PLANNING PROPOSAL

Vegetation Mapping

September 2020

HORNSBY SHIRE COUNCIL

Contents

Background

The *HLEP 2013* includes a Terrestrial Biodiversity Map and a corresponding Clause (6.4 Terrestrial Biodiversity) that details matters for consideration that must be addressed when assessing a development application on land within the mapped area. The current Terrestrial Biodiversity Map identifies National, State and Regionally significant vegetation communities based on Smith and Smith Vegetation Communities of Hornsby Shire Mapping (2008 Update) plus 'Bushland Protection' land previously recognised under the Hornsby Shire Local Environmental Plan 1994 (HSLEP 1994).

This comprises 3 Critically Endangered Ecological Communities (CEECs), 10 Endangered Ecological Communities (EECs) listed under State and Federal legislation and 11 regionally significant vegetation communities.

Due to changes in vegetation patterns and updates to State and Federal legislation and community classifications since the Smith and Smith 2008 mapping, the *HLEP 2013* Terrestrial Biodiversity Map requires updating in accordance with the ELA Vegetation Report 2017. Remnants of Cumberland Plain Woodland vegetation community have been identified which is a CEEC and Angophora Woodlands has been upgraded from local to regionally significant. The ELA 2017 mapping also applies a broader vegetation definition and has consequently captured more vegetation, as it accounts for remnant vegetation without a native understorey, particularly in the urban and rural residential boundaries with bushland (known as relictual occurrences).

Further, Council has resolved that the updated mapping include the identification of all vegetation communities (adding 9 local or common communities) plus a 10m buffer.

In accordance with Council's resolution, corresponding updates are required to be made to the Tree and Vegetation Preservation sections of the HDCP to allow residents to undertake exempt tree work as outlined in the HDCP within the mapped areas. Amendments to the HDCP will be presented to Council and placed on public exhibition concurrently with this planning proposal if a Gateway Determination is received from DPIE.

Part 1 – Objectives or intended outcomes

The objective of the planning proposal is to update and extend the Terrestrial Biodiversity Map and update the terminology in the corresponding Clause (6.4 Terrestrial Biodiversity) within the *Hornsby Local Environmental Plan 2013 (HLEP 2013)* to protect land of biodiversity value.

Part 2 – Explanation of provisions

The Planning Proposal seeks to amend the *HLEP 2013* as follows:

- Update the Terrestrial Biodiversity Map by:
    - Applying ELA Vegetation Mapping of National, State, Regional and locally significant or common communities, plus a 10m buffer; and
    - Amend the map title to "Environmentally Sensitive Land" and change all references to "Biodiversity" on each map to "Environmentally Sensitive Land".
- Replace all references to "Terrestrial Biodiversity" in Clause 6.4 and Dictionary with "Environmentally Sensitive Land"

Part 3 – Justification

Section A – Need for the planning proposal

Q1. Is the planning proposal a result of an endorsed local strategic planning statement, strategic study or report?

This planning proposal is a result of the updated vegetation mapping provided in the Hornsby Vegetation Mapping Report 2017 prepared by Eco Logical Australia (ELA Report 2017). Due to changes in vegetation patterns and updates to State and Federal legislation and community classifications since the Smith and Smith 2008 mapping, the *HLEP 2013* Terrestrial Biodiversity Map requires updating in accordance with the ELA Vegetation Report 2017. Remnants of Cumberland Plain Woodland vegetation community have been identified which is a CEEC and Angophora Woodlands has been upgraded from local to regionally significant. The ELA 2017 mapping also applies a broader vegetation definition and has consequently captured more vegetation, as it accounts for remnant vegetation without a native understorey, particularly in the urban and rural residential boundaries with bushland (known as relictual occurrences).

Further, Council has resolved that the updated mapping include the identification of all vegetation communities (adding 9 local or common communities) plus a 10m buffer.

Council's draft Biodiversity Conservation Strategy 2020 is currently on exhibition which will guide both Council and the community to conserve and manage Hornsby LGA's biodiversity. The strategy offers a range of recommended actions that sit alongside several other key strategies prepared in support of the Hornsby Local

Strategic Planning Statement. This planning proposal is consistent with the draft Strategy to give effect to *Action 1.1.2 Implement the revised HLEP 2013 Terrestrial Biodiversity Map*.

Clause 6.4 of the *HLEP 2013* details matters for consideration that must be addressed when assessing a development application on land within the area mapped on the Terrestrial Biodiversity Map. The terminology of both Clause 6.4 and the HLEP Map refers to "terrestrial biodiversity" in accordance with model provisions and drafting advice from the Department of Planning at the time the *HLEP 2013* was being prepared.

It is proposed that the terminology be replaced with "environmentally sensitive land" to avoid any uncertainty concerning the application of *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 (Codes SEPP).* The Codes SEPP identifies specific land-based exclusions under 'Clause 1.19 – Land on which complying development may not be carried out', which restrict complying development from being carried out on that land. One such exclusion is being identified by an environmental planning instrument as being environmentally sensitive land.

The Codes SEPP does not define environmentally sensitive land. However, an environmentally sensitive area is defined in the Codes SEPP (in part) as land identified within an environmental planning instrument as being of high biodiversity significance. To provide consistency with the terminology in the SEPP, the planning proposal seeks to amend the map title to "Environmentally Sensitive Land", change all references to "Biodiversity" on each map to "Environmentally Sensitive Land" and replace all references to "Terrestrial Biodiversity" in Clause 6.4 and the Dictionary with "Environmentally Sensitive Land".

Q2. Is the planning proposal the best means of achieving the objectives or intended outcomes, or is there a better way?

Yes. The planning proposal is the best means of achieving the intended outcomes. Through updating the Terrestrial Biodiversity Map within the *HLEP 2013*, it would ensure that the provisions for protection and management of the vegetation under Clause 6.4 Terrestrial Biodiversity of the *HLEP 2013* are extended to all vegetation communities throughout Hornsby Shire.

Section B – Relationship to the strategic planning framework

Q3. Will the planning proposal give effect to the objectives and actions of the applicable regional, or district plan or strategy (including any exhibited draft plans or strategies)?

Greater Sydney Region Plan 'A Metropolis of Three Cities'

Yes. The Planning Proposal is consistent with the *A Metropolis of Three Cities – the Greater Sydney Region Plan* (GSRP), in particular the following objective and strategy:

Objective 27: Biodiversity is protected, urban bushland and remnant vegetation is enhanced.

Strategy 27.1 Protects and enhance biodiversity by:

- *Supporting landscape-scale biodiversity conservation and the restoration of bushland corridors.*
- *Managing urban bushland and remnant vegetation as green infrastructure.*
- *Managing urban development and urban bushland to reduce edge-effect impacts.*

The planning proposal is consistent with the above objective and strategy as it provides continued protection to vegetation of all levels of biodiversity significance.

North District Plan

The North District Plan provides the strategic link between the GSRP and Council's local strategies and plans. The proposed updates to the Terrestrial Biodiversity Map give effect to the following priorities and actions:

Planning Priority N16 – Protecting and enhancing bushland and biodiversity

Planning Priority N17 – Protecting and enhancing scenic and cultural landscapes

Planning Priority N19 – Increasing urban tree canopy cover and delivering Green Grid connections

Action 66. Protect and enhance bushland and biodiversity by:

a. Support landscape-scale biodiversity conservation and the restoration of bushland corridors

b. Managing urban bushland and remnant vegetation as green infrastructure

c. Managing urban development and urban bushland to reduce edge-effect impacts

Action 67. Identify and protect scenic and cultural landscapes

Action 71. Expand urban tree canopy in the public realm

The Planning Proposal is consistent with the above planning priorities by providing continued recognition and protection of the biodiversity values of the native vegetation within Hornsby Shire.

Q4. Will the planning proposal give effect to a council's endorsed local strategic planning statement, or another endorsed local strategy or strategic plan?

Hornsby Community Strategic Plan – 'Your Vision Your Future 2028'

The Hornsby Community Strategic Plan 'Your Vision Your Future 2028' is a 10-year vision that identifies the main priorities and aspirations for the future of Hornsby Shire and is Council's long-term plan to deliver the best possible services for Hornsby Shire including:

FA6 Valuing green spaces and landscapes

FA8 Adapting to a changing environment

The proposed updates to the Terrestrial Biodiversity Map are generally consistent with the above focus areas of the Community Strategic Plan by improving the management and protection of vegetation communities throughout the Shire.

Hornsby Local Strategic Planning Statement

In March 2020, the Hornsby Local Strategic Planning Statement (LSPS) was published, which identifies its 20-year land use vision for managing growth and change over that time. The following priorities are key considerations for this mapping update:

Sustainable Priority 1. Improving the overall health of our natural environment and ecosystem.

Sustainable Priority 2. Protecting and increasing the extent and quality of natural areas.

Sustainable Priority 5. Embedding biodiversity conservation principles throughout local planning policies.

In addition to these priorities, the Biodiversity Map within the LSPS (figure 22) highlights those areas of biodiversity significance as identified within the ELA Vegetation Map 2017. The proposed updates to the Terrestrial Biodiversity Map are consistent with the key priorities within the Hornsby LSPS which will assist in the protection and improvement of the overall health of our natural environment.

Q5. Is the planning proposal consistent with applicable State Environmental Planning Policies?

Yes. The planning proposal is consistent with applicable State Environmental Planning Policies as follows (also refer to Appendix B):

State Environmental Planning Policy No. 19 Bushland in Urban Areas

This policy aims to protect and preserve bushland within the urban areas, specially to protect the remnants of plant communities which were once characteristic of land now within an urban area as well as rare and endangered flora and fauna species. The planning proposal is consistent with *SEPP No. 19 – Bushland in Urban Areas* as it would preserve and protect the natural and cultural values of the bushland within Hornsby Shire.

State Environmental Planning Policy (Koala Habitat Protection) 2019

This policy aims to encourage the proper conservation and management of areas of natural vegetation that provide habitat for koalas to ensure a permanent free-living population over their present range and reverse the current trend of koala population decline. The proposed update to the Terrestrial Biodiversity Map is consistent with this policy.

State Environmental Planning Policy (Exempt and Complying Development Codes) 2008

State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 – Codes SEPP provides exempt and complying development codes that have State-wide application. The Policy identifies types of development that are of minimal environmental impact that may be carried out without the need for development consent, and types of development (including dwelling houses, secondary dwellings, outbuildings and the like) that may be carried out as complying development.

By updating the Terrestrial Biodiversity Map to include all vegetation communities and a 10-metre buffer within the *HLEP 2013*, it would preclude further properties in Hornsby Shire from undertaking complying development on those portions of the property which contain the mapping. This would ensure that any proposed development on the portion of the site containing the mapping would be subject to Council assessment through the development application process.

State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017

This Policy aims to protect the biodiversity values of trees and other vegetation in non-rural areas of the State, and to preserve the amenity of non-rural areas of the State through the preservation of trees and other vegetation.

This planning proposal seeks to identify the native vegetation communities of Hornsby Shire under the *HLEP 2013* Terrestrial Biodiversity Map which would allow for its protection and preservation of the natural and cultural values of the surrounding area and is consistent with the objectives of the SEPP.

State Environmental Planning Policy (Coastal Management) 2018

This Policy aims to manage development in the coastal zone and protect the environmental assets of the coast which is identified within the mapping the four coastal management areas that comprise the NSW coastline. This planning proposal maps vegetation communities which exist in the coastal zone such as Mangrove Swamp, Swamp Oak Floodplain Forest, Rough-barked Apple River-flat Forest and Coastal Saltmarsh. Identifying these vegetation communities within the coastal zone and surrounding area within the *HLEP 2013* is consistent with the objectives of the SEPP.

Q6. Is the planning proposal consistent with applicable Ministerial Directions (s.9.1 directions)?

Yes. The planning proposal is consistent with applicable Ministerial Directions. See Appendix C. A discussion of the consistency with the relevant Ministerial Direction is included below:

Direction 1.1 Business and Industrial zones

The objectives of the direction are:

(a) encourage employment growth in suitable locations,

(b) protect employment land in business and industrial zones, and

(c) support the viability of identified centres.

This Direction applies as the proposal affects land within existing business and industrial zones. The planning proposal will generally not reduce the potential floor space area for employment uses in business or industrial zones but rather ensure greater consideration is given to the impact future development could have on the surrounding environment.

Direction 1.2 Rural Zones

The objective of this direction is to protect the agricultural production value of rural land. This planning proposal is consistent with this direction as it does not seek to rezone rural land or contain provisions that would increase the permissible density of land within a rural zone.

Direction 2.1 Environmental Protection Zones

The objective of this direction is:

(a) To protect and conserve environmental sensitive areas

The planning proposal is consistent with this direction as it would facilitate the protection of land identified as having high biodiversity significance in accordance with the Hornsby Vegetation Mapping Report 2017 prepared by Eco Logical Australia. It is intended to continue mapping endangered ecological communities and significant vegetation listed under *NSW Threatened Species Conservation Act 1995* and the *Environment Protection and Biodiversity Conservation Act 1999* as well as adding additional communities.

Direction 3.1 Residential Zones

The objectives of the direction are:

(a) to encourage a variety and choice of housing types to provide for existing and future housing needs,

(b) to make efficient use of existing infrastructure and services and ensure that new housing has appropriate access to infrastructure and services, and

(c) to minimise the impact of residential development on the environment and resource lands.

This Direction applies as the proposal affects land within an existing residential zone. The planning proposal is consistent with this direction as it ensures that housing design and implementation takes into consideration the environmental constraints of a site and the surrounding area to maintain the protection of significant vegetation communities.

Direction 4.4 – Planning for Bushfire Protection

The objectives of the direction are:

(a) To protect life, property and the environment from bush fire hazards, by discouraging the establishment of incompatible land use in bushfire prone area,

(b) To encourage sound management of bush fire prone areas.

The planning proposal applies to land identified under the bushfire prone land map of Hornsby Shire as it maps areas of vegetation which is aligned with the areas of high bushfire attack levels.

The planning proposal will be forwarded to the Commissioner of the NSW Rural Fire Service for comment following receipt of a gateway determination and prior to undertaking community consultation in accordance with Section 3.34 of the *Environmental Planning and Assessment Act 1979*.

Section C – Environmental, social and economic impact

Q7. Is there any likelihood that critical habitat or threatened species, populations or ecological communities, or their habitats, will be adversely affected as a result of the proposal?

The proposed changes seek to increase protection of critical habitat and ecological vegetation communities compared to what is currently included in the HLEP 2013 Terrestrial Biodiversity Map.

Q8. Are there any other likely environmental effects as a result of the planning proposal and how are they proposed to be managed?

No. There are no expected environmental effects as a result of the planning proposal as it would allow for stronger planning controls to provide appropriate environmental protection measures and prevent any vegetation community from being detrimentally impacted.

Q9. Has the planning proposal adequately addressed any social and economic effects?

The consideration of bushland is an integral part of the development assessment process within Hornsby Shire. There may be additional costs for the lodgement of a development application due to potential changes to the application of the SEPP (Exempt and Complying Development) 2008. However, the planning proposal seeks to enhance the protection and management of bushland by ensuring the appropriate level of consideration and assessment is undertaken for all vegetation.

Section D – State and Commonwealth interests

Q10. Is there adequate public infrastructure for the planning proposal?

The proposed amendments sought in this planning proposal will not require the provision of additional public infrastructure.

Q11. What are the views of state and Commonwealth public authorities consulted in accordance with the Gateway determination?

No consultation has been carried out at this stage with any State and/or Commonwealth Public Authorities However, consultation will be carried out in accordance with the requirements of the Gateway Determination. The Commissioner of the NSW Rural Fire Service will be consulted in accordance with Ministerial Direction 4.4.

Part 4 – Mapping

The Planning Proposal seeks to amend the *HLEP 2013* Terrestrial Biodiversity Maps by renaming them and changing the extent of them by implementing the ELA Vegetation Map 2017 (refer to figure 1) plus a 10-metre-wide buffer.

The mapping amendments associated with the planning proposal are outlined below.

ELA Vegetation Map 2017

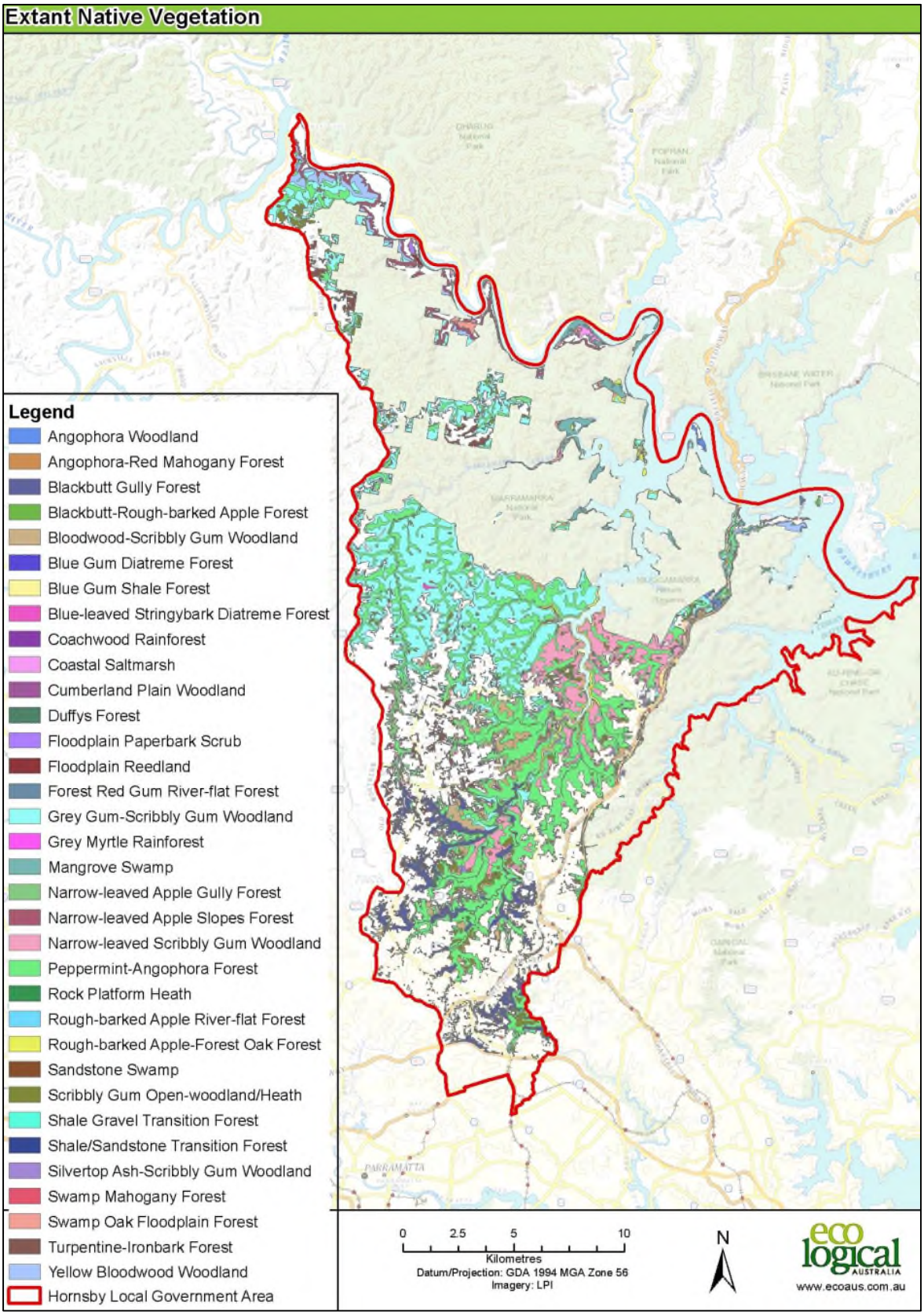

Figure 1: Hornsby Extant Native Vegetation Update Map 2017

Current and Proposed HLEP Vegetation Maps

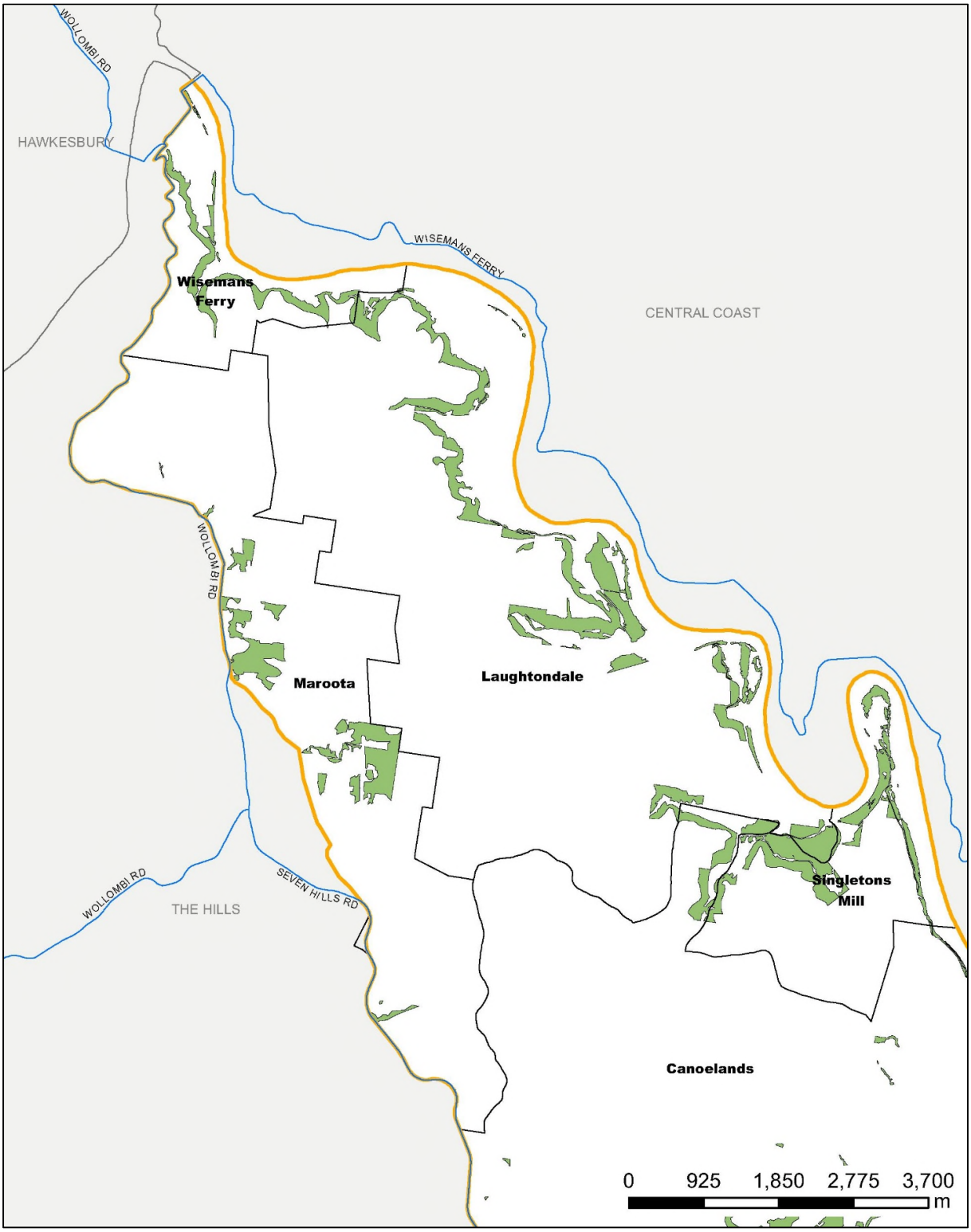

Figure 2: Current Terrestrial Biodiversity Map – Northern Tip of the Hornsby LGA

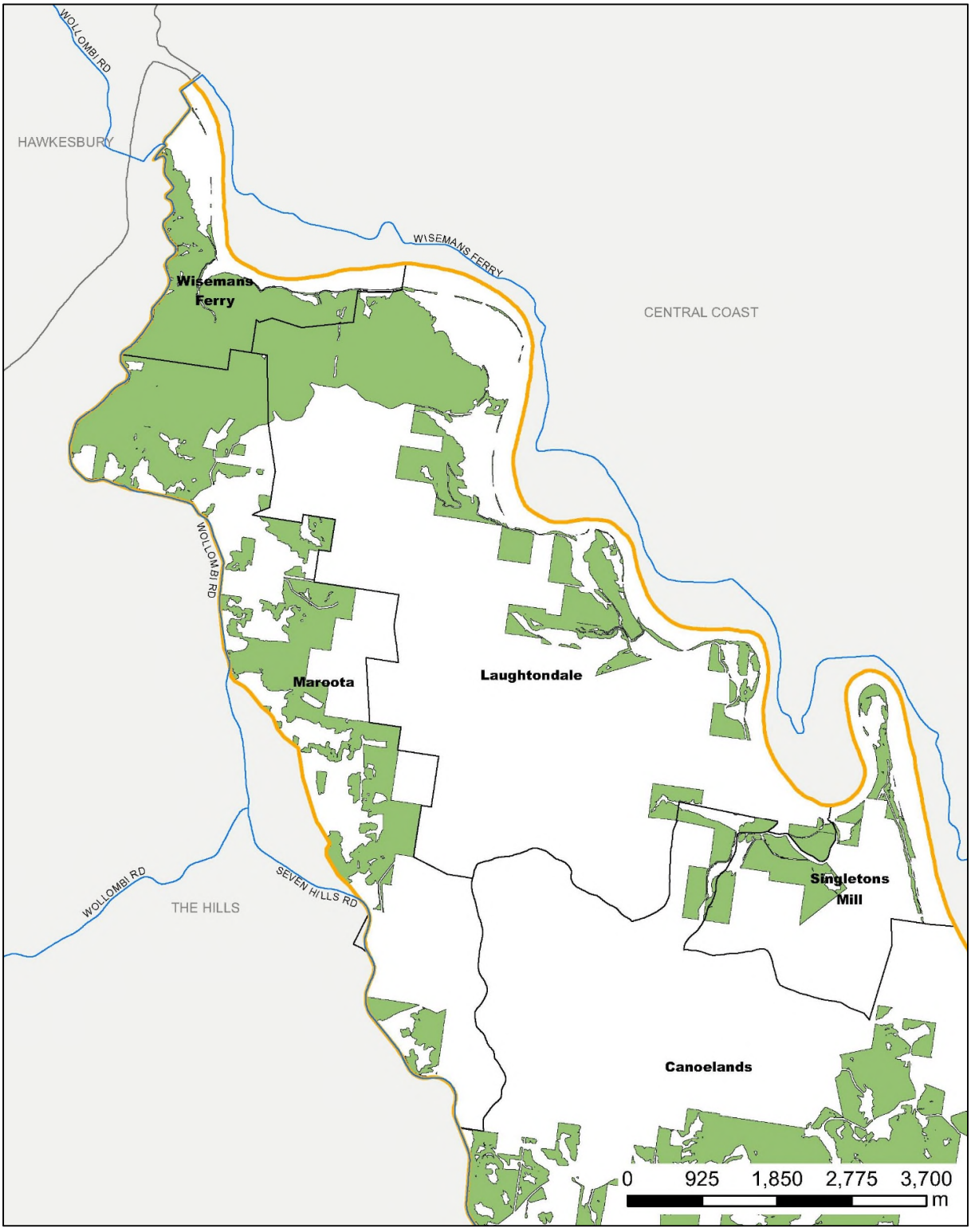

Figure 3: Proposed Terrestrial Biodiversity Map – Northern Tip of the Hornsby LGA

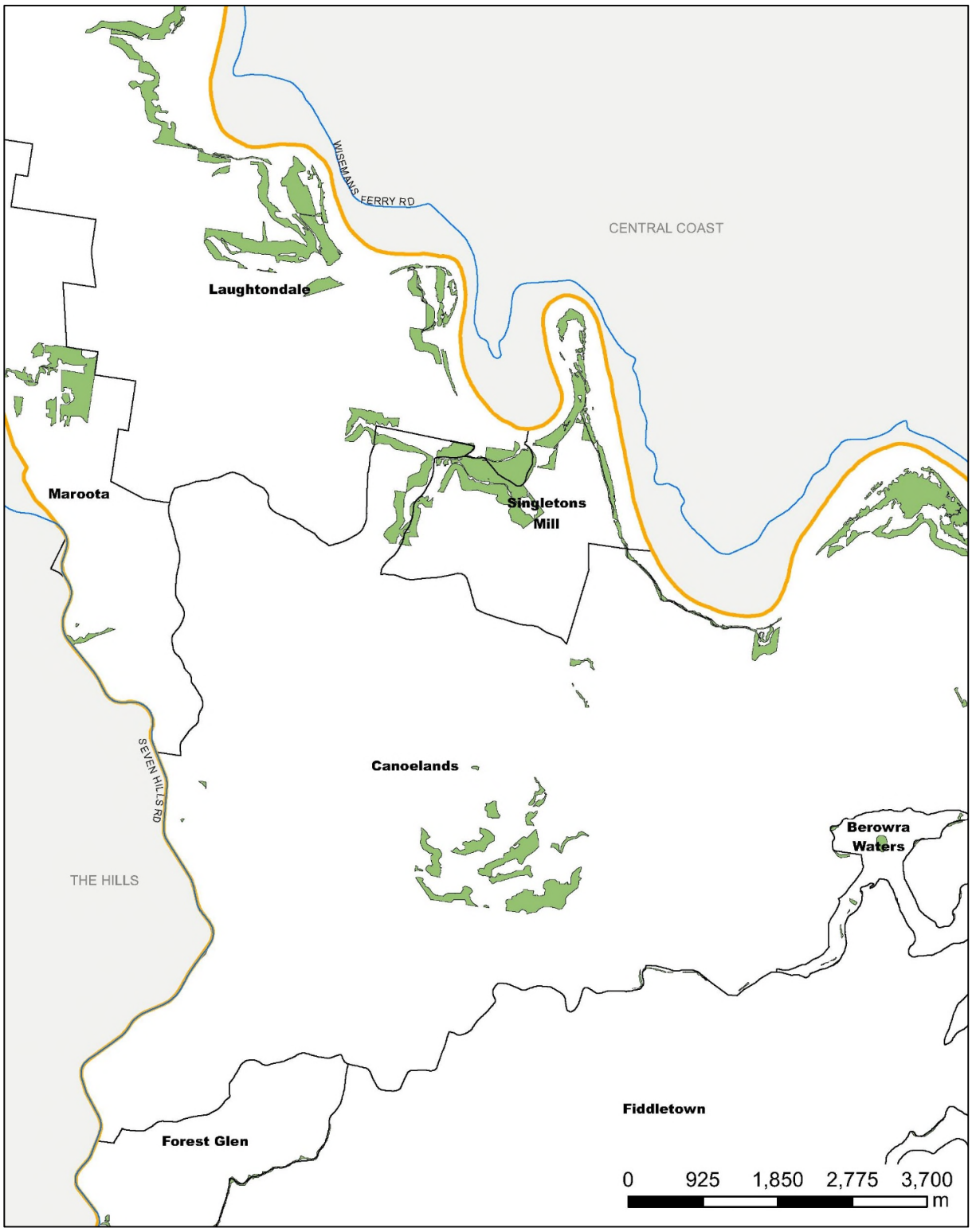

Figure 4: Current Terrestrial Biodiversity Map – Central Northern Area of the Hornsby LGA

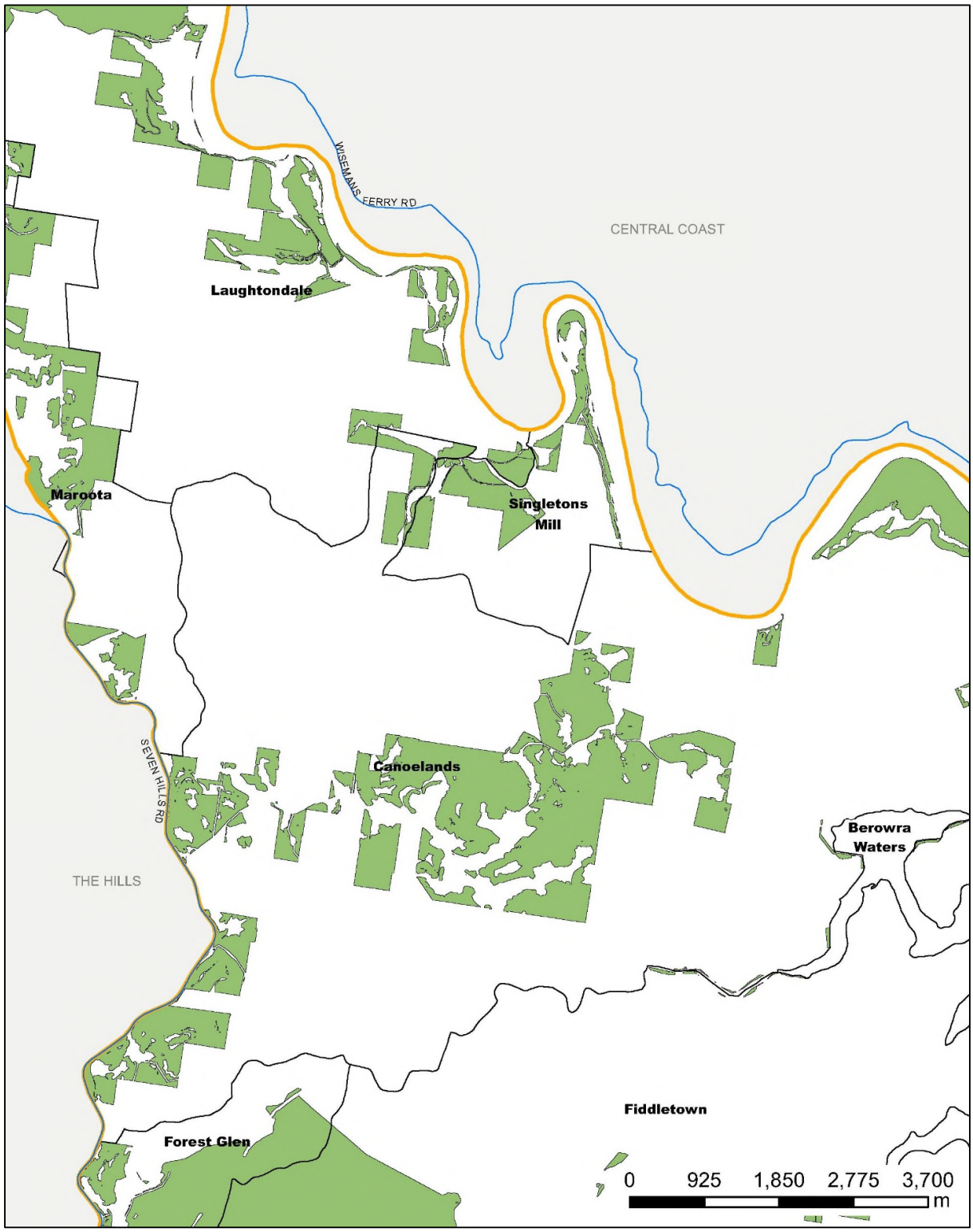

Figure 5: Proposed Terrestrial Biodiversity Map – Central Northern Area of the Hornsby LGA

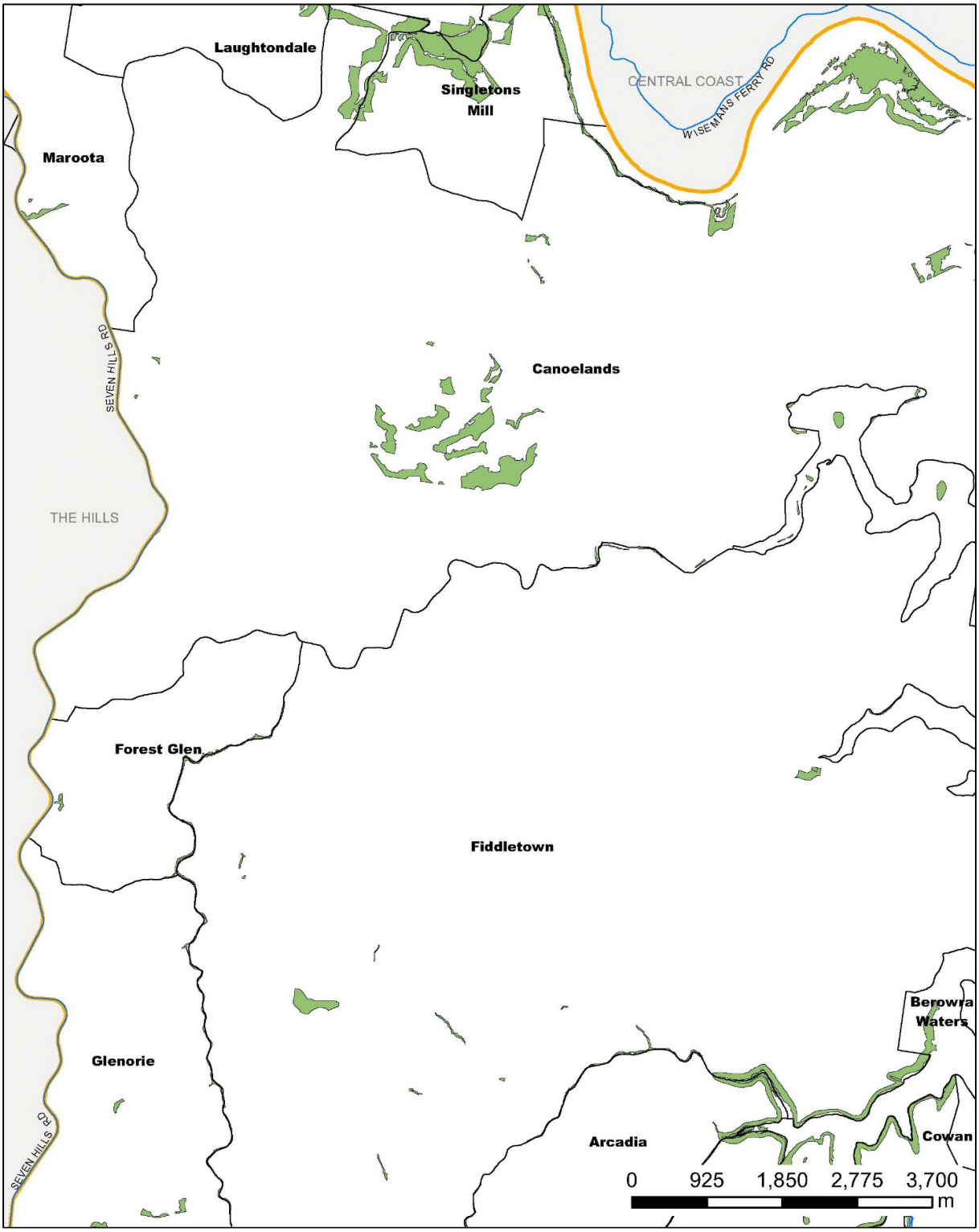

Figure 6 Current Terrestrial Biodiversity Map – North Western Area of the Hornsby LGA

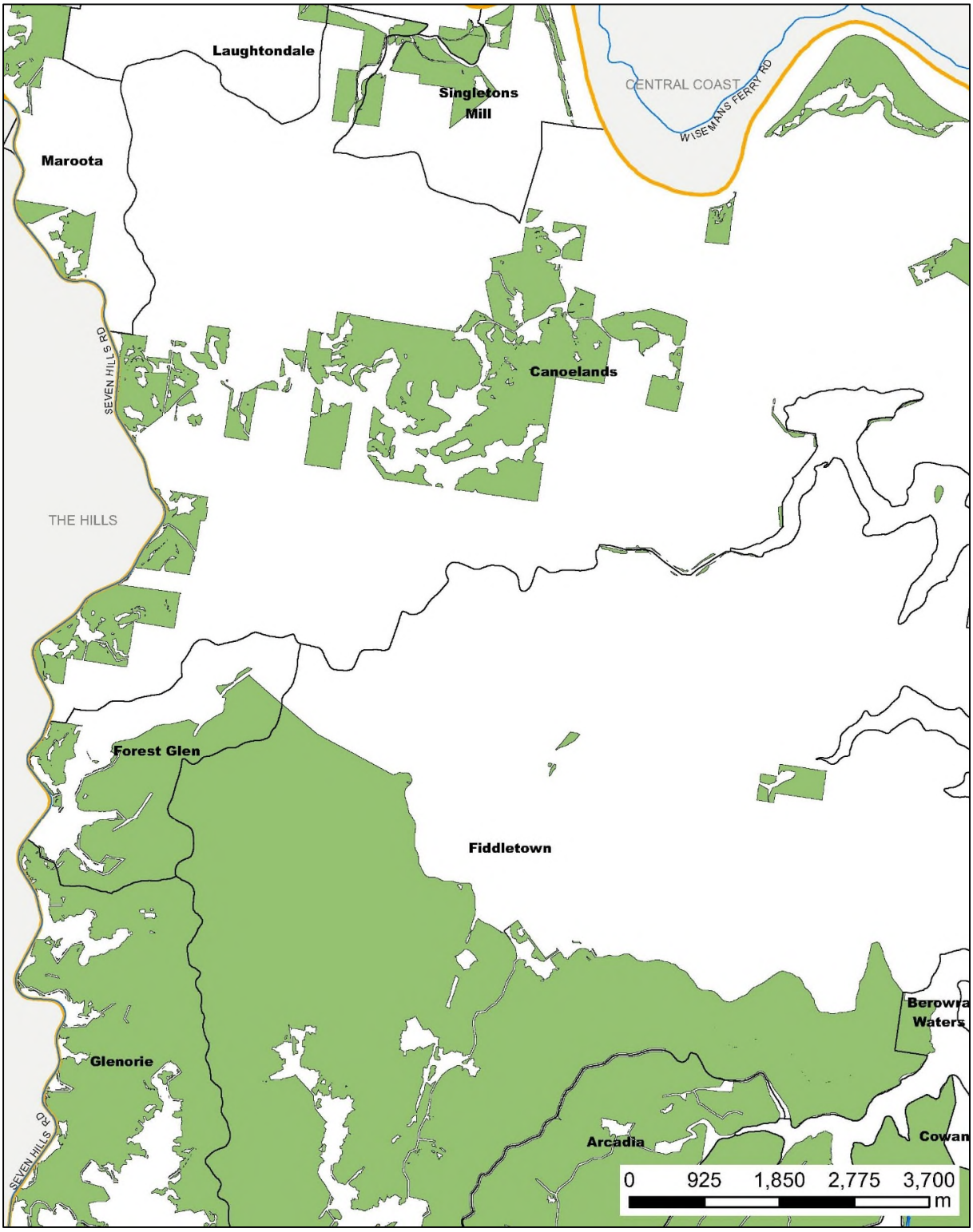

Figure 7: Proposed Terrestrial Biodiversity Map – North Western Area of the Hornsby LGA

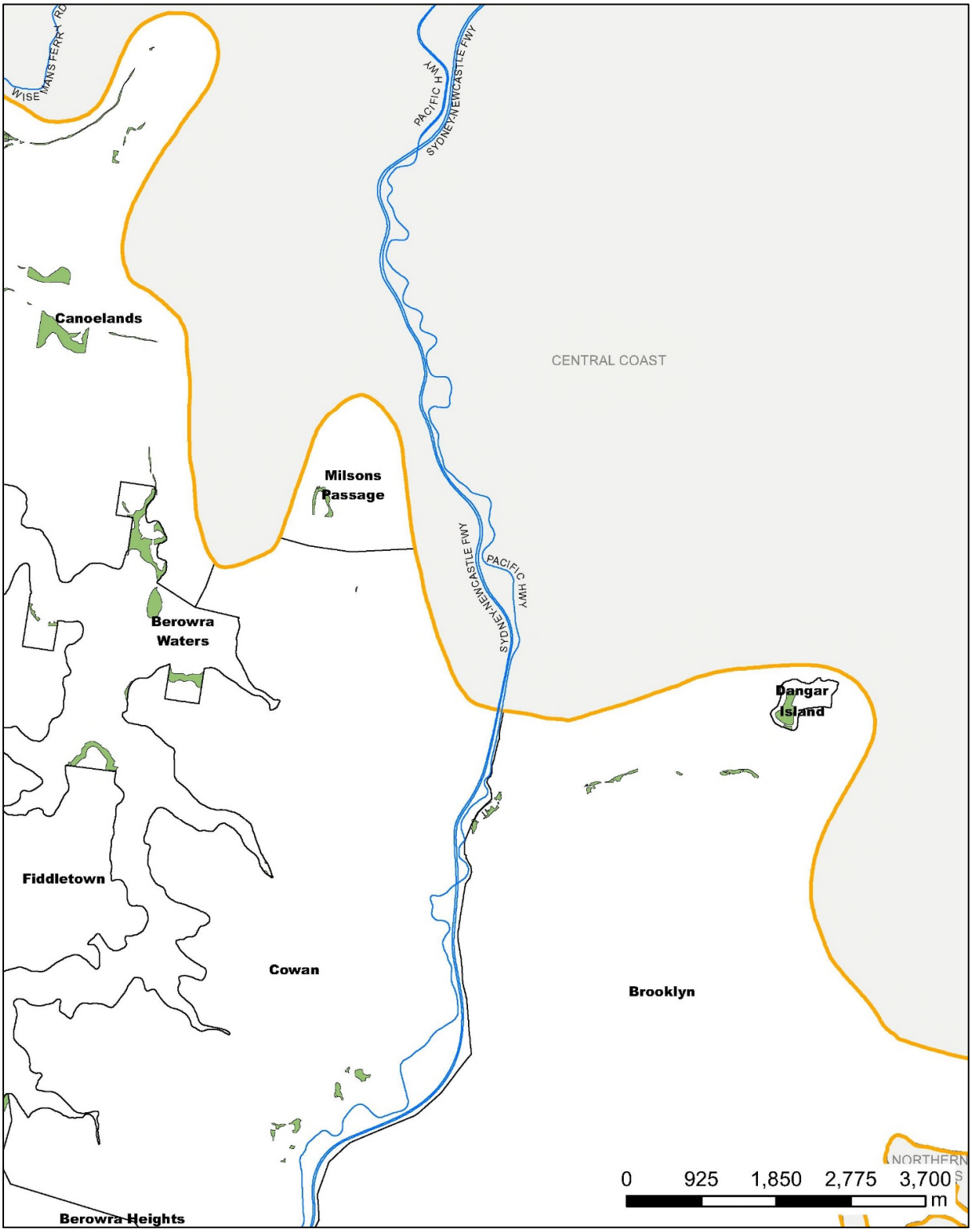

Figure 8: Current Terrestrial Biodiversity Map – North Eastern Area of the Hornsby LGA

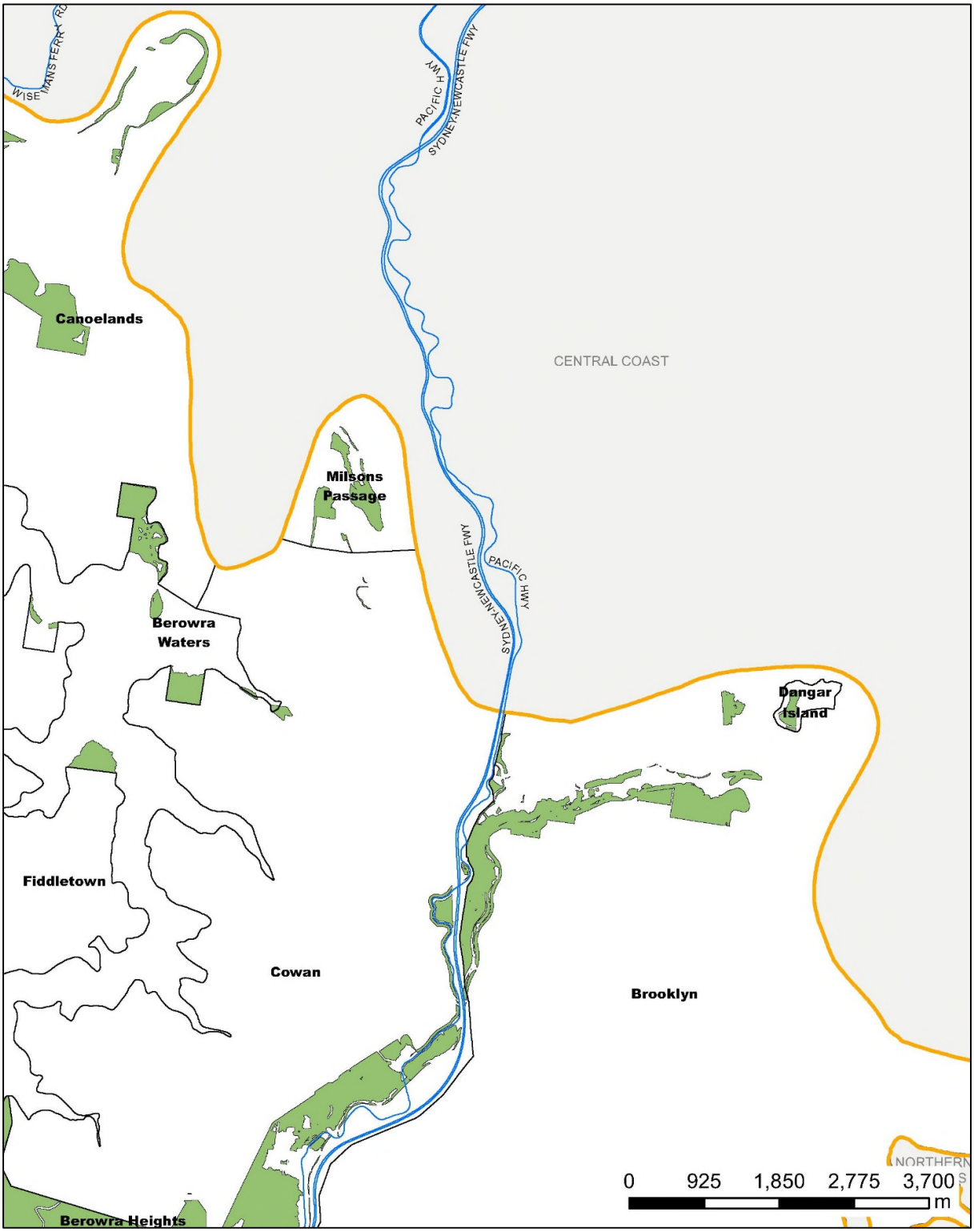

Figure 9: Proposed Terrestrial Biodiversity Map – North Eastern Area of the Hornsby LGA

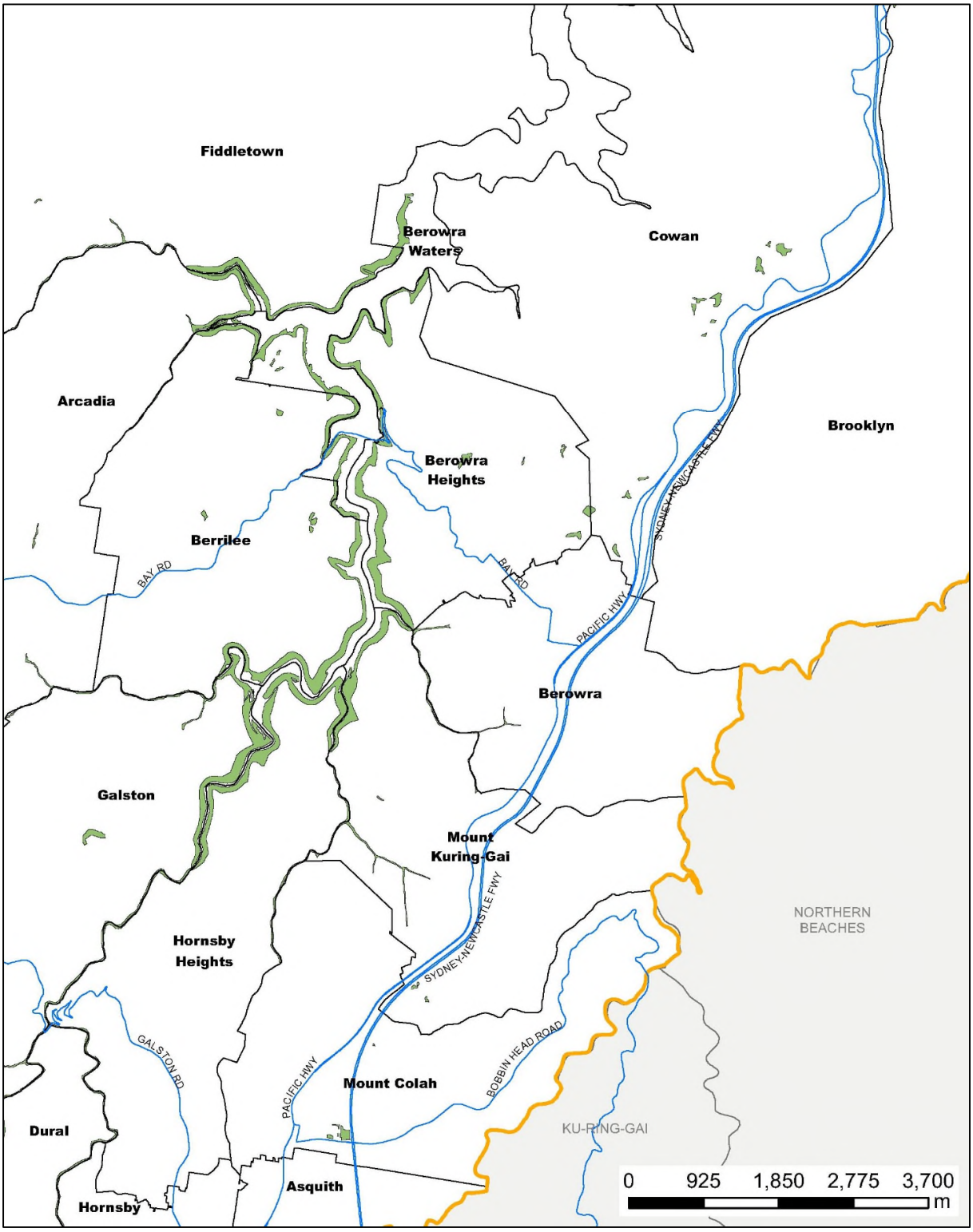

Figure 10: Current Terrestrial Biodiversity Map – Mid Eastern Area of the Hornsby LGA

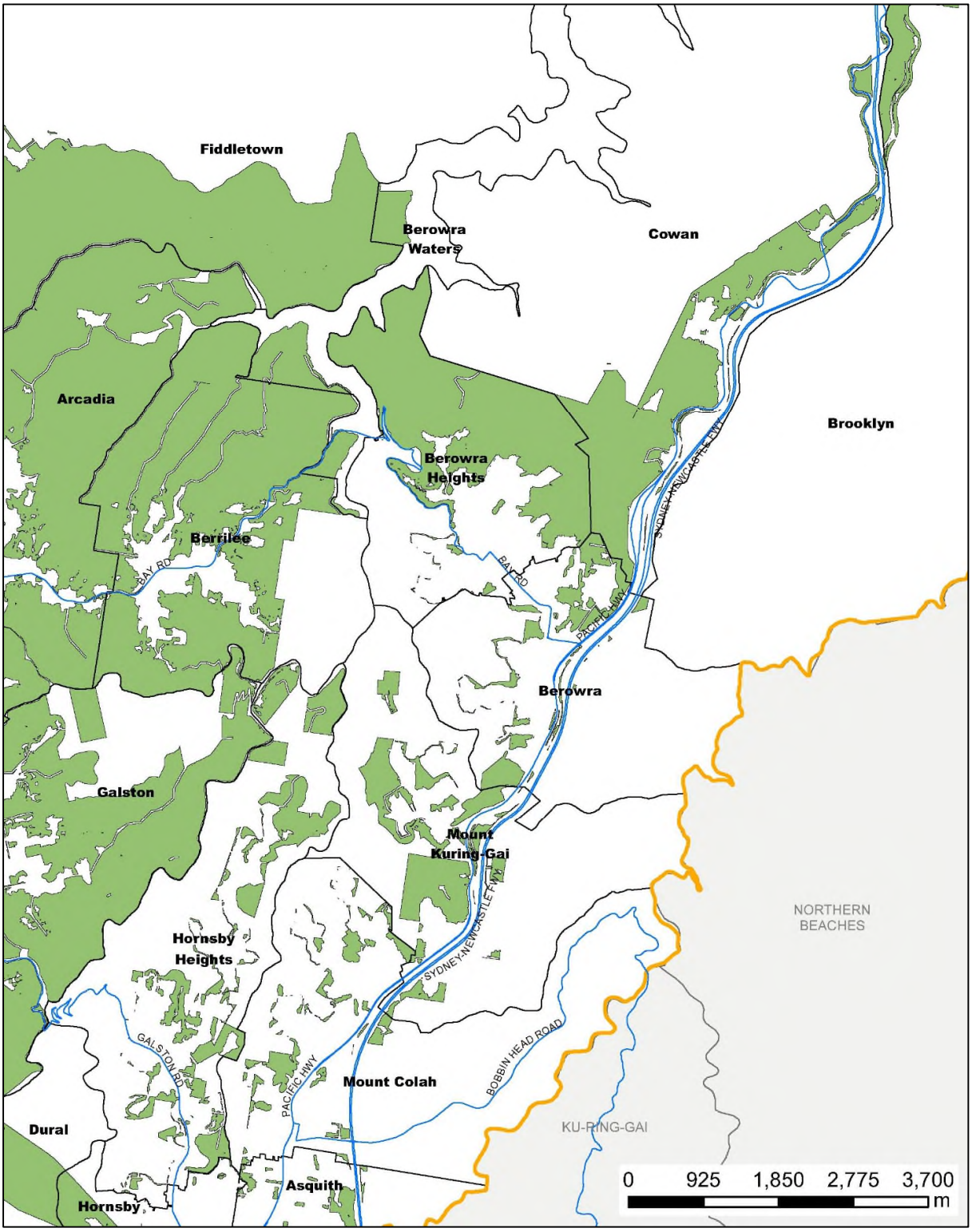

Figure 11: Proposed Terrestrial Biodiversity Map – Mid Eastern Area of the Hornsby LGA

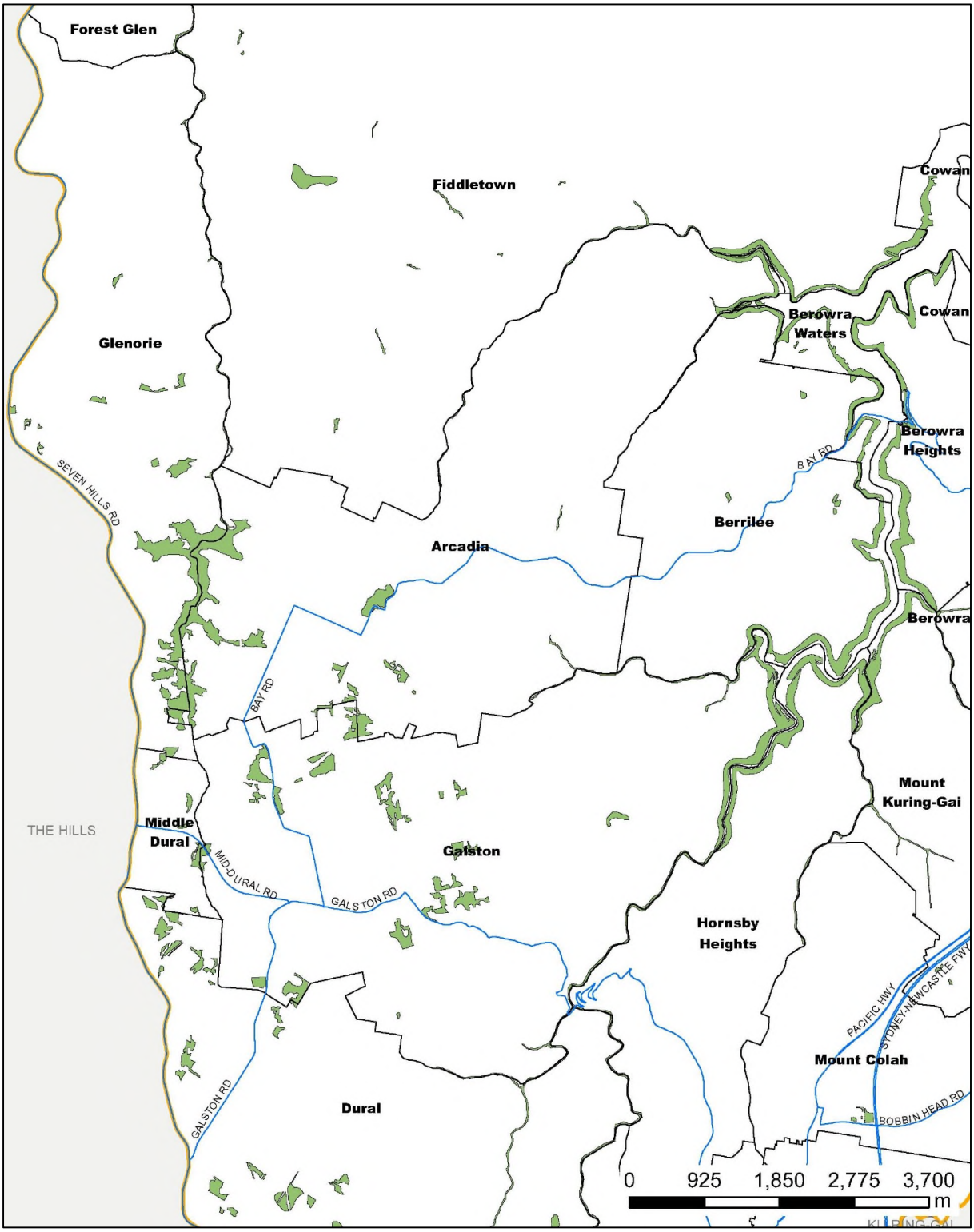

Figure 12: Current Terrestrial Biodiversity Map – Mid Western Area of the Hornsby

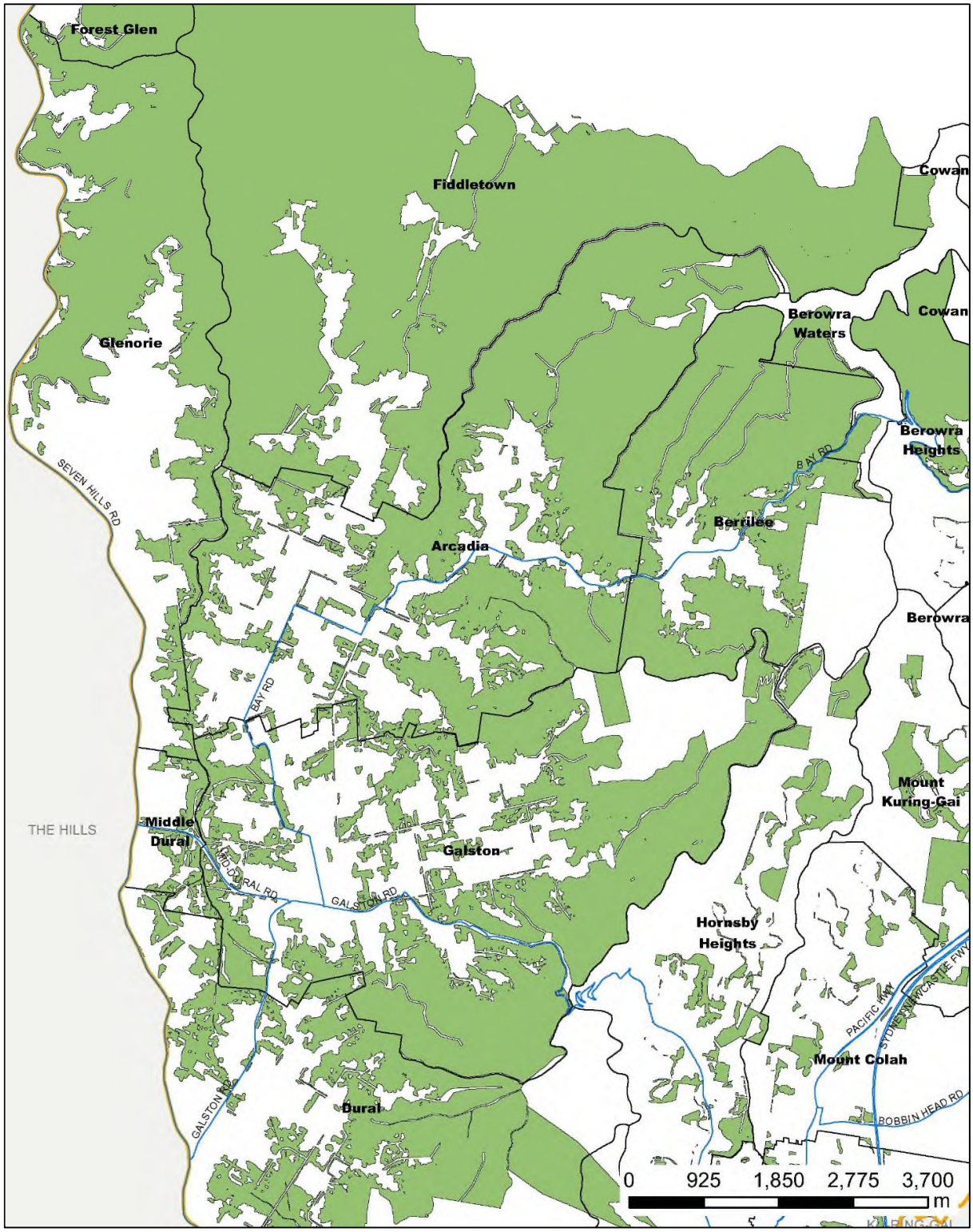

Figure 13: Proposed Terrestrial Biodiversity Map – Mid Western Area of the Hornsby LGA

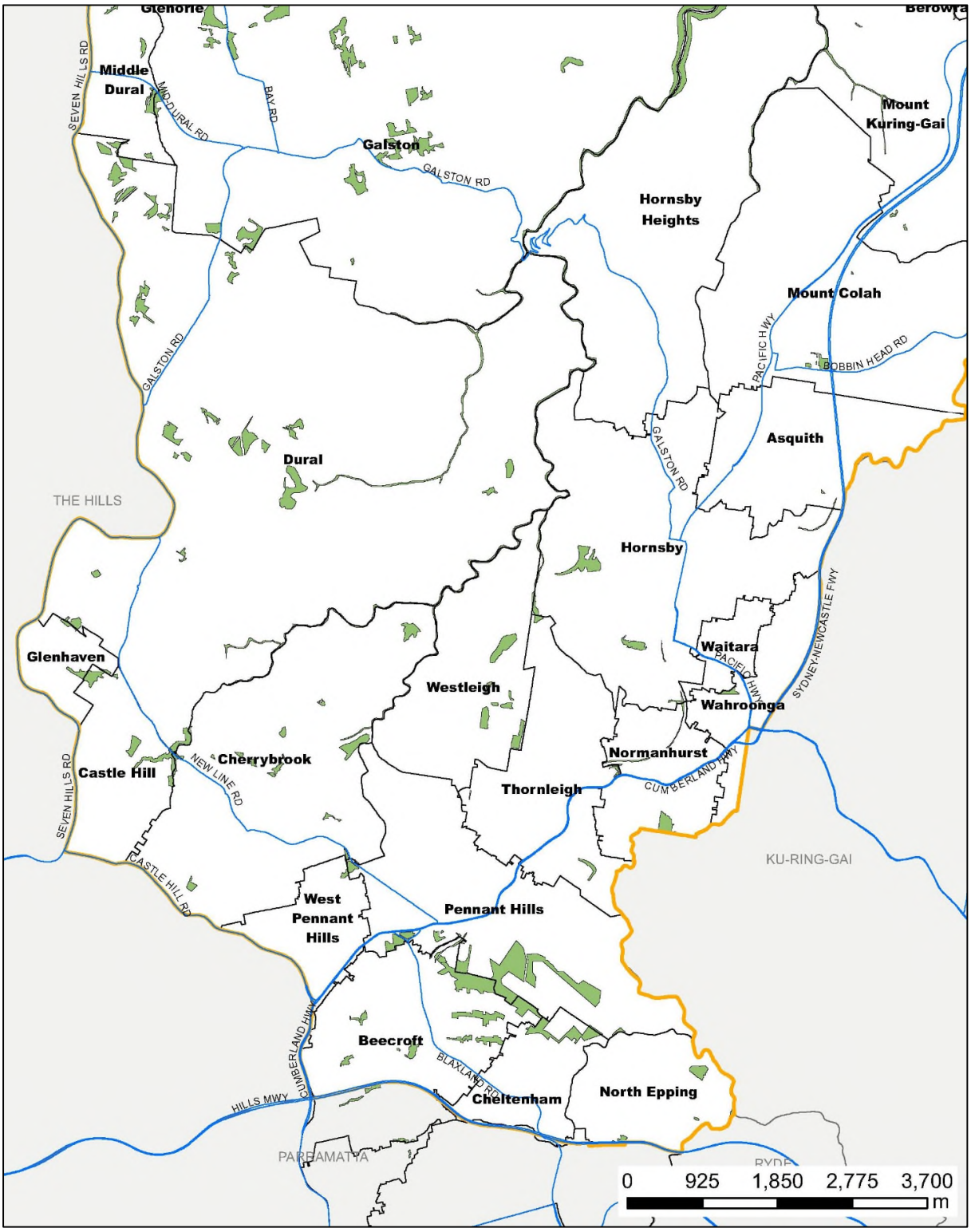

Figure 14: Current Terrestrial Biodiversity Map – Southern Area of the Hornsby LGA

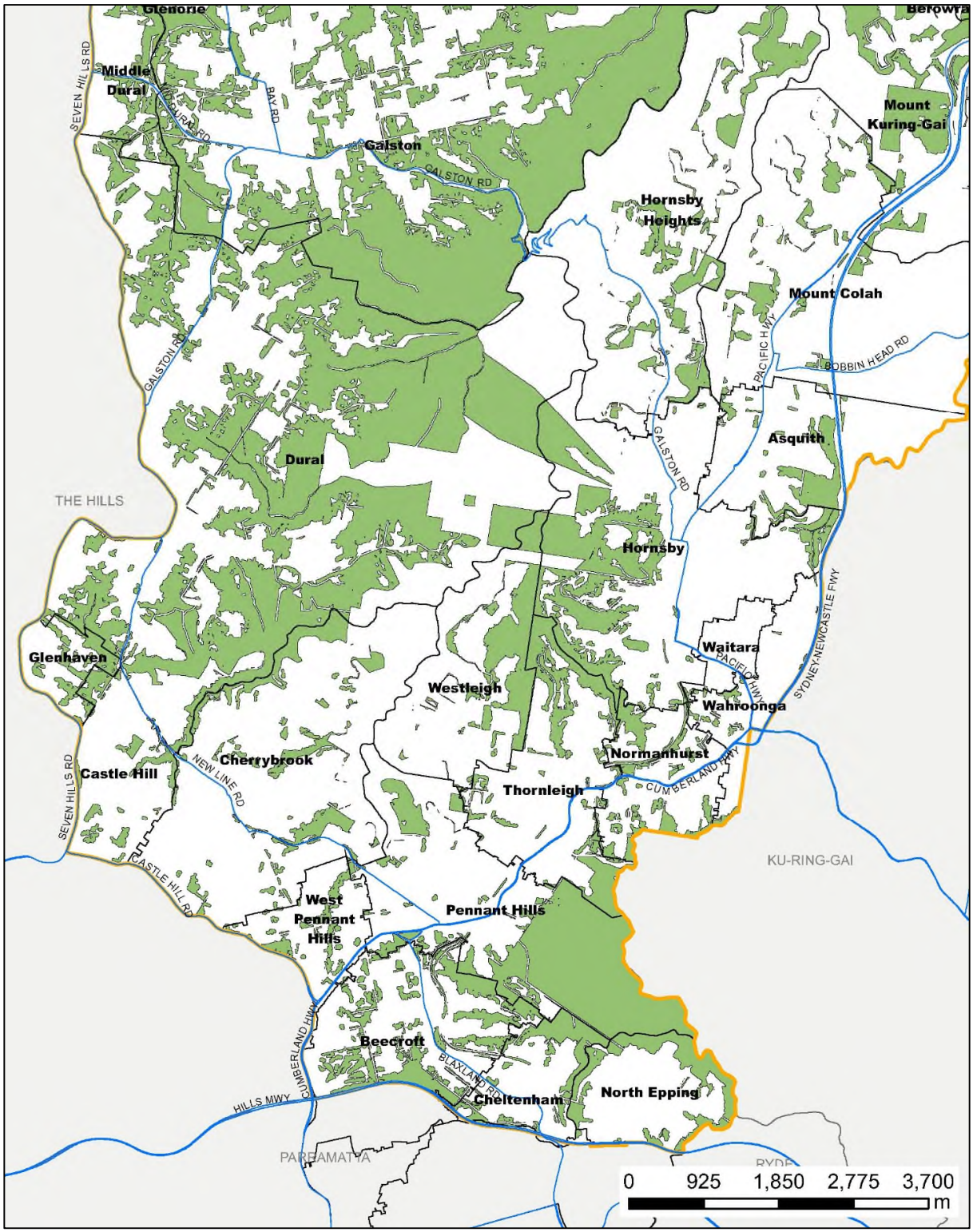

Figure 15: Proposed Terrestrial Biodiversity Map – Southern Area of the Hornsby LGA

Part 5 – Community Consultation

The planning proposal will be publicly exhibited in accordance with the requirements of the Gateway Determination. Public exhibition will include:

Public authorities
Notification letters and a copy of the planning proposal will be sent to public authorities identified in the Gateway Determination.

Letters to affected property owners
Notification letters will be sent to affected property owners advising of the exhibition of the planning proposal.

Advertisement in newspaper
A public notice will be placed in relevant newspapers. The public notice will identify the purpose of the planning proposal, exhibition dates and where the proposal can be viewed.

Have Your Say website
The planning proposal will be exhibited on Council's 'Have Your Say' website (https://www.hornsby.nsw.gov.au/council/noticeboard/your-say)

Display copies at Administration Building and local libraries
The planning proposal will be displayed at Council's Administration Building (296 Peats Ferry Road, Hornsby) and the following libraries:

- Hornsby Library
- Pennant Hills Library
- Berowra Library
- Galston Library

Following community consultation, a report summarising the submissions will be prepared to Council for its consideration.

Part 6 – Project timeline

Stage	Date
Lodge Planning Proposal with DPIE	October 2020
NSW RSF Consultation	November 2020
Anticipated date of Gateway Determination	To be determined
Timeframe for Government Agency Consultation	Approximately 4 weeks
Public exhibition period	Pending Gateway Determination Anticipated exhibition period is 28 days
Timeframe to consider submissions	Approximately 4-6 weeks
Report to Council on exhibition outcome	To be determined
Forward planning proposal to DPIE for finalisation	To be determined
Anticipated date Council will make plan (if delegated)	To be determined
Anticipated date Council will forward to the department for notification	To be determined

Appendix A

Hornsby Vegetation Map Update 2017
Report

Prepared for
Hornsby Shire Council

May 2017

DOCUMENT TRACKING

Item	Detail
Project Name	Hornsby Shire Council Vegetation Mapping Update
Project Number	16NEW - 4076
Project Manager	Sophie Powrie (02) 4910 3410 Level 7, 19 Bolton Street Newcastle, 2300 NSW
Prepared by	Sophie Powrie, Will Introna, Katie Maric
Reviewed by	Nathan Kearnes
Approved by	Nathan Kearnes
Status	FINAL
Version Number	1
Last saved on	17 May 2018

This report should be cited as 'Eco Logical Australia 2017. Hornsby Vegetation Map Update 2017. Prepared for Hornsby Shire Council.

ACKNOWLEDGEMENTS

This document has been prepared by Eco Logical Australia Pty Ltd with support from David Leggett, Mark Hood, Peter Coad, Alexander Fraser, Julie Ryland and David Beharrell from Hornsby Shire Council. The map is based on and updates earlier mapping completed by P. Smith and J. Smith (2008a).

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Abbreviations

Abbreviation	Description
ABS	Australian Bureau of Statistics
API	Aerial Photo Interpretation
BGH	Blue Gum High
EPBC	Commonwealth *Environmental Protection and Biodiversity Conservation Act 1996.*
HSC	Hornsby Shire Council
LGA	Local Government Area
MGA	Map Grid Australia
NSW	New South Wales
OEH	NSW Office of Environment and Heritage
PCT	Plant Community Type
RFS	NSW Rural Fire Service
TEC	Threatened Ecological Community (includes Endangered and Critically Endangered Ecological communities)
TSC	NSW *Threatened Species Conservation Act 1994*
VIS	NSW Vegetation Information System

Executive summary

The Hornsby Vegetation Map 2017 provides current information on the native vegetation in the study area. Previous Hornsby Vegetation mapping was completed in 2008. There are substantial changes in the mapped polygons on the urban-bushland boundary based on the updated imagery and map rules. New mapping thresholds are designed to address Council's information needs arising from new regulations governing vegetation management in NSW, in particular the 10/50 bushfire protection rule. These were developed in consultation with Council and tested in a trial area prior to mapping.

The map has been compiled using visual aerial photo interpretation of 2014 imagery and botanical review. New field work has included collect rapid floristic data at selected survey locations. The update incorporates other sources of field survey and vegetation mapping completed between 2008 and 2017. The map is approximately 1:25,000 scale.

The Hornsby Vegetation Map 2017 applies the existing, accepted vegetation classification established in Smith and Smith Hornsby Vegetation Map 2008 Update. Two updates are provided with the addition of a new code for mixed 'urban native/ exotic' patches (consistent with Sydney Metropolitan vegetation mapping that overlaps part of the study area (OEH 2015)) and an updated classification equivalence table necessitated by changes to NSW plant community types. Modified, predominantly native vegetation has been attributed with the closest, applicable native vegetation and denoted as disturbed. In areas identified as 'urban native/ exotic' the proportion of exotics is highly variable. Field validation is recommended to support land management decisions in these areas.

The 2017 map has identified 17,005 ha of vegetation including 664 ha of EEC and 653 ha of 'urban native/ exotic' vegetation in the study area. In addition, the map includes 231 ha of potential relictual EEC subject to field validation. A direct comparison of changes to vegetation extent between 2008 and 2017 are not possible due to differing map methods.

All maps have limitations and field validation is recommended for detailed site planning and to verify the presence of vegetation types, particularly communities or species listed under the NSW *Threatened Species Conservation Act 1994* or Commonwealth *Environmental Protection and Biodiversity Conservation Act 1996*. Air photo interpretation is limited to a 'birds eye view' and may not detect changes in vegetation composition observable from field survey. Approximately 21% of the map has been validated by current and previous authors.

It is recommended that the Hornsby Vegetation Map 2017 is reviewed after one year in circulation. This will provide an opportunity to collate user feedback and identify minor edits required and any major revisions arising. Changes to the NSW PCT database may be incorporated at that time.

1 Introduction

Hornsby Shire Council required updated vegetation mapping to better inform the development of conservation measures and support ecologically sustainable development in the Shire.

Hornsby Shire Council (HSC) commissioned Eco Logical Australia (LGA) to update of the Local Government Area (LGA) vegetation map. Prior to this update, the principle, LGA wide vegetation map used by Council was Smith & Smith Native Vegetation Communities of Hornsby Shire 2008 Update. Council required a consistent, shire-wide, current vegetation map to reflect changes in the amount of vegetation since 2008, to incorporate additional, detailed vegetation studies that have been completed in the interim and to address Council's information needs arising from new regulations governing vegetation management in NSW.

1.1 Objectives

The objectives of this project were to:

- Create a current, consistent map of extant native vegetation of the study area based on recent aerial photography provided by Council
- Capture vegetation polygons by aerial photo interpretation applying new map rules
- Attribute new polygons applying the existing Smith & Smith 2008 vegetation classes where applicable
- Define thresholds for vegetation to be applied in (separate) Bushfire Prone Analysis
- Identify links to EPBC/TSC Act listed Threatened Ecological Communities (EECs), Keith Class and Sydney vegetation map unit (Benson 1986, 1992, Benson and Howell 1994, Ryan et al. 1996)
- Use mapping methods consistent with OEH Vegetation Mapping Methodology
- Provide clean GIS data compatible with Councils system (ESRI ArcGIS) in GDA94 MGA Zone 56 Projection.

This report documents the technical mapping methods used to capture updated vegetation boundaries and assign vegetation types. The native vegetation types in the 2017 map have been previously defined in Smith & Smith 2008 and are not reproduced here. One additional vegetation type is defined in this report in **Section 2.1**.

1.2 Study Area

The survey area included the Hornsby Local Government Area, excluding National Parks estate (Berowra Valley National Park, Marramarra National Park, Muogamarra Nature Reserve, Long Island Nature Reserve and Ku-ring-gai Chase National Park). Hornsby Local Government Area is located 25 km north west of Sydney, NSW. The LGA covers 46,211 ha and has an estimated population of 168,614 people (ABS 2014). The location of the study area is shown in **Figure 1**.

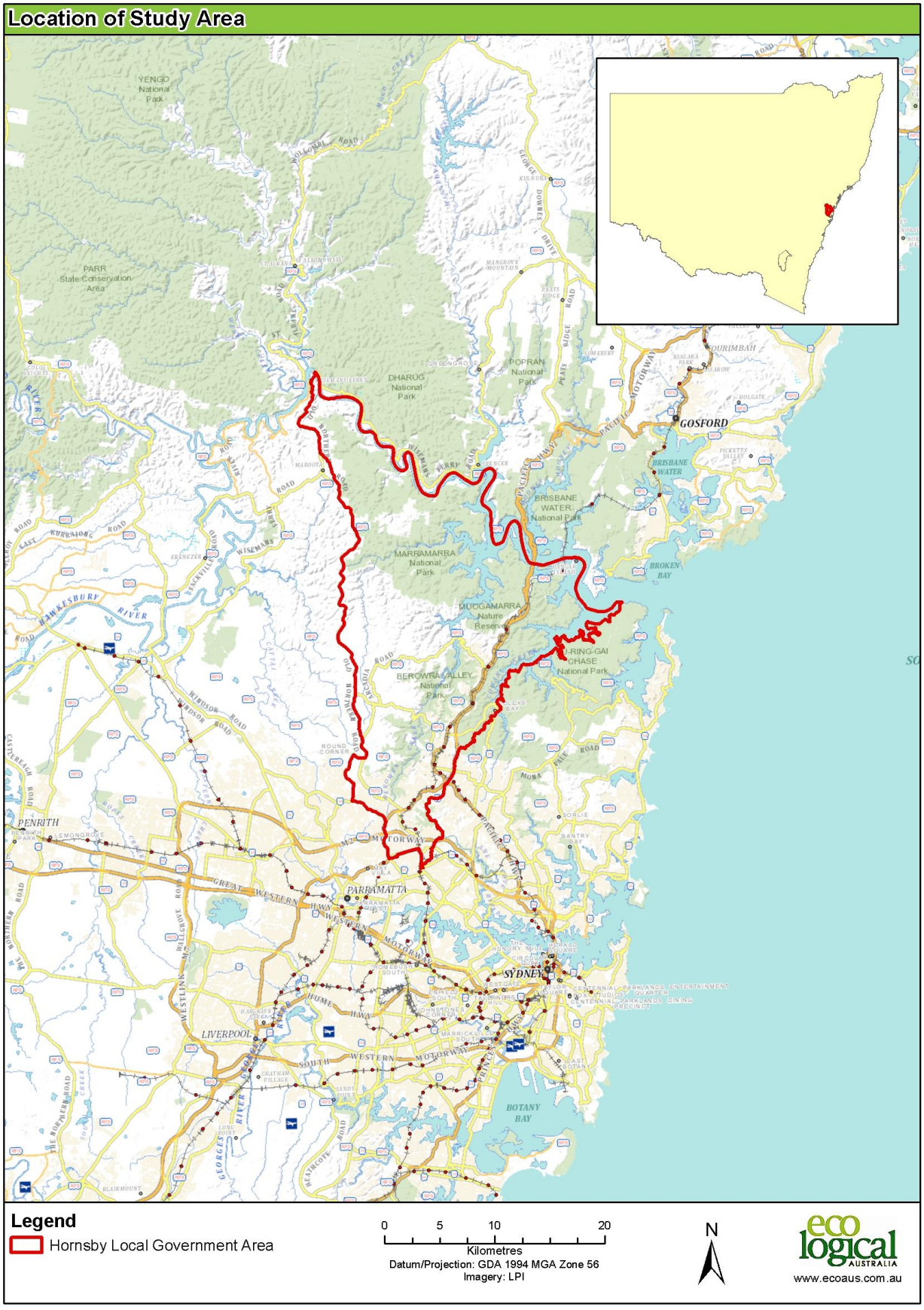

Figure 1: Location of Study Area

1.2.1 Previous vegetation surveys & mapping

There is a rich legacy of botanical surveys in the study area. The major, recent studies are listed in **Table 1**. The Smith & Smith vegetation classification was influenced by work from Benson (1986, 1992) and Benson & Howell (1994) as well as other flora studies.

Table 1: Previous Vegetation Maps

Survey	Author	Year
Remote Sensing analysis report and spatial data	Fugro LADS Corporation Pty Ltd	2015
Vegetation Assessment for Proposed Hornsby Mountain Bike Track	Smith & Smith	2012
The Native Vegetation of the Sydney Metropolitan Area	OEH	2009
Remnant Trees in the Urban District of Hornsby Shire	Smith & Smith	2009
Native Vegetation Communities of Hornsby Shire: 2008 Update	Smith & Smith	2008
Remnant Trees in the Southern Rural District of Hornsby Shire	Smith & Smith	2008
Urban Tree Study	Skelton	2008
Native Vegetation Communities of Hornsby Shire: 2007	Smith & Smith	2007
Endangered ecological community mapping project	Lembit	2005
Hornsby Shire threatened biota conservation plan.	ESP Ecological Surveys & Planning	1999

1.3 Limitations

The updated vegetation mapping is based on visual aerial photo interpretation of vegetation patterns with a discreet survey effort. Not all polygons have been surveyed to verify vegetation type present. All air photo interpretation is limited to a 'birds eye view' and may not detect understorey changes observable from field survey.

Vegetation is mapped at approximately 1:25,000 scale. Field validation is recommended for detailed site planning and to verify the presence of potential listed Threatened Ecological Communities (TEC). The vegetation map may be updated over time.

2 Methods

2.1 Existing classification

The vegetation map update 2017 has assigned vegetation types defined in Smith & Smith (2008a). For new and reclassified polygons (denoted in the GIS table), the 2017 map applied the closest fit vegetation type based on the floristics, structural characteristics and position in landscape. **Table 2** lists the Hornsby vegetation community types and corresponding profile in Smith & Smith 2008a.

In addition to the existing vegetation classes, one additional class has been added. "Remnant Vegetation – to check**"** is defined as

areas with evidence of both exotic and native species in the upper or lower strata situated in a built environment.

This definition is consistent with the unit mapped as "Urban/Native Exotic" in the Sydney Metropolitan Vegetation Mapping (OEH 2015). These polygons have modified structural or floristic characteristics and may include weeds, regrowth, canopy gaps, part clearing, dieback, cultivated exotic species or native plantings in urban or rural residential areas. Potential Sydney Blue Gum High Forest or Sydney Shale Transition Forest were tagged with relevant native vegetation codes pending field validation. Areas of predominantly native vegetation with evidence of structural modifications were assigned to relevant native vegetation code and annotated as 'disturbed, modified understorey'.

Table 2: Hornsby Vegetation Communities

Hornsby vegetation community	Profile description (page in Smith & Smith 2008a)
Coachwood Rainforest	15
Grey Myrtle Rainforest	16
Blackbutt Gully Forest	24
Angophora-Red Mahogany Forest	25
Blue Gum Shale Forest	17
Blue Gum Diatreme Forest	18
Blue-leaved Stringybark Diatreme Forest	21
Blackbutt-Rough-barked Apple Forest	27
Rough-barked Apple-Forest Oak Forest	26
Narrow-leaved Apple Slopes Forest	28
Turpentine-Ironbark Forest	22
Duffys Forest	23
Shale/Sandstone Transition Forest	30

Shale Gravel Transition Forest	29
Angophora Woodland	35
Bloodwood-Scribbly Gum Woodland	32
Silvertop Ash-Scribbly Gum Woodland	33
Narrow-leaved Scribbly Gum Woodland	34
Peppermint-Angophora Forest	31
Narrow-leaved Apple Gully Forest	36
Grey Gum-Scribbly Gum Woodland	37
Yellow Bloodwood Woodland	38
Scribbly Gum Open-woodland/Heath	39
Rock Platform Heath	40
Sandstone Swamp	41
Forest Red Gum River-flat Forest	20
Rough-barked Apple River-flat Forest	19
Swamp Oak Floodplain Forest	45
Floodplain Paperbark Scrub	43
Floodplain Reedland	44
Swamp Mahogany Forest	42
Mangrove Swamp	46
Coastal Saltmarsh	47
Urban Native/ Exotic	N/A

2.2 Baseline Data

The data sets listed in

Table 3 were appended together to create a single working footprint for the updated mapping. Overlapping polygons and gaps created in this process were resolved with new mapping.

Table 3: Baseline data layer inputs

Data set	Application
Smith_Smith_Vegetation_Communities_2008	Appended together to create a single working footprint for the updated mapping
Smith_Smith_Remnant_Trees_Urban_2008	
Smith_Smith_Remnant_Trees_Rural_2008	

2.3 Map Rules

An agreed set of map rules was developed in consultation with Council to guide mappers in consistent collection of vegetation information across the Shire.

- Minimum polygon size of 0.25 ha (except for potential EEC) – used as guidelines only. Polygons under this size threshold are not culled
- Min canopy cover 5% (per Smith & Smith 2007)
- Street trees not generally be mapped unless they form >0.25 ha
- Occurrence of single/isolated trees that may be candidate EEC are delineated in polygons less than 0.25ha. Field surveys are advisable
- Minimum polygon width of 20m, except for linear features such as visible roads and drainage lines
- Maximum gap of contiguous vegetation of 100m – in line with bushfire prone mapping categories
- No min canopy height
- Scale of data capture 1:5,000 or finer
- NPWS Estate to be excluded from mapping
- Edge matching to Ku-ring-gai vegetation mapping
- Native vegetation classification after Smith & Smith (2008a)
- Non native vegetation >0.25ha to be labelled “Remnant Vegetation - *to check*”

Field surveys followed similar guidelines and recorded natural, remnant trees with modified understorey but no greater than 100 m from adjacent native vegetation patch, with a native vegetation type.

The map rules were informed by guidelines to Mapping Bushfire Prone Land Mapping (RFS 2015). RFS definition of ‘bushfire prone’ excludes

- “single areas of vegetation less than 1 hectare in area and greater than 100 metres separation from other prone areas,
- multiple small, vegetation patches (>.25ha) not within 30 metres of each other;
- narrow strips of vegetation (<20m width) regardless of length and not within 20 metres of other prone areas or
- areas of “managed grassland”.

A trial area was mapped initially to verify map rules and mapping procedures matched Council’s information needs.

2.4 Mapping Process

Mapping was undertaken systematically across the study area starting with air photo interpretation followed by botanical review. The methods applied are broadly consistent with the Interim Vegetation Map Standards (OEH 2010).

2.4.1 Air Photo Interpretation

The purpose of Aerial Photo Interpretation (API) is to identify and capture vegetation boundaries. API is the process of delineating and assigning categories to features appearing on aerial photography (Keith 2004, OEH 2010, Lillesand, Kiefer and Chipman 2015). Characteristics of vegetation condition that may be observed from air photos include structural intactness where canopy is open e.g. modified understorey, canopy density (per type), weediness where major infestations are observed e.g. dominated by exotic species, diversity of observable species and mixed age cohorts.

API was based on aerial images taken in 2014 and provided in mosaic form by Council. The landscape was divided into a grid for working purposes and the base 2008 vegetation map was first systematically reviewed against the current imagery for differences requiring delineation. Where an edit was required the interpreter digitized the updated polygon boundary and assigned a 1st pass attribute based on:

- Spectral characteristics observed
- Adjacent vegetation types
- Topographic position in landscape
- Substrate – soil and/or geology
- Landuse context

Attribution was also informed by existing, available studies where possible. Identification of street trees and urban patches was assisted by Council's Street Tree Database (authors unrecorded 2013), Smith & Smith (2008b), Skelton (2008) and Lembit (2006).

API assigned each polygon a confidence rating to identify areas for botanical validation. Polygons were created or reshaped following the agreed map rules. In some areas, interpretation also cross referenced 2015 canopy mapping by OEH and/or Fugro to distinguish vegetation patches in mixed landscapes. Fugro developed a 2m Canopy map of vegetation above 3m height using multispectral Imagery and LiDAR analysis (Fugro LADS 2015).

A separate 'patch' was captured where the area displayed different vegetation characteristics to the adjacent polygon, was >0.25 ha and did not contain canopy gaps >100m. Where the new vegetation was observed to have similar characteristics to adjacent polyons the original polygon was reshaped. Where native vegetation patches contained a highly modified understorey the disturbance was annotated in the map table.

The label 'urban native / exotic' was applied to new capture polygons greater than 0.25 hectares in size where there was evidence of both exotic and native species in the upper or lower strata.

2.4.2 Field Survey

Botanical field surveys were used to identify or confirm vegetation types. Surveys were undertaken, between September 2017 and November 2017, by a qualified botanist. Rapid floristic surveys used a standard field proforma and all data collected digitally. Rapid floristic surveys record the dominant species present in each stratum, information on the landscape context, vegetation type and a photo point. A full list of survey attributes is listed in **Table 4**.

Field surveys were completed on public land including roadside reserves and Council reserves. The new field survey data augmented previous survey data which was also referenced where available to inform attribution.

Table 4: Rapid floristic attributes surveyed

Attribute	Explanation
Date	Date of survey
Recorder	Initials of ecologist undertaking survey
Site Number	Sequential site number per day
Location	Street, suburb reference
Emergent	List scientific name of any dominant species present in emergent stratum (first 4 letters of genus and species)
Tallest	
Mid 1	
Mid 2	
Low 1	
Low 2	
Terrain	Similar to landscape element - alluvial, depression, drainage, flats, dunes, swale, floodplain, hillcrest, hillslope, low hills, steep slopes, ridge, river bank, swale, wetland – to guide API collection
Substrate	Geological process or broad formation (to differentiate EEC presence)
Aspect	N, NE, E, SE, S, SW, W, NW
Slope	if present
Veg Condition	note structural and floristic intactness
Weed cover	% cover
Disturbance	Modified floristic assemblage, modified structure, modified environment eg access tracks
Photo	Photo number
Notes	Notes
Threatened	Threatened flora species observed
Veg Community	Potential equivalent Smith & Smith type(s)
EEC	EEC (candidate/related)

2.4.3 Validation

A 1st pass attribute was assigned to all polygons with a confidence rating. Confidence was rated highest where the polygon was surveyed or previously validated. Moderate confidence was assigned where the vegetation appearance was similar to adjacent confirmed polygon, matches topology, elevation and geology. All other areas were tagged as limited confidence and subject to botanical review. The botanical review started with desktop analysis with reference to:

- Species knowledge and distribution patterns
- Investigation of aerial imagery of adjacent polygons and similar landform and geological characteristics
- Investigation of alternative imagery on Google maps, Google street view and Six Maps. 1943 aerial photographs on Six Maps provided a useful indication of regrowth status
- Investigation of other vegetation studies (where available)

Residual query areas were targeted for field survey where they were accessible. A 2nd pass attribute was assigned following field survey results.

In addition to target areas, the review also sampled a random selection of polygons assigned higher confidence to check attribution was assigned correctly.

Additional field surveys were completed with Hornsby Shire Council staff to identify species present within a subset of areas labelled “Remnant vegetation – to check”. This field work informed attribution in the final map. The field surveys also informed how Council may capture the results of field inspections undertaken as part of routine environmental management services by Council staff for continual map validation and periodic updates.

3 Results

The results of the native vegetation map update 2017 are shown in **Figure 2**. In total 80% of polygons were edited or updated. This includes 3294 new polygons captured. The 2017 map depicts 33 native vegetation communities and 1 urban native/exotic map unit. 28 of the communities are significant at national, State, regional or local level (Smith & Smith 2008a, HSC 2006).

The relationship between native vegetation communities of Hornsby Shire and other vegetation classifications has been updated to reflect changes to the NSW Plant Community Type classification and EEC listings since 2008. The classification equivalence is provided in **Appendix A.**

The 2017 map has identified 17,005 ha of vegetation including 664 ha of EEC and 653 ha of 'Remnant *Vegetation - to check*' vegetation in the study area. The new map rules applied have broadened the definition of vegetation mapped to include vegetation on the peri urban boundary. This has increased the total amount of vegetation mapped by 1506 ha. The new map captures 231 ha of potential, modified EEC. A detailed summary of the extent of each vegetation community in comparison to 2008 mapping is provided in **Appendix B**.

The conservation status of *Angophora Woodlands* has changed to regionally significant for the Sydney Basin bioregion. *Angophora Woodlands* was previously classified as locally significant based on the Hornsby Shire Council Biodiversity Conservation Strategy 2006 (Smith & Smith 2008). *Angophora woodland* has a relatively small distribution of 62 ha in Hornsby LGA and it is not currently listed under the TSC Act or EPBC Act.

Angophora Woodlands is equivalent to NSW Plant Community Type (PCT) 1778 Smooth-barked Apple - Coast Banksia / Cheese Tree open forest on sandstone slopes on the foreshores of the drowned river valleys of Sydney (BVT HN655; ME65). The pre-European extent of this PCT was 6480 ha and the current extent is 648 ha. Therefore, there is only 10% of this community remaining. Over 90% of this PCT has been cleared in the Hawkesbury Nepean and Sydney Metro Catchment Management Areas. Based on the level of past clearing of PCT 1778 within the Sydney Basin bioregion it is considered that this community should be upgraded to a classification of 'regionally significant'.

Approximately 21% of the map has been validated by current and previous authors. 214 areas were validated by Eco Logical Australia in the development of this draft. 28 sites could not be surveyed without accessing private land.

A copy of all digital files are provided to Council for integration into Council's GIS and document system including the updated 2017 vegetation map, updated vegetation look up table, metadata, field survey data and geo-referenced photos.

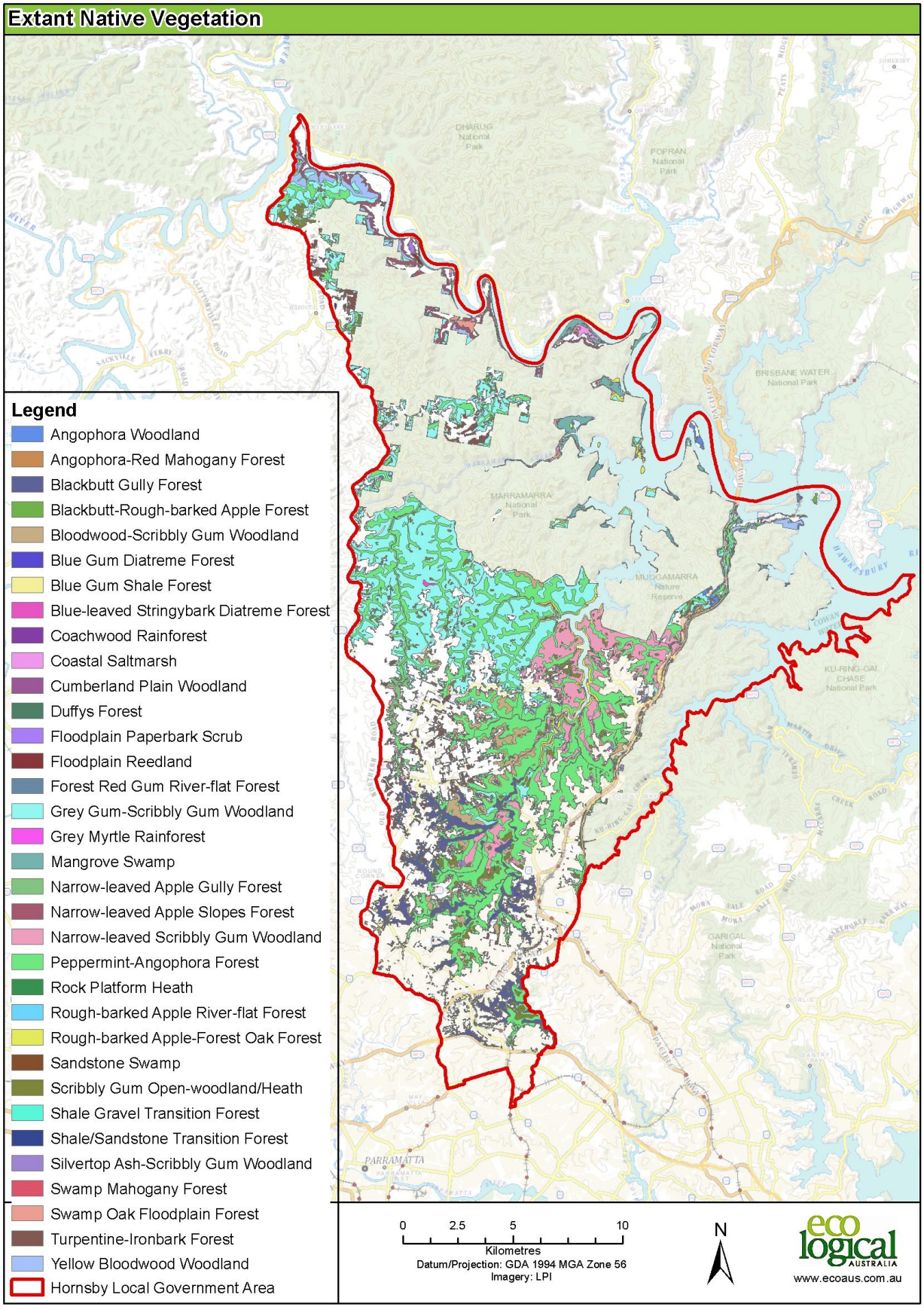

Figure 2: Hornsby Extant Native Vegetation Update 2017

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4 Discussion & Recommendations

The 2008 vegetation map used the definition of native from State Environmental Planning Policy 19 Bushland in Urban Areas. This definition only includes vegetation where the understorey had native component that could regenerate (i.e. presence of understorey). The 2017 map applies a broader vegetation definition and has consequently captured more polygons of remnant vegetation, particular in the urban and rural residential boundaries with bushland. Due to the difference in map thresholds it is not possible to compare the extent of vegetation mapped between 2008 and 2017.

The NSW Scientific Committee determinations of some Threatened Ecological Communities include highly modified relics of the original community. For example the final determination for Blue Gum High Forest noted that

> *Highly modified relics of the community persist as small clumps of trees without a native understorey. All remnants of the community are now surrounded by urban development. Consequently, the distribution of Blue Gum High Forest is severely fragmented. Fragmentation of habitat contributes to a very large reduction in the ecological function of the community. (NSW Scientific Committee 2007).*

The 2017 maps relics of all EECs, including Blue Gum High Forest (BGH) and Blue Gum Diatreme Forest denoted in the attribute table with an 'r'. This will help Council manage this threatened vegetation community and protect relictual occurrences. Whilst *Eucalyptus saligna* (BGH) and *Eucalyptus grandis* appear similar from air photos, *Eucalyptus grandis* is more likely to be planted in landscaped areas and as street trees.

The conservation status of *Angophora Woodlands* is upgraded to regionally significant based on the NSW Plant Community Type equivalent. It is recommended Council review and adopt explicit definitions of local significance and regional significance to assist in consistent interpretation and application across all vegetation in Hornsby LGA.

Almost all patches have exotics in varying dominance. Weed management continues to be a significant challenge in managing the natural bushland. This is a collective responsibility of all landholders and occupiers and is particularly important in areas of relictual EEC. In areas identified as 'urban native/exotic' the proportion of exotics is highly variable. Field validation is recommended to support land management decisions in these areas.

The 2017 map update has provided new, updated API for external vegetation boundaries and attributed observed changes to vegetation structure. Stereoscopic API was not required for this project. Smith & Smith used stereoscopic API to assist delineating vegetation types in contiguous remnants in certain terrain and this attribution was carried forward into the 2017 update (2008a).

It is recommended that the Hornsby Vegetation Map 2017 is reviewed after one year in circulation. This will provide an opportunity to collate user feedback and identify minor edits required and any major revisions arising. Changes to the NSW PCT database may be incorporated at that time. It is recommended Council develop a standard field data protocol to capture results of routine site inspections for the purposes of informing attribution updates on the vegetation map.

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Appendix A Classification Equivalence

This table identifies the relationship between the Hornsby vegetation classification and frequently used classifications. The equivalence table is built on Smith & Smith 2008a and updated with threatened community listings, Biometric Vegetation Types and Plant Community Types as at 20 January 2017. Additional information on equivalence to Sydney Metropolitan Area vegetation mapping (OEH 2013), Southeast NSW Vegetation Map Unit (Tozer et al 2010) and the Sydney vegetation map unit (Benson 1986, 1992, Benson and Howell 1994 and Ryan et al 1996) is available in the digital excel spreadsheet accompanying this report.

Legal status: CE = critically endangered ecological community, E = endangered ecological community, V = vulnerable ecological community. EPBC Act = Environment Protection and Biodiversity Conservation Act 1999, TSC Act = Threatened Species Conservation Act 1995.

Hornsby status: A = threatened community at national level (@20/1/17), N = threatened community in NSW (@20/1/17). R = regionally significant community (Sydney region), L = locally significant community (Hornsby Shire) per Smith & Smith 2008a.

Biometric Vegetation Type: HN numbers refer to Hawkesbury-Nepean catchment management area, ME numbers refer to Sydney Metropolitan catchment management area.

Hornsby vegetation community	NSW Plant Community Type	EPBC Act	NSW TSC Act	Keith Class (2004)	BioMetric Vegetation Type	Hornsby Status
Coachwood Rainforest	905. Lilly Pilly - Coachwood warm temperate rainforest on moist sheltered slopes and gullies, Sydney Basin Bioregion and South East Corner Bioregion	Not listed	Not listed	Northern Warm Temperate Rainforests	HN547/ME016. Lilly Pilly - Coachwood warm temperate rainforest on moist sheltered slopes and gullies, Sydney Basin and South East Corner Bioregion	R
	1292. Water Gum - Coachwood riparian scrub along sandstone streams, Sydney Basin Bioregion (part)	Not listed	Not listed		HN607/ME035.Water Gum - Coachwood riparian scrub along sandstone streams, Sydney Basin (part)	
Grey Myrtle Rainforest	877. Grey Myrtle dry rainforest of the Sydney Basin Bioregion and South East Corner Bioregion	Not listed	Not listed	Dry Rainforests	HN538/ME027. Grey Myrtle dry rainforest of the Sydney Basin and South East Corner	R
Blackbutt Gully Forest	1181. Smooth-barked Apple - Red Bloodwood - Sydney Peppermint heathy open forest on slopes of dry sandstone gullies of western and southern Sydney, Sydney Basin Bioregion (part)	Not listed	Not listed	North Coast Wet Sclerophyll Forests	HN586. Smooth-barked Apple - Red Bloodwood - Sydney Peppermint heathy open forest in sandstone gullies of western Sydney, Sydney Basin (part)	L
Angophora-Red Mahogany Forest	1841. Smooth-barked Apple - Turpentine - Blackbutt tall open forest on enriched sandstone slopes and gullies of the Sydney region	Not listed	Not listed		HN648/ME58. Smooth-barked Apple - Turpentine - Blackbutt tall open forest on enriched sandstone slopes and gullies of the Sydney region	R
Blue Gum Shale Forest	1237. Sydney Blue Gum - Blackbutt - Smooth-barked Apple moist shrubby open forest on shale ridges of the Hornsby Plateau, Sydney Basin Bioregion	Blue Gum High Forest of the Sydney Basin Bioregion (CE)	Blue Gum High Forest in the Sydney Basin Bioregion (CE)		HN596/ME001. Sydney Blue Gum - Blackbutt - Smooth-barked Apple moist shrubby open forest on shale ridges of the Hornsby Plateau, Sydney Basin Bioregion	A,N
Blue Gum Diatreme						A,N

Hornsby vegetation community	NSW Plant Community Type	EPBC Act	NSW TSC Act	Keith Class (2004)	BioMetric Vegetation Type	Hornsby Status
Forest						
Blue-leaved Stringybark Diatreme Forest	1565. Turpentine - Rough-barked Apple - Forest Oak moist shrubby tall open forest of the Central Coast	Not listed	Not listed	Northern Hinterland Wet Sclerophyll Forests	HN664. Turpentine - Rough-barked Apple - Forest Oak moist shrubby tall open forest of the Central Coast	R
Blackbutt-Rough-barked Apple Forest		Not listed	Not listed		HN664. Turpentine - Rough-barked Apple - Forest Oak moist shrubby tall open forest of the Central Coast	R
Rough-barked Apple-Forest Oak Forest	1557. Rough-barked Apple - Forest Oak - Grey Gum grassy woodland on sandstone ranges of the Sydney Basin	Not listed	Not listed		HN665/ME88. Rough-barked Apple - Forest Oak - Grey Gum grassy woodland on sandstone ranges of the Sydney Basin	R
Narrow-leaved Apple Slopes Forest	No corresponding type	Not listed	Not listed		No corresponding type	R
Turpentine-Ironbark Forest	1281. Turpentine - Grey Ironbark open forest on shale in the lower Blue Mountains, Sydney Basin Bioregion	Sydney Turpentine-Ironbark Forest in the Sydney Basin Bioregion (CE)	Sydney Turpentine-Ironbark Forest (E)		HN604/ME041. Turpentine - Grey Ironbark open forest on shale in the lower Blue Mountains, Sydney Basin Bioregion	A,N
Duffys Forest	1085. Red Bloodwood - Smooth-barked Apple shrubby forest on shale or ironstone of coastal plateaux, Sydney Basin Bioregion	Not listed Not listed	Duffys Forest Ecological Community in the Sydney Basin Bioregion (E)		HN567/ME039. Red Bloodwood - Smooth-barked Apple shrubby forest on shale or ironstone of coastal plateaux, Sydney Basin Bioregion	N
Shale/Sandstone Transition Forest	1395. Narrow-leaved Ironbark - Broad-leaved Ironbark - Grey Gum open forest of the edges of the Cumberland Plain, Sydney Basin Bioregion	Shale Sandstone Transition Forest of the Sydney Basin Bioregion (CE)	Shale/Sandstone Transition Forest in the Sydney Basin Bioregion (CE)	Cumberland Dry Sclerophyll Forests	HN556/ME021. Narrow-leaved Ironbark - Broad-leaved Ironbark - Grey Gum open forest of the edges of the Cumberland Plain, Sydney Basin Bioregion	A,N

Hornsby vegetation community	NSW Plant Community Type	EPBC Act	NSW TSC Act	Keith Class (2004)	BioMetric Vegetation Type	Hornsby Status
Shale Gravel Transition Forest	724. Broad-leaved Ironbark - Grey Box - *Melaleuca decora* grassy open forest on clay/gravel soils of the Cumberland Plain, Sydney Basin Bioregion	Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest (CE)	Shale Gravel Transition Forest in the Sydney Basin Bioregion (E)		HN512/ME004. Broad-leaved Ironbark - Grey Box - *Melaleuca decora* grassy open forest on clay/gravel soils of the Cumberland Plain, Sydney Basin Bioregion	A,N
Angophora Woodland	1778. Smooth-barked Apple - Coast Banksia / Cheese Tree open forest on sandstone slopes on the foreshores of the drowned river valleys of Sydney	Not listed	Not listed	Sydney Coastal Dry Sclerophyll Forests	HN655/ME65. Smooth-barked Apple - Coast Banksia / Cheese Tree open forest on sandstone slopes on the foreshores of the drowned river valleys of Sydney	R
Bloodwood-Scribbly Gum Woodland	1083. Red Bloodwood - scribbly gum heathy woodland on sandstone plateaux of the Sydney Basin Bioregion	Not listed	Not listed		HN566. Red Bloodwood - scribbly gum heathy woodland on sandstone plateaux, Sydney Basin Bioregion	
Silvertop Ash-Scribbly Gum Woodland		Not listed	Not listed			L
Narrow-leaved Scribbly Gum Woodland						
Peppermint-Angophora Forest	1250. Sydney Peppermint - Smooth-barked Apple - Red Bloodwood shrubby open forest on slopes of moist sandstone gullies, eastern Sydney Basin Bioregion	Not listed	Not listed		HN651/ME012. Sydney Peppermint - Smooth-barked Apple - Red Bloodwood shrubby open forest on slopes of moist sandstone gullies, eastern Sydney Basin Bioregion	A,N
	1183. Smooth-barked Apple - Sydney Peppermint - Turpentine heathy open forest on plateaux areas of the Sydney Basin Bioregion	Sydney Turpentine-Ironbark Forest in the Sydney Basin Bioregion (CE)	Sydney Turpentine-Ironbark Forest (E)		HN587. Smooth-barked Apple - Sydney Peppermint - Turpentine heathy open forest on plateaux areas of the Sydney Basin Bioregion	
	1292. Water Gum - Coachwood riparian scrub along sandstone streams, Sydney Basin Bioregion (part)	Not listed	Not listed		HN607/ME035.Water Gum - Coachwood riparian scrub along sandstone streams, Sydney Basin Bioregion (part)	
		Not listed	Not listed			
	1127. Sandstone cliff soak moist shrubland of the Sydney Basin Bioregion	Not listed	Not listed		HN580/ME92. Sandstone cliff soak moist shrubland of the Sydney Basin Bioregion	

Hornsby vegetation community	NSW Plant Community Type	EPBC Act	NSW TSC Act	Keith Class (2004)	BioMetric Vegetation Type	Hornsby Status
Narrow-leaved Apple Gully Forest	1181. Smooth-barked Apple - Red Bloodwood - Sydney Peppermint heathy open forest on slopes of dry sandstone gullies of western and southern Sydney, Sydney Basin Bioregion (part)	Not listed	Not listed	Sydney Hinterland Dry Sclerophyll Forests	HN586. Smooth-barked Apple - Red Bloodwood - Sydney Peppermint heathy open forest in sandstone gullies of western Sydney, Sydney Basin Bioregion (part)	R
Grey Gum-Scribbly Gum Woodland	1081. Red Bloodwood - Grey Gum woodland on the edges of the Cumberland Plain, Sydney Basin Bioregion	Not listed	Not listed		HN564. Red Bloodwood - Grey Gum woodland on the edges of the Cumberland Plain, Sydney Basin Bioregion	
		Not listed	Not listed			
Yellow Bloodwood Woodland	1328. Yellow Bloodwood - Narrow-leaved Apple heathy woodland on hinterland plateaux of the Central Coast, Sydney Basin Bioregion	Not listed	Not listed		HN613. Yellow Bloodwood - Narrow-leaved Apple heathy woodland on hinterland plateaux of the Central Coast, Sydney Basin Bioregion	
Scribbly Gum Open-woodland/Heath	882. Hairpin Banksia - Slender Tea-tree heath on coastal sandstone plateaux, Sydney Basin Bioregion	Not listed	Not listed	Sydney Coastal Heaths	HN541. Hairpin Banksia - Slender Tea-tree heath on coastal sandstone plateaux, Sydney Basin Bioregion	
		Not listed	Not listed			
Rock Platform Heath	881. Hairpin Banksia - *Kunzea ambigua* - *Allocasuarina distyla* heath on coastal sandstone plateaux, Sydney Basin Bioregion	Not listed	Not listed		HN540/ME008. Hairpin Banksia - *Kunzea ambigua* - *Allocasuarina distyla* heath on coastal sandstone plateaux, Sydney Basin	R
Sandstone Swamp	978. Needlebush - banksia wet heath on sandstone plateaux of the Sydney Basin Bioregion	Coastal Upland Swamps in the Sydney Basin Bioregion (E)	Coastal Upland Swamp in the Sydney Basin Bioregion (E)	Coastal Heath Swamps	HN560. Needlebush - banksia wet heath on sandstone plateaux of the Sydney Basin Bioregion.	A,N
Forest Red Gum River-flat Forest	835. Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion	Not listed	River-Flat Eucalypt Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner Bioregions (E)	Coastal Floodplain Wetlands	HN526/ME018. Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion	N
Rough-barked Apple River-flat Forest	No corresponding type				No corresponding type	N
Swamp Oak Floodplain Forest	1232. Swamp Oak floodplain swamp forest, Sydney Basin Bioregion and South East Corner Bioregion	Not listed	Swamp Oak Floodplain Forest of the NSW North Coast, Sydney Basin and South East Corner Bioregions (E)		HN594/ME026. Swamp Oak floodplain swamp forest, Sydney Basin Bioregion and South East Corner Bioregion	N

Hornsby vegetation community	NSW Plant Community Type	EPBC Act	NSW TSC Act	Keith Class (2004)	BioMetric Vegetation Type	Hornsby Status
	1234. Swamp Oak swamp forest fringing estuaries, Sydney Basin Bioregion and South East Corner Bioregion				HN595/ME023. Swamp Oak swamp forest fringing estuaries, Sydney Basin and South East Corner Bioregion	
Floodplain Paperbark Scrub	1236. Swamp Paperbark - Swamp Oak tall shrubland on estuarine flats, Sydney Basin Bioregion and South East Corner Bioregion				ME051. Swamp Paperbark - Swamp Oak tall shrubland on estuarine flats, Sydney Basin and South East Corner	N
Floodplain Reedland	1808. Common Reed on the margins of estuaries and brackish lagoons along the New South Wales coastline				ME076. Common Reed on the margins of estuaries and brackish lagoons along the New South Wales coastline	N
Swamp Mahogany Forest	1064. Paperbark swamp forest of the coastal lowlands of the NSW North Coast Bioregion and Sydney Basin Bioregion	Not listed	Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner Bioregions (E)	Coastal Swamp Forests	HN561. Paperbark swamp forest of the coastal lowlands of the North Coast and Sydney Basin Bioregion	N
	923. *Melaleuca linariifolia* - Swamp Mahogany swamp forest in drainage lines of the edges of the Cumberland Plain, Sydney Basin Bioregion				HN551. *Melaleuca linariifolia* - Swamp Mahogany swamp forest in drainage lines of the edges of the Cumberland Plain, Sydney Basin Bioregion	
Mangrove Swamp	920. Mangrove forest in estuaries of the Sydney Basin Bioregion and South East Corner Bioregion	Not listed	Not listed	Mangrove Swamps	HN550/ME024. Mangrove forest in estuaries of the Sydney Basin and South East Corner Bioregion	L
Coastal Saltmarsh	1126. Saltmarsh in estuaries of the Sydney Basin Bioregion and South East Corner Bioregion	Subtropical and Temperate Coastal Saltmarsh (V)	Coastal Saltmarsh in the NSW North Coast, Sydney Basin and South East Corner Bioregions (E)	Saltmarshes	HN579/ME025. Saltmarsh in estuaries of the Sydney Basin and South East Corner Bioregion	A,N
Seagrass Meadow	1913. Seagrass meadows of the estuaries and lagoons of the New South Wales coast	Not listed	Not listed	Seagrass Meadows	ME082. Seagrass meadows of the estuaries and lagoons of the New South Wales coast	R
Freshwater Floodplain Wetlands***	781. Coastal freshwater lagoons of the Sydney Basin Bioregion and South East Corner Bioregion	Not listed	Freshwater Wetlands on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner Bioregions (E)	Coastal Freshwater Lagoons	HN520/ME007. Coastal freshwater lagoons of the Sydney Basin and South East Corner Bioregion	N
	1071. *Phragmites australis* and *Typha orientalis* coastal freshwater wetlands of the Sydney Basin Bioregion				HN630. *Phragmites australis* and *Typha orientalis* coastal freshwater wetlands of the Sydney Basin Bioregion	

Appendix B Vegetation Extent 2017

Code	Vegetation Community	2017 (ha)	2016(ha)	2008(ha)	EEC equivalence
A	A Peppermint-Angophora Forest	5622	5622	5579	
Ar	Ar Peppermint-Angophora Forest	57	57	0	
B	B Narrow-leaved Apple Gully Forest	94	94	93	
BG1	BG1 Blue Gum Shale Forest	54	52	39	Blue Gum High Forest in the Sydney Basin Bioregion (CE)
BG1r	BG1r Blue Gum Shale Forest	81	81	0	Potential Blue Gum High Forest in the Sydney Basin Bioregion (CE). Field survey recommended.
BG2	BG2 Blue Gum Diatreme Forest	20	20	14	Blue Gum High Forest in the Sydney Basin Bioregion (CE)
BG2r	BG2r Blue Gum Diatreme Forest	2	2	0	Potential Blue Gum High Forest in the Sydney Basin Bioregion (CE). Field survey recommended.
Br	Br Narrow-leaved Apple Gully Forest	1	1	0	
C	C Bloodwood-Scribbly Gum Woodland	657	657	636	
CPr	CPr Cumberland Plain Woodland	1	1	0	
Cr	Cr Bloodwood-Scribbly Gum Woodland	51	51	0	
CS	CS Coastal Saltmarsh	58	58	53	Coastal Saltmarsh in the NSW North Coast, Sydney Basin and South East Corner Bioregions (E)
D	D Grey Gum-Scribbly Gum Woodland	4460	4460	4424	
DF	DF Duffys Forest	16	16	16	Duffys Forest Ecological Community in the Sydney Basin Bioregion (E)
DFr	DFr Duffys Forest	1	1	0	Potential Duffys Forest Ecological Community in the Sydney Basin Bioregion €. Field survey recommended.
Dr	Dr Grey Gum-Scribbly Gum Woodland	26	26	0	
E	E Silvertop Ash-Scribbly Gum Woodland	50	50	48	
Er	Er Silvertop Ash-Scribbly Gum Woodland	1	1	0	

Code	Vegetation Community	2017 (ha)	2016(ha)	2008(ha)	EEC equivalence
F	F Narrow-leaved Scribbly Gum Woodland	1295	1295	1271	
Fr	Fr Narrow-leaved Scribbly Gum Woodland	36	36	0	
G	G Scribbly Gum Open-woodland/Heath	647	647	657	
Gr	Gr Scribbly Gum Open-woodland/Heath	2	2	0	
H	H Rock Platform Heath	18	18	19	
I	I Sandstone Swamp	11	11	10	Coastal Upland Swamp in the Sydney Basin Bioregion (E)
L1	L1 Blackbutt Gully Forest	883	883	835	
L1r	L1r Blackbutt Gully Forest	90	90	0	
L2	L2 Angophora-Red Mahogany Forest	0	<0.5 ha	0	
L2r	L2r Angophora-Red Mahogany Forest	12	12	0	
N	N Blue-leaved Stringybark Diatreme Forest	8	8	8	
O1	O1 Coachwood Rainforest	108	108	108	
O2	O2 Grey Myrtle Rainforest	12	12	11	
Q1	Q1 Rough-barked Apple-Forest Oak Forest	312	312	271	
Q1r	Q1r Rough-barked Apple-Forest Oak Forest	0	<0.5 ha	0	
Q2	Q2 Blackbutt-Rough-barked Apple Forest	7	7	7	
R	R Narrow-leaved Apple Slopes Forest	297	297	281	
RF1	RF1 Rough-barked Apple River-flat Forest	7	7	6	River-Flat Eucalypt Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner Bioregions (E)
RF1r	RF1r Rough-barked Apple River-flat Forest	3	3	0	Potential River-Flat Eucalypt Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner Bioregions €. Field survey recommended.
RF2	RF2 Forest Red Gum River-flat Forest	2	2	2	River-Flat Eucalypt Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner Bioregions (E)
S	S Angophora Woodland	64	64	62	

Code	Vegetation Community	2017 (ha)	2016(ha)	2008(ha)	EEC equivalence
SF1	SF1 Swamp Mahogany Forest	5	5	5	Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner Bioregions (E)
SF2	SF2 Floodplain Paperbark Scrub	11	11	12	Swamp Oak Floodplain Forest of the NSW North Coast, Sydney Basin and South East Corner Bioregions (E)
SF3	SF3 Floodplain Reedland	19	19	18	Swamp Oak Floodplain Forest of the NSW North Coast, Sydney Basin and South East Corner Bioregions (E)
SGr	SGr Shale Gravel Transition Forest	1	1	0	Potential Swamp Oak Floodplain Forest of the NSW North Coast, Sydney Basin and South East Corner Bioregions €. Field survey recommended.
SO	SO Swamp Oak Floodplain Forest	134	134	110	Swamp Oak Floodplain Forest of the NSW North Coast, Sydney Basin and South East Corner Bioregions (E)
SOr	SOr Swamp Oak Floodplain Forest	0	<0.5 ha	<0.5 ha	Potential Swamp Oak Floodplain Forest of the NSW North Coast, Sydney Basin and South East Corner Bioregions €. Field survey recommended.
SS	SS Shale/Sandstone Transition Forest	5	5	5	Shale/Sandstone Transition Forest (E, proposed CE)
T	T Yellow Bloodwood Woodland	286	286	284	
TI	TI Turpentine-Ironbark Forest	323	323	295	Sydney Turpentine-Ironbark Forest (E)
TIr	TIr Turpentine-Ironbark Forest	143	143	0	Potential Sydney Turpentine-Ironbark Forest (E). Field survey recommended
W	W Mangrove Swamp	360	360	321	
Z	Z Urban Native Exotic/Remnant vegetation to check	648	653	0	
	EEC	**666**	**664**	**584**	
	Potential EEC relic	**151**	**231**	**n/a**	
	Total	**17003**	**17005**	**15499**	

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Appendix B

Consistency with State Environmental Planning Policies

State Environmental Planning Policy / Deemed SEPPs	Consistency
SEPP No 19 – Bushland in Urban Areas	The planning proposal will not affect the application of the SEPP.
SEPP No 21 – Caravan Parks	Not applicable
SEPP No 33 – Hazardous and Offensive Development	Not applicable
SEPP No 47 – Moore Park Showground	Not applicable
SEPP No 50 – Canal Estate Development	Not applicable
SEPP No 55 – Remediation of Land	The planning proposal will not affect the application of the SEPP.
SEPP No 64 – Advertising and Signage	The planning proposal will not affect the application of the SEPP.
SEPP No 65 – Design Quality of Residential Apartment Development	The planning proposal will not affect the application of the SEPP.
SEPP No 70 – Affordable Housing (Revised Schemes)	The planning proposal will not affect the application of the SEPP.
SEPP (Aboriginal Land) 2019	The planning proposal will not affect the application of the SEPP.
SEPP (Activation Precincts) 2020	Not applicable
SEPP (Affordable Rental Housing) 2009	The planning proposal will not affect the application of the SEPP.
SEPP (Building Sustainability Index: BASIX) 2004	The planning proposal will not affect the application of the SEPP.
SEPP (Coastal Management) 2018	The planning proposal will not affect the application of the SEPP.
SEPP (Concurrences and Consents) 2018	The planning proposal will not affect the application of the SEPP.
SEPP (Educational Establishments and Child Care Facilities) 2017	The planning proposal will not affect the application of the SEPP.
SEPP (Exempt and Complying Development Codes) 2008	The planning proposal will not affect the application of the SEPP.
SEPP (Gosford City Centre) 2018	Not applicable
SEPP (Housing for Seniors or People with a Disability) 2004	The planning proposal will not affect the application of the SEPP.
SEPP (Infrastructure) 2007	The planning proposal will not affect the application of the SEPP.
SEPP (Koala Habitat Protection) 2019	The planning proposal will not affect the application of the SEPP.
SEPP (Kosciuszko National Park - Alpine Resorts) 2007	Not applicable
SEPP (Kurnell Peninsula) 1989	Not applicable
SEPP (Major Infrastructure Corridors) 2020	The planning proposal will not affect the application of the SEPP.
SEPP (Mining, Petroleum Production and Extractive Industries) 2007	The planning proposal will not affect the application of the SEPP.
SEPP (Penrith Lakes Scheme) 1989	Not applicable
SEPP (Primary Production and Rural Development) 2019	The planning proposal will not affect the application of the SEPP.
SEPP (State and Regional Development) 2011	The planning proposal will not affect the application of the SEPP.
SEPP (State Significant Precincts) 2005	Not applicable
SEPP (Sydney Drinking Water Catchment) 2011	Not applicable
SEPP (Sydney Region Growth Centres) 2006	Not applicable
SEPP (Three Ports) 2013	Not applicable
SEPP (Urban Renewal) 2010	Not applicable

State Environmental Planning Policy / Deemed SEPPs	Consistency
SEPP (Vegetation in Non-Rural Areas) 2017	The planning proposal will not affect the application of the SEPP.
SEPP (Western Sydney Employment Area) 2009	Not applicable
SEPP (Western Sydney Parklands) 2009	Not applicable
SREP No 8 (Central Coast Plateau Areas)	Not applicable
SREP No 9 - Extractive Industry (No 2 - 1995)	Not applicable
SREP No 16 – Walsh Bay	Not applicable
SREP No 20 - Hawkesbury- Nepean River (No 2 - 1997)	The planning proposal will not affect the application of the SREP.
SREP No 24 - Homebush Bay Area	Not applicable
SREP No 26 – City West	Not applicable
SREP No 30 - St Marys	Not applicable
SREP No 33 - Cooks Cove	Not applicable
SREP (Sydney Harbour Catchment) 2005	The planning proposal will not affect the application of the SREP.

Appendix C

Consistency with Section 9.1 Ministerial Directions

Section 9.1 Direction		Consistency	Comment
1. Employment and resources			
1.1	Business and Industrial Zones	Yes	The planning proposal is consistent with the Direction as the vegetation mapping will generally not reduce the potential growth of employment land in business and industrial zones. Refer to Question 6 (page 8) of the planning proposal for additional information.
1.2	Rural Zones	Yes	The planning proposal is consistent with the Direction as it does not seek to increase the density within rural zoned land. Refer to Question 6 (page 8) of the planning proposal for additional information.
1.3	Mining, Petroleum Production and Extractive Industries	N/A	
1.4	Oyster Aquaculture	N/A	
1.5	Rural Land	N/A	
2. Environment and heritage			
2.1	Environment Protection Zones	Yes	The planning proposal seeks to update the Terrestrial Biodiversity Map which will facilitate the protection of land identified as having high biodiversity significance. Refer to Question 6 (page 8) of the planning proposal for additional information.
2.2	Coastal Management	N/A	
2.3	Heritage Conservation	N/A	
2.4	Recreation Vehicle Areas	N/A	
2.5	Application of E2 and E3 Zones and Environmental Overlays in Far North Coast LEPs	N/A	
3. Housing, Infrastructure and Urban Development			
3.1	Residential Development	Yes	The planning proposal is consistent with the Direction as it will ensure environmental protection is considered during the development of a residential site. Refer to Question 6 (pages 8) of the planning proposal for additional information.
3.2	Caravan Parks and Manufactured Home Estates	N/A	
3.3	Home Occupations	N/A	
3.4	Integrating Land Use and Transport	N/A	
3.5	Development Near Regulated Airports and Defence Airfields	N/A	

Section 9.1 Direction		Consistency	Comment
3.6	Shooting Ranges	N/A	
4. Hazard and Risk			
4.1	Acid Sulfate Soils	N/A	
4.2	Mine Subsidence and Unstable Land	N/A	
4.3	Flood Prone Land	N/A	
4.4	Planning for Bushfire Protection	Yes	The Planning Proposal applies to land which is mapped as bushfire prone land. However, the changes do not introduce development in hazardous areas. In accordance with this Direction, Council will consult with the Commissioner of the NSW RFS following receipt of the Gateway Determination and prior to undertaking community consultation. Refer to Question 6 (page 8) of the planning proposal for additional information.
5. Regional Planning			
5.1	Implementation of Regional Strategies	N/A	
5.2	Sydney Drinking Water Catchment	N/A	
5.3	Farmland of State and Regional Significance on the NSW Far North Coast	N/A	
5.4	Commercial and Retail Development along the Pacific Highway, North Coast	N/A	
5.5-5.8	Revoked		
5.9	North West Rail Link Corridor Strategy	N/A	
5.10	Implementation of Regional Plans	Yes	The planning proposal is consistent with the objectives of the *Greater Sydney Region Plan: A Metropolis of Three Cities.* Refer to Question 3 (page 5) of the planning proposal.
6. Local Plan Making			
6.1	Approval and Referral Requirements	Yes	The planning proposal does not contain provisions requiring concurrence, consultation or referral of development applications to a Minister or public authority.
6.2	Reserving Land for Public Purposes	N/A	
6.3	Site Specific Provisions	N/A	
7. Metropolitan Planning			
7.1	Implementation of *A Metropolis of Three Cities* (March 2018)	Yes	The planning proposal is consistent with the objectives of the *Greater Sydney Region Plan: A Metropolis of Three Cities.* Refer to Question 3 (page 5) of the planning proposal.
7.2 – 7.10		N/A	