Planning Proposal to amend Great Lakes Local Environmental Plan 2014

Rezone land at South Forster from RU2 (Rural Landscape) to R2 (Low Density Residential) and C2 (Environmental Conservation)

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Table of contents

Version	Purpose of Document	Author	Date
1	Lodgement on NSW Planning Portal	Winton (No. 18) Pty Ltd	02/12/2022
2	Amendment to comply with December 2021 LEP Guide	Locale Consulting	09/02/2022
3	Amendment to reflect updated SEPPs and Ministerial Directions	Locale Consulting	03/03/2022
4	Reviewed for reporting to Council	Council – Richard Pamplin	08/03/2022
5	For Gateway Determination	Locale Consulting	29/03/2022
6	Minor editorial amendments to reflect Gateway Determination	Locale Consulting	23/08/2022
7	Amendments in response to public and agency submissions received during exhibition	xxx	xxx

Introduction

The Planning Proposal has been prepared by MidCoast Council in accordance with Division 3.4 of the *Environmental Planning and Assessment Act 1979* and the relevant Department of Planning and Environment (Department) Guidelines, including the *Local Environmental Plan Making Guideline.*

The Planning Proposal seeks to amend Great Lakes Local Environmental Plan (LEP) 2014 to rezone land in South Forster from RU2 (Rural Landscape) to R2 (Low Density Residential) and C2 (Environmental Conservation).

This Planning Proposal outlines the intended effect of, and justification for, the proposed amendments to Great Lakes LEP 2014.

The proposed amendments were the subject of a report to Council's Wednesday 23rd March 2022 Ordinary Meeting. The report, annexures and resolution relevant to this Planning Proposal are available on MidCoast Council's website https://www.midcoast.nsw.gov.au/Council/Council-Meetings/Meeting-Agendas-and-Minutes

The proclamation of 12 May 2016 ratified the merger of the Local Government Areas of Gloucester Shire, Greater Taree and Great Lakes Council into MidCoast Council. Great Lakes LEP 2014 still stands as a separate environmental planning instrument.

Council requests that the Department issue delegations to Council to make this amendment.

Description of the land and surrounds

The following data is provided in relation to the site:

Table 2.1: Site details

Title Description	Part Lot 72 DP 1273289 (formerly part Lot 303 DP 1099114)
Property Address	Cape Hawke Drive, Forster
Site Area	Approximately 3.98 hectares
Current Zoning – Great Lakes LEP 2014	RU2 – Rural Landscape

The subject land is located at South Forster (known by Council as Fairview West and now called Summer Green by the proponent), and site locality plans are provided in Figures 1 and 2.

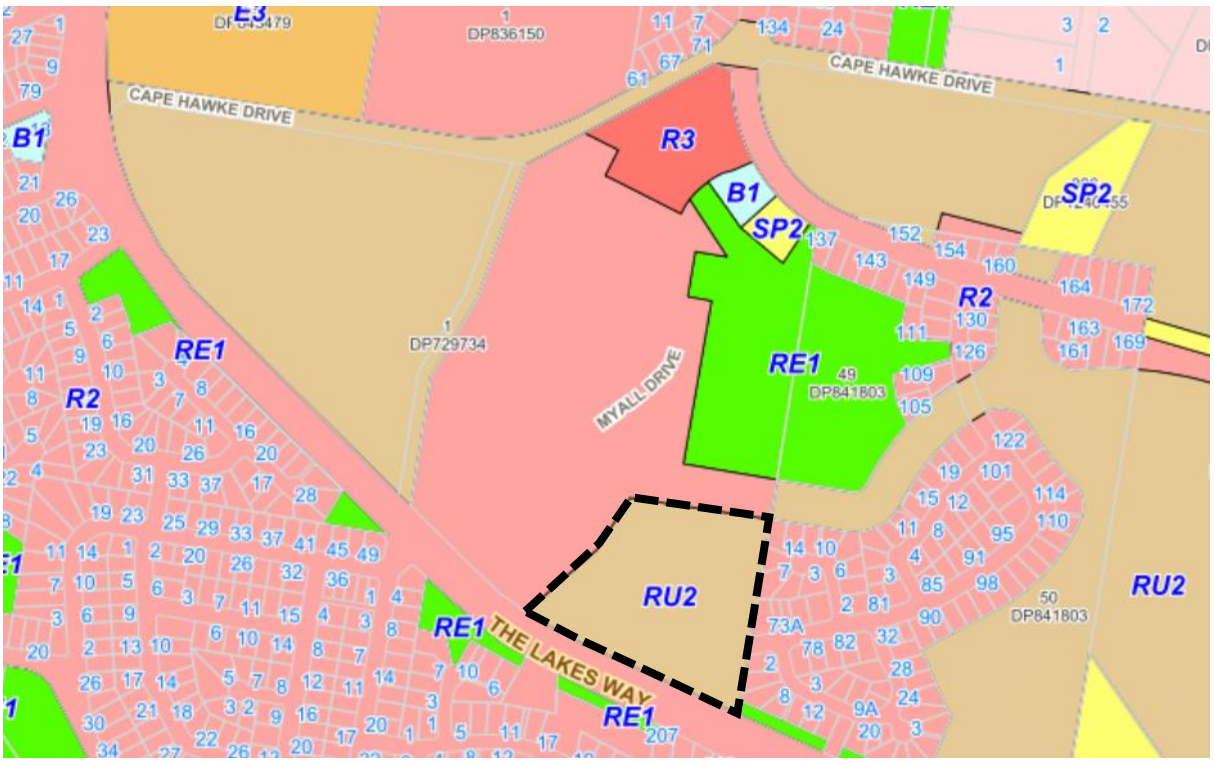


Figure 1: Site Locality Plan (Zoning) ***[MCC IntraMaps]***

Figure 2: Site Locality Plan (Satellite) ***[Nearmap]***

Development of the existing residential parts of the site have been approved and provide for an urban structure similar to the outcomes identified in the *South Forster Structure Plan*. A key component for the land in this structure plan is the connection of Myall Drive through this land to connect with Myall Drive within the adjoining Lakes Estate.

There is also a consent for the land (DA 247/2018) which approved bulk earthworks and a link road over the land zoned RU2. This consent was provided for the use of fill generated by other development at the site to create a raised road corridor and development areas in the area along the southern frontage of the land to The Lakes Way. These works have commenced on the land. An extract of the approved plans for the bulk earthworks is provided in Figure 3 below.

The application for bulk earthworks addressed ecological issues and included an ecological assessment by Ecological Australia. Flooding was considered in the bulk earthworks application. It was noted that localised flooding extends from the adjacent detention lake located on the southern side of Myall Street at approximately RL 4.5m AHD (conservative level). It was noted that flooding is not a major issue on the subject land and the adjacent detention lake will be reviewed in conjunction with the future construction of a bridge structure over the low point of The Lakes Way in a future development application. The proposed site level for the building pad and road area in the bulk earthworks application was approved at 5.2 m AHD to RL 6.0m AHD.

The subject land sits between existing residential development in The Lakes Estate, future residential development on residential zoned parts of the site, and The Lakes Way. Land to the north is forested and extends to the land zoned for public recreation.

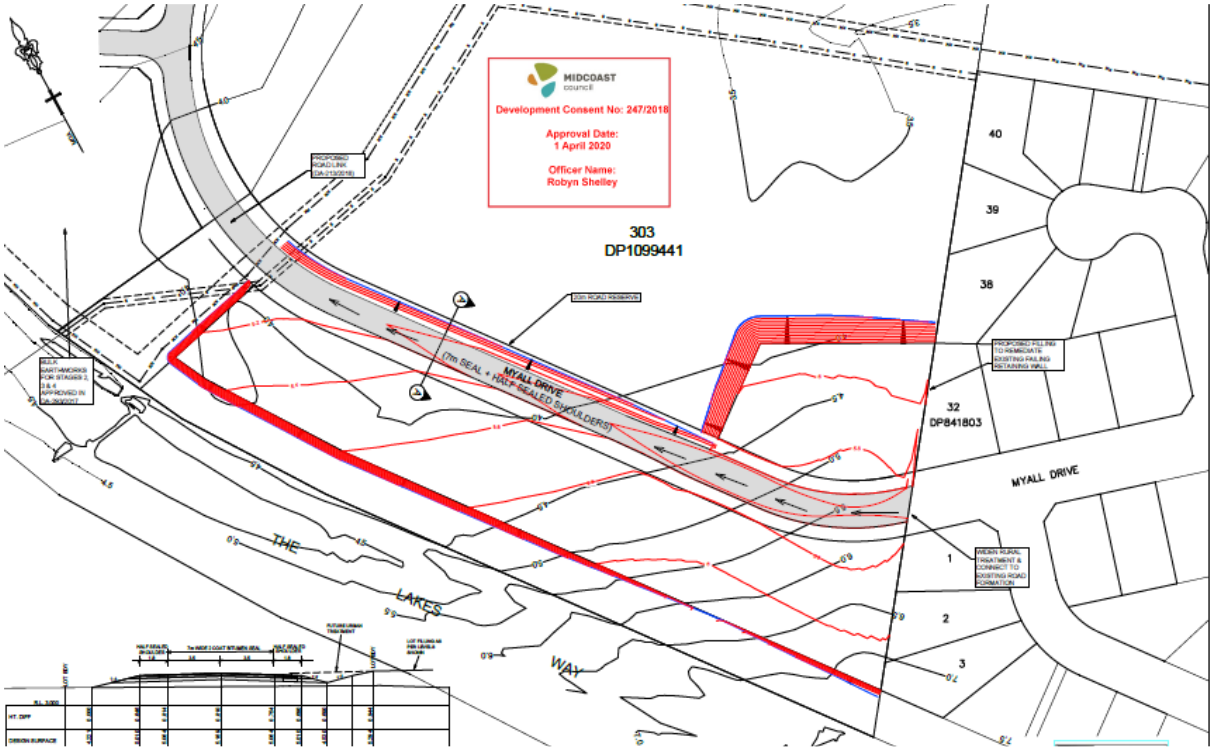


Figure 3: Bulk Earthworks area ***[Lidbury Summers and Whiteman]***

Potential development outcomes

The planning proposal will provide for development and use of the land in a manner consistent with the provisions of local and regional strategies applying to the area. The planning proposal will complete the planning for development of this parcel in accordance with the strategies for the area. The planning proposal will allow the provision of an important link to the Lakes Estate, allowing the completion of Myall Drive through the site and connecting with The Southern Parkway as detailed in the *South Forster Structure Plan*.

To be consistent, and link to, the existing / approved subdivisions to the north and south, any development on the subject land will require a 15 metre open space buffer along the frontage of the land to Lakes Way. No direct vehicular access to the Lakes Way is permitted in any future development on the subject land.

The proposed zoning provides an R2 Low Density Residential Zone over the cleared and disturbed areas where the approved bulk earthworks are under construction, including over the large open drain area that passes through the site. The consent for these works included consideration of ecological assessment and the area does not contain any relevant ecological values.

The remainder of the site contains areas of Endangered Ecological Community (Swamp Oak forest and sedgelands) that are established in the area and provide a core habitat for the threatened species *Lindernia alsiniodes*. These parts of the site will be zoned C2 Environmental Conservation.

Part 1 - Objectives or intended outcomes

(s.3.33(2)(a) A statement of the objectives or intended outcomes of the proposed instrument)

The objectives of the Planning Proposal are to:

1. Rezone RU2 zoned areas of the site from RU2 (Rural Landscape) to R2 (Low Density Residential) and C2 (Environmental Conservation) in accordance with the South Forster Structure Plan.

Part 2 - Explanation of provisions

(s.3.33(2)(b) An explanation of the provisions that are to be included in the proposed instrument)

The objectives and intentions would be achieved by an amendment to Great Lakes LEP 2014. This can be achieved by amending the GL LEP 2014 maps, as outlined below:

- Amend zoning map (Tile LZN_011E) as it affects the subject land by changing the RU2 zoned areas to R2 Low Density Residential and C2 – Environmental Conservation as detailed in the proposed zoning maps.

- Amend the Lot Size Map (Tile LSZ_011E) as it affects the subject land by changing the RU2 zoned area minimum lot size control from 40 hectares to 450m^2 in the areas to be zoned R2.

- Amend the floor space ratio map (Tile FSR_011E) as it affects the subject land by changing the R2 zoned area floor space ratio control from 0.4:1 to 0.5:1.

Part 3 - Justification

(s.3.33(2)(c) Justification for the objectives or intended outcomes and the process for their implementation)

Section A – Need for the Planning Proposal

3.A.1 Is the Planning Proposal a result of an endorsed LSPS, strategic study or report?

The land is part of the South Forster Development Area which has been identified for urban growth for over 30 years. The growth of the area has been the subject of numerous local strategies and studies that support the proposed outcomes for the land.

Forster Tuncurry Conservation and Development Strategy

The subject land was identified as part of the South Forster Development Precinct in this Strategy which was prepared by Council in 2003. The strategy identifies the land as relatively unconstrained land and shows the entire areas as future residential land as can be seen in the map extract from the strategy.

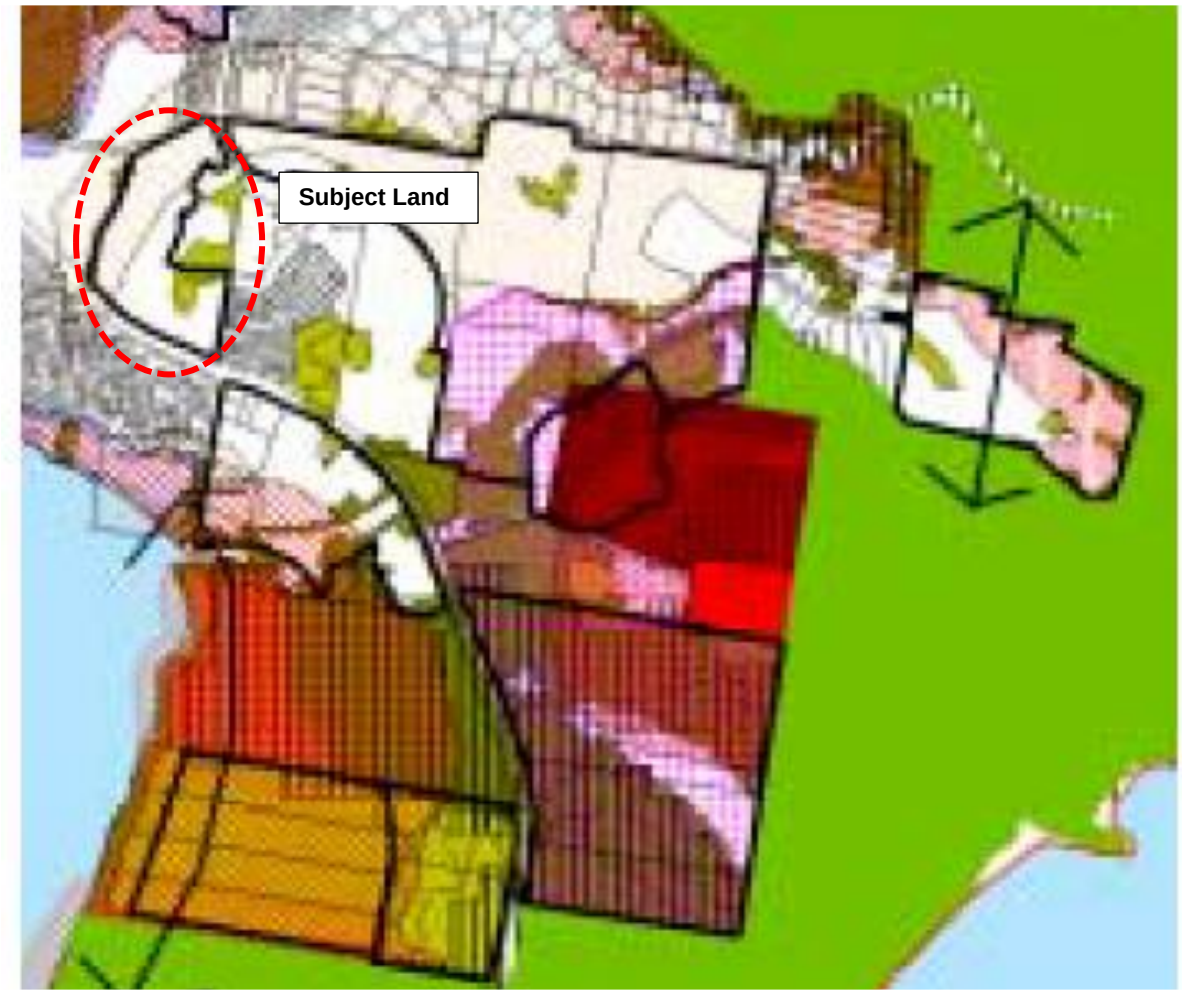


Figure 5: Extract of Forster Tuncurry Conservation and Development Strategy [MCC]

South Forster Structure Plan

To further guide development of the South Forster area and ensure that the development of different landholdings occurred in a coordinated manner, Great Lakes Council prepared the *South Forster Structure Plan* in 2006. The area has been rezoned and areas in the precinct are developing in a manner consistent with the Structure Plan.

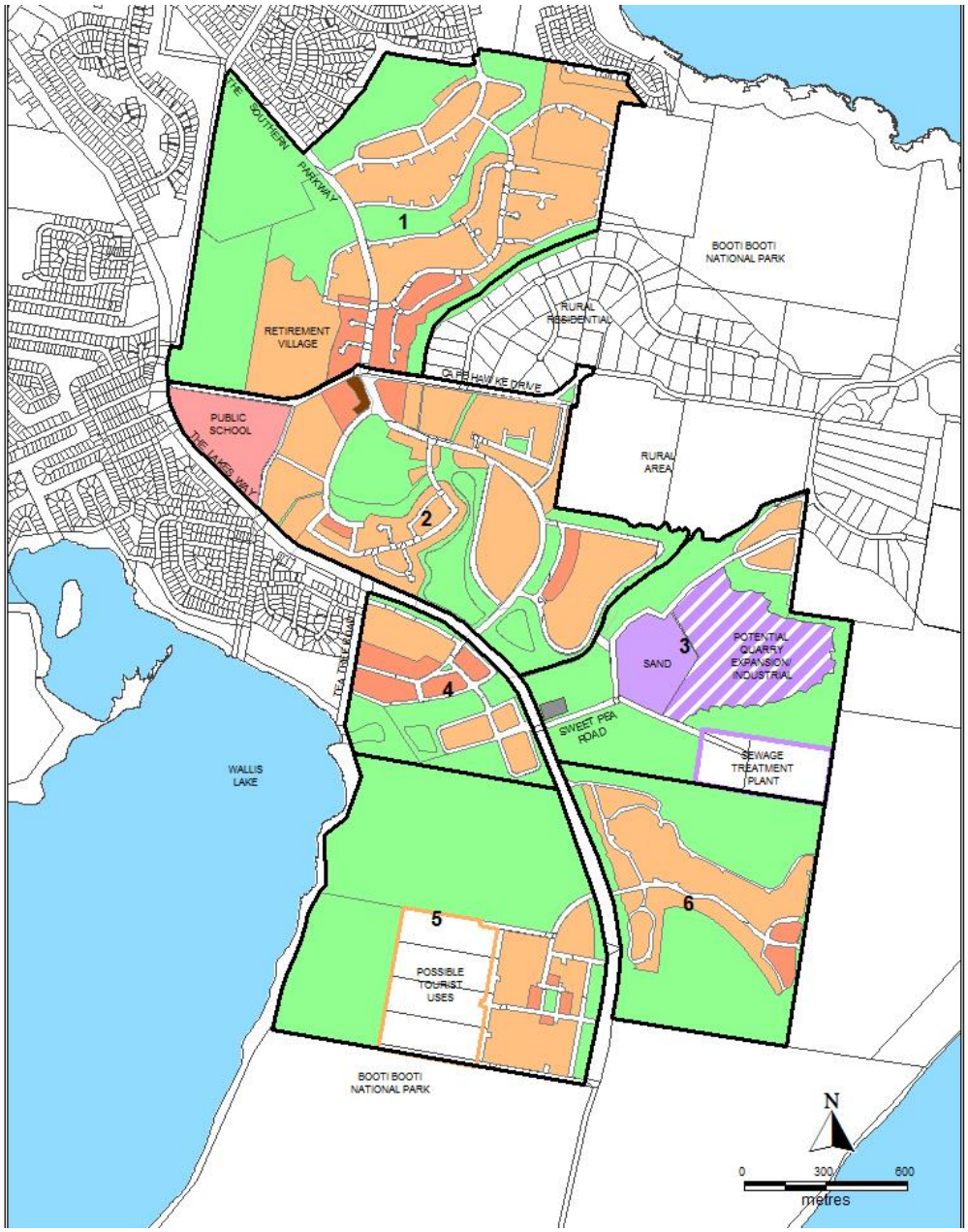


Figure 6: Overall Structure Plan ***[MCC]***

The area is identified as *Area 2 – Lakeside Estate* in the Structure Plan.

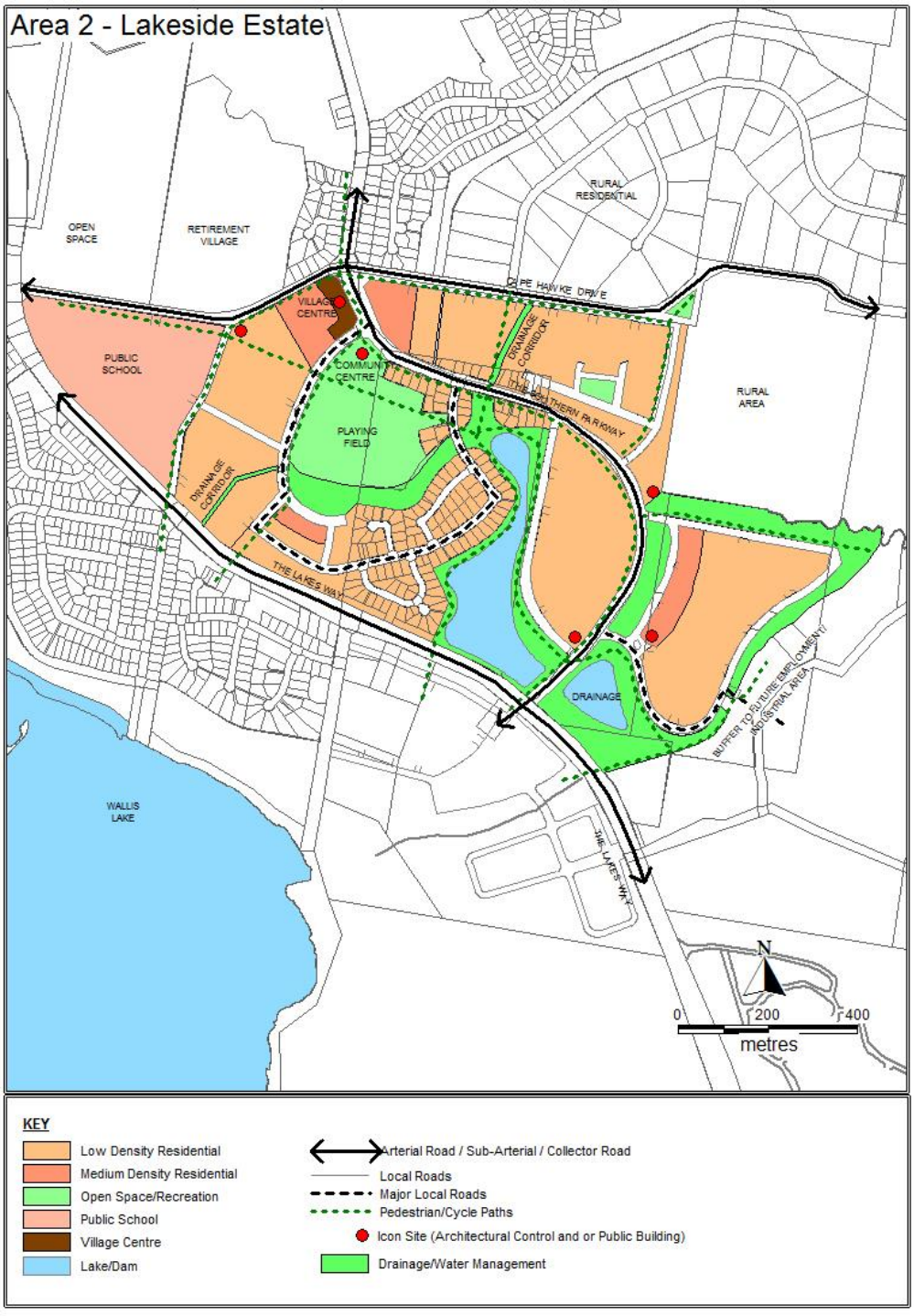


Figure 7: Lakeside Estate Precinct [MCC]

The structure plan provides for a number of outcomes in development of the site, including:

- Linkage of major local road (Myall Drive) through the site.
- Areas of Playing Fields.
- Pedestrian/Cycle connections.

Most of these items have been resolved through the approved plan of subdivision for the remainder of the site. The major local road linkage through the site has not been completed and the proposed rezoning will facilitate the completion of this connection.

MidCoast Council Housing Strategy

The MidCoast Council Housing Strategy was adopted in December 2020 as a basis for its new comprehensive LEP for the entire MidCoast Local Government Area. The Strategy provides for the outcomes identified in this planning proposal and identifies the subject land as *Potential Residential Land* and as an infill area to match the surrounds to establish long term supply of land.

Figure 8: MidCoast Housing Strategy Extract [MCC]

MidCoast Urban Release Areas Report

Council in July 2021 adopted the MidCoast Urban Release Areas Report. The document provides a brief discussion of identified growth areas for various strategies from the former Great Lakes, Greater Taree and Gloucester Council areas to determine if MidCoast Council will still proceed with the previously identified growth areas.

The subject land is included in this review and has been identified as Forster Growth Area 4.

The document confirms that the land should be rezoned in the short term (1-5 years) and is of Medium Constraint.

Forster Growth Area 4 – MidCoast Urban Release Areas Report

3.A.2 Is the Planning Proposal the best means of achieving the objectives or intended outcomes, or is there a better way?

The strategies identify use of the land for future urban purposes providing for a range of residential development opportunities. The current RU2 zoning only permits a small range of residential uses and the 40 hectare lot size applying to the land is clearly contrary to this outcome.

The change of zoning and lot size controls applying to the land is the only feasible way the outcomes identified by the development strategies for the area could be realised. This planning proposal completes the land use planning for the land in a similar manner to the rest of the land and is clearly the best way to achieve the outcomes.

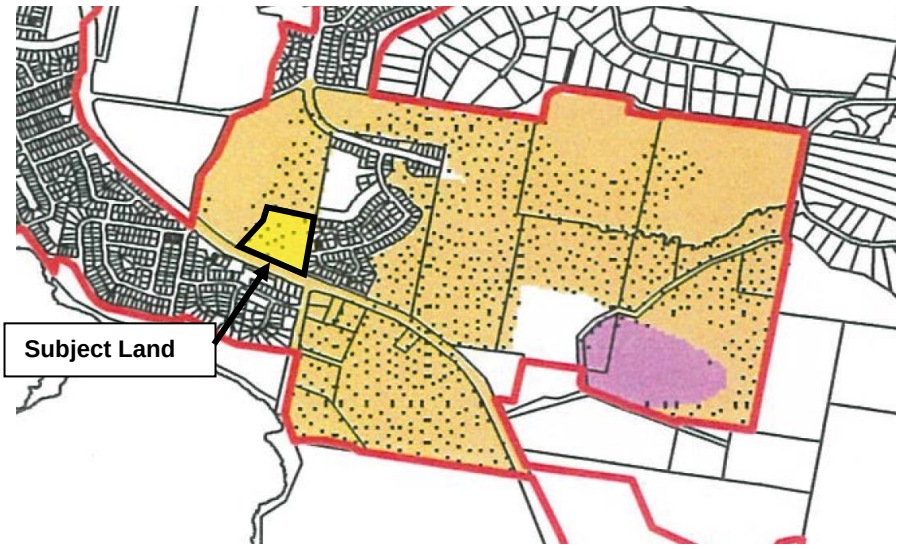
Other options such as modifying the RU2 zone or creating an enabling clause are not appropriate methods to facilitate development of the area in accordance with the strategies.

Section B – Relationship to Strategic Planning Framework

3.B.1 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)?

Mid North Coast Regional Strategy

The *Mid North Coast Regional Strategy* previously applied to the land and provided growth maps for areas within the former Greater Taree and Great Lakes local government areas. These maps are preserved as growth areas under the Hunter Regional Plan 2036. The subject lands are identified as Proposed Urban Area in these maps as shown below:



The subject land is the last remaining area of RU2 zoned land remaining in this precinct of South Forster.

The proposal will complete the outcomes consistent with the regional growth strategies for the area.

Figure 9: MidCoast Regional; Strategy Extract [MCC]

Hunter Regional Plan 2036

The *Hunter Regional Plan 2036* is relevant to the Planning Proposal. The Planning Proposal is considered to be generally consistent with the objectives and actions contained within the *Hunter Regional Plan 2036*. A summary of the Planning Proposal's consistency is provided in **Appendix A**.

The Planning Proposal encourages compact settlement within the existing town area and the proposal provides for conservation zoning over areas with relevant environmental values. The Planning Proposal will provide additional urban land to facilitate low density residential development in the existing South Forster development precinct.

MidCoast Housing Strategy

As discussed, a housing strategy has been adopted by Council to support the consolidation of the Greater Taree, Great Lakes and Gloucester Local Environmental Plans into a single MidCoast LEP. The housing strategy identifies the subject land as future residential land.

MidCoast Urban Release Areas Report July 2021

This Planning Proposal is for Forster Urban Release Area (URA) 4, in the above adopted Council document which identifies URAs supported by Council for rezoning and under which

timeframe rezoning would be supported. Forster URA 4 is identified for rezoning in the short-term (1-5 years).

Urban Land Monitor 2016-2036

The Urban Land Monitor (ULM) produced by MidCoast Council dated October 2019 has been both internally and externally reviewed, including by the NSW Department of Planning, Infrastructure and Environment in September 2019. The ULM has been useful to assist in determining the strategic merit of any Planning Proposal being considered for the MidCoast.

The Urban Land Monitor confirms that:

- The MidCoast population grew from 88,818 in 2011 to 91,958 in 2016, being an increase of 3,140 people and 0.69% cumulative growth rate.
- There was increased population growth in coastal towns, such as Forster, which experienced above average growth for the area (1.05% growth rate 2011-2016).
- Forster-Tuncurry is expected to grow by between 4,630-5,556 people during the Land Monitor timeframe (2016-2036).

While some infill development and increasing of densities in existing centres may contribute to additional housing stock, population growth is largely dependent in the MidCoast upon the rezoning of additional greenfield land for housing.

Overall, the report identifies that the entire MidCoast area has adequate supply of residential zoned land to meet historic average growth rates until 2036. However, examining centres at a local level highlights that development pressure is being experienced within coastal areas.

Key findings of the Urban Land Monitor regarding Forster are that:

- *Overall, the potential supply estimate of 4,043 dwellings is adequate to meet the high growth demand estimate for 2036 of 3,042 dwellings. However, this is extremely dependent on the development of North Tuncurry (approximately 1,900 dwellings), as many sites in Forster have ownership, contamination or other constraints.*
- *In terms of dwelling types, the potential housing supply (3,107) should easily meet demand, while the unit supply (936) is much closer to the average demand estimate (872) and high demand estimate (1,046).*
- *The R4 High Density Residential zone in Forster caters for both the tourism market and permanent residents. This zone has sufficient short term redevelopment supply but is constrained in the medium to long term. It is important to examine areas of potential future expansion and any factors that would support that growth.*
- *The R3 Medium Density Residential zone in Tuncurry and Forster is under-developed. These areas have the potential to cater for the unit demand, especially in the context of a slightly constrained R4 Zone area. Consideration needs to be given to factors which could promote growth and redevelopment of these R3 areas.*
- *High demand for retirement and aged care living should be able to be met within the existing capacity of the R2 Low Density Residential and R3 Medium Density Residential zones, Undeveloped Residential Land and Urban Release Areas.*

Anecdotally, there has been a significant upswing in demand for all forms of housing in Forster-Tuncurry since 2020 and future markets will need supply sooner than expected.

3.B.2 Is the Planning Proposal consistent with a council LSPS that has been endorsed by the Planning Secretary or GSC, or another endorsed local strategy or strategic plan?

MidCoast Local Strategic Planning Statement 2020

The MidCoast Local Strategic Planning Statement (LSPS) provides guidance as to how the strategic outcomes of the Hunter Regional Plan and Community Strategic Plan will be achieved by Council. The planning proposal gives effect to the following planning priorities of the LSPS.

- P3 – Deliver housing supply, choice and diversity
- P5 – Connect people and places
- P6 – Protect and improve our environment
- P9 – Improve our infrastructure and become a location of choice

MidCoast 2030 Community Strategic Plan

The Mid Coast 2030 Community Strategic Plan (CSP) is a roadmap for the future of the MidCoast. In the development of this Plan, other key government plans and legislative frameworks were considered; in particular the *NSW State Plan*, the *Hunter Regional Plan*, the *Local Government Act 1993* and the *Integrated Planning and Reporting Guidelines*, to ensure that there is alignment and the community is working towards a shared vision.

The Vision of the CSP is:

> *"We aspire to be a place of unique environmental significance where our quality of life and sense of community is balanced by sustainable and sensitive development, which fosters economic growth"*

The most relevant values of the CSP are:

We balance the needs of our natural and built environments

- Ensure growth and new development complements our existing natural assets and heritage sites.

- Optimise land use to meet our environmental, social and development needs.

The planning proposal involves rezoning of the land which was excluded from the previous rezoning. The planning proposal will create residential development opportunities over existing disturbed lands and will provide for conservation of areas with relevant environmental values.

A region that is a popular place to visit, live, work and invest

- Provide an environment to attract, grow and strengthen local businesses.

The proposal will allow residential accommodation which will support and strengthen local business in the area with growth in trade.

Overall, this Planning Proposal is consistent with the values of the CSP.

3.B.3 Is the Planning Proposal consistent with any other applicable State and regional studies or strategies?

The Planning Proposal is considered to be generally consistent with all other applicable State and regional studies or strategies including the overarching NSW Housing Strategy 2041 and the 20 Year Economic Vision for Regional NSW.

3.B.4 Is the Planning Proposal consistent with applicable SEPPs?

The Planning Proposal is considered to be generally consistent with applicable state environmental planning policies.

A summary of the Planning Proposal's consistency with applicable State Environmental Planning Policies is provided in Appendix B of this Planning Proposal.

3.B.5 Is the Planning Proposal consistent with applicable Ministerial Directions (section 9.1 Directions)?

The Planning Proposal is generally consistent with applicable section 9.1 Ministerial Directions, although it is justifiably inconsistent with Direction 9.1 Rural Zones and Direction 9.2 Rural Land as the Planning Proposal is:

- Of minor significance
- Identified as residential / urban land in the local and regional strategies for the land, including the Mid North Coast Regional Strategy, MidCoast Housing Strategy, South Forster Structure Plan and the MidCoast Urban Release Areas Report.
- Located on land that is not highly suitable for agriculture.
- Located in a small, isolated area in existing urban zoned areas with surrounding rural land already fragmented.
- Not impacting on rural values identified in these directions.
- Identifying and protecting environmental values through the rezoning to a more accurate C2 – Environmental Conservation zone over part of the site.
- Not identified as State significant agricultural land.

A summary of the Planning Proposal's consistency with relevant section 9.1 Ministerial Directions is provided in Appendix C of this Planning Proposal.

Section C – Environmental, Social and Economic Impact

3.C.1 Is there any likelihood that critical habitat or threatened species, populations or ecological communities, or their habitats, will be adversely affected because of the proposal?

The proposal provides a residential zoning and future development over parts of the site that have been cleared and earthworks are currently being completed over the site. The bulk earthworks consent (DA 247/2018) adequately addressed ecological impacts over the site and the rezoning follows the outcomes of that consent, with R2 zone established over the filled areas, and C2 provided over the areas identified for conservation.

The Ecology assessment prepared by Ecological Australia identified the limits of development to maintain suitable outcomes for the regrowth vegetation over the site that includes endangered ecological communities and the threatened plant species *L. alsinoides*. The proposal will allow residential zoning over these areas that contain no native vegetation or habitat values.

A copy of the ecological assessment for the land is provided in Appendix D.

The areas of vegetation will be conserved within the C2 – Environmental Conservation Zone and protected from disturbance. The area is inundated by stormwater from the urban drainage system that passes through the site. This broad drainage area has created the swamp vegetation existing in these areas and the area is expected to ultimately be dedicated to Council as part of its drainage reserve to be established for development of the land.

3.C.2 Are there any other likely environmental effects of the Planning Proposal and how are they proposed to be managed?

The planning proposal provides for planned outcomes completing the development of this part of the South Forster Precinct. The following table provides a brief comment on other environmental effects that may be expected as a result of development of the land.

Item	**Comment**
Traffic	The planning proposal is unlikely generate significant traffic and would be within the capacity for the local roads. The planning proposal has a potential positive effect in providing the linkage of Myall Drive through the site which will improve the traffic network efficiency for the area, especially considering the imminent closure of the existing access for the Lakes Estate to The Lakes Way.
Drainage	Development of the land for residential purposes will create increased stormwater flow from roofs, hard surfaces, etc., that can be expected in an urbanised environment. The drainage strategy for the other development on the land allows for the drainage of this site. Any future development on the land will require the provision of drainage structures to treat water quality and flows in the existing disturbed areas and does not impact on the C2 zoned areas.
Geotechnical	The land was previously subject to geotechnical assessment in 2007 which found that the land was suitable for residential development and did not contain actual or potential acid sulfate soils. Bulk earthworks are being undertaken over the land in accordance with the consent (DA 247/2018) issued by Council. Geotechnical investigation of this filling is being undertaken and will be certified at completion. A preliminary investigation for contamination has been prepared for the land which has concluded that the site is suitable for residential land use. The report has been reviewed by a Certified Environmental Practitioner.
Visual	The development of the site will create new built form over an area that is currently vacant. The impact will be similar to the effect of buildings in the adjoining residential estate and is compatible with the low-density residential character of the area.
Heritage	The subject land is not identified as a heritage item or heritage conservation area in the LEP. The land is not considered significant in terms of the European heritage and no significance has been attributed to the site or surrounding area in the *Great Lakes Heritage Study 2007*.

Item	Comment
	The land was the subject of an Aboriginal Cultural Heritage Assessment in 2006 which included consultation with the Local Aboriginal Land Council and other Aboriginal organisations. The assessment did not identify any Aboriginal sites or places or other constraints on the land. A copy of the Aboriginal Cultural Heritage Assessment by ERM completed in 2006 is provided in Appendix E.

3.C.3 Has the Planning Proposal adequately addressed any social and economic effects?

The planning proposal will have positive social and economic impacts in the area through the creation of additional housing to meet demand in the area. The proposal provides lands to add to urban land supply in the area.

The proposal will provide much needed vehicular and pedestrian access between existing residential areas and facilitate access to proposed/existing recreational facilities in the area, as well as improved access to the Forster township resulting in positive social impacts for residents in the area.

Additional development on the land may result in negative impacts to the local community such as increased traffic and activity; however, the impacts are minor and are consistent with the established development in the area.

Section D – Infrastructure (Local, State and Commonwealth)

3.D.1 Is there adequate public infrastructure for the Planning Proposal?

There are no public infrastructure implications with the Planning Proposal.

All necessary utilities such as water, sewer, electricity and telecommunications are available in the area. The proposal only involves minor increases to demand for these utilities and development of this land is provided for in development servicing plans, etc.

Any future development on the subject land is unlikely to cause any significant increased demand for public services for the area and is within the growth strategies for the area. The connection of Myall Drive improves the road network permeability for these estates which improves transport efficiency and access for emergency services, etc.

Section E – State and Commonwealth Interests

3.D.1 What are the views of State and Commonwealth public authorities consulted in accordance with the Gateway Determination?

The Gateway determination received by the NSW Department of Planning and Environment on 5 July 2022 determined that consultation is required with the Biodiversity Conservation Division under section 3.34(2)(d) of the *Environmental Planning and Assessment Act 1979.*

The Biodiversity Conservation Division (BCD) provided feedback on 17 August 2022, noting that the Planning Proposal has been reviewed and that BCD have no comment.

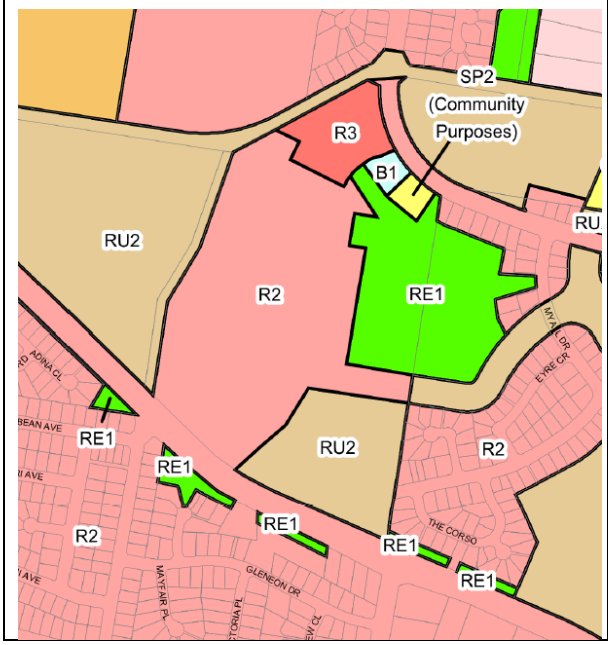
Part 4 - Maps

(s.55(2)(d) Maps to be adopted by the proposed instrument)

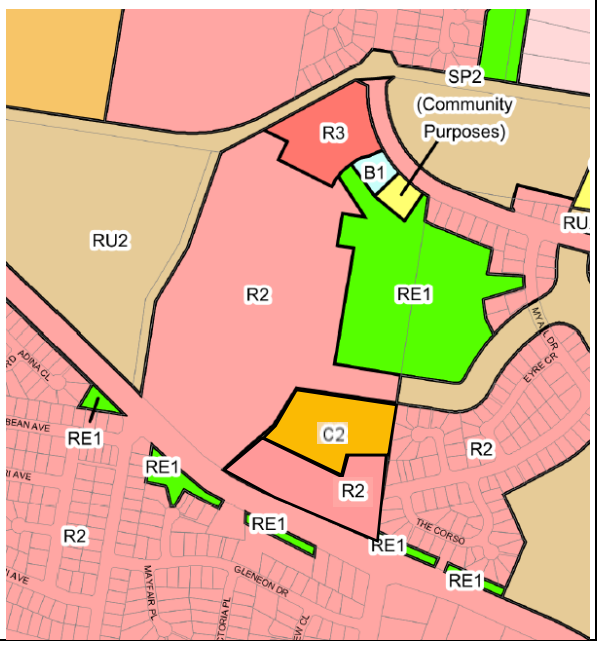
The proposed amendment to Great Lakes LEP 2014 will require amendments to existing map layers as follows.

- Amend zoning map (Tile LZN_011E) as it affects the subject land by changing the RU2 - Rural Landscape zone to R2 - Low Density Residential and C2 - Environmental Conservation.

Current Zoning Map



Proposed Zoning Map

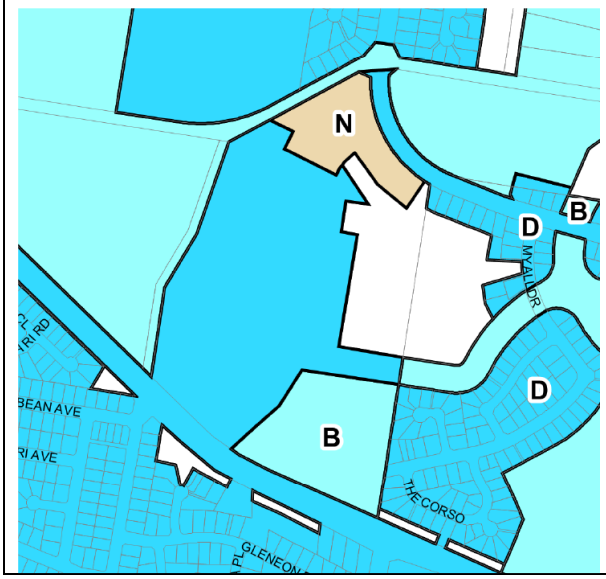
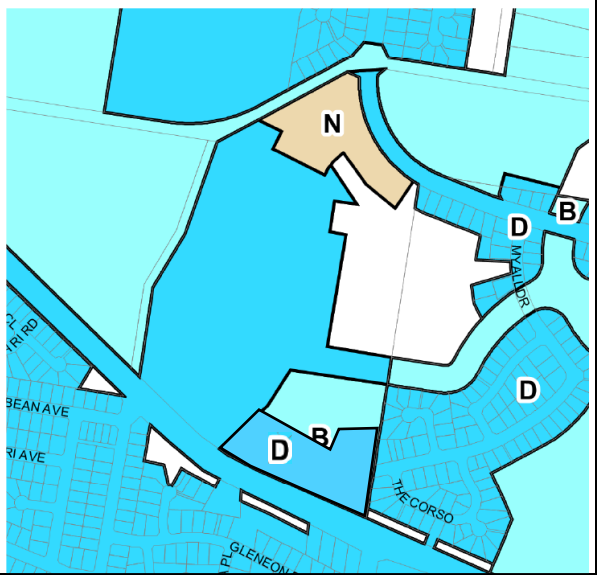


- Amend the Lot Size Map (Tile LSZ_011E) as it affects the subject land by changing the minimum lot size control for parts of the site from 40 hectares to 450m^2 and no control.

Current Lot Size Map

Proposed Lot Size Map

- Amend the floor space ratio map (Tile FSR_011E) as it affects the subject land by amending the FSR control to 0.5:1 for the proposed R2 – Low Density Residential zone.

Current FSR Map	Proposed FSR Map
	

Additional amendments may be identified as the proposal progresses through public exhibition and subsequent stages in the timeline. Should this occur, the planning proposal will be amended and the subsequent amendment to Great Lakes LEP 2014 revised to reflect this.

The maps are indicative only. Final survey will be provided and Council will prepare mapping associated with the proposed amendments in accordance with the *Standard Technical Requirements for LEP Maps* for the amended LEP document.

Part 5 - Community consultation

In accordance with Section 3.34(2)(c) of the *Environmental Planning and Assessment Act 1979*, this Planning Proposal will be made publicly available for a minimum of 28 days.

In accordance with Council's adopted consultation protocols, the following will also be undertaken:

- Notice in the local newspaper;
- Direct mail notification to potentially affected landowners;
- Exhibition material and all relevant documents will be available at Council's Administrative Office;
- Exhibition material and all relevant documents will be available on Council's website.

Further consultation with the Biodiversity Conservation Division as required by the Gateway Determination will also be undertaken.

Part 6 - Project timeline

In accordance with the Department of Planning and Environment guidelines, the following timeline is provided, which includes the tasks deemed necessary for the making of this local environmental plan.

Task	Timeframe and/or date
Consideration by Council	January / March 2022
Council decision	March 2022
Gateway determination	July 2022
Pre-exhibition and any additional studies	August 2022
Commencement and completion of public exhibition period	August-September 2022 (28 working days)
Consideration of submissions	November 2022
Council decision	November 2022
Submission to the Department for finalisation (where applicable)	December 2022
LEP amendment made	February 2023

Part 7 - Conclusion

The primary aims of the Planning Proposal are to amend Great Local Environmental Plan (LEP) 2014 are to:

- Rezone land in South Forster from RU2 (Rural Landscape) to R2 (Low Density Residential), and C2 (Environmental Conservation) and adjust lot size maps and floor space ratio maps accordingly.

The Proposal is considered to have strategic merit being identified in the Growth Maps of the Mid North Coast Regional Strategy and consistent with the Hunter Regional Plan 2036 and being identified as an action in the MidCoast Council Housing Strategy adopted in December 2020 and a short-term urban release area identified in the MidCoast Urban Release Area Report July 2021. The proposal will also deliver outcomes identified in the South Forster Structure Plan and will complete this development precinct.

Appendix A – Consistency with Hunter Regional Plan Goals, Directions & Actions

Goal 1 – the leading regional economy in Australia	
Direction 4 – Enhance inter-regional linkages to support economic growth	
Action 4.1 Enhance inter-regional transport connections to support economic growth.	Not applicable
Action 4.2 Work with stakeholders to upgrade transport network capacity in line with changing demands.	Not applicable
Action 4.3 Strengthen and leverage opportunities from the interconnections with other regions, particularly the Pacific Highway, the Golden Highway and the New England Highway.	Not applicable
Action 4.4 Promote freight facilities that leverage the Port of Newcastle and its associated freight transport network.	Not applicable
Action 4.5 Plan for multimodal freight facilities that support economic development of the region and respond to the location of the proposed Freight Rail Bypass.	Not applicable
Action 4.6 Investigate opportunities for logistics and freight growth and other complementary land uses around airports, leveraging investments at Taree and Newcastle airports.	Not applicable
Action 4.7 Enhance the efficiency of existing nationally significant transport corridors and protect their intended use from inappropriate surrounding land uses.	Not applicable
Action 4.9 Balance competing interests and deliver conservation, transport and land use planning objectives in the national pinch point area by: • Identifying preferred habitat corridors and priorities for investment in conservation to sustain habitat connectivity; and • Developing in integrated management plan for the area.	Not applicable
Direction 6 – Grow the economy of MidCoast and Port Stephens	
Action 6.1 Enhance tourism infrastructure and connectivity, recognising the importance of: • regional and inter-regional connections via the Pacific Highway and the Newcastle and Taree airports and cruise ship gateways; and	Not applicable

• local routes such as The Lakes Way and Nelson Bay Road.	
Action 6.2 Enhance links to regional services in Greater Newcastle.	Not applicable
Action 6.3 Enable economic diversity and new tourism opportunities that focus on reducing the impacts of the seasonal nature of tourism and its effect on local economies.	Not applicable
Action 6.4 Promote growth of industries that can leverage accessibility provided by the Pacific Highway.	Not applicable
Action 6.5 Plan for and provide infrastructure and facilities that support the ageing population.	Not applicable
Direction 7: Develop advanced manufacturing, defence and aerospace hubs	
Action 7.2 Grow and diversify the manufacturing sector through local planning and appropriate planning controls.	Not applicable
Action 7.3 Promote manufacturing business export opportunities and become part of global supply chains.	Not applicable
Action 7.4 Facilitate research partnerships between tertiary education providers and businesses.	Not applicable
Direction 8 – Promote innovative small business and growth in the service sectors	
Action 8.1 Implement initiatives to promote small business growth and innovation, particularly in Newcastle City centre and other strategic centres.	Not applicable
Action 8.2 Facilitate opportunities for incubator spaces for technology and non-technology early stage businesses, and ensure opportunities for new and emerging enterprises are encouraged.	Not applicable
Action 8.3 Improve connectivity to the region's major health and education precincts and strategic centres.	Not applicable
Action 8.5 Establish a health precinct around Metford and other hospitals in the region, including Manning Base Hospital at Taree.	Not applicable

Direction 9 – Grow tourism in the region	
Action 9.1 Enable investment in infrastructure to expand the tourism industry, including connections to tourism gateways and attractions.	Not applicable
Action 9.2 Encourage tourism development in natural areas that support conservation outcomes.	Not applicable
Action 9.5 Develop capacity for growth in food-based tourism in the region.	Not applicable
Direction 10 – Protect and enhance agricultural productivity	
Action 10.1 Protect locations that can accommodate agricultural enterprises from incompatible development, and facilitate the supply chain, including infrastructure, distribution areas, processing facilities and research and development in local plans.	Not applicable
Action 10.2 Address sector-specific considerations for agricultural industries through local plans.	Not applicable
Action 10.3 Protect the region's wellbeing and prosperity through increased biosecurity measures.	Not applicable
Action 10.4 Encourage niche commercial, tourist and recreation activities that complement and promote a stronger agricultural sector, and build the sector's capacity to adapt to changing circumstances.	Not applicable
Action 10.6 Manage Biophysical Strategic Agricultural Land and other important agricultural land as locations for agricultural activities and complementary uses.	Not applicable
Direction 11 – Manage the ongoing use of natural resources	
Action 11.1 Manage the ongoing use of mineral resources and provide access to up-to-date information about these resources through the Department of Industry's Common Ground website and its Geoscientific Data Warehouse.	Not applicable
Action 11.2 Work with relevant stakeholders including councils, communities and industry, to prepare land use plans that respond to the lifecycle of resource activity for active and emerging mining areas.	Not applicable

Action 11.3 Implement the cumulative impact assessment methodology when planning for important agricultural land and water resources.	Not applicable
Action 11.4 Review the Synoptic Plan: Integrated Landscapes for Coal Mine Rehabilitation in the Hunter Valley (1999) in conjunction with the development of the Upper Hunter Strategic Biodiversity Assessment to ensure best-practice rehabilitation and visual impact management for closed mines.	Not applicable
Direction 12: Diversify and grow the energy sector	
Action 12.1 Diversify and grow the energy sector by working with stakeholders, including councils, communities and industry, to identify and support opportunities for smaller-scale renewable energy initiatives such as those using bioenergy or waste coalmine methane.	Not applicable
Action 12.2 Enable new opportunities for renewable energy industries by reviewing local planning controls.	Not applicable
Action 12.3 Promote new opportunities arising from the closure of coalfired power stations that enable long term sustainable economic and employment growth in the region.	Not applicable
Direction 13 – Plan for greater land use compatibility	
Action 13.1 Identify and protect important agricultural land, including intensive agriculture clusters, in local plans to avoid land use conflicts, particularly associated with residential expansion.	Not applicable
Action 13.2 Limit urban and rural housing encroachment into identified agricultural and extractive resource areas, industrial areas, and transport infrastructure when preparing local strategies.	Not applicable
Action 13.3 Amend planning controls to deliver greater certainty of land use.	Not applicable
Action 13.4 Provide non-statutory guidance on the types of land uses that would be considered most appropriate, suitable or sympathetic with existing land uses in the Upper Hunter and other areas where land use conflicts occur.	Not applicable

Goal 2 – A biodiversity-rich natural environment	
Direction 14 – Protect and connect natural areas	
Action 14.1 Identify terrestrial and aquatic biodiversity values and protect areas of high environmental value to sustain the lifestyle, economic success and environmental health of the region.	Not applicable
Action 14.2 Identify and strengthen biodiversity corridors as places for priority biodiversity offsets.	Not applicable
Action 14.3 Improve the quality of, and access to, information relating to high environmental values.	Not applicable
Action 14.4 Protect biodiversity by maintaining and, where possible, enhancing existing protection of high environmental value areas; implementing appropriate measures to conserve validated high environmental value areas; developing local strategies to avoid and minimise the impacts of development on areas of high environmental value and biodiversity corridors; and identifying offsets or other mitigation measures for unavoidable impacts.	The planning proposal has recognised biodiversity values of the native vegetation on the land and provides for the C2 Environmental Conservation zoning over those parts of the land.
Action 14.5 Secure the long term protection of regionally significant biodiversity corridors.	Not applicable
Direction 15: Sustain water quality and security	
Action 15.1 Protect water catchments to sustain high quality and dependable water supplies across the region.	Not applicable
Action 15.2 Effectively manage surface and groundwater use in agricultural areas to support ecosystem function, food production, and to cater for the increasing demand of urban communities and industry.	Not applicable
Action 15.3 Plan for the security of the region's town water supply.	Not applicable
Action 15.4 Implement catchment-based plans for the ongoing sustainable management and health of estuaries.	Not applicable
Action 15.5 Apply the neutral or beneficial water quality objectives to land use planning in surface and groundwater drinking water catchment areas to minimise the effects of development on waterways, including watercourses, wetlands, groundwater	Not applicable

dependent ecosystems, riparian lands, estuaries, lakes, beaches and marine waters.	
Action 15.6 Reduce the risk of introduction or spread of aquatic pests and diseases from new development that may affect fisheries and aquaculture industry practices.	Not applicable
Action 15.7 Incorporate water-sensitive design into development that is likely to have an adverse impact on coastal water catchments, water quality and flows.	Not applicable
Direction 16: Increase resilience to hazards and climate change	
Action 16.1 Manage the risks of climate change and improve the region's resilience to flooding, sea level rise, bushfire, mine subsidence and land contamination.	The subject land is not subject to significant hazards or climate change risk.
Action 16.2 Review and consistently update floodplain risk and coastal zone management plans, particularly where urban growth is being investigated.	Not applicable
Action 16.3 Incorporate new knowledge on regional climate projections and related cumulative impacts in local plans for new urban development.	Not applicable
Action 16.4 Review and update the Newcastle Mines Grouting Fund and investigate its relevance to other areas.	Not applicable
Goal 3 – Thriving communities	
Direction 17: Create healthy built environments through good design	
Action 17.1 Develop best-practice guidelines for planning, designing and developing healthy built environments.	Not applicable
Action 17.2 Enhance access to fresh food by promoting initiatives that increase urban food production and access to produce from local farmers.	Not applicable
Action 17.3 Enhance the quality of neighbourhoods by integrating recreational walking and cycling networks into the design of new communities to encourage physical activity.	The proposal facilitates outcomes in the South Forster Structure Plan which will provide for connectivity between neighbourhoods. The proposal will provide much needed vehicular, pedestrian and cycle linkages between neighbourhoods and existing/proposed residential facilities, as well as connection to the Forster township generally.

Direction 18: Enhance access to recreational facilities and connect open space	
Action 18.1 Facilitate more recreational walking and cycling paths including planning for the Richmond Vale Rail Trail and expanded inter-regional and intra-regional walking and cycling links, including the NSW Coastal Cycleway.	Not applicable
Action 18.2 Deliver connected biodiversity-rich corridors and open space areas for community enjoyment.	Not applicable
Action 18.3 Enhance public access to natural areas, including coastal and lake foreshores.	Not applicable
Action 18.4 Assist councils to develop open space and recreation strategies that identify a range of accessible open space and recreation opportunities; integrate open space, active transport and recreation networks; and improve public foreshore access.	Not applicable
Action 18.5 Implement actions and invest in boating infrastructure priorities identified in regional boating plans to improve boating safety, boat storage and waterway access.	Not applicable
Direction 19 – Identify and protect the region's heritage	
Action 19.1 Consult with the local Aboriginal communities to identify and protect heritage values to minimise the impact of urban growth and development, and to recognise their contribution to the character and landscape of the region.	Not applicable
Action 19.2 Assist the preparation of appropriate heritage studies to inform the development of strategic plans, including regional Aboriginal cultural heritage studies.	Not applicable
Direction 20: Revitalise existing communities	
Action 20.1 Accelerate urban revitalisation by directing social infrastructure where there is growth.	Not applicable
Action 20.2 Undertake planning and place-making for main streets and centres.	Not applicable
Action 20.3 Enhance the amenity and attractiveness of existing places.	Not applicable

Goal 4 – Greater housing choice and jobs	
Direction 21: Create a compact settlement	
Action 21.1 Promote development that respects the landscape attributes and the character of the metropolitan area, towns and villages.	The planning proposal will facilitate development in a manner consistent with the establishing character on South Forster.
Action 21.2 Focus development to create compact settlements in locations with established services and infrastructure, including the Maitland Corridor growth area; Newcastle–Lake Macquarie Western Corridor growth area; the emerging growth area around Cooranbong, Morisset and Wyee; and in existing towns and villages, and sites identified in an endorsed regional or local strategy.	Not applicable
Action 21.4 Create a well-planned, functional and compact settlement pattern that responds to settlement planning principles and does not encroach on sensitive land uses, including land subject to hazards, on drinking water catchments or on areas with high environmental values.	Not applicable
Action 21.5 Promote small-scale renewal in existing urban areas, in consultation with the community and industry to ensure that this occurs in the right locations.	Not applicable
Action 21.6 Provide greater housing choice by delivering diverse housing, lot types and sizes, including small-lot housing in infill and greenfield housing locations.	Not applicable
Action 21.7 Promote new housing opportunities in urban areas to maximise the use of existing infrastructure	The proposal provides for urban housing opportunities on land which has access to services and will link services and connections to network services and improve reliability of supply.
Direction 22: Promote housing diversity	
Action 22.1 Respond to the demand for housing and services for weekend visitors, students, seasonal workers, the ageing community and resource industry personnel.	Not applicable
Action 22.2 Encourage housing diversity including studio and one and two-bedroom dwellings, to match forecast changes in household sizes.	Not applicable
Action 22.3 Develop local housing strategies to respond to housing needs, including social and affordable housing, and support initiatives to increase the supply of affordable housing.	Not applicable

Action 22.4 Develop Settlement Planning Principles and a local planning toolkit to assist councils in implementing the Plan.	Not applicable
Action 22.5 Include guidance in local land use strategies for expanding rural villages and rural-residential development so that future rural residential development will: • not impact on strategic or important agricultural land, energy, mineral or extractive resource viability or biodiversity values; • not impact on drinking water catchments; • not result in greater natural hazard risk; • occur on land that is unlikely to be needed for urban development; • contribute to the conservation of important biodiversity values or the establishment of important corridor linkages; and • facilitate expansion of existing and new tourism development activities in agricultural or resource lands and related industries across the region.	Not applicable
Direction 23 – Grow centres and renewal corridors	
Action 23.1 Concentrate growth in strategic centres, local centres and urban renewal corridors to support economic and population growth and a mix of uses.	Not applicable
Action 23.2 Develop precinct plans for centres to take an integrated approach to transport, open space, urban form and liveable neighbourhoods, and investigate the capacity of centres to accommodate additional housing and diversity, without compromising employment growth.	Not applicable
Action 23.3.Consider improvements to the public transport network when planning new renewal corridors and precincts.	Not applicable
Action 23.4 Investigate locations for new and expanded centres, including within the Newcastle – Lake Macquarie Western Corridor and Maitland Corridor growth areas, and in the established urban areas that are projected to have high demand for housing growth is projected.	Not applicable
Action 23.5 Focus commercial and retail development within existing centres and transport hubs and ensure that locations for new centres are integrated with existing or planned residential development; do not undermine existing centres; encompass high	Not applicable

quality urban design; and consider transport and access requirements.	
Direction 24 – Protect the economic functions of employment land	
Action 24.1 Locate new employment land so that it does not conflict with surrounding residential uses.	Not applicable
Action 24.2 Protect the economic functions of employment land by not permitting non-industrial uses unless: • opportunities for urban renewal arise through the relocation of industry and in locations well serviced by public transport; and • contaminated land can be remediated.	Not applicable
Action 24.3 Provide for mixed use opportunities and themed employment precincts in local plans.	Not applicable
Direction 25 – Monitor housing and employment supply and demand	
Action 25.1 Establish and implement an Urban Development Program to develop data on existing zoned land supply and its servicing status, monitor dwelling production and take-up rates, and coordinate the staged release and rezoning of land.	Not applicable
Action 25.2 Establish and implement an Employment Lands Development Program to develop data on existing and future planned stocks of employment land.	Not applicable
Action 25.3 Sequence new greenfield urban development that makes efficient use of infrastructure networks and capacity.	Not applicable
Action 25.4 Maintain an adequate supply of employment land that is appropriately serviced and to respond to changing industry demands for land use, location and floor space.	Not applicable
Direction 26 – Deliver infrastructure to support growth and communities	
Action 26.1 Align land use and infrastructure planning to maximise the use and capacity of existing infrastructure and the efficiency of new infrastructure.	Not applicable
Action 26.2 Enable the delivery of health facilities, education, emergency services, energy production and supply, water and waste water, waste disposal areas,	Not applicable

cemeteries and crematoria, in partnership with the infrastructure providers.	
Action 26.3 Protect existing and planned major infrastructure corridors and sites, including inter-regional transport routes like the M1 Pacific Motorway and the railway, port and airport, to support their intended function.	Not applicable
Action 26.4 Coordinate the delivery of infrastructure to support the timely and efficient release of land for development, including working with councils and service providers on inter-regional infrastructure and service delivery issues between growing areas.	Not applicable
Action 26.5 Ensure growth is serviced by enabling and supporting infrastructure.	Not applicable
Action 26.6 Review and finalise the Hunter Special Infrastructure Contributions Plan.	Not applicable
Direction 27: Strengthen the economic self-determination of Aboriginal communities	
Action 27.1 Work with the Purfleet–Taree, Forster, Karuah, Worimi, Mindaribba, Awabakal, Bahtabah, Biraban and Wanaruah Local Aboriginal Land Councils to identify priority sites that can create a pipeline of potential initiatives.	Not applicable
Action 27.2 Identify landholdings and map the level of constraint at a strategic scale for each site to develop options for the potential commercial use of the land.	Not applicable

Appendix B – Consistency with State Environmental Planning Policies

State Environmental Planning Policy (SEPP)	Issue 1
SEPP No 19—Bushland in Urban Areas	Not applicable
SEPP No 47—Moore Park Showground	Not applicable
SEPP No 50—Canal Estate Development	Not applicable
SEPP No 65—Design Quality of Residential Apartment Development	Not applicable
SEPP (Building Sustainability Index: BASIX) 2004	Future dwellings on the land will be subject to the requirements of BASIX.
SEPP (Exempt and Complying Development Codes) 2008	Not applicable
SEPP (Housing) 2021	Not applicable
SEPP (Koala Habitat Protection) 2020	The vegetation inventory does identify *M. quinquenervia* which is now listed in the new SEPP. The areas with this species, however, are conserved within the C2. In the absence of other koala feed trees, the vegetation is not suitable to support koala habitation.
SEPP (Koala Habitat Protection) 2021	The vegetation inventory does identify *M. quinquenervia* which is now listed in the new SEPP. The areas with this species, however, are conserved within the C2. In the absence of other koala feed trees, the vegetation is not suitable to support koala habitation.
SEPP (Kurnell Peninsula) 1989	Not applicable
SEPP (Penrith Lakes Scheme) 1989	Not applicable
SEPP (Planning Systems) 2021	Not applicable
SEPP (Precincts – Eastern Harbour City) 2021	Not applicable
SEPP (Precincts - Regional) 2021	Not applicable
SEPP (Precincts – Central River City) 2021	Not applicable

State Environmental Planning Policy (SEPP)	Issue 1
SEPP (Precincts – Western Parklands City) 2021	Not applicable
SEPP (Primary Production) 2021	Not applicable
SEPP (Resilience and Hazards) 2021	A narrow portion of the frontage to The Lakes Way is identified as within the Coastal Environment Area. The planning proposal would not impact on coastal environmental values or processes and future development can be undertaken in a manner to protect coastal water quality and other environmental values. A Preliminary Assessment for contamination has been completed for the site which has concluded that the site is suitable for residential use. Preliminary examination of the land reveals that it does not appear to have been used for purposes which may have resulted in land contamination.
SEPP (Resources and Energy) 2021	Not applicable
SEPP (State Significant Precincts) 2005	Not applicable
SEPP (Sydney Drinking Water Catchment) 2011	Not applicable
SEPP (Sydney Region Growth Centres) 2006	Not applicable
SEPP (Transport & Infrastructure) 2021	The proposal will utilise existing infrastructure for the area and servicing plans provide for development of this land.
SEPP (Urban Renewal) 2010	Not applicable
SEPP (Vegetation in Non-Rural Areas) 2017	Not applicable
SEPP (Western Sydney Parklands) 2009	Not applicable
SEPP (Vegetation in Non-Rural Areas) 2017	Not applicable

Appendix C – Consistency with S9.1 Ministerial Directions

S9.1 Ministerial Direction	Issue 1
Focus Area 1: Planning systems	
1.1 Implementation of Regional Plans	The Planning Proposal is considered to be consistent with the objectives and actions contained within the Hunter Regional Plan 2036, particularly *Direction 22 – Promote housing diversity* in *Action 23.1 Concentrate growth in strategic centres, local centres and urban renewal corridors to support economic and population growth and a mix of uses* as Forster-Tuncurry is an identified strategic centre. The Planning Proposal encourages compact settlement within the existing town area and the proposal provides for conservation zoning over areas with relevant environmental values. The Planning Proposal will provide additional urban land to facilitate low density residential development in the existing South Forster development precinct.
1.2 Development of Aboriginal Land Council land	Not applicable
1.3 Approval and Referral Requirements	Not applicable
1.4 Site Specific Provisions	The planning proposal includes no site specific provisions
Focus Area 1: Planning Systems – Place Based	
1.5 Parramatta Road Corridor Urban Transformation Strategy	Not applicable
1.6 Implementation of North West Priority Growth Area Land Use and Infrastructure Implementation Plan	Not applicable
1.7 Implementation of Greater Parramatta Priority Growth Area Interim Land Use and Infrastructure Implementation Plan	Not applicable
1.8 Implementation of Wilton Priority Growth Area Interim Land Use and Infrastructure Implementation Plan	Not applicable
1.9 Implementation of Glenfield to Macarthur Urban Renewal Corridor	Not applicable
1.10 Implementation of the Western Sydney Aerotropolis Plan	Not applicable

S9.1 Ministerial Direction	Issue 1
1.11 Implementation of Bayside West Precincts 2036 Plan	Not applicable
1.12 Implementation of Planning Principles for the Cooks Cove Precinct	Not applicable
1.13 Implementation of St Leonards and Crows Nest 2036 Plan	Not applicable
1.14 Implementation of Greater Macarthur 2040	Not applicable
1.15 Implementation of the Pyrmont Peninsula Place Strategy	Not applicable
1.16 North West Rail Link Corridor Strategy	Not applicable
1.17 Implementation of the Bays West Place Strategy	Not applicable
Focus Area 2: Design and Place	
No current Ministerial Directions in Focus Area 2	
Focus Area 3: Biodiversity and Conservation	
3.1 Conservation Zones	Previous investigations of the land have identified ecological values over the land and have identified a development area and constrained areas containing endangered ecological community and threatened species habitat. The planning proposal creates a C2 Environmental Conservation Zone over these constrained areas of the site to ensure protection and conservation. The planning proposal is consistent with this Direction.
3.2 Heritage Conservation	This Direction applies whenever a planning proposal is prepared and provides for the conservation and protection of items of environment heritage and items of indigenous heritage significance. The subject land does not contain any listed heritage items. In relation to indigenous heritage, the Direction provides that items of Aboriginal Heritage should be identified by an Aboriginal Heritage Survey. Previous Aboriginal Cultural Heritage Assessment has been undertaken for the land including consultation with Aboriginal groups and direct consultation with the Forster Local Aboriginal Land Council. The assessment did not identify any sites or constraints to development over the site.

S9.1 Ministerial Direction	Issue 1
	The consent and construction certificate for the bulk earthworks (DA 247/2018) have resulted in cleared disturbed land only being identified for zoning to R2. The planning proposal is consistent with this Direction.
3.3 Sydney Drinking Water Catchments	Not applicable
3.4 Application of C2 and C3 Zones and Environmental Overlays in Far North Coast LEPs	Not applicable
3.5 Recreation Vehicle Areas	Not applicable
Focus Area 4: Resilience and Hazards	
4.1 Flooding	The subject land is partly identified as flood planning area. The approved bulk earthworks (DA 247/2018) create ground levels above the design flood level and have been based on drainage studies for the land. The proposed rezoning of the land will not alter the flood or drainage of the area and will provide flood free land for development consistent with the Council flood related development controls. The planning proposal is consistent with this Direction.
4.2 Coastal Management	The land is not located in areas identified as subject to coastal hazards or processes identified in the Coastal Management Plans for the area and is consistent with this Direction.
4.3 Planning for Bushfire Protection	This Direction does not apply as the land is not mapped as Bushfire Prone Land.
4.4 Remediation of Contaminated Land	A Preliminary Assessment for contamination has been completed for the site which has concluded that the site is suitable for residential use. Preliminary examination of the land reveals that it does not appear to have been used for purposes which may have resulted in land contamination. The planning proposal is consistent with this Direction.
4.5 Acid Sulfate Soils	Not applicable
4.6 Mine Subsidence and Unstable Land	Not applicable
Focus Area 5: Transport & Infrastructure	

S9.1 Ministerial Direction	Issue 1
5.1 Integrating Land Use and Transport	The direction is applicable as it provides residential opportunities. The proposal is consistent with the direction by completing the neighbourhood road system, including a major local road to connect through the land and adjoining Lakes Estate, as well as pedestrian cycleway linkages to the surrounding urban areas.
5.2 Reserving Land for Public Purposes	Not applicable
5.3 Development Near Regulated Airports and Defence Airfields	Not applicable
5.4 Shooting Ranges	Not applicable
Focus Area 6: Housing	
6.1 Residential Zones	The proposal is consistent with this direction which maintains low density residential development established in the area. The proposal will make efficient use of existing infrastructure and provide compact development form reducing consumption of land for housing. The planning proposal is consistent with the Direction.
6.2 Caravan Parks and Manufactured Home Estates	Consistent with the Direction the change in zone from RU2 to R2 will maintain permissibility for caravan parks and manufactured home estates.
Focus Area 7: Industry and Employment	
7.1 Business and Industrial Zones	Not applicable
7.2 Reduction in non-hosted short-term rental accommodation period	Not applicable
7.3 Commercial and Retail Development along the Pacific Highway, North Coast	Not applicable
Focus Area 8: Resources and Energy	
8.1 Mining, Petroleum Production and Extractive Industries	Not applicable
Focus Area 9: Primary Production	
9.1 Rural Zones	This direction applies as the planning proposal is to rezone land from RU2 to R2 and C2.

S9.1 Ministerial Direction	Issue 1
	The Planning Proposal is justifiably inconsistent with Direction 9.1 Rural Zones as the Planning Proposal is: • Of minor significance • Identified as residential / urban land in the local and regional strategies for the land, including the Mid North Coast Regional Strategy, MidCoast Housing Strategy, South Forster Structure Plan and the MidCoast Urban Release Areas Report. • Located on land that is not highly suitable for agriculture • Located in a small, isolated area in existing urban zoned areas with surrounding rural land already fragmented. • Not impacting on rural values identified in this direction. • Identifying and protecting environmental values through the rezoning to a more accurate C2 – Environmental Conservation zone over part of the site. • Not identified as State significant agricultural land
9.2 Rural Lands	This direction applies as the planning proposal is to rezone land from RU2 to R2 and C2. The Planning Proposal is justifiably inconsistent with Direction 9.2 Rural Lands as the Planning Proposal is: • Of minor significance • Identified as residential / urban land in the local and regional strategies for the land, including the Mid North Coast Regional Strategy, MidCoast Housing Strategy, South Forster Structure Plan and the MidCoast Urban Release Areas Report. • Located on land that is not highly suitable for agriculture • Located in a small, isolated area in existing urban zoned areas with surrounding rural land already fragmented. • Not impacting on rural values identified in this direction. • Identifying and protecting environmental values through the rezoning to a more accurate C2 – Environmental Conservation zone over part of the site. • Not identified as State significant agricultural land
9.3 Oyster Aquaculture	Not applicable
9.4 Farmland of State and Regional Significance on the NSW Far North Coast	Not applicable

Appendix D – Flora and Fauna Assessment – Ecological Australia

Fairview West Stage 5

Flora and Fauna Assessment

Prepared for
Winten (No. 18) Pty Ltd

June 2019

DOCUMENT TRACKING

Item	Detail
Project Name	Fairview West Stage 5 – Flora and Fauna Assessment
Project Number	17NEW - 7805
Project Manager	Alex Pursche (02) 4910 3413 19 Bolton Street Newcastle NSW 2300
Prepared by	Alex Pursche
Reviewed by	Lily Gorrell
Approved by	Martin Sullivan
Status	FINAL
Version Number	1
Last saved on	13 June 2019
Cover photo	Clockwise from upper left: Blackberry paddock, *Lindernia alsinoides*, deer tracks in swamp forest

This report should be cited as 'Eco Logical Australia November 2018. *Fairview West Stage 5 – Flora and Fauna Assessment*. Prepared for Winten (No 18) Pty Ltd.'

Contents

List of figures

List of tables

Abbreviations

Abbreviation	Description
AoS	Assessment of Significance
BC Act	Biodiversity Conservation Act 2016
CEMP	Construction Environmental Management Plan
DA	Development Application

Abbreviation	Description
DP	Deposited Plan
DPI	Department of Primary Industries
DCP	Development Control Plan
EEC	Endangered Ecological Community
ELA	Eco Logical Australia Pty Ltd
EP&A Act	*Environmental Planning and Assessment Act 1979*
EPBC Act	*Environment Protection & Biodiversity Conservation Act 1999*
PMST	Protected Matters Search Tool
HBT	Hollow-bearing Tree
KTP	Key Threatening Processes
LEP	Local Environment Plan
LGA	Local Government Area
MNES	Matters of National Environmental Significance
NES	National Environmental Significance
Biosecurity Act	NSW *Biosecurity Act 2015*
OEH	Office of Environment and Heritage
SEPP	State Environmental Planning Policy
SIC	Significant Impact Criteria
SIS	Species Impact Statement
TSC Act	*Threatened Species Conservation Act 1995*
VMP	Vegetation Management Plan
WoNS	Weeds of National Significance
WM Act	NSW *Water Management Act 2000*

Executive summary

Winten (No. 18) Pty Ltd engaged Eco Logical Australia (ELA) to conduct a Flora and Fauna assessment for a bulk earthworks development application at The Lakes Way, Forster.

The aim of this report is to address impacts to threatened species, threatened species habitat, ecological communities and threatened populations listed under the NSW *Threatened Species Conservation Act 1995* (TSC Act), NSW *Fisheries Management Act 1994* (FM Act), and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The NSW *Biodiversity Conservation Act 2016* (BC Act) commenced on 25 August 2017, henceforth repealing the NSW TSC Act and parts of the former NSW *Native Vegetation Act 2003* (NV Act). In accordance with Clause 27 and 28 of the Biodiversity Conservation (Savings and Transitional) Regulation 2017, if the Development Application (DA) was lodged prior to the commencement of the BC Act, the former planning provisions apply. As this project DA was lodged prior to the new Act, the works are assessed under the TSC Act.

The field surveys were undertaken by ELA ecologists Alex Pursche, Lily Gorrell, and Dee Ryder in 2017 and 2018. Additional field surveys for *Lindernia alsinoides* (Noah's False Chickweed) were undertaken in December 2018.

The vegetation within the site was identified as a regenerating occurrence of 'Swamp Oak Floodplain Forest', which is listed as an Endangered Ecological Community (EEC) under the BC Act. This ecological community is also known as 'Coastal Swamp Oak (*Casuarina glauca*) forest of New South Wales and South East Queensland' which is listed as an EEC under the EPBC Act. The study area also contains cleared/pasture areas.

The following threatened species have been recorded within the study area:

- *Lindernia alsinoides* (Noah's False Chickweed)
- *Miniopterus australis* (Little Bentwing-bat)
- *Mormopterus norfolkensis* (Eastern Freetail-bat)
- *Myotis macropus* (Southern Myotis)
- *Scoteanax rueppellii* (Greater Broad-nosed Bat)

The Assessment of Significance and Significant Impact Criteria assessments were undertaken for these species and the TEC. The assessments concluded that a significant impact is not likely and that a SIS is not required and a referral to the Commonwealth is not recommended.

Special considerations for *L. alsinoides*:

The population observed onsite is currently experiencing pressure from grazing and trampling from feral deer, although it is noted that the same deer trails appear to be promoting growth of *L. alsinoides* by exposing narrow corridors to sunlight.

All occurrences that occur within the proposed development site (up to 110 individuals) will be subject to bulk earthworks and will be directly impacted. The individuals impacted form part of a larger population that extends north into land retained and proposed for management under a VMP. The species is thought to pollinate via native bees which can share genetic material for up to 600m. Based on this conservative assumption, the population within the study area is unlikely to share genetic material with other occurrences in the Forster region. As such the local population for this assessment includes only those individuals that occur within the study area.

The Assessment of Significance and a Significant Impact Criteria assessment were undertaken for these species and the EEC. The assessments concluded that a significant impact is not likely if the recommendations in this report are adopted and that a SIS is not required and a referral to the Commonwealth is not recommended.

Although the proposal would result in the removal of 1.61 ha of habitat for this species, the proposed clearance is considered unlikely to be significant given the species tolerance to disturbance and retained areas of suitable habitat.

1 Introduction

Eco Logical Australia Pty Ltd (ELA) were engaged by Winten (No. 18) Pty Ltd (the proponent) to prepare a Flora and Fauna Assessment (FFA) to facilitate the development of a portion of Lot 303 DP1099114 (the study area) on the Lakes Way, Forster. The proponent has submitted a bulk earthworks development application (DA) for a portion of the study area, which if approved will require the removal of native vegetation that currently occurs within the study area.

The proposed bulk earthworks DA for the study area will remove approximately 1.61 ha of native vegetation. The purpose of the bulk earthworks is to facilitate the future development of the RU2 portion of the study area which is proposed to be subdivided into 22 lots, and include a linking roadway from Myall Drive parallel to The Lakes Way (Figure 1). All proposed developments within the study area have been combined into a single spatial context known as the 'development site'. The development site also includes a 6m buffer around the link road along the western periphery.

1.1 Background

Land within the study area is currently a mixture of the following land zoning types (Figure 2) under the Great Lakes Local Environment Plan 2014 (LEP):

- B1 – Neighbourhood centre
- R2 – Low density residential
- R3 – Medium density residential
- RE1 – Public recreation
- RU2 – Rural landscape
- SP2 – Infrastructure: community purpose

The land subject to this assessment includes only the portion of land currently zoned RU2 – Rural landscape, in the south-eastern portion of the study area, and adjacent to The Lakes Way. The study area has been subject to several previous biodiversity investigations for the rezoning of the site in 2014.

1.2 Previous investigations

ELA initially conducted a biodiversity review of the site in 2008, and combined field investigations with peer review of the following studies:

- Conacher Travers (2007) Flora and Fauna Assessment for Lot 303 DP1099114 & Lot 1 DP 729734
- De Groot and Benson (2000) South Forster Local Environment Study. For Great Lakes Council

Field studies included an assessment in the condition and extent of Threatened Ecological Communities listed under the [now repealed] NSW *Threatened Species Conservation Act 1995* (TSC Act), mapping of hollow-bearing trees, targeted fauna surveys for *Crinia tinnula* (Wallum Froglet), and targeted flora surveys for *Lindernia alsinoides* (Noah's False Chickweed). The study by ELA (2008) concluded that the study area has been subject to ongoing disturbance including land clearing, habitat fragmentation, drainage modification, and weed invasion. The native vegetation identified onsite was considered to consist of regenerating Swamp Oak Floodplain Forest which is listed as an Endangered Ecological Community (EEC) under the TSC Act and EPBC Act. The occurrence of this EEC was however considered to be of low ecological value, being:

- devoid in hollow-bearing trees
- subject to high weed invasion
- lacking in connectivity to other areas of native vegetation

The study did conclude that the primary ecological value within the study area was the presence of a small population of approximately 20 *L. alsinoides*. This species was anecdotally observed to respond well to the intermediate disturbance regime.

1.3 Development site boundary and consideration of biodiversity values

The development site boundary for this report has been subject to several revisions. The initial development footprint as submitted with the DA was for 3.9 ha of land zoned RU2 – Rural landscape (shown in blue on Figure 1).

Following an initial survey by ELA in December 2017 and the identification of *L. alsinoides* and Threatened Ecological Communities (TECs) within the subject land, the development site footprint was reduced to avoid, where possible, the greatest impacts to biodiversity. This resulted in a 33% reduction in the developable footprint.

The final development footprint was developed in consultation with Winten and ELA, with the final development footprint as shown in red on Figure 1.

1.4 Purpose of this report

The proposed Bulk Earthworks DA will require removal of native vegetation. As such MidCoast Council (Council) have requested an assessment of the ecological impacts of the proposal consistent with:

- S79C and s5A of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act)
- Ecological matters of State Environmental Planning Policy (SEPP) 71 – Coastal Protection
- S4.1 of the Great Lakes Development Control Plan 2014
- Wallis Lake Wetland Strategy

This report aims to satisfy Councils request, which is contained within **Appendix A** of this report.

1.5 Local context

The development site is located on The Lakes Way and is bounded to the east by housing, west by a cleared paddock (to be housing), to the south by a powerline easement along the Lakes Way, and to the north by regenerating native vegetation.

The development site is located within the MidCoast Local Government Area (LGA) and is situated within the greater Forster residential area. Nearby natural areas include Wallis Lake and Booti Booti national Park. The development site is located wholly within the NSW North Coast IBRA Region and the Karuah Manning IBRA subregion (Figure 3). Within the locality (being a 5km radius of the development site) there are several Mitchell Landscapes mapped, however the development site is wholly contained within the Myall – Forster Barrier System. Soils within the development site consist of estuarine clays of the Wallinghat River soil landscape.

The development site is poorly drained and includes a broad drainage line that is not part of a named creek or river. Hydrological flows across the site are primarily overland flow from adjacent paddocks, however there is a small raingarden along the Lakes Way that during rainfall events feeds water to the study area. Water within the site ponds and does not regularly flow offsite. There is a floodway

constructed within the Lakes Estate to the east of the study area which carries water away from the development site during heavy rainfall events to prevent flooding to adjacent housing. As such drainage within the development site is not connected to any other natural drainage lines. The nearest natural drainage is Dunns Creek, approximately 800m to the east.

Topography within the development site is flat, with elevations less than 10m above sea level across the study area.

Native vegetation within the study area is disjunct from any other natural areas. Any fauna habitat present is cut off from other areas by roads, housing, or cleared paddocks.

The study area has been subject to previous land use primarily as agriculture (grazing). This has resulted in extensive habitat fragmentation, vegetation clearing, drainage alteration, and weed incursion.

Figure 1 Concept layout

Figure 2 Land zoning

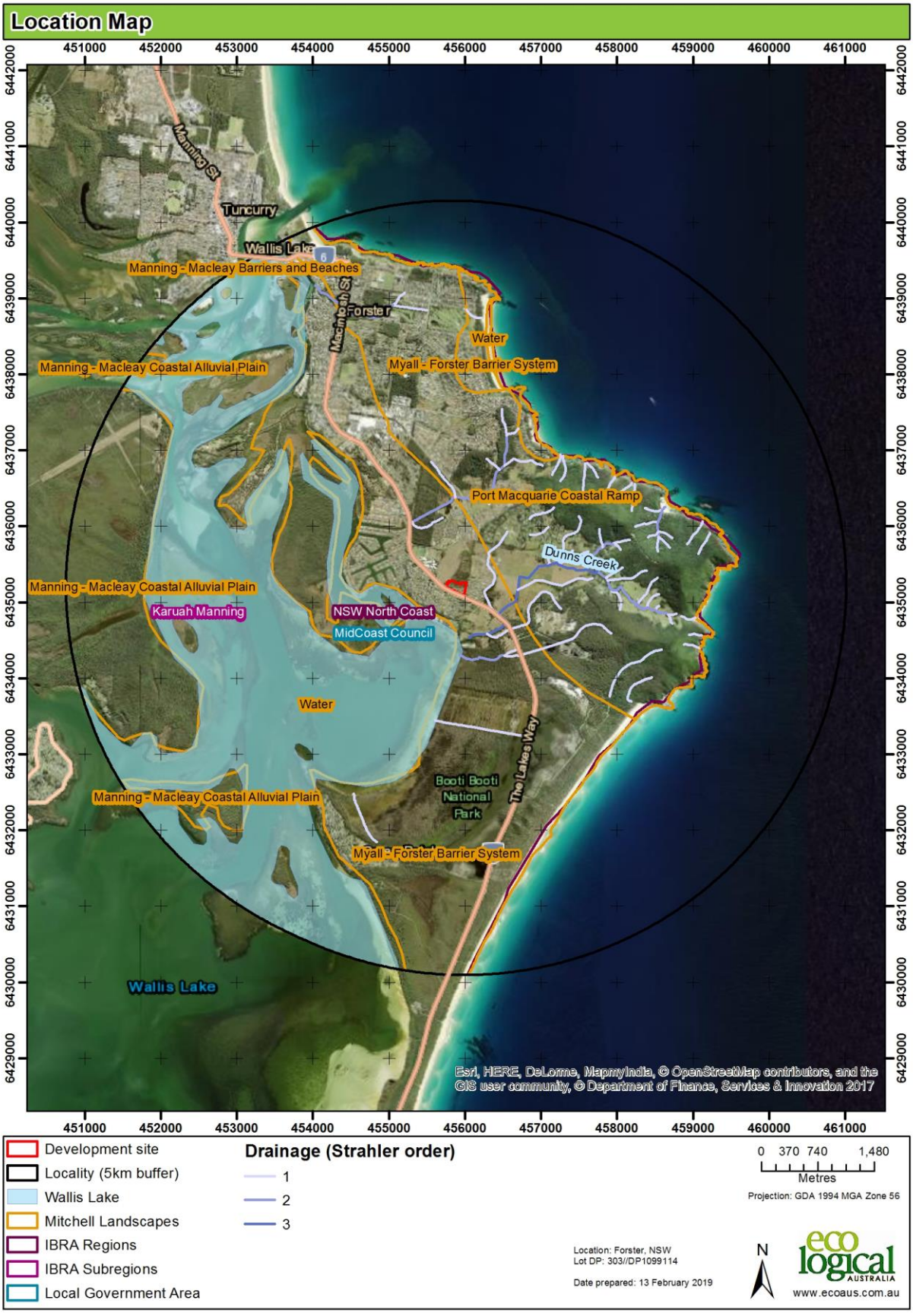


Figure 3 Location map

2 Legislative context

In November 2016 the NSW parliament passed the NSW *Biodiversity Conservation Act 2016* (BC Act). This new legislation has now repealed the TSC Act. The BC Act commenced on 25 August 2017 along with the *Biodiversity Conservation (Savings and Transitional) Regulation 2017*. Under the provisions relating to biodiversity assessment and approvals under the EP&A Act, Part 7 of the regulation allows for pending or interim planning applications to be assessed under the former planning provisions rather than the new BC Act. The regulation defines a '*pending or interim planning application*' as including:

> *"(a) an application for planning approval (or for the modification of a planning approval) made before the commencement of the new Act but not finally determined immediately before that commencement"*

A planning approval includes a development consent under Part 4 of the EP&A Act. Given the current application was submitted to MidCoast Council on 16 November 2017, it is captured under the *S*avings and Transitional Arrangements and will not be assessed under the BC Act.

Table 1 Relevant legislative context for the flora and fauna assessment.

Name	Relevance to the project	Section in this report
Commonwealth		
Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)	Matters of National Environmental Significance (MNES) have been identified on or near the site. This report assesses impacts to MNES and concludes that the development is not likely to have a significant impact on MNES.	Section 5 & Appendix H
NSW		
Environmental Planning and Assessment Act 1979 (EP&A Act)	The proposed development requires consent under Great Lakes Local Environmental Plan 2014 and is to be assessed under Part 4 of the EP&A Act. The EP&A Act was amended at the time of the gazetting of the NSW *Biodiversity Conservation Act 2016* (BC Act). Prior to this amendment, assessments of significance for impacts to threatened ecological communities, species, or endangered populations, have been prepared in accordance with s5A of the Act.	Section 5 & Appendix G
Threatened Species Conservation Act 1995 (TSC Act)	The TSC Act has been repealed and replaced with the BC Act. Prior to 25 August 2017, impacts to threatened species and endangered ecological communities listed under the TSC Act are required in accordance with s5A of the EP&A Act. Assessments of significance for impacts to threatened species have been prepared concluding that a significant impact is not likely and therefore a SIS is not required.	Section 5 & Appendix G
Fisheries Management Act 1994	The development does not involve harm to mangroves or other protected marine vegetation (or dredging and reclamation or blocking of fish passage) within a Key Fish Habitat identified creek. Therefore, a permit under the FM Act is not required.	Not required

Name	Relevance to the project	Section in this report
NSW Biosecurity Act 2015	The Act has repealed the *Noxious Weeds Act 1993.* The Act provides a framework for the prevention, elimination and minimisation of biosecurity risks posed by biosecurity matter, dealing with biosecurity matter, carriers and potential carriers, and other activities that involve biosecurity matter, carriers or potential carriers. Whilst the Act provides for all biosecurity risks, implementation of the Act for weeds is supported by Regional Strategic Weed Management Plans (RSWMP) developed for each region in NSW.	Section 4
Planning Instruments		
State Environmental Planning Policy (SEPP) 44 Koala Habitat	SEPP 44 applies to the local government area in which the development is proposed (MidCoast). An assessment of koala habitat has been made in accordance with Part 2 of the SEPP.	Section 5
State Environmental Planning Policy (SEPP) 71 – Coastal management	SEPP 17 applies to the local government area in which the development is proposed (MidCoast). An assessment of Coastal management has been made in this report.	Section 5
Great Lakes Local Environmental Plan 2011	The study area is predominately zoned RU2 – Rural Landscape under the Great Lakes Local Environmental Plan 2011. Within this zone, bulk earthworks are permissible with consent.	Section 5
Great Lakes Development Control Plan 2014	An assessment against s4.1 of the Great Lakes DCP has been made in this report.	Section 5
Wallis Lake Wetland Strategy	A review of the Wallis Lake Wetland Strategy has been undertaken within this report.	Section 5

3 Methodology

3.1 Database search and literature review

Database searches were conducted on 11 October 2018 using the Atlas of NSW Wildlife and EPBC Act protected matters search tool (EPBC PMST) to provide records of threatened and migratory species previously recorded, or with potential habitat in the locality. A 5 km radius surrounding the study area was searched using the BioNet Atlas of NSW Wildlife.

Several other relevant documents were reviewed and are listed below:

- Eco Logical Australia (2008) Ecological investigations for the proposed rezoning of Fairview West. Prepared for Great Lakes Council

These searches were combined to produce a list of threatened species that may occur within the study area ("subject species"). Likelihood of occurrences for threatened species, endangered populations and communities in the study area were then made based on location of database records, the likely presence or absence of suitable habitat on the study area, and knowledge of the species' ecology, as described in **Appendix B**.

Five terms for the likelihood of occurrence of species are used in this report, defined as follows:

1. "yes" = the species was or has been observed in the study area
2. "likely" = a medium to high probability that a species uses the study area
3. "potential" = suitable habitat for a species occurs in the study area, but there is insufficient information to categorise the species as likely to occur, or unlikely to occur
4. "unlikely" = a very low to low probability that a species uses the study area, and
5. "no" = habitat in the study area and in its vicinity is unsuitable for the species.

A list of potentially "affected species" was then identified (those that were defined as "yes", "likely" or having "potential" to occur in the study area). Aerial photography (SIXmaps) of the study area and surrounds were also used to investigate the extent of vegetation cover and landscape features.

3.2 Floristic assessment

Floristic assessment was undertaken by ELA Ecologists Lily Gorrell and Dee Ryder on 4 & 20 December 2017. Three floristic plots were undertaken within each vegetation zone in accordance with the Biodiversity Assessment Methodology (BAM; OEH, 2017). At each floristic plot, the following information was collected:

- Site ID
- Name of recorder(s)
- Date
- Plot orientation, slope, and aspect
- Easting and northing at either end of the 50 m transect
- Site photographs
- A plot-based 400 m^2 full floristic survey
- A plot and transect survey (20 x 50).

Within a 20 m x 20 m quadrats, the following data was collected at each plot-based full floristic survey site:

- Species name: Scientific name and common name
- Stratum (& layer): in which each species occurs
- Cover: an estimate of the appropriate cover measure for each recorded species: from 1-5% and then to the nearest 5%
- Abundance: A relative measure of the number of individuals or shoots of a species within the plot using the following intervals: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 20, 50, 100, 500, 1000, or specify a number greater than 1000 if required
- Form: (T) Tree; (S) Shrub; (G) Grass and grass like (F) Forb; (E) Fern; (O) other

At each floristic plot site, the following information was collected:

- Within a 50 m x 20 m quadrat:
    - Number of large trees
    - Tree regeneration
    - Tree stem size class
    - Total length of fallen logs
    - Number of hollow bearing trees
- Within five 1m x 1m sub-plots
    - Litter cover

3.3 Habitat assessment

Terrestrial fauna habitat assessment was conducted throughout the development site and recorded the following site details:

- site topography
- soil landscapes
- habitat types (dry sclerophyll forest, wet sclerophyll forest, forested wetland, freshwater wetland, cleared / disturbed Land)
- detailed hollow-bearing tree (HBT) assessments
- bush rock / rocky outcrops
- watercourses
- wetland areas
- standing / flowing water
- permanent soaks and seepages
- leaf litter
- flowering tree species
- winter flowering eucalypts; *Eucalyptus robusta* (Swamp Mahogany)
- *Allocasuarina* species
- flowering shrubs
- natural burrows
- logs
- nests and roosts
- den trees
- latrine or den sites
- distinctive scats
- bat subterranean roosts including caves, culverts, tunnels etc.

The habitat assessment also reviewed the adequacy of previous hollow-bearing tree assessments, collected by ELA in 2008.

3.4 Threatened flora searches

Targeted threatened flora surveys were undertaken by ELA on 4 & 20 December 2017 specifically targeting habitat suitable for *L. alsinoides*. Surveys were consistent with the *NSW Guide to surveying threatened plants* (OEH, 2016) and consisted of parallel meanders with two observers. Meanders were spaced at approximately 5 m and were conducted across all lands zoned RU2 – Rural landscape. The extent of threatened flora searches were recorded using a handheld GPS and are shown on Figure 4.

3.5 Threatened fauna searches

Threatened fauna searches were conducted to supplement previous investigations. Fauna surveys were planned to target those species most likely to occur within the development site. Understanding the largely exotic nature of the site and limited habitat features, the following species were targeted during surveys:

Amphibian surveys for:

- *Crinia tinnula* (Wallum Froglet)

Diurnal bird surveys for:

- *Calyptorhynchus lathami* (Glossy Black-Cockatoo)
- *Circus assimilis* (Spotted Harrier)
- *Daphoenositta chrysoptera* (Varied Sittella)
- *Hieraaetus morphnoides* (Little Eagle)
- *Lophoictinia isura* (Square-tailed Kite)
- *Pomatostomus temporalis temporalis* (Grey-crowned Babbler (eastern subspecies))

Spotlighting and habitat assessment for:

- *Tyto longimembris* (Eastern Grass Owl)

Ultrasonic detector surveys for:

- *Miniopterus australis* (Little Bentwing-bat)
- *Miniopterus schreibersii oceanensis* (Eastern Bentwing-bat)
- *Mormopterus norfolkensis* (Eastern Freetail-bat)

A summary of the survey effort for each species and the minimum requirement is shown in Table 2 and on Figure 4.

Table 2 Fauna survey effort

Group	Target species	Minimum effort	Relevant guidelines	Surveys undertaken
Amphibians	*Crinia tinnula* Wallum Froglet	Combination of tadpole surveys, call surveys and nocturnal searches in suitable weather conditions around swamps, dams and flooded roadside ditches. Minimum of one 200-metre transect per water body or inundated area, repeated on a minimum of two separate nights. (DECC, 2009)	*Threatened species survey and assessment guidelines: field survey methods for fauna – Amphibians* (DECC, 2009)	Targeted surveys undertaken on evenings of 3 and 4 October 2018 in areas of suitable habitat (including roadside drains and raingardens) at three locations: 1. Drainage line in development site 2. Roadside ditch on Lakes Way 3. Raingarden on Southern Parkway
Diurnal birds	*Calyptorhynchus lathami* (Glossy Black-Cockatoo), *Circus assimilis* (Spotted Harrier), *Daphoenositta chrysoptera* (Varied Sittella), *Hieraaetus morphnoides* (Little Eagle), *Lophoictinia isura* (Square-tailed Kite), *Pomatostomus temporalis temporalis* (Grey-crowned Babbler (eastern subspecies))	A 1 ha (200m x 500m) 20-minute search is the most common method	*Threatened biodiversity survey and assessment: Guidelines for developments and activities – Working* draft (DEC, 2004)	Targeted surveys undertaken on mornings of 4 and 5 October 2018 within development site.
Nocturnal birds	*Tyto longimembris* (Eastern Grass Owl)	Search habitat for pellets, and likely hollows. Flushing by walking through potential habitat. Spotlighting on foot.	*Threatened biodiversity survey and assessment: Guidelines for developments and activities – Working* draft (DEC, 2004)	Spotlighting transects undertaken on 4 and 5 October 2018.

Group	Target species	Minimum effort	Relevant guidelines	Surveys undertaken
Microchiropteran bats	*Miniopterus australis* (Little Bentwing-bat), *Miniopterus schreibersii oceanensis* (Eastern Bentwing-bat), *Mormopterus norfolkensis* (Eastern Freetail-bat)	Two sound activated recording devices utilised for the entire night (a minimum of four hours), starting at dusk for two nights	*Threatened biodiversity survey and assessment: Guidelines for developments and activities – Working* draft (DEC, 2004)	Two Song Meter units deployed from 3 – 9 October, recording continuously from 1800 till 0000, then 30 minutes every hour until 0600.

3.6 Weeds and pests

Any weeds observed during field surveys were identified and recorded. Areas of particular infestation were noted on maps.

Pest species were identified using baited remote cameras placed along game trails through the forest. Cameras were left in situ from 3 October to 9 October 2018.

3.7 Water courses

Watercourses were identified during meanders across the site. Any defined channels were marked using handheld GPS.

3.8 Weather

Weather during surveys was typical for the seasons in which the surveys occurred. Rainfall was predicted in early October 2018 and surveys were planned to coincide with a predicted rain event. The rainfall during this period was delayed by two days resulting in the majority of rainfall occurring just after the completion of amphibian surveys. The weather leading up to this rainfall event was however humid and overcast and considered suitable for amphibian surveys.

Table 3 Weather conditions during surveys

Date	Minimum temperature (°C)	Maximum temperature (°C)	Rainfall (mm)
4 December 2017	18.0	25.0	5.5
20 December 2017	19.5	24.8	0
3 October 2018	12.5	21.5	0.0
4 October 2018	14.6	23.1	0.0
5 October 2018	17.0	21.1	1.0
6 October 2018	10.5	19.4	56.0
7 October 2018	14.0	22.5	7.2
8 October 2018	15.8	22.5	0.0
9 October 2018	14.0	22.5	0.0

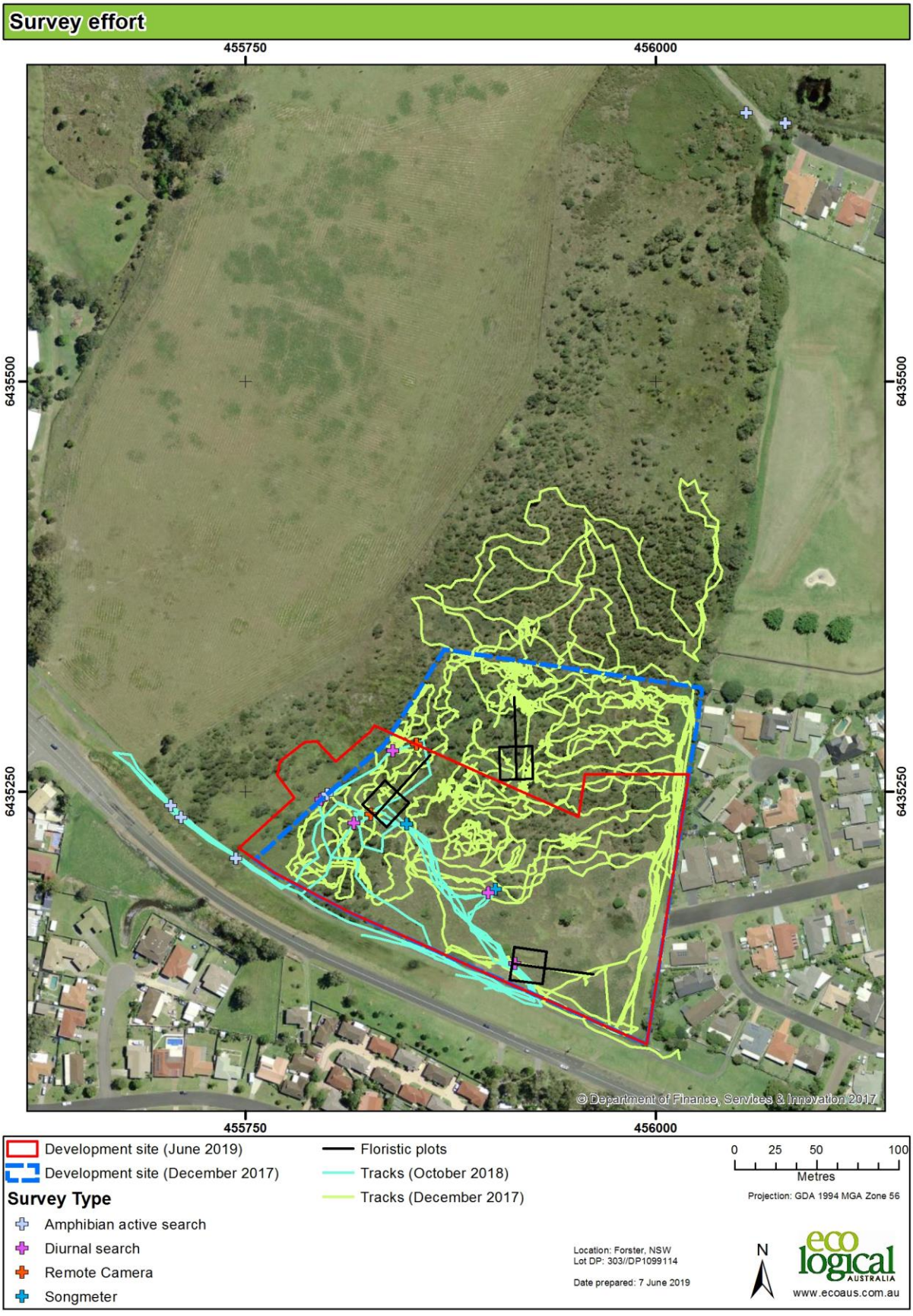


Figure 4 Survey effort

4 Results

4.1 Database search

The Atlas of NSW Wildlife search returned 56 TSC Act listed threatened fauna species and five threatened flora species. The EPBC protected matters search tool returned a list of 64 EPBC Act listed threatened species, 67 migratory species and five threatened ecological communities that may occur in the locality.

A likelihood table for the study area that includes these threatened species along with other threatened species known or thought to potentially occur is included in Appendix B.

Based on the likelihood assessment, the following species are further considered for the assessment as they either occur on site, are likely to occur or potentially may occur within the development site:

- *Lindernia alsinoides* (Noah's False Chickweed)
- *Asperula asthenes* (Trailing woodruff)
- *Crinia tinnula* (Wallum Froglet)
- *Calyptorhynchus lathami* (Glossy Black-Cockatoo)
- *Circus assimilis* (Spotted Harrier)
- *Daphoenositta chrysoptera* (Varied Sittella)
- *Hieraaetus morphnoides* (Little Eagle)
- *Lophoictinia isura* (Square-tailed Kite)
- *Miniopterus australis* (Little Bentwing-bat)
- *Miniopterus schreibersii oceanensis* (Eastern Bentwing-bat)
- *Mormopterus norfolkensis* (Eastern Freetail-bat)
- *Pomatostomus temporalis temporalis* (Grey-crowned Babbler (eastern subspecies))
- *Tyto longimembris* (Eastern Grass Owl)

The location of all species identified during the desktop assessment is shown on Figure 5 and Figure 6.

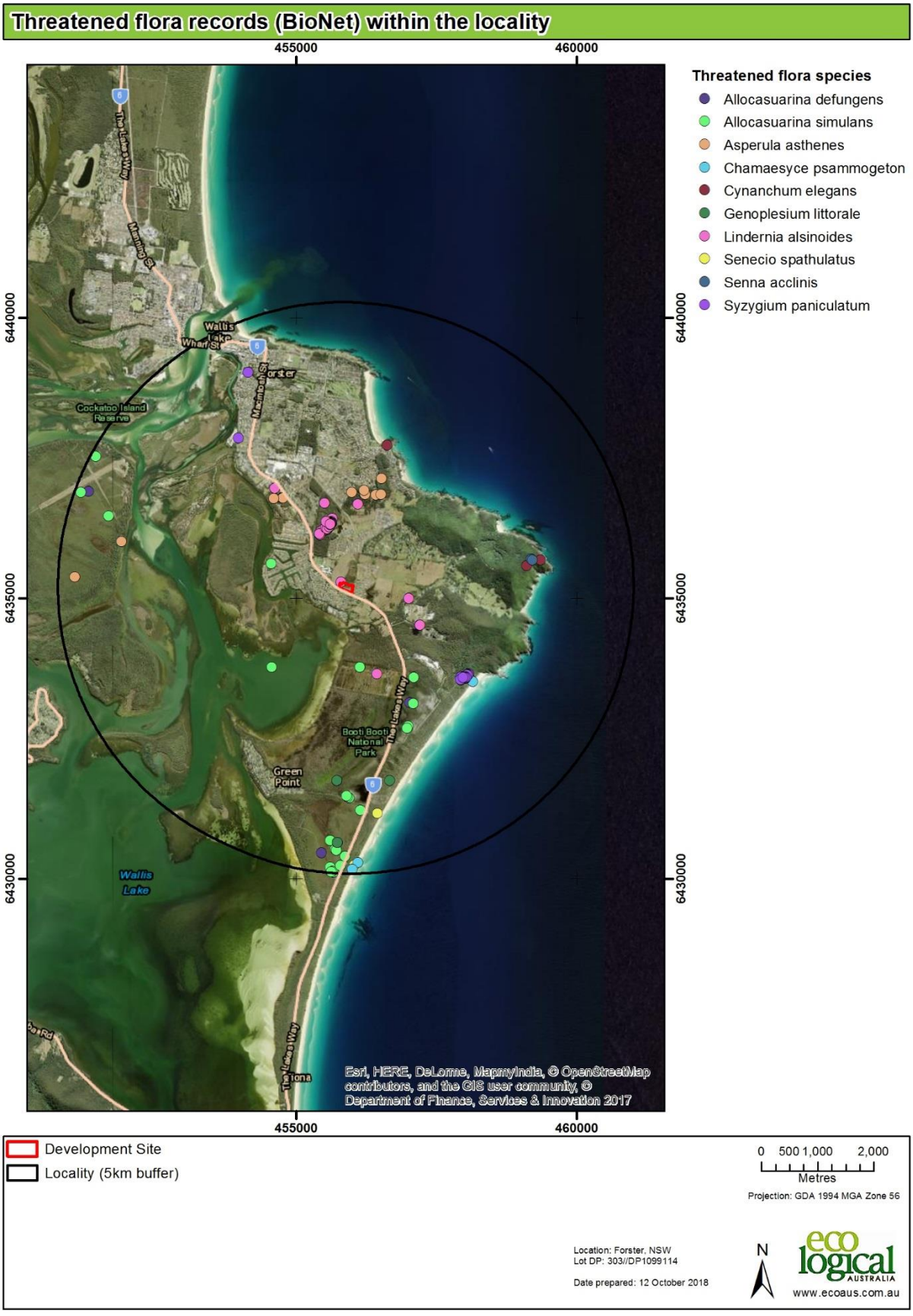


Figure 5 Threatened flora records (Bionet) from the locality (5km)

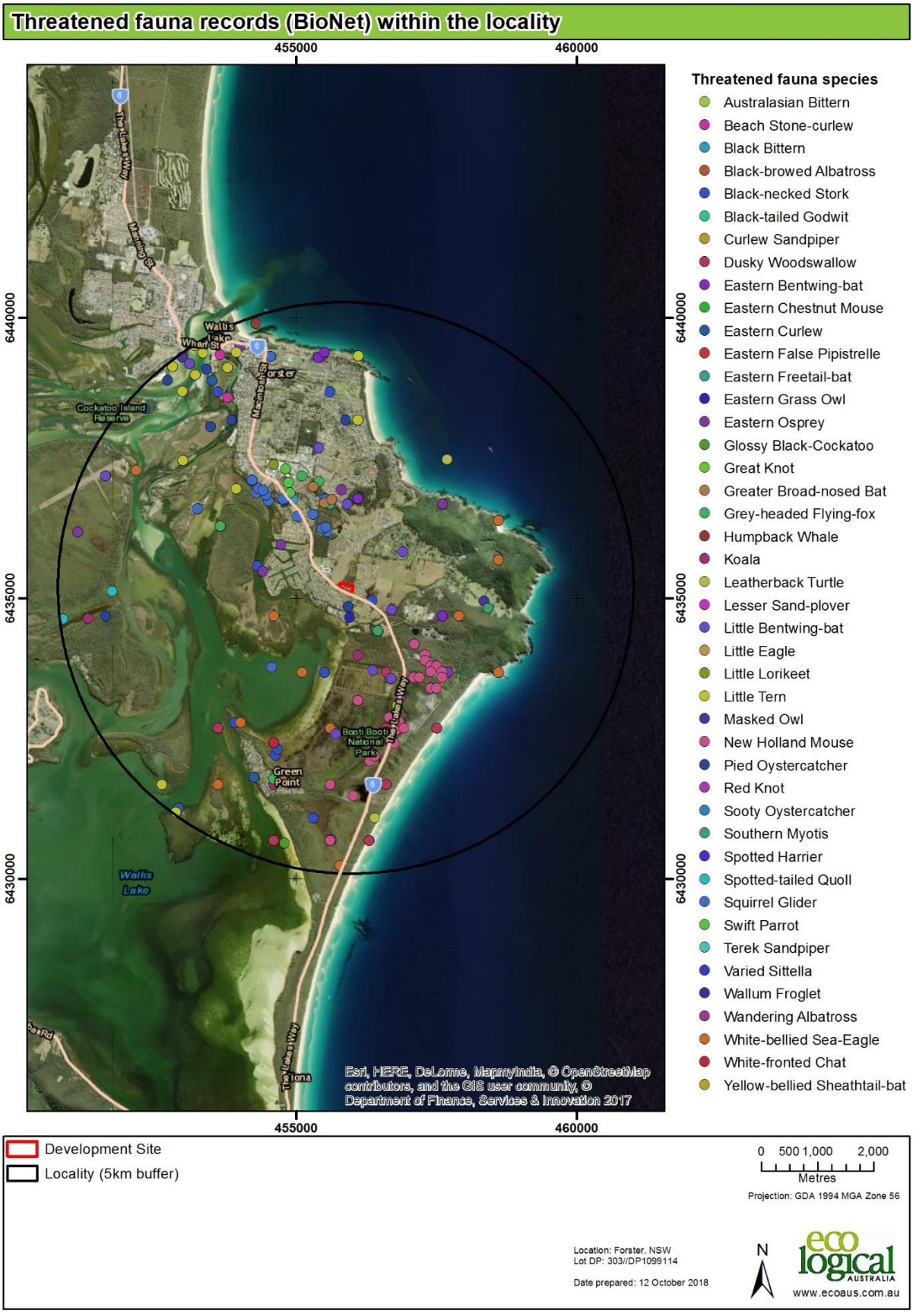


Figure 6 Threatened fauna records (Bionet) from the locality (5km)

4.2 Floristic assessment

Broadly there are three vegetation communities that occur within the study area, which corresponds to two Plant Community Types (PCTs) in accordance with the NSW Vegetation Information System (VIS).

- 1235 Swamp Oak swamp forest of the coastal lowlands of the NSW North Coast Bioregion
- 780 Coastal floodplain sedgelands, rushlands, and forblands of the North Coast
- Disturbed exotic and native vegetation

All vegetation within the study area is regenerating from what was a cleared paddock in 2001 as shown in Figure 7.

Details of each of these vegetation communities, including their dominant canopy, midstorey, and ground layer species, landscape position, and any listing under the BC Act or EPBC Act, are provided below.

A complete inventory of flora species, including their cover and abundance from each of the three floristic quadrats is provided in **Appendix C**.

Figure 7 Historic imagery of the study area from 2001 (Source – Google Earth)

1235 Swamp Oak swamp forest of the coastal lowlands of the NSW North Coast Bioregion

Vegetation formation:	Forested wetland
Vegetation class:	Coastal floodplain wetlands
Vegetation structure	Regenerating forest
Conservation status:	BC Act Endangered Ecological Community; EPBC Act Endangered Ecological Community

Swamp forest dominated by regenerating *Casuarina glauca* (Swamp Oak), also intergrades with areas of *Melaleuca quinquenervia* (Broad-leaved Paperbark). Occurs in low lying areas of the study area, generally below 3m above sea level.

Mid-storey includes *Breynia oblongifolia* and *Myrsine variabilis*.

Ground layer is variable. Exposed areas to sunlight include *Juncus continuus*, *Entolasia marginata*, *Ranunculus plebeius*, and *Hypolepis muelleri*. Areas shaded by *C. glauca* contain significantly less ground cover.

Characteristic trees	*Casuarina glauca, Melaleuca quinquenervia*
Characteristic midstorey	*Breynia oblongifolia, Myrsine variabilis*
Characteristic groundcovers	*Juncus continuus*, *Entolasia marginata*, *Ranunculus plebeius*, *Hypolepis muelleri*
Weediness (all species)	Moderate
Exotic species	*Cinnamomum camphora, Lantana camara, Conyza bonariensis*
Condition	Regenerating.
Variation and disturbance	Relatively homogenous regenerating forest. Disturbance currently experienced by littering, land clearing, agriculture, trampling by deer, weed ingress
Soil type	Estuarine clays.
% remaining in NSW	25 %
Threats	Littering, land clearing, agriculture, trampling by deer, weed ingress
No. sites sampled	Two (Plots 1 & 2)
Threatened flora species	*Lindernia alsinoides*

780 Coastal floodplain sedgelands, rushlands, and forblands of the North Coast

Vegetation formation:	Forested wetland
Vegetation class:	Coastal floodplain wetlands
Vegetation structure	Wetland
Conservation status:	BC Act Endangered Ecological Community

Discrete patch of rushland that occurs in between PCT1235 in low lying topography. The occurrence of this vegetation community is strictly driven by hydrological influence of a culvert underneath The Lakes Way. Surface water is fed from a raingarden adjacent to housing estate, or via overland flow from adjacent areas.

This vegetation community does not have a canopy or mid-stratum. Ground cover consists of *Typha orientalis, Baumea rubiginosa*, *Baumea articulata*, and *Juncus continuous*.

This vegetation community occurs within the study area, and only occurs on the edge of the development site. A small (<0.01 ha) area of this community occurs within the development site..

Characteristic trees	Absent
Characteristic midstorey	Absent
Characteristic groundcovers	*Typha orientalis*, *Baumea rubiginosa*, *Baumea articulata*, *Juncus continuous*
Weediness (all species)	Moderate
Exotic species	*Ageratina adenophora, Asparagus aethiopicus*
Condition	Disturbed
Variation and disturbance	Given the limited extent of this community, there is little variation in the condition. Disturbance to this community is caused primarily by litter, weed ingress, and trampling by deer.
Soil type	Estuarine clays
% remaining in NSW	20 %
Threats	Weed invasion, litter, trampling by deer
No. sites sampled	No sites sampled – outside development site
Threatened flora species	Absent

Exotic vegetation

Vegetation formation:	Exotic grassland
Vegetation class:	Exotic grassland
Vegetation structure	Grassland
Conservation status:	Not listed

Exotic grassland that occurs on slightly elevated portions of the study area. No canopy of mid-storey present. Ground layer dominated by *Rubus ulmifolius, Paspalum dilatatum, Cenchrus clandestinus, Ranunculus repens*, and *Cyperus brevifolius*.

Native species such as *Juncus usitatus, Cynodon dactylon*, and *Carex* spp. Occur at low densities.

Vegetation typical example of a coastal unmanaged former grazing pasture.

Characteristic trees	Absent
Characteristic midstorey	Absent
Characteristic groundcovers	*Rubus ulmifolius, Paspalum dilatatum, Cenchrus clandestinus, Ranunculus repens, Cyperus brevifolius*
Weediness (all species)	> 50%
Exotic species	*Lycium ferocissimum, Lolium perenne, Carthamus lanatus*
Condition	Low condition exotic paddock.
Variation and disturbance	Disturbed grassland that has regenerated as a weed paddock.
Soil type	Estuarine clays.
% remaining in NSW	N/A
Threats	Weed invasion
No. sites sampled	One only (Plot 3)
Threatened flora species	Absent

Figure 8 Plant community types within the study area

Figure 9 Threatened ecological communities (TSC Act) within the study area

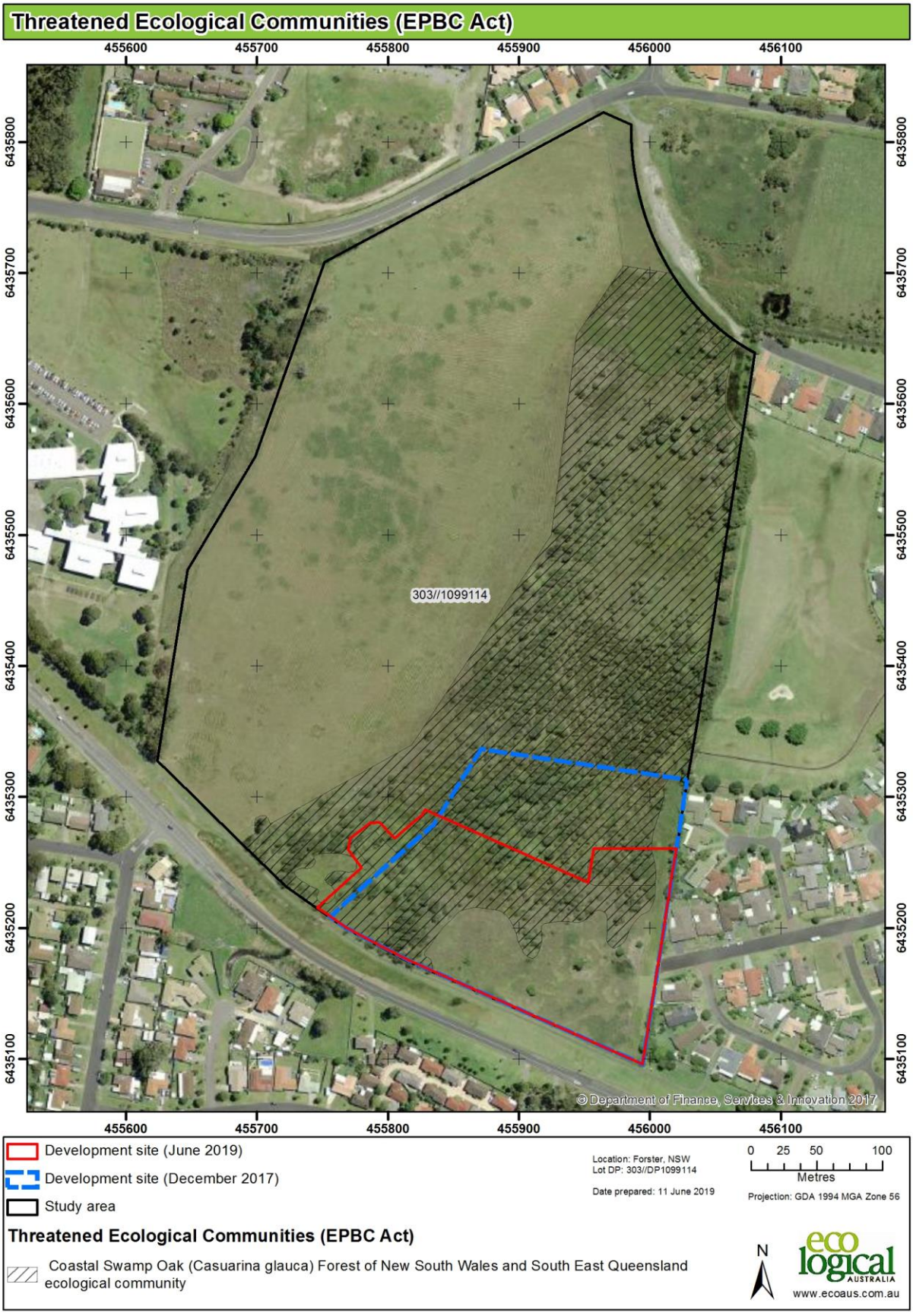


Figure 10 Threatened ecological communities (EPBC Act) within the study area

4.3 Habitat assessment

Habitat assessment was undertaken within the study area and sought to identify key fauna habitat features. The habitat assessment identified that the development site contains regenerating Swamp Oak Forest that does not provide for ongoing maintenance of threatened fauna species. Many of the candidate fauna species initially identified for this study are unlikely to use the development site on an ongoing basis. The development site is more likely to provide temporary foraging habitat for threatened species.

A summary of the habitat assessment undertaken in detailed in Table 4.

Table 4 Fauna habitat assessment

Habitat feature	Study area	Development site
Site topography	Undulating clay soils less than 10m ASL	Undulating clay soils less than 10m ASL
Soil landscapes	Estuarine clays	Estuarine clays
Habitat types	Forested wetlands, freshwater wetlands, exotic vegetation, cleared paddock	Forested wetlands, exotic vegetation
Hollow-bearing trees	Identified on western and northern periphery	Absent
Bush rock / rocky outcrops	Absent	Absent
Watercourses	Absent	Absent
Wetland areas	Discrete manmade damp areas in north and south of study area, adjacent to roadways	Absent
Standing / flowing water	Discrete manmade damp areas in north and south of study area, adjacent to roadways	Absent
Permanent soaks and seepages	Absent	Absent
Leaf litter	Casuarina litter only	Casuarina litter only
Flowering tree species	No flowering species at time of survey. *M. quinquenervia* at other times of year.	No flowering species present
Winter flowering eucalypts; or flowering shrubs	Absent	Absent
Allocasuarina species	Absent	Absent
Natural burrows or logs	Absent	Absent
Nests and roosts	Absent	Absent
Den trees, latrine sites	Absent	Absent
Distinctive scats	Absent	Absent
Bat subterranean roosts including caves, culverts, tunnels etc.	Absent	Absent

Figure 11 Fauna habitats within the study area

4.4 Threatened flora searches

Threatened flora searches were undertaken over 9.39 km of transects. Surveys were focussed on areas of land zoned RE2, consistent with the proposed footprint at the time of survey.

Recent (2017) surveys confirmed the presence of *L. alsinoides* which had previously been recorded onsite. Previous surveys by ELA (2008) indicated that a population of 20 individuals occur onsite. Surveys undertaken in 2017 & 2018 identified 337 individuals within the RE2 lands. The location and count of individuals identified is shown on Figure 12.

The majority of *L. alsinoides* within the study area identified was growing predominantly along the edge of disturbed game trails made through the understorey by *Cervus timorensis* (Rusa Deer) which inhabit the study are and adjacent natural areas.

Photograph 1 *Lindernia alsinoides* (Noahs False Chickweed)

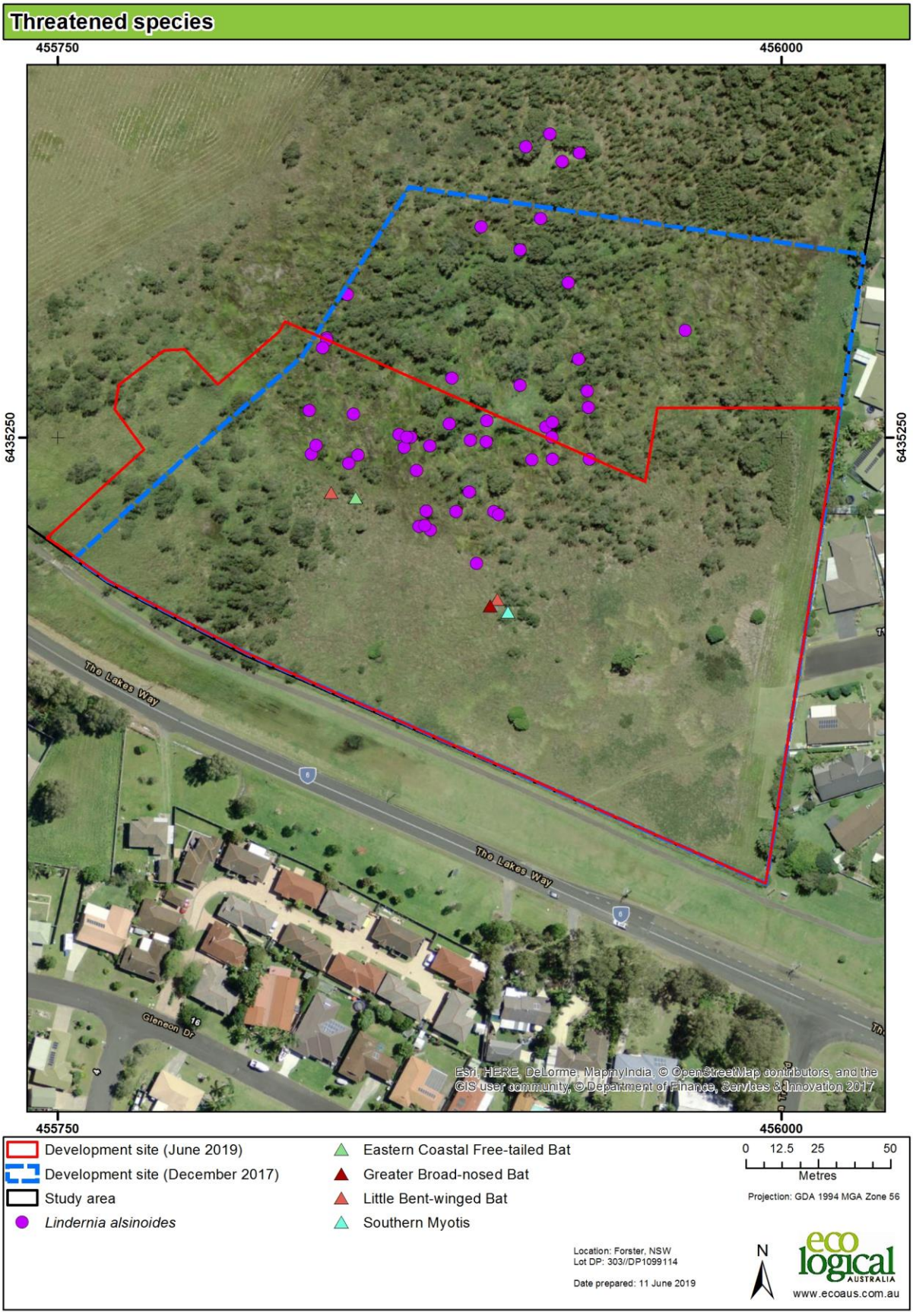


Figure 12 Threatened species within the study area

4.5 Threatened fauna searches

Threatened fauna searches conducted did not detect any threatened species using the site. Several *Pteropus poliocephalus* (Grey-headed Flying-foxes) were observed flying over the site in an easterly direction on the evening of 4 October, however they were not using the site.

The majority of fauna species using the site were small passerines such as *Malurus cyaneus* (Superb Fairy-wren) and *Neochmia temporalis* (Red-browed Finch), which were both observed during field surveys. The young age class of the forest contributes to this fauna diversity structure, lacking in hollows, mature trees, flowering eucalypts, or structural diversity (such as logs, rocks etc).

No nocturnal bird species were observed. This result is not unexpected considering the limited foraging or roosting habitat available within the development site.

Only one reptile species was observed during surveys *Pseudechis porphyriacus* (Red-bellied Black Snake) which was observed in a small clearing between blackberries.

Two amphibian species were observed during surveys, *Litoria fallax* (Eastern Dwarf Tree Frog) and *Litoria peronii* (Peron's Tree Frog), both of which are common to coastal NSW. Both species were heard in semi-permanent water within manmade drains and rain gardens adjacent to roadways. No amphibians were heard or observed within the development site. This lack of observations is due to the development site being dry at the time of survey. Both of these species would likely inhabit the development site during periods of inundation.

The lack of detection of *C. tinnula* is consistent with previous surveys of the study area. Whilst this species can inhabit manmade habitats (such as the raingardens surveyed by ELA in 2018), the lack of connectivity between the development site and any other adjacent natural areas is a likely barrier to the species occurring within the study area.

Analysis of ultrasonic data determined that there are likely at least 12 species of microchiropteran bats present, which includes the following species as shown in the table below. Of these species, three are listed under the BC Act as Vulnerable. No bats detected are listed under the EPBC Act.

Table 5 Microchiropteran bat species identified

Scientific name	Common name	BC Act	EPBC Act	Call ID quality
Chalinolobus gouldii	Gould's Wattled Bat			Definitely present
Chalinolobus morio	Chocolate Wattled Bat			Definitely present
*Micronomus norfolkensis** (syn. *Mormopterus norfolkensis*)	Eastern Coastal Free-tailed Bat	Vulnerable		Definitely present
*Miniopterus australis**	Little Bent-winged Bat	Vulnerable		Definitely present
*Myotis macropus**	Southern Myotis	Vulnerable		Definitely present
Nyctophilus geoffroyi	Lesser Long-eared Bat			Potentially present
Nyctophilus gouldi	Gould's Long-eared Bat			Potentially present
Ozimops ridei	Ride's Free-tailed Bat			Definitely present
*Scoteanax rueppellii**	Greater Broad-nosed Bat	Vulnerable		Potentially present

Scientific name	Common name	BC Act	EPBC Act	Call ID quality
Scotorepens orion	Eastern Broad-nosed Bat			Potentially present
Vespadelus pumilus	Eastern Forest Bat			Definitely present
Vespadelus vulturnus	Little Forest Bat			Definitely present

The bats detected are likely using the site as foraging habitat. Key roosting and breeding habitat for these species (such as caves, culverts, or hollows) are absent from the site.

A complete list of fauna species observed during current and previous studies is found in **Appendix D**.

4.6 Weeds and pests

Several weed/exotic flora species were observed within the development site. Several of these species are listed under Schedule 3 of the NSW *Biosecurity Regulation 2017*, which are declared weeds that cannot be sold, traded, or propagated in NSW.

Within exotic grassland areas there are significant Blackberry (*Rubus ulmifolius*) infestations which are shown in Photograph 2. Exotic grasslands also contain Fireweed (*Senecio madagascariensis*).

Within Swamp Oak Forest areas, Crofton Weed (*Ageratina adenophora*) and Lantana (*Lantana camara*) are prevalent.

Table 6 Exotic flora and weed species recorded in development site

Species	Common	Listed under Biosecurity Regulation 2017
Agapanthus spp.	African Lily	
Ageratina adenophora	Crofton Weed	
Anagallis arvensis	Scarlet Pimpernel	
Andropogon virginicus	Whiskey Grass	
Asparagus aethiopicus	Asparagus Fern	Yes
Bidens pilosa	Cobblers Pegs	
Briza maxima	Quaking Grass	
Briza minor	Shivery Grass	
Briza subaristata		
Cinnamomum camphora	Camphor laurel	
Conyza bonariensis	Flaxleaf Fleabane	
Cyperus brevifolius	Mullumbimby Couch	
Eragrostis tenuifolia	Elastic Grass	
Lantana camara	Lantana	Yes
Paspalum dilatatum	Paspalum	
Cenchrus clandestinus	Kikuyu	
Plantago lanceolata	Lamb's Tongues	
Ranunculus repens	Creeping Buttercup	
Rubus ulmifolius	Blackberry	Yes
Senecio madagascariensis	Fireweed	Yes
Sonchus spp.	Sowthistle spp.	
Verbena bonariensis	Purpletop	
Verbena rigida	Veined Verbena	

Photograph 2 Exotic paddock with significant blackberry infestation

No pest species were observed during recent surveys. Previous surveys have identified Red Fox in grassland areas, which are a declared pest in NSW. Although declared as a game animal under the NSW *Game and Feral Animal Control Act 2002*, wild Rusa Deer observed within the development site (Photograph 3) behave as a pest through grazing and trampling of native vegetation, as well as forming wallows in wetland areas.

Photograph 3 *Cervus timorensis* (Rusa Deer) observed within the study area

4.7 Summary of threatened species, population, and ecological communities

Based on the review of previous studies, consideration of local records, and recent field studies, the following threatened species and ecological communities are known to occur within the development site and may be impacted by the proposed bulk earthworks:

Threatened flora: *Lindernia alsinoides* (Noah's False Chickweed) – TSC Act Endangered

Threatened fauna: *Micronomus norfolkensis* (syn. *Mormopterus norfolkensis*) (Eastern Coastal Free-tailed Bat) – TSC Act Vulnerable

Miniopterus australis (Little Bent-winged Bat) – TSC Act Vulnerable

Myotis macropus (Southern Myotis) – TSC Act Vulnerable

Scoteanax rueppellii (Greater Broad-nosed Bat) – TSC Act Vulnerable

Threatened ecological communities: Swamp Oak Floodplain Forest – TSC Act and EPBC Act Endangered

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5 Impact assessment

Both direct and indirect impacts during the construction phase and long-term impacts have been considered in the below impact assessment.

A worst case scenario of total clearing of all vegetation in the 'subject site'/impact area has been assumed in this assessment

5.1 Direct impacts

Direct impacts are those impacts that directly affect habitat and individuals. Direct impacts considered for this assessment are vegetation and habitat removal. The proposed development is likely to result in the following direct impacts:

- Direct – Removal of 1.61 ha of EEC
- Direct – Loss of potential foraging habitat for threatened fauna
- Direct – Removal of 110 individuals of *Lindernia alsinoides*

5.1.1 Vegetation communities

The proposed works will result in the clearing of both native and exotic vegetation. A total of 2.91 ha of will be removed under the scenario assumed in this assessment. Out of the total impacted vegetation, 1.61 ha is moderate to good quality Swamp Oak Floodplain Forest (SOFF) EEC and 1.3 ha is low condition comprised of predominately exotic species in a cleared paddock. Within the area of land zoned RU2, the development site will remove approximately 18% of vegetation within the study area.

A summary of the area of each vegetation community to be impacted is shown in the table below and shows as the hatched area on Figure 13.

Table 7 Direct impacts to native vegetation

Vegetation Community	BC Act	EPBC Act	Impacted (ha)	Retained in RU2 land (ha)	Retained land within study area (ha)	Total (ha)
1235 Swamp Oak swamp forest of the coastal lowlands of the NSW North Coast Bioregion	EEC	EEC	1.61	0.89	7.29	8.9
780 Coastal floodplain sedgelands, rushlands, and forblands of the North Coast	EEC	Not listed	0.0	0.0	0.2	0.2
Disturbed exotic vegetation	Not listed	Not listed	1.3	0.1	0.1	1.4
Cleared paddock	Not listed	Not listed	0.0	0.0	10.8	10.8
Total			**2.91**	**0.9**	**18.39**	**21.3**

According to threatened species assessment guidelines (DECC 2007) the local occurrence may include adjacent areas if the ecological community on the study area forms part of a larger contiguous area of that ecological community and the movement of individuals and exchange of genetic material across the boundary of the study area can be clearly demonstrated.

The local occurrence for Swamp Oak Floodplain Forest is assumed to be any areas of similar vegetation that is contiguous with the vegetation in the development site. According to vegetation mapping prepared as part of this report, this area totals 8.89 ha. This patch is unlikely to share genetic material with the similar vegetation in the locality as it is not connected via native vegetation. Therefore, the local occurrence is assumed to be only that vegetation which occurs within the study area.

For the purpose of this assessment the Swamp Oak Floodplain Forest proposed for removal makes up approximately 18% of the local occurrence. The retained vegetation within the drainage easement adjacent to the development site is proposed to be managed under the guidance of a Vegetation Management Plan (VMP; Figure 14) and a restrictive covenant on title. This will ensure that the vegetation is protected and enhanced through weed management and revegetation. It is noted that a portion of the VMP area contains an existing stormwater drain which may require access for repairs in the future. This area has been identified as 'managed land' on **Figure 14**. It is assumed that any impacts of works within the stormwater management area will be rehabilitated in line with the VMP requirements. All other areas of the VMP will be fully managed in accordance with the VMP. The VMP area includes 2.23 ha of land.

An assessment of significance for the impacts of the proposed bulk earthworks has been undertaken in accordance with s5A of the EP&A Act and in accordance with EPBC Act. Based on the extent of impacts and retention of the EEC onsite, it is unlikely that the proposed works will result in the extinction of the community within the locality. Therefore, a significant impact is not considered likely.

Figure 13 Direct impacts of the proposal

Figure 14 Proposed VMP area

5.1.2 Threatened flora

One threatened flora species *Lindernia alsinoides* (Noah's False Chickweed), listed as Endangered under the BC Act, has been was observed to occur in Swamp Oak Forest within and adjacent to the development site (Figure 12). 337 individuals were counted in total within the study area during surveys in 2017 & 2018.

The population observed onsite is currently experiencing pressure from grazing and trampling from feral deer, although it is noted that the same deer trails appear to be promoting growth of *L. alsinoides* by exposing narrow corridors to sunlight.

All occurrences that occur within the proposed development site (110 individuals) will be subject to bulk earthworks and will be directly impacted. The individuals impacted form part of a larger population that extends north into land retained and proposed for management under a VMP. The species is thought to pollinate via native bees which can share genetic material for up to 600m. It is noted that the exact pollination distance of native bees in this instance has not been quantified, and may be more than 600m. Based on this assumption, the population within the study area is unlikely to share genetic material with other occurrences in the Forster region (Figure 15). As a precautionary measure, the local population for this assessment includes only those individuals that occur within the study area.

The proposed bulk earthworks will therefore impact on approximately 30% of the local population (should the ocal population be restricted to those only within the study area). This extent of impacts is considered to reduce the local population, however a local extinction is unlikely occur. Based on the current evidence available, a significant impact is unlikely.

An Assessment of Significance (AoS) was undertaken for *L. alsinoides*. It was concluded that a significant impact is not likely and a SIS is not required.

No other threatened flora species were considered as likely or potential to occur within the study area.

5.1.3 Threatened fauna

Microchiropteran bats such as Little Bentwing-bat, Eastern Coastal Freetail-bat, Southern Myotis, and Greater Broad-nosed Bat have been recorded within the development site and are considered as having foraging habitat within the study area. The study area had a low amount of microbat call activity which may be explained by the vegetated landscape the study area is in as well as cleared areas and dams where bats can forage.

A number of hollow-bearing trees within the locality may provide roosting and breeding habitat for a number of these species. The proposed development however is not proposing to remove any hollow-bearing trees. The combined Assessment of Significance for these species (Appendix G) has assumed the worst case scenario. It was concluded that a significant impact is not likely and that a Species Impact Statement (SIS) is not required.

Figure 15 Local records of *Lindernia alsinoides*

5.2 Indirect impacts

Indirect impacts are those impacts that do not directly affect habitat and individuals but that have the potential to interfere through indirect action. Indirect impacts considered for this assessment are site impacts (noise, light and weed invasion) and downstream or downwind impacts (sedimentation, dust, accidental spills and leaks).

During the bulk earthworks, dust and to a small degree vibration will be emitted which could have an indirect impact on local fauna. These impacts result from the operation of heavy machinery to clear vegetation. These impacts are short term only and therefore are unlikely to significantly impact fauna. Also, during the construction period there is a risk that sediment runoff may impact adjacent native vegetation and nearby drainage lines/creeks if appropriate sediment and erosion measures are not in place. This impact will be managed via an appropriate sediment and erosion control plan. The overall impact is likely to be minor.

Possible increase in weeds infestation can result if weed propagules are introduced or moved around by machinery during construction. A Vegetation Management Plan (VMP) which will be in place, will recommend weed control measures.

As such, indirect impacts to threatened species and native vegetation are unlikely to be significant and will be managed.

5.3 Key threatening processes

A number of Key Threatening Processes (KTPs) listed under the TSC Act and / or EPBC Act are likely to be relevant to the proposed works. The KTPs are:

- clearing of native vegetation (TSC Act) / Land clearance (EPBC Act)
- removal of dead wood and trees (TSC Act).

The threatening processes are considered in the assessments of significance (7-part tests) and EPBC significant impact criteria assessments.

5.4 SEPP 44 – Koala Habitat Protection

According to Schedule 1, SEPP 44 applies to the local government area of Great Lakes (now MidCoast). An assessment of koala habitat has been made in accordance with Part 2 of the SEPP.

No listed Koala Feed Tree species according to Schedule 2 of the Koala SEPP.

The density of Koala feed trees did not account for 15% of the canopy and therefore the study area is not likely to be core Koala habitat and further assessment of the SEPP 44 is not required. Furthermore, no evidence of Koala habitation such as scats and scratches were not observed.

5.5 SEPP71 – Coastal Protection

SEPP71 – Coastal Protection has been repealed and is intended to be replaced with the Coastal Management SEPP, however as the DA was submitted in November 2017, the *SEPP71 – Coastal Protection* still applies.

The SEPP71 – Coastal protection applies to land identified as within the coastal zone. The consent authority must consider all matters within Clause 8 of the SEPP71 – Coastal Protection, of which the impacts of the bulk earthworks DA have been detailed in the table below.

Table 8 matters for consideration under SEPP71 – Coastal Protection

Consideration	Response
(a) The aims of this (SEPP71) Policy set out in clause 2	The proposal is consistent with the following aims of the SEPP71: - To encourage a strategic approach to coastal management
(b) existing public access to and along the coastal foreshore for pedestrians or persons with a disability should be retained and, where possible, public access to and along the coastal foreshore for pedestrians or persons with a disability should be improved,	The proposed bulk earthworks does not affect access to the coastal foreshore
(c) opportunities to provide new public access to and along the coastal foreshore for pedestrians or persons with a disability,	The proposed bulk earthworks does not provide any new public access to the coastal foreshore
(d) the suitability of development given its type, location and design and its relationship with the surrounding area,	Bulk earthworks (and future development of the site) are consistent with existing development adjacent to the site
(e) any detrimental impact that development may have on the amenity of the coastal foreshore, including any significant overshadowing of the coastal foreshore and any significant loss of views from a public place to the coastal foreshore,	The proposed bulk earthworks does not affect the visual amenity of the coastal foreshore
(f) the scenic qualities of the New South Wales coast, and means to protect and improve these qualities,	The proposed bulk earthworks does not affect the scenic qualities of the New South Wales coast
(g) measures to conserve animals (within the meaning of the *Threatened Species Conservation Act 1995*) and plants (within the meaning of that Act), and their habitats,	The proposal will conserve a patch of native vegetation under a VMP which will be protected under a planning instrument.
(h) measures to conserve fish (within the meaning of Part 7A of the *Fisheries Management Act 1994*) and marine vegetation (within the meaning of that Part), and their habitats	The proposed bulk earthworks does not affect fish and their habitats
(i) existing wildlife corridors and the impact of development on these corridors,	The proposed bulk earthworks will reduce a patch of native vegetation. This patch however has very low connectivity to other natural areas. As such the connectivity for wildlife is unlikely to be significantly impacted by the proposal.
(j) the likely impact of coastal processes and coastal hazards on development and any likely impacts of development on coastal processes and coastal hazards,	The proposed bulk earthworks does not affect coastal process and coastal hazards
(k) measures to reduce the potential for conflict between land-based and water-based coastal activities,	The proposed bulk earthworks does not exacerbate any conflict between land-based and water-based coastal activities

Consideration	Response
(l) measures to protect the cultural places, values, customs, beliefs and traditional knowledge of Aboriginals,	No cultural places are known onsite
(m) likely impacts of development on the water quality of coastal waterbodies,	The development is unlikely to impact on any coastal waterbodies
(n) the conservation and preservation of items of heritage, archaeological or historic significance,	No items of heritage or cultural significance are known from the site
(o) only in cases in which a council prepares a draft local environmental plan that applies to land to which this Policy applies, the means to encourage compact towns and cities,	No draft LEP is prepared for this site.
(p) only in cases in which a development application in relation to proposed development is determined: - the cumulative impacts of the proposed development on the environment, and - (ii) measures to ensure that water and energy usage by the proposed development is efficient.	The development will further reduce the occupancy of native vegetation locally by 1.61 ha. No measures to ensure water or energy usage are proposed under the bulk earthworks.

5.6 Great Lakes Development Control Plan 2014

Under the Great Lakes DCP, Council must consider the ecological impacts of the proposal. The ecological considerations of the proposal in relation to the DCP are detailed in the table below.

Table 9 Council considerations to ecological impacts

Section	Consideration	Response
4.1.1	the avoidance (where possible) or minimisation of loss and harm to remnant native vegetation and trees and the habitat of wildlife populations	The bulk earthworks DA is primarily focussed on an area of cleared land.
4.1.2	the protection of natural biodiversity, including native vegetation and wildlife, their habitats and biological processes and functions	The bulk earthworks will reduce the occurrence of natural biodiversity by 1.61 ha. Ecological values present onsite will be protected on retained land under a VMP and on title restriction.
4.1.3	the protection of all ecological values of the natural landscape including scenic, recreational, aesthetic and cultural heritage values	Ecological values present onsite will be protected on retained land under a VMP and on title restriction.

Section	Consideration	Response
4.1.4	the design and siting of the development (including the footprints of all built structures, access, services, bushfire asset protection zones, water management structures, and other ancillary features of that development) in the area of the land that is of least ecological or biodiversity constraint and where the siting of that development results in the least possible ecological or biodiversity-related impact	The bulk earthworks DA is primarily focussed on an area of cleared land.
4.1.5	the appropriate siting and design of a development (including lot boundaries) with regards to the protection of agricultural sustainability, ecological integrity, topography, landform, native vegetation, wildlife habitat, wetlands and watercourses	The bulk earthworks DA is primarily focussed on an area of cleared land. The area of disturbance is in line with adjacent areas including linking an unfinished road.
4.1.6	the adoption of suitable and effective protective safeguards that avoids, minimises or compensates for the clearing of habitat and native vegetation within any development	Areas of retained vegetation will be managed under a VMP. It is also recommended that a Biodiversity Management Plan be drafted for the site to control any additional impacts that may occur during construction.
4.1.7	the capability of the land to accommodate the development without impairment or harm to important ecosystem services functions and the condition, ecological value and significance of fauna and flora	The development of the cleared portion of land is unlikely to affect nearby ecosystem function. Areas of built up land will need to be managed carefully to prevent ongoing impacts from run off, dust, littler, weeds, feral cats, and other disturbances associated with residential development.
4.1.8	avoidance of fragmentation or disturbance of wildlife habitats and the protection, maintenance and (where possible) enhancement of ecological linkages and wildlife corridors in a local, sub-regional and regional context	The development will not fragment the current occurrence of ecological linkages. The site is currently isolated in a local context.
4.1.9	the avoidance (where possible) and minimisation of negative impacts on natural landscapes that provide key ecological services provisions, including but not limited to, rainforests, wetlands, riparian zones, vegetated steep lands, rare, regionally significant or poorly conserved ecological communities, threatened species habitats, endangered ecological communities and protected land	As identified above, areas of built up land will need to be managed carefully to prevent ongoing impacts from run off, dust, littler, weeds, feral cats, and other disturbances associated with residential development.

Section	Consideration	Response
4.1.10	the identification and active protection of natural landscapes that provide key ecological services provisions, including but not limited to, rainforests, wetlands, riparian zones, vegetated steep lands, rare, regionally significant or poorly conserved ecological communities, threatened species habitats, endangered ecological communities and protected land, including the need to adopt buffers of adequate width and configuration to such areas to protect them from the overt direct or indirect effects of that development	As identified above, areas of built up land will need to be managed carefully to prevent ongoing impacts from run off, dust, littler, weeds, feral cats, and other disturbances associated with residential development.
4.1.11	the compensating or offsetting of unavoidable impacts of a development such that the natural environment and native biodiversity is maintained or improved. The provision of any offsets should be located on the development site or as close as possible to the area of impact, and not beyond the bounds of the Great Lakes Local Government Area	A portion of land onsite will be set aside and managed under a VMP with on-title in-perpetuity protection from development. No other offsets are provided within this application.
4.1.12	where primary koala food tree species occur, the means with which the development would avoid such trees and where, if impacts on such trees are unavoidable, the means with which there would be a long-term net gain in the representation of primary koala food tree species as a consequence of that development	No Koala food trees occur onsite.
4.1.13	where hollow-bearing trees (comprising trees with cavities, hollows, splits or decorticating bark capable of providing roosting, denning or refuge sites for native vertebrate fauna) occur, the means with which the development would avoid such trees and where, if impacts on such trees are unavoidable, the means with which there would be a long-term net gain in the representation of denning opportunities for hollow-dependent native wildlife as a consequence of that development	No hollow-bearing trees occur onsite.

Section	Consideration	Response
4.1.14	the adequate, effective and active conservation management of areas of high biodiversity conservation value of the land of a development site and/ or a restoration or an offset area through a permanent, executed legal mechanism and the preparation, funding and implementation of a habitat or restoration management plan	As described above, a portion of land onsite will be set aside and managed under a VMP with on-title in-perpetuity protection from development.
4.1.15	the management of risks associated with bush fire in a manner that does not unreasonably compromise and minimises or avoids impacts on native vegetation, wildlife and wildlife habitats	The site is not identified as bushfire prone land.
4.1.16	the containment, within a single lot, of the area of a holding that comprises land that is zoned E2 Environmental Conservation	No lands within the lot are zoned E2
4.1.17	the encouragement of conservation and recovery of populations of threatened biodiversity within a development and/ or any offset areas	As described above, a portion of land onsite will be set aside and managed under a VMP with on-title in-perpetuity protection from development.
4.1.18	the adoption of suitable and effective protective safeguards that avoids impacts to areas of high conservation value native vegetation and native wildlife populations and their habitats from any harm or impact associated with the introduction or encouragement of domestic pets, invasive exotic plants and animals and grazing animals	As described above, a portion of land onsite will be set aside and managed under a VMP with on-title in-perpetuity protection from development. As identified above, areas of built up land will need to be managed carefully to prevent ongoing impacts from run off, dust, littler, weeds, feral cats, and other disturbances associated with residential development.
4.1.19	the means with which priority invasive environmental weeds would be effectively and actively controlled and suppressed on the development site for the life of the development	As described above, a portion of land onsite will be set aside and managed under a VMP with on-title in-perpetuity protection from development.
4.1.20	consideration of the location and style of fencing on the land on the development site to enclose and/ or protect areas of high conservation value native vegetation and native wildlife populations and their habitats	No fencing is proposed under the bulk earthworks DA

5.7 Wallis Lakes Wetland Strategy

The *Wallis Lake Wetlands Strategy* (The strategy; Great Lakes Council, 2010) seeks to recognise that:

- Wetlands provide ecosystem services and functions that are vital to the quality and integrity of natural systems
- Wetlands contribute significantly to the biodiversity, aesthetics and economy
- Most wetland communities are under-represented in the reserve system and are of high conservation value.

Portions of the development site that include Swamp Oak forest are considered a wetland in accordance with the strategy. The strategy is guided by 16 principles adopted from the NSW Wetlands Policy (DECCW, 2010), which have been reviewed against the current development proposal in the table below.

Table 10 Review of the development against the Principles of the Wallis Lake Wetlands Strategy

Principle	Consideration	Response
Principle 1	Wetlands are to be valued as significant and important parts of the catchment landscape. Only through the recognition that wetlands provide vital water quality protection and management and other services to our rivers, estuaries and lakes can they be managed in accordance with their values. In particular, the value of wetlands to water quality maintenance and improvement is to be specifically recognised. In this manner, wetlands are to be conserved and restored to assist deliver the targets and outcomes of the adopted Water Quality Improvement Plan for the Wallis Lake catchment.	The occurrence of the wetland within the site is a regenerating Swamp Oak forest and is not identified as a significant wetland. Water quality including run-off from the proposed bulk earthworks will need to be controlled during and following construction to ensure integrity of the Wallis Lake catchment.
Principle 2	Wetlands are to be recognised as places with important cultural and social values, especially as an important part of "Country" for Aboriginal people.	No important places are known from the site
Principle 3	Wetlands are to be protected, managed and, where required, restored and not be knowingly destroyed or degraded. If significant social or economic imperatives that in the wider public interest result in a wetland being degraded or destroyed, the establishment and protection of a wetland offset area that supports equivalent or greater biodiversity and ecological outcomes is to be provided. Wetlands that possess very high or unique conservation values that cannot be compensated or offset must be preserved and protected free from any harm or degradation.	Retained portions of vegetation within the site will be protected and managed under a VMP.
Principle 4	Land use and management practices that maintain or rehabilitate wetland habitats, ecosystem services and cultural values are to be adopted for wetlands of all tenures.	As above, retained portions of vegetation within the site will be protected and managed under a VMP.
Principle 5	General and specific risks and threats are to be identified, evaluated and managed for wetland systems. This relies on adequate skills, knowledge, expertise and capacity of those entrusted with the care and management of the natural environment. It also relies on effective communication, research and adaptive management.	A biodiversity management plan (BMP) for the development, as well as a VMP for the retained lands are to be developed and enacted to minimise risks to retained areas of wetlands.

Principle	Consideration	Response
Principle 6	It is essential that degraded and damaged wetlands are rehabilitated and that their ecological processes are reinstated, as far as is possible. The priority for wetland restoration is to be directed to impaired or damaged wetlands that: • Are of high conservation value; • Discharge acid sulfate outflows; • Are very important in strategically protecting or providing estuarine or riverine assets or values; • Have a high degree of stakeholder support; and/ or • Adjoin existing conservation areas.	As above, a BMP and VMP will be developed to assist the rehabilitation of the retained areas of wetland.
Principle 7	Management and conservation depends upon actions that establish, protect, manage and (where required) restore adequate buffers and wildlife corridors into and out of wetland systems.	The VMP prepared for retained areas of wetland will consider buffers where practical and appropriate.
Principle 8	The conservation and management of wetlands must include and consider the management of the wetland catchment.	Not applicable, as the catchment of the wetland is currently residential development south of The Lakes Way.
Principle 9	Developments and activities upstream of wetlands are to be designed and operated so as to exert no net biological, physical, chemical or hydrological impact on any wetland.	As above, existing development is already *in situ* upstream from the wetland.
Principle 10	Water quality and quantity regimes and hydrological processes that provide for the natural condition and ecological resilience of wetland systems are to be maintained or, where altered, reinstated.	Up-stream development already dictates the quality and volume of water ingress.
Principle 11	Floodplains are to be managed in a manner that maintains or restores the natural distribution of water to and from floodplain wetlands.	Up-stream development already dictates the quality and volume of water ingress.
Principle 12	An effective wetland conservation framework is essential for the protection and management of wetlands.	The development considers the Wallis Lake Wetland Strategy by retaining and managing areas of wetland on private land.
Principle 13	The potential impact of climate change is a significant threat to many wetland systems, especially those of coastal and estuarine landscapes. Wetlands are to be managed in a manner that considers and, where possible, responds to the risks associated with climate change and global sea level rise. This includes actions that enhance the natural resilience of wetlands and, wherever possible, provides for spatial retreat of wetlands in the face of sea level rise	Up-stream development already dictates the quality and volume of water ingress.

Principle	Consideration	Response
Principle 14	Research into wetlands is essential to inform adaptive planning and management of wetlands and their conservation. Only through scientific investigation and the publishing and dissemination of the results of such can a sufficient body of knowledge be compiled that ensures adequate wetland management into the future.	Not applicable
Principle 15	Partnership arrangements are essential for effective wetland management. Only through cooperation and shared effort by land managers, government authorities, catchment management authorities, non-government organisations and the general community can wetlands continue to supply environmental benefits into the future.	The development considers the Wallis Lake Wetland Strategy by retaining and managing areas of wetland on private land.
Principle 16	The regular reporting of wetland extent and condition is to be used to assess performance, to understand wetland dynamics and to contribute to adaptive management systems for wetlands in the future.	The VMP for retained areas will include an adaptive management strategy to accommodate best performance outcomes.

6 Recommendations

6.1 Pre-construction

1. Prepare a Construction Environmental Management Plan (CEMP) to guide the construction works in avoiding and minimising environmental impacts. The CEMP is to:
    - Document relevant mitigation measures from this report.
    - Identify sensitive and 'no-go' areas.
    - Contain a sediment and erosion control plan in accordance with 'the Blue Book' Managing Urban Stormwater, Soils and Construction.
    - The plan is to provide guidance on erosion controls to minimise potential impacts to adjacent native vegetation and to minimise sediment run off into nearby drainage lines/creeks.
2. A Vegetation Management Plan (VMP) is to be prepared to guide the management of retained vegetation in the north of the study area. It is to address;
    - Management/control of exotic weed species.
    - Revegetation works including density and type of plantings.
3. The retention area is to be protected under a section 88 covenant *Conveyancing Act 1919* or similar to ensure protection.
4. Recommend translocation of impacted viable occurrences of *L. alsinoides* into the VMP area.

6.2 During construction

5. Areas of vegetation not to be cleared should be fenced and marked with highly visible fencing to prevent accidental clearing.
6. Tree clearing is to aim to avoid times of year such as spring that is particularly likely to have nesting occurring.
7. Clearing of vegetation must only be conducted within the designated impact area.
8. Micro siting is to occur to avoid impacts to trees and sensitive vegetation where possible. It is recommended that a qualified ecologist provide advice during micro-siting on avoiding impacts to individual trees.

6.3 Post-construction

9. Landscaping should include locally indigenous species where possible in accordance with the VMP.
10. Remove weeds and dispose of appropriately at a designated waste facility.

7 Conclusion

ELA has conducted a Flora and Fauna Assessment of the study area, with a focus on determining the significance of impacts to threatened species, populations, or ecological communities that may result from the proposed bulk earthworks.

The assessment determined that the site contains native vegetation that is consistent with the final determination for Swamp Oak Floodplain Forest. The site is also known to be habitat for *L. alsinoides* as well as foraging habitat for several threatened microchiropteran bats.

The Assessment of Significance and a Significant Impact Criteria assessment were undertaken for these species and the EEC. The assessments concluded that a significant impact is not likely if the recommendations in this report are adopted and that a SIS is not required and a referral to the Commonwealth is not recommended.

References

Conacher Travers (2007) Flora and Fauna Assessment for Lot 303 DP1099114 & Lot 1 DP 729734

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Appendix A Correspondence

MIDCOAST council

Forster office
4 Breese Parade | PO Box 450
Forster NSW 2428

LIDBURY SUMMERS & WHITEMAN PTY LTD
PO Box 510
FORSTER NSW 2428

Our Reference: DA-247/2018

Contact : Robyn Shelley.
Telephone:

6 February 2018

Dear Sir/Madam

DEVELOPMENT APPLICATION NO. DA-247/2018
LOCATION: LOT 303 DP 1099114, LOT 303 CAPE HAWKE DRIVE, FORSTER
PROPOSED LINK ROAD AND BULK EARTHWORKS

I refer to your Development Application submitted on 16 November 2017 seeking development consent at the above premises.

The application was referred to Council's Senior Ecologist who has requested the submission of the following information prior to further assessment of the proposal.

- An Ecological Impact Assessment report addressing the relevant and applicable legislation and which includes proper consideration of the type, nature and significance of impacts arising from the proposal on *Lindernia alsinoides* and various Endangered Ecological Communities and which includes consideration of offsetting opportunities. The legislation that must be considered in the assessment includes s79C and s5A of the EP&A Act 1979, ecological matters of SEPP71, s4.1 considerations of the Great Lakes DCP 2014, as well as considerations of the Wallis Lake Wetland Strategy (and any other relevant matter). The report should consider the means to avoid, mitigate and offset ecological impacts. The report will need to be prepared by a qualified and experienced consultant.

If you have any further enquiries in relation to this matter please contact Mrs Robyn Shelley on ☎ 02 6591 7345 between 8:30 am and 10:00 am Monday to Friday.

Yours faithfully

Mrs Robyn Shelley
Senior Development Assessment Planner
Planning & Environmental Services

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Appendix B Likelihood table for threatened and migratory species

An assessment of likelihood of occurrence was made for threatened and migratory species identified from the database search. This assessment applies to the impact assessment area only, not to the entire subject site. Five terms for the likelihood of occurrence of species are used in this report. This assessment was based on database or other records, presence or absence of suitable habitat, features of the proposed development site, results of the field survey and professional judgement. The terms for likelihood of occurrence are defined below:

- "known" = the species was or has been observed on the site
- "likely" = a medium to high probability that a species uses the site
- "potential" = suitable habitat for a species occurs on the site, but there is insufficient information to categorise the species as likely to occur, or unlikely to occur
- "unlikely" = a very low to low probability that a species uses the site
- "no" = habitat on site and in the vicinity is unsuitable for the species.

Species, populations and communities considered to have the potential, are likely or are known to occur are highlighted blue.

Key to the table:

- TSC Act = Listing under the NSW Threatened Species Conservation Act 1995
- EPBC Act = Listing under the Environment Protection and Biodiversity Conservation Act 1999
- CE = Critically Endangered
- E = Endangered (EPBC Act)
- E1 = Endangered (TSC Act)
- E2 = Endangered Population (TSC Act)
- E4 = Extinct (TSC Act)
- V = Vulnerable
- M = Migratory (EPBC Act)
- Mar = Marine (EPBC Act)

Table 11 Threatened flora

Scientific Name	Common Name	TSC Act	EPBC Act	Distribution	Habitat	Ecology	Habitat quality present (good, marginal, none)	Species known to occur on site (yes/no)	Likelihood of occurrence	Habitat or species on site directly or indirectly impacted (Yes/No)	Impact Assessment Required
Allocasuarina defungens	Dwarf Heath Casuarina	E1	E	Only in NSW, from the Nabiac area, north-west of Forster, to Byron Bay on the NSW north coast.	Tall heath on sand, also nearby-coastal hills or headlands adjacent to sandplains.		None	No	No	No	No
Allocasuarina simulans	Nabiac Casuarina	V	V	Restricted to the mid-north coast of NSW, from Nabiac to Forster.	Heathland on coastal sands.		None	No	No	No	No
Asperula asthenes	Trailing Woodruff	V	V	Only in NSW, in scattered locations from Bulahdelah north to near Kempsey, with several records from the Port Stephens/Wallis Lakes area	Damp sites, often along river banks.		Marginal	No	Potential	No	No
Chamaesyce psammogeton	Sand Spurge	E1		Sparsely along the coast from south of Jervis Bay (at Currarong, Culburra and Seven Mile Beach National Park) to Qld (and Lord Howe Island).	Fore-dunes, pebbly strandlines and exposed headlands, often with *Spinifex sericeus* (Spinifex) and *Zoysia macrantha* (Prickly Couch).	Flowering recorded in spring and summer. Sand Spurge seeds float, so some dispersal between beaches may occur. Longevity of the species is approximately 5 – 30 years with a primary juvenile period of less than 1 year.	None	No	No	No	No
Cynanchum elegans	White-flowered Wax Plant	E1	E	Restricted to eastern NSW, from Brunswick Heads on the north coast to Gerroa in the Illawarra region, and as far west as Merriwa in the upper Hunter River valley.	Dry rainforest; littoral rainforest; *Leptospermum laevigatum-Banksia integrifolia subsp. integrifolia* (Coastal Tea-tree– Coastal Banksia) coastal scrub; *Eucalyptus tereticornis* (Forest Red Gum) or *Corymbia maculata* (Spotted Gum) open forest and woodland; and *Melaleuca armillaris* (Bracelet Honeymyrtle) scrub.	Flowering occurs between August and May, with a peak in November. The fruit can take up to six months to mature. Seed production is variable and unreliable. Seeds are wind dispersed. It is considered to be unlikely that a soil seed bank for this species exists. Plants are capable of suckering from rootstock in response to occasional slashing or grazing. The fire response of the species is unknown.	None	No	No	No	No

Scientific Name	Common Name	TSC Act	EPBC Act	Distribution	Habitat	Ecology	Habitat quality present (good, marginal, none)	Species known to occur on site (yes/no)	Likelihood of occurrence	Habitat or species on site directly or indirectly impacted (Yes/No)	Impact Assessment Required
Genoplesium littorale	Tuncurry Midge Orchid	E4A	CE	Known only from a small area just north of Tuncurry on the NSW mid-north Coast.	Coastal heath in deep, well-drained sandy soils, with *Leptospermum laevigatum, Monotoca elliptica, Ochrosperma lineare* and *Banksia spp.*		None	No	No	No	No
Lindernia alsinoides	Noah's False Chickweed	E1		Coastal areas from Bulahdelah to Coopernook and with occurrences further north at Shannon Creek west of Coutts Crossing and also at Bungawalbyn.	Swamp forests and wetlands along coastal and hinterland creeks.		Good	Yes	Yes	Yes	Yes, species identified onsite
Senecio spathulatus	Coast Groundsel	E1		Nadgee Nature Reserve (Cape Howe) and between Kurnell in Sydney and Myall Lakes National Park (with a possible occurrence at Cudmirrah). Scattered populations in Victoria from Wilsons Promontory to the NSW border.	Frontal dunes in coastal areas.		None	No	No	No	No
Senna acclinis	Rainforest Cassia	E1		Coastal districts and adjacent tablelands of NSW from the Illawarra in NSW to Qld.	Subtropical and dry rainforest.		None	No	No	No	No
Syzygium paniculatum	Magenta Lilly Pilly	E1	V	Only in NSW, in a narrow, linear coastal strip from Upper Lansdowne to Conjola State Forest.	Subtropical and littoral rainforest on gravels, sands, silts and clays.		Marginal	No	No	No	No

Table 12 Threatened fauna

Class	Scientific Name	Common Name	TSC Act	EPBC Act	Distribution	Habitat	Ecology	Habitat quality present	Species known to occur on site	Likelihood of occurrence	Habitat on site directly or indirectly impacted	Impact Assessment Required
Amphibia	*Crinia tinnula*	Wallum Froglet	V		Along the coastal margin from Litabella National Park in south-east Qld to Kurnell in Sydney.	Acidic swamps on coastal sand plains (typically in sedgelands and wet heathlands), drainage lines, and swamp sclerophyll forests.	The species breeds in swamps with permanent water as well as shallow ephemeral pools and drainage ditches. Breeding is thought to peak in the colder months, but can occur throughout the year following rain. Wallum Froglets shelter under leaf litter, vegetation, other debris or in burrows of other species. Shelter sites are wet or very damp and often located near the water's edge. Males may call throughout the year and at any time of day, peaking following rain.	Marginal	No	Potential	Yes	No, species not identified as using the site
Amphibia	*Litoria aurea*	Green and Golden Bell Frog	E1	V	Since 1990, recorded from ~50 scattered sites within its former range in NSW, from the north coast near Brunswick Heads, south along the coast to Victoria. Records exist west to Bathurst, Tumut and the ACT region.	Marshes, dams and stream-sides, particularly those containing Typha spp. (bullrushes) or *Eleocharis* spp. (spikerushes). Some populations occur in highly disturbed areas.	The species is active by day and usually breeds in summer when conditions are warm and wet. Males call while floating in water and females produce a raft of eggs that initially float before settling to the bottom, often amongst vegetation. Tadpoles feed on algae and other plant-matter; adults eat mainly insects, but also other frogs.	None	No	No	No	No
Amphibia	*Mixophyes balbus*	Stuttering Frog	E1	V	Along the east coast of Australia from southern Qld to north-eastern Victoria.	Rainforest and wet, tall open forest in the foothills and escarpment on the eastern side of the Great Dividing Range.	Outside the breeding season adults live in deep leaf litter and thick understorey vegetation on the forest floor. Feed on insects and smaller frogs. Breed in streams during summer after heavy rain. Eggs are laid on rock shelves or shallow riffles in small, flowing streams. As the tadpoles grow they move to deep permanent pools and take approximately 12 months to metamorphose.	None	No	No	No	No

Class	Scientific Name	Common Name	TSC Act	EPBC Act	Distribution	Habitat	Ecology	Habitat quality present	Species known to occur on site	Likelihood of occurrence	Habitat on site directly or indirectly impacted	Impact Assessment Required
Aves	*Anthochaera phrygia*	Regent Honeyeater	E4A	CE	Inland slopes of south-east Australia, and less frequently in coastal areas. In NSW, most records are from the North-West Plains, North-West and South-West Slopes, Northern Tablelands, Central Tablelands and Southern Tablelands regions; also recorded in the Central Coast and Hunter Valley regions.	Eucalypt woodland and open forest, wooded farmland and urban areas with mature eucalypts, and riparian forests of *Casuarina cunninghamiana (*River Oak).	Two of three known key breeding areas are in NSW: the Capertee Valley and Bundarra-Barraba region. The species breeds between July and January and usually nests in horizontal branches or forks in tall mature eucalypts and Sheoaks. The Regent Honeyeater primarily feeds on nectar from box and ironbark eucalypts and occasionally from banksias and mistletoes.	Marginal	No	Unlikely	No	No
Aves	*Ardenna carneipes*	Flesh-footed Shearwater	V	M	Recorded in NSW coastal waters. Breeds on Lord Howe Island.	Marine.	Nests on Lord Howe Island in forests on sandy soils. Eggs are laid at the end of a burrow 1 - 2 metres in length.	None	No	No	No	No
Aves	*Calidris tenuirostris*	Great Knot	V	CE, M	In NSW, recorded at scattered sites along the coast down to about Narooma. It has also been observed inland at Tullakool, Armidale, Gilgandra and Griffith.	Intertidal mudflats or sandflats, including inlets, bays, harbours, estuaries and lagoons.	Migrates to Australia from late August to early September. Most birds return north in March and April, however some individuals may stay over winter in Australia. Forages for invertebrates such as bivalve molluscs, gastropods, polychaete worms and crustaceans.	None	No	No	No	No
Aves	*Calyptorhynchus lathami*	Glossy Black-Cockatoo, Riverina population	E2,V		Within the Narrandera Range and to the north-west in the Brobenah Hills, McPhersons Range, Cocoparra Range, Lachlan Range and Jimberoo State Forests, and the Naradhan Range.	Largely restricted to hills and low ridges where suitable stands of its food plant *Allocasuarina verticillata* (Drooping Sheoak) remain.	Requires large tree-hollows for breeding. Areas adjacent to drainage lines may be preferred for nesting. The diet consists almost exclusively of sheoak seeds, especially Drooping Sheoak for the Riverina population.	None	No	No	No	No
Aves	*Calyptorhynchus lathami*	Glossy Black-Cockatoo	V		In NSW, widespread along coast and inland to the southern tablelands and central western plains, with a small population in the Riverina.	Open forest and woodlands of the coast and the Great Dividing Range where stands of sheoak occur.	Feeds almost exclusively on the seeds of several species of she-oak *(Casuarina* and *Allocasuarina* species), shredding the cones with the massive bill. Dependent on large hollow-bearing eucalypts for nest sites. A single egg is laid between March and May.	Marginal	No	Potential	Yes	No, species not identified as using the site

Class	Scientific Name	Common Name	TSC Act	EPBC Act	Distribution	Habitat	Ecology	Habitat quality present	Species known to occur on site	Likelihood of occurrence	Habitat on site directly or indirectly impacted	Impact Assessment Required
Aves	*Circus assimilis*	Spotted Harrier	V		Found throughout the Australian mainland, except in densely forested or wooded habitats, and rarely in Tasmania.	Grassy open woodland, inland riparian woodland, grassland, shrub steppe, agricultural land and edges of inland wetlands.	Builds a stick nest in a tree and lays eggs in spring (or sometimes autumn), with young remaining in the nest for several months. Preys on terrestrial mammals (e.g. bandicoots, bettongs, and rodents), birds and reptile, occasionally insects and rarely carrion.	Marginal	No	Potential	Yes	No, species not identified as using the site
Aves	*Daphoenositta chrysoptera*	Varied Sittella	V		Distribution in NSW is nearly continuous from the coast to the far west.	Inhabits eucalypt forests and woodlands, mallee and *Acacia* woodland.	Feeds on arthropods gleaned from crevices in rough or decorticating bark, dead branches, standing dead trees and small branches and twigs in the tree canopy. Builds a cup-shaped nest of plant fibres and cobwebs in an upright tree fork high in the living tree canopy, and often re-uses the same fork or tree in successive years.	Marginal	No	Potential	Yes	No, species not identified as using the site
Aves	*Dasyornis brachypterus*	Eastern Bristlebird	E1	E	There are three main populations: Northern - southern Qld/northern NSW, Central - Barren Ground NR, Budderoo NR, Woronora Plateau, Jervis Bay NP, Booderee NP and Beecroft Peninsula and Southern - Nadgee NR and Croajingalong NP in the vicinity of the NSW/Victorian border.	Central and southern populations inhabit heath and open woodland with a heathy understorey. In northern NSW, habitat comprises open forest with dense tussocky grass understorey.	Feeds on a variety of insects, particularly ants. Nests are elliptical domes constructed on or near the ground amongst dense vegetation. Two eggs are laid during August to February.	None	No	No	No	No
Aves	*Diomedea antipodensis*	Antipodean Albatross	V	V	Regularly occurs off the NSW south coast from Green Cape to Newcastle during winter.	Marine.	The species ranges across the southern Pacific Ocean, east to the coast of Chile and west to eastern Australia. The majority of birds breed on Antipodes Island, with a small number of pairs breeding on Campbell Island. Egg laying begins in January (Antipodes Island) and February (Campbell Island). This species feeds pelagically on squid, fish and crustaceans.	None	No	No	No	No

Class	Scientific Name	Common Name	TSC Act	EPBC Act	Distribution	Habitat	Ecology	Habitat quality present	Species known to occur on site	Likelihood of occurrence	Habitat on site directly or indirectly impacted	Impact Assessment Required
Aves	*Ephippiorhynchus asiaticus*	Black-necked Stork	E1		Coastal and subcoastal northern and eastern Australia, south to central-eastern NSW and with vagrants recorded further south and inland.	In NSW, floodplain wetlands of the major coastal rivers are key habitat. Also minor floodplains, coastal sandplain wetlands and estuaries.	Usually forage in water 5-30cm deep for vertebrate and invertebrate prey (eels, fish, frogs and invertebrates). Black-necked Storks build large nests high in tall trees close to water. In NSW, breeding activity occurs May - January; incubation May - October; nestlings July - January; fledging from September.	None	No	No	No	No
Aves	*Epthianura albifrons*	White-fronted Chat population in the Sydney Metropolitan Catchment Management Area	E2		Two isolated sub-populations known from the Sydney Metropolitan Catchment Management Authority area; one at Newington Nature Reserve on the Parramatta River and one at Towra Point Nature Reserve in Botany Bay	Saltmarsh of Newington Nature Reserve and in grassland on the northern bank of the Parramatta River. Saltmarsh and on the sandy shoreline of a small island of Towra Point Nature Reserve.	The species is insectivorous, feeding mainly on flies and beetles caught from or close to the ground. Have been observed breeding from late July through to early March, with 'open-cup' nests built in low vegetation or mangroves.	None	No	No	No	No
Aves	*Epthianura albifrons*	White-fronted Chat	V		Occurs mostly in the southern half of the state, in damp open habitats along the coast, and near waterways in the western part of the state.	Saltmarsh vegetation, open grasslands and sometimes low shrubs bordering wetland areas.	The species is insectivorous, feeding mainly on flies and beetles caught from or close to the ground. Have been observed breeding from late July through to early March, with 'open-cup' nests built in low vegetation or mangroves.	None	No	No	No	No
Aves	*Erythrotriorchis radiatus*	Red Goshawk	E4A	V	In NSW, extends to ~30°S. Recent records confined to the Northern Rivers region north of the Clarence River.	Open woodland and forest, often along or near watercourses or wetlands. In NSW, preferred habitats include mixed subtropical rainforest, *Melaleuca* swamp forest and coastal riparian *Eucalyptus* forest.	Red Goshawks mainly eat medium to large birds, but they also take mammals, reptiles and insects. The breeding behaviour of Red Goshawks is not well known. Breeding is likely to be in spring and summer in southern Qld and NSW (if they breed in the state at all). The birds lay clutches of 1-2 eggs, in a stick nest in a tall tree (>20 m tall) within 1 km of a watercourse or wetland. In winter in eastern Australia, the birds appear to move from nesting sites in the ranges to coastal plains, where they are associated with permanent wetlands.	None	No	No	No	No

Class	Scientific Name	Common Name	TSC Act	EPBC Act	Distribution	Habitat	Ecology	Habitat quality present	Species known to occur on site	Likelihood of occurrence	Habitat on site directly or indirectly impacted	Impact Assessment Required
Aves	*Esacus magnirostris*	Beach Stone-curlew	E4A		Across northern and north-eastern Australia, south to the Manning River in north-eastern NSW, with occasional vagrants to south-eastern NSW and Victoria.	Exclusively along the coast, on beaches, islands, reefs and in estuaries, and edges of or near mangroves.	Forage in the intertidal zone of beaches and estuaries. The diet consists of crabs and other marine invertebrates. Breed above the littoral zone, at the backs of beaches, or on sandbanks and islands, among low vegetation of grass, scattered shrubs or low trees; also among open mangroves. In NSW, clutches have been recorded from early October to late March.	None	No	No	No	No
Aves	*Fregetta grallaria*	White-bellied Storm-Petrel	V	V	Vagrant birds occur in coastal NSW waters, particularly after storm events.	Marine.	In Australia breeds only on offshore islands in the Lord Howe Island group. Nest consists of a chamber usually located amongst large rocks.	None	No	No	No	No
Aves	*Glossopsitta pusilla*	Little Lorikeet	V		In NSW, found from the coast westward as far as Dubbo and Albury.	Dry, open eucalypt forests and woodlands, including remnant woodland patches and roadside vegetation.	Nomadic movements are common, influenced by season and food availability. Feeds mostly on nectar and pollen, occasionally on native fruits such as mistletoe, and only rarely in orchards. Roosts in treetops, often distant from feeding areas. Nests in proximity to feeding areas if possible, most typically selecting hollows in the limb or trunk of smooth-barked Eucalypts. Nesting season extends from May to September.	None	No	No	No	No
Aves	*Grantiella picta*	Painted Honeyeater	V	V	Widely distributed in NSW, predominantly on the inland side of the Great Dividing Range but avoiding arid areas.	Boree, Brigalow and Box-Gum Woodlands and Box-Ironbark Forests.	A specialist feeder on the fruits of mistletoes growing on woodland eucalypts and acacias. Prefers mistletoes of the genus *Amyema.* Insects and nectar from mistletoe or eucalypts are occasionally eaten. Nest from spring to autumn in a small, delicate nest hanging within the outer canopy of drooping eucalypts, she-oak, paperbark or mistletoe branches.	None	No	No	No	No

Class	Scientific Name	Common Name	TSC Act	EPBC Act	Distribution	Habitat	Ecology	Habitat quality present	Species known to occur on site	Likelihood of occurrence	Habitat on site directly or indirectly impacted	Impact Assessment Required
Aves	*Haematopus fuliginosus*	Sooty Oystercatcher	V		Distributed along the entire NSW coast.	Rocky headlands, rocky shelves, exposed reefs with rock pools, beaches and muddy estuaries.	Forages on exposed rock or coral at low tide for foods such as limpets and mussels. Breeds in spring and summer, almost exclusively on offshore islands, and occasionally on isolated promontories. The nest is a shallow scrape on the ground, or small mounds of pebbles, shells or seaweed when nesting among rocks.	None	No	No	No	No
Aves	*Haematopus longirostris*	Pied Oystercatcher	E1		Thinly scattered along the entire NSW coast.	Intertidal flats of inlets and bays, open beaches and sandbanks.	Forages on exposed sand, mud and rock at low tide, for molluscs, worms, crabs and small fish. Nests mostly on coastal or estuarine beaches although occasionally they use saltmarsh or grassy areas. Nests are shallow scrapes in sand above the high tide mark, often amongst seaweed, shells and small stones. Two to three eggs are laid between August and January.	None	No	No	No	No
Aves	*Haliaeetus leucogaster*	White-bellied Sea-Eagle	V		Distributed along the coastline of mainland Australia and Tasmania, extending inland along some of the larger waterways, especially in eastern Australia.	Freshwater swamps, rivers, lakes, reservoirs, billabongs, saltmarsh and sewage ponds and coastal waters. Terrestrial habitats include coastal dunes, tidal flats, grassland, heathland, woodland, forest and urban areas.	The breeding season extends from June to January (or sometimes February) in southern Australia. Breeding habitat is usually close to water, but may occur up to a kilometre away. Nests are mainly located in tall open forest or woodland, but sometimes in other habitats such as dense forest, closed scrub or in remnant trees on cleared land. The White-bellied Sea-Eagle feeds opportunistically on a variety of fish, birds, reptiles, mammals and crustaceans, and on carrion and offal.	None	No	No	No	No
Aves	*Hieraaetus morphnoides*	Little Eagle	V		Throughout the Australian mainland, with the exception of the most densely-forested parts of the Dividing Range escarpment.	Open eucalypt forest, woodland or open woodland, including sheoak or *Acacia* woodlands and riparian woodlands of interior NSW.	Nests in tall living trees within a remnant patch, where pairs build a large stick nest in winter. Lays two or three eggs during spring, and young fledge in early summer. Preys on birds, reptiles and mammals, occasionally adding large insects and carrion.	Marginal	No	Potential	Yes	No, species not identified as using the site

Class	Scientific Name	Common Name	TSC Act	EPBC Act	Distribution	Habitat	Ecology	Habitat quality present	Species known to occur on site	Likelihood of occurrence	Habitat on site directly or indirectly impacted	Impact Assessment Required
Aves	*Ixobrychus flavicollis*	Black Bittern	V		In NSW, records are scattered along the east coast, with individuals rarely being recorded south of Sydney or inland.	Terrestrial and estuarine wetlands. Also flooded grassland, forest, woodland, rainforest and mangroves where permanent water is present.	Feeds on frogs, reptiles, fish and invertebrates, with most feeding done at dusk and at night. During the day, roosts in trees or on the ground amongst dense reeds. Breeding season is December to March. Nests, built in spring are located on a branch overhanging water and consist of a bed of sticks and reeds on a base of larger sticks.	None	No	No	No	No
Aves	*Limosa limosa*	Black-tailed Godwit	V	M	Arrives in August and leaves in March. In NSW, most frequently recorded at Kooragang Island, with occasional records elsewhere along the coast, and inland in the Murray-Darling Basin, on the western slopes of the Northern Tablelands and in the far north-western corner of the state.	Usually sheltered bays, estuaries and lagoons with large intertidal mudflats and/or sandflats. Further inland, it can also be found around muddy lakes and swamps.	Breeds in Mongolia and Eastern Siberia and flies to Australia for the southern summer, arriving in August and leaving in March. Forages for insects, crustaceans, molluscs, worms, larvae, spiders, fish eggs, frog eggs and tadpoles in soft mud or shallow water. Roosts and loafs on low banks of mud, sand and shell bars.	None	No	No	No	No
Aves	*Lophoictinia isura*	Square-tailed Kite	V		In NSW, it is a regular resident in the north, north-east and along the major west-flowing river systems. It is a summer breeding migrant to the south-east, including the NSW south coast.	Timbered habitats including dry woodlands and open forests, particularly timbered watercourses.	It is a specialist hunter of passerines, especially honeyeaters, and most particularly nestlings, and insects in the tree canopy, picking most prey items from the outer foliage. Appears to occupy large hunting ranges of more than 100km2. Breeding is from July to February, with nest sites generally located along or near watercourses, in a fork or on large horizontal limbs.	Marginal	No	Potential	Yes	No, species not identified as using the site
Aves	*Macronectes giganteus*	Southern Giant Petrel	E1	E, M	Common visitor off the coast of NSW.	Marine.	Over summer, the species nests in small colonies amongst open vegetation on Antarctic and subantarctic islands. It is an opportunistic scavenger and predator, and scavenges from fishing vessels and animal carcasses on land. It is also an active predator of cephalopods and euphausiids, as well as smaller birds (particularly penguins) both at land and at sea.	None	No	No	No	No

Class	Scientific Name	Common Name	TSC Act	EPBC Act	Distribution	Habitat	Ecology	Habitat quality present	Species known to occur on site	Likelihood of occurrence	Habitat on site directly or indirectly impacted	Impact Assessment Required
Aves	*Macronectes halli*	Northern Giant-Petrel	V	V, M	Common visitor in NSW waters, predominantly along the south-east coast during winter and autumn.	Marine.	Breeding in Australian territory is limited to Macquarie Island and occurs during spring and summer. Females obtain most of their prey live from the sea, while males also scavenge from the carcases of penguins and seals on land. At sea, they feed on fish, cephalopods, birds and crustaceans, including euphausiids or krill, and regularly scavenge on fishing vessels.	None	No	No	No	No
Aves	*Ninox strenua*	Powerful Owl	V		In NSW, it is widely distributed throughout the eastern forests from the coast inland to tablelands, with scattered records on the western slopes and plains.	Woodland, open sclerophyll forest, tall open wet forest and rainforest.	It roosts by day in dense vegetation comprising species such as *Syncarpia glomulifera* (Turpentine), *Allocasuarina littoralis* (Black She-oak), *Acacia melanoxylon* (Blackwood), *Angophora floribunda* (Rough-barked Apple), *Exocarpus cupressiformis* (Cherry Ballart) and eucalypt species. The main prey items are medium-sized arboreal marsupials. Powerful Owls nest in large tree hollows in large eucalypts that are at least 150 years old. Nesting occurs from late autumn to mid-winter.	None	No	No	No	No
Aves	*Pandion cristatus*	Eastern Osprey	V		Common around the northern NSW coast, and uncommon to rare from coast further south. Some records from inland areas.	Rocky shorelines, islands, reefs, mouths of large rivers, lagoons and lakes.	Feed on fish over clear, open water. Breed from July to September in NSW. Nests are made high up in dead trees or in dead crowns of live trees, usually within one kilometre of the sea.	None	No	No	No	No
Aves	*Pomatostomus temporalis temporalis*	Grey-crowned Babbler (eastern subspecies)	V		In NSW, occurs on the western slopes of the Great Dividing Range, and as far as Louth and Balranald on the western plains. Also occurs in woodlands in the Hunter Valley and in some locations on the north coast	Open woodland habitats; favours Box-gum woodlands on the slopes and Box-cypress and open Box woodlands on alluvial plains.	The species is insectivorous and forages on trunks and branches of trees or on the ground. It builds conspicuous dome-shaped stick nests in shrubs or eucalypt saplings, which are also used for roosting each night. It breeds co-operatively in sedentary family groups of 2-13 birds. Breeding occurs between July and February.	Marginal	No	Potential	Yes	No, species not identified as using the site

Class	Scientific Name	Common Name	TSC Act	EPBC Act	Distribution	Habitat	Ecology	Habitat quality present	Species known to occur on site	Likelihood of occurrence	Habitat on site directly or indirectly impacted	Impact Assessment Required
Aves	*Pterodroma leucoptera leucoptera*	Gould's Petrel	V	E	Recorded off NSW coast. Breeds on Cabbage Tree Island offshore from Port Stephens, and on nearby Boondelbah island.	Marine. Nesting habitat is located within steeply sloping rock scree gullies with a canopy of Cabbage Tree Palms.	They nest predominantly in natural rock crevices among the rock scree and also in hollow fallen palm trunks, under mats of fallen palm fronds and in cavities among the buttresses of fig trees. They breed colonially and the nests are clumped and often less than 1 m apart. Egg laying takes place over a six week period commencing in early November.	None	No	No	No	No
Aves	*Pterodroma neglecta neglecta*	Kermadec Petrel (west Pacific subspecies)	V	V	Vagrant birds occur in coastal NSW waters, particularly after storm events. Breeds on Balls Pyramid (near Lord Howe Island) and Phillip Island (near Norfolk Island).	Marine.	Nests in a crevice amongst rocks. Diet is squid and crustaceans.	None	No	No	No	No
Aves	*Rostratula australis*	Australian Painted Snipe	E1	E	In NSW most records are from the Murray-Darling Basin. Other recent records include wetlands on the Hawkesbury River and the Clarence and lower Hunter Valleys.	Swamps, dams and nearby marshy areas.	Nests on the ground amongst tall vegetation, such as grasses, tussocks or reeds. The nest consists of a scrape in the ground, lined with grasses and leaves. Breeding is often in response to local conditions; generally occurs from September to December. Forages nocturnally on mud-flats and in shallow water. Feeds on worms, molluscs, insects and some plant-matter.	Marginal	No	No	No	No
Aves	*Sternula albifrons*	Little Tern	E1	M	In NSW, it arrives from September to November, occurring mainly north of Sydney, with smaller numbers found south to Victoria.	Sheltered coastal environments, harbours, inlets and rivers.	Migrates from eastern Asia. It breeds in spring and summer along the entire east coast from Tasmania to northern Qld, and is seen until May. Nests in small, scattered colonies in low dunes or on sandy beaches. The nest is a scrape in the sand, which may be lined with shell grit, seaweed or small pebbles. Forages for small fish, crustaceans, insects, worms and molluscs.	None	No	No	No	No

Class	Scientific Name	Common Name	TSC Act	EPBC Act	Distribution	Habitat	Ecology	Habitat quality present	Species known to occur on site	Likelihood of occurrence	Habitat on site directly or indirectly impacted	Impact Assessment Required
Aves	*Thalassarche cauta cauta*	Shy Albatross	V	V	Occurs along the east coast south from Stradbroke Island and across the south coast to Carnarvon in WA. It is commonly recorded off southeast NSW, though rarely north of Sydney.	Marine.	This pelagic or ocean-going species inhabits subantarctic and subtropical marine waters, spending the majority of its time at sea. Occasionally the species occurs in continental shelf waters, in bays and harbours. The species feeds on fish, crustaceans, offal and squid. Known breeding locations include Albatross Island off Tasmania, Auckland Island, Bounty Island and The Snares, off New Zealand. Breeding occurs September-December.	None	No	No	No	No
Aves	*Thalassarche melanophris*	Black-browed Albatross	V	V	Regularly recorded off the NSW coast during May-November.	Marine.	This species migrates to waters off the continental shelf from approximately May to November. This species nests annually on Antarctic and subantarctic islands. Breeding occurs September-December. This species feeds on fish, crustaceans, offal and squid.	None	No	No	No	No
Aves	*Tyto longimembris*	Eastern Grass Owl	V		Recorded occasionally in all mainland states. In NSW they are more likely to be resident in the north-east.	Areas of tall grass, including grass tussocks, swampy areas, grassy plains, swampy heath, and in cane grass or sedges on flood plains.	They rest by day in a ‘form’ - a trampled platform in a large tussock or other heavy vegetative growth. Always breeds on the ground. Nests are found in trodden grass, and often accessed by tunnels through vegetation. Breeding season is highly variable and dependent on environmental conditions, but in NSW nesting most typically occurs in autumn or winter.	Marginal	No	Potential	Yes	No, species not identified as using the site
Aves	*Tyto novaehollandiae*	Masked Owl	V		Recorded over approximately 90% of NSW, excluding the most arid north-western corner. Most abundant on the coast but extends to the western plains.	Dry eucalypt forests and woodlands from sea level to 1100 m.	Often hunts along the edges of forests, including roadsides. The typical diet consists of tree-dwelling and ground mammals, especially rats. Pairs have a large home-range of 500 to 1000 hectares. Roosts and breeds in moist eucalypt forested gullies, using large tree hollows or sometimes caves for nesting.	None	No	No	No	No

Class	Scientific Name	Common Name	TSC Act	EPBC Act	Distribution	Habitat	Ecology	Habitat quality present	Species known to occur on site	Likelihood of occurrence	Habitat on site directly or indirectly impacted	Impact Assessment Required
Aves	*Xenus cinereus*	Terek Sandpiper	V	M	A rare migrant to the eastern and southern Australian coasts. The two main sites in NSW are the Richmond River estuary and the Hunter River estuary.	Mudbanks and sandbanks near mangroves, rocky pools and reefs, and occasionally up to 10 km inland around brackish pools.	Generally roosts communally amongst mangroves or dead trees, often with related wader species. The diet includes worms, crabs and other crustaceans, small shellfish and the adults and larvae of various flies, beetles and water-bugs.	None	No	No	No	No
Mammalia	*Balaenoptera musculus*	Blue Whale	E1	E, M	Between 20 degrees to 70 degrees South including NSW waters.	Marine.	Breeds in warm water at low latitudes, preferring open seas rather than coastal waters. Often feeds during spring and summer on krill close to the ice edge.	None	No	No	No	No
Mammalia	*Cercartetus nanus*	Eastern Pygmy-possum	V		In NSW it extents from the coast inland as far as the Pilliga, Dubbo, Parkes and Wagga Wagga on the western slopes.	Rainforest, sclerophyll forest (including Box-Ironbark), woodland and heath.	Feeds largely on nectar and pollen collected from banksias, eucalypts and bottlebrushes. Also eats soft fruits and insects. Shelters in tree hollows, rotten stumps, holes in the ground, abandoned bird-nests, *Pseudocheirus peregrinus* (Ringtail Possum) dreys or thickets of vegetation. Young can be born whenever food sources are available, however most births occur between late spring and early autumn. Frequently spends time in torpor especially in winter.	None	No	No	No	No
Mammalia	*Chalinolobus dwyeri*	Large-eared Pied Bat	V	V	Recorded from Rockhampton in Qld south to Ulladulla in NSW. Largest concentrations of populations occur in the sandstone escarpments of the Sydney basin and the NSW north-west slopes.	Wet and dry sclerophyll forests, Cyprus Pine dominated forest, woodland, sub-alpine woodland, edges of rainforests and sandstone outcrop country.	Roosts in caves, rock overhangs and disused mine shafts and as such is usually associated with rock outcrops and cliff faces. It also possibly roosts in the hollows of trees. The species is thought to require roosting habitat that is adjacent to higher fertility sites which are used for foraging. This species probably forages for small, flying insects below the forest canopy. Likely to hibernate through the coolest months. It is uncertain whether mating occurs early in winter or in spring.	None	No	No	No	No

Class	Scientific Name	Common Name	TSC Act	EPBC Act	Distribution	Habitat	Ecology	Habitat quality present	Species known to occur on site	Likelihood of occurrence	Habitat on site directly or indirectly impacted	Impact Assessment Required
Mammalia	*Eubalaena australis*	Southern Right Whale	E1	E, M	Migrate between summer feeding grounds in Antarctica and winter breeding grounds around the coasts of southern Australia.	Marine.	They feed in the open ocean in summer, and move inshore in winter for calving and mating. Calving females and females with young usually remain very close to the coast. They feed on krill and copepods by filtering water through their baleen; however, it appears they may not feed at all in Australian waters.	None	No	No	No	No
Mammalia	*Falsistrellus tasmaniensis*	Eastern False Pipistrelle	V		South-east coast and ranges of Australia, from southern Qld to Victoria and Tasmania. In NSW, records extend to the western slopes of the Great Dividing Range.	Tall (greater than 20m) moist habitats.	Predominately roosts in Eucalypt tree hollows. It has also been found to roost under loose bark on trees and in man-made structures. It hunts beetles, moths, weevils and other flying insects above or just below the tree canopy, in open forests. Hibernates in winter. Females are pregnant in late spring to early summer.	None	No	No	No	No
Mammalia	*Miniopterus australis*	Little Bentwing-bat	V		East coast and ranges south to Wollongong in NSW.	Moist eucalypt forest, rainforest, vine thicket, wet and dry sclerophyll forest, Melaleuca swamps, dense coastal forests and banksia scrub.	Roost in caves, tunnels, tree hollows, abandoned mines, stormwater drains, culverts, bridges and sometimes buildings during the day, and at night forage for small insects beneath the canopy of densely vegetated habitats. They often share roosting sites with the Common Bentwing-bat. Maternity colonies form in spring. Males and juveniles disperse in summer.	Marginal	No	Potential	Yes	Yes, species identified onsite

Class	Scientific Name	Common Name	TSC Act	EPBC Act	Distribution	Habitat	Ecology	Habitat quality present	Species known to occur on site	Likelihood of occurrence	Habitat on site directly or indirectly impacted	Impact Assessment Required
Mammalia	*Miniopterus schreibersii oceanensis*	Eastern Bentwing-bat	V		In NSW it occurs on both sides of the Great Dividing Range, from the coast inland to Moree, Dubbo and Wagga Wagga.	Rainforest, wet and dry sclerophyll forest, monsoon forest, open woodland, paperbark forests and open grassland.	It forages above and below the tree canopy on small insects, especially moths. The bats congregate at the same maternity roosts each year to give birth and rear young. In the southern part of the species' range this occurs during spring. Maternity roosts may be located in caves, abandoned mines, concrete bunkers and lava tubes. Over-wintering roosts used outside the breeding period include cooler caves, old mines, and stormwater channels, under bridges and occasionally buildings.	Marginal	No	Potential	Yes	No, species not identified as using the site
Mammalia	*Mormopterus norfolkensis*	Eastern Freetail-bat	V		Found along the east coast from south Qld to southern NSW.	Dry sclerophyll forest, woodland, swamp forests and mangrove forests east of the Great Dividing Range.	Roost mainly in tree hollows but will also roost under bark or in man-made structures. Usually solitary but also recorded roosting communally, probably insectivorous.	Marginal	No	Potential	Yes	Yes, species identified onsite
Mammalia	*Myotis macropus*	Southern Myotis	V		In NSW, found in the coastal band. It is rarely found more than 100 km inland, except along major rivers.	Foraging habitat is waterbodies (including streams, or lakes or reservoirs) and fringing areas of vegetation up to 20m.	Generally roost in groups of 10 - 15 close to water in caves, mine shafts, hollow-bearing trees, storm water channels, buildings, under bridges and in dense foliage. Forage over streams and pools catching insects and small fish by raking their feet across the water surface. In NSW females have one young each year usually in November or December.	None	No	No	No	Yes, species identified onsite
Mammalia	*Petaurus norfolcensis*	Squirrel Glider	V		Widely though sparsely distributed on both sides of the Great Dividing Range in eastern Australia, from northern Qld to western Victoria.	Mature or old growth Box, Box-Ironbark woodlands and River Red Gum forest west of the Great Dividing Range and Blackbutt-Bloodwood forest with heath understorey in coastal areas.	Live in family groups of a single adult male one or more adult females and offspring. Require abundant tree hollows for refuge and nest sites. Diet varies seasonally and consists of *Acacia* gum, eucalypt sap, nectar, honeydew and manna, with invertebrates and pollen providing protein.	None	No	No	No	No

Class	Scientific Name	Common Name	TSC Act	EPBC Act	Distribution	Habitat	Ecology	Habitat quality present	Species known to occur on site	Likelihood of occurrence	Habitat on site directly or indirectly impacted	Impact Assessment Required
Mammalia	*Phascogale tapoatafa*	Brush-tailed Phascogale	V		In NSW it is mainly found east of the Great Dividing Range although there are occasional records west of the divide.	Dry sclerophyll open forest, heath, swamps, rainforest and wet sclerophyll forest.	Agile climber foraging preferentially in rough barked trees. Feeds mostly on arthropods but will also eat other invertebrates, nectar and sometimes small vertebrates. Nest and shelter in tree hollows and use many different hollows over a short time span. Mating occurs May - July; males die soon after the mating season whereas females can live for up to three years but generally only produce one litter.	None	No	No	No	No
Mammalia	*Potorous tridactylus*	Long-nosed Potoroo	V	V	In NSW it is generally restricted to coastal heaths and forests east of the Great Dividing Range, with an annual rainfall exceeding 760 mm.	Coastal heaths and dry and wet sclerophyll forests.	Breeding occurs throughout the year, although there is a peak from late winter to early summer. The fruit-bodies of hypogeous (underground-fruiting) fungi are a large component of the diet. They also eat roots, tubers, insects and their larvae. Individuals are thought to be non-territorial and have home ranges of about 2-5ha. Potoroos are nocturnal and crepuscular and rarely seen. They spend the day in "squats" in dense vegetation and their regular movement through the vegetation creates characteristic runways.	None	No	No	No	No
Mammalia	*Pseudomys gracilicaudatus*	Eastern Chestnut Mouse	V		In NSW, it mainly occurs north from the Hawkesbury River area along the coast and eastern edge of the Great Dividing Range. There are however isolated records in the Jervis bay area.	In NSW mostly found in dense, wet heathland and swamps.	Optimal habitat appears to be in regenerating heathland burnt from 18 months to four years previously. By the time the heath is mature, the larger Swamp Rat becomes dominant, and Eastern Chestnut Mouse numbers drop again. Feeds at night via runways through the grassy and sedge understorey. It has a broad diet of grass stems, invertebrates, fungi and seeds. Up to three litters are produced from spring to autumn; this strategy allows rapid build-up of numbers in years following fire.	Marginal	No	Unlikely	No	No

Class	Scientific Name	Common Name	TSC Act	EPBC Act	Distribution	Habitat	Ecology	Habitat quality present	Species known to occur on site	Likelihood of occurrence	Habitat on site directly or indirectly impacted	Impact Assessment Required
Mammalia	*Saccolaimus flaviventris*	Yellow-bellied Sheathtail-bat	V		There are scattered records of this species across the New England Tablelands and North West Slopes. Rare visitor in late summer and autumn to south-western NSW.	Almost all habitats, including wet and dry sclerophyll forest, open woodland, open country, mallee, rainforests, heathland and waterbodies.	It forages for insects above the canopy in eucalypt forests, and closer to the ground in more open country. It is dependent on suitable hollow-bearing trees to provide roost sites. The species has also been recorded using caves and abandoned sugar glider nests as roost sites. Breeding occurs between December and mid-march.	None	No	No	Yes	No
Mammalia	*Scoteanax rueppellii*	Greater Broad-nosed Bat	V		Both sides of the great divide, from the Atherton Tableland in Qld to north-eastern Victoria, mainly along river systems and gullies. In NSW it is widespread on the New England Tablelands.	Woodland, moist and dry eucalypt forest and rainforest.	Usually roosts in tree hollows, but has also been found in buildings. Forages after sunset along creek and river corridors for beetles and other large, slow-flying insects; this species has been known to eat other bat species. Little is known of its reproductive cycle, however a single young is born in January; prior to birth, females congregate at maternity sites located in suitable trees.	None	No	No	No	Yes, species identified onsite
Mammalia	*Syconycteris australis*	Common Blossom-bat	V		Found north from Hawks Nest in NSW in coastal areas of eastern Australia.	Often roost in littoral rainforest and feed in adjacent heathland and paperbark swamps. Also recorded in subtropical rainforest, wet sclerophyll forest and other coastal forests.	They generally roost individually in dense foliage and vine thickets of the sub-canopy. They require a year round supply of nectar and pollen which is gathered from a mosaic of coastal complex vegetation types. When these vegetation types are in short supply of nectar and pollen known to utilise riverine areas containing Black Bean, Silky Oak and Weeping Bottlebrush.	None	No	No	No	No
Mammalia	*Vespadelus troughtoni*	Eastern Cave Bat	V		Found in a broad band on both sides of the Great Dividing Range south to Kempsey, with records from the New England Tablelands and the upper north coast of NSW. The western limit appears to be the Warrumbungle Range, and there is a single record from southern NSW, east of the ACT.	Dry open forest and woodland, near cliffs or rocky overhangs, cliff-lines in wet eucalypt forest and rainforest.	A cave-roosting species; has been recorded roosting in disused mine workings, occasionally in colonies of up to 500 individuals. Little is understood of its feeding or breeding requirements or behaviour.	None	No	No	No	No

Class	Scientific Name	Common Name	TSC Act	EPBC Act	Distribution	Habitat	Ecology	Habitat quality present	Species known to occur on site	Likelihood of occurrence	Habitat on site directly or indirectly impacted	Impact Assessment Required
Reptilia	*Caretta caretta*	Loggerhead Turtle	E1	E, M	In NSW, seen in coastal waters as far south as Jervis Bay and have been recorded nesting on the NSW north coast and feeding around Sydney.	Marine. Nesting occurs on beaches.	Loggerhead Turtles are ocean-dwellers, foraging in deeper water for fish, jellyfish and bottom-dwelling animals. The female comes ashore to lay her eggs in a hole dug on the beach in tropical regions during the warmer months.	None	No	No	No	No

Table 13 Threatened ecological communities

3	TSC Act	EPBC Act	Description	Distribution	Habitat	EPBC listing equivalent	Community known to occur on site (yes/no)	Impact Assessment Required
Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E	V	Characteristic plants include *Baumea juncea, Juncus kraussii subsp. australiensis* (Sea Rush), *Sarcocornia quinqueflora subsp. quinqueflora* (Samphire), *Sporobolus virginicus* (Marine Couch), *Triglochin striata* (Streaked Arrowgrass), *Ficinia nodosa* (Knobby Club-rush), *Samolus repens* (Creeping Brookweed), *Selliera radicans* (Swamp Weed), *Suaeda australis* (Seablite) and *Zoysia macrantha* (Prickly Couch).	Occurs in the intertidal zone along the NSW coast.	The intertidal zone on the shores of estuaries and lagoons that are permanently or intermittently open to the sea. Frequently found as a zone on the landward side of mangrove stands.	Subtropical and Temperate Coastal Saltmarsh	No	No
Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E		Dominated by herbaceous plants and have very few woody species. Areas that lack standing water most of the time are usually dominated by dense grassland or sedgeland vegetation, often forming a turf less than 0.5 metre tall and dominated by amphibious plants including *Paspalum distichum* (water couch), *Leersia hexandra* (swamp rice-grass), *Pseudoraphis spinescens* (mud grass) and *Carex appressa* (tussock sedge). Where they are subject to regular inundation and drying the vegetation may include large emergent sedges over 1 metre tall, such as *Baumea articulata, Eleocharis equisetina* and *Lepironia articulata,* as well as emergent or floating herbs such as *Hydrocharis dubia* (frogbit), *Philydrum lanuginosum* (frogsmouth), *Ludwigia peploides subsp. montevidensis* (water primrose), *Marsilea mutica* (nardoo) and *Myriophyllum spp.* (milfoils).	Known from along the majority of the NSW coast.	Coastal areas subject to periodic flooding and in which standing fresh water persists for at least part of the year. Typically occurs on silts, muds or humic loams in low-lying parts of floodplains, alluvial flats, depressions, drainage lines, backswamps, lagoons and lakes but may also occur in backbarrier landforms where floodplains adjoin coastal sandplains.		No	No
Hunter Lowland Redgum Forest in the Sydney Basin and New South Wales North Coast Bioregions	E		Open forest where the most common canopy tree species are Eucalyptus tereticornis (Forest Red Gum) and E. punctata (Grey Gum). Other frequently occurring canopy species are Angophora floribunda (Rough-barked Apple), E. crebra (Narrow-leaved Ironbark), E. moluccana (Grey Box) and Corymbia maculata (Spotted Gum). The shrub layer is open and common shrub species include Breynia oblongifolia (Coffee Bush), Leucopogon juniperinus (Prickly Beard-heath), Daviesia ulicifolia (Gorse Bitter Pea) and Jacksonia scoparia (Dogwood). The ground cover typically comprises grasses and herbs with common species being Microlaena stipoides var. stipoides Forest Weeping Grass, Pratia purpurascens (Whiteroot), Lomandra multiflora (Many-flowered Mat-rush), Cymbopogon refractus (Barbed Wire Grass), Cheilanthes sieberi (Poison Rock Fern) and Dichondra repens (Kidney Weed).	Between Muswellbrook, Beresfield, Mulbring and Cessnock in the Lower Hunter in the Sydney Basin and North Coast bioregions. It has been recorded from the Maitland, Cessnock, Port Stephens, Muswellbrook and Singleton LGAs.	Gentle slopes of depressions and drainage flats on the Permian sediments of the Hunter Valley floor.		No	No
Littoral Rainforest in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E	CE	Littoral Rainforest is generally a closed forest, the structure and composition of which is strongly influenced by its proximity to the ocean. The plant species of this community are predominantly rainforest species. While the canopy is dominated by rainforest species, scattered emergent individuals of sclerophyll species, such as *Angophora costata, Banksia integrifolia, Eucalyptus botryoides* and *Eucalyptus tereticornis* occur in many stands. There is considerable floristic variation between stands.	Occurs only on the coast, mostly within two kilometres of the sea though occasionally further inland. Found at locations in the NSW North Coast Bioregion, Sydney Basin Bioregion and South East Corner Bioregion.	Occurs on sand dunes and on soil derived from underlying rocks.	Littoral Rainforest and Coastal Vine Thickets of Eastern Australia.	No	No

3	TSC Act	EPBC Act	Description	Distribution	Habitat	EPBC listing equivalent	Community known to occur on site (yes/no)	Impact Assessment Required
Lowland Rainforest on Floodplain in the New South Wales North Coast Bioregion	E	CE	Larger stands of the community typically have a dense canopy, which blocks most light from reaching the ground, creating cool, moist conditions within. Typical tree species in the community include figs (*Ficus macrophylla, F. obliqua and F. watkinsiana*), palms (*Archontophoenix cunninghamiana and Livistona australis*), *Grevillea robusta* (Silky Oak), *Castanospermum australe* (Black Bean) and *Syzygium australe* (Brush Cherry).	Small remnants in scattered localities on the NSW north coast, on the floodplains of the Tweed, Richmond, Clarence, Bellinger, Macleay, Hastings, Manning, and Hunter Rivers. Other minor river systems also support the community.	Generally occupies riverine corridors and alluvial flats with rich, moist silts often in subcatchments dominated by basic volcanic substrates.	Lowland Rainforest of Subtropical Australia.	No	No
River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E		The structure of the community may vary from tall open forests (>40m) to woodlands. The most widespread and abundant dominant trees include *Eucalyptus tereticornis* (forest red gum), *E. amplifolia* (cabbage gum), *Angophora floribunda* (rough-barked apple) and *A. subvelutina* (broad-leaved apple). *Eucalyptus baueriana* (blue box), *E. botryoides* (bangalay) and *E. elata* (river peppermint) may be common south from Sydney. *E. ovata* (swamp gum) occurs on the far south coast, *E. saligna* (Sydney blue gum) and *E. grandis* (flooded gum) may occur north of Sydney, while *E. benthamii* is restricted to the Hawkesbury floodplain. A layer of small trees may be present, including *Melaleuca decora, M. styphelioides* (prickly-leaved teatree), *Backhousia myrtifolia* (grey myrtle), *Melia azadarach* (white cedar), *Casuarina cunninghamiana* (river oak) and *C. glauca* (swamp oak). Scattered shrubs include *Bursaria spinosa, Solanum prinophyllum, Rubus parvifolius, Breynia oblongifolia, Ozothamnus diosmifolius, Hymenanthera dentata, Acacia floribunda* and *Phyllanthus gunnii.* The groundcover is composed of abundant forbs, scramblers and grasses.	Found on the river flats of the coastal floodplains. Known from parts of the Local Government Areas of Port Stephens, Maitland, Singleton, Cessnock, Lake Macquarie, Wyong, Gosford, Hawkesbury, Baulkham Hills, Blacktown, Parramatta, Penrith, Blue Mountains, Fairfield, Holroyd, Liverpool, Bankstown, Wollondilly, Camden, Campbelltown, Sutherland, Wollongong, Shellharbour, Kiama, Shoalhaven, Palerang, Eurobodalla and Bega Valley.	Associated with silts, clay-loams and sandy loams, on periodically inundated alluvial flats, drainage lines and river terraces associated with coastal floodplains.		No	No
Subtropical Coastal Floodplain Forest of the New South Wales North Coast Bioregion	E		The composition of the tree stratum (which may exceed 40 m in height) varies considerably, but the most widespread and abundant dominant trees include *Eucalyptus tereticornis* (forest red gum), *E. siderophloia* (grey ironbark), *Corymbia intermedia* (pink bloodwood) and, north of the Macleay floodplain, *Lophostemon suaveolens* (swamp turpentine). A layer of small trees may be present, including *Allocasuarina torulosa* (forest oak), *Alphitonia excelsa* (red ash), *Glochidion ferdinandi* (cheese tree), *Callistemon spp., Melaleuca spp.* and *Casuarina glauca* (swamp oak). Scattered shrubs include *Breynia oblongifolia, Acacia concurrens, Commersonia spp.,* and *Hibiscus spp.* Occasional vines include *Eustrephus latifolius, Parsonsia straminea* and *Geitonoplesium cymosum.* The groundcover is composed of abundant forbs, scramblers and grasses.	Coastal floodplains of the North Coast of NSW. Known from parts of the Local Government Areas of Tweed, Byron, Lismore, Ballina, Richmond Valley, Clarence Valley, Coffs Harbour, Bellingen, Nambucca, Kempsey, Hastings, Greater Taree, Great Lakes and Port Stephens.	Associated with clay-loams and sandy loams, on periodically inundated alluvial flats, drainage lines and river terraces associated with coastal floodplains.		No	No

3	TSC Act	EPBC Act	Description	Distribution	Habitat	EPBC listing equivalent	Community known to occur on site (yes/no)	Impact Assessment Required
Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E	E	The structure of the community may vary from open forests to low woodlands, scrubs or reedlands with scattered trees. It has a dense to sparse tree layer in which *Casuarina glauca* (swamp oak) is the dominant species northwards from Bermagui. Other trees including *Acmena smithii* (lilly pilly), *Glochidion spp.* (cheese trees) and *Melaleuca spp.* (paperbarks) may be present as subordinate species, and are found most frequently in stands of the community northwards from Gosford. *Melaleuca ericifolia* is the only abundant tree in this community south of Bermagui. The understorey is characterised by frequent occurrences of vines, *Parsonsia straminea, Geitonoplesium cymosum* and *Stephania japonica var. discolor,* a sparse cover of shrubs, and a continuous groundcover of forbs, sedges, grasses and leaf litter. The composition of the ground stratum varies depending on levels of salinity in the groundwater.	Coastal floodplains of NSW. Known from parts of the Local Government Areas of Tweed, Byron, Lismore, Ballina, Richmond Valley, Clarence Valley, Coffs Harbour, Bellingen, Nambucca, Kempsey, Hastings, Greater Taree, Great Lakes, Port Stephens, Maitland, Newcastle, Cessnock, Lake Macquarie, Wyong, Gosford, Pittwater, Warringah, Hawkesbury, Baulkham Hills, Hornsby, Lane Cove, Blacktown, Auburn, Parramatta, Canada Bay, Rockdale, Kogarah, Sutherland, Penrith, Fairfield, Liverpool, Bankstown, Wollondilly, Camden, Campbelltown, Wollongong, Shellharbour, Kiama, Shoalhaven, Eurobodalla and Bega Valley	Associated with grey-black clay-loams and sandy loams, where the groundwater is saline or sub-saline, on waterlogged or periodically inundated flats, drainage lines, lake margins and estuarine fringes associated with coastal floodplains Generally occurs below 20 m elevation.	Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland	Yes	Yes
Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E		The most widespread and abundant dominant trees include *Eucalyptus robusta* (swamp mahogany), *Melaleuca quinquenervia* (paperbark) and, south from Sydney, *Eucalyptus botryoides* (bangalay) and *Eucalyptus longifolia* (woollybutt). Shrubs include A*cacia longifolia, Dodonaea triquetra, Ficus coronata, Leptospermum polygalifolium subsp. polygalifolium* and *Melaleuca spp.* Occasional vines include *Parsonsia straminea, Morinda jasminoides* and *Stephania japonica var. discolor.* The groundcover is composed of abundant sedges, ferns, forbs, and grasses including *Gahnia clarkei, Pteridium esculentum, Hypolepis muelleri, Calochlaena dubia, Dianella caerulea, Viola hederacea, Lomandra longifolia, Entolasia marginata and Imperata cylindrica.*	Known from parts of the Local Government Areas of Tweed, Byron, Lismore, Ballina, Richmond Valley, Clarence Valley, Coffs Harbour, Bellingen, Nambucca, Kempsey, Hastings, Greater Taree, Great Lakes and Port Stephens, Lake Macquarie, Wyong, Gosford, Hornsby, Pittwater, Warringah, Manly, Liverpool, Rockdale, Botany Bay, Randwick, Sutherland, Wollongong, Shellharbour, Kiama and Shoalhaven.	Associated with humic clay loams and sandy loams, on waterlogged or periodically inundated alluvial flats and drainage lines associated with coastal floodplains. Generally occurs below 20 m (though sometimes up to 50 m) elevation.		No	No
Themeda grassland on seacliffs and coastal headlands in the NSW North Coast, Sydney Basin and South East Corner Bioregions	E		In this community *Themeda australis* may have a distinctive appearance, being prostrate and having glaucous leaves. *Banksia integrifolia subsp. integrifolia, Westringia fruticosa* and *Acacia sophorae* occurs as an emergent shrub or as a dense cover where they have recruited over grasslands. Smaller shrubs occur often as prostrate to dwarf forms, most frequently *Pimelea linifolia, Hibbertia vestita, Pultenaea maritima* and *Westringia fruticosa.* In central and south coastal stands tussocks of *Poa poiformis* may be found in some stands of the community. Other grasses that occur in the community include *Zoysia macrantha* and *Cynodon dactylon.*Herbs in the ground layer include *Polymeria calycina, Apium prostratum, Senecio pinnatifolius subsp. pinnatifolius* and *Xerochrysum bracteatum.*	Widely scattered patches in the NSW North Coast, Sydney Basin and South East Corner bioregions.	Found on a range of substrates, although infrequently on sandstone. Larger stands are found on old sand dunes above cliffs, and on metasedimentary and rarely adamellite headlands on the north coast.		No	No

Appendix C Floristic quadrat data

Growth Form Group	Species	Exotic	Plot 1		Plot 2		Plot 3	
			Cover	Abundance	Cover	Abundance	Cover	Abundance
Tree (TG)	*Casuarina glauca*		10	35	15	40		
	Grevillea robusta						0.1	1
	Melaleuca quinquenervia		10	30				
Shrub (SG)	*Breynia oblongifolia*		0.1	1				
	Myrsine variabilis		0.1	2				
Other (OG)	*Archontophoenix cunninghamiana*		0.1	2				
	Convolvulus erubescens						0.1	5
	Cyathea spp.							
	Hardenbergia violacea		0.1	2				
	Parsonsia straminea		0.1	2				
Grass & grasslike (GG)	*Baumea articulata*				2	100		
	Carex longebrachiata						0.1	50
	Carex spp.						1	20
	Cynodon dactylon						2	100
	Cyperus imbecillis		1	100				
	Cyperus polystachyos				0.5	100	0.5	100
	Echinopogon ovatus						0.1	20
	Empodisma minus						1	500
	Entolasia marginata		2	100	2	100		
	Fimbristylis dichotoma						1	100
	Gahnia clarkei		0.5	5				
	Isachne globosa		0.1	10				
	Ischaemum australe						5	500
	Juncus continuus		20	1000	5	500		
Grass & grasslike (GG)	*Juncus spp.*						1	100

Growth Form Group	Species	Exotic	Plot 1		Plot 2		Plot 3	
			Cover	Abundance	Cover	Abundance	Cover	Abundance
	Juncus usitatus						0.1	50
	Juncus usitatus						2	500
	Lepidosperma neesii				10	1000		
	Lepidosperma spp.				10	500		
	Sacciolepis indica						1	100
	Sporobolus sp.						5	500
	Unknown grass sp.		0.1	5	2	100		
	Unknown grass sp. 2				2	100		
Forb (FG)	*Centella asiatica*		0.1	100	1	500	0.5	100
	Dianella caerulea		0.2	20	0.1	10	0.1	20
	Enydra fluctuans		0.5	50				
	Hydrocotyle hirta		1	500	5	1000	1	500
	Lindernia alsinoides		0.1	2				
	Lobelia anceps		0.1	50	0.2	100		
	Persicaria strigosa		5	500	3	100		
	Pratia purpurascens		0.1	50	0.1	20		
	Ranunculus inundatus		0.2	500	0.2	500		
	Ranunculus plebeius		2	500	0.1	100		
	Villarsia exaltata		0.2	100				
	Viola banksii		1	200				
Fern (EG)	*Blechnum indicum*		2	200				
	Hypolepis muelleri		50	1000	60	1500		
Exotic	*Agapanthus spp.*	*					0.1	1
	Ageratina adenophora	*			0.1	2		
	Anagallis arvensis	*			0.1	5	0.5	50
	Andropogon virginicus	*					2	100
Exotic	*Asparagus aethiopicus*	*	0.1	5				

Growth Form Group	Species	Exotic	Plot 1		Plot 2		Plot 3	
			Cover	Abundance	Cover	Abundance	Cover	Abundance
	Bidens pilosa	*	0.1	10				
	Briza maxima	*					0.2	50
	Briza minor	*					0.1	10
	Briza subaristata	*					0.2	50
	Cinnamomum camphora	*	10	5				
	Conyza bonariensis	*			2	100	0.2	20
	Cyperus brevifolius	*					2	500
	Lantana camara	*	1	5				
	Paspalum dilatatum	*					5	50
	Cenchrus clandestinus	*					2	100
	Plantago lanceolata	*					1	50
	Ranunculus repens	*					2	500
	Rubus ulmifolius	*					50	500
	Senecio madagascariensis	*			1	100	0.5	100
	Sonchus spp.	*			0.1	1		
	Verbena bonariensis	*			0.2	20		
	Verbena rigida	*					5	500

Appendix D Fauna species list

Class	Species	Common	ELA 2018	ELA 2007	BC Act	EPBC Act	Exotic
Amphibia	*Crinia signifera*	Common Eastern Froglet		X			
	Limnodynastes peronii	Brown-striped Frog		X			
	Litoria caerulea	Green Tree Frog		X			
	Litoria dentata	Bleating Tree Frog		X			
	Litoria fallax	Eastern Dwarf Tree Frog	X	X			
	Litoria peronii	Peron's Tree Frog	X	X			
	Litoria tyleri	Tyler's Tree Frog		X			
Anguillidae	*Anguilla australis*	Short Finned Eel	X				
Aves	*Acrocephalus australis*	Australian Reed-Warbler	X				
	Anas superciliosa	Pacific Black Duck		X			
	Anhinga melanogaster	Darter		X			
	Anthochaera carunculata	Red Wattlebird		X			
	Anthochaera chrysoptera	Little Wattlebird	X	X			
	Cacatua sanguinea	Little Corella		X			
	Caligavis chrysops	Yellow-faced Honeyeater	X				
	Centropus phasianinus	Pheasant Coucal		X			
	Chenonetta jubata	Australian Wood Duck	X				
	Colluricincla harmonica	Grey Shrike-thrush		X			
	Coracina novaehollandiae	Black-faced Cuckoo-shrike		X			
	Corvus coronoides	Australian Raven	X				
	Corvus orru	Torresian Crow		X			
	Cracticus nigrogularis	Pied Butcherbird		X			
	Cracticus tibicen	Australian Magpie	X	X			
	Cracticus torquatus	Grey Butcherbird	X	X			
	Dacelo novaeguineae	Laughing Kookaburra	X	X			
	Egretta novaehollandiae	White-faced Heron		X			
	Elanus axillaris	Black-shouldered Kite		X			
	Eolophus roseicapillus	Galah	X	X			

Class	Species	Common	ELA 2018	ELA 2007	BC Act	EPBC Act	Exotic
	Eudynamys orientalis	Eastern Koel	X	X			
Aves	*Geopelia humeralis*	Bar-shouldered Dove	X				
	Gerygone mouki	Brown Gerygone		X			
	Grallina cyanoleuca	Magpie-lark	X	X			
	Hirundapus caudacutus	White-throated Needletail		X			
	Hirundo neoxena	Welcome Swallow		X			
	Lichmera indistincta	Brown Honeyeater		X			
	Malurus cyaneus	Superb Fairy-wren	X	X			
	Manorina melanocephala	Noisy Miner		X			
	Meliphaga lewinii	Lewin's Honeyeater	X				
	Neochmia temporalis	Red-browed Finch	X				
	Ocyphaps lophotes	Crested Pigeon		X			
	Oriolus sagittatus	Olive-backed Oriole	X	X			
	Pardalotus striatus	Striated Pardalote		X			
	Phalacrocorax sulcirostris	Little Black Cormorant		X			
	Phalacrocorax varius	Pied Cormorant		X			
	Phylidonyris niger	White-cheeked Honeyeater		X			
	Platycercus elegans	Crimson Rosella		X			
	Plectorhyncha lanceolata	Striped Honeyeater	X				
	Porphyrio porphyrio	Purple Swamphen		X			
	Rhipidura leucophrys	Willie Wagtail		X			
	Scythrops novaehollandiae	Channel-billed Cuckoo	X	X			
	Sericornis frontalis	White-browed Scrubwren	X				
	Sphecotheres vieilloti	Australasian Figbird		X			
	Strepera graculina	Pied Currawong	X	X			
	Sturnus tristis	Common Myna		X			
	Threskiornis spinicollis	Straw-necked Ibis		X			
	Trichoglossus chlorolepidotus	Scaly-breasted Lorikeet	X				
	Trichoglossus haematodus	Rainbow Lorikeet	X				
	Vanellus miles	Masked Lapwing		X			
	Zosterops lateralis	Silvereye	X	X			

Class	Species	Common	ELA 2018	ELA 2007	BC Act	EPBC Act	Exotic
Mammalia	*Canis lupus familiaris*	Dog	X				*
Mammalia	*Cervus timorensis*	Rusa Deer	X				*
	Mus musculus	House Mouse		X			*
	Oryctolagus cuniculus	Rabbit		X			*
	Rattus lutreolus	Swamp Rat		X			
	Rattus rattus	Black Rat		X			*
	Vulpes vulpes	Fox		X			*
Reptillia	*Hemiaspis signata*	Black-bellied Swamp Snake		X			
	Lampropholis guichenoti	Pale-flecked Garden Sunskink		X			
	Pseudechis porphyriacus	Red-bellied Black Snake	X	X			

Appendix E NSW Herbarium correspondence

The Royal Botanic Gardens & Domain Trust
National Herbarium of New South Wales

Ms Lily GORRELL
Eco Logical Australia Pty Ltd
PO Box 1056
Newcastle, NSW 2300
AUSTRALIA

Enquiry No: 20391
Botanical.Is@rbgsyd.nsw.gov.au
Fax No: (02) 9251 1952
Ph. No: (02) 9231 8111
Date: 21 December 2017

Dear Ms GORRELL,

Thank you for your enquiry of 21-Dec-17. We are happy to provide the following information:

Lindernia alsinoides det. B.M. Wiecek 21 Dec 2017, specimen retained.
There is no charge for this enquiry.

Thank you for your enquiry.

Yours sincerely

Barbara Wiecek
Identification Botanist
Botanical Information Service

PlantNET
Go to our online Botanical Information Services at plantnet.rbgsyd.nsw.gov.au to find out more about plants of New South Wales
NSW Office of Environment & Heritage

The Botanical Information Email address is Botanical.Is@rbgsyd.nsw.gov.au
Mrs Macquaries Road Sydney NSW 2000 Australia • Telephone (02) 9231 8111 • Fax (02) 9251 1952

An estate of the Royal Botanic Gardens and Domain Trust, a statutory body within the Office of Environment and Heritage, Department of Premier and Cabinet.

Appendix F Bat call analysis report

5 November 2018

Project ref: 7805

Lakes Way, Forster Ultrasonic Analysis Report - October 2018

Methods

10 Songmeter nights

Two Songmeters were placed within the Lakes Way subject site at Forster, on the mid-north coast of NSW between 4 and 9 October 2018. There was rainfall during the survey period and weather conditions were suboptimal for microbat activity and foraging during these times.

The subject site contains a large patch of regenerating *Casuarina glauca* (Swamp oak) forest adjacent to a paddock dominated by *Rubus sp.* (Blackberry). There were no hollow bearing trees identified on the site. The subject site lies approximately 300 m from Wallis Lake and is surrounded by a mix of residential and rural areas.

Data Analysis

Bat calls were analysed by Alicia Scanlon from Eco Logical Australia using the program AnalookW (Version 4.3z 10 September 2018, written by Chris Corben, www.hoarybat.com). Call identifications were made using regional based guides to the echolocation calls of microbats in New South Wales (Pennay et al 2004); and south-east Queensland and north-east New South Wales (Reinhold et al 2001) and the accompanying reference library of over 200 calls from Sydney Basin, NSW (which is available at http://www.forest.nsw.gov.au/research/bats/default.asp). Alicia has over eleven years of experience in the identification of ultrasonic call recordings. Call identifications were internally reviewed by Danielle Adams Bennett from Eco Logical Australia who has over four years of experience in the analysis of ultrasonic call data.

Bat calls were analysed using species-specific call profile parameters including call shape, characteristic frequency, initial slope and time between pulses (Reinhold et al 2001). To ensure reliable and accurate results the following protocols (adapted from Lloyd et al 2006) were followed:

- Search phase calls were used in the analysis, rather than cruise phase calls or feeding buzzes (McKenzie et al 2002). Cruise phase or feeding calls were labelled as being unidentifiable.
- Recorded calls containing less than three pulses were not analysed and these sequences were labelled as unidentifiable, being too short to confidently determine the identity of the species making the call (Law et al 1999)
- For those calls that were able to be identified to species, two categories of confidence were used (Mills et al 1996):
    - Definitely present – the quality and structure of the call profile is such that the identity of the bat species making the calls is not in doubt.
    - Potentially present – the quality and structure of the call profile is such that there is some / low probability of confusion with other microbat species that produce similar calls profiles.

- Unidentifiable – calls made by bats which cannot be used for identification purposes such as social calls, short and low-quality calls, cruise and approach phase calls.
- *Nyctophilus* spp. (Long-eared bats) are difficult to identify confidently from their calls and no attempt was made to identify this genus to species level (Pennay et al. 2004).
- The *Mormopterus* group of Free-tailed Bats have recently undergone taxonomic revision (Reardon et al 2014) and there is uncertainty around published reference calls (Pennay et al 2004) for this groups of species (Greg Ford pers. comm.). This report uses nomenclature for Free-tailed bat species as referred to in Jackson and Groves (2015). There were two Free-tailed bat species recorded on the site. In the NSW State environmental legislation, they are known as *Mormopterus ridei* (or *Mormopterus species 2)* and *Mormopterus norfolkensis* respectively but are referred to in this report as *Ozimops ridei* (Ride's Free-tailed Bat) and *Micronomus norfolkensis* (Eastern Coastal Free-tailed Bat) (Jackson and Groves, 2015).
- Sequences not attributed to microbat echolocation calls (e.g. insect buzzes, wind, train and vehicle movement) were dismissed from the analysis.
- Sequences labelled as unidentifiable were of inferior quality and therefore not able to be identified to any microbat species, they can however be used as an indicator of microbat activity at the site.

Results

There were 194 call sequences recorded during this survey. Of these, 92 (47%) were deemed useful, because the call profile was of sufficient quality or length to enable positive identification of bat species. The remaining 102 (53%) call sequences were either too short or of low quality preventing positive identification of bat species.

There were at least ten (10) species recorded in this survey (**Table 1** to **Table 3** and **Figure 1** to **Figure 11)**. The total includes at least one of the following Nyctophilus species that are known to occur in the area; *Nyctophilus gouldii* (Gould's Long-eared Bat) and *Nyctophilus geoffroyii* (Lesser Long-eared Bat). Calls of these species overlap considerably and could not be separated in the dataset of call recordings provided.

The list includes up to four (4) species, listed as vulnerable under the NSW *Biodiversity Conservation Act 2017* (BC Act) (**Table 1**). Vulnerable species definitely present at the subject site were;

- ***Micronomus norfolkensis* (Eastern Coastal Free-tailed Bat)**
- ***Miniopterus australis* (Little Bent-winged Bat)**
- ***Myotis macropus* (Southern Myotis)**

One other species listed as vulnerable may also have been present at the subject site, but the quality of the single call recorded was not adequate to discount confusion with other species. This species was;

- ***Scoteanax rueppellii* (Greater Broad-nosed Bat)**

Table 1. Microbat species diversity recorded over 10 Songmeter nights at Lakes Way, Forster between 4 and 9 October 2018.

SCIENTIFIC NAME	COMMON NAME	DEFINITELY PRESENT	POTENTIALLY PRESENT
Chalinolobus gouldii	Gould's Wattled Bat	X	
Chalinolobus morio	Chocolate Wattled Bat	X	
Micronomus norfolkensis*	**Eastern Coastal Free-tailed Bat**	**X**	
Miniopterus australis*	**Little Bent-winged Bat**	**X**	
Myotis macropus*	**Southern Myotis**	**X**	
Nyctophilus geoffroyi	Lesser Long-eared Bat		X
Nyctophilus gouldi	Gould's Long-eared Bat		X
Ozimops ridei	Ride's Free-tailed Bat	X	
Scoteanax rueppellii*	**Greater Broad-nosed Bat**		**X**
Scotorepens orion	Eastern Broad-nosed Bat		X
Vespadelus pumilus	Eastern Forest Bat	X	
Vespadelus vulturnus	Little Forest Bat	X	

*** Threatened species listed under BC Act**

The most commonly recorded species on the subject site were Little Bent-winged Bats *and Chalinolobus gouldii* (Gould's Wattled Bat). The calls of these species accounted for 69 (75%) of all positively identified calls. The remaining species were represented by less than 10 calls each.

Microbat activity levels varied from night to night and between recording locations within the subject site. SM11 recorded the greatest amount of microbat activity as well as the greatest diversity of microbat species (**Table 2).** When calls were summed over the entire 5 nights of recording for each Songmeter, microbat activity was extremely low at SM12 with calls recorded at a rate of one every hour on average throughout the survey period. Activity at SM11 was also low; with calls recorded at a rate of one every 30 minutes on average throughout the survey period.

There were some long sequences and a few feeding buzzes observed in the dataset indicating the site is used by several species of microbats as foraging habitat (Little Bent-winged Bats, Gould's Wattled Bats).

Table 2: Microbat calls recorded on SM11 at Lakes Way, Forster between 4 and 9 October 2018.

SCIENTIFIC NAME	COMMON NAME	DEFINITELY PRESENT	POTENTIALLY PRESENT	TOTAL
Chalinolobus gouldii	Gould's Wattled Bat	26	1	27
Chalinolobus gouldii / Ozimops ridei	Gould's Wattled Bat / Ride's Free-tailed Bat			3
Chalinolobus morio	Chocolate Wattled Bat	1	2	3
Miniopterus australis*	**Little Bent-winged Bat**	**35**		**35**
Myotis macropus*	**Southern Myotis**	**1**		**1**
Nyctophilus sp.	Long-eared Bat	1		1
Ozimops ridei	Ride's Free-tailed Bat	3		3
Scoteanax rueppellii* / *Scotorepens orion*	**Greater Broad-nosed Bat** / Eastern Broad-nosed Bat		**1**	**1**
Vespadelus pumilus	Eastern Forest Bat	1	1	2
Vespadelus pumilus / Vespadelus vulturnus	Eastern Forest Bat / Little Forest Bat			4
Vespadelus vulturnus	Little Forest Bat			1
Unidentifiable				46
Total identifiable calls				81
Total calls				127
Percentage identifiable calls				64%

*** Threatened species listed under BC Act**

Table 3: Microbat calls recorded on SM12 at Lakes Way, Forster between 4 and 9 October 2018.

SCIENTIFIC NAME	COMMON NAME	DEFINITELY PRESENT	POTENTIALLY PRESENT	TOTAL
Chalinolobus gouldii	Gould's Wattled Bat	2	4	6
Miniopterus australis*	**Little Bent-winged Bat**	**1**		**1**
Micronomus norfolkensis*	**Eastern Coastal Free-tailed Bat**	**2**		**2**
Ozimops ridei	Ride's Free-tailed Bat	2		2
Unidentifiable				56
Total identifiable calls				11
Total calls				67
Percentage identifiable calls				16%

*** Threatened species listed under BC Act**

Implications on the importance of the site to microbats

The site on Lakes Way, Forster does not represent key roosting or breeding habitat for any species of microbat because of a lack of hollow-bearing trees and subterranean roosting habitat. The site does represent foraging habitat for a range of locally occurring microbat species, and evidence of this was recorded during surveys from Little Bent-winged Bats and Gould's Wattled Bats.

The relatively low activity levels recorded throughout the survey period will be strongly influenced by the heavy rainfall (56mm on 5th October) and suboptimal weather conditions experienced during the survey period. Despite this, at least ten (10) microbat species, including up to four threatened species were recorded during ultrasonic surveys of the site.

The subject site includes areas of cleared land, open canopy woodland as well as areas of Swamp Oak forest. It is near larger tracts of private and reserved forested vegetation (Booti Booti National Park) and large permanent water bodies such as Wallis Lake. These landscape features all provide microbat foraging habitat, with roosting habitat likely to be available within the larger patches of forest and the reserved areas to the south and east.

A reduction of foraging habitat at the subject site will contribute to the cumulative loss of foraging habitat for microbats, particularly for those threatened microbat species that are not well adapted to urban environments (Eastern Coastal Free-tailed Bat, Greater Broad-nosed Bat). These are species that do well in areas with a matrix of open woodland / grasslands and closed forest communities.

Survey Limitations

Calls were only positively identified when the defining characteristics were present and there was no chance of confusion between species with overlapping and/or similar calls. In this survey, there were some call sequences that could not be positively identified to species level. Further, some species recorded in this survey can have call profiles that overlap with other species.

When overlap occurs, species with similar call profiles are assigned to multi species groups of two or three potential species depending on the characteristics displayed in the recorded call sequences. Calls with intermediate characteristics were assigned mixed species labels.

The species recorded in this survey with overlapping call profiles include *Chalinolobus gouldii* (Gould's Wattled Bat), Eastern Coastal Free-tailed Bat and *Ozimops ridei* (Ride's Free-tailed Bat). The calls of these three species overlap in the range 28 kHz to 32 kHz. Calls were identified as Eastern Coastal Free-tailed Bat if the call shape was flat (initial slope S1 of less than 100 octaves per second), there was alternation in call frequency between

pulses and the frequency was between 31.5 – 36 kHz. Calls were identified as Ride's Freetail Bat if the call shape was flat (initial slope S1 of less than 100 octaves per second) and the frequency was between 28 – 32 kHz. Gould's Wattled Bat was distinguished by curved pulses with a frequency of 28 – 32.5 kHz and alternation in call frequency between pulses. Calls with intermediate characteristics were assigned mixed species labels.

The calls of Southern Myotis are very similar to all *Nyctophilus* (Long-eared Bat) species and it is often difficult to separate these species on call characteristics alone. Calls can be identified as *Nyctophilus spp*. when the time between calls (TBC) is higher than 95ms and the initial slope S1 is lower than 300 octaves per second (OPS). Calls can be identified as Southern Myotis when the time between calls (TBC) is lower than 75ms and the initial slope S1 is greater than 400 (OPS). Where the TBC is between 75 and 95ms and the OPS is between 300 and 400 calls are assigned a mixed species label of Southern Myotis / Long-eared Bats (Pennay, Law and Reinhold 2004).

On the north coast of NSW, the calls of *Falsistrellus tasmaniensis* (Eastern False Pipistrelle), Greater Broad-nosed Bat and *Scotorepens orion* (Eastern Broad-nosed Bat) can be difficult to separate as their call frequencies and some other call characteristics overlap.

- Greater Broad-nosed Bats can be distinguished by a frequency of 32 – 36 kHz, lack of a tail or short down-sweeping tail, frequency of the knee greater than 37 kHz, and drop of more than 3 kHz from the knee to the characteristic section.

- Eastern False Pipistrelle bat calls have a characteristic frequency between 35 and 39 kHz, display curved, often steep pulses without up-sweeping tails and sometimes with down-sweeping tails. The pre-characteristic section is often long (greater than 3 kHz). This species can only be separated from Eastern Broad-nosed Bat when the characteristic frequency is above 37 kHz.

- Eastern Broad-nosed Bat calls fall between 34 and 37 kHz but can only be separated from Eastern False Pipistrelle when calls are between 34 and 35 kHz, and the frequency of the knee is above 38 kHz.

When calls showed characteristics intermediate between these three species they were assigned mixed species labels.

The calls of Eastern Cave Bat, *Vespadelus pumilus* (Eastern Forest Bat) and *Vespadelus vulturnus* (Little Forest Bat) overlap on the north coast of NSW when they fall in the range 50 – 53 kHz. These species can be separated from *Chalinolobus morio* (Chocolate Wattled Bat) whose calls also fall within the same frequency range by the presence of up-sweeping tails. Eastern Cave Bat is unlikely to be present at the subject site because of the absence of sandstone or volcanic escarpments in the surrounding landscape that provide cave dwelling roosting habitat for this species. Eastern Forest Bat calls (50 – 58 kHz) can be separated from Little Forest Bat if the frequency is above 54 kHz, or if the frequency is below 54 kHz only when the end frequency of each pulse falls above 54.5 kHz. Most of the recorded calls with up-sweeping tails in the range 50 – 53 kHz could not be assigned to a single species and were therefore given mixed species labels.

Call profiles

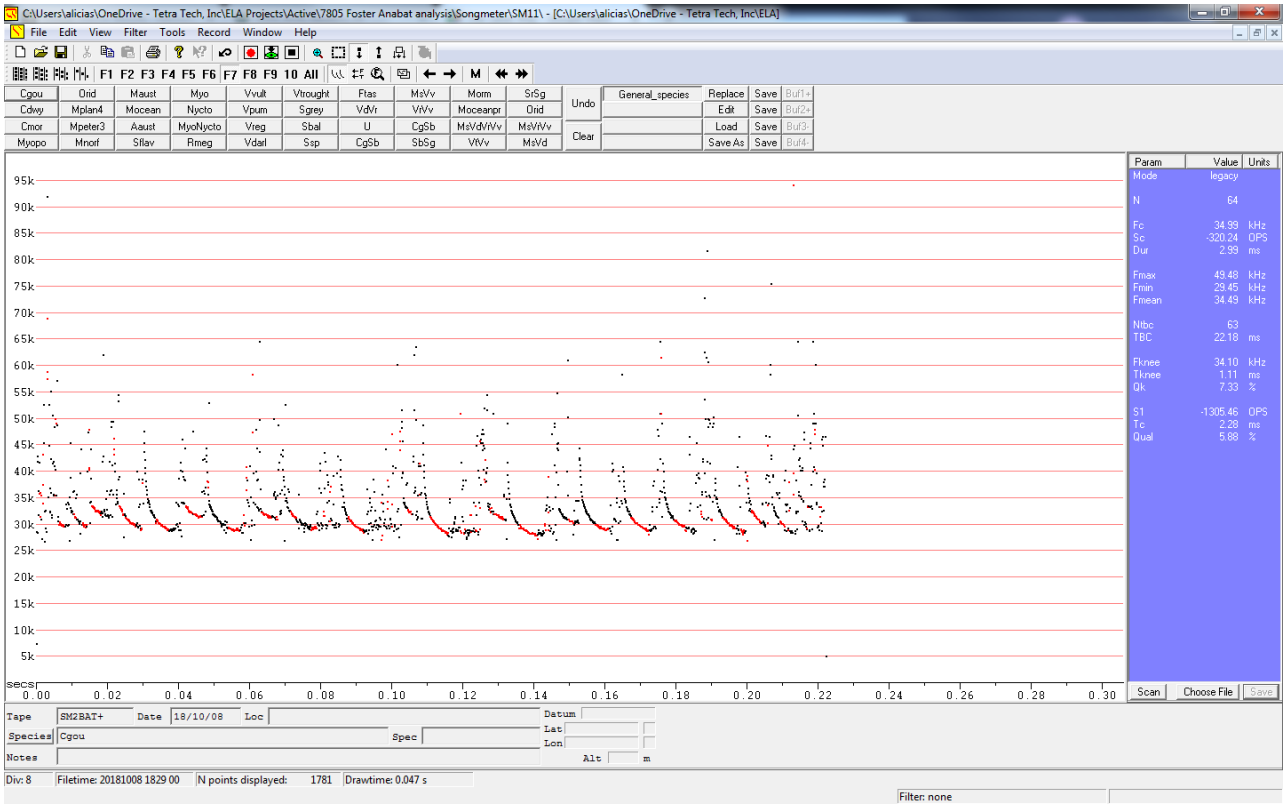

Figure 1: Call profile for *Chalinolobus gouldii* (Gould's Wattled Bat) recorded on SM11 at Lakes Way, Forster at 1829 (6.29pm) on 8 October 2018.

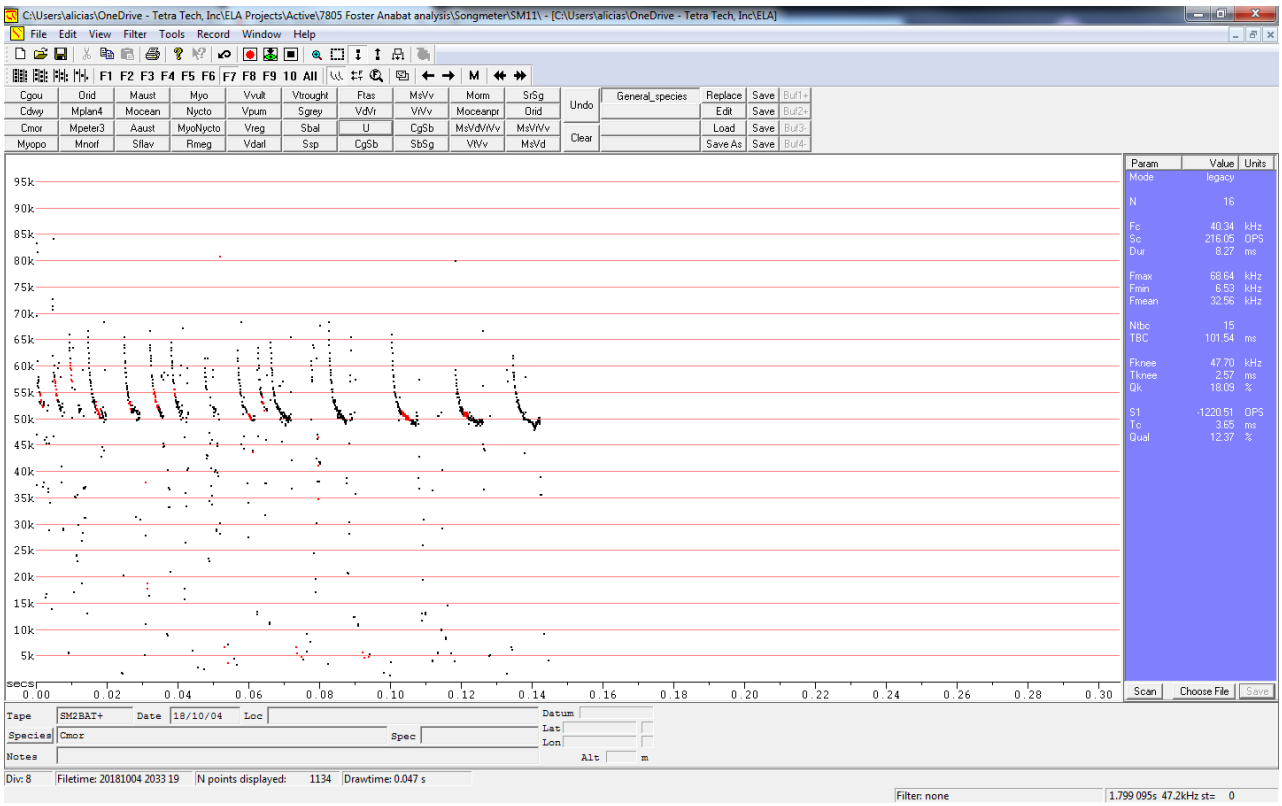

Figure 2: Call profile for *Chalinolobus morio* (Chocolate Wattled Bat) recorded on SM11 at Lakes Way, Forster at 2033 (8.33pm) on 4 October 2018.

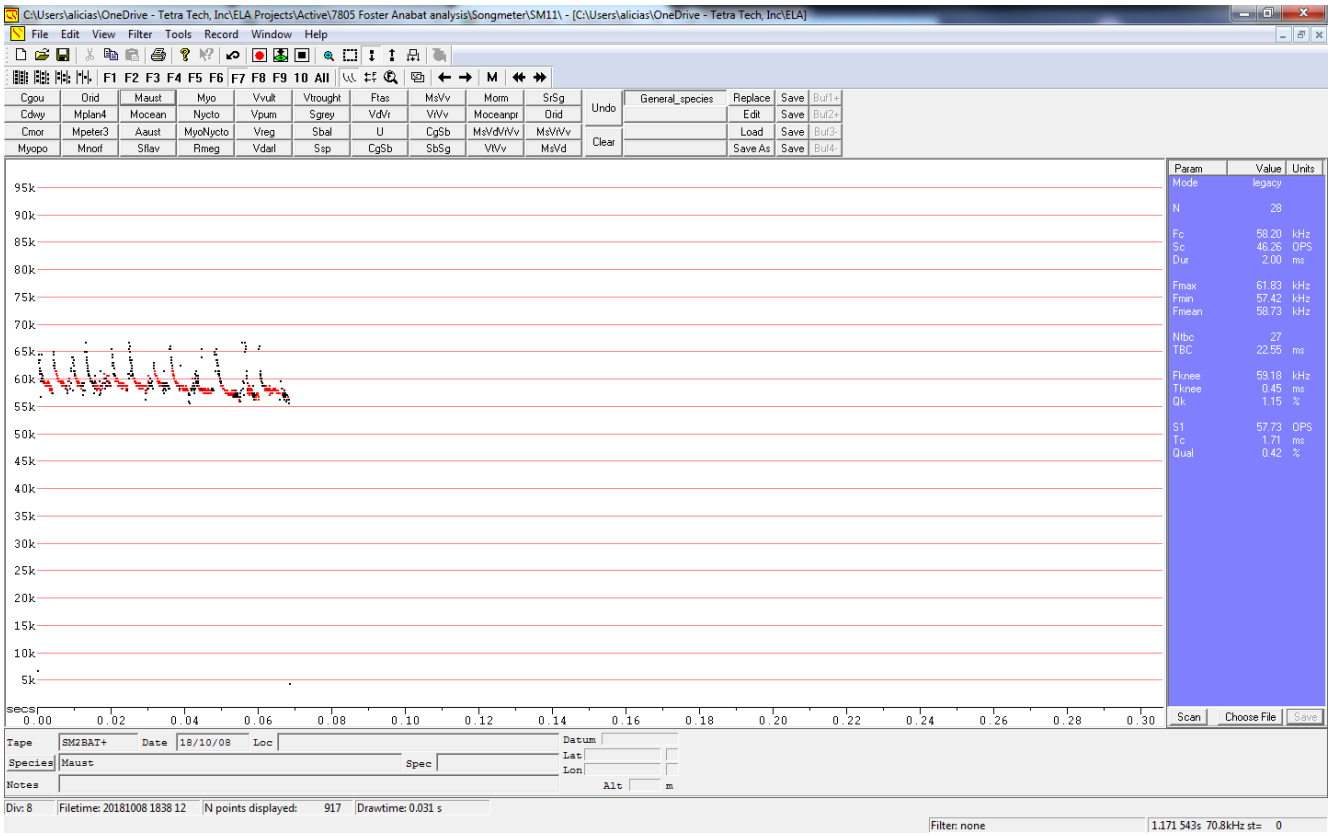

Figure 3. Call profile for *Miniopterus australis* (Little Bentwing Bat) recorded on SM11 at Lakes Way, Forster at 1838 (6:38pm) on 8 October 2018.

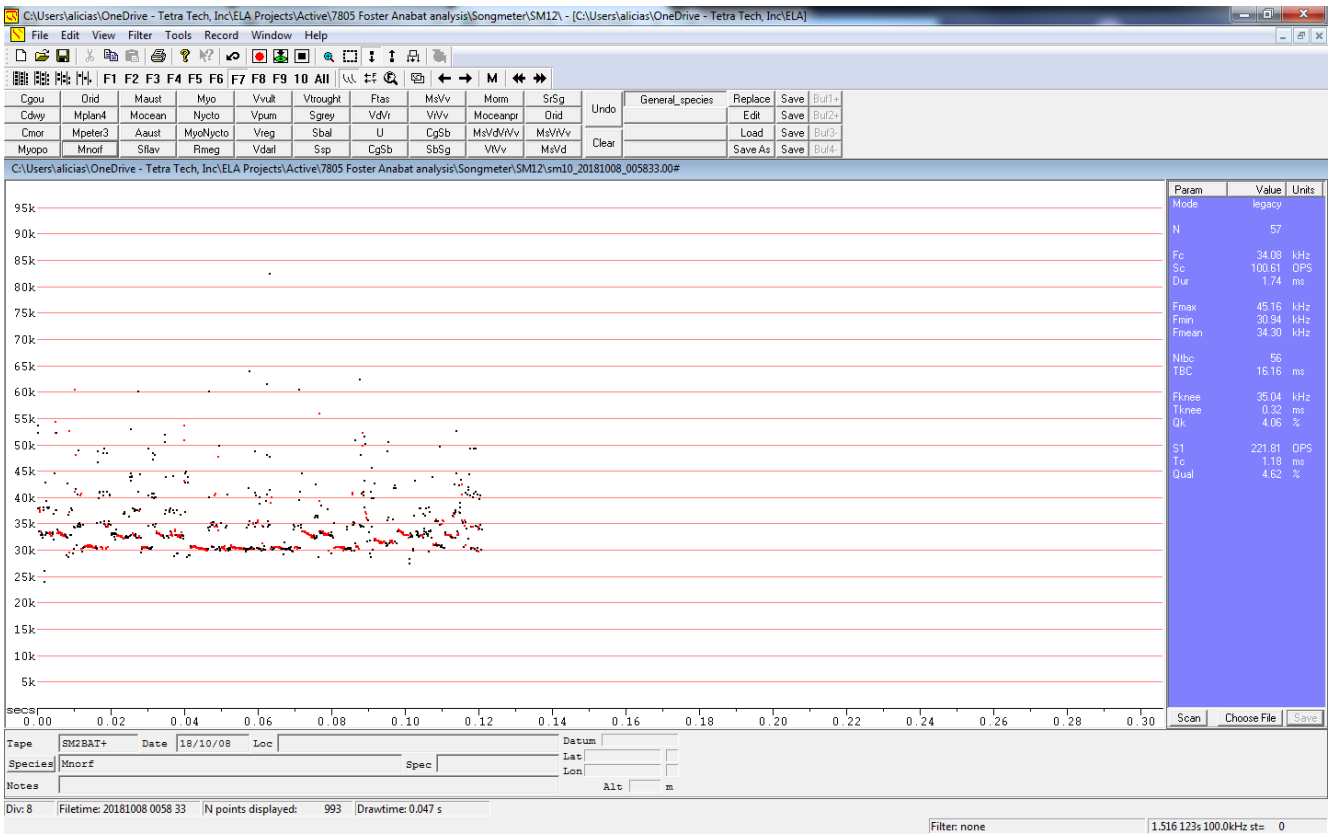

Figure 4: Call profile for *Micronomus norfolkensis* (Eastern Coastal Free-tailed Bat) recorded on SM12 at Lakes Way, Forster at 0058 (12:58am) on 8 October 2018.

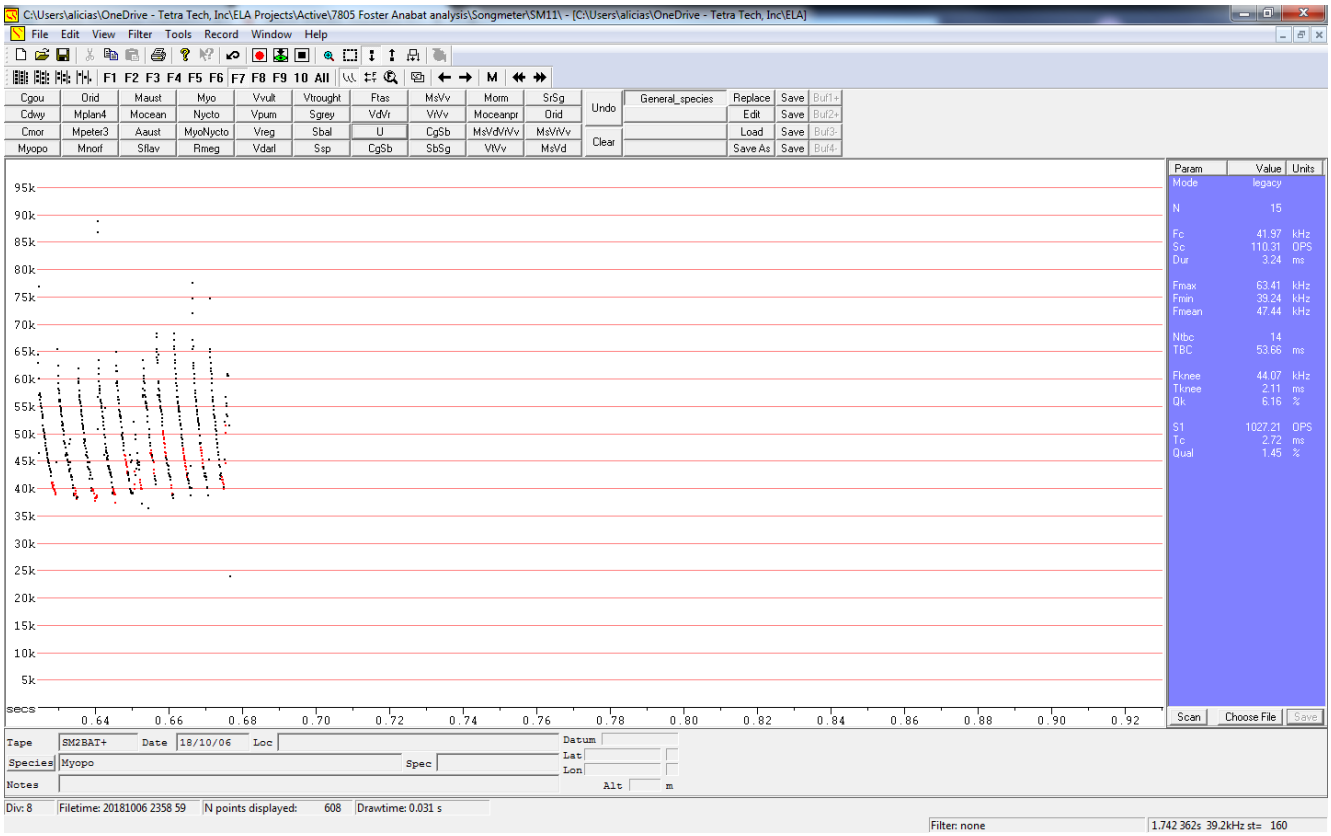

Figure 5: Call profile for *Myotis macropus* (Southern Myotis) recorded on SM11 at Lakes Way, Forster at 2358 (11:58pm) on 6 October 2018.

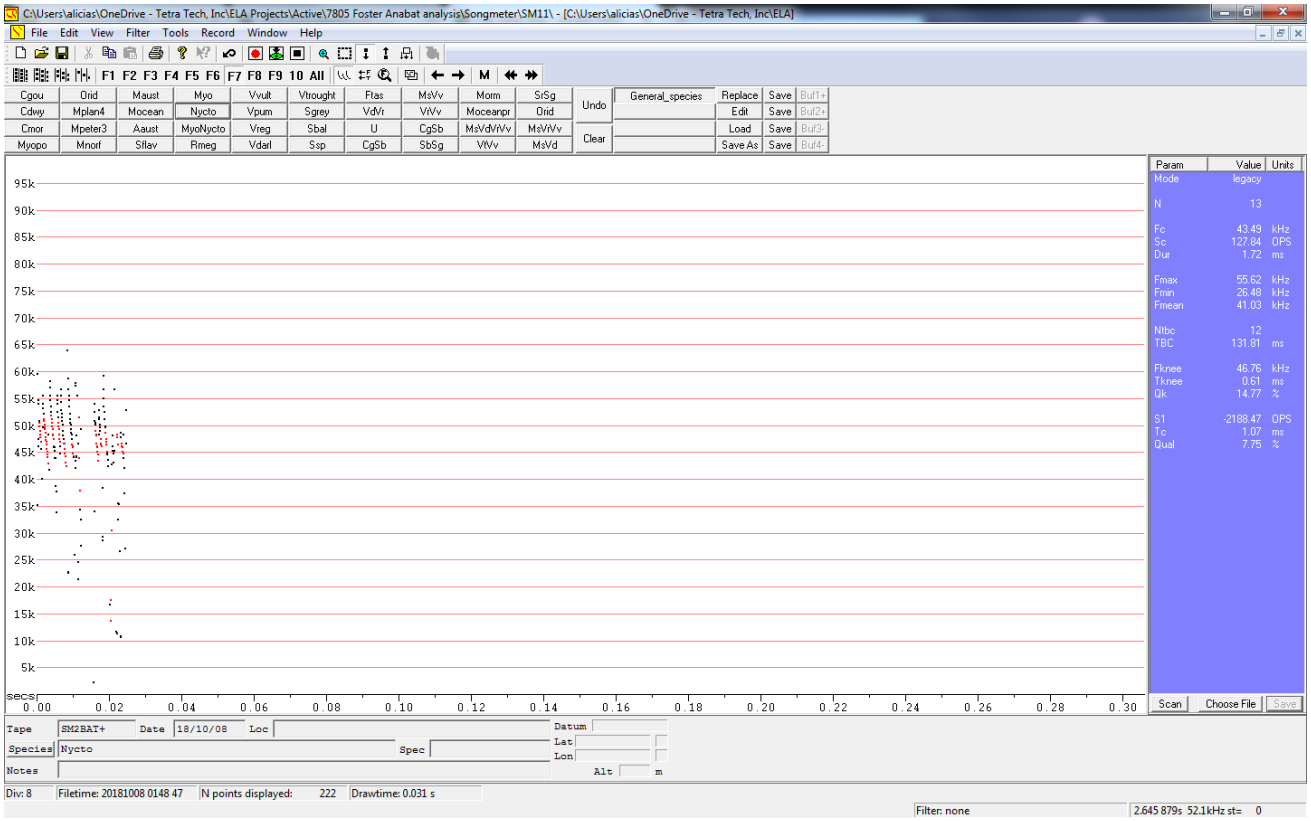

Figure 6: Call profile for *Nyctophilus sp*. (Long-eared Bat) recorded on SM11 at Lakes Way, Forster at 0148 (1:48am) on 8 October 2018.

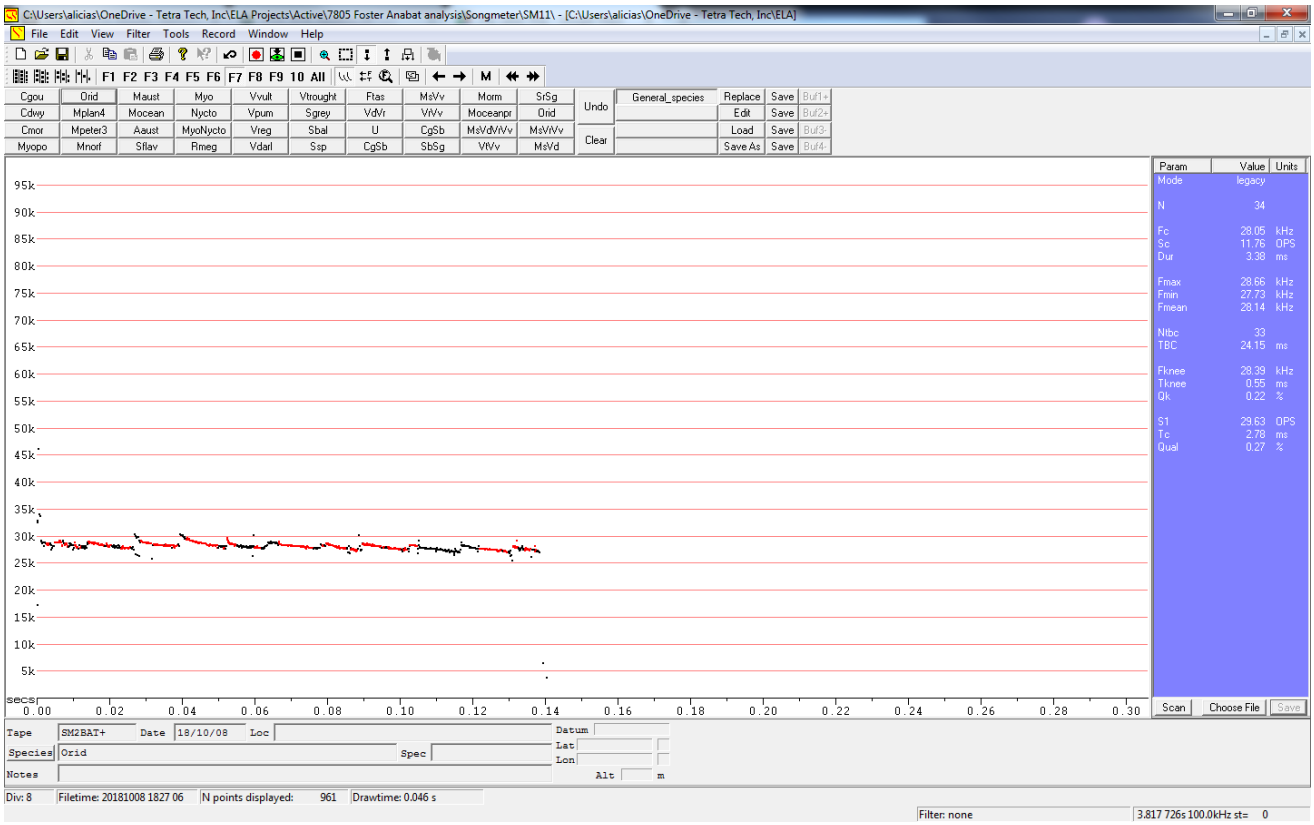

Figure 7: Call profile for *Ozimops ridei* (Ride's Free-tailed Bat) recorded on SM11 at Lakes Way, Forster at 18:27 (6.27pm) on 8 October 2018.

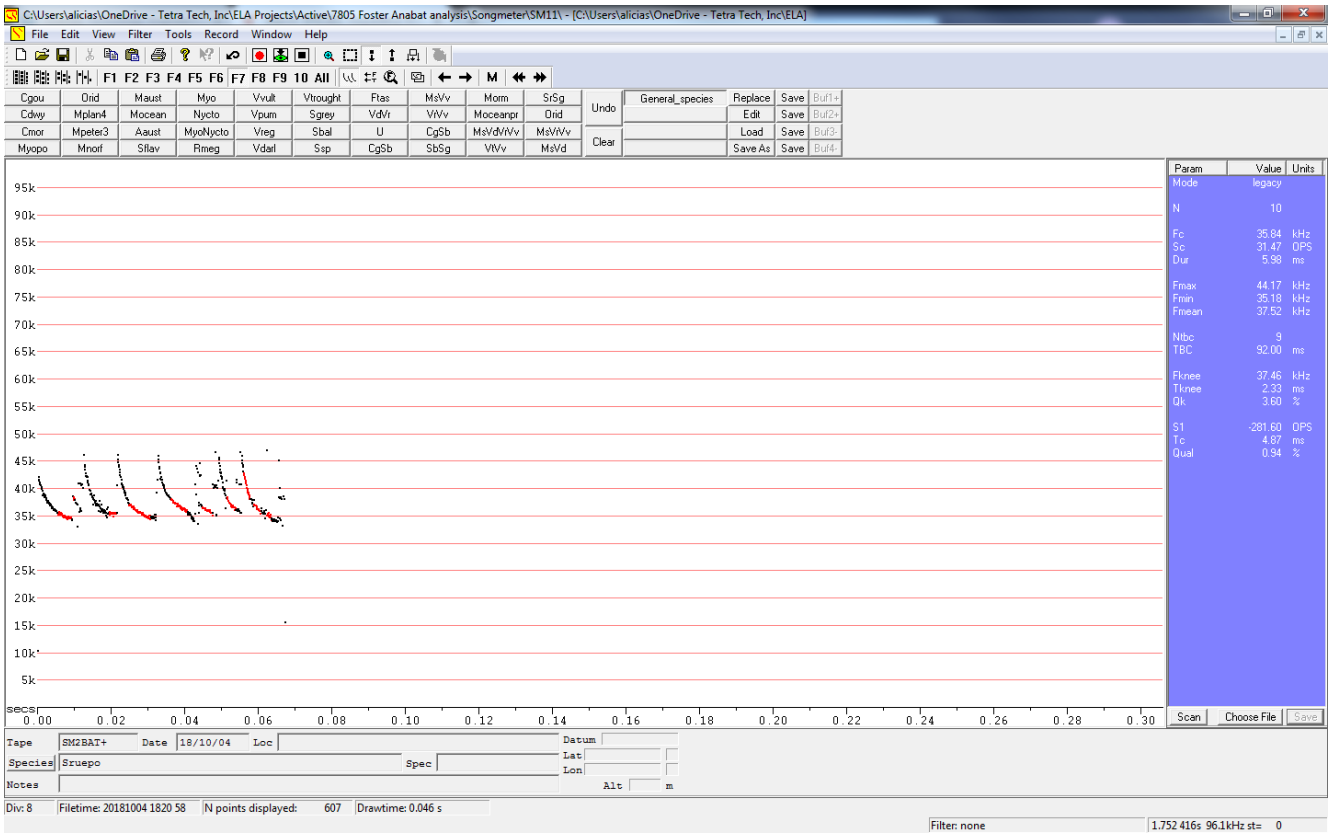

Figure 8: Call profile for *Scoteanax rueppellii* (Greater Broad-nosed Bat) / *Scotorepens orion* (Eastern Broad-nosed Bat) recorded on SM11 at Lakes Way, Forster at 18:20 on 4 October 2018.

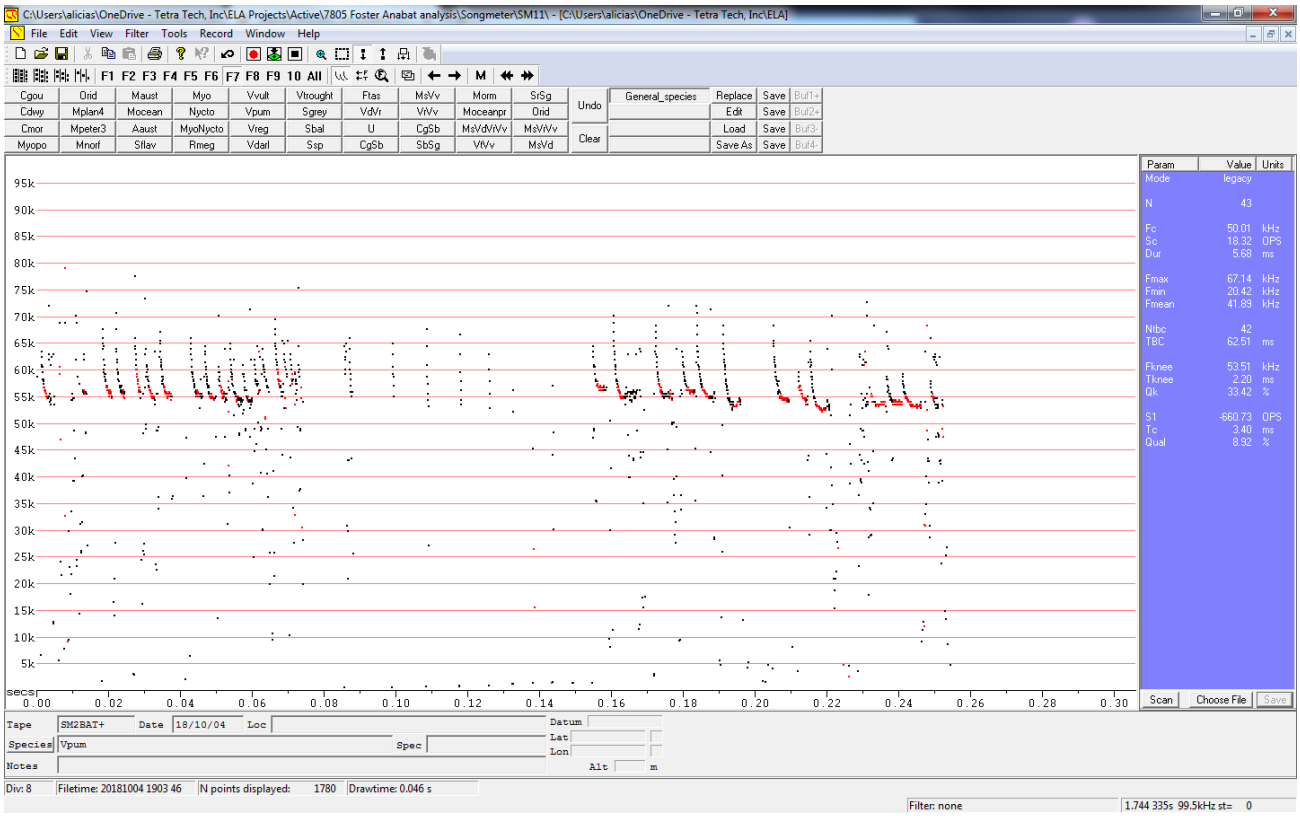

Figure 9: Call profile for *Vespadelus pumilus* (Eastern Forest Bat) recorded on SM11 at Lakes Way, Forster at 19:03 (7.03pm) on 4 October 2018.

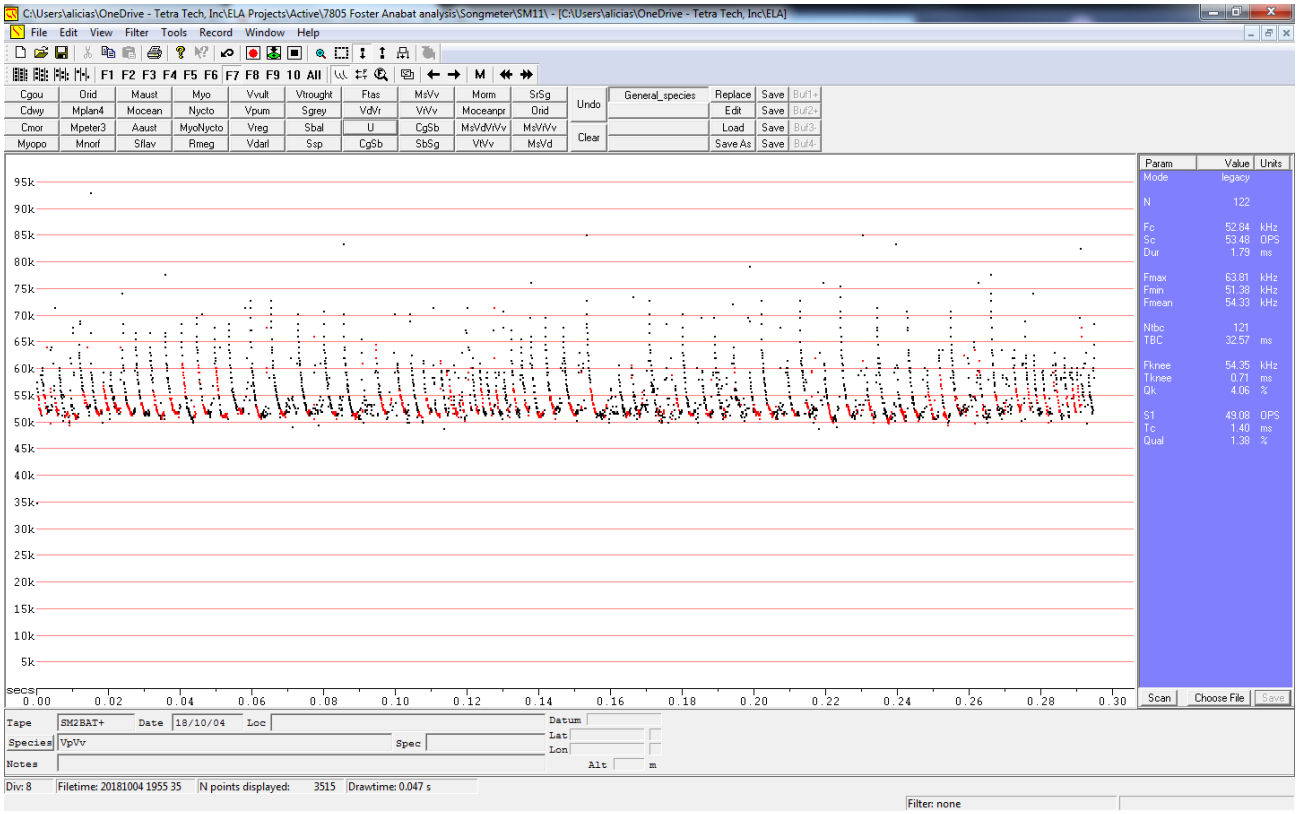

Figure 10: Call profile for *Vespadelus pumilus* (Eastern Forest Bat) / *Vespadelus vulturnus* (Little Forest Bat) recorded on SM11 at Lakes Way, Forster at 1955 (7.55pm) on 4 October 2018.

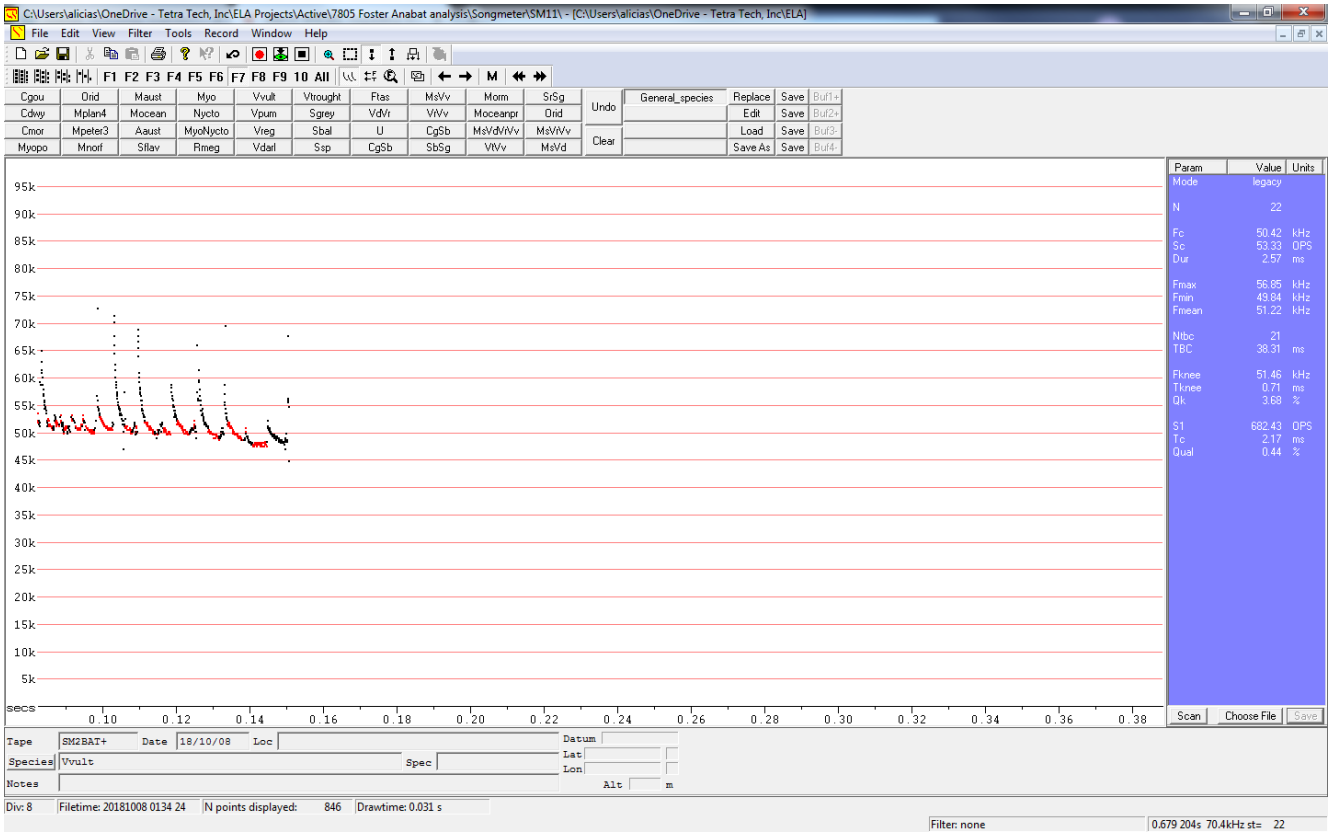

Figure 11: Call profile for *Vespadelus vulturnus* (Little Forest Bat) recorded on SM11 at Lakes Way, Forster at 0134 (1.34am) on 8 October 2018.

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Appendix G Assessments of significance (TSC Act)

The Assessment of Significance (7-part test) is applied to species, populations and ecological communities listed on Schedules 1, 1A and 2 of the TSC Act and Schedules 4, 4A and 5 of the FM Act. The assessment sets out 7 factors, which when considered, allow proponents to undertake a qualitative analysis of the likely impacts of an action and to determine whether further assessment is required via a Species Impact Statement (SIS). All factors must be considered and an overall conclusion made based on all factors in combination. An SIS is required if, through application of the 7-part test, an action is considered likely to have a significant impact on a threatened species, population or ecological community.

Tests of significance for the endangered communities onsite listed under the NSW TSC Act are provided below. Threatened species, populations and ecological communities to be assessed under the TSC Act, which have potential to occur within the study area or may be indirectly impacted are:

Threatened Ecological Community

Swamp Oak Floodplain Forest

Threatened Flora

Lindernia alsinoides

Threatened Fauna

Microchiropteran bats

1. *Miniopterus australis* (Little Bentwing-bat)
2. *Micronomus norfolkensis* (Eastern Freetail-bat)
3. *Myotis macropus* (Southern Myotis)
4. *Scoteanax rueppellii* (Greater Broad-nosed Bat)

Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions

Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions is listed as an Endangered Ecological Community (EEC) under the TSC Act

The occurrence of the community onsite is regenerating from a cleared paddock and is dominated by mid-aged *C. glauca*. The ground layer within this community is variable onsite, and represents a matrix of exotic and native species.

a) In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

Not applicable.

b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

Not applicable.

c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) Is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

The proposed development is considered unlikely to place the local occurrence of this EEC at risk of extinction. The ecological community in the study area forms part of a larger contiguous area that continues into the land holdings north of the proposed bulk earthworks. Portions of this EEC will also be retained and managed within the study area.

d) In relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed activity, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality

The proposed subdivision and subsequent development of the study area will remove 1.61 ha of habitat for the community. The proposed development will retain a broad corridor of vegetation along the north of the study area. The proposed clearing will not significantly fragment or isolate the ecological community.

The habitat to be removed is not considered important for the survival of the community as there is a much larger area of it in the locality. Current management conditions within the study area have resulted in a degraded site that is not important to the long-term survival of the community.

e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).

There is no critical habitat listed on the register of critical habitat relevant for this ecological community.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.

There is no recovery or threat abatement plan developed for this ecological community.

g) ***Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process*****.***

The action of removing a small number of trees and shrubs is part of the key threatening process “clearing of native vegetation”.

The northern portion of the subject site will be retained and will retain a corridor for biodiversity within the site.

Summary

In consideration of the above assessment of significance, the proposed activity is unlikely to constitute a significant impact to the EEC assessed as it is:

1. Unlikely to impact on the long-term survival or cause extinction of the ecological community within the locality
2. The impacts to the ecological community will be ameliorated by retaining and managing a portion of the study area under a VMP.

***Lindernia alsinoides* (Noahs False Chickweed)**

Lindernia alsinoides is an Endangered species listed under the TSC Act.

This species was observed to occur throughout regenerating vegetation consisting of multiple stems within the study area. 259 individuals were counted in total within the study area. The species is known locally from other wetlands within the Forster region.

a. in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at the risk of extinction.

Factors that have the potential to impact the life cycle of *L. alsinoides* include: loss and fragmentation of habitat associated with clearing for urban development; land clearing, agriculture and road maintenance activities and habitat degradation as a result of weed invasion, inappropriate fire regime and uncontrolled access. The occurrence of the species within the subject site is currently enhanced through intermediate disturbance to regenerating swamp forests by feral deer.

The local population of the species extends beyond the development site, however, is unlikely to extend beyond the study area. The species is likely pollinated by native bees which can [anecdotally] transmit genetic material to up to 600m. As such the occurrence of this species within the study area is likely disjunct from the sweet pea and golden ponds populations.

110 individuals of the species will be removed and relocated from bulk earthworks to the retained area in the north of the study area.

The extent of the local population has not been fully assessed. As such there is likely more of the species throughout the occurrence of Swamp Oak Forest onsite. Should the species occur throughout all 8.8 ha of habitat, the loss of individuals from the bulk earthworks would not significantly reduce the local occurrence of the species.

b. in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction

Not applicable.

c. in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:
- **i. is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or**
- **ii. is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.**

Not applicable.

d. in relation to the habitat of a threatened species, population or ecological community:
- **i. the extent to which habitat is likely to be removed or modified as a result of the action proposed, and**

The proposed development will remove 1.61 ha of habitat for the species.

ii. whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

The dispersal of the species is limited to probably less than 2 m, it is therefore not likely that the populations to the north of the study area are likely to be fragmented by the proposal. The proposed development will remove a small portion of habitat for the species however land will be retained within the study area to maintain a larger area of suitable habitat.

iii. the importance of the habitat to be removed, modified, fragmented or isolated to the long term survival of the species, population or ecological community in the locality.

The species appears to respond well to intermediate disturbance. As such the vegetation within the study area is unlikely to be important for the species, other than that it currently occurs within the study area.

All occurrence of the species within the subject site will be relocated to the retained area. Given the disturbance history and wider local population, it is unlikely that this habitat is important to the survival of the species.

e. whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).

No critical habitat for this species has been identified on the Register of Critical Habitat.

f. whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.

No recovery plan or threat abatement plan has been developed for *L. alsinoides*.

g. whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

A number of KTPs are relevant to this proposal with respect to *L. alsinoides*. These include:

1. clearing of native vegetation (TSC Act)

The proposed bulk earthworks will remove native vegetation.

Conclusion

The population observed onsite is currently experiencing pressure from grazing and trampling from feral deer, although it is noted that the same deer trails appear to be promoting growth of *L. alsinoides* by exposing narrow corridors to sunlight.

All occurrences that occur within the proposed development site (110 individuals) will be subject to bulk earthworks and will be directly impacted. The individuals impacted form part of a larger population that extends north into land retained and proposed for management under a VMP. The species is thought to pollinate via native bees which can share genetic material for up to 600m. Based on this assumption, the population within the study area is unlikely to share genetic material with other occurrences in the Forster region (Figure 15). As such the local population for this assessment includes only those individuals that occur within the study area.

The proposed bulk earthworks will therefore impact on 30% of the local population. This extent of impacts is considered to reduce the local population, however a local extinction is unlikely occur. Based on the current evidence available, a significant impact is unlikely.

An Assessment of Significance (AoS) was undertaken for *L. alsinoides*. It was concluded that a significant impact is not likely and a SIS is not required.

Microchiropteran Bats – Tree roosting

Due to similar habitat requirements and associated impacts, a single 7-part test has been undertaken for the following microchiropteran bats:

1. *Miniopterus australis* (Little Bentwing-bat)
2. *Myotis macropus* (Southern Myotis)
3. *Saccolaimus flaviventris* (Eastern Freetail-bat)
4. *Scoteanax rueppellii* (Greater Broad-nosed Bat)

All species are listed as Vulnerable under Schedule 2 of the TSC Act. These species were detected by Anabat recordings.

The four species are insectivorous and can occur in Eucalypt woodlands and forests. They are known to primarily utilise tree hollows as roosting sites, which are present in the study area and likely to occur locally in intact vegetation. The site is likely to be foraging habitat only for these species, as there are no hollows within the regenerating swamp forest.

a) In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

Given these species are highly mobile, the relatively limited amount of habitat proposed for removal, it is considered unlikely that impacts will occur on these species such that it would place a local population at risk of extinction.

b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

Not applicable.

c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction

Not applicable.

d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

1.61 ha of foraging habitat will be removed by the proposed bulk earthworks.

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

The proposed development is unlikely to fragment or isolate areas of potential foraging habitat for these species. The study area is on the very edge of a much larger patch of vegetation that forms a connecting corridor which can easily be accessed by these highly mobile species.

The removal of 1.61 ha of vegetation is not likely to fragment or isolate the habitat for these species.

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality

The majority of potential habitat for these species within the subject site is limited in extent. Habitat within the subject site has been disturbed and previously cleared.

Individuals have the potential to use the site on an occasional basis if it forms part of their larger home range. The long-term survival of these species is unlikely to be dependent on the habitat in the study area.

e) Whether the action proposed is likely to have an adverse effect on critical habitat.

No critical habitat has been declared by the Chief Executive of OEH for these species.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.

No recovery plan or threat abatement plan has been prepared for these species.

The action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

One key threatening processes listed under Schedule 3 of the TSC Act is relevant to the current proposal and may pose a threat to these species

- Clearing of native vegetation

Vegetation clearance is listed as a key threatening process. The potential of habitat to be cleared and/or requiring selective canopy thinning is 1.61 ha, particularly in relation to the home range of these species. Additional areas of potential habitat would also remain at the site and significant areas of suitable habitat are also present in the locality. It is unlikely that the proposed development will exacerbate any key threatening processes to such an extent that they would place any local populations of these species at risk of extinction.

Conclusion

The proposed development is unlikely to have a significant impact on these species given that:

- The proposed works would remove only a small area of potential habitat relative to the amount available in the immediate area for these mobile species.
- The proposed works would not isolate foraging habitat for these species.
- No hollow-bearing trees will be removed
- A large amount of potential foraging and roosting habitat for these species would remain directly adjacent to the site within intact vegetation and is present throughout the locality.

On the basis of the above considerations, it is unlikely that the proposed subdivision would result in a significant impact on the survival of these species. Consequently, a SIS is not required.

Appendix H Significant Impact Criteria Assessment (EPBC Act)

This appendix provides an assessment of the effects of the proposal under the Significant Impact Guidelines 1.1 for Matters of National Environmental Significance in accordance with the EPBC Act for Coastal Swamp Oak (Casuarina glauca) Forest

Coastal Swamp Oak (Casuarina glauca) Forest

An action is likely to have a significant impact on a critically endangered or endangered ecological community if there is a real chance or possibility that it will:

a) reduce the extent of an ecological community

The local occurrence of the community extends from the study area to the north and along a broad drainage depression in the landscape. The occurrence onsite is a regenerating form of the EPBC Act EEC. The proposed removal and modification of 1.61 ha of habitat is considered unlikely to adversely impact the extent of this ecological community.

b) fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines

The area where the works are proposed are located on the southern edge of this ecological community that extend to the north. The removal of the 1.61 ha on the southern edge of the vegetation patch is unlikely to fragment or increase fragmentation of this ecological community.

c) adversely affect habitat critical to the survival of an ecological community

Due to the disturbed nature of the site with exotic species along the paddock edge, the fact that the site is a regenerating paddock, and the proximity of the proposed works area to connecting areas of this ecological community, the study area is not considered as habitat which is critical to its survival.

d) modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns

There will be short term impacts from the construction activities proposed however these will be short in duration and limited to the construction period. In the absence of fine scale modelling, it is assumed that once the works are complete; environmental conditions (including drainage conditions) similar to those that existed prior to works commencing will persist.

e) cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting

The removal of the 1.61 ha on the southern edge of the regenerating vegetation patch is unlikely to cause a decline or loss of functionality of the ecological community or species that depend on it.

f) cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to: – assisting invasive species, that are harmful to the listed ecological community, to become established, or – causing regular mobilisation of

fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community,

The construction works have the potential to increase the impacts of invasive species that may be harmful to the ecological community or release chemicals and pollutants into the local environment which have the potential to kill or inhibit the growth of species in the ecological community. A comprehensive suite of environmental safeguards are to be included in the CEMP; to ensure any impacts from invasive species or chemicals and pollutants are avoided, mitigated and minimised.

g) interfere with the recovery of an ecological community.

The proposed works will remove 1.61 ha of the ecological community. A comprehensive suite of environmental safeguards are to be included in the CEMP; and ensure any impacts that may interfere with the recovery of the ecological community at this site are avoided, mitigated and minimised.

Conclusion

The proposal is considered unlikely to have a significant impact on this community due to:

- the relatively small size of the proposed impacts
- the disturbed and moderately weedy nature of the study area
- the proximity of the study area to connecting areas of this EEC in the locality.

Consequently, a referral to the Commonwealth is not recommended for the proposal with respect to this EEC.

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Appendix E – Aboriginal Cultural Heritage Assessment - ERM

Lidbury, Summers _Whiteman

From: Steve.OConnor@erm.com
Sent: Monday, 10 July 2006 4:53 PM
To: consult@lswsurveyors.com.au
Subject: Draft Archaeological Report for Andrews land at South Forster

0048573 Sth Forster Draft.pdf ...

Brian,

Please find attached the draft archaeological report which we recently completed for your client's land at South Forster.

Russ has asked that I forward it to you so we can get any input prior to forwarding it to the Forster Local Aboriginal Land Council for their comments.

If you have any questions please call.

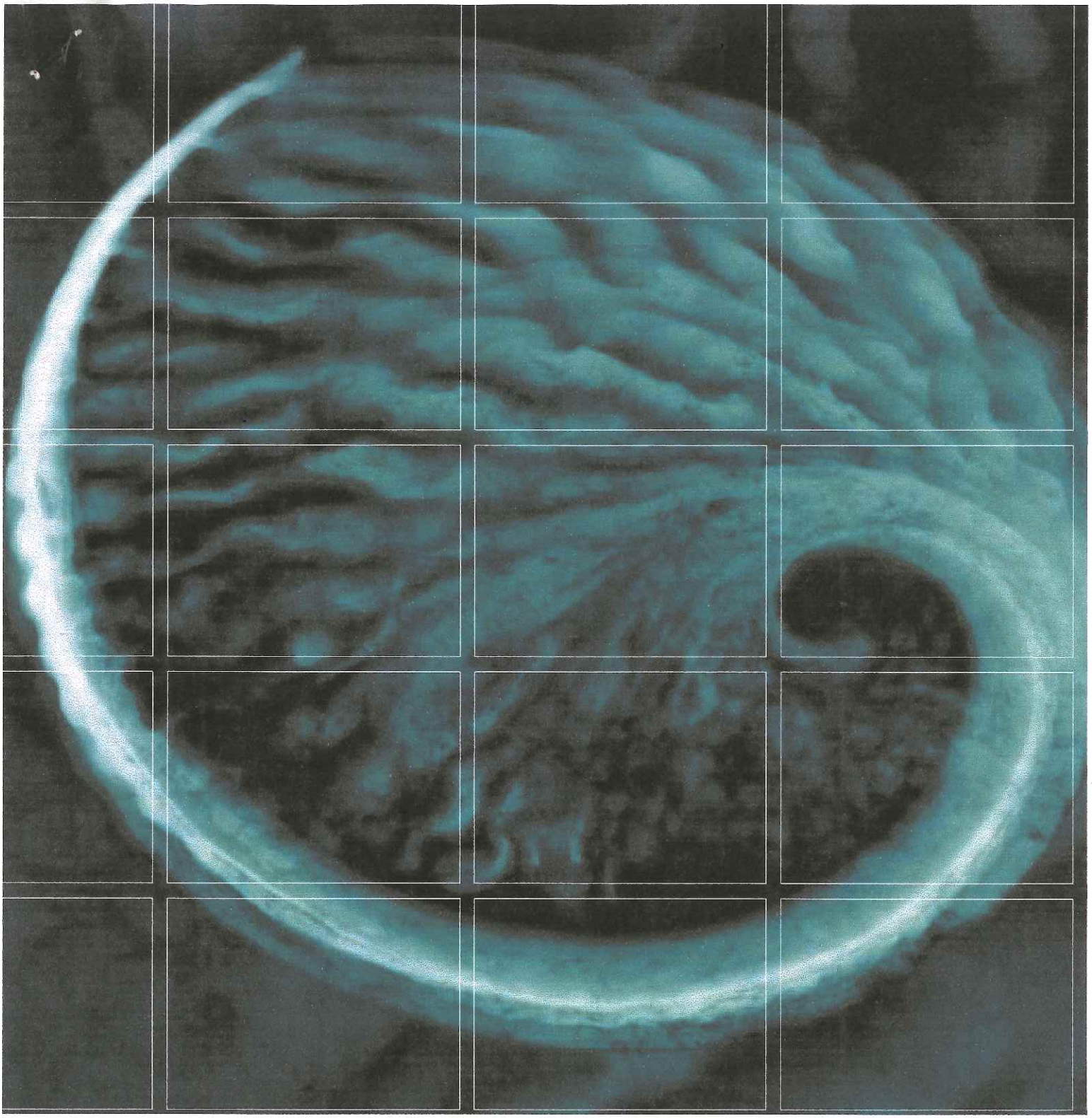
(See attached file: 0048573 Sth Forster Draft.pdf)

Regards
Steve

Steve O'Connor

Phone: (02) 4964 2150

22
10



South Forster Proposed Residential Development

Aboriginal Cultural Heritage Assessment

Winten Property Group

July 2006

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South Forster Proposed Residential Development

Aboriginal Cultural Heritage Assessment

Winten Property Group

July 2006

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Approved by:	*Nicola Roche*
Position:	Project Manager
Signed:	
Date:	*10 July, 2006*
Partner:	
	Steve O'Connor

Environmental Resources Management Australia Pty Ltd Quality System

CONTENTS

CONTENTS

LIST OF TABLES

LIST OF FIGURES

1 INTRODUCTION

The Winten Property Group Pty Ltd proposes to establish a residential community south of Forster, New South Wales. The establishment of proposed residential community will involve the rezoning of approximately 43 hectares and has the potential to impact on Aboriginal cultural heritage. Winten Property Group Pty Ltd engaged Environmental Resources Management Australia Pty Ltd (ERM) to assess Aboriginal cultural heritage within the proposed development area and to examine the potential impacts on Aboriginal cultural heritage associated with the development. This report will support the rezoning of the site and a Part 3A application for the proposed residential community. It details the assessment and management recommendations in regard to Aboriginal cultural heritage.

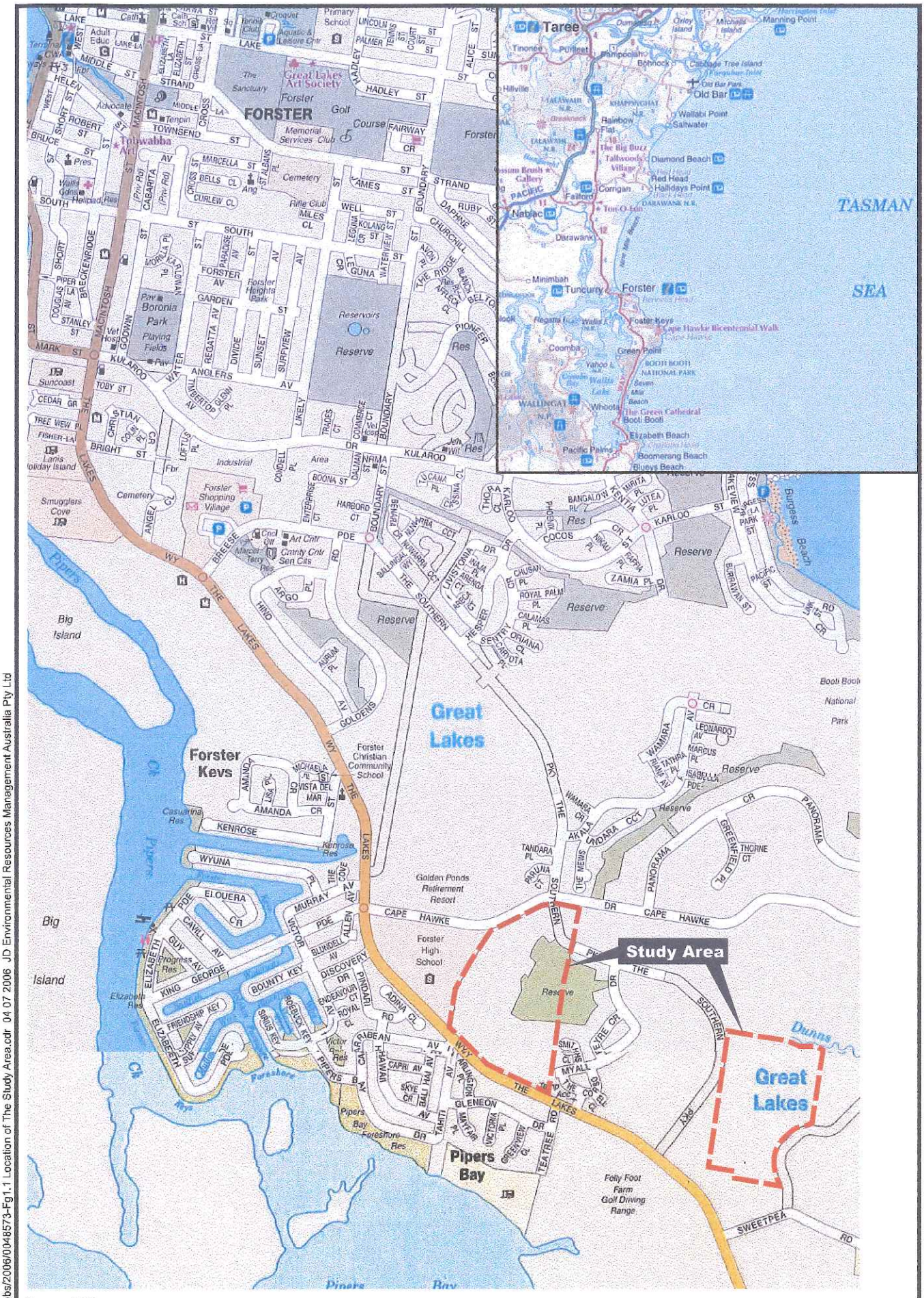
1.1 THE STUDY AREA

The proposed residential community is comprised of two portions of land, Lot 303 DP 792065 and Lot 2 DP614397 (hereafter referred to as the study area). The study area is situated approximately four kilometres to the south of the commercial centre of Forster, less than 500 metres north of Wallis Lake and less than two kilometres from the Booti Booti State Recreation Area at Cape Hawke (refer to *Figure 1.1*). Lot 303 DP 792065 is bordered by The Lakes Way to the south and Cape Hawke Drive to the north whilst Lot 2 DP614397 incorporates part of an existing concrete batching plant and is surrounded by small rural holdings. A residential subdivision and a portion of farmland are situated between the two parcels of land.

1.2 PROPOSED DEVELOPMENT

The proposed residential community within Lot 303 DP 792065 will consist of approximately 180 residential dwellings, a neighbourhood centre and a large public reserve. The residential dwellings will be situated on the elevated areas along the north western and south eastern boundaries of the study area. The public reserve will adjoin an existing public reserve within the central portion of the lot abutting the western boundary. It is proposed that Lot 2 DP614397 will contain approximately 80 residential dwellings distributed along the area of the lot not presently disturbed by the concrete batching plant.

The establishment of the proposed residential community will cause soil movement given the need to create level surfaces for dwelling construction, the construction of roads, sewer lines and other associated infrastructure and will result in surface and subsurface disturbance within the study area. Impacts within the public reserve will be minimal and may involve drainage and landscaping works.



Source: UBD

Figure 1.1 **Location of The Study Area**

ERM

0 500m

Approximate

Winten Property Group - The Southern Parkway Forster

1.3 *ASSESSMENT OBJECTIVES*

The objective of the assessment is to identify any impacts that the proposed residential community may have on Aboriginal cultural heritage and to provide appropriate mitigation and management strategies. In order to meet these objectives, the assessment includes:

- a review of the local and regional environmental and archaeological context including a review of previous archaeological investigations and an examination of relevant cultural heritage registers including the Department of Environment and Conservation (DEC) Aboriginal Heritage Information Management System (AHIMS) database;
- a field survey of the study area conducted with members of the Aboriginal community;
- consultation with the Aboriginal community regarding the Aboriginal significance of the study area; and
- mitigation and management recommendations relating to Aboriginal heritage within the study area.

1.4 *ABORIGINAL CONSULTATION*

Aboriginal people play a significant role in managing and protecting Aboriginal cultural heritage and consultation with the local Aboriginal community is an integral component of the assessment. All consultation was undertaken in accordance with the Department of Environment and Conservation (DEC) Community Consultation Requirements for Applicants (Interim). Notification of the assessment was provided to the following organisations:

- Forster Local Aboriginal Land Council (FLALC);
- Great Lakes Council;
- the New South Wales DEC;
- New South Wales Native Title Services; and
- the Registrar of Aboriginal Owners.

Correspondence with the DEC resulted in the identification of an additional 23 Aboriginal groups, all of whom were invited to register their interest in the project. FLALC registered an interest in the project and were provided with further information regarding the proposed development and its specific location. Representatives of FLALC participated in the field survey. A copy

of the draft report will be forwarded to FLALC and their comments will be presented in *Annex A* of the final report.

1.5 STATUTORY CONTROLS

Aboriginal cultural heritage in New South Wales is primarily protected and managed under the *National Parks and Wildlife Act 1974* (NPW Act). The NPW Act defines an Aboriginal object as any deposit, object or material evidence (not being a handicraft made for sale) relating to Aboriginal habitation of the area that comprises New South Wales. Under Section 90 of the Act, it is an offence to knowingly destroy, deface or damage Aboriginal objects or Aboriginal places (defined under Section 86 of the NPW Act) without the prior written consent of the Director-General of National Parks and Wildlife.

The *Environmental Planning and Assessment Act* 1979 (EP & A Act) also provides protection for cultural heritage. Part 3A of the EP & A Act covers the assessment and approvals process for projects that are considered (by the Minister for Planning) to be major projects. The Director General of Planning may deem an Aboriginal cultural heritage assessment necessary for a project being assessed under Part 3A. The recommendations of this assessment may form part of a Statement of Commitments for the project. Approved projects under Part 3A of the EP & A Act do not require Section 87 permits or Section 90 consents under the *National Parks and Wildlife Act 1974*.

Other legislation and planning instruments relating to Aboriginal cultural heritage which are of interest include *The Aboriginal and Torres Strait Islander Heritage Protection Act 1984* (Commonwealth) and the *Great Lakes Local Environmental Plan 1996*.

1.6 PROJECT TEAM

The field survey was undertaken by Nicola Roche (ERM), Robert Yettica and Isaac Paulson (FLALC). The report was prepared by Nicola Roche and a technical review was undertaken by Neville Baker.

2 ENVIRONMENTAL CONTEXT

Human behaviour is directly and indirectly influenced by the environment setting in which people live. This is particularly true for hunter gatherer societies, in which choices are affected by local resource availability. Environmental factors may also influence the likelihood that archaeological sites will be preserved and visible. The physical setting of the study area is therefore discussed in terms of geology and soils, landforms, water availability, flora and fauna and past land use and disturbance.

2.1 GEOLOGY AND GEOMORPHOLOGY

The Cape Hawke headland played a major role in the geomorphic development of the South Forster area. Barrier sands accumulated to the north and east of Cape Hawke during the Pleistocene period, resulting in the closure of the Wallis Lake embayment. During the Holocene period, estuarine muds and sands accumulated along the interior of Wallis Lake whilst a thin barrier of Holocene sands formed along the coastline to the north and south of Cape Hawke (refer to Roy et al 1997).

The study area is situated on Quaternary alluvium and estuarine deposits that partially overlie the Devonian-age Bundook beds of which Cape Hawke is composed. Lot 303 DP 792065 is situated on Pleistocene and Holocene alluvium. Lot 2 DP614397 is situated on Pleistocene transgressive dunes and estuarine sandy backbarrier deposits (Engel *et al* 1991). The Bundook Beds contain lithic sandstone and siltstone (which is frequently cherty), greywacke and conglomerate (Engel *et al* 1991). Siltstone (particularly siliceous siltstone) and greywacke are both suitable raw materials for the manufacture of stone artefacts.

2.2 LANDFORMS

The study area can be divided into landform elements based on the ten morphological landform element units described by Speight (1990). A low, level crest is present in the north western corner of Lot 303 DP 792065. Long, gentle slopes extend from the crest to an open depression that constitutes the majority of this lot. A small waterhole is located in the north eastern portion of the lot.

The south eastern portion of Lot 2 DP614397 has been disturbed by sand mining activity. It is therefore not possible to determine former landform elements within the sand mine. Gentle slopes are present in the north eastern corner of this lot. The remaining portion of the study area consists of level to gently undulating flats that are bordered by Dunn's Creek, a second order drainage line (open depression). An artificial drainage line (open depression) has been constructed across the swampy flats in the north western corner of Lot 2 DP 614397.

Jobs/2006/0048573- Fg 2.1 Landform Units within The Study Area.cdr 04 07 2006 JD Environmental Resources Management Australia Pty Ltd

Legend

- Study Area
- Crest
- Slopes
- Flats
- Disturbed
- Open Depression
- Open Depression (artificial)

Source: Lidbury, Summers & Whiteman Surveyors, Planners and Engineers

ERM

0 144m

Approximate Only

Figure 2.1 **Landform Units within The Study Area**

Winten Property Group - The Southern Parkway Forster

2.3 *WATER AVAILABILITY*

The study area is situated approximately 500 metres north of Wallis Lake and Pipers Creek, both of which are estuarine watercourses. A small water hole is present in the north eastern portion of Lot 303 DP 792065. Lot 2 DP614397 is bordered to the north west by a branch of Dunns Creek, a second order drainage line. The Forster 1:100,000 scale topographic sheet shows a linear drainage line extending from halfway across the northern border and continuing down the western border of the lot. This drainage line and has been constructed to drain the low-lying swampy flats. Prior to the introduction of artificial drainage in both lots freshwater would have been available within the low-lying swampy areas.

2.4 *FLORA AND FAUNA*

Most of the study area has been cleared of its native vegetation. Lot 303 DP 792065 has been entirely cleared with the exception of several trees on the crest along the north western boundary of the lot. The remainder of the lot is heavily vegetated by introduced grass species and minor shrubs. The concrete batching plant in Lot 2 DP614397 has been cleared and contains no vegetation. A fringe of dense melaleuca swamp vegetation surrounds the concrete batching plant however the remaining portion of the lot has been cleared and is populated by introduced grass species.

Given the swampy nature of the low-lying areas that comprise the majority of both lots, it is likely that the study area originally hosted swamp vegetation communities. Vegetation communities of this type would have attracted a range of animal species relevant to Aboriginal occupation, including small mammals, a variety of bird life and a range of reptiles. The study area is also situated approximately 500 metres north of Wallis Lake and Pipers Creek, estuarine watercourses that would have provided a range of resources including fish, shellfish and waterbirds.

2.5 *PAST LAND USES AND DISTURBANCES*

Past land use and the associated disturbances impact upon the archaeological record in terms of both the presence or absence of cultural materials and the integrity of any remaining deposits. The majority of Lot 303 DP 792065 and Lot 2 DP614397 have been cleared and used for grazing. The removal of vegetation results in surface and subsurface disturbance and potentially causes the horizontal and vertical movement of artefacts. The concrete batching plant in the south east corner of Lot 2 DP614397 is an area of significant disturbance in which sand deposits have been mined to a depth of

up to five metres. Any archaeological deposits present in this area would consequently have been destroyed.

2.6 *CONCLUSION*

A review of the environmental context of the study area demonstrates that the area contains (and would have contained in the past) a range of resources that were used by Aboriginal people. Fresh water would have been available in the low-lying areas within both lots and would have supported a range of plants and animals used by Aboriginal people. The rich estuarine environment of Wallis Lake and Pipers Creek is also situated approximately 500 metres south. The study area has been disturbed by vegetation clearance across the majority of both lots and the sand extraction associated with the concrete batching plant has had a significant impact on the heritage value of the area.

3 CULTURAL CONTEXT

The following information provides the context in which Aboriginal cultural heritage in the study area can be understood and assessed. It includes a review of early historic records relating to Aboriginal people within the region and a discussion of previous archaeological investigations in the Forster area.

3.1 ETHNOHISTORIC CONTEXT

Early historic records provide information about the northern New South Wales coastline during the period of early European settlement. Ethnohistoric accounts (historical accounts relating to Aboriginal people) can be used to obtain information about the way in which Aboriginal people in the area lived at the time of early European contact and may be used to make inferences regarding the pre-contact period.

There is some disparity between ethnohistoric records regarding the Forster area. Tindale (1974) described Forster as being within the Worimi 'tribal territory' which he defined as extending from the Hunter River to Forster along the coast, inland to approximately Gresford and from the head of Myall Creek south to Maitland. Enright (1932) defined Worimi lands as extending south from the Manning River to Norah Head and possibly as far south as the Hawkesbury River, including the study area. Enright (1932:75) also described the area north of Port Stephens as being the territory of the Gamipingal sub-group of the Worimi people (Enright 1932:75).

There are a range of ethnohistoric records relating to Aboriginal people within the region. These primarily record interaction between Aboriginal people and Europeans associated with the Australian Agricultural Company settlement on the northern side of Port Stephens (to the south of the study area). Ethnohistoric records from this region are reviewed in detail (ERM in prep) and provide information regarding the social organisation, spiritual beliefs and practices and material culture of Aboriginal people in the region. However, these accounts inevitably reflect the impact of introduced disease and European settlement and do not provide a definitive account of pre-contact society.

3.2 ARCHAEOLOGICAL CONTEXT

A number of archaeological investigations have been undertaken in the Foster area. The results of these investigations provide an indication of the range, nature and distribution of archaeological sites within the local area and therefore provide essential background information for the present study.

3.2.1 *DEC AHIMS Register*

Aboriginal heritage sites recorded in New South Wales are generally reported to the Department of Environment and Conservation (DEC) and registered on the Aboriginal Heritage Information Management System (AHIMS) database. A search of the AHIMS database reveals that 84 sites have been recorded within a 156 square kilometre area (AMG coordinates 450000E-462000E and 6429000N-6442000N) surrounding the study area. *Figure 3.1* shows those sites present in relatively close proximity to the study area. The site coordinates provided for site 38-3-0256 and 38-3-0020 place these sites within Wallis Lake and therefore are assumed to be incorrect.

Table 3.1 ***AHIMS Registered Sites***

Site feature	Number
ACD,BUR (artefact, burial)	1
ETM,SHL,AFT (earth mound, shell, artefact)	59
TRE (scarred or carved tree)	2
AFT (artefact)	9
AFT,SHL (artefact, shell)	2
GDG (grinding groove)	1
PAD (potential archaeological deposit)	1
SHL (shell)	7
BUR (burial)	2
Total	**84**

1. From AHIMS data 10/04/06

The AHIMS database describes sites according to site feature rather than site type. Sites may include several different features, as shown in *Table 3.1*. The feature AFT refers to the presence of artefactual material which may be stone, bone, shell, ceramic or metal, however sites assigned this feature are typically stone artefact scatters or isolated artefacts. The site feature SHL can be combined with a range of other features including AFT and ETM (earth mound) and typically refers to shell middens. When sites containing features typical of middens are grouped, it is apparent that middens represent the majority of sites (68) within the search area.

3.2.2 *Previous Archaeological Investigations*

The most relevant of the archaeological investigations previously conducted in the Forster area are briefly summarised below. Based on the DEC AHIMS listing, a recent assessment was conducted at Follyfoot Farm, immediately to the south east of the study area. Unfortunately, the results of this assessment are not presently available.

Bonhomme (1988)

This study was conducted approximately six kilometres north west of the present study area on Pleistocene and Holocene. Three sites were recorded on the Pleistocene dune formations. Two of these overlooked the Wallamba River wetlands whilst the third was situated in an area with easy access to the river itself. All three sites were shell middens containing predominantly estuarine shell species and some stone artefacts. The recorded sites had a subsurface component, with Site 3 containing archaeological deposit to a depth of approximately 50 centimetres.

No sites were identified along the beach or foredune areas however, this may be a reflection of the limited visibility and the high level of disturbance. Bonhomme (1988:15) suggested that these geomorphic units should be considered archaeologically sensitive. In contrast, despite good visibility on the Pleistocene dunes, sites were only present in areas with access to estuarine resources.

Dean-Jones (1988)

This study was conducted north of Tuncurry, to the north west of the present study area. The survey focussed on Holocene dunes situated approximately 700m from Wallamba River and 800m from the ocean. Fresh water was available within low-lying swales across the study area. A continuous low density scatter of shell was present across most of the study area and five discrete areas of higher density shell scatter were also identified.

TAC (2000a)

This study involved the survey of sections of Little St and Mark St, Forster. These streets run along the bank of the Breckenridge Channel, an estuarine watercourse that flows into Wallis Lake. Three midden sites were identified and contained primarily *Anadara* and *Pyrazus* shell, both of which are estuarine species. The sites had been heavily disturbed by previous road construction however, Therin (TAC 2000a:19-20) identified four potential archaeological deposits within areas that had been subject to limited disturbance.

Source: LPI 1:25000 Topo Series, Forster Sheet

ERM

0 1km

Approximate

Figure 3.1 **Previously Recorded Sites**

Winten Property Group - The Southern Parkway Forster

TAC (2000b)

This study was supplementary to TAC (2000a) and involved the survey of an additional area along Little St. Three midden sites and one stone artefact scatter were identified and all sites had been subject to a degree of disturbance. It was considered likely that undisturbed deposits would be present beneath the road surface and outside existing areas of disturbance along the channel bank (TAC 2000:12).

Therin (TAC 2000:12) argued that the distribution and density of sites along the Breckenridge Channel suggests that the area was repeatedly used by Aboriginal people in the past and was of considerable importance. Based on the presence of stone artefacts, Therin (TAC 200:14) argued that terrestrial resources were also being processed in conjunction with the exploitation of estuarine shellfish. It was argued that the presence of relatively large numbers of stone artefacts indicates that terrestrial resources were also being processed in conjunction with the exploitation of estuarine shellfish.

Collins (2002)

Collins (2002) undertook a reinvestigation of a portion of the Forster Bridge Tool Site (NPWS #38-3-0260). This site had been previously recorded as a high-density scatter of stone and shell situated on a low sand bank above Wallis Lake at Forster. Previous examination of the broader site area (Fife 1995 in Collins 2002) estimated that as many as 1400 artefacts were distributed across an area of over 120 metres. A number of auger holes and shovel pits were excavated within the site and a large volume of shell, animal bone and stone artefacts were recovered. The majority of artefacts were recovered from an organic rich dark grey or black sand. However, the stratigraphic pattern was not consistent across the site and European materials were present both within and below the deposits containing Aboriginal materials. Geotechnical logs indicated that sand containing artefacts had actually been introduced to the site as fill (Collins 2002:22). Consequently, Collins (2002) concluded that it was highly unlikely that undisturbed midden deposits were present at the site. However, the deposit was considered likely to have originated in the Forster Bridge locality, indicating that use of the Forster area by Aboriginal people involved the exploitation of large quantities of fish, shell fish and, to a lesser extent, terrestrial mammals and birds (Collins 2002:36). Stone artefacts were distributed throughout the deposit and were made primarily from local mudstone but also from other less readily available materials (Collins 2002:36).

3.3 *PREDICTIVE STATEMENT AND EXPECTED SITES*

Based on the previous assessments within the locality, the sites most likely to be present within the study area are stone artefact scatters and isolated finds.

It is also possible that shell midden material may be present in the study area. However, previous studies indicate that within the Forster area, both midden sites and stone artefact scatters are most concentrated in close proximity to estuarine resources. The study area is approximately 500 metres from the estuarine resources of Wallis Creek and over three kilometres from the closest marine resources in the Burgess Beach/Booti Booti National Park area. Thus, although the study area is moderately well resourced, it is unlikely that large or extensive sites will be present.

4 SURVEY METHODOLOGY

In order to determine the validity of a field survey, it is necessary to review the fieldwork methodology. This section describes the survey strategy, the criteria relevant to the identification of sites and the means by which survey coverage was calculated.

4.1 SURVEY STRATEGY

The survey was conducted by three people in two pedestrian transects. Survey participants were spaced approximately ten metres apart. Prior to pedestrian survey, both lots were inspected briefly from the site boundaries to identify any areas of exposure or increased visibility.

4.2 SURVEY COVERAGE

In accordance with NSW NPWS (1997:18), the description of survey coverage includes the landform unit area and a quantification of the level of exposure and visibility. The survey units were mapped using a combination of hand-held GPS and visible landmarks.

Visibility refers to the amount of ground upon which artefacts could be seen. The presence of vegetation, leaf litter and other variables can obscure visibility, which is expressed as a percentage (NSW NPWS 1997:18).

Exposure is defined as areas in which disturbance (normally in the form of erosion) results in the removal of soils and permits the detection of archaeological material that was formerly subsurface. The level of exposure is similarly expressed as a percentage of the survey unit (NSW NPWS 1997:18).

4.3 ABORIGINAL SITE IDENTIFICATION

The criteria applied to the identification of Aboriginal sites are outlined below.

Stone Artefacts

There are a number of grounds for distinguishing between artefacts that have been flaked through human activity and those that result from natural processes. These include features such as negative and positive bulbs of percussion, ring cracks, ripple marks, flake terminations and errailure scars (Holdaway and Stern 2004:6-9)). For the purposes of this assessment, flaked stone artefacts were identified on the basis of the presence of one or more of these attributes. The primary criterion for the identification of other stone

artefacts such as grindstones or hammerstones was the presence of distinctive pitted, crushed or abraded surfaces.

Scarred Trees

The removal of bark and wood from trees results in the presence of scarring on the tree trunk. However, it is often difficult to distinguish between scars of natural and anthropogenic origin. It is similarly important to identify where scarring relates to Aboriginal rather than European activities. Three broad criteria, detailed below, are distinctive of Aboriginal scarred trees.

- The scar must be of a size and shape and location on the tree that suggests it was caused by removal of bark by an Aboriginal person or Aboriginal people. Typically scars are symmetrical in form and a size that suggests the removal of bark for containers, carrying implements, shields or canoes. There may also be small scars resulting from the cutting of footholds used to climb trees or as a result of the removal of 'sugarbag' (native honey).

- Any tool/axe marks that may be present should demonstrate a degree of weathering that indicates that they are not of recent origin.

- The tree (and the scar) must be sufficiently old to indicate that the scarring of the tree took place at a time when Aboriginal people were employing traditional methods in the production of their material culture.

5 SURVEY RESULTS

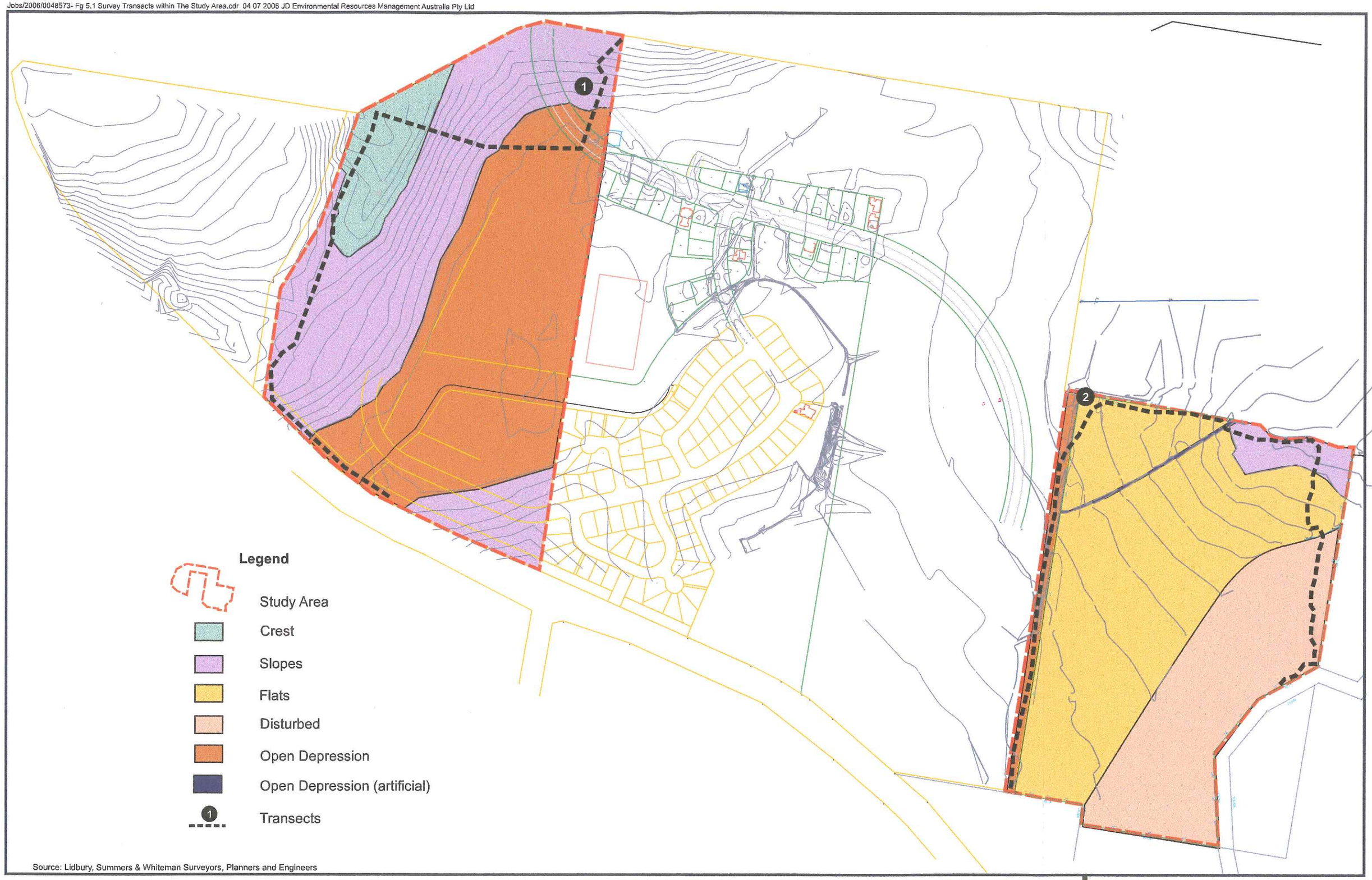
The survey was conducted on the 7th of June 2006. No archaeological sites or areas of potential archaeological deposit were identified.

5.1 SURVEY COVERAGE

The surveyed transects are shown in *Figure 5.1* and are described in *Table 5.1*. Due to heavy vegetation coverage and limited exposure across the study area, only two transects were surveyed on foot. Over the course of these transects, every effort was made to identify any areas of exposure or increased visibility across the study area. However vegetation coverage was so extensive that no suitable areas were present. With the exception of the concrete batching plant and a small vehicle track in Transect 2, visibility within the study area was less than five percent and there were no visible exposures. The level of effective coverage was too low to warrant quantification.

Sand extraction within the concrete batching plant in Lot 2 DP614397 created a very large area of exposure and visibility, the sand within this area had been removed to a depth of between three and five metres. It was considered that all sites within this area had been destroyed and the artefacts removed during the process of sand extraction. Additional survey within the study area would not have resulted in increased effective coverage and was therefore deemed pointless.

Jobs/2006/0048573- Fg 5.1 Survey Transects within The Study Area.cdr 04 07 2006 JD Environmental Resources Management Australia Pty Ltd



Source: Lidbury, Summers & Whiteman Surveyors, Planners and Engineers

ERM

0 144m

Approximate Only

Figure 5.1 **Survey Transects within The Study Area**

Winten Property Group - The Southern Parkway Forster

Table 5.1 Transect Description and Effective Coverage

Transect	Landform(s)	Area surveyed (m²)	Description
1	Slopes, crest and open depression	Slopes 5620 Crest 2400 Open depression 3100	Transect 1 began in the north eastern corner of Lot 303 DP 792065 and progressed downslope into the open depression. Due to the impenetrability of the vegetation in this area, it was decided to discontinue efforts to survey within the open depression. Transect 1 then went east up the very gentle slopes to the level crest in the north western corner of the study area. Vegetation was less dense in this area however the heavy pasture grass coverage obscured visibility, which remained less than five percent. The western boundary of the lot was then surveyed and no notable areas of exposure or visibility were identified. The slopes covered by Transect 1 were extremely gentle (less than five degrees in inclination) and were populated by pasture grass. The open depression was extremely marshy and contained a small waterhole along the north eastern boundary in close proximity to the fence of the adjoining residential development.
2	Slopes, flats, open depression and disturbed	Slopes 2440 Flats 3780 Open depression 4960 Disturbed 2440	Transect 2 began within the concrete batching plant. The concrete batching plant was highly disturbed and the upper sand deposits had been removed to a depth of between three and five metres. Transect 2 then followed a small vehicle track that began on the gentle slope in the north of the lot and continued along the lot boundary to the juncture with Dunns Creek. The track was approximately three metres in width and 250 metres in length. Exposure and visibility within the track were 20% and 30% respectively. Exposure and visibility within the surrounding area was extremely limited due to the dense vegetation coverage. From the termination of the track, Transect 2 followed the edge of Dunns Creek along level waterlogged flats. Dunns Creek was lined with cabbage tree palms and other small trees and visibility was limited due to heavy pasture grass coverage. An artificial drainage channel had been constructed across Lot 2 DP614397 and the course of Dunns Creek also appeared to have been altered.

5.2 *DISCUSSION*

The results of the survey broadly concur with the predictive model and local archaeological pattern. No archaeological sites were recorded within the study area. However, the detection of sites was severely impeded by the level of vegetation coverage and the lack of exposures. It is essential to consider the potential for archaeological material to be present either in areas of poor visibility and/or in a subsurface context. In relation to the management of the archaeological resource and legislative requirements, the likelihood that sub-surface archaeological deposits may be present within an area has implications for any proposed development activity.

In terms of archaeological assessment, it is important to recognise that not all potential deposits necessarily contribute to our understanding of past human activities. The primary archaeological importance of subsurface deposits lies in their potential to provide information that will assist in interpretation of the archaeological record through time and space. For this reason, areas described as potential archaeological deposits should satisfy one or more of the following criteria:

- deposits that contain sufficiently high numbers of artefacts to allow for statistically viable analysis and intra- and inter-site comparison of artefact assemblages;
- deposits that have been subject to minimal disturbance and retain integrity; and
- deposits that contain materials that may be dated, either in chronological or absolute terms.

The level of disturbance within the concrete batching plant in Lot 2 DP614397 dictates that any archaeological deposits in this area would have been removed by previous sand extraction activities. In relation to the remainder of the study area, a review of the local archaeological context (refer to *Section 3.2.2*) indicates that the majority of archaeological deposits are concentrated in areas with access to estuarine or marine resources. The study area is situated over 500 metres from the nearest estuarine resource. Areas in much closer proximity to Wallis Lake contain similar landforms and have the same level of water availability as the study area. It is therefore more likely that areas bordering Wallis Lake and Pipers Creek would have been preferable locations for camping activities. In contrast, Aboriginal use of the study area is likely to have been transitory and therefore the study area is unlikely to contain any potential archaeological deposits.

6 *SIGNIFICANCE ASSESSMENT*

The assessment of significance is an integral component in the formulation of management and mitigation plans in relation to cultural heritage resources (Pearson and Sullivan 1994:21). Cultural heritage management recommendations are typically made in response to an assessment of cultural significance. The Burra Charter (Australia ICOMOS Burra Charter 1999) defines cultural significance in terms of the aesthetic, historic, scientific and social value of a heritage item or place. In relation to Aboriginal cultural material, considerations of social and scientific significance are generally weighted most heavily, although other factors may also be of relevance. This report will be provided to the Aboriginal community for input prior to finalisation of the report. Feedback from the Aboriginal community regarding social significance will be an important component of the significance assessment.

For management purposes, the levels of site significance can be described as follows:

- sites that are assessed to be of high significance should be conserved and warrant protection against development;
- sites that are assessed to be of moderate significance should be conserved if possible, however in the event that these may be affected by development, management strategies should be implemented to mitigate against the impact; and
- sites that are assessed to be of low significance should be conserved if possible, but should not represent an obstacle to development.

6.1 *ABORIGINAL (SOCIAL) SIGNIFICANCE*

The assessment of social significance is the prerogative of the Aboriginal community and typically involves the consideration of a site or sites in conjunction with the archaeological, cultural and natural aspects of the surrounding landscape.

During the field survey, no specific comments were made by the FLALC sites officers regarding areas or sites of particular cultural value. However, any artefacts that may be present within the study area will have Aboriginal significance as a tangible link to the use of the area by Aboriginal people in the past. Robert Yettica stated that the Aboriginal community would like the opportunity to reinspect the crest and gentle slopes during vegetation removal and initial ground surface disturbance in order to collect any artefacts that may be present. Comments from the Aboriginal community in response to the draft copy of this report will provide additional information regarding the significance of the survey area to Aboriginal people and will be included in *Annex A*.

6.2 *ARCHAEOLOGICAL (SCIENTIFIC) SIGNIFICANCE*

The archaeological significance of an Aboriginal site, object or place is assessed according to its potential to address research questions and provide additional information of value to interpretations of past human activities (Australia ICOMOS Incorporated 2000:12). The assessment of scientific significance should consider the rarity and representativeness of the site, its integrity and connectedness in relation to research potential. No archaeological sites or areas of archaeological potential were identified within the study area.

7 IMPACT ASSESSMENT

In order to provide appropriate recommendations for the management of cultural heritage, it is essential to understand the impacts that the establishment of the proposed residential community will have on the study area. This will involve both the direct impacts associated with the proposed residential community and the cumulative impacts of ongoing residential development within the locality.

7.1 DIRECT IMPACTS

The establishment of the proposed residential community will involve the clearance and landscaping of the areas designated for the construction of residential dwellings. Roads and infrastructure (including water, power, stormwater and sewerage services) will be constructed to service the dwellings. Sub-surface disturbance will also occur in association with the construction of individual dwellings. Surface and sub-surfaces disturbances will be extensive and are likely to result in the movement, damage or destruction of any archaeological materials that are present within the development footprint. The public reserve within Lot 303 DP 792065 will be significantly less disturbed although drainage works and landscaping activities may result in surface and subsurface impacts within limited areas.

7.2 CUMULATIVE IMPACTS

The direct impacts of the proposed residential communities on cultural heritage should also be considered in relation to previous and ongoing impacts within the area. The study area is situated in an area that is currently undergoing residential growth. Existing residential developments are present to the north west and south west and between the two lots that comprise the study area. Current and future residential developments may impact upon Aboriginal cultural heritage. Earlier vegetation clearance relating to farming activities and subsequent residential development has also impacted upon the landscape within the study area. Thus, the direct impacts of the proposed residential community are an additional impact in a locality where residential development and the associated land clearance have impacted on the broader landscape and any Aboriginal heritage that may have been present.

8 MITIGATION AND MANAGEMENT RECOMMENDATIONS

The following mitigation and management recommendations have been formulated in light of the local and regional context of the study area, the results of the survey, the potential impacts of the proposed residential community and the requirements of cultural heritage legislation.

No further archaeological investigation is required. However, representatives of the Forster Local Aboriginal Land Council (FLALC) have expressed an interest in monitoring vegetation removal and initial ground surface disturbance on the crest and gentle slope formations within Lot 303 DP 792065. Should any Aboriginal objects (artefacts) be exposed during ground surface disturbance, representatives of the FLALC will collect the artefacts. A brief report on any excavated artefacts should be prepared by an archaeologist and the artefacts should be retained by the FLALC.

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Annex A

Aboriginal Community Comments

ERM consulting services worldwide **www.erm.com**

Environmental Resources Management Australia
53 Bonville Ave
Thornton NSW 2322
Telephone (02) 4964 2150
Facsimile (02) 4964 2152

Appendix F – Site Contamination Assessment – Regional Geotechnical Solutions

Winten (No.18) Pty Ltd

Site Contamination Assessment – Desktop Study

Fairview West – Stage 5

The Lakes Way, Forster

Report No. RGS02755.1-AB

28 May 2021

REGIONAL GEOTECHNICAL SOLUTIONS

REGIONAL GEOTECHNICAL SOLUTIONS

Manning-Great Lakes
Port Macquarie
Coffs Harbour

RGS02755.1-AB

28 May 2021

Winten (No.18) Pty Ltd
C/ Lidbury Summers & Whiteman
PO Box 510
FORSTER NSW 2428

Attention: Phillip Lidbury

Dear Phillip

RE: Fairview West – Stage 5 – The Lakes Way, Forster
Site Contamination Assessment – Desktop Study

As requested, Regional Geotechnical Solutions Pty Ltd (RGS) has undertaken a desktop site contamination assessment for the proposed Fairview West Stage 5 residential subdivision located at the Lakes Way, Forster, NSW.

The assessment found the site is suitable for the proposed residential landuse in its current state from a contamination perspective.

The work presented herein was reviewed by Dr David Tully CEnvP SC. A copy of Dr Tully's letter pertaining to the review is appended to the report.

If you have any questions regarding this project, or require any additional consultations, please contact the undersigned.

For and on behalf of

Regional Geotechnical Solutions Pty Ltd

Prepared by

Andrew Hills

Senior Environmental Engineer

Reviewed by

Steven Morton

Principal Geotechnical Engineer

Regional Geotechnical Solutions Pty Ltd
ABN 51141848820

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Table of Contents

Figures

Appendices

1 INTRODUCTION

1.1 General

Regional Geotechnical Solutions Pty Ltd (RGS) has undertaken a desktop site contamination assessment for the proposed Fairview West Stage 5 residential subdivision located at The Lakes Way, Forster, NSW. The site location is shown on Figure 1.

The site occupies approximately 2.5 hectares and comprises part of Lot 303 DP 1099114.

It is understood that the desktop site contamination assessment is required to assist in the proposed rezoning from rural to residential land use to address SEPP 55 (Remediation of Land).

1.2 Objectives

The objectives of the desktop site contamination assessment were to provide a preliminary assessment of the potential for soil contamination to be present on the site.

1.3 Scope of Works

In accordance with the relevant sections of the *National Environmental Protection (Assessment of Site Contamination) Measure 1999 (Amended 2013*), the assessment involved the following process:

- Site walkover to assess visible surface conditions and identify evidence of contamination, or past activities that may cause contamination;
- Land titles search to check for evidence of past ownership that may be indicative of potentially contaminating activities;
- Review of recent and historical aerial photography dating back as far as 50 years;
- A search of NSW DECCW records for contaminated land notifications on the site;
- A search of government records of groundwater bores in the area; and
- Using the above information, characterise the site into Areas of Environmental Concern, in which the potential for contamination has been identified, and nominate Chemicals of Concern that might be associated with those activities.
-

1.4 Site Identification

General site information is provided below in Table 1. The site location is shown in Figure 1.

Table 1: Summary of Site Details

Site Location:	The Lakes Way, Forster
Approximate Site Area:	2.5 hectares
Title Identification Details:	Part Lot 303 DP1099114
Current Ownership:	Winten (No.18) Pty Ltd
Current Landuse:	Undeveloped land
Proposed Landuse:	Residential subdivision
Adjoining Site Uses:	• Undeveloped land to the north; • Earthworks for a residential subdivision in progress to the west; • Residential to the east; and • The Lakes Way and residential to the south.
Government Area:	Midcoast Council

2 Site Description

2.1 Topography and Drainage

The site is irregular in shape and is bound by undeveloped land to the north, earthworks for a residential subdivision which was in progress at the time of the site visit to the west, residential properties to the east, and by The Lakes Way to the south.

A satellite image that shows the site boundary and the site setting is reproduced below.

Aerial image obtained from NSW 'Six Maps' website that illustrates the site location and setting. The subject site boundary is marked by the dashed red line.

The site is generally flat and situated on a low-lying alluvial floodplain. There is a slight slope in the eastern part of the site towards the west at about 1° to 2°. The Wallis Lake foreshore (Pipers Bay) is located approximately 500m to the south-west. Surface elevations are inferred to vary between RL6m and RL8m AHD.

Drainage of the site will be via overland flow into existing drainage channels and sedimentation ponds located in the western and northern parts of the subject site, as well on the adjoining part of the proposed subdivision to the west which was under construction at the time of the site visit.

Topsoil stripping of some of the site had been undertaken and filled with rock aggregate. The remaining undisturbed areas were covered by grass and some Casuarina trees located around the property boundaries up to 12m in height.

2.2 Geology

The Forster 1:100,000 Coastal Quaternary Geology map indicates the central and eastern parts of the site are underlain by Devonian to Carboniferous sedimentary rocks belonging to the Tamworth Belt. The western part of the site is underlain by Pleistocene undifferentiated deposits comprising clay, silt, fluvial sand and marine sand, and also by, Quaternary alluvial and colluvial fan deposits comprising fluvial sand, silt, gravel and clay.

2.3 Hydrogeology

A groundwater bore search on the NSW Water Information website, http://waterinfo.nsw.gov.au/gw/ indicates that there is a licenced groundwater bore (with available work summary) located approximately 250m to the south west of the site as shown below.

Plate 2: *Approximate site boundary outlined in red. Nearest off-site licensed groundwater bore is located approximately 250m to the south east of the site.*

Groundwater bore GW066838 was drilled to a depth of 30.0m on 6 January 1992 for stock purposes with its licence status listed as current. The driller's log indicates that two water bearing zones were present from 14.5m to 16.0m and 28.0m to 30.0m respectively.

2.4 Site History

2.4.1 Historical Aerial Photography

Aerial photographs and satellite imagery of the site were obtained from NSW Spatial Services and Google Earth and reviewed to assist in identifying past land uses that may contribute to site contamination. The results of the review are summarised in Table 1.

Table 1 - Aerial Photograph and Satellite Imagery Summary

Year	Site	Surrounding Land
1971	Site appears to have been cleared and used as grazing land. There are no other distinguishing features visible.	Predominantly surrounded by cleared grazing land with several rural residential properties visible to the south and south west of the site.
1980	No visible changes from previous photograph.	Residential development has expanded to the south west with the Forster Keys development under construction.
1997	A drainage channel transecting the site from the south west to the north east is visible, otherwise the site appears to be unchanged from the previous photograph.	Significant residential development has continued to the south and south west with the completion of Forster Keys and Pipers Bay developments. Construction of the Lakes Estate residential subdivision has commenced to the east of the site also. Forster High school is visible on land to the west of the site.
2009 (Google Earth)	Some slight increase in the number of trees present is visible otherwise no visible changes from previous photograph.	Residential development has continued to the north of the site off Cape Hawke Drive and The Southern Parkway.
2019 (Google Earth)	Tree numbers and vegetation has increased significantly in the western and northern parts of the site. Appears to be no longer used for grazing purposes.	Residential development has continued to the north of the site off Cape Hawke Drive and The Southern Parkway.

2.4.2 Site Observations

A site walkover was undertaken on 14 May 2021. Observations made during the site visit are summarised below:

- Some of the central and western parts of the site had been stripped of topsoil and deleterious material and filled with rock aggregate. It is understood that the aggregate was sourced from a local quarry;
- The eastern part of the site comprised remnant natural terrain which had not been stripped;
- There were existing sedimentation ponds present in the northern and western parts of the site;
- One small stockpile of vegetation was present in the eastern part of the site;
- No visual or olfactory evidence of contamination was observed; and

- No Asbestos Containing Materials (ACM) were identified.

A selection of images of the site is presented below.

Looking south east showing the undisturbed natural terrain in the eastern part of the site.

Stockpiled vegetation in the eastern part of the site.

Looking north west showing the undisturbed natural terrain in the eastern and central parts of the site.

Looking north west showing the imported rock aggregate following topsoil stripping and a sedimentation pond in the western part of the site.

2.4.3 NSW EPA Records

A check with the NSW Office of Environment and Heritage website (www.environment.nsw.gov.au) revealed that no notices have been issued on the site under the Contaminated Land Management Act (1997).

2.4.4 Land Title Search

A list of past registered proprietors and lessors of the site was obtained from the Land Titles Office. A summary of the title details is included in Appendix A.

The title history search revealed the following:

- 1920 - 1925: Thomas McBride, retired farmer;
- 1925 – 1930: James Francis McBride, dairy farmer and George Edward McBride, labourer;
- 1930 – 1956: Allan Foster McBride, farmer and Edward Rainsford Clive McBride, labourer;
- 1956 – 2003: Allan Foster McBride, farmer;
- 2003 – 2008: Eva Florence McBride and Trevor Allan McBride
- 2008 – 2016: Patricia Florence Griffiths
- 2016 – 2016: 115 Pty Ltd; and
- 2016 to date : Winten (No.18) Pty Ltd.

2.4.5 Site History Summary

Based on available data the chronological development of the site is summarised below:

- The site appears to have been used for grazing and farming activities since at least 1920 until around 2009;
- Since 2009, the number of trees and vegetation appears to have significantly increased on the site indicating that farming/grazing activities were likely to have ceased;
- Aerial photographs indicate that there has not been any construction of structures such as houses or sheds; and
- Topsoil stripping and importation of quarry supplied rock aggregate commenced in 2021.

3 SITE CONTAMINATION ASSESSMENT

3.1 Conceptual Site Model

Based on the site observations and knowledge obtained about site activities as outlined above, a conceptual site model (CSM) has been developed.

3.1.1 Potential Sources of Contamination

Potential Areas of Environmental Concern (AECs) and Chemicals of Concern (COCs) identified for the assessment are outlined in Table 2.

Table 2: Potential AECs and COCs

AEC	Mode of Potential Contamination	Potential COCs	Likelihood of Contamination
AEC1: Isolated areas of soil contamination associated with former grazing/farming activities	Potential spillage of chemicals from containers including agro-chemicals, fuels/oils, pesticides	Heavy Metals, TRH, BTEX, PAH, and OC/OPP	Low
AEC2: Unidentified stockpiles of fill of unknown origin	Importation of potentially contaminated fill	Heavy Metals, TPH, BTEX, PAH, PCB, OC/OPP and asbestos	Low
AEC3: Unidentified waste from illegal dumping	Potential spillage or leaks of fuels/oils and/or presence of potential hazardous building materials	Heavy Metals, TPH, BTEX, PAH, PCB, OC/OPP and asbestos	Low
Heavy Metals - Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel and Zinc *BTEX - Benzene, Toluene, Ethylbenzene and Xylene* *TPH - Total Petroleum Hydrocarbons* *PAH – Polycyclic Aromatic Hydrocarbons* *PCB – Polychlorinated Biphenyls* *OC/OPP – Organochlorine and Organophophorus Pesticides*			

The approximate locations of the AEC's are shown on Figure 2.

3.1.2 Potential Exposure Pathways and Receptors

Based on the site observations and knowledge obtained about site activities as outlined above, potential exposure pathways and receptors identified for the assessment are summarised in Table in Table 3.

Table 3: Potential Exposure Pathways and Receptors

Chemicals of Concern	Key Pathways	Key Receptors
Asbestos, heavy metals	Generation of dust, notably during earthworks or from landscaped areas which is inhaled	Onsite - Construction and site workers, future site users Offsite – Occupants and users of adjacent sites
Heavy metals, TPH, BTEX, PAH, OC/OPP	Skin contact / ingestion, plant uptake	Onsite - Construction and site workers, future site users, vegetation in landscaped areas
Heavy Metals, TPH, BTEX, PAH, OC/OPP	Surface runoff and leaching of soils	Offsite - Surface water ecosystems and users of surface water and groundwater

Heavy Metals - Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel and Zinc
BTEX - Benzene, Toluene, Ethylbenzene and Xylene
TPH - Total Petroleum Hydrocarbons
PAH – Polycyclic Aromatic Hydrocarbons
PCB – Polychlorinated Biphenyls
OC/OPP – Organochlorine and Organophophorus Pesticides

3.2 Discussion

A Stage 1 desktop site contamination assessment was required to assess past and present potentially contaminating activities and contamination types with regard to the site's suitability for future residential land use.

The previous activities on the site generally appear to have involved low intensity grazing and farming since at least the 1920's based off land title information. There has been no development in the form of structures such as houses or sheds. A drainage channel appears to have been constructed between 1980 and 1997. Topsoil stripping and importation of quarry supplied rock aggregate appears to have commenced in 2021.

Identified AEC's included isolated areas of contamination associated with the former agricultural activities such as spills and leaks of agro-chemicals, fuels/oils and pesticides/herbicides, unidentified fill stockpiles and potentially waste from illegal dumping (if any). However, based on the walkover assessment and site history study the likelihood of each of these to have resulted in contamination of the site soils is considered to be low.

There was no visual or olfactory evidence of soil contamination observed nor were ACM identified.

3.3 Conclusions and Recommendations

Should any unidentified fill materials be encountered that require removal off site, assessment for a *Resource Recovery Exemption under Part 9, Clauses 91 and 92 of the Protection of the Environment Operations (Waste) Regulation 2014* in accordance with the *Resource Recovery Order under Part 9, Clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014 – the Excavated Natural Material (ENM) Order 2014,* will be required.

The investigation works undertaken were of limited scope and provide a preliminary assessment of identified AECs. Should any materials suspected of being contaminated (by way of visual or olfactory evidence) be encountered during development of the site, it is recommended that advice from a suitable qualified and experienced environmental consultant be sought without delay.

Based on the results obtained in this investigation, the site is considered suitable for the proposed residential land use with regard to the presence of soil contamination in its current state, provided the recommendations and advice of this report are adopted, and site preparation works are conducted in accordance with appropriate site management protocols and legislative requirements.

4 LIMITATIONS

This report comprises the results of an investigation carried out for a specific purpose and client as defined in the document. The report should not be used by other parties or for purposes or projects other than those assumed and stated within the report, as it may not contain adequate or appropriate information for applications other than those assumed or advised at the time of its preparation. The contents of the report are for the sole use of the client and no responsibility or liability will be accepted to any third party. The report should not be reproduced either in part or in full, without the express permission of Regional Geotechnical Solutions Pty Ltd.

Contaminated site investigations are based on data collection, judgment, experience, and opinion. By nature, these investigations are less exact than other engineering disciplines. The findings presented in this report and used as the basis for the recommendations presented herein were obtained using normal, industry accepted practises and standards. To our knowledge, they represent a reasonable interpretation of the general condition of the site. Under no circumstances, however, can it be considered that these findings represent the actual state of the site at all points.

Recommendations regarding ground conditions referred to in this report are estimates based on the information available at the time of its writing. Estimates are influenced and limited by the fieldwork method and testing carried out in the site investigation, and other relevant information as has been made available. In cases where information has been provided to Regional Geotechnical Solutions for the purposes of preparing this report it has been assumed that the information is accurate and appropriate for such use. No responsibility is accepted by Regional Geotechnical Solutions for inaccuracies within any data supplied by others.

If site conditions encountered during construction vary significantly from those discussed in this report, Regional Geotechnical Solutions Pty Ltd should be contacted for further advice.

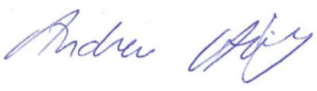
This report alone should not be used by contractors as the basis for preparation of tender documents or project estimates. Contractors using this report as a basis for preparation of tender documents should avail themselves of all relevant background information regarding the site before deciding on selection of construction materials and equipment.

If you have any questions regarding this project, or require any additional consultations, please contact the undersigned.

For and on behalf of

Regional Geotechnical Solutions Pty Ltd

Prepared by



Andrew Hills

Senior Environmental Engineer

Reviewed by

Steven Morton

Principal Geotechnical Engineer

Figures

REGIONAL GEOTECHNICAL SOLUTIONS

Client:	Winten (No.18) Pty Ltd	Job No.	RGS02755.1
Project:	Fairview West - Stage 5	Drawn By:	APH
		Scale:	As Shown
	The Lakes Way, Forster	Date:	25-May-21
Title:	Site Location Plan	Drawing No.	**Figure 1**

REGIONAL GEOTECHNICAL SOLUTIONS	**Client:**	Winten (No.18) Pty Ltd	Job No.	RGS02755.1
	Project:	Fairview West - Stage 5	Drawn By:	APH
			Scale:	As Shown
		The Lakes Way, Forster	Date:	25-May-21
	Title:	Site Plan - Areas of Environmental Concern	Drawing No.	**Figure 2**

Appendix A

Site History Documentation

ADVANCE LEGAL SEARCHERS PTY LTD

(ACN 147 943 842)
ABN 82 147 943 842

18/36 Osborne Road,
Manly NSW 2095

Telephone: +612 9977 6713
Mobile: 0412 169 809
Email: search@alsearchers.com.au

12th May, 2021

REGIONAL GEOTECHNICAL SOLUTIONS PTY LTD
44 Bent Street,
WINGHAM, NSW, 2429

Attention: Andrew Hills

RE: **Lot 303, The Lakes Way, (Cape Hawke Drive), Forster**
RGS02755.1

Current Search

Folio Identifier 303/1099114 (title attached)
DP 1099114 (plan attached)
Dated 11th May, 2021
Registered Proprietor:
WINTEN (NO 18) PTY LIMITED *(ACN 094 443 115)*

Title Tree
Lot 303 DP 1099114

Folio Identifier 303/1099114

Folio Identifier 302/792065

Certificate of Title Volume 3066 Folio 78

****

Summary of proprietor(s)
Lot 303 DP 1099114

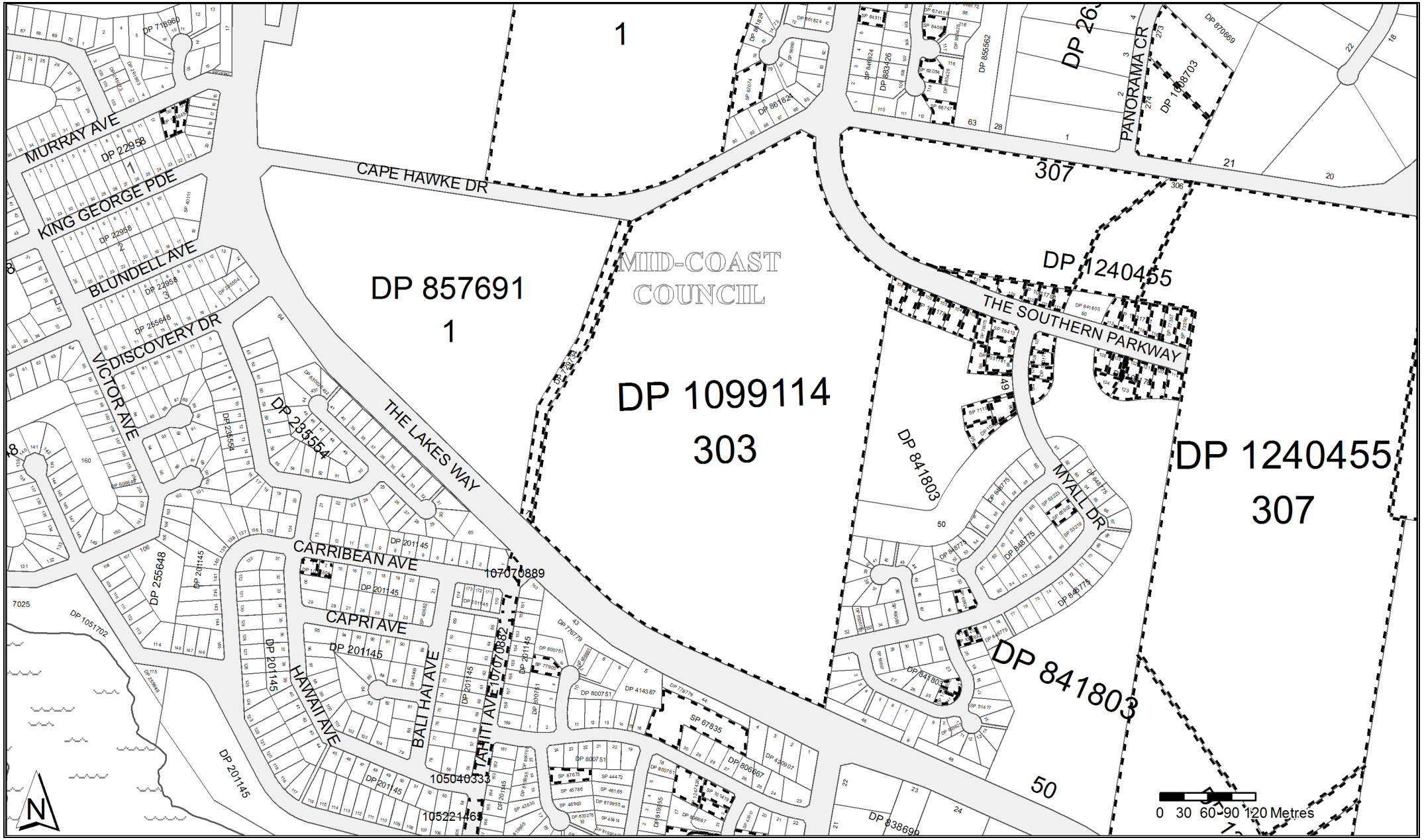
Year	Proprietor(s)
	(Lot 303 DP 1099114)
2016 – todate	Winten (No 18) Pty Limited *(ACN 094 443 115)* *(formerly ACN 094 443 115 Pty Limited)*
2016 – 2016	ACN 094 443 115 Pty Limited *(ACN 094 443 115)*
2008 – 2016	Patricia Florence Griffiths
2006 – 2008	Eva Florence McBride Trevor Allan McBride
	(Lot 302 DP 792065)
2003 – 2006	Eva Florence McBride Trevor Allan McBride
1989 – 2003	Allan Foster McBride, farmer
	(Portion 105 & Part Portion 30 Parish Forster – Area 135 Acres 1 Rood 23 Perches – CTVol 3066 Fol 78)
1956 – 1989	Allan Foster McBride, farmer
1956 – 1956	Allan Foster McBride, farmer Edward Rainsford Clive McBride, labourer
1930 – 1956	James Francis McBride, dairy farmer
1925 – 1930	James Francis McBride, dairy farmer George Edward McBride, laboure
1920 – 1925	Thomas McBride, retired farmer

****

Cadastral Records Enquiry Report : Lot 303 DP 1099114

Ref : NOUSER

Locality : FORSTER
Parish : FORSTER
LGA : MID-COAST
County : GLOUCESTER



This information is provided as a searching aid only.Whilst every endeavour is made to ensure that current map, plan and titling information is accurately reflected, the Registrar General cannot guarantee the information provided. For ALL ACTIVITY PRIOR TO SEPTEMBER 2002 you must refer to the RGs Charting and Reference Maps

	Status	Surv/Comp	Purpose
DP729734			
Lot(s): 1			
DP266053	REGISTERED	SURVEY	EASEMENT
DP753168			
Lot(s): 9			
DP1010465	REGISTERED	SURVEY	EASEMENT
DP836150			
Lot(s): 1			
DP1215170	REGISTERED	SURVEY	EASEMENT
DP1002632			
Lot(s): 211, 212			
DP841803	HISTORICAL	SURVEY	SUBDIVISION
DP1008703			
Lot(s): 273, 274			
DP870669	HISTORICAL	SURVEY	SUBDIVISION
DP1018304			
Lot(s): 1, 2			
DP201145	HISTORICAL	SURVEY	SUBDIVISION
DP1031781			
Lot(s): 95, 96, 98, 99, 100, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131			
DP848775	HISTORICAL	SURVEY	SUBDIVISION
DP1033052			
Lot(s): 241, 242			
DP841803	HISTORICAL	SURVEY	SUBDIVISION
DP1048454			
Lot(s): 130, 131			
DP22958	HISTORICAL	SURVEY	UNRESEARCHED
DP1099114			
Lot(s): 303			
DP792065	HISTORICAL	SURVEY	SUBDIVISION
DP1273289	PRE-ALLOCATED	UNAVAILABLE	SUBDIVISION
DP1240455			
Lot(s): 305, 306, 307, 308			
DP792065	HISTORICAL	SURVEY	SUBDIVISION
DP1099114	HISTORICAL	SURVEY	SUBDIVISION
Lot(s): 305			
NSW GAZ. 31-05-2019 Folio : 1691 ACQUIRED FOR PUBLIC ROAD LOT 305 DP1240455			
Lot(s): 306, 308			
NSW GAZ. 31-05-2019 Folio : 1691 ACQUIRED FOR DRAINAGE RESERVE - LOTS 306 AND 308 DP1240455. ERRATUM VIDE GOV. GAZ. 07-06-2019 FOLS. 1896-1897			
DP1247426			
Lot(s): 1, 3			
DP793973	HISTORICAL	SURVEY	SUBDIVISION
SP62054			
DP883426	HISTORICAL	SURVEY	SUBDIVISION
SP62074			
DP861824	HISTORICAL	SURVEY	SUBDIVISION
SP64311			
DP846824	HISTORICAL	SURVEY	SUBDIVISION
SP65902			
DP848775	HISTORICAL	SURVEY	SUBDIVISION
SP66747			
DP883426	HISTORICAL	SURVEY	SUBDIVISION
SP67675			
DP819955	HISTORICAL	SURVEY	SUBDIVISION
SP67835			
DP800751	HISTORICAL	SURVEY	SUBDIVISION

	Status	Surv/Comp	Purpose
SP69424			
DP848775	HISTORICAL	SURVEY	SUBDIVISION
SP70075			
DP848775	HISTORICAL	SURVEY	SUBDIVISION
DP1031781	HISTORICAL	COMPILATION	SUBDIVISION
SP71190			
DP848775	HISTORICAL	SURVEY	SUBDIVISION
DP1031781	HISTORICAL	COMPILATION	SUBDIVISION
SP71506			
DP806667	HISTORICAL	SURVEY	SUBDIVISION
SP73290			
DP848775	HISTORICAL	SURVEY	SUBDIVISION
DP1031781	HISTORICAL	COMPILATION	SUBDIVISION
SP75413			
DP848775	HISTORICAL	SURVEY	SUBDIVISION
DP1031781	HISTORICAL	COMPILATION	SUBDIVISION
SP77307			
DP848775	HISTORICAL	SURVEY	SUBDIVISION
DP1031781	HISTORICAL	COMPILATION	SUBDIVISION
SP77905			
DP800751	HISTORICAL	SURVEY	SUBDIVISION
SP83008			
DP806667	HISTORICAL	SURVEY	SUBDIVISION
SP84060			
DP883426	HISTORICAL	SURVEY	SUBDIVISION
SP101419			
DP793973	HISTORICAL	SURVEY	SUBDIVISION
DP1247426	HISTORICAL	SURVEY	SUBDIVISION

Road

Polygon Id(s): 105040333, 105221465, 105255771, 107070882, 107070889

NSW GAZ. 27-06-2008 Folio : 6360

TRANSFER OF CROWN ROAD TO COUNCIL

Plan	Surv/Comp	Purpose
DP22958	SURVEY	UNRESEARCHED
DP201145	SURVEY	SUBDIVISION
DP235554	SURVEY	SUBDIVISION
DP245073	SURVEY	SUBDIVISION
DP255648	SURVEY	SUBDIVISION
DP255649	SURVEY	SUBDIVISION
DP260379	SURVEY	SUBDIVISION
DP261963	SURVEY	SUBDIVISION
DP263815	SURVEY	SUBDIVISION
DP264211	SURVEY	SUBDIVISION
DP264330	SURVEY	SUBDIVISION
DP414387	SURVEY	UNRESEARCHED
DP420907	SURVEY	UNRESEARCHED
DP593704	COMPILATION	SUBDIVISION
DP608849	SURVEY	SUBDIVISION
DP609496	COMPILATION	SUBDIVISION
DP614397	COMPILATION	SUBDIVISION
DP718960	SURVEY	SUBDIVISION
DP729734	COMPILATION	CROWN FOLIO CREATION
DP753168	COMPILATION	CROWN ADMIN NO.
DP773088	COMPILATION	SUBDIVISION
DP776779	SURVEY	SUBDIVISION
DP800751	SURVEY	SUBDIVISION
DP806667	SURVEY	SUBDIVISION
DP819955	SURVEY	SUBDIVISION
DP830025	SURVEY	SUBDIVISION
DP833278	SURVEY	SUBDIVISION
DP836150	SURVEY	SUBDIVISION
DP838699	SURVEY	SUBDIVISION
DP841803	SURVEY	SUBDIVISION
DP843479	SURVEY	SUBDIVISION
DP846824	SURVEY	SUBDIVISION
DP848775	SURVEY	SUBDIVISION
DP850875	SURVEY	SUBDIVISION
DP855543	SURVEY	SUBDIVISION
DP855562	SURVEY	SUBDIVISION
DP855825	SURVEY	SUBDIVISION
DP856681	SURVEY	SUBDIVISION
DP857691	SURVEY	SUBDIVISION
DP861824	SURVEY	SUBDIVISION
DP868172	SURVEY	SUBDIVISION
DP870669	SURVEY	SUBDIVISION
DP874117	SURVEY	SUBDIVISION
DP874119	SURVEY	SUBDIVISION
DP883426	SURVEY	SUBDIVISION
DP1002632	SURVEY	SUBDIVISION
DP1008703	SURVEY	SUBDIVISION
DP1018304	SURVEY	SUBDIVISION
DP1031781	COMPILATION	SUBDIVISION
DP1033052	SURVEY	SUBDIVISION
DP1048454	SURVEY	SUBDIVISION
DP1051702	COMPILATION	DEPARTMENTAL
DP1058820	COMPILATION	DEPARTMENTAL
DP1099114	SURVEY	SUBDIVISION
DP1107994	COMPILATION	DEPARTMENTAL
DP1240455	SURVEY	RESUMPTION OR ACQUISITION
DP1247426	SURVEY	SUBDIVISION
SP40111	COMPILATION	STRATA PLAN
SP40682	COMPILATION	STRATA PLAN
SP42017	COMPILATION	STRATA PLAN
SP43830	COMPILATION	STRATA PLAN
SP44472	COMPILATION	STRATA PLAN
SP45409	COMPILATION	STRATA PLAN
SP45414	COMPILATION	STRATA PLAN
SP45786	COMPILATION	STRATA PLAN

Plan	Surv/Comp	Purpose
SP46165	COMPILATION	STRATA PLAN
SP46963	COMPILATION	STRATA PLAN
SP47593	COMPILATION	STRATA PLAN
SP48846	COMPILATION	STRATA PLAN
SP49086	COMPILATION	STRATA PLAN
SP49333	COMPILATION	STRATA PLAN
SP51417	COMPILATION	STRATA PLAN
SP53219	COMPILATION	STRATA PLAN
SP53223	COMPILATION	STRATA PLAN
SP56697	COMPILATION	STRATA PLAN
SP56980	COMPILATION	STRATA PLAN
SP62054	COMPILATION	STRATA PLAN
SP62074	COMPILATION	STRATA PLAN
SP64311	COMPILATION	STRATA PLAN
SP65902	COMPILATION	STRATA PLAN
SP66747	COMPILATION	STRATA PLAN
SP67675	COMPILATION	STRATA PLAN
SP67835	COMPILATION	STRATA PLAN
SP69424	COMPILATION	STRATA PLAN
SP70075	COMPILATION	STRATA PLAN
SP71190	COMPILATION	STRATA PLAN
SP71506	COMPILATION	STRATA PLAN
SP73290	COMPILATION	STRATA PLAN
SP75413	COMPILATION	STRATA PLAN
SP77307	COMPILATION	STRATA PLAN
SP77905	COMPILATION	STRATA PLAN
SP83008	COMPILATION	STRATA PLAN
SP84060	COMPILATION	STRATA PLAN
SP101419	COMPILATION	STRATA PLAN

Form: 01T
Licence: 01-05-025
Licensee: Stacks/Forster

TRANSFER

New South Wales
Real Property Act 1900

AD733761H

PRIVACY NOTE: Section 31B of the Real Property Act 1900 (RP Act) authorises the Registrar General to collect the information required by this form for the establishment and maintenance of the Real Property Act Register. Section 96B RP Act requires that the Register is made available to any person for search upon payment of a fee, if any.

STAMP DUTY Office of State Revenue use only

Office of State Revenue
NSW Treasury
Client No: 1394680 576
Duty: $10.00 Trans No: 4822762
Asst details: S63 on Transfer

(A) **TORRENS TITLE** ~~If appropriate, specify the part transferred~~ ~~Part Identifier 302/792065 being~~ Lot [illegible] now being Folio Identifier 303/1099114

(B) **LODGED BY**

Delivery Box	Name, Address or DX and Telephone	CODES
394X	Higgins + Higgins LLPM 123269P Reference (optional): R 204017	T TW (Sheriff)

(C) **TRANSFEROR** EVA FLORENCE McBRIDE and TREVOR ALLAN McBRIDE

(D) **CONSIDERATION** The transferor acknowledges receipt of the consideration of COURT ORDER DATED 10th April 2006 IN Supreme Court of N.S.W. Case No. 5327 of 2003. and as regards

(E) **ESTATE** the land specified above transfers to the transferee an estate in fee simple.

(F) **SHARE TRANSFERRED**

(G) Encumbrances (if applicable):

(H) **TRANSFEREE** PATRICIA FLORENCE GRIFFITHS

(I) **TENANCY:**

DATE 29th JANUARY 2008

(J) I certify that the person(s) signing opposite, with whom I am personally acquainted or as to whose identity I am otherwise satisfied, signed this instrument in my presence.

Signature of witness:

Name of witness: William Ackhurst
Address of witness: Wharf Street, Forster NSW 2428

Certified correct for the purposes of the Real Property Act 1900 by the transferor.

Signature of transferor:

E. J. McBride
Trevor McBride

I certify that the person(s) signing opposite, with whom I am personally acquainted or as to whose identity I am otherwise satisfied, signed this instrument in my presence.

Signature of witness:

Name of witness:
Address of witness:

Certified correct for the purposes of the Real Property Act 1900 by the transferee.

Signature of transferee:

KLAUS FEGERANK
Solicitor for TRANSFEREE

VOT 9808254

ALL HANDWRITING MUST BE IN BLOCK CAPITALS

Form: 01T
Licence: 01-05-025
Licensee: LEAP Legal Software Pty Limited
Firm name: Harris Freidman

TRANSFER

New South Wales
Real Property Act 1900

AK789385U

PRIVACY NOTE: Section 31B of the Real Property Act 1900 (RP Act) authorises the by this form for the establishment and maintenance of the Real Property Act Register. Section 96B RP Act requires that the Register is made available to any person for search upon payment of a fee, if any.

STAMP DUTY Office of State Revenue use only

Office of State Revenue (NSW)
Client No: 1411509 4173
Duty: $10 Trans No: 8029507001
Assessment No.
8.9.16

(A) **TORRENS TITLE** 303/1099114

(B) **LODGED BY**

Document Collection Box	Name, Address or DX, Telephone, and Customer Account Number if any	CODES
124E _ LLPN : 123820V	GlobalX Legal Solutions Pty Ltd Level 3, 175 Castlereagh Street SYDNEY 2000 Ph: 13 5669 Reference: HFRR 50199776	T TW

(C) **TRANSFEROR** PATRICIA FLORENCE GRIFFITHS

(D) **CONSIDERATION** The transferor acknowledges receipt of the consideration of $4,700,000.00 and as regards

(E) **ESTATE** the abovementioned land transfers to the transferee an estate in fee simple.

(F) **SHARE TRANSFERRED**

(G) Encumbrances (if applicable):

(H) **TRANSFEREE** A.C.N. 094 443 115 Pty Limited A.C.N. 094 443 115 under administration

(I) **TENANCY:**

DATE 8 September 2016

(J) I certify that I am an eligible witness and that the transferor signed this dealing in my presence. [See note* below]

Signature of witness:

Name of witness: TANIA SCHIFF
Address of witness: LEVEL 11
65 YORK ST
SYDNEY NSW 2000

Certified correct for the purposes of the Real Property Act 1900 by the transferor.

Signature of transferor:

Certified correct for the purposes of the Real Property Act 1900 by the person whose signature appears below.

Signature:

Signatory's name: Scott Maurice Freidman
Signatory's capacity: Solicitor for the Transferee

(K) The transferee certifies that the eNOS data relevant to this dealing has been submitted and stored under eNOS ID No. _____ Full name: _____ Signature: _____

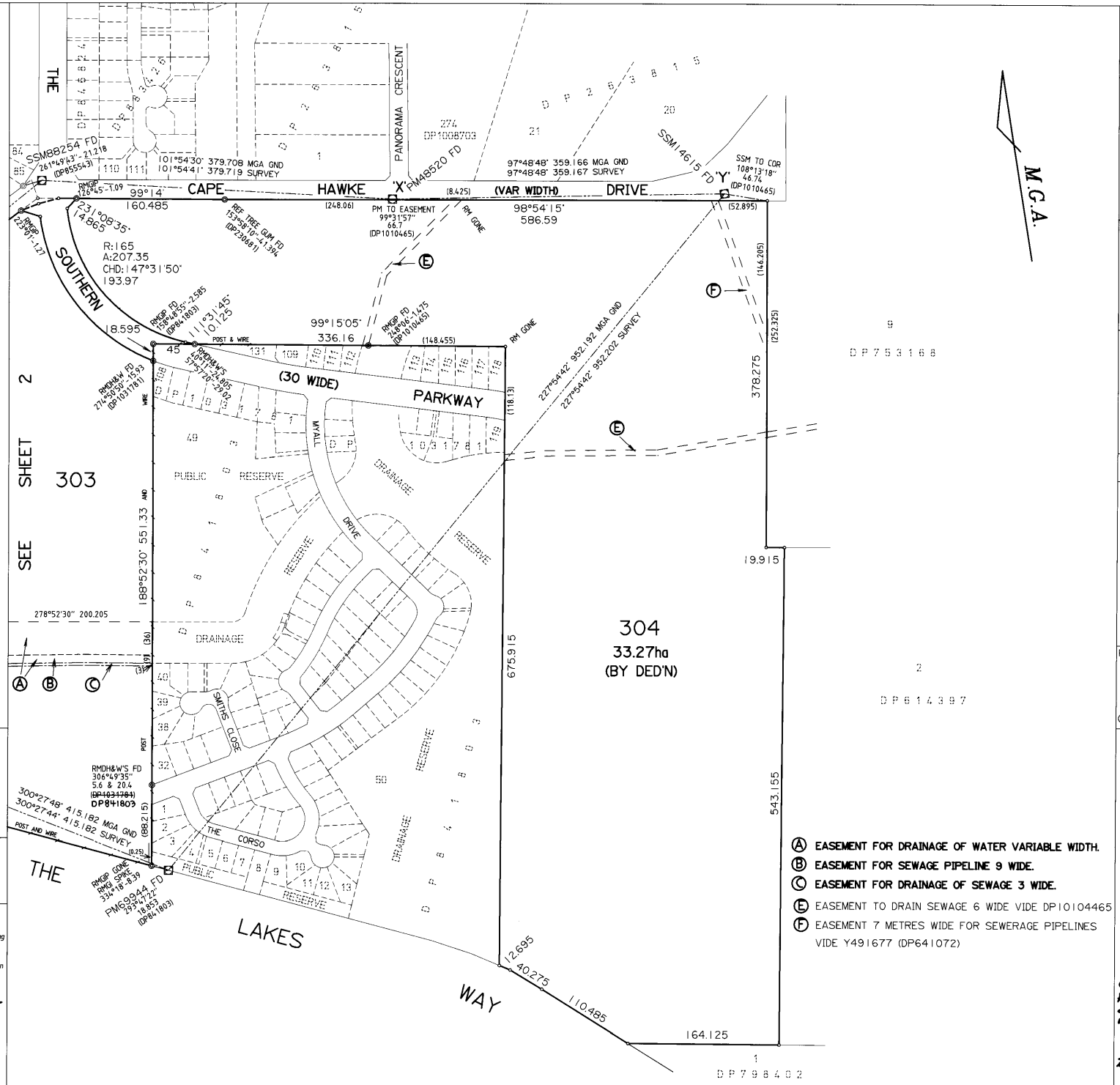
** s 117 RP Act requires that you must have known the signatory for more than 12 months or have sighted identifying documentation.0310243*

ALL HANDWRITING MUST BE IN BLOCK CAPITALS.

PLAN FORM 2

Plan Drawing only to appear in this space

SIGNATURE AND SEALS ONLY.



Department of Lands Approval

I ..... (Authorised Officer) in approving this plan certify that all necessary approvals in regard to the allocation of the land shown hereon have been given.

Signature .....

Date .....

File Number .....

Office .....

The plan is Exempt from Subdivision Certificate under Section 23G(b) of the Conveyancing Act 1919.

..... CL Authorised Officer

Subdivision Certificate

I hereby certify that the provisions of s.109J of the Environmental Planning and Assessment Act 1979 have been satisfied in relation to the proposed

SUBDIVISION ..... set out herein

* (Insert "subdivision" or "new road")

..... * Authorised Person/General Manager/Accredited Certifier

Consent Authority GREAT LAKES Council

Date of Endorsement 24/05/06

Accreditation no .....

Subdivision Certificate no 40/06

File no. DA 953/05

*Delete whichever is inapplicable

SURVEYOR'S REFERENCE. 5325

CAD FILE \5325\DWGDP1 (W40)

WARNING. CREASING OR FOLDING WILL LEAD TO REJECTION

Ⓐ EASEMENT FOR DRAINAGE OF WATER VARIABLE WIDTH.
Ⓑ EASEMENT FOR SEWAGE PIPELINE 9 WIDE.
Ⓒ EASEMENT FOR DRAINAGE OF SEWAGE 3 WIDE.
Ⓔ EASEMENT TO DRAIN SEWAGE 6 WIDE VIDE DP1010465
Ⓕ EASEMENT 7 METRES WIDE FOR SEWERAGE PIPELINES VIDE Y491677 (DP641072)

DP1099114

Registered: 28.06.2006 *

Title System: TORRENS

Purpose: SUBDIVISION

Ref.Map: Z.5532-71,72,73&74

Last Plan: DP792065

PLAN OF SUBDIVISION OF LOT 302 DP792065

Lengths are in metres. Reduction Ratio 1:3000

L.G.A. GREAT LAKES

Locality. FORSTER

Parish. FORSTER

County. GLOUCESTER

This is sheet 1 of my plan in 2 sheets. (Delete if inapplicable).

Surveying Regulation, 2001

I, BRIAN ALBERT LIDBURY

of 3 WHARF STREET FORSTER. PO BOX 510

a surveyor registered under the Surveying Act 2002, hereby certify that the survey represented in this plan is accurate, has been made in accordance with the Surveying Regulation 2001 and was completed on 27-02-06.

The survey relates to LOTS 303 AND PART 304 (here specify the land actually surveyed, or specify any land shown in the plan that is not the subject of the survey)

Signature ..... Dated. 23/03/06

Surveyor registered under the Surveying Act, 2002

Datum Line. 'X'-'Y'

Type. Urban/~~Rural~~

Plans used in preparation of survey/compilation.
DP84183, DP230681, DP266053 DP567033,DP614397, DP641072, DP729734, DP792065, DP846824, DP855543, DP857691, DP1010465, DP1031781, G667-1497, G2336-1497, R30387-1603

PANEL FOR USE ONLY for statements of intention to dedicate public roads, to create public reserves, drainage reserves, easements, restrictions on the use of land or positive covenants

IT IS INTENDED TO DEDICATE THE EXTENSION OF THE SOUTHERN PARKWAY TO THE PUBLIC AS PUBLIC ROAD

PURSUANT TO SEC 88B OF THE CONVEYANCING ACT 1919-1964. IT IS INTENDED TO CREATE:-

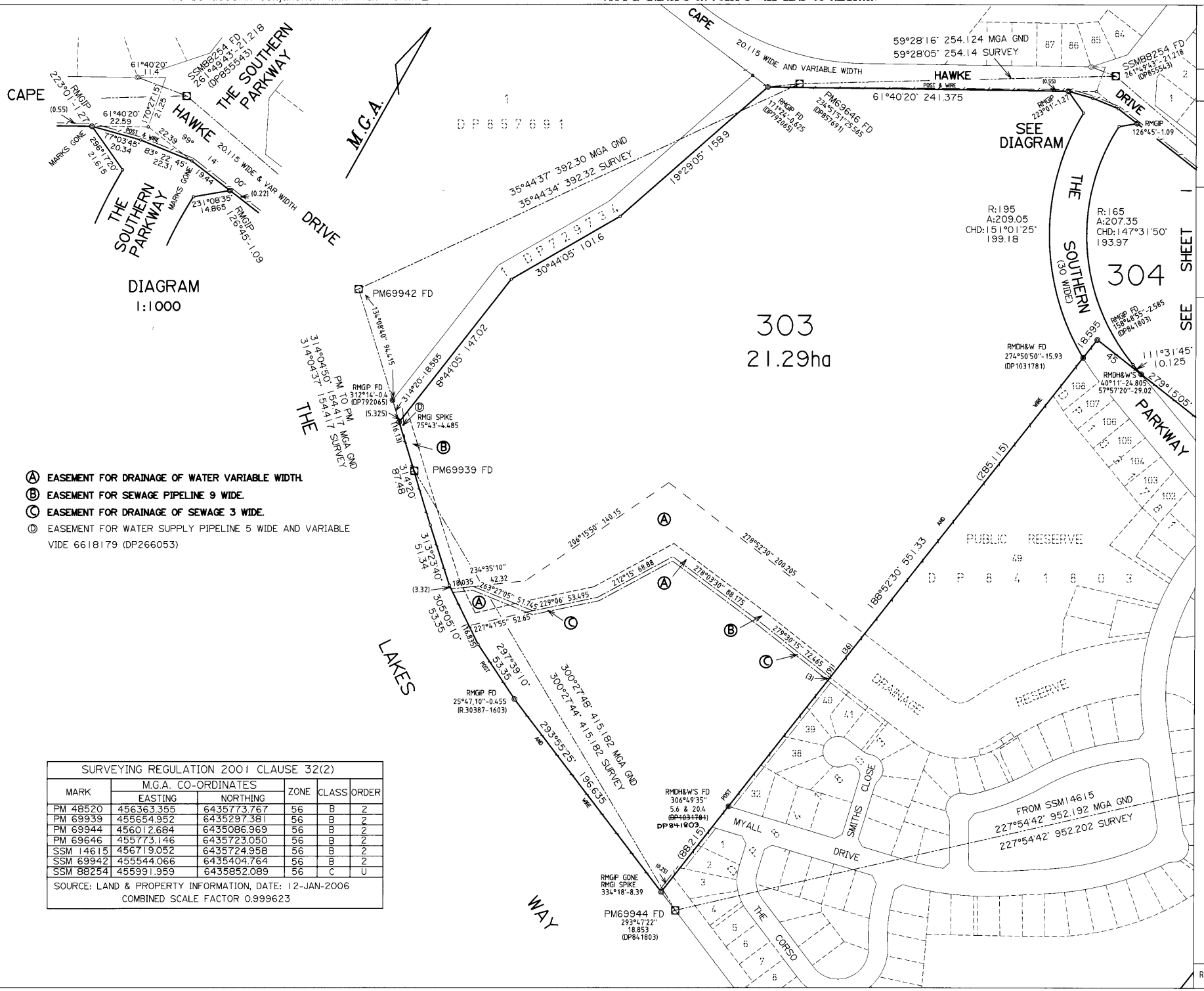
1. EASEMENT FOR DRAINAGE OF WATER VARIABLE WIDTH.
2. EASEMENT FOR SEWAGE PIPELINE 9 WIDE.
3. EASEMENT FOR DRAINAGE OF SEWAGE 3 WIDE.

Great Lakes Council accepts Restriction 1) Easement for drainage of water variable width.

..... Authorised Person/General Manager

* OFFICE USE ONLY

PLAN FORM 3 To be used in conjunction with Plan Form 2 **WARNING. CREASING OR FOLDING WILL LEAD TO REJECTION**



Ⓐ **EASEMENT FOR DRAINAGE OF WATER VARIABLE WIDTH.**
Ⓑ **EASEMENT FOR SEWAGE PIPELINE 9 WIDE.**
Ⓒ **EASEMENT FOR DRAINAGE OF SEWAGE 3 WIDE.**
Ⓓ EASEMENT FOR WATER SUPPLY PIPELINE 5 WIDE AND VARIABLE VIDE 6618179 (DP266053)

SURVEYING REGULATION 2001 CLAUSE 32(2)

MARK	M.G.A. CO-ORDINATES		ZONE	CLASS	ORDER
	EASTING	NORTHING			
PM 48520	456363.355	6435773.767	56	B	2
PM 69939	455654.952	6435297.381	56	B	2
PM 69944	456012.684	6435086.969	56	B	2
PM 69646	455773.146	6435723.050	56	B	2
SSM 14615	456719.052	6435724.958	56	B	2
SSM 69942	455544.066	6435404.764	56	B	2
SSM 88254	455991.959	6435852.089	56	C	U

SOURCE: LAND & PROPERTY INFORMATION, DATE: 12-JAN-2006
COMBINED SCALE FACTOR 0.999623

DP1099114

Registered AW 28.06.2006

This is sheet 2 of my plan in 2 sheets dated

BA Jolly 23/03/06
Surveyor registered under Surveyors Act 1929

This is sheet 2 of the plan of 2 sheets sheets covered by Subdivision certificate No. 40/06 of DA 953/05

Authorised Person/~~General Manager/Accredited Certifier~~

For use where space is insufficient in any panel on Plan Form 2

Reduction Ratio 1:2000

OFFICE USE ONLY

CAD FILE \5325\DWGDP2 (W43)

Plan Drawing only to appear in in this space

SURVEYOR'S REFERENCE 5325

NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE
11/5/2021 12:13PM

FOLIO: 302/792065

First Title(s): VOL 1855 FOL 162 VOL 2735 FOL 193
Prior Title(s): VOL 2735 FOL 193 VOL 3066 FOL 78

Recorded	Number	Type of Instrument	C.T. Issue
16/10/1989	DP792065	DEPOSITED PLAN	FOLIO CREATED EDITION 1
15/7/1994	U444233	DEPARTMENTAL DEALING	
23/2/1996	DP266053	DEPOSITED PLAN	
16/9/1999	6068591	REQUEST	
9/2/2000	DP1010465	DEPOSITED PLAN	EDITION 2
28/3/2000	6618179	REQUEST	
28/4/2003	9554113	TRANSMISSION APPLICATION	EDITION 3
22/7/2003	9808254	CAVEAT	
28/6/2006	DP1099114	DEPOSITED PLAN	FOLIO CANCELLED RESIDUE REMAINS

*** END OF SEARCH ***

advlegs PRINTED ON 11/5/2021

NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE
11/5/2021 12:13PM

FOLIO: 303/1099114

First Title(s): VOL 1855 FOL 162
Prior Title(s): 302/792065

Recorded	Number	Type of Instrument	C.T. Issue
28/6/2006	DP1099114	DEPOSITED PLAN	FOLIO CREATED EDITION 1
5/2/2008	AD733761	TRANSFER	EDITION 2
5/2/2008	AD734115	CAVEAT	
7/3/2008	AD813289	DEPARTMENTAL DEALING	EDITION 3
31/3/2008	AD854103	WITHDRAWAL OF CAVEAT	
31/3/2008	AD854104	MORTGAGE	EDITION 4
6/10/2016	AK789384	DISCHARGE OF MORTGAGE	
6/10/2016	AK789385	TRANSFER	
6/10/2016	AK799710	CHANGE OF NAME	EDITION 5

*** END OF SEARCH ***

advlegs PRINTED ON 11/5/2021

NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: 303/1099114

SEARCH DATE	TIME	EDITION NO	DATE
11/5/2021	12:13 PM	5	6/10/2016

LAND

LOT 303 IN DEPOSITED PLAN 1099114
AT FORSTER
LOCAL GOVERNMENT AREA MID-COAST
PARISH OF FORSTER COUNTY OF GLOUCESTER
TITLE DIAGRAM DP1099114

FIRST SCHEDULE

WINTEN (NO 18) PTY LIMITED (CN AK799710)

SECOND SCHEDULE (5 NOTIFICATIONS)

1 LAND EXCLUDES MINERALS AND IS SUBJECT TO RESERVATIONS AND CONDITIONS IN FAVOUR OF THE CROWN - SEE CROWN GRANT(S)
2 6618179 EASEMENT FOR WATER SUPPLY PIPELINE 5 METRES WIDE AND VARIABLE DESIGNATED (D) AFFECTING THE PART OF THE LAND ABOVE DESCRIBED SHOWN SO BURDENED IN THE TITLE DIAGRAM (SEE DP266053)
6618179 EASEMENT NOW VESTED IN MIDCOAST COUNTY COUNCIL
3 DP1099114 EASEMENT FOR DRAINAGE OF WATER VARIABLE WIDTH DESIGNATED (A) AFFECTING THE PART(S) OF THE LAND ABOVE DESCRIBED SHOWN SO BURDENED IN THE TITLE DIAGRAM
4 DP1099114 EASEMENT FOR SEWAGE PIPELINE 9 METRES WIDE DESIGNATED (B) AFFECTING THE PART(S) OF THE LAND ABOVE DESCRIBED SHOWN SO BURDENED IN THE TITLE DIAGRAM
5 DP1099114 EASEMENT FOR DRAINAGE OF SEWAGE 3 METRES WIDE DESIGNATED (C) AFFECTING THE PART(S) OF THE LAND ABOVE DESCRIBED SHOWN SO BURDENED IN THE TITLE DIAGRAM

NOTATIONS

UNREGISTERED DEALINGS: PP DP1273289.

*** END OF SEARCH ***

advlegs PRINTED ON 11/5/2021

Appendix B

Letter from Dr David Tully CEnvP SC

Contaminated Land Solutions

28 May 2021

Ref: CLS0134.L01

Regional Geotechnical Solutions Pty Ltd
44 Brent Street
Wingham
NSW 2429

For the attention of Andrew Hills

Dear Andrew,

RE: Report Review: Site Contamination Assessment Desk Top Study - Fairview West – Stage 5 The Lakes Way, Forster

I, Dr David Tully of Contaminated Land Solutions Pty Ltd, am a Certified Environmental Practitioner Site Contamination Specialist (General Certified Environmental Practitioner certification no. 1138 and Site Contamination Specialist certification no. SC40084).

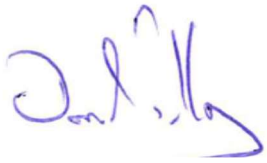
I confirm I have reviewed the Regional Geotechnical Solutions letter report entitled "*Site Contamination Assessment Desk Top Study - Fairview West – Stage 5 The Lakes Way, Forster*" (Ref: RGS02755.1-AB), dated 27 May 2021 and a copy of which I have retained.

I can confirm that on the basis of the information contained within the letter report, I support the conclusions and recommendations provided therein.

Should the client, regulator or local authority have any queries regarding the report review, I can be contacted by e-mail via david.tully@contaminatedlandsolutions.com.au. Specific queries regarding the content of the report should be addressed to Andrew Hills at Regional Geotechnical Solutions.

For and on behalf of

Contaminated Land Solutions Pty Ltd



Dr David Tully CEnvP SC
Director
Contaminated Land Solutions Pty Ltd

Contaminated Land Solutions Pty Ltd
10 Heath Road
Crafers West SA 5152
0410 012 292
david.tully@contaminatedlandsolutions.com.au