
1. Introduction

This Statement of Environmental Effects applies to a proposed shed and six (6) lot subdivision at 595 The Branch Lane, The Branch, being Lot 3 DP 800185.

The land on which the proposed subdivision is to be undertaken is shown in **Figure 1**.

Figure 1 - Site Location

N ^ - Source: Midcoast Council Online Mapping



This SEE provides and assessment of the impacts of the proposed development.

The decision making process for the proposed development falls under Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act). The Council, in deciding whether consent should be granted, must examine and take into account relevant matters for consideration. This report is intended to assist in this decision making process and to provide information that satisfies the requirements of Section 4.15 of the EP&A Act, specifically:

(b) the likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality,

(c) the suitability of the site for the development,

The proposed development is integrated development and requires a Bushfire Safety Authority from the NSW Rural Fire Service. The subject site is not within the coastal zone.

2. The Proposed Development

The proposed development six lot subdivision as depicted in the plans attached to the Development Application. The subdivision proposes:

- Lot 1 with an area of 117.5 hectares being retained as a conservation lot;
- Lot 2 with an area of 5.6 hectares containing the existing dwelling on the land; and
- Lots 3 – 6 each with an area of 1.1 hectares containing a 525m^2 building envelope. Lots 2-6 will be serviced by individual effluent disposal systems. Site specific water quality controls and clearing of those lots for will be undertaken at the time of construction of dwellings on those lots (subject to a separate DA).

The subdivision is proposed to be created under the provisions of Clause 4.1B of Great Lakes Local Environmental Plan 2014 (see below).

Consideration of the following was undertaken to determine a potential subdivision layout for the site as presented in the attached plan:

- Minimisation of clearing;
- Locating lots with direct road access;
- Asset Protection requirements;
- Provision of land for future on site effluent disposal;
- Provision of nominated building envelope
- Protection of drainage lines; and
- Retention of the majority of the land in a single lot.

3. Site Significance

In 2017 Key Botany and Eastcoast Flora Survey undertook an assessment of the significance of the subject land for Midcoast Council. A copy of this report is attached.

This report identified the ecological significance of the site as follows:

In general terms, the study area is in very good condition, with minimal influence from disturbance or degradation processes. There is evidence of a history of logging but there has been no recent activity on the land. Past logging has impacted the age structure and complexity of the forests, although some old-growth/ over-mature and hollow-bearing trees are present. There are only two very small areas of significant disturbance, one is associated with the dwelling-house and the other is a small area of historic clearing in the south-east near The Branch River. This latter disturbance is slowly naturally- regenerating, but remains dominated by exotic pasture grass species. Weed occurrence is generally very low across the study area, but Lantana camara is scattered at low density through many parts of the land, and Tradescantia fluminensis dominates part of the groundcover of MU3 Sydney Blue Gum alluvial forest complex. Targeted controls of these two (2) priority invasive exotic flora species would be beneficial to improve the integrity of the site. There is minor evidence of active bank erosion and/ or bed-lowering of minor watercourses on the study area, but the soil types of this part of The Branch are known to be susceptible to erosion as they are highly dispersible when disturbed.

No opportunistic sightings of threatened fauna species were recorded during field surveys; however it must be noted that the vegetation and habitat present is likely to support both resident and transient populations of several species. Threatened fauna species with moderate to high likelihood of occurrence in the study area include species such as Spotted-tailed Quoll, Brush-tailed Phascogale, Squirrel Glider, Grey-headed Flying-fox, Eastern Freetail-bat, Golden-tipped bat, Eastern Bentwing-bat, Little Bentwing-bat, Eastern False Pipistrelle, Greater Broadnosed-bat, Stephen's Banded Snake, Square-tailed Kite, Glossy Black-Cockatoo, Little Lorikeet, Powerful Owl, Masked Owl and Varied Sittella.

However, targeted fauna surveys would be required to confirm the presence of these species in the study area.

On the whole, the vegetation and habitats of the study area are of high integrity and resilience. There is little impairment of the range of functional ecological processes and the native vegetation provides for a range of significant and valuable ecosystem services, including but not limited to: water cycling, soil retention, nutrient cycling, pollination and seed dispersal, oxygen production, air quality maintenance, climate regulation, water quality maintenance and water regulation, flood control, erosion control, nutrient removal and landscape amenity. The study area may provide for or contain natural cultural heritage values and is therefore intrinsically valuable.

The report also indicates:

Alternatively, it is possible that the study area may hold limited opportunities for ecological conservation style development under Clause 4.1B of Great Lakes Local Environmental Plan 2012. Several small lifestyle lots may potentially be created in the north-west corner and offset by the permanent conservation of the balance of the land. The Clause 4.1B policy of Council would permit approximately four (4) 2 - 5-hectare lots in the north-west with permanent conservation of 100 -

114- hectares of the land, subject to Council approval. A Voluntary Planning Agreement would be required to deliver this outcome via a Part 4 merits assessment under the Environmental Planning and Assessment Act 1979.

The proposed subdivision layout includes four (4) additional small lots fronting The Branch Lane. The lots have been separated to ensure the integrity of drainage lines traversing from The Branch Lane though the site to The Branch River.

4. Site Context

595 The Branch Lane abuts the western banks of The Branch River, which feeds into the Karuah River in the Mid Coast Council local government area (MCC LGA). The land comprises a range of dry sclerophyll forests on hilltops, slopes and flats to a complex of wet sclerophyll alluvial forests associated with The Branch River.

The site is located approximately 14.5 km north-east of the township of Karuah. The surrounding landscape includes a significant number (>30) rural properties of approximately 40 hectares along The Branch Lane to the north and Warraba Road to the west. The site has sealed road frontage.

The additional lots created by the proposed subdivision will not create the need for additional services and is not out on context in the immediate locality.

5. Great Lakes Local Environmental Plan 2014

The subject site is zoned RU2 Rural Landscape under the provisions of Great Lakes Local Environmental Plan 2014. The objectives of the RU2 zone are:

- *To encourage sustainable primary industry production by maintaining and enhancing the natural resource base.*
- *To maintain the rural landscape character of the land.*
- *To provide for a range of compatible land uses, including extensive agriculture.*
- *To provide for rural tourism in association with the primary industry capability of the land which is based on the rural attributes of the land.*
- *To secure a future for agriculture in the area by minimising the fragmentation of rural land and loss of potential agricultural productivity.*

The proposed subdivision maintains the rural landscape character of the lane through significant conservation of vegetated land of high ecological values. Minimisation of rural land fragmentation is also achieved. The proposed subdivision is consistent with the zone objectives.

The subdivision proposes the use of Clause 4.1B of the Great Lakes Local Environmental Plan 2014 (exceptions to minimum lot sizes for ecological protection clause). This clause states:

> *4.1B Exceptions to minimum lot sizes for ecological protection*
>
> *(1) The objective of this clause is to facilitate subdivision that will result in the improvement and protection of high value conservation land for ecological and ecosystem service purposes.*
>
> *(2) This clause applies to each lot (an original lot) that contains any of the following land—*
>
> *(a) an environmentally sensitive area,*
>
> *(b) land identified as "Wetland" on the Wetlands Map,*
>
> *(c) land the subject of a planning agreement that makes provision for the conservation or enhancement of the natural environment.*
>
> *(3) Despite clause 4.1, development consent may be granted for the subdivision of an original lot to create other lots (the resulting lots) if the consent authority is satisfied that—*
>
> *(a) one of the resulting lots will contain all of the land referred to in subclause (2) (a), (b) or (c) that was in the original lot, and*
>
> *(b) all other resulting lots will contain land that has an area that is not less than 1 hectare.*
>
> *(4) Development consent must not be granted under subclause (3) unless the consent authority is satisfied that suitable arrangements have been, or will be, made for the conservation and management of the land referred to in subclause (3) (a).*
>
> *(4A) Despite any other provision of this Plan, the erection of a dwelling house—*
>
> *(a) is prohibited on any resulting lot referred to in subclause (3) (a), and*
>
> *(b) is permitted with development consent on any resulting lot referred to in subclause (3) (b).*
>
> *(5) In this clause—*
>
> *environmentally sensitive area means land that is an environmentally sensitive area for exempt or complying development within the meaning of clause 3.3.*

It is proposed to submit a Planning Agreement for acceptance by Council should support of the proposed subdivision be forthcoming. A letter of request to enter into a Planning Agreement is included with the Development Application.

6. Ecological Assessment

Given the extent of clearing for the proposed the ecological impacts of the proposed subdivision are required to be assessed by the undertaking of a biodiversity development assessment report (BDAR).

A BDAR identifies the developer proposes to avoid, minimise and offset impacts from your proposed development upon native vegetation or biodiversity listed under the New South Wales Biodiversity Conservation Act 2016 and the Biodiversity Regulation 2017.

Preliminary work has been undertaken for the BDAR report to assess the impacts of the proposed subdivision. A copy of the preliminary credit assessment and credits retirement reports are attached.

The clearing for the subdivision would require:

- 155 Ecosystem Credits to be retired; and
- 161 Species Credits for 4 (four) species to be retired.

A credit summary for the retained Lot 1 indicates the following will be retained:

- 480 Ecosystem Credits:
- 480 Species Credits for 4 (four) species.

7. Proposed Offsets

Under the Biodiversity Conservation Act 2016, credits are required need to be purchased or provided in a Stewardship Agreement in order to offset the credits identified in the BDAR report.

The reminder of the property to be contained within one lot has significant ecological attributes and the landowner seeks to use this land as an offset to the impact of the clearing. He is not however interested in setting up a Stewardship Agreement over the reminder of the land. Such agreements require significant up-front costs and given that any credits would be used to offset clearing on land owned by him, it is submitted that there is no need for a Stewardship Agreement.

The credit report for the remainder of the land concludes that there is a 335 Ecosytem Credits and 319 Species Credits for 4 (four) species credit surplus to offset the requirements of the BDAR. The credit report for the remainder of the land will however include credits for additional flora species credits and additional vegetation types. This report will therefore demonstrate a significant positive ecological outcome for the proposed subdivision.

The Biodiversity Conservation Act 2016 includes the following clause:

7.13 Development other than State significant development or infrastructure

(1) This section applies to an application for development consent under Part 4 of the Environmental Planning and Assessment Act 1979 that is required under Division 2 to be accompanied by a biodiversity development assessment report, except—

(a) an application for development consent for State significant development, or

(b) an application for a complying development certificate.

(2) The consent authority, when determining in accordance with the Environmental Planning and Assessment Act 1979 any such application, is to take into consideration under that Act the likely impact of the proposed development on biodiversity values as assessed in the biodiversity development assessment report that relates to the application. The consent authority may (but is not required to) further consider under that Act the likely impact of the proposed development on biodiversity values.

(3) If the consent authority decides to grant consent and the biodiversity offsets scheme applies to the proposed development, the conditions of the consent must require the applicant to retire biodiversity credits to offset the residual impact on biodiversity values of the number and class specified in the report (subject to subsection (4)). The residual impact is the impact after the measures that are required to be carried out by the terms or conditions of the consent to avoid or minimise the impact on biodiversity values of the proposed development (being measures on which the report was based).

Note—

Division 6 of Part 6 enables a person who is required under this section to retire biodiversity credits to make a payment instead to the Biodiversity Conservation Fund of the value of the credits in accordance with the offsets payment calculator.

(4) The consent authority may reduce or increase the number of biodiversity credits that would otherwise be required to be retired if the consent authority determines that the reduction or increase is justified having regard to the environmental, social and economic impacts of the proposed development. The consent authority must give reasons for a decision to reduce or increase the number of biodiversity credits.

The mechanism for the securing of the conservation of the remainder of the land, and an equitable outcome for offsetting clearing of vegetation, is critical to the success of the subdivision. It is submitted that the subdivision will have overwhelming social, environmental and economic benefits. Council's support for varying the credit retirement process as per clause 7.13 (4) under a Clause 4.1B application for development / conservation outcomes is therefore sought.

8. Clause 4.1B Interim Policy

Midcoast Council has inherited a former Great Lakes Interim Policy of Clause 4.1B. An assessment of the proposed subdivision against the provisions of this interim policy is provided below.

Policy	Compliance
1. *One bonus lot will be considered for every 30-hectares of land that will be protected under clause 4.1B*	It is proposed to conserve 117.5 hectares of land which would lead to potential for three bonus lots. The land has an area that would be able to be subdivides into three lots greater than 40 hectares. The proposal therefore seeks two bonus lots. existing one theoretical entitlement. The proposal does meet this requirement.
2. *A maximum of two bonus lots will be considered for any development application submitted under clause 4.1B*	The proposal seeks four (4) additional bonus lots, which exceeds the maximum of two (2) bonus lots. The proposal does meet this requirement.
3. *The area to which clause 4.1B applies be limited to a distance of 15km by a continuous Council maintained roads from the service towns of Forster and Tuncurry, Nabiac, Bulahdelah, Tea Gardens, Hawks Nest, Pacific Palms and Stroud*	The site of the proposed subdivision is 16.2-kilometres from Karuah on sealed road (The Branch Lane) and sealed road (Tarean Road), both of which are Council-maintained roads. The proposal does not meet this requirement. Given the significance of the ecological conservation a variation is sought.
4. *That the access to the nearest service town, as set out in 3 above, is to be of a satisfactory standard to support the additional traffic that will be generated*	The Branch Lane and Tarean Road are a satisfactory standard that will support the additional traffic. The proposal does meet this requirement.
5. That Council will generally not accept responsibility for the management of conservation land	The proposed mechanism for the conservation lot is that the conservation lot be subject to a s88B instrument and a Conservation Agreement (with the Biodiversity Conservation Trust). This Agreement entitles the registered proprietor to $15,000 per annum for three years for natural resource management work and is rates exempt. The proposal does meet this requirement.
Variations [to the above] *will only be considered where exceptional environmental outcomes are demonstrated, and provided there will be no unreasonable additional loading upon services and infrastructure*	See above for minor variation sought.

9. Development Controls

The relevant provisions of Great Lakes Development Control Plan 2014 are addressed below:

4 Environmental Considerations

An environmental assessment of the proposed development is provided below. This assessment addresses the identified considerations, where relevant.

9.5 Rural Subdivision Controls

(1) An allotment size in excess of this minimum area standard as shown in the LEP 2014 lots size map may be required where land is identified as having agricultural or environmental value that would be compromised if the land is fragmented by subdivision.

Not Applicable.

(2) Allotment dimensions should allow for the inclusion of buffer distances for onsite sewage management systems as prescribed by the NSW Department of Local Government's Environment & Health Guidelines titled "Onsite Sewage Management for Single Households".

Effluent Management report included with the Development Application.

(3) Land application areas for onsite disposal systems are not to be located on or adjacent to areas where mature trees have been removed. Residual tree roots have the potential to cause the disposal area to fail due to funnelling of effluent. Details may be required with the subdivision application.

Effluent Management report included with the Development Application.

(4) Where sites contain areas of significant vegetation, the subdivision boundaries shall be designed so as to minimise the clearing of land.

Land clearing is minimised to what is required for building envelopes only, inclusive of APZ's and is appropriately offset.

(5) Boundaries over hills, ridgelines and elevated areas shall be designed so as to minimise visual impact as a result of clearing.

Not applicable.

(6) All subdivision boundaries are to be designed so as to ensure the best practical location for fencelines and fire trails.

The best location for fences has been identified.

(7) A topographical map is to be submitted showing the proposed boundaries and all site improvements including buildings, dams etc.

Appropriate plan included with the Development Application.

(8) Proposed allotments will indicate a dwelling site that allows for reasonable sunlight access.

Appropriate dwelling sites are provided.

(9) The plan of subdivision shall indicate an appropriate dwelling site for each lot, taking into consideration the constraints and opportunities for the future development of the land.

Appropriate dwelling sites are provided.

10. Environmental Assessment

Acid Sulfate Soils

The subject land is not classified as ASS land under the provisions of GTCC DCP 2010. The proposal does not involve the disturbance of any soils.

Contamination

The subject land is identified as not potentially contaminated on Council's mapping.

Aboriginal Heritage

There are no known Aboriginal heritage items on the land. The Aboriginal Heritage checklist has been provided with the application.

Bushfire

The subject land is classified as bushfire prone buffer on Council's mapping and a Bushfire Assessment is included with the Development Application.

Traffic and Access

The proposed dwelling will have no adverse traffic impact.

Flooding

The subject land is classified as flood prone buffer on Council's mapping; however, the proposed lots are not subject to flood development controls.

11. Conclusion

Information presented in this Statement of Environmental Effects indicates that the proposed six (6) lot subdivision on Lot 3 DP 800185, 595 The Branch Lane, The Branch is generally consistent with the relevant Local and State planning instruments.

Minor variations to Council's Interim Clause 4.1B policy are sought.

Clause in the BC Act 2016 (clause 7.13), at subsection 4 states that "The consent authority may reduce or increase the number of biodiversity credits that would otherwise be required to be retired if the consent authority determines that the reduction or increase is justified having regard to the environmental, social and economic impacts of the proposed development. The consent authority must give reasons for a decision to reduce or increase the number of biodiversity credits." Council's support for varying the credit retirement process as per clause 7.13 (4) under a Clause 4.1B application for development / conservation outcomes is therefore sought.

The potential impact of the proposed development has been examined in detail and the environmental impacts have been found to be acceptable or able to be managed so that there are no detrimental impacts. The proposed development will not adversely impact upon the surrounding environment.

Yours faithfully
Midcoast Town Planning

A signed copy can be provided upon request.

TONY FISH
Town Planner

Vegetation of the Branch (Stage One)

FINAL

24 NOVEMBER 2017

Vegetation of the Branch (Stage One)

FINAL

Prepared by:
Key Botany and Eastcoast Flora Survey

On behalf of
MidCoast Council

Authors: Ryan Sims and Stephen Bell

Report No: Vegetation of the Branch (Stage One)_FINAL.docx
Date: Friday, 24 November 2017

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Acknowledgements

We would like to thank property owner Dr Phillip Baird for access to his property and information and advice provided during the project.

Mat Bell of MidCoast Council reviewed and provided comments to the first draft of this report.

1. Introduction

1.1 Background

Key Botany and *Eastcoast Flora Survey* were commissioned by MidCoast Council ('the Council') to undertake a systematic vegetation survey and prepare a vegetation map of Lot 3 DP 800185 595 The Branch Lane, The Branch, NSW (hereafter referred to as *the study area*).

The vegetation survey represents the first of several botanical and biometric investigations planned by the Council for this part of the local government area.

In the MidCoast Waterway & Catchment Report Card prepared by MidCoast Council in 2016, the Branch River and its catchment was considered in "poor" condition. Through this monitoring, The Branch catchment was shown to have impaired ecosystem function, and affects water quality in the Lower Karuah River. It is therefore a priority catchment for repair and restoration, and one of the key management actions is protection and enhancement of existing native vegetation.

This vegetation survey forms part of a wider collaboration between Council and private landholders in relation to the development of a model for investment in conserving high value vegetation on private land to contribute to catchment improvement goals. In this regard, the program will seek to engage with the NSW Biodiversity Reforms (see Section 1.3).

A description of the vegetation community types (and threatened flora species present) has the potential to underpin future Biodiversity Stewardship Site Assessment Report investigations, which would be required to develop a framework for investment in nature conservation.

1.2 Study Area

The study area (Figure 1.1) occupies approximately 122-hectares, and abuts the western banks of The Branch River, which feeds into the Karuah River in the Mid Coast Council local government area (MCC LGA). The land comprises a range of dry sclerophyll forests on hilltops, slopes and flats to a complex of wet sclerophyll alluvial forests associated with The Branch River.

1.3 NSW Biodiversity Conservation investment

According to the NSW Government, the *Biodiversity Conservation Act 2016* introduces a more streamlined and strategic approach to supporting conservation on private land, delivering a range of initiatives and incentives to encourage landholders who want to establish protected areas on their land to manage and improve biodiversity.

The NSW Biodiversity Conservation Trust (BCT) has been established by the *Biodiversity Conservation Act 2016*. The BCT will invest $240 million over the next five years to support landholders and other organisations that wish to participate in private land conservation. It will oversee the Private Land Conservation program across NSW and have a key role in the new Biodiversity Offsets Scheme. Additionally, the BCT will manage and deliver private land conservation across NSW with the aim of maintaining a healthy, productive and resilient environment for the community, now and into the future.

Investment from the BCT will provide opportunities for landholders to diversify their income sources through protecting and managing areas of high environmental value on their properties alongside other uses such as farming.

In summary, the object of the BCT is to protect and enhance biodiversity by:

- Encouraging landholders to enter into co-operative arrangements for the management and protection of the natural environment that is significant for the conservation of biodiversity;
- Seeking strategic biodiversity offset outcomes to compensate for the loss of biodiversity due to development and other activities;
- Providing mechanisms for achieving the conservation of biodiversity; and
- Promoting public knowledge, appreciation and understanding of biodiversity, and the importance of conserving biodiversity.

The BCT will work in partnership with farmers, land managers, landholders, developers, industries, local councils and the state government to provide advice and support in protecting land with high biodiversity values in ways which brings benefits to landholders for doing so. The investment in conserving native vegetation on private land seeks to provide opportunities for landholders to diversify their income sources through protecting and managing areas of high environmental value on their properties and will support sustainable farming enterprises.

The *Biodiversity Conservation Act 2016* establishes three main types of voluntary private land conservation agreements. Having different types of agreements for landholders is important as each landholder has different circumstances and goals for their land or farm. The agreements have been designed to deliver better support to landholders, in financial and non-financial ways, and in doing so create land use options and additional income streams for rural landholders. The types of agreements are:

- Biodiversity stewardship agreements (BSAs) that provide permanent protection and management of biodiversity and allow for the creation of biodiversity credits;
- Conservation agreements (CAs) which are permanent or time-bound agreements and may be eligible for stewardship payments; and
- Wildlife refuge agreements (WRAs) which are an entry level option for landholders who want to protect the biodiversity on their property but do not wish to enter into a permanent agreement.

Landholders, land managers and other organisations may be interested in entering into an agreement on their land or part of their land if they wish to explore how this may offer financial or other benefits, possibly provide payments to help protect their property's natural values, and/ or provide technical and other support to help protect the property's natural values.

The NSW government recognises that engaging private landowners in conservation is an important opportunity and plays a key role in keeping biodiversity across NSW healthy. Therefore, a key long-term aim of this project is to identify the ecological values of the study area to potentially support a business case for participation in the conservation of native vegetation and wildlife habitats.

Figure 1.1: Location of Stage One Study Area

2. Methods

2.1 Database Analysis

Information on threatened flora species and threatened ecological communities likely to occur in the study area was obtained through interrogation of the following databases:

- NSW Office of Environment and Heritage (OEH) Atlas of NSW Wildlife [accessed July 2017]; and
- Department of Environment Protected Matters Search Tool [accessed July2017].

The number and age of records of threatened species recorded within a 5-kilometre radius of the study area (locality) provided information on the expected distribution of threatened species within the locality. The information obtained from interrogations was used to assess the likelihood of occurrence of threatened species within the study area.

2.2 Preliminary Vegetation Mapping

Vegetation formations were mapped prior to field surveys using aerial photograph interpretation (API). High resolution aerial photography (ADS 50cm resolution) was used in MapInfo Pro Version 12.5 geographical information system (GIS). The aerial imagery enabled viewing and mapping at small scales (up to a scale of 1:300) without a loss of resolution. Vegetation formations were mapped based on patterns observed in the imagery attributed to vegetation cover (density), perceived height classes (low, mid and high), dominance of woody or non-woody plants and colour.

2.3 Field Surveys

2.3.1 Summary

Field surveys were undertaken on the 1st August 2017 and 14th September 2017 by Stephen Bell and Ryan Sims. The aims of field surveys were to:

- Ground-truth preliminary vegetation mapping and test assumptions made during this process;
- Collect summary data from rapid vegetation assessments and map the distribution of vegetation communities occurring in the study area;
- Obtain a comprehensive census of vascular plants occurring in the study area; and
- Collect quantitative plot-based data to guide vegetation classification.

Field surveys of the study area included the following sampling methods:

- Full-floristic quadrat sampling;
- Rapid vegetation assessments;
- Searches for threatened flora species; and
- Incidental observations.

2.3.2 Rapid Vegetation Assessment

Using the preliminary vegetation mapping (API layer), 92 rapid vegetation assessment data points (Rapid Data Points: RDP) were undertaken on foot. Data collected included dominant floristic species in each structural layer, later used to revise the vegetation map, and notes on representative locations for full floristic survey plots.

One of the advantages of this method is that this baseline data can be used to inform both the map polygons and the classification, without the need to re-visit a particular site. It also allows better selection of sites to sample with full floristic plots, thus obtaining a more robust classification of the vegetation. Full details of the method are included in Bell (2013), or an example is shown in Bell (2009) for Columbey National Park.

The locations of RDPs are shown in **Figure 2.1.**

2.3.3 Quadrat Sampling

A total of 9 quadrats were sampled in 400m^2 quadrats, either 20 x 20 metre quadrats or 10 x 40 metre quadrats in linear habitats, such as drainage lines. Quadrat sampling followed standard NPWS survey methodology (the Type Standard: Sivertsen 2010), which will remain consistent with the large existing regional dataset. Plot sites were preferentially (not randomly) selected primarily with regard to observable floristic patterns, with acknowledgement of the distribution of major environmental variables (geology, soil, aspect etc).

Quadrat locations are shown in **Figure 2.1**.

In each quadrat, the following information was recorded:

- All vascular flora species present within the quadrat;
- Percentage projective foliage cover of each plant species within the quadrat (less than 5% cover estimated to the nearest percent up to 5%, then in 5% increments);
- Estimated counts of abundance of each plant species within the quadrat;
- Vegetation structural data (i.e. height and percentage cover of each stratum);
- A waypoint to mark the location of the quadrat, obtained using a handheld geographical positioning system (GPS); and
- Photographs of the quadrat.

2.3.4 Targeted Searches

Targeted meandering transects of various lengths were walked throughout the study area to provide additional information about the floristic composition of communities, ground-truth preliminary vegetation mapping (see **Section 2.2**) and a search for threatened species. These meanders enabled refinement of community descriptions and overall understanding of the local ecology and ecosystem processes.

Targeted meanders enable sampling of much larger areas than quadratic sampling and provide opportunities to find and record significant or cryptic species including threatened species, endangered populations and threatened ecological communities (TECs).

Targeted meanders were carried out concurrently with field surveys in the study area.

2.4 Plant Identification and Nomenclature

All vascular plants recorded or collected during field surveys were identified using keys provided in Harden (1990-93) and Wheeler *et al.* (2002). Known changes in taxonomic nomenclature were incorporated according to *PlantNET* (The Royal Botanic Gardens and Domain Trust 2017).

2.5 Vegetation Community Mapping

A vegetation map was informed by the results of aerial photography interpretation, rapid assessment, full-floristic data collection and other ground-truthing exercises.

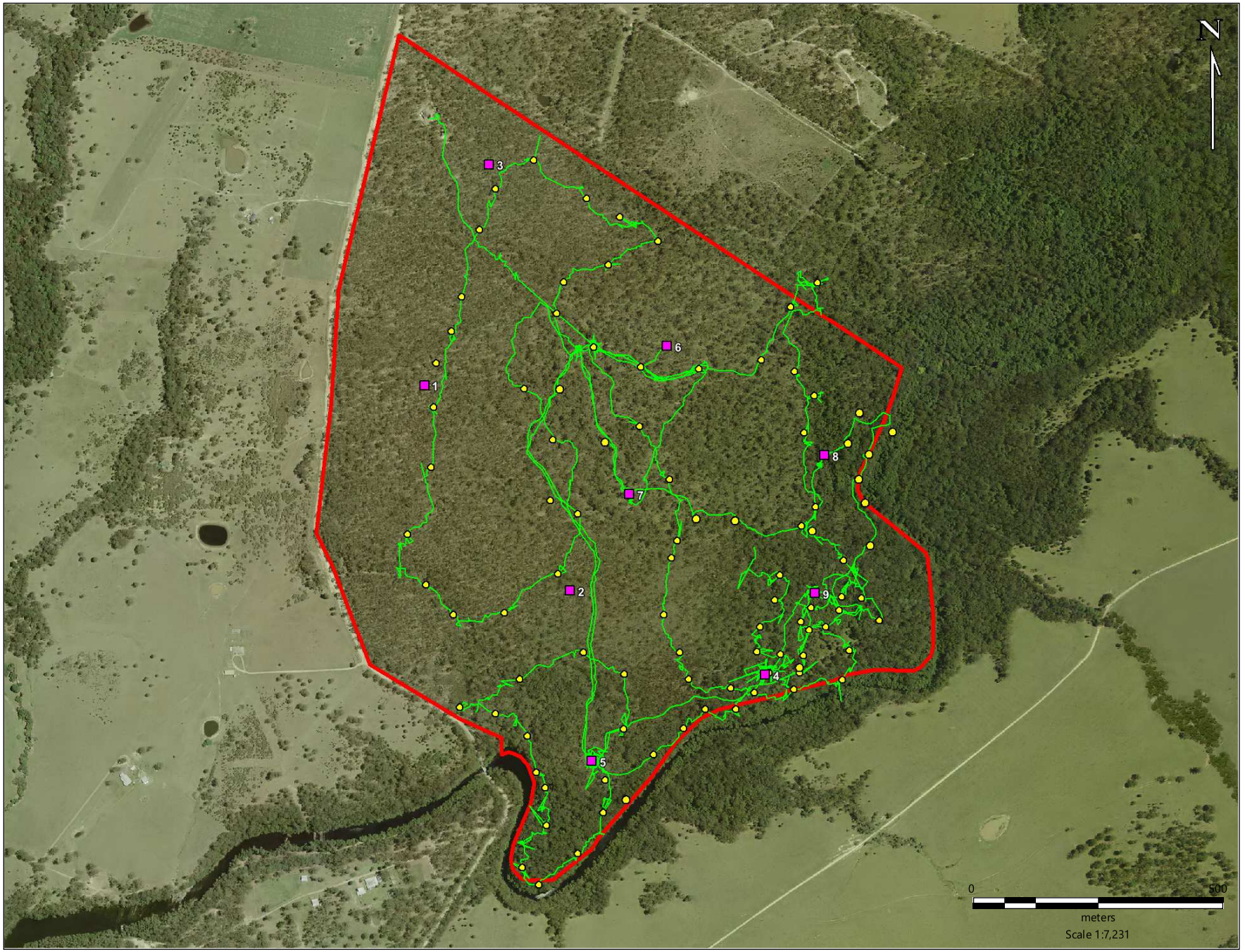

Figure 2.1: Survey Effort

3. Results

The results of database searches and field surveys for threatened flora species are discussed in more detail below.

3.1 Database Analysis

Four (4) threatened flora species are known in the locality and have potential to occur. This includes:

- *Tetratheca juncea* (Black-eyed Susan), listed Vulnerable under the *Biodiversity Conservation Act 2016* (BC Act) and *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act);
- *Angophora inopina* (Charmhaven Apple), listed Vulnerable under the *Biodiversity Conservation Act 2016* (BC Act) and *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act);
- *Grevillea guthrieana* (Guthrie's Grevillea), listed Endangered under the *Biodiversity Conservation Act 2016* (BC Act) and the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act); and
- *Asperula asthenes* (Trailing Woodruff), listed Vulnerable under the *Biodiversity Conservation Act 2016* (BC Act) and *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

3.2 Flora Species

3.2.1 Native Flora

In total, 211 flora species were recorded within the study area. The most abundant plant families include Myrtaceae, Poaceae, Fabaceae (Mimosoideae and Faboideae) and Orchidaceae.

Table 3.1 below shows the top 10 most speciose plant families in the study area.

Table 3.1 Most Abundant Speciose Families of the Study Area

Family	Number of Species
Myrtaceae	27
Poaceae	21
Fabaceae (Faboideae)	13
Orchidaceae	13
Fabaceae (Mimosoideae)	10
Cyperaceae	7
Asteraceae	6
Lomandraceae	6
Proteaceae	6
Lauraceae	5

Appendix A provides a full list of plant species recorded during field surveys. This list should not be considered exhaustive, and is expected to expand upon with increased survey effort.

3.2.2 Weed Species

A very low abundance of weed species was observed within the study area. *Lantana camara* was observed as isolated occurrences in lower parts of the landscape on alluvial flats. *Tradescantia fluminensis* was particularly abundant and a dominant ground cover in parts of the Sydney Blue Gum alluvial complex, near quadrat 9 (see Figure 2.1).

3.2.3 Threatened Flora

Two (2) threatened species were detected; one confirmed and one pending confirmation from the Royal Botanic Gardens, Sydney.

Tetratheca juncea, listed Vulnerable under the BC Act and EPBC Act, was detected at one location during surveys on the 14th September 2017. A small population comprising at least twelve (12) individuals was recorded on the top bank of a narrow drainage line in the centre of the study area.

Three (3) individuals of *Callistemon linearifolius* were detected during surveys on 1st August 2017 in Smooth-barked Apple - Red Bloodwood - Stringybark - Banksia woodland. *C. linearifolius* is listed Vulnerable under the BC Act, and has been previously recorded in parts of the nearby Karuah and Wallaroo Nature Reserves (Bell 2002; McCarthy 2002).

The location of *Tetratheca juncea* and *Callistemon linearifolius* are shown in Figure 3.1.

3.3 Vegetation Communities

Seven (7) vegetation communities were recorded and described within the study area. These include:

- MU1 Spotted Gum - Red Ironbark - Mahogany forest (part of the Lower Hunter Spotted Gum-Ironbark Forest TEC);
- MU2 Smooth-barked Apple - Red Bloodwood - Stringybark - Banksia woodland;
- MU3 Sydney Blue Gum alluvial complex (part of the River-flat Eucalypt Forest on Coastal Floodplains TEC);
- MU4 Melaleuca - Callicoma - Callistemon - Tall Saw-sedge on narrow drainage lines;
- MU5 Grey Ironbark - Spotted Gum forest;
- MU6 Forest Red Gum - White Stringybark - Ischaemum sedge flat (part of the River-flat Eucalypt Forest on Coastal Floodplains TEC); and
- MU7 Exotic pasture.

The distribution of vegetation communities recorded in the study area is provided in Figure 3.1.

Table 3.2 provides a list and extent (in hectares) of each vegetation community recorded within the study area.

Table 3.2 Areas of Vegetation Communities within the Study Area

Vegetation Community	Area (ha)
MU1 Spotted Gum – Red Ironbark – Mahogany forest (TEC)	68.91
MU2 Smooth-barked Apple – Red Bloodwood – Stringybark - Banksia woodland	30.18
MU3 Sydney Blue Gum alluvial forest complex (TEC)	11.26
MU4 Paperbark – Black Wattle – Bottlebrush – Tall Saw-sedge riparian forest	3.16
MU5 Grey Ironbark - Spotted Gum forest	7.00
MU6 Forest Red Gum – White Stringybark – Bluegrass – Tall Saw-sedge woodland (TEC)	1.00
MU7 Exotic pasture	0.21
Total	**121.72**

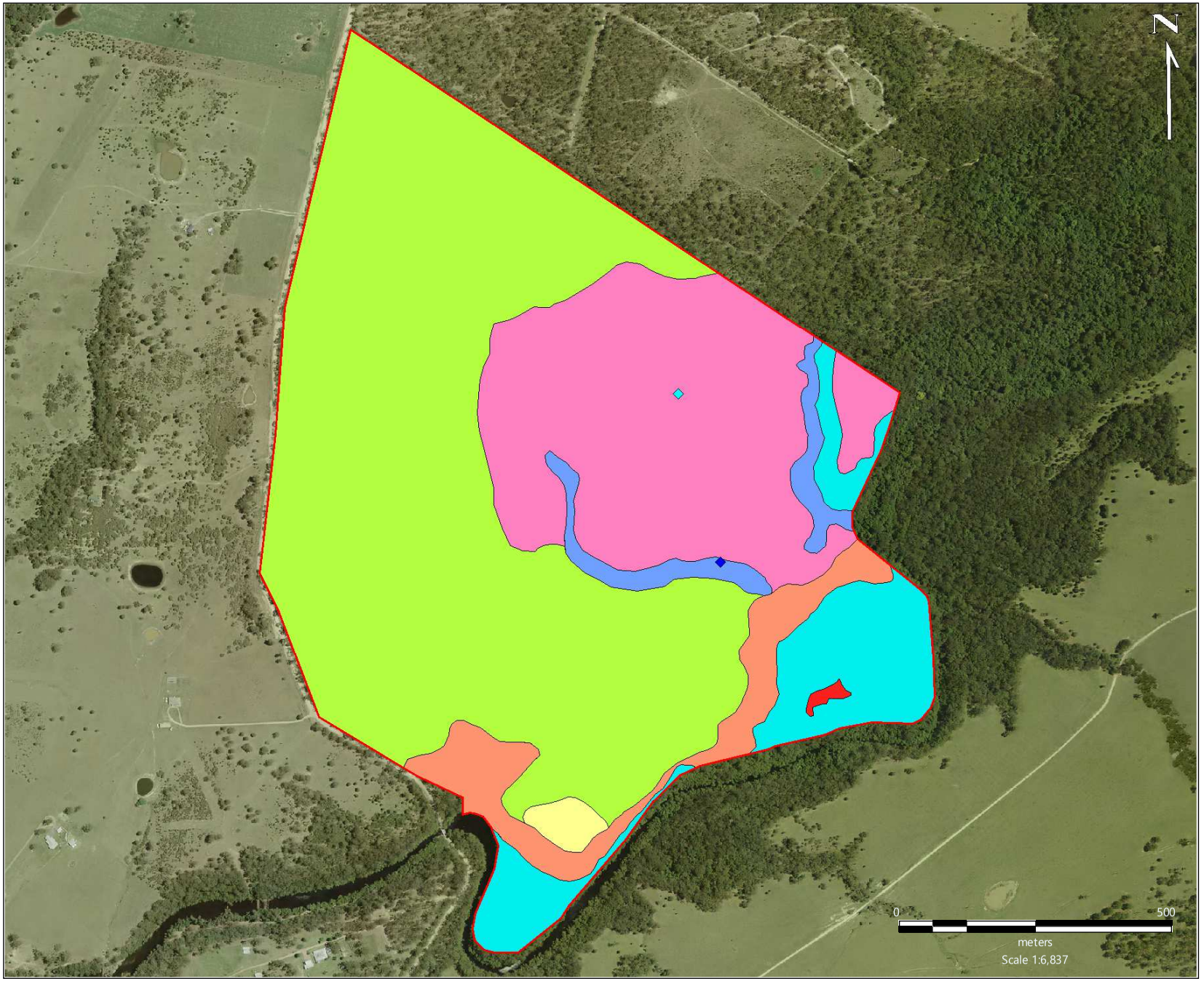

Figure 3.1: Vegetation Communities and Threatened Species

3.3.1 Vegetation Community Descriptions

3.3.1.1 MU1 Spotted Gum - Red Ironbark - Mahogany forest (EEC)

Photograph 3.1 MU1 Spotted Gum - Red Ironbark - Mahogany forest (shrubby variant)

Photograph 3.2 MU1 Spotted Gum - Red Ironbark - Mahogany forest (grassy variant)

Corresponding Classification

Keith (2004): Hunter - Macleay Dry Sclerophyll Forests
PCT: 1207 Spotted Gum – Broad-leaved Ironbark grassy open forest of dry hills of the lower Hunter Valley, Sydney Basin Bioregion

BC Act: Lower Hunter Spotted Gum – Ironbark Forest in the Sydney Basin Bioregion.
EPBC Act: not listed

Distribution and Habitat

Spotted Gum - Red Ironbark - Mahogany forest occupies crests and gentle upper and mid slopes of the study area.

Floristics Description

This open forest has a canopy dominated by *Corymbia maculata* (Spotted Gum), *Eucalyptus fibrosa* (Red Ironbark) and *Eucalyptus umbra* (Broad-leaved Mahogany). Other eucalypts that are present in low numbers include *E. moluccana* (Grey Box) and *E. propinqua* (Small-fruited Grey Gum).

The shrub layer is variable, and ranges from dense pockets of *Bursaria spinosa* (Blackthorn) or *Melaleuca nodosa* (Prickly-leaved Paperbark), to a more open and sparse layer of *Daviesia ulicifolia*, *Leucopogon juniperinus* (Prickly Beard-heath), *Acacia ulicifolia* (Prickly Moses), along with climbers including *Hardenbergia violacea*, *Glycine clandestina* and *Polymeria calycina*.

The ground layer is grassy and may include a diverse range of species, in particular *Themeda triandra* (Kangaroo Grass) and *Entolasia stricta.* Other grasses include *Imperata cylindrica*, *Microlaena stipoides* var. *stipoides* and *Panicum simile*. Various herbs such as *Pratia purpurascens*, *Dianella caerulea* var. *assera*, *Opercularia diphylla*, *Brunoniella australis*, *Vernonia cinerea* along with ground ferns, predominately *Cheilanthes sieberi*, are also typically present.

3.3.1.2 MU2 Smooth-barked Apple - Red Bloodwood - Stringybark - Banksia woodland

Photograph 3.3 MU2 Smooth-barked Apple - Red Bloodwood - Stringybark - Banksia woodland

Corresponding Classification

Keith (2004): Sydney Coastal Dry Sclerophyll Forests
PCT: 1182 Smooth-barked Apple – Red Bloodwood open forest on coastal plains on the Central Coast, Sydney Basin Bioregion

BC Act: not listed
EPBC Act: not listed

Distribution and Habitat

This community occupies the lower slopes and flats lower on the landscape profile than MU1 Spotted Gum - Red Ironbark - Mahogany forest.

Floristics Description

This community forms an open forest or woodland and is characterised by *Angophora costata* (Smooth-barked Apple), *Corymbia gummifera* (Red Bloodwood), *Eucalyptus globoidea* (White Stringybark) and *Eucalyptus resinifera* (Red Mahogany).

An upper mid storey of taller shrubs and small trees is often present and includes *Allocasuarina littoralis* (Black Forest Oak), *Persoonia linearis* (Narrow-leaved Geebung), *P. levis* (Broad-leaved Geebung) and *Melaleuca sieberi*.

The understorey is typically shrubby and commonly includes smaller shrubs such as *Phyllanthus hirtellus*, *Banksia collina*, *Daviesia ulicifolia* (Gorse Bitter Pea), *Pultenaea euchila* (Orange Pultenaea), *P. myrtoides*, *P. villosa* (Hairy Bush Pea), *Leptospermum polygalifolium* and *Epacris pulchella*.

The ground layer is commonly dominated by the grass tree *Xanthorrhoea latifolia,* tussock grasses *Entolasia stricta* and *Themeda triandra,* as well the sedge *Ptilothrix deusta.* Grasses in lower abundance include A*ristida vagans, Panicum simile* and *Imperata cylindrica*. Rushes and sedges such as *Lomandra obliqua, L. glauca*, *Lepidosperma laterale* and *Dianella caerulea* var. *assera* may also be common. Sparsely distributed herbs include *Gonocarpus tetragynus, Pratia purpurascens, Goodenia heterophylla* and *G. bellidifolia* subsp. *argentea*.

Scrambling climbers such as *Billardiera scandens, Polymeria calycina* and *Hardenbergia violacea* are also present.

3.3.1.3 MU3 Sydney Blue Gum alluvial forest complex

Photograph 3.4 MU3 Sydney Blue Gum alluvial forest complex

Corresponding Classification

Keith (2004): North Coast Wet Sclerophyll Forests
PCT: conforms broadly with 1258 Tallowwood – Brush Box – Sydney Blue Gum moist shrubby forest on coastal foothills of the Southern North Coast.

BC Act: River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions
EPBC Act: not listed

Distribution and Habitat

This community occupies alluvial flats, river banks and old river beds associated with The Branch River. As the name suggests, the community forms a complex of possibly several different wet sclerophyll forests.

Floristics Description

This community forms a closed forest characterised by *Eucalyptus saligna* (Sydney Blue Gum), *Eucalyptus microcorys* (Tallowwood), *Syncarpia glomulifera* (Turpentine), with occasional *Eucalyptus tereticornis* (Forest Red Gum).

In some areas, canopy trees are emergent above a dense small tree layer of *Callistemon salignus* (Willow Teatree), *Waterhousea floribunda* (Weeping Lilly Pilly), *Glochidion ferdinandi* (Cheese Tree) with robust vines *Parsonsia straminea* (Monkey Rope) and *Cissus hypoglauca*.

The understorey can be sparse or dense and characterised by mesophyllous species, including *Ficus coronata* (Sandpaper Fig), *Waterhousea floribunda*, *Cryptocarya microneura* (Murrogun), *Syzygium oleosum* (Blue Lilly Pilly), *Acmena smithii*, *Acronychia oblongifolia,* and the climber *Morinda jasminoides*.

In the ground layer exotic *Tradescantia fluminensis* (Wandering Jew) is locally domain with *Carex longebrachiata, Lomandra hystrix, Hypolepis muelleri, Adiantum aethiopicus,* and *Oplismenus imbecillis.*

3.3.1.4 MU4 Paperbark – Black Wattle – Bottlebrush – Tall Saw-sedge riparian forest

Photograph 3.5 MU4 Paperbark – Black Wattle – Bottlebrush – Tall Saw-sedge riparian forest

Corresponding Classification

Keith (2004): Coastal Swamp Forest
PCT: 926 Melaleuca sieberi – Tall Saw-sedge close shrubland in drainage lines on the Central Coast, Sydney Basin Bioregion

BC Act: not listed
EPBC Act: not listed

Distribution and Habitat

This community is restricted to narrow ephemeral drainage lines and small billabongs that traverse the study area in the lower northern and eastern parts. It is not present on the floodplain associated with The Branch River, but occurs in the minor drainage lines feeding into it from higher in the landscape.

Floristics Description

This linear community varies in canopy species and generally adopts the canopy of neighbouring vegetation communities. However, the small tree and understorey is consistently characterised by dense *Callistemon salignus, Melaleuca linariifolia* (Flax-leaved Paperbark) and *Callicoma serratifolia* (Black Wattle), with occasional *Melaleuca styphelioides* (Prickly-leaved Teatree). The shrub layer includes *Glochidion ferdinandi* (Cheese Tree), *Myrsine howittiana* (Brush Muttonwood), *Pittosporum revolutum* (Rough-fruit Pittosporum) and *Polyscias sambucifolia* (Elderberry Panax).

Ground cover is tall and dominated by *Gahnia clarkei* (Tall Saw Sedge), *Lomandra hystrix* and *Adiantum aethiopicum*.

3.3.1.5 MU5 Grey Ironbark - Spotted Gum forest

Photograph 3.6 MU5 Grey Ironbark - Spotted Gum forest

Corresponding Classification

Keith (2004): Hunter-Macleay Dry Sclerophyll Forests
PCT: 1216 Spotted Gum – Grey Ironbark open forest on the foothills of the Central Coast, Sydney Basin Bioregion

BC Act: not listed
EPBC Act: not listed

Distribution and Habitat

Grey Ironbark – Spotted Gum forest occurs as a band, almost in the role of an ecotone, between Sydney Blue Gum alluvial forest complex and Spotted Gum – Red Ironbark – Mahogany forest.

Floristics Description

It forms an open forest with a mesophyllous understorey. The canopy is characterised by *Eucalyptus siderophloia* (Grey Ironbark) with occasional *Corymbia maculata*. An upper mid storey of small trees includes *Melaleuca nodosa*, *Callistemon salignus, Acacia floribunda* and *Alphitonia excelsa* (Red Ash).

The understorey is typically shrubby and includes *Pittosporum multiflorum*, *Notelaea longifolia* and *Myrsine howittiana*. The ground layer is typically dominated by *Microlaena stipoides* var. *stipoides, Lomandra longifolia, Carex longebrachiata, Oplismenus imbecillis, Pratia purpurascens* and *Adiantum aethiopicum.* Scrambling climbers are common and include *Parsonsia straminea* and *Morinda jasminoides*.

3.3.1.6 MU6 Forest Red Gum - White Stringybark – Large Bluegrass- Tall Saw-sedge Woodland

Photograph 3.7 MU6 Forest Red Gum - White Stringybark – Large Bluegrass- Tall Saw-sedge Woodland

Corresponding Vegetation Classification

Keith (2004)*:* Coastal Swamp Forests
PCT: 826 Forest Gum – Rough-barked Apple open forest on poorly drained lowlands of the Central Coast, Sydney Basin Bioregion

BC Act*:* broadly conforms with River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions
EPBC Act*:* Not listed

Distribution and Habitat

Forest Red Gum - White Stringybark – Large Bluegrass- Tall Saw-sedge woodland occupies a single small flat and upper flood terrace of The Branch River.

Floristic Description

This open forest has a canopy dominated by *Eucalyptus tereticornis* and *Eucalyptus globoidea*. A small tree layer contains *Melaleuca linariifolia* and *Callistemon salignus* with lower frequencies of *Melaleuca sieberi*.

The understorey is open and characterised by a grass/sedge complex, characterised by *Entolasia stricta*, *Ischaemum australe* var. *australe*, *Imperata cylindrica*, *Ptilothrix deusta* and *Chorizandra cymbaria.* Various herbs such as *Pratia purpurascens*, *Dianella caerulea* var. *assera*, *Brunoniella australis*, *Vernonia cinerea,* along with the orchid *Calochilus paludosus*, are also present.

3.3.1.7 MU7 Exotic pasture

Corresponding Classification

Keith (2004)*:* n/a
PCT: n/a

BC Act*:* not listed
EPBC Act*:* Not listed

Distribution and Habitat

Exotic pasture occurs in one isolated area to the east on an alluvial flat. This is a derived community, which has resulted from historical clearing. A derived/ maintained area also exists in the vicinity of the existing dwelling in the north-west corner of the study area.

Floristics Description

This open community is treeless, except occasional regenerating *Melaleuca* species.

The understorey is grassy and dominated by exotic pasture species **Paspalum dilatatum* (Paspalum), **Verbena* spp. (Verbena species), *Conyza* spp. (Fleabane), *Hypochaeris radicata* and *Senecio madagascariensis* (Fireweed). The native sedge *Carex longebrachiata* is also common.

4. Discussion

4.1 Summary of Ecological Values

The 122-hectare study area at The Branch represents an area of special ecological value and contains important ecological values and features.

Three (3) of the mapped vegetation communities present form part of Threatened Ecological Communities listed on the *Biodiversity Conservation Act 2016*:

- MU1 Spotted Gum - Red Ironbark - Mahogany Forest is analogous to the Lower Hunter Spotted Gum - Ironbark Forest in the Sydney Basin Bioregion Endangered Ecological Community, and occupies a broad area in the west of the study area.
- MU3 Sydney Blue Gum Alluvial Forest Complex is part of the River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions Endangered Ecological Community, and in the study area is associated with the riparian zone of The Branch River.
- MU6 Forest Red Gum - White Stringybark - Large Bluegrass - Tall Saw-sedge Woodland is also considered to conform to the River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions Endangered Ecological Community.

In total, over two-hundred flora species were detected during this study, including the presence of two (2) threatened flora species listed on the *Biodiversity Conservation Act 2016*; *Tetratheca juncea* and *Callistemon linearifolius*. Several seasonal and cryptic species are unlikely to have been detected and consequently the overall floristic diversity for the study area would increase with additional survey effort.

Figure 4.1 shows the distribution and extent of Threatened Biodiversity of the study area.

In general terms, the study area is in very good condition, with minimal influence from disturbance or degradation processes. There is evidence of a history of logging but there has been no recent activity on the land. Past logging has impacted the age structure and complexity of the forests, although some old-growth/ over-mature and hollow-bearing trees are present. There are only two very small areas of significant disturbance, one is associated with the dwelling-house and the other is a small area of historic clearing in the south-east near The Branch River. This latter disturbance is slowly naturally-regenerating, but remains dominated by exotic pasture grass species. Weed occurrence is generally very low across the study area, but *Lantana camara* is scattered at low density through many parts of the land, and *Tradescantia fluminensis* dominates part of the groundcover of MU3 Sydney Blue Gum alluvial forest complex. Targeted controls of these two (2) priority invasive exotic flora species would be beneficial to improve the integrity of the site. There is minor evidence of active bank erosion and/ or bed-lowering of minor watercourses on the study area, but the soil types of this part of The Branch are known to be susceptible to erosion as they are highly dispersible when disturbed.

No opportunistic sightings of threatened fauna species were recorded during field surveys; however it must be noted that the vegetation and habitat present is likely to support both resident and transient populations of several species. Threatened fauna species with moderate to high likelihood of occurrence in the study area include species such as Spotted-tailed Quoll, Brush-tailed Phascogale, Squirrel Glider, Grey-headed Flying-fox, Eastern Freetail-bat, Golden-tipped bat, Eastern Bentwing-bat, Little Bentwing-bat, Eastern False Pipistrelle, Greater Broadnosed-bat, Stephen's Banded Snake, Square-tailed Kite, Glossy Black-Cockatoo, Little Lorikeet, Powerful Owl, Masked Owl and Varied Sittella.

However, targeted fauna surveys would be required to confirm the presence of these species in the study area.

On the whole, the vegetation and habitats of the study area are of high integrity and resilience. There is little impairment of the range of functional ecological processes and the native vegetation provides for a range of significant and valuable ecosystem services, including but not limited to: water cycling, soil retention, nutrient cycling, pollination and seed dispersal, oxygen production, air quality maintenance, climate regulation, water quality maintenance and water regulation, flood control, erosion control, nutrient removal and landscape amenity. The study area may provide for or contain natural cultural heritage values and is therefore intrinsically valuable.

Figure 4.1: Threatened Biodiversity of the Study Area

4.2 Regional Significance

The NSW Governments Comprehensive Regional Assessment (CRA) process undertaken in New South Wales during the late 1990s identified certain vegetation community types in this region to be of regional conservation significance. In the study area, five (5) vegetation communities can be considered regionally significant based on the outcomes of the CRA regional assessment:

- MU1 Spotted Gum - Red Ironbark - Mahogany Forest and MU5 Grey Ironbark - Spotted Gum Forest were considered to be a regional priority for private land conservation.
- MU3 Sydney Blue Gum alluvial forest complex was considered to be a regional priority for private land conservation. This community also contains gallery or lowland rainforest elements in the sub-canopy layer.
- MU4 Paperbark - Black Wattle - Bottlebrush - Tall Saw-sedge riparian forest was considered to be vulnerable in this region.
- MU6 Forest Red Gum - White Stringybark - Large Bluegrass - Tall Saw-sedge Woodland was considered to be vulnerable, severely-depleted, highly inadequately reserved and a priority for private land conservation in the region.

In addition, the study area falls within a modelled Key Regional Corridor for forest fauna (**Figure 4.2**) as mapped by the Department of Environment and Climate Change (Scotts & Drielsma 2002; NPWS 2003). It also falls marginally outside of the eastern edge of the Great Eastern Ranges corridor (**Figure 4.3**). More intuitively, the area forms part of a connected network of naturally-vegetated private land that links the Karuah Nature Reserve in the west with Nerong State Forest and Myall Lakes National Park to the north-east.

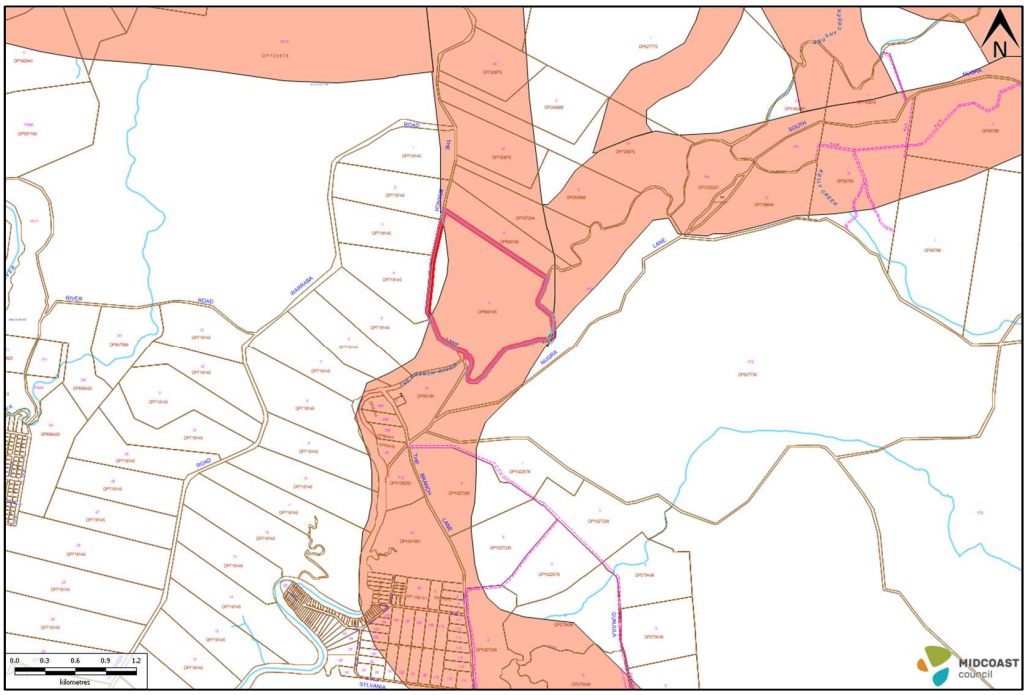

Figure 4.2 Key Regional Corridor

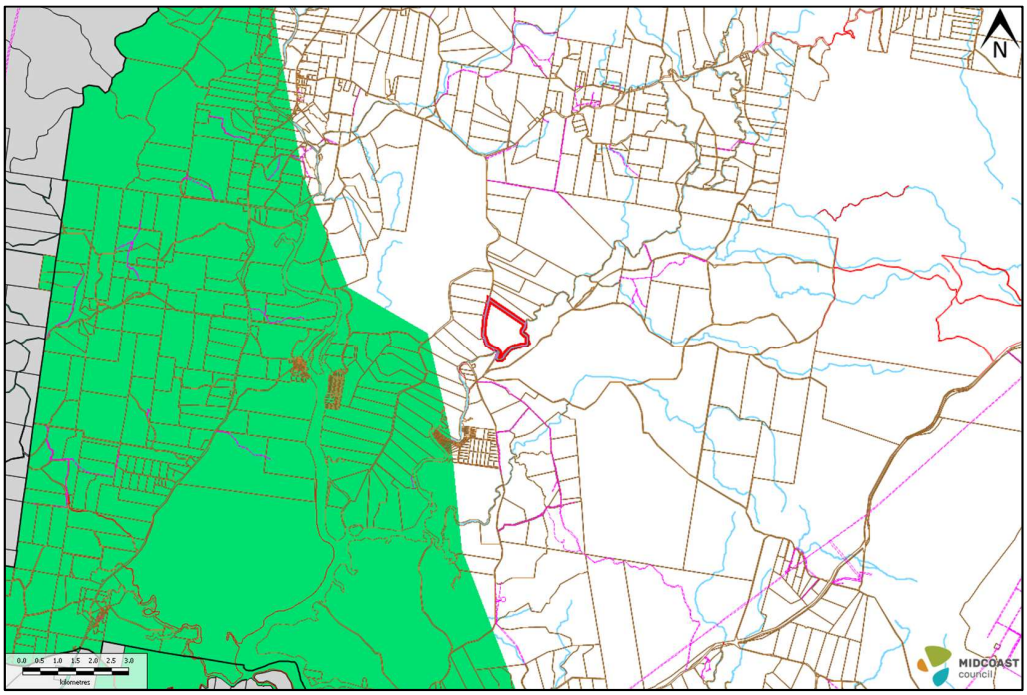

Figure 4.3 Great Eastern Ranges corridor

4.3 Potential for Future Investment

Further, parts of the land are mapped as Key Regional Habitat for forest fauna by Department of Environment and Climate Change (**Figure 4.3**):

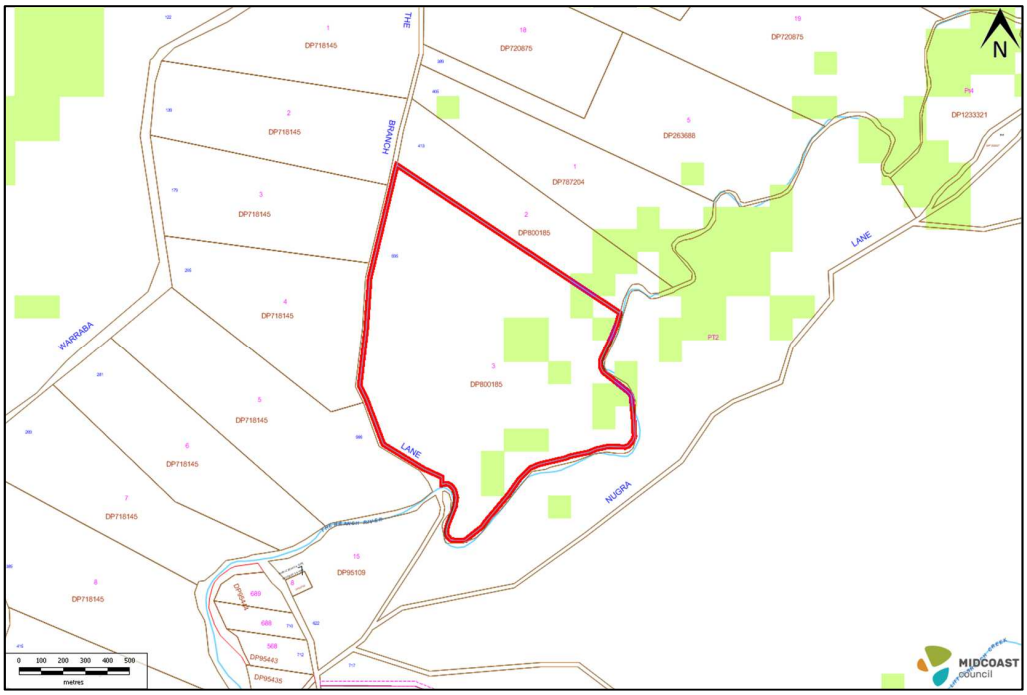

Figure 4.4 Key Regional Habitat

More intuitively, the study area forms part of a connected network of naturally-vegetated private land that connects the wider Karuah Nature Reserve with Nerong State Forest/ Myall Lakes National Park. As such, the habitats of the study area would provide both important core habitat but also connecting habitat for a range of fauna species.

This assessment of Lot 3 DP 800185 at 595 The Branch Lane concludes that it exhibits a range of natural values that would be worthy of conservation investment under the new biodiversity conservation framework in New South Wales, and that this represents a potential financial/ investment opportunity for the landholder. Significant attributes such as Threatened Ecological Communities and threatened species may serve to increase a market demand for any biodiversity stewardship credits that are generated from the site.

Alternatively, it is possible that the study area may hold limited opportunities for ecological conservation style development under Clause 4.1B of Great Lakes Local Environmental Plan 2012. Several small lifestyle lots may potentially be created in the north-west corner and offset by the permanent conservation of the balance of the land. The Clause 4.1B policy of Council would permit approximately four (4) 2 - 5-hectare lots in the north-west with permanent conservation of 100 - 114-hectares of the land, subject to Council approval. A Voluntary Planning Agreement would be required to deliver this outcome via a Part 4 merits assessment under the *Environmental Planning and Assessment Act 1979*.

If the business case for conservation is to be realised, a Biodiversity Stewardship Site Assessment Report would now need to be prepared for the study area to determine the types and nature of species and ecosystem credits generated from the land. This could then be attributed a Part A and Part B dollar value under the Biodiversity Offsets scheme or the Conserving Private Land for Nature Conservation scheme that applies in New South Wales.

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Appendix A Flora List

		Quadrats								
Genus Species	Incidental	THB07C1M	THB08C8C	THB09C1U	THB10C1L	THB11C3F	THB12C1F	THB13C3F	THB14A2D	THB15A3F
Acacia falcata	x									
Acacia floribunda	x				1					
Acacia implexa	x					0.5				
Acacia irrorata	x						0.5			
Acacia irrorata subsp. irrorata	x				0.5					
Acacia longifolia	x						0.5			
Acacia longifolia subsp. longifolia	x		0.5							
Acacia myrtifolia	x							0.5		
Acacia terminalis	x							0.5		
Acacia ulicifolia	x	0.5	0.5	2						
Acmena smithii	x				0.5					
Acronychia oblongifolia	x									0.5
Acrotriche divaricata	x									
Adiantum aethiopicum	x				1				0.5	
Adiantum hispidulum	x									
Alectryon subcinereus	x									0.5
Allocasuarina littoralis	x						0.5	1	0.5	
Allocasuarina torulosa	x					0.5				
Alocasia brisbanensis	x									
Alphitonia excelsa	x				0.5					
Angophora costata	x						10	7		
Archontophoenix cunninghamiana	x									
Aristida vagans	x	1	0.5	1			0.5	0.5		
Aristida warburgii	x						0.5			

Arthropodium sp. B	x	0.5		0.5						
Astrotricha longifolia	x									
Austrostipa pubescens	x						0.5	0.5		
Banksia oblongifolia	x									
Banksia spinulosa var. collina	x						1	5		
Billardiera scandens	x								0.5	
Boronia polygalifolia	x	0.5	0.5	0.5						
Breynia oblongifolia	x				0.5					0.5
Briza minor	x	0.5								
Brunoniella australis	x	0.5	0.5	0.5			0.5	0.5	0.5	0.5
Burchardia umbellata	x						0.5			
Bursaria spinosa	x	10	0.5							
Caesia parviflora var. parviflora	x					0.5	0.5			
Caladenia catenata	x	0.5	0.5	0.5						
Caladenia fuscata	x	0.5	0.5		0.5	0.5			0.5	
Callicoma serratifolia	x								1	
Callistemon linearifolius	x									
Callistemon rigidus	x									
Callistemon salignus	x		0.5		3	10			15	15
Calochilus paludosus	x					0.5				
Calochlaena dubia	x								0.5	
Carex appressa	x									0.5
Carex inversa	x	0.5		0.5						
Carex longebrachiata	x				1					15
Cassytha glabella f. glabella	x		0.5							
Cheilanthes sieberi subsp. sieberi	x	0.5		0.5						

Chorizandra cymbaria	x					1				
Cissus antarctica	x				0.5			0.5		
Cissus hypoglauca	x				0.5					
Clematis glycinoides var. glycinoides	x				0.5					
Comesperma ericinum	x							0.5		
Commelina cyanea	x									0.5
Corymbia gummifera	x						5		0.5	
Corymbia maculata	x	15	10	10						
Cryptocarya microneura	x				1				0.5	0.5
Cryptostylis subulata	x						0.5			
Cymbidium canaliculatum	x									
Cymbopogon refractus	x	0.5		0.5						
Daviesia ulicifolia	x						1	0.5		
Daviesia ulicifolia subsp. ulicifolia	x	0.5		0.5						
Dendrophthoe spp.	x									
Dendrophthoe vitellina	x		0.5	0.5						
Desmodium gunnii	x			0.5						
Dianella caerulea var. assera	x	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Dianella longifolia var. longifolia	x	0.5								
Dianella revoluta var. revoluta	x		0.5							
Dichelachne micrantha	x	0.5		2						
Dichondra repens	x	0.5		0.5	0.5				0.5	
Dillwynia retorta	x		0.5				1	2		
Dioscorea transversa	x									0.5
Drosera peltata	x	0.5	0.5			0.5			0.5	

Echinopogon caespitosus var. caespitosus	x					0.5				
Elaeocarpus reticulatus	x				1					
Entolasia marginata	x	0.5	0.5			0.5			0.5	0.5
Entolasia stricta	x	0.5	70	0.5		40	25	30	0.5	
Epacris pulchella	x							0.5		
Epaltes australis	x					0.5				
Eragrostis brownii	x	0.5		0.5		0.5	0.5	0.5		
Eragrostis spp.	x					0.5				
Eucalyptus fibrosa	x	20	15	10				0.5		
Eucalyptus globoidea	x					10	2	7	0.5	
Eucalyptus moluccana	x									
Eucalyptus propinqua	x			3						
Eucalyptus resinifera	x						5	7		
Eucalyptus saligna	x									10
Eucalyptus siderophloia	x				35					
Eucalyptus tereticornis	x					15				
Eucalyptus umbra	x		2	15						
Eustrephus latifolius	x				0.5				0.5	
Exocarpos cupressiformis	x	0.5								
Ficus coronata	x									0.5
Gahnia clarkei	x					1			30	
Galium binifolium	x									0.5
Geitonoplesium cymosum	x	0.5		0.5	0.5	0.5			0.5	
Genoplesium spp.	x									
Glochidion ferdinandi	x								2	1
Glochidion ferdinandi var. ferdinandi	x	0.5	0.5	0.5	0.5	1				
Glycine clandestina	x	0.5	0.5	0.5			0.5			

Glycine tabacina	x	0.5		0.5						
Gompholobium pinnatum	x							0.5		
Gonocarpus tetragynus	x	0.5	0.5	0.5	0.5	0.5	0.5	0.5		
Goodenia bellidifolia subsp. argentea	x	0.5	0.5	0.5			0.5	0.5		
Goodenia heterophylla	x						0.5	0.5		
Goodenia heterophylla subsp. heterophylla	x		0.5	0.5						
Gymnostachys anceps	x				0.5				0.5	0.5
Haloragis heterophylla	x									
Hardenbergia violacea	x			0.5			0.5	0.5		
Hemarthria uncinata var. uncinata	x					1				
Hibbertia aspera subsp. aspera	x	1	0.5	0.5	0.5	0.5			0.5	
Hibbertia scandens	x				0.5				0.5	
Hibbertia vestita	x							0.5		
Hybanthus monopetalus	x									
Hydrocotyle sibthorpioides	x								0.5	
Hypericum gramineum	x	0.5					0.5	0.5		
Hypolepis muelleri	x									1
Imperata cylindrica	x			0.5	0.5	0.5	0.5	0.5		
Ischaemum australe var. australe	x					40				
Lagenifera stipitata	x	0.5								
Lagenophora stipitata	x		0.5			0.5		0.5		
Lantana camara	x				0.5					
Lepidosperma laterale	x		0.5	0.5		0.5	0.5	0.5		
Leptospermum polygalifolium	x						0.5	3	0.5	

Leptospermum polygalifolium subsp. cismontanum	x		0.5		1					
Lepyrodia scariosa	x						0.5			
Leucopogon juniperinus	x	0.5	0.5	0.5	0.5	0.5		0.5		
Lindsaea microphylla	x									
Livistona australis	x									
Logania albiflora	x									
Lomandra filiformis subsp. filiformis	x	1	0.5	0.5						
Lomandra glauca	x						0.5	0.5		
Lomandra hystrix	x								10	1
Lomandra longifolia	x	0.5	0.5	0.5	1	1		0.5		
Lomandra multiflora subsp. multiflora	x	0.5	0.5	0.5						
Lomandra obliqua	x		0.5					0.5		
Lomatia silaifolia	x									
Lyperanthus suaveolens	x									
Maytenus silvestris	x				0.5	0.5				
Melaleuca decora	x		4			2				
Melaleuca linariifolia	x				0.5	10			15	
Melaleuca nodosa	x		60	0.5	55			0.5		
Melaleuca sieberi	x					10	1	2		
Melaleuca styphelioides	x								2	
Microlaena stipoides var. stipoides	x	10	2	6	50	0.5			0.5	0.5
Mirbelia rubiifolia	x						0.5	0.5		
Morinda jasminoides	x				1				1	3
Myrsine howittiana	x				1				1	1
Myrsine variabilis	x									

Neolitsea dealbata	x									
Notelaea longifolia	x									0.5
Notelaea longifolia f. longifolia	x	0.5			0.5					
Opercularia diphylla	x	0.5	0.5	0.5			0.5			
Oplismenus imbecillis	x				0.5				0.5	0.5
Oxalis perennans	x					0.5				
Ozothamnus diosmifolius	x						0.5			
Pandorea pandorana	x	0.5			0.5	0.5				
Pandorea pandorana subsp. pandorana	x									0.5
Panicum simile	x	0.5				0.5	0.5			
Parsonsia straminea	x		0.5		1	0.5			2	3
Paspalidium distans	x						0.5			
Paspalum mandiocanum	x									
Patersonia sericea	x							0.5		
Persoonia laurina	x									
Persoonia levis	x						0.5	0.5		
Persoonia linearis	x	0.5		0.5	0.5	0.5	0.5	0.5		
Phyllanthus gunnii	x									
Phyllanthus hirtellus	x						0.5	0.5		
Pimelea linifolia	x						0.5			
Pittosporum multiflorum	x				0.5				0.5	0.5
Pittosporum revolutum	x				0.5				0.5	
Platycerium bifurcatum	x									
Plectorrhiza tridentata	x									
Poa labillardierei var. labillardierei	x	0.5		0.5						
Polymeria calycina	x	0.5	0.5	0.5		0.5	0.5		0.5	

Polyscias sambucifolia	x								0.5	
Pratia purpurascens	x	0.5	0.5	0.5	0.5	0.5	0.5		0.5	
Prostanthera linearis	x									
Pseuderanthemum variabile	x				0.5	0.5			0.5	0.5
Pteridium esculentum	x				0.5				0.5	
Pterostylis longifolia	x									
Pterostylis nutans	x									
Pterostylis pedunculata	x								0.5	
Pterostylis spp.	x			0.5	0.5					
Ptilothrix deusta	x		1			6	4	2		
Pultenaea euchila	x							3		
Pultenaea myrtoides	x		0.5				0.5	0.5		
Pultenaea retusa	x			0.5						
Pultenaea villosa	x	2	0.5	1				0.5		
Pyrrosia rupestris	x									0.5
Ripogonum album	x				0.5					
Senecio madagascariensis	x			0.5						
Smilax australis	x								0.5	
Smilax glyciphylla	x				0.5				0.5	
Streblus brunonianus	x									
Stylidium graminifolium	x						0.5	0.5		
Syncarpia glomulifera	x								5	
Syzygium oleosum	x									0.5
Tetratheca juncea	x									
Thelymitra purpurata	x									
Themeda triandra	x	70	0.5	50		1	0.5	2		
Tradescantia fluminensis	x									5
Tristaniopsis laurina	x									

Vernonia cinerea var. cinerea	x	0.5				0.5				
Veronica plebeia	x									
Waterhousea floribunda	x									30
Wurmbea biglandulosa	x	0.5		0.5		0.5				
Xanthorrhoea latifolia	x						7	8		
Xanthorrhoea macronema	x									
Zieria smithii	x									

Nb: numbers in body of table represent the estimated percent of projected foliage cover of each species.

BAM Credit Summary Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00029014/BAAS18020/21/00029015		22/06/2023
Assessor Name	Report Created	BAM Data version *
Sarah Elizabeth Jones	27/11/2023	61
Assessor Number	BAM Case Status	Date Finalised
BAAS18020	Open	To be finalised
Assessment Revision	Assessment Type	BOS entry trigger
3	Part 4 Developments (General)	BOS Threshold: 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 SAII	Ecosystem credits

Spotted Gum - Broad-leaved Mahogany - Red Ironbark shrubby open forest												
1	1590_Classname1	Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions	63.5	63.5	4.3	PCT Cleared - 48%	High Sensitivity to Gain	Endangered Ecological Community	Not Listed	2.00		137
											Subtotal	**137**
Spotted Gum - Grey Ironbark open forest of the Macleay Valley lowlands of the NSW North Coast Bioregion												
2	1215_Classname101	Not a TEC	55.8	55.8	0.86	PCT Cleared - 35%	High Sensitivity to Gain			1.50		18
											Subtotal	**18**
											Total	**155**

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 SAII	Species credits
Myotis macropus / Southern Myotis (Fauna)									
1590_Classname1	63.5	63.5	4.3			Vulnerable	Not Listed	False	137

1215_Classname101	55.8	55.8	0.86			Vulnerable	Not Listed	False	24
								Subtotal	**161**
Ninox strenua / Powerful Owl (Fauna)									
1590_Classname1	63.5	63.5	4.3			Vulnerable	Not Listed	False	137
1215_Classname101	55.8	55.8	0.86			Vulnerable	Not Listed	False	24
								Subtotal	**161**
Petaurus norfolcensis / Squirrel Glider (Fauna)									
1590_Classname1	63.5	63.5	4.3			Vulnerable	Not Listed	False	137
1215_Classname101	55.8	55.8	0.86			Vulnerable	Not Listed	False	24
								Subtotal	**161**
Pterostylis chaetophora / Pterostylis chaetophora (Flora)									
1590_Classname1	63.5	63.5	4.3			Vulnerable	Not Listed	False	137
1215_Classname101	55.8	55.8	0.86			Vulnerable	Not Listed	False	24
								Subtotal	**161**

BAM Credit Summary Report - Stewardship Agreement

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00032515/BAAS18020/22/00032517	The Branch	22/06/2023
Assessor Name	Report Created	BAM Data version *
	10/10/2023	61
Assessor Number	BAM Case Status	Date Finalised
	Open	To be finalised
Assessment Revision	Assessment Type	
0	Stewardship (for offset sites)	

* 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	Percent Cleared Value	Area (ha)	Current Vegetation integrity score	Future Vegetation integrity score without management	Future Vegetation integrity score with management	Security benefit score	Total gain in Vegetation integrity	BC Act listing status	EPBC Act listing status	Total number of ecosystem credits

BAM Credit Summary Report - Stewardship Agreement

Spotted Gum - Broad-leaved Mahogany - Red Ironbark shrubby open forest												
1	1590_Classname1	Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions	48	49	63.4	57.5	94.2	2.5	39.2	Endangered Ecological Community	Not Listed	480
											Subtotal	**480**
											Total	**480**

Species credits for threatened species

Vegetation zone name	Total gain in Habitat condition (HC)	Area (ha) / Count (no. individuals)	Constant	BC Act listing status	EPBC Act listing status	Total number of species credits
Myotis macropus / Southern Myotis (Fauna)						
1590_Classname1	39.2	49	0.25	Vulnerable	Not Listed	480
					Subtotal	**480**
Ninox strenua / Powerful Owl (Fauna)						
1590_Classname1	39.2	49	0.25	Vulnerable	Not Listed	480
					Subtotal	**480**
Petaurus norfolcensis / Squirrel Glider (Fauna)						
1590_Classname1	39.2	49	0.25	Vulnerable	Not Listed	480
					Subtotal	**480**
Pterostylis chaetophora / Pterostylis chaetophora (Flora)						
1590_Classname1	39.2	49	0.25	Vulnerable	Not Listed	480
					Subtotal	**480**