Central Coast Council
Business Paper
Ordinary Council Meeting
30 November 2020

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ONE CENTRAL COAST COMMUNITY STRATEGIC PLAN 2018-2028

ONE – CENTRAL COAST IS THE COMMUNITY STRATEGIC PLAN (CSP) FOR THE CENTRAL COAST LOCAL GOVERNMENT AREA

ONE – CENTRAL COAST DEFINES THE COMMUNITY'S VISION AND IS OUR ROADMAP FOR THE FUTURE

ONE – CENTRAL COAST BRINGS TOGETHER EXTENSIVE COMMUNITY FEEDBACK TO SET KEY DIRECTIONS AND PRIORITIES

One - Central Coast will shape and inform Council's business activities, future plans, services and expenditure. Where actions are the responsibility of other organisations, sectors and groups to deliver, Council will work with key partners to advocate on behalf of our community.

Ultimately, every one of us who live on the Central Coast has an opportunity and responsibility to create a sustainable future from which we can all benefit. Working together we can make a difference.

RESPONSIBLE

WE'RE A RESPONSIBLE COUNCIL AND COMMUNITY, COMMITTED TO BUILDING STRONG RELATIONSHIPS AND DELIVERING A GREAT CUSTOMER EXPERIENCE IN ALL OUR INTERACTIONS. We value transparent and meaningful communication and use community feedback to drive strategic decision making and expenditure, particularly around the delivery of essential infrastructure projects that increase the safety, liveability and sustainability of our region. We're taking a strategic approach to ensure our planning and development processes are sustainable and accessible and are designed to preserve the unique character of the coast.

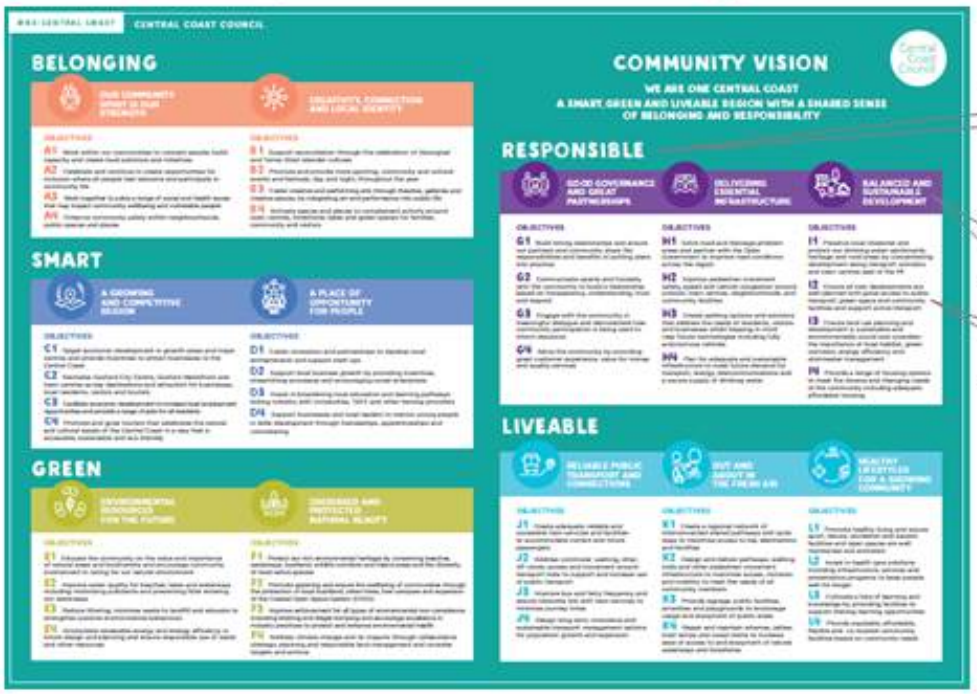
Good governance and great partnerships

G2 Communicate openly and honestly with the community to build a relationship based on transparency, understanding, trust and respect

There are 5 themes, 12 focus areas and 48 objectives

COMMUNITY STRATEGIC PLAN 2018-2028 FRAMEWORK

All council reports contained within the Business Paper are now aligned to the Community Strategic Plan. Each report will contain a cross reference to a Theme, Focus Area and Objective within the framework of the Plan.



Meeting Notice

The Ordinary Council Meeting of Central Coast Council will be held in the Council Chamber, 49 Mann Street, Gosford on Monday 30 November 2020 at 6.30 pm,

for the transaction of the business listed below:

6 Roads, Transport, Drainage And Waste Reports

7 Confidential Item

Rik Hart
Acting Chief Executive Officer

Chapter 14 of the *Local Government Act 1993* ("LG Act") regulates the way in which the councillors and relevant staff of Council conduct themselves to ensure that there is no conflict between their private interests and their public functions.

Section 451 of the LG Act states:

> *(1) A councillor or a member of a council committee who has a pecuniary interest in any matter with which the council is concerned and who is present at a meeting of the council or committee at which the matter is being considered must disclose the nature of the interest to the meeting as soon as practicable.*
>
> *(2) The councillor or member must not be present at, or in sight of, the meeting of the council or committee:*
>
> *(a) at any time during which the matter is being considered or discussed by the council or committee, or*
> *(b) at any time during which the council or committee is voting on any question in relation to the matter.*
>
> *(3) For the removal of doubt, a councillor or a member of a council committee is not prevented by this section from being present at and taking part in a meeting at which a matter is being considered, or from voting on the matter, merely because the councillor or member has an interest in the matter of a kind referred to in section 448.*
>
> *(4) Subsections (1) and (2) do not apply to a councillor who has a pecuniary interest in a matter that is being considered at a meeting, if:*
>
> *(a) the matter is a proposal relating to:*
>
> *(i) the making of a principal environmental planning instrument applying to the whole or a significant part of the council's area, or*
>
> *(ii) the amendment, alteration or repeal of an environmental planning instrument where the amendment, alteration or repeal applies to the whole or a significant part of the council's area, and*
>
> *(a1) the pecuniary interest arises only because of an interest of the councillor in the councillor's principal place of residence or an interest of another person*

(whose interests are relevant under section 443) in that person's principal place of residence, and

(b) the councillor made a special disclosure under this section in relation to the interest before the commencement of the meeting.

(5) The special disclosure of the pecuniary interest must, as soon as practicable after the disclosure is made, be laid on the table at a meeting of the council and must:

(a) be in the form prescribed by the regulations, and
(b) contain the information required by the regulations.

Further, the Code of Conduct adopted by Council applies to all councillors and staff. The Code relevantly provides that if a councillor or staff have a non-pecuniary conflict of interest, the nature of the conflict must be disclosed as well as providing for a number of ways in which a non-pecuniary conflicts of interests might be managed.

Recommendation

That Administrator and staff now disclose any conflicts of interest in matters under consideration by Council at this meeting.

Item No: 1.2

Title: Confirmation of Minutes of Previous Meeting

Department: Governance

30 November 2020 Ordinary Council Meeting

Trim Reference: F2020/00039 - D14269412

Summary

Confirmation of minutes of the Ordinary Meeting of Council held on 23 November 2020.

Due notice is given of this matter in accordance with Council's Code of Meeting Practice. The report and any relevant attachments will be provided prior to the Ordinary Meeting of 30 November 2020. The reason for providing this report as a late item is at the time of publishing the meeting of 23 November had not taken place.

Recommendation

That Council confirm the minutes of the Ordinary Meeting of Council held on the 23 November 2020.

Attachments

1 Minutes - Ordinary Meeting - 23 November 2020

Item No:	1.3
Title:	Notice of Intention to Deal with Matters in Confidential Session
Department:	Governance

30 November 2020 Ordinary Council Meeting

Trim Reference: F2020/00039 - D14269594

Summary

It is necessary for the Council to adopt a resolution to formalise its intention to deal with certain matters in a closed and confidential Session. The report is incorporated in the "Confidential" business paper which has been circulated.

The *Local Government Act 1993* requires the Chief Executive Officer to identify those matters listed on the business paper which may be categorised as confidential in terms of section 10A of the *Local Government Act 1993*. It is then a matter for Council to determine whether those matters will indeed be categorised as confidential.

Recommendation

That Council resolve that the following matters be dealt with in closed session, pursuant to s. 10A(2) of the Local Government Act 1993 for the following reasons:

Item 7.1 – Deferred Item – Metro cinema at Lake Haven – Rent Waiver

Reason for considering in closed session:

That Council resolve that this matter be dealt with in closed session, pursuant to s. 10A(2)(d) of the Local Government Act 1993 for the following reason:

2(d) commercial information of a confidential nature that would, if disclosed:

(i) prejudice the commercial position of the person who supplied it

That Council resolve in accordance with section 10A(2)(a) and (i) of the Local Government Act that this matter be considered in closed session of Council as it relates to alleged contraventions of the Code of Conduct made under section 440. On balance consideration of this matter in open Council would not be in the public interest as it contains confidential information and the matter remains undetermined by Council at this time.

Context

Section 10A of the *Local Government Act 1993* (the Act) states that a Council may close to the public so much of its meeting as comprises:

2(a) personnel matters concerning particular individuals (other than Councillors),

2(b) the personal hardship of any resident or ratepayer,

2(c) information that would, if disclosed, confer a commercial advantage on a person with whom the Council is conducting (or proposes to conduct) business,

2(d) commercial information of a confidential nature that would, if disclosed:

(i) prejudice the commercial position of the person who supplied it, or
(ii) confer a commercial advantage on a competitor of the Council, or
(iii) reveal a trade secret,

2(e) information that would, if disclosed, prejudice the maintenance of law,

2(f) matters affecting the security of the Council, Councillors, Council staff or Council property,

2(g) advice concerning litigation, or advice that would otherwise be privileged from production in legal proceedings on the ground of legal professional privilege,

2(h) information concerning the nature and location of a place or an item of Aboriginal significance on community land.

2(i) alleged contraventions of any code of conduct requirements applicable under section 440

It is noted that with regard to those matters relating to all but 2(a), 2(b) and 2(d)(iii) it is necessary to also give consideration to whether closing the meeting to the public is, on balance, in the public interest.

Further, the Act provides that Council may also close to the public so much of its meeting as comprises a motion to close another part of the meeting to the public (section 10A(3)).

As provided in the Office of Local Government Meetings Practice Note August 2009, it is a matter for the Council to decide whether a matter is to be discussed during the closed part of a meeting. The Council would be guided by whether the item is in a confidential business paper, however the Council can disagree with this assessment and discuss the matter in an open part of the meeting.

Attachments

Nil

Item No: 2.1

Title: 2020-21 Q1 Business Report

Department: Chief Financial Officer

30 November 2020 Ordinary Council Meeting

Trim Reference: F2019/01964 - D14175093

Authors: Mellissa McKee, Financial Controller
Sharon McLaren, Section Manager, Corporate Planning and Reporting
Michelle Best, Financial Controller

Managers: Vivienne Louie, Unit Manager, Financial Performance
Michelle Bannister, Unit Manager, Performance and Innovation

Executives: Natalia Cowley, Chief Financial Officer
Ricardo Martello, Executive Manager Innovation and Futures

Report Purpose

This paper reports on Central Coast Council's performance progress as measured against the organisation's Operational Plan for 2020-21 to 30 September 2020 (Q1). The report covers the progress on the operational plan activities and financial performance for the period 1 July 2020 to 30 September 2020.

Due notice is given of this matter in accordance with Council's Code of Meeting Practice. The report and any relevant attachments will be provided prior to the Ordinary Meeting of 30 November 2020.

Item No: 2.2

Title: Investment Report for September 2020

Department: Chief Financial Officer

30 November 2020 Ordinary Council Meeting

Trim Reference: F2004/06604 - D13749452

Author: Melissa McCulloch, Unit Manager Financial Services

Executive: Natalia Cowley, Chief Financial Officer

Report purpose

Council is required to present Investment Reports on a monthly basis in accordance with cl. 212 of the *Local Government (General) Regulation 2005* which states as follows:

1 The responsible accounting officer of a council

a) must provide the council with a written report (setting out details of all money that the council has invested under section 625 of the Act) to be presented—

i. if only one ordinary meeting of the council is held in a month, at that meeting, or

ii. if more than one such meeting is held in a month, at whichever of those meetings the council by resolution determines, and

b) must include in the report a certificate as to whether or not the investment has been made in accordance with the Act, the regulations and the council's investment policies.

2 The report must be made up to the last day of the month immediately preceding the meeting.

Executive Summary

This report details Council's investments as at 30 September 2020.

Chief Financial Officer Recommendation

That Council receive the Investment Report for September 2020.

Context

Council's investments are made in accordance with the Local Government Act 1993, Local Government (General) Regulation 2005, the investment policy adopted at the Ordinary Council Meeting on 28 October 2019, Ministerial Investment Order issued February 2011 and Division of Local Government (as it was then known) Investment Policy Guidelines published in May 2010.

Current Status

Council's current cash and investment portfolio totals $326.67 million at 30 September 2020.

Source of Funds	**Sep 2020 Value ($'000**
Investment Portfolio	$299,678
Transactional accounts and cash in hand	$26,986
Total	**$326,665**

Council's Investment Portfolio is managed through term deposits and floating rate note maturities and placements.

Total net interest return on the portfolio for Council, for September was $343K. The total value of the Council's investment portfolio as at 30 September 2020 is outlined in Table 1 below.

Table 1 – Portfolio Movement

Description	2019-20 Financial Year $'000	Jul-20 2020/21 $'000	Aug-20 2020/21 $'000	Sep-20 2020/21 $'000	**FYTD 2020/21 $'000**
Opening Balance	**445,661**	348,210	313,214	307,978	**348,210**
Movement for the period	-97,451	-34,996	-5,236	-8,299	-48,531
Closing Balance	**348,210**	313,214	307,978	299,678	**299,678**

In September, Council had a net inflow of $10.14 million, with increase in cash of $18.44 million and decrease of $8.30 million in Investments.

Council's investments are evaluated and monitored against a benchmark appropriate to the risk (Standard and Poor's BBB long term or above) and time horizon of the investment concerned.

A summary of the term deposit and floating rate notes maturities are listed in Table 2 below.

Table 2 - Investment Maturities as at 30 September 2020

Time Horizon	Percentage Holdings	Maturity on or before	Value $'000
At Call	18.39%	Immediate	**55,097**
Investments			
0 - 3 months	13.35%	Dec-2020	40,003
4 - 6 months	2.00%	Mar-2021	6,000
7 - 12 months	12.98%	Sep-2021	38,905
1 - 2 years	31.75%	Sep-2022	95,151
2 - 3 years	3.34%	Sep-2023	10,000
3 - 4 years	8.34%	Sep-2024	25,000
4 - 5 years	9.85%	Sep-2025	29,522
Total Investments	**81.61%**		**244,581**
Total Portfolio	**100.00%**		**299,678**

The Investment Portfolio is made up as follows: AA above (64.57%), A (8.34%), BBB (20.08%) and Unrated (7.01%).

The investments in AA are of a higher credit rating and BBB represented the best returns at the time of investment.

It is noted that for the month of September 2020 the BBB rated investments were outside of the Investment Policy guidelines by 0.08%. This will be corrected for the month of October 2020 by placing funds placed in higher rated institutions.

Council holds three term deposit parcels that are "grandfathered" investments in the unrated category. These investments are also outside of Council's Investment Policy by 5.01%. This came about due to a change in Investment Policy since the initial investment was placed. These investments offer Council a higher level of interest rate return, which will be lost if these investments are closed prior to maturity and on that basis, it is recommended that they are kept to maturity.

Start Date	Institution	Product	Rating	Maturity Date	Amount
15/02/2020	Unity Bank*	Term Deposit	Unrated	15/02/2021	$1,000,000
6/07/2018	Rabo Bank**	Term Deposit	Unrated	5/07/2021	$10,000,000
13/12/2017	Rabo Bank**	Term Deposit	Unrated	12/12/2022	$10,000,000

** Unity Bank is a local credit union and this is a historical rolling investment from pre- amalgamation Wyong Council*

*** Rabo Bank is a highly reputable non-domiciled institution that is unrated in Australia but does carry a rating overseas.*

Council monitors and manage the portfolio taking into consideration credit ratings of financial institutions, interest rates offered for the maturity dates required and counterparty exposure.

The current spread of investments and counterparty exposure for September 2020 are shown in Graphs 1 and 2 respectively in Attachment 3.

Environmental, Social and Green (ESG) Investments

Council continues to look for 'ESG' investment opportunities subject to prevailing investment guidelines. A list of current ESG investments held is contained on the investment listing, highlight in green. For the month of September, there have been no new green investments undertaken.

Council currently holds 9.85% or $29.52 million in ESG investments as at 30 September 2020.

Portfolio Return

Interest rates on investments in the month, ranged from 0.50% to 3.18%, all of which exceeded the monthly Bank Bill Swap Rate (BBSW) benchmark of 0.09%.

The annualised financial year to date return for August of 1.53% for Central Coast Council is favourable compared to benchmark bank bill swap (BBSW) *financial year to date* Calculated Bank Bill Index of 1.13% as shown in Graph 3 - Portfolio Returns in Attachment 3.

Council's Portfolio by Source of Funds

Council is required to restrict funds received for specific purposes. Restricted funds consist of funds in the investment portfolio and in transactional accounts as follows:

Source of Funds	**Value ($'000) September 2020**
Investment Portfolio	$299,678
Transactional accounts and cash in hand	$26,986
Total	**$326,665**
Draft Restrictions	$448,653
Unrestricted Funds as at 30 Sept 2020	$-121,988

Council is managing the negative unrestricted funds balance, as part of Council's Business Recovery Plan.

Financial Considerations

At its meeting held 19 October 2020, Council resolved the following:

> *1036/20 That any motions put before Council for the remainder of this term of Council that have financial implications require the Chief Executive Officer to provide a report on how those additional costs will be met.*

The following statement is provided in response to this resolution of Council.

Council's investment portfolio includes rolling maturity dates to ensure that Council has sufficient liquidity to meet its ongoing obligations.

Link to Community Strategic Plan

Theme 4: Responsible

Goal G: Good governance and great partnerships

R-G4: Serve the community by providing great customer experience, value for money and quality services.

Attachments

1	Summary of Investments as at 30 September 2020	D14291007
2	Summary of Restrictions as at 30 September 2020	D14291010
3	Investment Report for September 2020 - Graph 1, 2 and 3	D14291013

Central Coast Council
Summary of Investments as at 30-September-2020

Financial Institution	Type of Investment	Short Term Rating	Long Term Rating	Maturity Date	Portfolio Balance $	As a % of the total Portfolio	Interest Rate %
CASH AT CALL:							
Westpac Banking Corporation	Corporate Investment Account	A-1+	AA	Daily	13,794,546	4.60%	1.10%
Commonwealth Bank of Australia	Business On-line Saver	A-1+	AA	Daily	31,270,000	10.43%	0.90%
AMP limited		A-2	BBB	Daily	10,032,836	3.35%	1.30%
Total Cash At Call					55,097,382	18.39%	
TERM DEPOSITS, FLOATING RATE NOTES & BONDS:							
NSW Treasury Corporation	Term Deposit	A-1+	AAA	04-May-2021	8,098,000	2.70%	0.84%
National Australia Bank	Term Deposit	A-1+	AA	06-Oct-2020	10,000,000	3.34%	1.48%
National Australia Bank	Term Deposit	A-1+	AA	12-Oct-2020	10,000,000	3.34%	1.48%
Suncorp-Metway Limited	Floating Rate Note	A-1	A	20-Oct-2020	4,302,340	1.50%	BBSW +1.25%
Suncorp-Metway Limited	Floating Rate Note	A-1	A	20-Oct-2020	300,260	0.17%	BBSW +1.25%
National Australia Bank	Term Deposit	A-1+	AA	10-Dec-2020	5,000,000	1.67%	2.80%
Westpac Banking Corporation	Term Deposit	A-1+	AA	10-Dec-2020	10,000,000	3.34%	2.90%
Westpac Banking Corporation	Term Deposit	A-1+	AA	21-Jun-2021	10,000,000	3.34%	3.06%
Rabo Bank	Term Deposit	Unrated	Unrated	05-Jul-2021	10,000,000	3.34%	2.92%
Bank of Queensland	Term Deposit	A-2	BBB	26-Aug-2021	10,000,000	3.34%	1.75%
Westpac Banking Corporation	Floating Rate Note	A-1+	AA	26-Nov-2021	5,000,000	1.67%	BBSW + 0.93%
Newcastle Permanent Building Society	Floating Rate Note	A-2	BBB	24-Jan-2022	10,151,200	3.39%	BBSW + 1.65%
Rabo Bank	Term Deposit	Unrated	Unrated	12-Dec-2022	10,000,000	3.34%	3.18%
Westpac Banking Corporation	Floating Rate Note	A-1+	AA	27-Nov-2023	5,000,000	1.67%	BBSW + 0.93%
Bank of Queensland	Term Deposit	A-2	BBB	26-Sep-2024	10,000,000	3.34%	2.00%
NSW Treasury Corporation	Bonds	A-1+	AAA	20-Mar-2025	2,073,860	0.69%	1.25%
NSW Treasury Corporation	Bonds	A-1+	AAA	15-Nov-2028	17,448,300	5.82%	3.00%
Unity Bank	Term Deposit	Unrated	Unrated	15-Feb-2021	1,000,000	0.33%	1.65%
MyState Bank	Term Deposit	A-2	BBB	04-Mar-2021	5,000,000	1.67%	1.50%
Bank of Queensland	Term Deposit	A-2	BBB	16-Jun-2025	10,000,000	3.34%	1.53%
National Australia Bank	Term Deposit	A-1+	AA	14-Jun-2024	10,000,000	3.34%	1.15%
AMP limited	Term Deposit	A-2	BBB	14-Jun-2022	5,000,000	1.67%	1.40%
NSW Treasury Corporation	Term Deposit	A-1+	AAA	04-Jun-2021	807,000	0.27%	1.00%
Macquarie Bank	Term Deposit	A-1	A	12-Oct-2021	10,000,000	3.34%	0.80%
Macquarie Bank	Term Deposit	A-1	A	06-Nov-2020	10,000,000	3.34%	0.50%
National Australia Bank	Term Deposit	A-1+	AA	16-Nov-2020	10,000,000	3.34%	0.58%
Australia New Zealand Banking Group	Term Deposit	A-1+	AA	12-Jan-2021	10,000,000	3.34%	0.66%
National Australia Bank	Term Deposit	A-1+	AA	25-Jan-2021	5,000,000	1.67%	0.53%
Australia New Zealand Banking Group	Term Deposit	A-1+	AA	19-Jan-2021	10,000,000	3.34%	0.66%
Australia New Zealand Banking Group	Term Deposit	A-1+	AA	22-Feb-2021	10,000,000	3.34%	0.68%
National Australia Bank	Term Deposit	A-1+	AA	29-Mar-2021	10,000,000	3.34%	0.50%
Total Term Deposit & Bonds:					244,580,960	81.61%	
TOTAL PORTFOLIO					299,678,342	100.00%	
Current					205,004,982	68.41%	
Non-Current					94,673,360	31.59%	
TOTAL PORTFOLIO					299,678,342	100.00%	

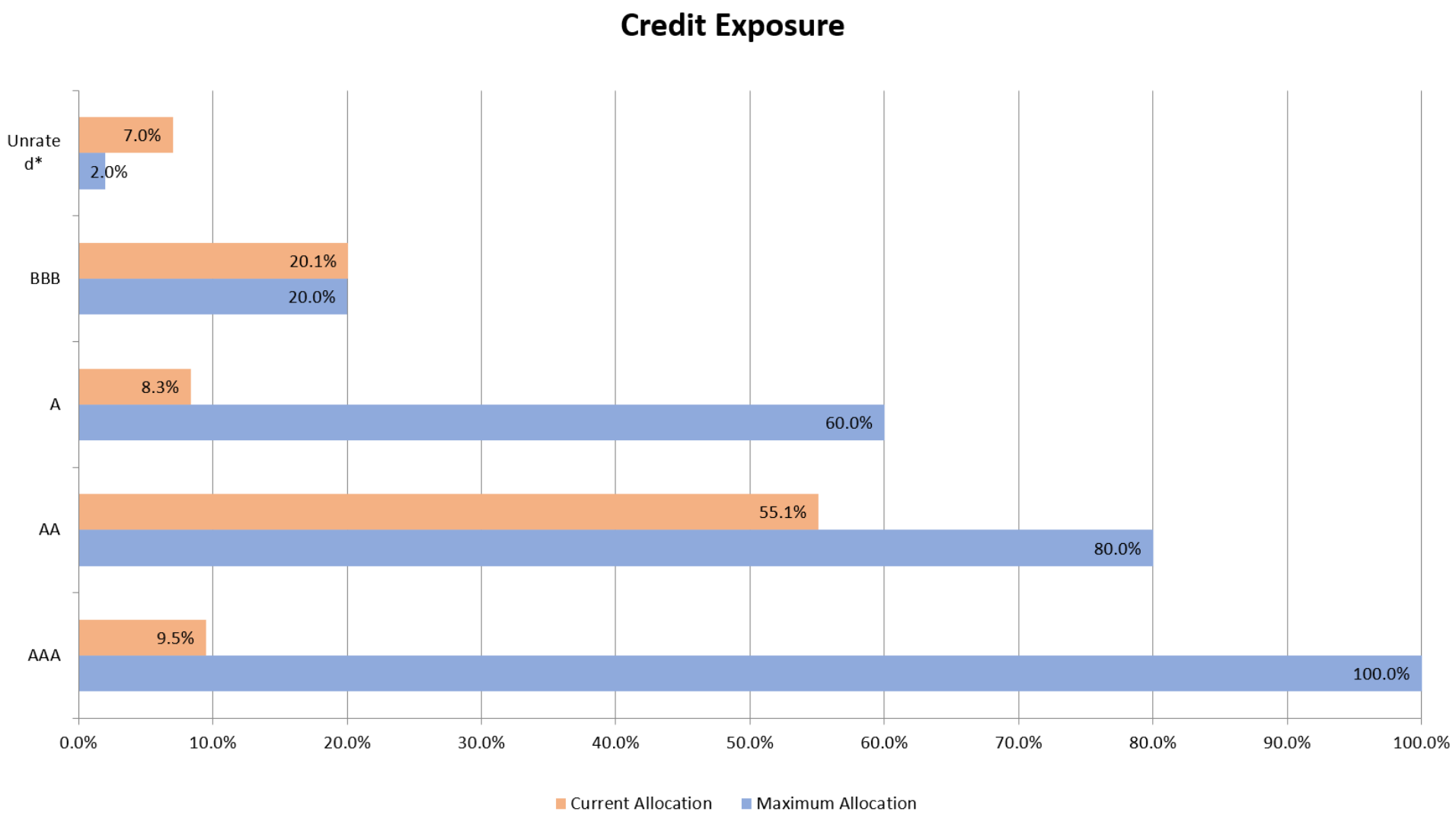
Green Investments

SUMMARY OF RESTRICTIONS as at 30 September 2020

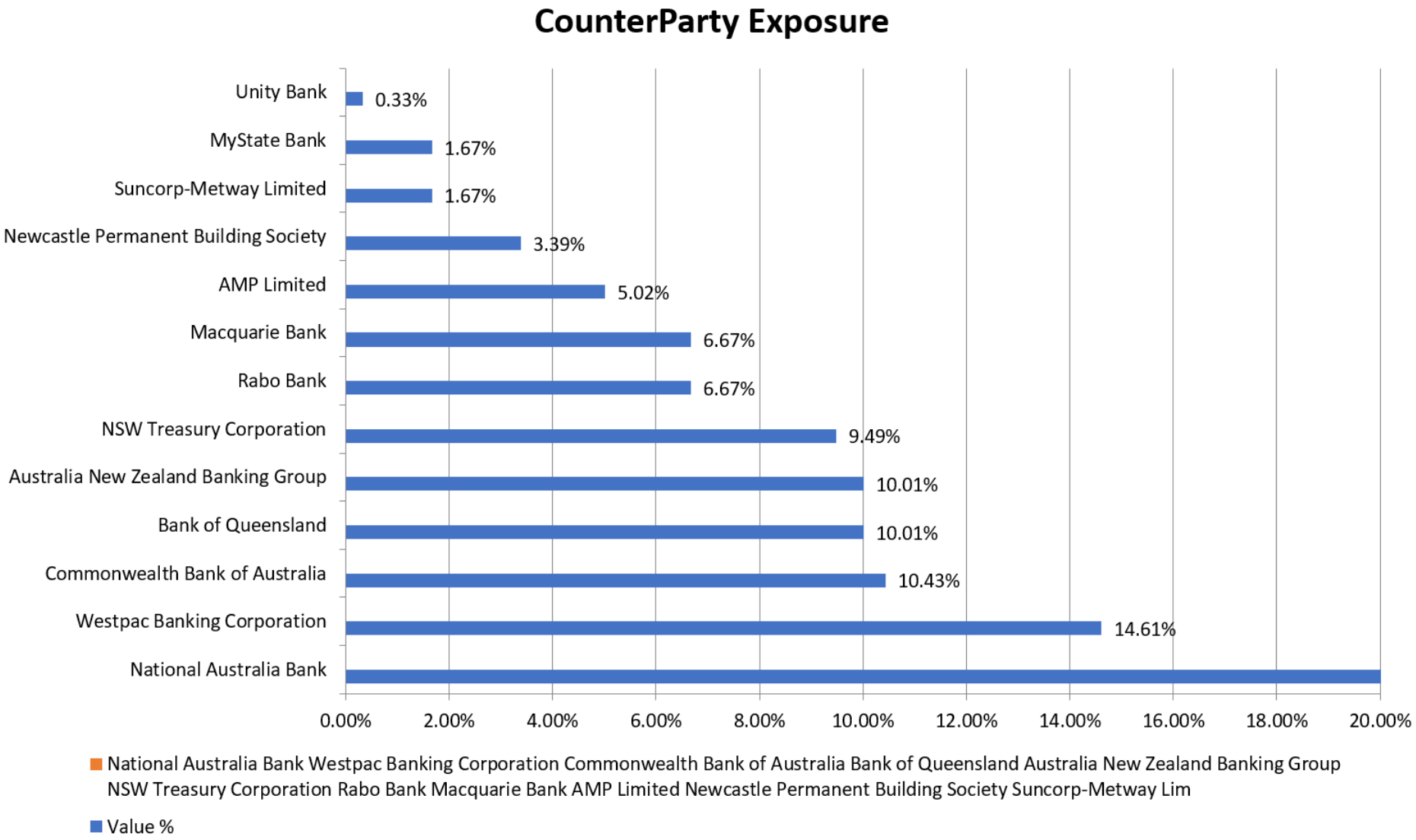
FUND	SOURCE	Sep-20 Principal Amount $'000
GENERAL FUND	Developer contributions	95,828
	Developer contributions – bonus provisions	5,424
	Developer Contributions – Sec 94A Levy	17,619
	Developer contributions – VPA	2,690
	Specific purpose unexpended grants	13,276
	Self insurance claims	6,519
	Stormwater Levy	528
	RMS Advance	1,068
	Holiday Parks	11,903
	Cemeteries	714
	Coastal Open Space	6,562
	Bio Banking	286
	Crown Land Business Enterprises	1,110
	Crown Land Patonga Camping Ground	821
	Other External	336
	Terrigal Tourism Special Rate Levy	0
	Tourism Special Rate	3,390
	Gosford CBD Special Rate Levy	381
	Gosford Parking Station Special Rate Levy	1,264
	The Entrance Town Centre Special Rate Levy	350
	Toukley Town Centre Special Rate Levy	194
	Wyong Town Centre Special Rate Levy	35
	TOTAL GENERAL FUND RESTRICTIONS	**170,298**
Water FUND	Developer contributions	16,309
	Developer contributions – VPA	1,048
	Specific purpose unexpended grants	3,791
	Self insurance claims	1,208
	Other External	45
	TOTAL WATER FUND RESTRICTIONS	**22,401**
SEWER FUND	Developer contributions	19,420
	Developer contributions – VPA	492
	Self insurance claims	2,027
	Specific purpose unexpended grants	179
	TOTAL SEWER FUND RESTRICTIONS	**22,118**
DRAINAGE FUND	Developer contributions	34,545
	Developer contributions – VPA	1,362
	Specific purpose unexpended grants	580
	Other External	100
	TOTAL DRAINAGE FUND RESTRICTIONS	**36,588**
DOMESTIC WASTE FUND	Specific purpose unexpended grants	0
	Domestic Waste Management	86,184
	TOTAL WASTE FUND RESTRICTIONS	**86,184**
	TOTAL EXTERNALLY RESTRICTED FUNDS	**337,588**

GENERAL FUND		109,106
Water FUND		1,026
SEWER FUND		877
DRAINAGE FUND		55
DOMESTIC WASTE FUND		0
	INTERNALLY RESTRICTED FUNDS	**111,065**

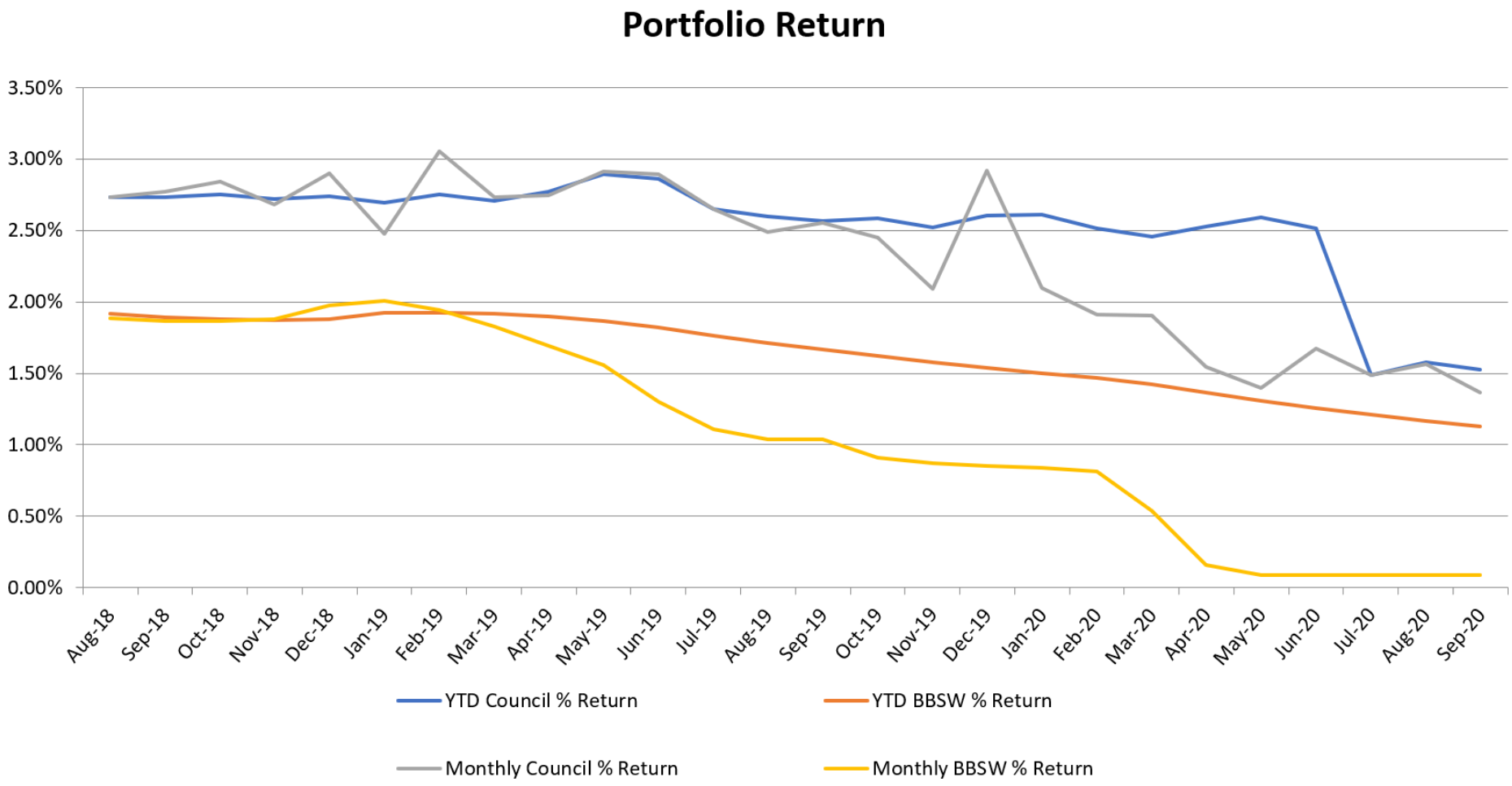
Graph 1 – Credit Exposure



Graph 2 – CounterParty Exposure



Graph 3 – Portfolio Return



Item No: 2.3

Title: Investment Report for October 2020

Department: Chief Financial Officer

30 November 2020 Ordinary Council Meeting

Trim Reference: F2004/06604 - D14288193

Author: Melissa McCulloch, Unit Manager Financial Services

Executive: Natalia Cowley, Chief Financial Officer

Report purpose

Council is required to present Investment Reports on a monthly basis in accordance with cl. 212 of the *Local Government (General) Regulation 2005* which states as follows:

1 *The responsible accounting officer of a council*
   a) *must provide the council with a written report (setting out details of all money that the council has invested under section 625 of the Act) to be presented—*
      i. *if only one ordinary meeting of the council is held in a month, at that meeting, or*
      ii. *if more than one such meeting is held in a month, at whichever of those meetings the council by resolution determines, and*
   b) *must include in the report a certificate as to whether or not the investment has been made in accordance with the Act, the regulations and the council's investment policies.*

2 *The report must be made up to the last day of the month immediately preceding the meeting.*

Executive Summary

This report details Council's investments as at 31 October 2020.

Chief Financial Officer Recommendation

That Council receive the Investment Report for October 2020.

Context

Context

Council's investments are made in accordance with the Local Government Act 1993, Local Government (General) Regulation 2005, the investment policy adopted at the Ordinary Council Meeting on 28 October 2019, Ministerial Investment Order issued February 2011 and

Division of Local Government (as it was then known) Investment Policy Guidelines published in May 2010.

Current Status

Council's current cash and investment portfolio totals $353.34 million at 31 October 2020.

Source of Funds	**Oct 2020 Value ($'000**
Investment Portfolio	$320,003
Transactional accounts and cash in hand	$33,540
Total	**$353,343**

Council's Investment Portfolio is managed through term deposits and floating rate note maturities and placements.

Total net return on the portfolio for Council, in October was $344K, comprising entirely of interest earning. The total value of the Council's investment portfolio as at 31 October 2020 is outlined in Table 1 below.

Table 1 – Portfolio Movement

Description	2019-20 Financial Year $'000	Jul-Sep 20 Qtr 2020/21 $'000	Oct-20 2020/21 $'000	**FYTD 2020/21 $'000**
Opening Balance	**445,661**	348,210	299,678	**348,210**
Movement for the period	-97,451	-48,532	20,325	-28,207
Closing Balance	**348,210**	299,678	320,003	**320,003**

In October, Council had a net inflow of $26.67 million, with increase in cash of $6.55 million and increase of $20.32 million in Investments.

Council's investments are evaluated and monitored against a benchmark appropriate to the risk (Standard and Poor's BBB long term or above) and time horizon of the investment concerned.

A summary of the term deposit and floating rate notes maturities are listed in Table 2 below

Table 2 - Investment Maturities as at 31 October 2020

Time Horizon	Percentage Holdings	Maturity on or before	Value $'000
At Call	18.76%	Immediate	60,021
Investments			
0 - 3 months	18.75%	Jan-2021	60,000
4 - 6 months	14.37%	Apr-2021	46,000
7 - 12 months	21.53%	Oct-2021	68,905
1 - 2 years	6.30%	Oct-2022	20,153
2 - 3 years	3.12%	Oct-2023	10,000
3 - 4 years	7.81%	Oct-2024	25,000
4 - 5 years	9.35%	Oct-2025	29,924
Total Investments	**81.24%**		**259,982**
Total Portfolio	**100.00%**		**320,003**

The investment portfolio is concentrated in AA above (68.37%), A (6.25%), BBB (18.81%) and Unrated (6.56%).

The investments in AA are of a higher credit rating and BBB represented the best returns at the time of investment within Policy guidelines.

Council holds three term deposit parcels that are "grandfathered" investments in the unrated category. These investments are also outside of Council's Investment Policy by 4.56% - as per Attachment 4. This came about due to a change in Investment Policy since the initial investment was placed. These investments offer Council a higher level of interest rate return, which will be lost if these investments are closed prior to maturity and on that basis, it is recommended that they are kept to maturity.

Start Date	Institution	Product	Rating	Maturity Date	Amount
15/02/2020	Unity Bank*	Term Deposit	Unrated	15/02/2021	$1,000,000
6/07/2018	Rabo Bank**	Term Deposit	Unrated	5/07/2021	$10,000,000
13/12/2017	Rabo Bank**	Term Deposit	Unrated	12/12/2022	$10,000,000

' Unity Bank is a local credit union and this is a historical rolling investment from pre- amalgamation Wyong Council*

*'** Rabo Bank is a highly reputable non-domiciled institution that is unrated in Australia but does carry a rating overseas.*

Council monitors and manages the portfolio taking into consideration credit ratings of financial institutions, interest rates offered for the maturity dates required and counterparty exposure.

The current spread of investments and counterparty exposure for October 2020 are shown in Graphs 1 and 2 respectively in Attachment 2.

Environmental, Social and Green (ESG) Investments

Council continues to look for 'ESG' investment opportunities subject to prevailing investment guidelines. A list of current ESG investments held is contained on the investment listing, highlight in green. For the month of October, there have been no new green investments undertaken.

Council currently holds 9.35% or $29.92 million in ESG investments as at 31 October 2020.

Portfolio Return

Interest rates on investments in the month, ranged from 0.41% to 3.18%, all of which exceeded the monthly Bank Bill Swap Rate (BBSW) benchmark of 0.08%.

The annualised financial year to date return for August of 1.46% for Central Coast Council is favourable compared to benchmark bank bill swap (BBSW) *financial year to date* Calculated Bank Bill Index of 1.09% as shown in Graph 3 - Portfolio Returns in Attachment 2.

Council's Portfolio by Source of Funds

Council is required to restrict funds received for specific purposes. Restricted funds consist of funds in the investment portfolio and in transactional accounts as follows:

Source of Funds	**Value ($'000) October 2020**
Investment Portfolio	$320,003
Transactional accounts and cash in hand	$33,540
Total	**$353,343**
Draft Restrictions as at 30 September 2020*	$453,875
Unrestricted Funds as at 31 October 2020	$-100,332

Council is managing the negative unrestricted funds balance, as part of Council's Business Recovery Plan.

Market values reflected in the Portfolio valuation report in Attachment 5 have been used to record the unrecognized gains in tradeable fixed rate bonds and floating rate notes. Interest accrued has been recorded separately and is not reflected in portfolio valuations.

Financial Considerations

At its meeting held 19 October 2020, Council resolved the following:

1036/20 That any motions put before Council for the remainder of this term of Council that have financial implications require the Chief Executive Officer to provide a report on how those additional costs will be met.

The following statement is provided in response to this resolution of Council.

Council's investment portfolio includes rolling maturity dates to ensure that Council has sufficient liquidity to meet its ongoing obligations.

Link to Community Strategic Plan

Theme 4: Responsible

Goal G: Good governance and great partnerships

R-G4: Serve the community by providing great customer experience, value for money and quality services.

Attachments

1	Summary of Investments as at 31 October 2020	D14291486
2	Summary of Restrictions as at 30 October 2020	D14291010
3	Investment Report for October 2020 - Graph 1, 2 and 3	D14291492
4	Treasury Direct Trading Limits Report October 2020	D14306982
5	Treasury Direct Portfolio Valuation Report October 2020	D14306978

Central Coast Council
Summary of Investments as at 31-October-2020

Financial Institution	Type of Investment	Short Term Rating	Long Term Rating	Maturity Date	Portfolio Balance $	As a % of the total Portfolio	Interest Rate %
CASH AT CALL:							
Westpac Banking Corporation	Corporate Investment Account	A-1+	AA	Daily	15,797,481	4.94%	1.10%
Commonwealth Bank of Australia	Business On-line Saver	A-1+	AA	Daily	34,170,000	10.68%	0.90%
AMP limited		A-2	BBB	Daily	10,053,452	3.14%	1.30%
Total Cash At Call					60,020,933	18.77%	
TERM DEPOSITS, FLOATING RATE NOTES & BONDS:							
NSW Treasury Corporation	Term Deposit	A-1+	AAA	04-May-2021	8,098,000	2.53%	0.84%
National Australia Bank	Term Deposit	A-1+	AA	10-Dec-2020	5,000,000	1.56%	2.80%
Westpac Banking Corporation	Term Deposit	A-1+	AA	10-Dec-2020	10,000,000	3.13%	2.90%
Westpac Banking Corporation	Term Deposit	A-1+	AA	21-Jun-2021	10,000,000	3.13%	3.06%
Raba Bank	Term Deposit	Unrated	Unrated	05-Jul-2021	10,000,000	3.13%	2.92%
Bank of Queensland	Term Deposit	A-2	BBB	26-Aug-2021	10,000,000	3.13%	1.75%
Westpac Banking Corporation	Floating Rate Note	A-1+	AA	26-Nov-2021	5,000,000	1.56%	BBSW + 0.93%
Newcastle Permanent Building Society	Floating Rate Note	A-2	BBB	24-Jan-2022	10,153,500	3.17%	BBSW + 1.65%
Raba Bank	Term Deposit	Unrated	Unrated	12-Dec-2022	10,000,000	3.13%	3.18%
Westpac Banking Corporation	Floating Rate Note	A-1+	AA	27-Nov-2023	5,000,000	1.56%	BBSW + 0.93%
Bank of Queensland	Term Deposit	A-2	BBB	26-Sep-2024	10,000,000	3.13%	2.00%
NSW Treasury Corporation	Bonds	A-1+	AAA	20-Mar-2025	2,081,100	0.65%	1.25%
NSW Treasury Corporation	Bonds	A-1+	AAA	15-Nov-2028	17,640,450	5.52%	3.00%
Unity Bank	Term Deposit	Unrated	Unrated	15-Feb-2021	1,000,000	0.31%	1.65%
MyState Bank	Term Deposit	A-2	BBB	04-Mar-2021	5,000,000	1.56%	1.50%
Bank of Queensland	Term Deposit	A-2	BBB	16-Jun-2025	10,000,000	3.13%	1.53%
National Australia Bank	Term Deposit	A-1+	AA	14-Jun-2024	10,000,000	3.13%	1.13%
AMP limited	Term Deposit	A-2	BBB	14-Jun-2022	5,000,000	1.56%	1.40%
NSW Treasury Corporation	Term Deposit	A-1+	AAA	04-Jun-2021	807,000	0.25%	1.00%
Macquarie Bank	Term Deposit	A-1	A	12-Oct-2021	10,000,000	3.13%	0.80%
Macquarie Bank	Term Deposit	A-1	A	06-Nov-2020	10,000,000	3.13%	0.50%
National Australia Bank	Term Deposit	A-1+	AA	16-Nov-2020	10,000,000	3.13%	0.58%
Australia New Zealand Banking Group	Term Deposit	A-1+	AA	12-Jan-2021	10,000,000	3.13%	0.66%
National Australia Bank	Term Deposit	A-1+	AA	25-Jan-2021	5,000,000	1.56%	0.53%
Australia New Zealand Banking Group	Term Deposit	A-1+	AA	19-Jan-2021	10,000,000	3.13%	0.66%
Australia New Zealand Banking Group	Term Deposit	A-1+	AA	22-Feb-2021	10,000,000	3.13%	0.68%
National Australia Bank	Term Deposit	A-1+	AA	29-Mar-2021	10,000,000	3.13%	0.50%
Commonwealth Bank of Australia	Term Deposit	A-1+	AA	07-Apr-2021	10,000,000	3.13%	0.64%
Commonwealth Bank of Australia	Term Deposit	A-1+	AA	21-Apr-2021	10,000,000	3.13%	0.64%
National Australia Bank	Term Deposit	A-1+	AA	04-May-2021	10,000,000	3.13%	0.50%
National Australia Bank	Term Deposit	A-1+	AA	18-May-2021	10,000,000	3.13%	0.41%
Total Term Deposit & Bonds:					259,780,050	81.23%	
TOTAL PORTFOLIO					319,800,983	100.00%	
Current					234,925,933	73.46%	
Non-Current					84,875,050	26.54%	
TOTAL PORTFOLIO					319,800,983	100.00%	

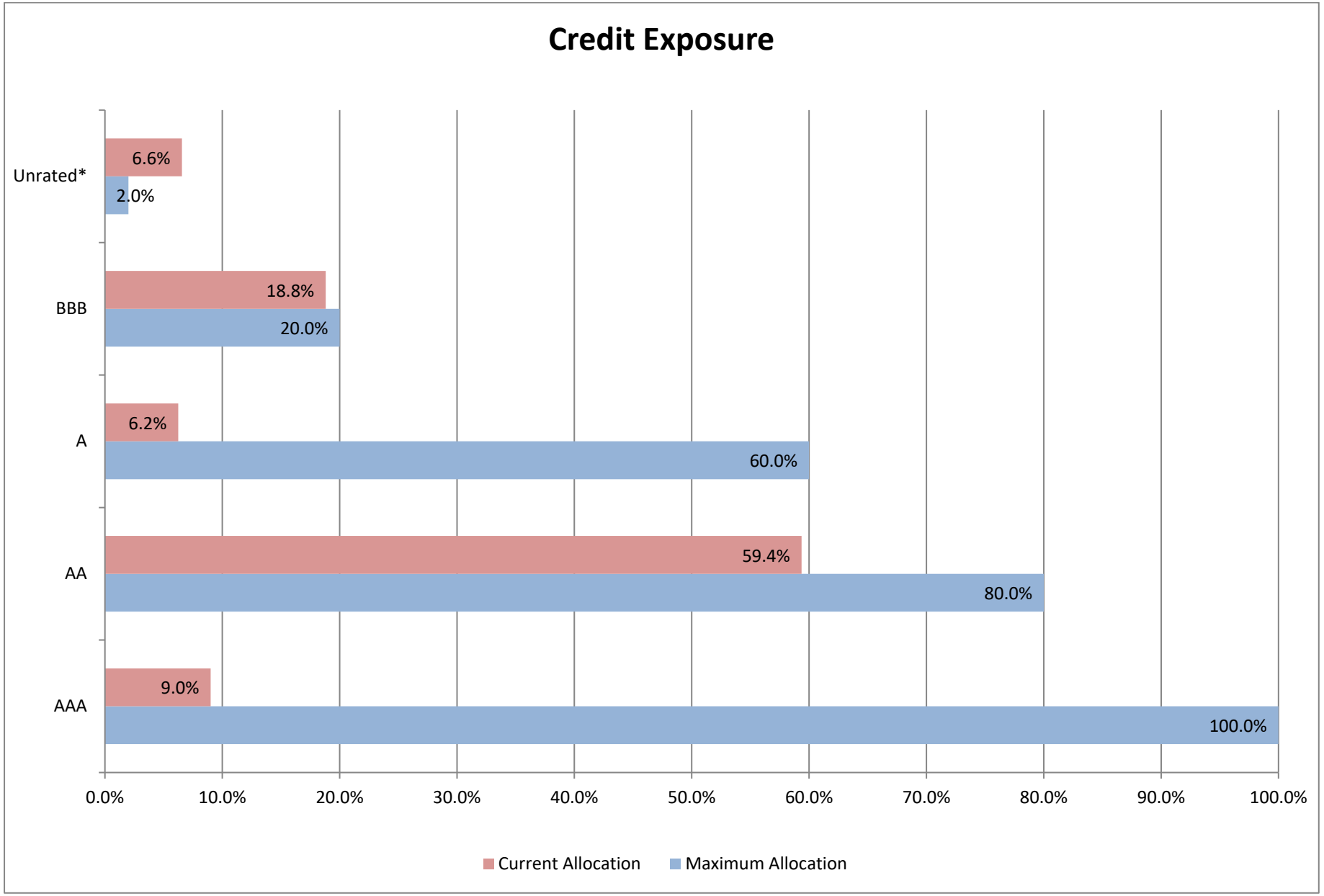
Green Investments

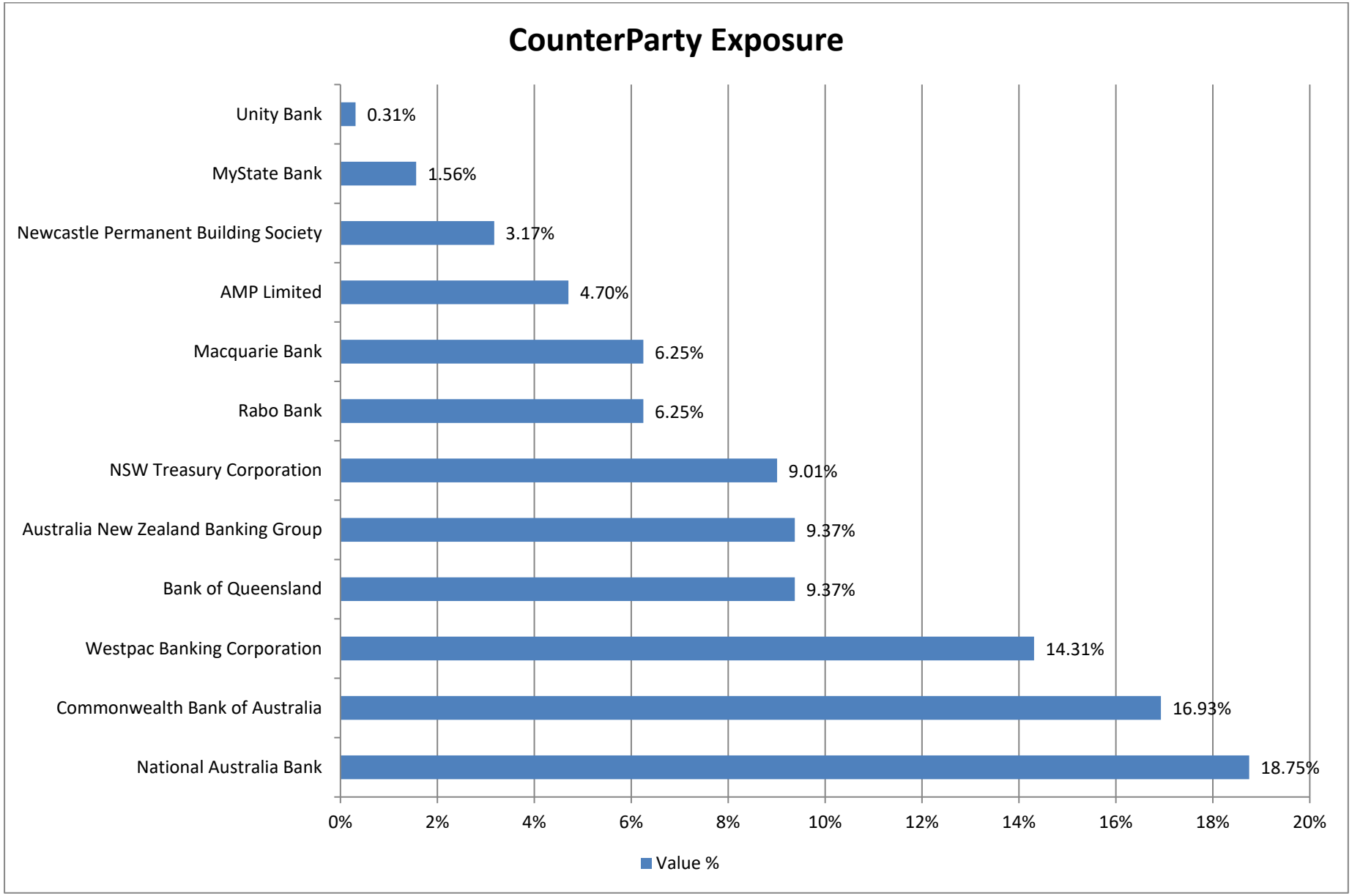
SUMMARY OF RESTRICTIONS as at 31 October 2020

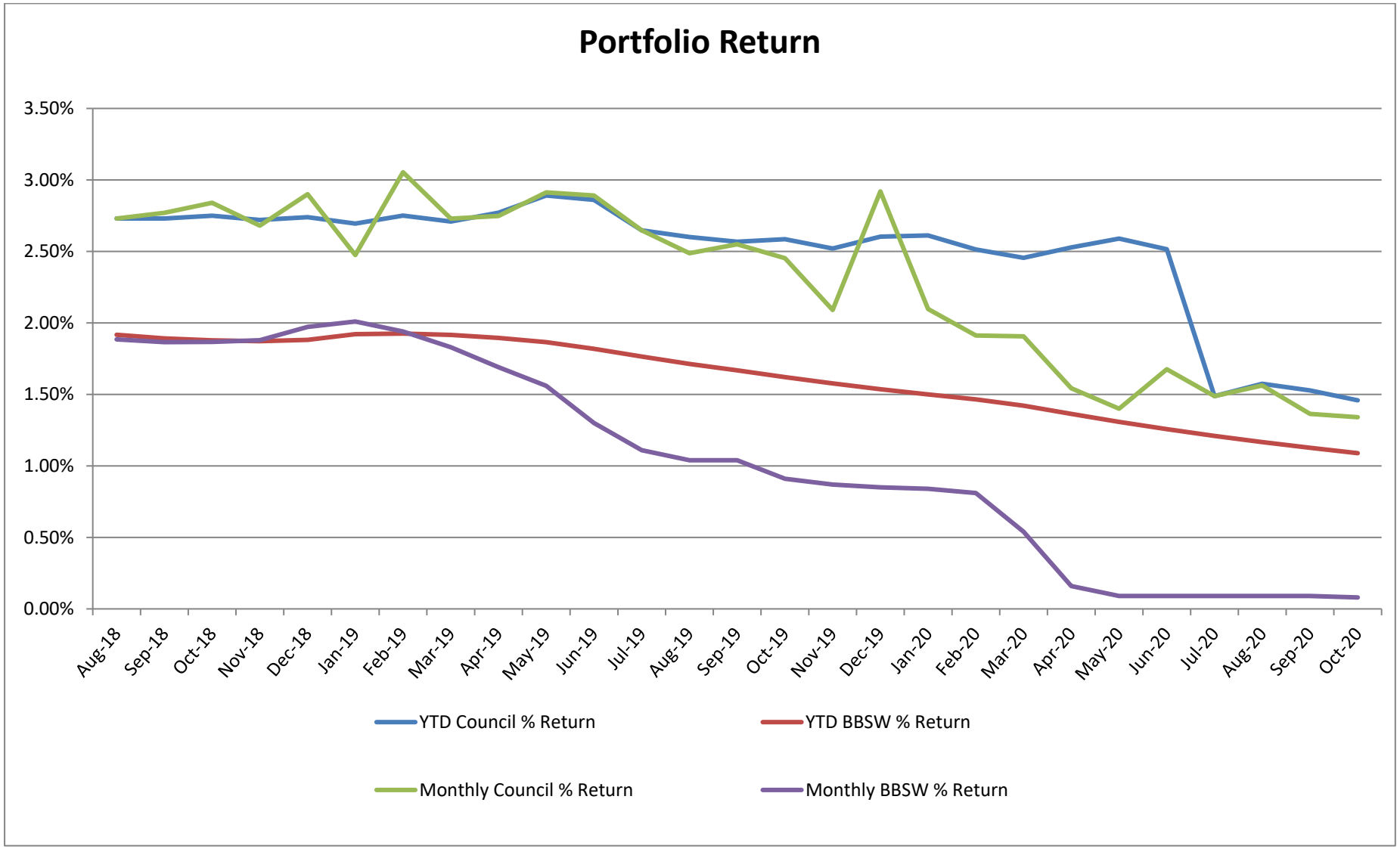
Oct-20

FUND	SOURCE	Principal Amount $'000
GENERAL FUND	Developer contributions	96,406
	Developer contributions – bonus provisions	5,429
	Developer Contributions – Sec 94A Levy	17,629
	Developer contributions – VPA	2,694
	Specific purpose unexpended grants	12,440
	Self insurance claims	6,519
	Stormwater Levy	751
	RMS Advance	776
	Holiday Parks	12,243
	Cemeteries	741
	Coastal Open Space	6,565
	Bio Banking	286
	Crown Land Business Enterprises	1,141
	Crown Land Patonga Camping Ground	860
	Other External	337
	Terrigal Tourism Special Rate Levy	0
	Tourism Special Rate	3,371
	Gosford CBD Special Rate Levy	274
	Gosford Parking Station Special Rate Levy	1,258
	The Entrance Town Centre Special Rate Levy	278
	Toukley Town Centre Special Rate Levy	187
	Wyong Town Centre Special Rate Levy	35
	TOTAL GENERAL FUND RESTRICTIONS	**170,220**
Water FUND	Developer contributions	13,448
	Developer contributions – VPA	1,049
	Specific purpose unexpended grants	3,868
	Self insurance claims	1,208
	Other External	45
	TOTAL WATER FUND RESTRICTIONS	**19,619**
SEWER FUND	Developer contributions	19,290
	Developer contributions – VPA	492
	Self insurance claims	2,027
	Specific purpose unexpended grants	179
	TOTAL SEWER FUND RESTRICTIONS	**21,988**
DRAINAGE FUND	Developer contributions	34,624
	Developer contributions – VPA	1,364
	Specific purpose unexpended grants	452
	Other External	100
	TOTAL DRAINAGE FUND RESTRICTIONS	**36,539**
DOMESTIC WASTE FUND	Specific purpose unexpended grants	0
	Domestic Waste Management	93,491
	TOTAL WASTE FUND RESTRICTIONS	**93,491**
	TOTAL EXTERNALLY RESTRICTED FUNDS	**341,857**

GENERAL FUND		110,059
Water FUND		1,026
SEWER FUND		877
DRAINAGE FUND		55
DOMESTIC WASTE FUND		0
	INTERNALLY RESTRICTED FUNDS	**112,018**


Credit Exposure
Unrated*
BBB
A
AA
AAA
6.6%
2.0%
18.8%
20.0%
6.2%
60.0%
59.4%
80.0%
9.0%
100.0%
0.0%
10.0%
20.0%
30.0%
40.0%
50.0%
60.0%
70.0%
80.0%
90.0%
100.0%
Current Allocation
Maximum Allocation


CounterParty Exposure
Unity Bank
0.31%
MyState Bank
1.56%
Newcastle Permanent Building Society
3.17%
AMP Limited
4.70%
Macquarie Bank
6.25%
Rabo Bank
6.25%
NSW Treasury Corporation
9.01%
Australia New Zealand Banking Group
9.37%
Bank of Queensland
9.37%
Westpac Banking Corporation
14.31%
Commonwealth Bank of Australia
16.93%
National Australia Bank
18.75%
0%
2%
4%
6%
8%
10%
12%
14%
16%
18%
20%
Value %


Portfolio Return
3.50%
3.00%
2.50%
2.00%
1.50%
1.00%
0.50%
0.00%
Aug-18
Sep-18
Oct-18
Nov-18
Dec-18
Jan-19
Feb-19
Mar-19
Apr-19
May-19
Jun-19
Jul-19
Aug-19
Sep-19
Oct-19
Nov-19
Dec-19
Jan-20
Feb-20
Mar-20
Apr-20
May-20
Jun-20
Jul-20
Aug-20
Sep-20
Oct-20
YTD Council % Return
YTD BBSW % Return
Monthly Council % Return
Monthly BBSW % Return

Central Coast Council

Trading Limit Report 125
Central Coast Council
As At 31 October 2020

1 Issuer Trading Limits

Issuer	Issuer Rating Group (Long Term)	Issuer Parent	Already Traded (with Issuer Group) Face Value Notional	Limit For Book or Entity	Trading Limit	Trading Limit Type	Trading Limit Value	Trading Limit Used (%)	Trading Limit Available (%)	Trading Limit Available (Value)	Trading Limit Exceeded (%)	Trading Limit Exceeded ($)
AMP Bank Ltd	BBB+ to BBB-		15,053,451.70	Book	10.00	% of 316,925,932.69	31,692,593.27	48.00	52.00	16,639,142	0.00	0
ANZ Banking Group Ltd	AA+ to AA-		30,000,000.00	Book	20.00	% of 316,925,932.69	63,385,186.54	47.00	53.00	33,385,187	0.00	0
Bank of Melbourne	AA+ to AA-	Westpac Banking Corporation Ltd	45,797,480.99	Book	20.00	% of 316,925,932.69	63,385,186.54	72.00	28.00	17,587,706	0.00	0
Bank of Queensland Ltd	A+ to A-		30,000,000.00	Book	20.00	% of 316,925,932.69	63,385,186.54	47.00	53.00	33,385,187	0.00	0
BankSA	AA+ to AA-	Westpac Banking Corporation Ltd	45,797,480.99	Book	20.00	% of 316,925,932.69	63,385,186.54	72.00	28.00	17,587,706	0.00	0
BankWest Ltd	AA+ to AA-	Commonwealth Bank of Australia Ltd	54,170,000.00	Book	20.00	% of 316,925,932.69	63,385,186.54	85.00	15.00	9,215,187	0.00	0
Commonwealth Bank of Australia Ltd	AA+ to AA-		54,170,000.00	Book	20.00	% of 316,925,932.69	63,385,186.54	85.00	15.00	9,215,187	0.00	0
Macquarie Bank	A+ to A-		20,000,000.00	Book	20.00	% of 316,925,932.69	63,385,186.54	32.00	68.00	43,385,187	0.00	0
MyState Bank Ltd	BBB+ to BBB-		5,000,000.00	Book	10.00	% of 316,925,932.69	31,692,593.27	16.00	84.00	26,692,593	0.00	0
National Australia Bank Ltd	AA+ to AA-		60,000,000.00	Book	20.00	% of 316,925,932.69	63,385,186.54	95.00	5.00	3,385,187	0.00	0
Newcastle Permanent Building Society Ltd	BBB+ to BBB-		10,000,000.00	Book	10.00	% of 316,925,932.69	31,692,593.27	32.00	68.00	21,692,593	0.00	0
NSW Treasury Corporation	AAA		25,905,000.00	Book	100.00	% of 316,925,932.69	316,925,932.69	8.00	92.00	291,020,933	0.00	0
Rabobank Australia Ltd	AA+ to AA-		20,000,000.00	Book	20.00	% of 316,925,932.69	63,385,186.54	32.00	68.00	43,385,187	0.00	0
St George Bank Limited	AA+ to AA-	Westpac Banking Corporation Ltd	45,797,480.99	Book	20.00	% of 316,925,932.69	63,385,186.54	72.00	28.00	17,587,706	0.00	0
Unity Bank Limited	N/R		1,000,000.00	Book	2.00	% of 316,925,932.69	6,338,518.65	16.00	84.00	5,338,519	0.00	0
Westpac Banking Corporation Ltd	AA+ to AA-		45,797,480.99	Book	20.00	% of 316,925,932.69	63,385,186.54	72.00	28.00	17,587,706	0.00	0
			508,488,375.66				1,115,579,283.07			607,090,913		0
		(Excluding Parent Group Duplicates)	316,925,932.69									

Central Coast Council

Trading Limit Report 125
Central Coast Council
As At 31 October 2020

2 Security Rating Group Trading Limits

Security Rating Group	Already Traded Face Value Notional	Limit For Book or Trading Entity	Trading Limit	Trading Limit Type	Trading Limit Value	Trading Limit Used (%)	Trading Limit Available (%)	Trading Limit Available (Value)	Trading Limit Exceeded (%)	Trading Limit Exceeded ($)
AAA	25,905,000.00	Book	100.00	% of 316,925,932.69	316,925,932.69	8.00	92.00	291,020,933	0.00	0
AA+ to AA-	209,967,480.99	Book	80.00	% of 316,925,932.69	253,540,746.15	83.00	17.00	43,573,265	0.00	0
A+ to A-	50,000,000.00	Book	60.00	% of 316,925,932.69	190,155,559.61	26.00	74.00	140,155,560	0.00	0
BBB+ to BBB-	30,053,451.70	Book	20.00	% of 316,925,932.69	63,385,186.54	47.00	53.00	33,331,735	0.00	0
N/R	1,000,000.00	Book	2.00	% of 316,925,932.69	6,338,518.65	16.00	84.00	5,338,519	0.00	0
	316,925,932.69				830,345,943.65			513,420,012		0

Notes
1. The above rating groups are actually based upon the issuer's long term rating rather than the ratings associated with each security.

Central Coast Council

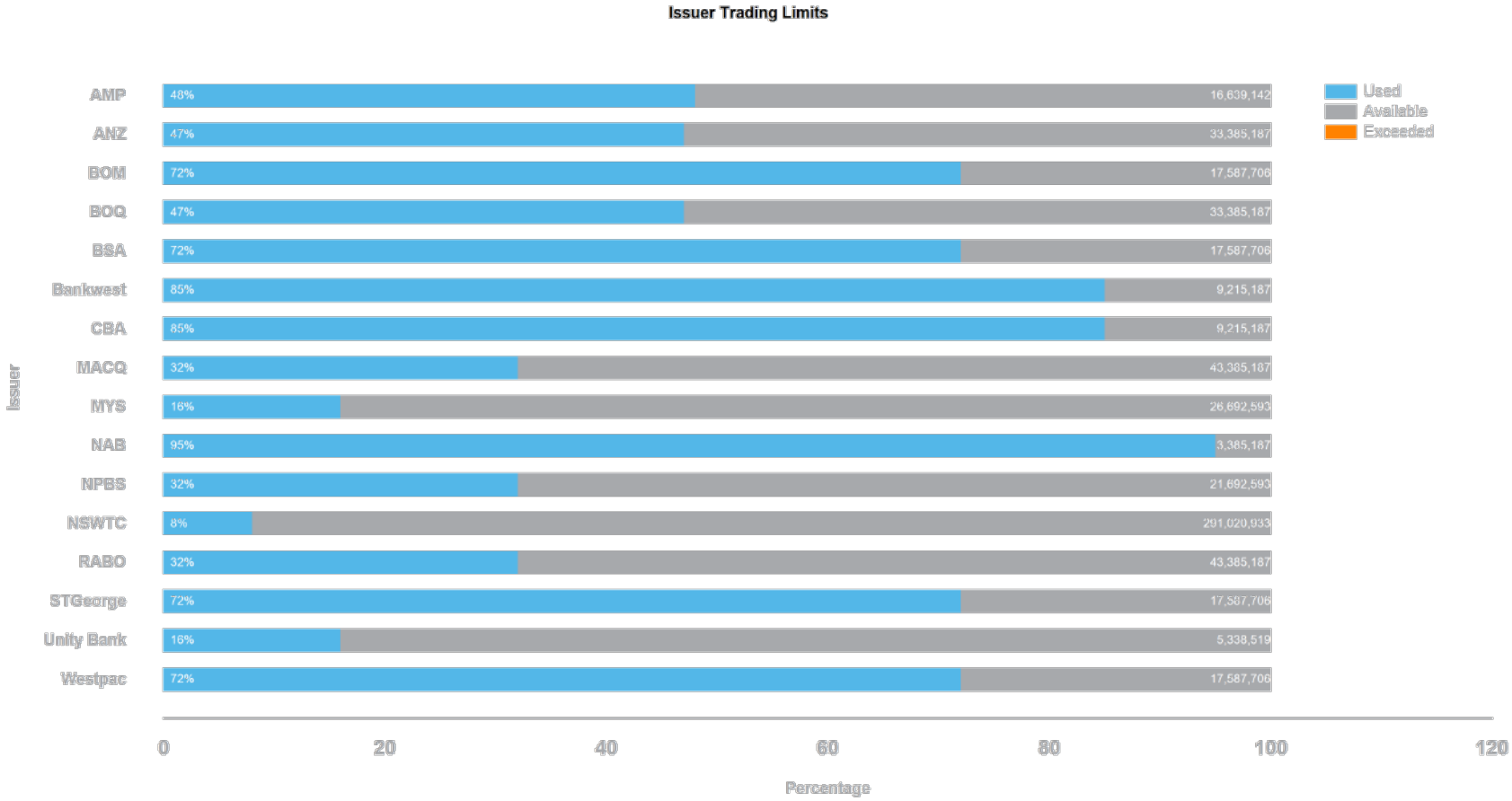
Trading Limit Report 125
Central Coast Council
As At 31 October 2020

3 Term Group Trading Limits

Term Group	Already Traded Face Value Notional	Limit For Book or Trading Entity	Trading Limit	Trading Limit Type	Trading Limit Value	Trading Limit Used (%)	Trading Limit Available (%)	Trading Limit Available (Value)	Trading Limit Exceeded (%)	Trading Limit Exceeded ($)
0-1 Year	234,925,932.69	Book	100.00	% of 316,925,932.69	316,925,932.69	74.00	26.00	82,000,000	0.00	0
1-3 Year	30,000,000.00	Book	70.00	% of 316,925,932.69	221,848,152.88	14.00	86.00	191,848,153	0.00	0
3-5 Year	37,000,000.00	Book	40.00	% of 316,925,932.69	126,770,373.08	29.00	71.00	89,770,373	0.00	0
5+ Year	15,000,000.00	Book	5.00	% of 316,925,932.69	15,846,296.63	95.00	5.00	846,297	0.00	0
	316,925,932.69				681,390,755.28			364,464,823		0

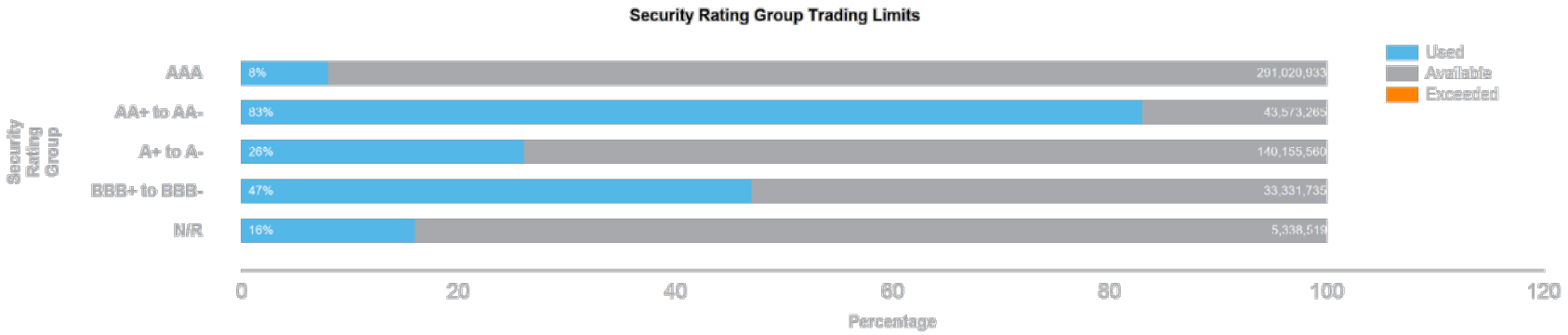
Central Coast Council

Trading Limit Report 125
Central Coast Council
As At 31 October 2020



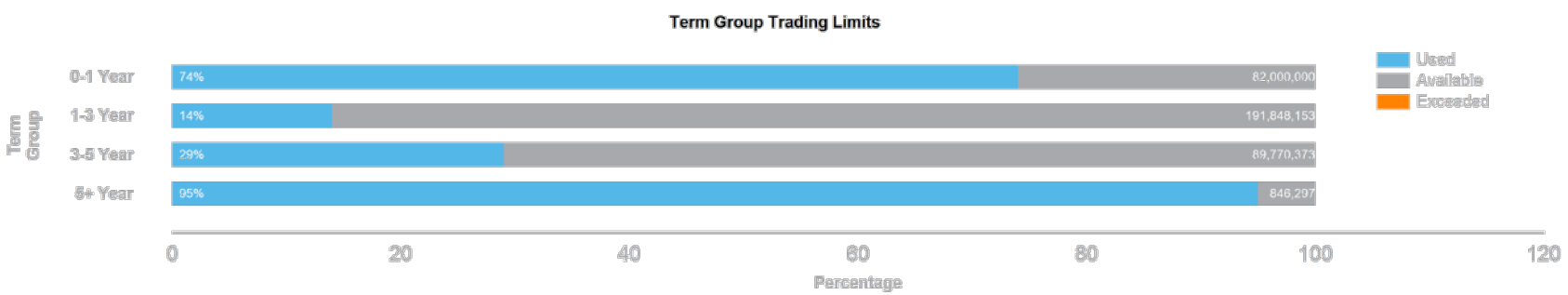
Central Coast Council

Trading Limit Report 125
Central Coast Council
As At 31 October 2020



Central Coast Council

Trading Limit Report 125
Central Coast Council
As At 31 October 2020



Central Coast Council

Trading Limit Report 125
Central Coast Council
As At 31 October 2020

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Report Code: TSSIP125EXT-00.16
Report Description: Trading Limit Performance As At Date
Parameters:
As At/Scenario Date: 31 October 2020
Balance Date: 17 November 2020 (not 31 Oct 2020 used instead)
Trading Entity: Central Coast Council
Trading Book: Central Coast Council
Report Mode: BidOnly
Using Face Value
Trading Entity and Book Limits
Effects of Parent/Child Issuers Not Ignored
Issuer Long Term Rating Group Used Instead of Security Rating Group
Hide Zero Holdings

Central Coast Council

Portfolio Valuation Report
Central Coast Council
As At 31 October 2020

	Fixed Interest Security	ISIN	Face Value Original	Bond Factor	Face Value Current	Capital Price	Accrued Interest Price	Market Value	% Total Value	Running Yield	Weighted Running Yield
At Call Deposit											
	AMP At Call		10,053,451.70	1.00000000	10,053,451.70	100.000	0.000	**10,053,451.70**	3.13%	0.95%	
	CBA At Call		34,170,000.00	1.00000000	34,170,000.00	100.000	0.000	**34,170,000.00**	10.65%	0.05%	
	Westpac At Call		15,797,480.99	1.00000000	15,797,480.99	100.000	0.000	**15,797,480.99**	4.92%	0.45%	
			60,020,932.69		60,020,932.69			**60,020,932.69**	18.70%		0.31%
Fixed Rate Bond											
	NSWTC 1.25 20 Mar 2025 Fixed	AU3SG0002025	2,000,000.00	1.00000000	2,000,000.00	104.077	0.138	**2,084,300.00**	0.65%	1.25%	
	NSWTC 3 15 Nov 2028 Fixed	AU3SG0001878	15,000,000.00	1.00000000	15,000,000.00	117.555	1.378	**17,839,950.00**	5.56%	3.00%	
			17,000,000.00		17,000,000.00			**19,924,250.00**	6.21%		2.79%
Floating Rate Deposit											
	Westpac 0.82 26 Nov 2021 1096DAY FRD		5,000,000.00	1.00000000	5,000,000.00	100.000	0.148	**5,007,413.70**	1.56%	0.82%	
	Westpac 0.93 27 Nov 2023 1827DAY FRD		5,000,000.00	1.00000000	5,000,000.00	100.000	0.166	**5,008,280.80**	1.56%	0.93%	
			10,000,000.00		10,000,000.00			**10,015,694.50**	3.12%		0.88%
Floating Rate Note											
	NPBS 1.65 24 Jan 2022 FRN	AU3FN0034021	10,000,000.00	1.00000000	10,000,000.00	101.506	0.019	**10,152,500.00**	3.16%	1.71%	
			10,000,000.00		10,000,000.00			**10,152,500.00**	3.16%		1.71%
Term Deposit											
	AMP 1.4 14 Jun 2022 728DAY TD		5,000,000.00	1.00000000	5,000,000.00	100.000	0.525	**5,026,273.95**	1.57%	1.40%	
	ANZ 0.66 12 Jan 2021 130DAY TD		10,000,000.00	1.00000000	10,000,000.00	100.000	0.103	**10,010,306.80**	3.12%	0.66%	
	ANZ 0.66 19 Jan 2021 119DAY TD		10,000,000.00	1.00000000	10,000,000.00	100.000	0.071	**10,007,052.10**	3.12%	0.66%	
	ANZ 0.68 22 Feb 2021 153DAY TD		10,000,000.00	1.00000000	10,000,000.00	100.000	0.073	**10,007,265.80**	3.12%	0.68%	
	BOQ 1.75 26 Aug 2021 728DAY TD		10,000,000.00	1.00000000	10,000,000.00	100.000	0.302	**10,030,205.50**	3.13%	1.75%	
	BOQ 2 26 Sep 2024 1827DAY TD		10,000,000.00	1.00000000	10,000,000.00	100.000	0.192	**10,019,178.10**	3.12%	2.00%	
	BOQ 1.53 16 Jun 2025 1826DAY TD		10,000,000.00	1.00000000	10,000,000.00	100.000	0.574	**10,057,427.40**	3.13%	1.53%	
	CBA 0.64 07 Apr 2021 180DAY TD		10,000,000.00	1.00000000	10,000,000.00	100.000	0.039	**10,003,857.50**	3.12%	0.64%	
	CBA 0.64 21 Apr 2021 194DAY TD		10,000,000.00	1.00000000	10,000,000.00	100.000	0.039	**10,003,857.50**	3.12%	0.64%	
	MACQ 0.5 06 Nov 2020 91DAY TD		10,000,000.00	1.00000000	10,000,000.00	100.000	0.116	**10,011,643.80**	3.12%	0.50%	
	MACQ 0.8 12 Oct 2021 456DAY TD		10,000,000.00	1.00000000	10,000,000.00	100.000	0.241	**10,024,109.60**	3.12%	0.80%	
	MYS 1.5 04 Mar 2021 363DAY TD		5,000,000.00	1.00000000	5,000,000.00	100.000	0.982	**5,049,109.60**	1.57%	1.50%	
	NAB 0.58 16 Nov 2020 91DAY TD		10,000,000.00	1.00000000	10,000,000.00	100.000	0.119	**10,011,917.80**	3.12%	0.58%	
	NAB 2.8 10 Dec 2020 1093DAY TD		5,000,000.00	1.00000000	5,000,000.00	100.000	2.478	**5,123,890.40**	1.60%	2.80%	
	NAB 0.55 25 Jan 2021 132DAY TD		5,000,000.00	1.00000000	5,000,000.00	100.000	0.069	**5,003,465.75**	1.56%	0.55%	
	NAB 0.5 29 Mar 2021 182DAY TD		10,000,000.00	1.00000000	10,000,000.00	100.000	0.045	**10,004,520.50**	3.12%	0.50%	
	NAB 0.5 04 May 2021 210DAY TD		10,000,000.00	1.00000000	10,000,000.00	100.000	0.034	**10,003,424.70**	3.12%	0.50%	
	NAB 0.41 18 May 2021 218DAY TD		10,000,000.00	1.00000000	10,000,000.00	100.000	0.021	**10,002,134.20**	3.12%	0.41%	
	NAB 1.15 14 Jun 2024 1459DAY TD		10,000,000.00	1.00000000	10,000,000.00	100.000	0.432	**10,043,164.40**	3.13%	1.15%	
	NSWTC 0.84 04 May 2021 365DAY TD		8,098,000.00	1.00000000	8,098,000.00	100.000	0.414	**8,131,545.72**	2.53%	0.84%	

Portfolio Valuation Report
Central Coast Council
As At 31 October 2020

	Fixed Interest Security	ISIN	Face Value Original	Bond Factor	Face Value Current	Capital Price	Accrued Interest Price	Market Value	% Total Value	Running Yield	Weighted Running Yield
	NSWTC 1 04 Jun 2021 365DAY TD		807,000.00	1.00000000	807,000.00	100.000	0.408	**810,294.33**	0.25%	1.00%	
	RABO 2.92 05 Jul 2021 1095DAY TD		10,000,000.00	1.00000000	10,000,000.00	100.000	0.936	**10,093,600.00**	3.14%	2.92%	
	RABO 3.18 12 Dec 2022 1825DAY TD		10,000,000.00	1.00000000	10,000,000.00	100.000	2.814	**10,281,408.20**	3.20%	3.18%	
	Unity Bank 1.65 15 Feb 2021 366DAY TD		1,000,000.00	1.00000000	1,000,000.00	100.000	1.171	**1,011,708.22**	0.32%	1.65%	
	Westpac 2.9 10 Dec 2020 1093DAY TD		10,000,000.00	1.00000000	10,000,000.00	100.000	0.405	**10,040,520.50**	3.13%	2.90%	
	Westpac 3.06 21 Jun 2021 1096DAY TD		10,000,000.00	1.00000000	10,000,000.00	100.000	0.335	**10,033,534.20**	3.13%	3.06%	
			219,905,000.00		219,905,000.00			**220,845,416.57**	68.81%		1.32%
Fixed Interest Total			316,925,932.69		316,925,932.69			**320,958,793.76**	100.00%		1.21%

Central Coast Council

Portfolio Valuation Report
Central Coast Council
As At 31 October 2020

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Report Code: TBSHP100EXT-01.16
Report Description: Portfolio Valuation As At Date
Parameters:
Term Deposit Interest Included
Cash Included

Item No: 3.1

Title: Artificial Reefs

Department: Environment and Planning

30 November 2020 Ordinary Council Meeting

Reference: F2020/00039 - D14235813

Author: Ben Fullagar, Section Manager, Coastal Protection

Manager: Luke Sulkowski, Unit Manager, Environmental Management

Executive: Scott Cox, Director Environment and Planning

Report purpose

To provide an information report as resolved by Council on the findings from Gold Coast City Council and other stakeholders on the performance of artificial reefs to provide coastal protection and recreational benefits, and the potential benefit for Central Coast beaches.

Executive Summary

Gold Coast City Council has an extensive array of coastal management measures in place and artificial reefs are just one part of their 'Ocean Beaches Strategy 2013-2023'. The two artificial reefs at Narrowneck and Palm Beach work in conjunction with and compliment the other coastal management measures such as seawalls, groynes and sand nourishment of the beaches.

Studies of artificial reefs around the world have indicated that they often don't meet all of the intended objectives, they require detailed site specific studies and take many years to plan and execute.

The potential benefit of artificial reefs on New South Wales beaches, including the Central Coast, is likely to be limited due to a varied wave climate and direction, high cost compared to other coastal protection measures, limited ability to protect large lengths of coastline unless installed in series and a coastline already rich in natural surfing breaks. Multi-purpose reefs as an instrument of coastal protection for the Central Coast are therefore not considered to be a suitable solution to coastal protection due to the inherent cost and low certainty of success in the Central Coast's coastal landscape.

Council has commenced development of a new Coastal Management Program(CMP) for the Open Coastal and Coastal Lagoons. Council is required to follow the steps outlined in the Coastal Management Manual in development of the CMP. All appropriate and feasible actions to address identified coastal management issues will be evaluated during Stage 3 of this process. The stage specifically requires evaluation of each options feasibility, viability and acceptability to stakeholders to identify the preferred and optimal solution to the specific coastal management issue. This may include consideration of artificial reefs and sand nourishment where they are an appropriate solution to the location specific coastal management issue.

Environment and Planning Recommendation

That Council receive and note the report on Artificial Reefs.

Background

Council resolved on the 10 August 2020:

761/20 That Council via the Chief Executive Officer seek findings/report from Gold Coast Council and other stakeholders regarding the performance of artificial reefs in providing beach protection and any additional economic and social benefits from increased surfing, fishing, kayaking, diving measures that may be of benefit to coastal erosion issues on the Central Coast.

762/20 The Council notes that to receive any Government grant funding for potential artificial reefs they must be defined in the Coastal Management Plan due by the end of 2021.

763/20 That staff together with stakeholders include artificial reefs and sand nourishment under stage 3 when evaluating options to be included in the Coastal Management Plan.

This report addresses resolution 761/20.

Gold Coast City Council's use of Artificial Reefs

Discussions between Central Coast Council staff and Gold Coast City Council staff have so far indicate that the Gold Coast has an extensive array of coastal management measures in place and artificial reefs are just one part of their 'Ocean Beaches Strategy 2013-2023'.

The Gold Coast City Council's strategy includes the following:

- The 'A-line' terminal protection rock revetment seawall,
- Rock groynes,
- Tweed River Sand By-pass System and nourishment using dredged sand (with NSW Government),
- Sand nourishment using off shore sand sources,
- Sand By-pass system at Gold Coast Seaway,
- Coastal Dune Management,
- Dredging of a number of creek entrances and nourishment of nearby beaches,
- Narrowneck Artificial Reef,
- Palm Beach Artificial Reef

From discussions with Gold Coast City Council staff and review of the information contained on the Gold Coast City Council website the two artificial reefs work in conjunction with, and

compliment the other coastal management measures such as seawalls, groynes and sand nourishment of the beaches.

The Narrowneck multipurpose artificial reef was primarily built to protect the vulnerable, exposed and narrow stretch of foreshore whilst also appreciating the importance of surfing on the Gold Coast and subsequently surfing amenity was also considered in the design. Comprised of approximately 400 geotextile sand containers, it was the largest MPR in the world when it was initially constructed in 1999. A review by the University of NSW - Water Research Laboratory (See attachment 1, (Blacka et al. (2013)) considered the structure to be only a "minor" success at achieving its primary and secondary objectives, being coastal protection and surfing enhancement respectively. This may in part be attributed to the fact that the crest height was lowered from the 'theoretical design' crest level due to safety concerns. Nonetheless, others suggest it has "improved" surf quality, achieved its specific design objectives and that the environmental benefits were greater than expected (See attachment 1, (Jackson, 2005)). These reviews were undertaken prior to a renewal project however, which saw the addition of a total of 84 mega geotextile bags placed around the structure over a 10-month period and completed in 2018.

The Palm Beach shoreline project included construction of a 160m long, 80m wide underwater artificial reef and implemented in conjunction with a sand nourishment program (stabilised by the reef) to enhance coastal protection. This option was favoured largely due to its low visual impact and the long-term retainment of nourished sand. The 180m long, 80m wide artificial reef was constructed using 60,000 tonnes of rock and was completed in September 2019 at a cost of $18.2 million. Long term effectiveness of the structure is not yet known.

Potential Application for New South Wales and Central Coast

Application of submerged constructed reefs and multi-purpose reefs to address coastal management issues are often favoured within the community due to the perception of the potential benefits outweighing the limitations. However, the success of MPRs in NSW seeking to achieve multiple objectives, such as combining both surfing enhancement and protection measures, are likely to be limited due to a number of factors, including:

- NSW has a tidal range of approximately 1.5m and a multi-directional wave climate with a wide wave height and period distribution. To accommodate surfing as a design objective the cross-shore dimension of a MPR has to be large enough to allow proper wave pre-conditioning under a range of wave and tidal conditions. This makes structures relatively cost-inefficient at protecting any significant stretch of coast, unless used in series (which is expensive compared to other protection options);

- Most sections of the NSW coast are relatively rich in high quality natural surf breaks, resulting in high community expectations if surfing is a primary design objective; and

- Safety concerns for the various reef users results in reef designs that are not optimum for coastal protection or surfing.

These limitations, however, may be overcome by designing SCRs to address only a single objective so that optimal performance can be achieved. Generally, for coastal protection purposes, the structures would need to be raised above the water level (emergent) but to improve surfing amenity they would need to be submerged. Consequently, this example highlights the difficulty in attempting to meet multiple objectives and that attempting to combine the objectives often leads to suboptimal outcomes for each.

Additionally, it is expected that sea level rise will also reduce the effectiveness of such structures over time or that they will require additional maintenance to top up the structures and maintain the desired level of service. Safety aspects also require careful consideration. The key risks associated with artificial reefs include the potential for impact between watercraft users and the structure, people becoming trapped underwater due to gaps in the structure, drownings due to the formation of unnatural currents and rips, dangerous marine organisms and conflicts occurring between different user groups.

Installation of large-scale coastal protection structures, such as artificial reefs, is a long and complicated process. They must be considered within the NSW coastal management framework and any designs would need to be determined on its merits under the planning system. Environmental approvals also become complex in situations such as these where you are explicitly attempting to alter the natural coastal processes through the construction of an offshore structure. Multi-purpose reefs as an instrument of coastal protection for the Central Coast are therefore not considered to be a suitable solution to coastal protection due to the inherent cost and low certainty of success in the Central Coast's coastal landscape.

The development of the new Coastal Management Programs (CMPs) is underway with Stage 1: Scoping Study currently being prepared for the Open Coast and Coastal Lagoons CMP. Staff are required to follow the stages outlined in the Coastal Management Manual prepared by the NSW Government. This includes consultation with the community enabling all stakeholders to participate in long term coastal management for the Central Coast, including Wamberal and The Entrance North beaches.

All appropriate and feasible actions to address identified coastal management issues will be evaluated during Stage 3 of this process. The stage specifically requires evaluation of each options feasibility, viability and acceptability to stakeholders to identify the preferred and optimal solution to the specific coastal management issue. This may include consideration of artificial reefs and sand nourishment where they are an appropriate solution to the location specific coastal management issue.

Consultation

The development of the new Coastal Management Program (CMP) for the Open Coast and Coastal Lagoons is required to be developed in accordance with the steps in the Coastal Management Manual. This will include consultation with the community enabling all

stakeholders to participate in long term coastal management for the Central Coast. Consultation is planned throughout 2021.

Financial Considerations

At its meeting held 19 October 2020, Council resolved the following:

> *1036/20 That any motions put before Council for the remainder of this term of Council that have financial implications require the Chief Executive Officer to provide a report on how those additional costs will be met.*

The following statement is provided in response to this resolution of Council.

There are no financial implications arising from the recommendations of this information report. As outlined the development of Coastal Management Programs has commenced with Stage 1 Scoping Study underway for the Open Coastal and Coastal Lagoons. In developing the CMP, Council is required to follow the steps outlined in the Coastal Management Manual and protection options such as artificial reefs and sand nourishment may be considered at that time.

Link to Community Strategic Plan

Theme 3: Green

Goal F: Cherished and protected natural beauty

F1: Protect our rich environmental heritage by conserving beaches, waterways, bushland, wildlife corridors and inland areas, ant the diversity of local native species.

Attachments

1 Artificial Reefs around the world D14296323

Artificial Reefs around the world

Artificial reefs are manmade structures with a single intended purpose and are typically located nearshore in depths ranging from 2 to 10 metres. They're usually submerged during most tides to minimise the visual impacts. Artificial reefs intended to achieve multiple objectives, such as coastal erosion protection, marine habitat enhancement, recreational amenity (surfing, diving, fishing), are commonly referred to as multi-purpose reefs (MPR). They are commonly constructed from rock/rubble, geotextile containers (including sand filled geotextile bags), pre-cast concrete units or other 'materials of opportunity'. Each construction material affords a range of different advantages, limitations and potential applications.

Mariani et al. (2015) undertook an international review of emerging technologies to manage beach erosion and documented the following key findings regarding artificial reefs:

- Of the 26 artificial reefs reviewed, 19 were intended to provide coastal protection as a primary objective. Approximately half of these structures had no significant accretionary impact on shoreline alignment compared to the predicted morphological response.
- Six artificial reefs were constructed with the primary objective of improving 'surfability' and at least half of these were considered unsuccessful.
- Where monitored, enhancement of marine colonisation and biodiversity was reported at all structures.
- Settlement and local scouring was observed at most artificial reefs. This affected the structure stability and intended performance, which often led to maintenance works and top up costs.

Blacka et al. (2013, Water Research Laboratory Technical Report 2012/08) undertook a comprehensive review of the potential use of submerged artificial reefs for coastal protection in New South Wales. The review examined existing submerged constructed reefs (SCR) around the world with the following terminology used in the report to describe the different types of submerged constructed reef (SCR):

- **Artificial Reef:** artificial reef structure, typically submerged during most tides, with a single intended purpose. This may be to improve surfing amenity, enhancing marine habitat or for coastal protection.
- **Multi-Purpose Reef** (MPR): artificial reef structure, typically submerged during most tides, with multiple objectives.
- **Submerged Breakwater**: a submerged artificial structure, detached from the shoreline and intended primarily to reduce wave climate in the structures lee (typically for coastal protection) and accrete sand in its lee.

The report concludes:

- Of the thirty-two (32) SCR structures reviewed, twenty-nine (29) were intended to provide coastal protection as a primary or secondary objective;
- Approximately half of the "protection" structures (29) had no significant accretionary impact on shoreline alignment compared to the predicted morphological response;

- 55% of submerged breakwaters were successful at providing increased coastal protection, though not all to the degree initially predicted; (It is noted this is as expected due to the primary objective of reducing the wave climate in the lee of the structure.)
- One of the five multi-purpose reefs (MPR) may be providing a reasonable level of coastal protection but this structure has only been monitored for two to three years. Three other MPRs provide only minor or negligible coastal protection compared to design, and the performance of the newest MPR (Borth, Wales, United Kingdom) is yet to be determined;
- Eight artificial reefs were constructed with the objective of improving surfability and approximately half of there were considered at least partially successful;
- The resulting shoreline morphology behind reef structures often differed significantly from the design predictions, even when the best available design methods were applied;
- Most structures settled and/or suffered from localised scour which resulted in an actual crest level which differed from that specified by design and subsequently led to further maintenance and top up costs or under performance; and
- Approximate construction costs (in 2012 dollars) per lineal metre of coastline protected were in the order of $1,500 to $5,500 for submerged 'reef' breakwater type structures and $7,000 to $10,000 for MPR structures, compared with $5,000 to $10,000 for a high-quality engineered seawall on the open NSW coast. The relatively high wave climate of the NSW coast is likely to further increase the construction costs of the offshore structures relative to the precedent structures located in milder climates.

(Note for reference, in today's dollars the typical cost of a seawall on the NSW open cost is in the order of $20,000 per lineal metre.)

Jackson, (2005) in reviewing the monitoring of Narrowneck Reef summarised:

- The Narrowneck Reef is successful as a multi-functional reef and has achieved its specific design objectives as well as environmental benefits that were much greater than expected.
- The number of surfers at Narrowneck has increased and surf quality has been "improved".
- Monitoring is invaluable and a number of design changes have been able to be implemented.
- The size and cost of Narrowneck reef could be reduced significantly and the next generation of multipurpose reef design based on Narrowneck and El Segundo reef data has been proposed for Palm Beach on the Gold Coast and Moonlight Beach and Sth. Carlsbad State Beach in California.
- Safety is a key concern in multi-purpose reefs that involves compromises in design.
- Wave conditions at locations such as Narrowneck vary considerably and it may not be practical or desirable to try to cater for all conditions.
- "Surfing" encompasses a wide and diverse range of activities and skill levels.
- There is a difference between surfing as recreation and surfing as a sport.
- The expectations of many of the general surfing public were that Narrowneck reef would produce "perfect" waves 24/7/52 regardless of wind and wave conditions.
- There is no "perfect" wave for all surfers and surfcraft. (Jackson et al 2001)

- Simple changes in the seabed can enhance surfing conditions and very tight tolerances are not necessary for construction of a recreational surfing reef.
- Confidence in using numerical models for submerged reef design is low and numerical models should only be used as coarse tuning tools.
- Surfing reefs are viable and can be constructed at reasonable cost using simple design and construction techniques.
- Surfing and coastal protection can be combined successfully but the culture of surf localism and surf rage makes construction of any structure with surfing implications difficult.

References:

- Blacka, M. J., Shand, T. D., Carley, J. T., & Mariani, A. (2013). A Review of Artificial Reefs for Coastal Protection in NSW.
- Jackson, L. A., Tomlinson, R., Turner, I., Corbett, B., d'Agata, M., & McGrath, J. (2005). Narrowneck artificial reef; results of 4 yrs monitoring and modifications. In *Proceedings of the 4th International Surfing Reef Symposium*
- Mariani, A., Carley, J. T., Lord, D. B., Turner, I. L., & Cox, R. J. (2015). International Review of Emerging Technologies to Manage Beach Erosion: Do They Really Work?

Item No:	3.2
Title:	Meeting Record of the Coastal Open Space System (COSS) Committee Meeting held on 20 October 2020
Department:	Environment and Planning

30 November 2020 Ordinary Council Meeting

Reference:	F2018/00099 - D14292709
Manager:	Luke Sulkowski, Unit Manager, Environmental Management
Executive:	Scott Cox, Director Environment and Planning

Report purpose

To receive the Meeting Record of the Coastal Open Space System (COSS) Committee Meeting held 20 October 2020 for the information of Council.

Executive Summary

The Coastal Open Space System Committee held a meeting on 20 October 2020. The Meeting Record of that meeting is attached for the information of Council. There are no recommendations for Council.

Environment and Planning Recommendation

That Council receive the report on Meeting Record of the Coastal Open Space System (COSS) Committee meeting held 20 October 2020.

Background

The Coastal Open Space System Committee held a meeting on 20 October 2020. The Meeting Record of that meeting is Attachment 1 to this report.

There are no recommendations for Council. The Meeting Record is being reported for information only in accordance with the Terms of Reference.

Financial Considerations

At its meeting held 19 October 2020, Council resolved the following:

> *1036/20 That any motions put before Council for the remainder of this term of Council that have financial implications require the Chief Executive Officer to provide a report on how those additional costs will be met.*

The following statement is provided in response to this resolution of Council.

There are no financial implications associated with any discussions or actions resulting from this meeting.

Link to Community Strategic Plan

Theme 4: Responsible

Goal G: Good governance and great partnerships

R-G3: Engage with the community in meaningful dialogue and demonstrate how community participation is being used to inform decisions.

Attachments

1 COSS Committee Meeting Record - 20 October 2020 D14292657

Coastal Open Space System (COSS) Committee Meeting Record 20 October 2020

Location:	Zoom Meeting	
Date:	20 October 2020	
Time	Started at: 3.02pm	Closed at: 4.53pm
Chair	Councillor Jane Smith	
File Ref	F2018/00099	

Present:
Councillor Chris Holstein, Councillor Jane Smith, John Andrews, Deb Holloman (arrived 3.10pm), Paul Links, Douglas Williamson, Barbara Wills

External Representatives present:
Steve Atkins – NPWS Central Coast Area Manager, David Green – Local Land Services (Greater Sydney)

Council Staff present:
Luke Sulkowski – Unit Manager Environmental Management, Larry Melican – Section Manager Natural Assets and Biodiversity, Dr Anumitra Mirti – Section Manager Environmental Strategies (arrived 3.05pm), Kelly Drover – Advisory Group Support Officer

Item 1 Welcome, Apologies and Acknowledgement of Country

Apologies received: Councillor Jeff Sundstrom, David Holland, Scott Cox – Director Environment and Planning

The Chairperson, Councillor Jane Smith declared the meeting open and completed an Acknowledgement of Country and Connection to Land Statement.

Item 2 Disclosures of Interest

The Chair called for any declarations of interest.

No disclosures were received.

Item 3 Confirmation of Previous Meeting Records

The Advisory Group confirmed the Meeting Records from 25 June 2020 and 18 August 2020.

The Advisory Group reviewed the Action Log.

Coastal Open Space System (COSS) Committee Meeting Record
20 October 2020

Item 4 Brief Update on Council's Current Financial Situation

Luke Sulkowski (Unit Manager Environmental Management) provided the Advisory Group with an update on Council's current financial situation. A 100-day plan has been put in place and a forensic audit will be undertaken.

Item 5 Land Acquisition and Prioritisation (Standing Agenda Item)

Larry Melican (Section Manager Natural Assets and Biodiversity) advised that Council are continuing to negotiate and obtain valuations on properties, however there are no new purchases or acquisitions to report.

Item 6 Update on Biodiversity Strategy

Larry Melican (Section Manager Natural Assets and Biodiversity) advised that the Biodiversity Strategy was adopted by Council on 28 September 2020.

The Advisory Group acknowledged the work of staff on the Biodiversity Strategy and thanked them for including the additional theme *Protect and expand the Coastal Open Space System*.

Action: The action plan from the Biodversity Strategy be included as a standing agenda item.

Item 7 Update on Winney Bay Clifftop Walk (Action 106)

Larry Melican (Section Manager Natural Assets and Biodiversity) advised that the yourvoiceourcoast website for community engagement is currently being developed and will be open for public comment on 3 November 2020.

The Advisory Group discussed forming a view on the recommendations if there is consensus, however will wait to view the options again once public exhibition is open.

The issue of tree removal was raised. Selective pruning and tree removal around the vicinity of the lookout had been completed but staff were not aware of any additional tree removal.

Action: Douglas Williamson to send photos of tree removal to staff via advisorygroups@centralcoast.nsw.gov.au. Staff to then provide further information to Advisory Group members.

The issue of disabled access along the Winney Bay Clifftop walk was discussed by the Advisory Group. In regard to the 3 options for the Clifftop Walk, A and B provide disability access for varying lengths of that route. In regard to Captain Cook Lookout, there is a provision for wheelchair access (with the exception of the 4th option).

Action: Link to the yourvoiceourcoast community engagement website to be sent to Advisory Group members once live.

Item 8 Access to COSS lands by Mountain Biking Community (Action 108)

The Advisory Group discussed Access to COSS lands by the Mountain Biking Community which had been raised in General Business at the extraordinary meeting.

Staff advised that a feasibility discussion paper is due to be presented at the 2 November 2020 Council Briefing followed by the 9 November 2020 Council Meeting. Once considered by Council it will be presented to the COSS Committee.

It was suggested that Council needs to rethink its messaging with media coming out from Council basically justifying the illegal tracks whereas we should be highlighting the number of tracks available on the Central Coast.

Item 9 Responses to Coffs Regional Park Model Questions

The Advisory Group discussed responses received from Rod McKelvey regarding questions from the Advisory Group on the Coffs Regional Park Model.

Steve Atkins (NPWS Central Coast Area Manager) advised that the parcels proposed by Council to be transferred have been through the internal review process and now sit with the Ministers Office.

Karen Eardley from the NPWS Reserve Establishment Team is aware that Council has been pursuing this model and this has been considered as part of the assessment process.

Item 10 Update from External Representatives (Standing Agenda Item)

David Green – Local Land Services (Greater Sydney)

- A Pasture Field Day was held today, which is the second event held during COVID. A field day was held a few weeks ago at a private property at Matcham which involved tree planting (rainforest species).
- LLS are doing a staged return to the office for staff.
- Running a baiting program targeting dogs and foxes. Discussions have been held with Council staff regarding whether our baiting program will continue given current financial circumstances.
- Working with landholders regarding bushfire funding. If a landholder lost a boundary fence and they neighbour crown land, there is an opportunity to have funding for the boundary fence to be replaced.
- LLS has obtained funding from State Treasury for bushfire affected properties to assist with weed control, animal welfare and pests.
- 30 – 40 goats at Ourimbah University near Bill Soheir Park that were causing damage to people's cars and gardens have been moved on.

Steve Atkins – NPWS Central Coast Area Manager

- Busy with increased visitation over the last few months as a result of COVID with more people visiting National Parks. For the Bouddi Coastal Walk, during the winter period just gone there were over 60,000 people recorded on that particular track which is a 115% increase on the same period last year.

- Working to develop COVID summer safe plans with the first meeting of a group formed through the Local Emergency Management Committee taking place next week.
- Bouddi Coastal Walk Track is into stage 2 of the upgrade works.
- Hazard reduction burning is a priority for spring, working through as conditions allow.
- Funding obtained through Local Land Services to do increased works in Western Parks on invertebrate pests and weeds.
- Discussions held with Transport for NSW regarding the Wamberal Nature Reserve and Central Coast Highway widening. Consultants have been engaged to do ecological surveys. Review of Environmental Factors (REF) report should be prepared by mid next year and hoping to commence construction by the end of 2022.

Action: Relevant staff member to be invited to attend the next meeting to give an update on the Central Coast Highway road widening between Wamberal and Bateau Bay.

Action: Advisory Group Support Officer to send RMS website link to Advisory Group members on the Central Coast Highway Upgrade Wamberal to Bateau Bay.

Item 11 General Business and Close

a) The Advisory Group discussed the email from Leif Arnebark regarding the makeup of the Coastal Open Space System Committee. It was noted that Membership of Advisory Group was through an EOI process and members were appointed by Council Resolution.

Action: Leif Arnebark to be invited to attend the first COSS Advisory Group meeting of 2021.

b) Advisory Group members expressed strong concerns and frustrations that they were not consulted on the Mountain Biking Feasibility Discussion paper prior to a report going to Council.

Action: Staff to provide a briefing on the Mountain Biking Feasibility Discussion Paper at the next meeting.

Action: Staff to arrange a site inspection for Advisory Group members of areas of concern affected by Mountain Biking in COSS lands.

c) Dr Anumitra Mirti (Section Manager Environmental Strategies) advised that the Biodiversity Assessment Method (BAM) calculator has been updated, as well as minor changes in the stewardship model in the Biodiversity offsets scheme to fix a calculator error.

A Koala Survey has just commenced, with 150 song metres rolled out across the LGA. This will help to inform a Koala DCP to provide insight for planning proposals and developments.

d) Councillor Smith advised that the Protection of the Environment Trust had held a Strom Talk last year, which Council resolved to hold annually, however due to COVID it was unable to proceed this year. In a few weeks a screening of *David Attenborough: A life on Our Planet* will be held at Avoca Beach Theatre. Profits will go to the Protection of the Environment Trust. Details will be distributed to Advisory Group members once available.

Coastal Open Space System (COSS) Committee Meeting Record
20 October 2020

The meeting closed at 4.53pm

Next Meeting: **Tuesday 1 December 2020**
2pm – 4pm
Zoom Meeting

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Item No:	4.1
Title:	Councillor Attendance and Expenses and Facilities Report to 30 October 2020
Department:	Governance

30 November 2020 Ordinary Council Meeting

Reference:	F2020/00039 - D14274490
Author:	Sarah Georgiou, Section Manager, Councillor Support
Manager:	Shane Sullivan, Unit Manager, Governance and Business Services
Executive:	Krystie Bryant, Executive Manager, People and Culture

Report purpose

The purpose of this information report is to table the provision of expenses and facilities to Councillors for the period May 2020 to 30 October 2020 as required under clause 122 of the *Councillor Expenses and Facilities Policy* and to table the attendance records of Councillor attendance as resolved by Council for the period July 2020 to 30 October 2020.

Executive Summary

This information report provides a summary of Councillor Expenses and Facilities and Councillor Attendance for the period 1 July 2020 to 30 October 2020. It is recommended that it be received and noted.

Governance Recommendation

That Council receive and note this report.

Background

At its Ordinary Meeting 10 August 2020 Council resolved as follows:

754/20 *That Council note that the Councillor Expenses and Facilities Policy requires at Clause 122 detailed reports on the provision of expenses and facilities to Councillors to be publicly tabled at a Council meeting every six months and published in full on Council's website.*

755/20 *That Council resolve that as part of that six monthly report there be the following information:*

- *Statistics regarding Councillor requests including the number of requests submitted by Councillor*
- *Details of Councillor attendance at Council Meetings*

- *Details of Councillor attendance at Briefings or Workshops*
- *Details of Councillor attendance at weekly CEO Updates*
- *Details of Councillor attendance at Advisory Group meetings of which they are members*
- *Details of Councillor access to the HUB and review of relevant documents*

Expenses and Facilities

Central Coast Council adopted a *Councillors Expenses and Facilities Policy (the Policy)* on 27 August 2018 to enable the reasonable and appropriate reimbursement of expenses and provision of facilities to Councillors, to help them undertake their civic duties.

The policy was drafted in accordance with the *Local Government Act 1993* and *Local Government (General) Regulation 2005* and complies with the Office of Local Government's *Guidelines for the payment of expenses and provision of facilities to Mayors and Councillors in NSW*.

To ensure accountability and transparency, and to align the costs incurred with community expectations, the Policy provides at clause 122:

> *122 Detailed reports on the provision of expenses and facilities to Councillors will be publicly tabled at a Council meeting every six months and published in full on Council's website. These reports will include expenditure summarised by individual Councillor and as a total for all Councillors.*

Attachment 1 is provided to Council to satisfy the requirements of clause 122 of the Policy for the six-month period up to 30 October 2020.

Reports to Council will be provided every six months. The last report was provided to the Council Meeting of 25 May 2020 for the six-month period to 30 April 2020.

It is noted that Councillors Gale and Marquart resigned from civic office on Monday 26 October 2020. Data for both Councillors has been included in this report as they were in office for the majority of the reporting period.

Councillor Attendance and Requests

Attachment 2 provides the Councillor attendance and request statistics for the period 1 July 2020 to 30 October 2020 as resolved by Council on 10 August 2020. Due to the suspension of Council on 30 October 2020 this reporting period is not a full six months as per the Council resolution.

It is noted that Councillors Gale and Marquart resigned from civic office on Monday 26 October 2020. Data for both Councillors has been included in this report as they were in office for the majority of the reporting period.

Financial Considerations

At its meeting held 19 October 2020, Council resolved the following:

> *1036/20 That any motions put before Council for the remainder of this term of Council that have financial implications require the Chief Executive Officer to provide a report on how those additional costs will be met.*

The following statement is provided in response to this resolution of Council.

Attachment 1 provides information on expenses already incurred and does not propose any future expenditure. The attached spend is within the budgeted parameters and in accordance with the adopted Policy at the time.

Link to Community Strategic Plan

Theme 4: Responsible

Goal G: Good governance and great partnerships

R-G2: Communicate openly and honestly with the community to build a relationship based on transparency, understanding, trust and respect.

Attachments

1	Councillor Expenses and facilities 1 May 2020 to 30 October 2020	D14297563
2	Councillor Attendance and CR for 1 July 2020 to 30 October 2020	D14297541

Councillor Expenses Report 1 May 2020 to 30 October 2020							
Councillor	**General Travel Expenses**	**Interstate, Overseas and Long Distance Travel Expenses**	**Accommodation and Meals**	**Professional Development**	**ICT Expenses and Services**	**Carer Expenses**	**Home Office Expenses**
Best					$ 355.00		$ 41.00
Burke	$ 30.00	$ -	$ -			$ -	$ -
Gale	$ 464.00				$ 657.00	$ 1,163.00	
Greenaway	$ 2,017.00	$ -	$ -		$ -	$ -	$ -
Hogan	$ -	$ -	$ -	$ 990.00	$ -	$ -	$ -
Holstein	$ 776.00	$ -	$ -	$ 990.00	$ -	$ -	
MacGregor	$ -	$ -	$ -	$ 8,259.00	$ -	$ -	$ -
Marquart	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Matthews (Mayor)		$ -			$ -	$ -	
McLachlan		$ -	$ -	$ -	$ -	$ -	$ -
Mehrtens	$ -	$ -	$ -	$ 3,500.00	$ -	$ -	$ -
Pilon	$ -	$ -	$ -		$ -	$ -	$ -
Smith (Deputy Mayor)	$ 381.00	$ -		$ 460.00	$ -	$ -	$ -
Sundstrom	$ -	$ -	$ -	$ 400.00	$ -	$ -	$ -
Vincent	$ 136.00	$ -	$ -	$ -	$ 235.00	$ -	$ -
TOTAL	$ 3,804.00	$ -	$ -	$ 14,599.00	$ 1,247.00	$ 1,163.00	$ 41.00

Councillor	Council Meetings	Briefings (Mondays)	Briefings (Other)	CEO Weekly Update	# of Clr requests	Advisory Groups	The Hub - Access
Total	**11**	**8**	**10**	**16**	**614**		
Best	82%	13%	30%	19%	13	1	23
Burke	100%	25%	50%	13%	2	n/a	21
Greenaway	100%	100%	90%	50%	99	4	72
Gale	91%	63%	30%	13%	7	n/a	52
Holstein	100%	100%	60%	75%	112	12	77
Hogan	100%	100%	70%	94%	84	4	53
McLachlan	100%	88%	40%	19%	16	2	56
Marquart	55%	0%	10%	0%	1	n/a	39
Mehrtens	100%	88%	50%	13%	32	n/a	75
MacGregor	100%	100%	60%	63%	47	7	70
Matthews (Mayor)	91%	100%	70%	63%	1	3	11
Pilon	82%	75%	60%	38%	16	2	17
Sundstrom	100%	88%	60%	25%	92	4	69
Smith	100%	100%	70%	94%	56	18	73
Vincent	91%	75%	70%	56%	36	3	66

Data description	Attendance at Council Meetings is recorded as present if the Councillor is present for part or all of the Meeting	Attendance at Briefings is recorded as present if the Councillor is present for part or all of the session. Full details are reported in the Councillor Support Update	Attendance at Briefings is recorded as present if the Councillor is present for part or all of the session. The Briefings in this column are outside of usual planned briefings schedule.	Attendance at the CEO Update is recorded as present if the Councillor is present for part or all of the session	# is based on total number of requests managed through the Councillor request system regardless of complexity. CRs are submitted by Councillors, sonetimes on behalf of constituents.	Attendance at Advisory Groups is recorded as present if the Councillor is present for part or all of the Meeting. Some Councillors are on multiple Advisory Groups and some Councillors are not on any.	The Hub is an online portal for Councillors to access key documents and information.Hub access is calculated as stories opened on the Hub including Business Papers. Due to the way data is collected there may be a small number of 'hits' that have not been logged.

Item No:	4.2
Title:	Audit Risk and Improvement Committee recruitment
Department:	Governance

30 November 2020 Ordinary Council Meeting

Reference:	F2018/00028-002 - D14222828
Author:	James Taylor, Section Manager Governance
Manager:	Shane Sullivan, Unit Manager, Governance and Business Services
Executive:	Krystie Bryant, Executive Manager, People and Culture

Report purpose

To recommend that Council select an Interview Panel to appoint a new Independent External Member to the *Audit Risk and Improvement Committee* (ARIC).

Executive Summary

The appointment of the current ARIC Chairperson ceases on 27 April 2021, resulting in a vacancy on ARIC. This report sets out the recruitment and selection process and recommends the appointment of an Interview Panel to recruit a new Independent External Member to ARIC.

Governance Recommendation

That the Council resolve to establish the Interview Panel to select a new Audit Risk and Improvement Committee Independent External Members as set out in this Report.

Background

The initial three-year appointment of the three Independent External Members made at the 26 July 2017 Ordinary Council Meeting expired on 26 April 2020, and a formal review (as required under Clause 15 of the ARIC Charter) was undertaken and presented to Council for consideration at the 27 April 2020 Ordinary Council Meeting.

At that meeting, Council resolved, in part:

> *317/20* *That Council recognise the contribution of the three Independent External Members of Audit, Risk and Improvement Committee for their assistance and contribution over the past three years and make the following phased re-appointments:*
>
> *a* *Dr Colin Gellatly (AO) be re-appointed for a period of one year;*

b John Gordon be re-appointed for a period of two years; and

c Carl Millington be re-appointed for a period of three years.

It is noted that the re-appointment of Dr Gellatly for a period of 12 months coincides with the remaining time that he can serve as Chair of ARIC under clause 21 of the ARIC Charter. Dr Gellatly's re-appointment as Chairperson of the Committee and to ARIC will cease on **27 April 2021**, resulting in a vacancy on ARIC.

It is also noted that the re-appointment of all three Independent External Members may have been up to an additional five years as allowed under clause 17 of the ARIC Charter, but subject to a phased replacement of each of the three Independent External Members to ensure continuity in ARIC.

As a result, there is a relatively urgent need to appoint a new Independent External Member to ARIC before 27 April 2021. An opportunity for handover and transition would be beneficial.

Appoint a new Independent External Member to ARIC

The ARIC Charter does not set out a process for the recruitment of an Independent External ARIC Member, however the NSW OLG's Discussion Paper on A New Risk Management and Internal Audit Framework for local councils in NSW (September 2019) makes the following observation at pages 35 and 36:

> *Appointment and size of the Committee*
>
> *The Audit, Risk and Improvement Committee is to be appointed by the governing body of the council. Councils may find it practical to establish a small committee of councillors and the general manager to conduct the selection process and make appointment recommendations to the larger governing body.*
>
> *Each council's Audit, Risk and Improvement Committee is to have no fewer than three members and no more than five members. The Chair is to be counted as a member of the committee. The exact size of the committee is to be determined by the governing body of the council, in consultation with the general manager, taking into account the size and complexity of the council's operations and risk profile.*
>
> *The Chair of the Audit, Risk and Improvement Committee is to act as the interface between the Committee and the general manager, the Committee and the governing body of council, and the Committee and the Chief Audit Executive.*

The process proposed is consistent with the previous method of recruiting an Independent External ARIC Member conducted by Central Coast Council and the process outlined in the NSW OLG's discussion paper. Although the OLG Discussion Paper has not come into effect it is considered best to align our processes with what was placed on exhibition for comment.

The process was discussed by ARIC at the latest Ordinary ARIC Meeting (9 November 2020) and questions were raised about the timing of the recruitment given the current financial situation facing Council and whether Council would attract the best candidate as a result of this. However, it is considered appropriate to progress with the recruitment to give effect to the resolution of Council.

It is recommended that the Interview Panel consider a new Independent External ARIC Member to consist of the following five members (or a selection thereof):

1 the Administrator;
2 the Acting Chief Executive Officer;
3 the Chief Financial Officer;
4 the Chief Internal Auditor; and
5 the Executive Manager People and Culture.

If the Interview Panel is of the opinion that there is more than one suitable candidate to be appointed as the new Independent External ARIC Member, then there is the option of expanding the ARIC to up five members *taking into account the size and complexity of the council's operations and risk profile.*

However, this is not recommended as currently it is unclear if this is just five independent members or three independents and two Councillors members to be appointed to ARIC. It is noted that the NSW OLG's discussion paper did propose to remove Councillors from ARIC altogether.

Terms for independent members

Given the current financial situation facing Council an option available to Council is to consider revisiting the timeframes set in *Resolution 317/20*. At this time the terms for the remaining independent members are as follows:

- Mr John Gordon to April 2022
- Mr Carl Millington to April 2023

It may be prudent to consider reviewing the timeframes previously resolved in relation to the engagement of John Gordon and Carl Millington based on their experience with Council, and given their respective extensive financial, auditing, accounting, corporate governance and risk management skill set. This could provide a balance between the recruitment of a new member and ensuring continuity.

As noted both could have been reappointed for a further five years. The Charter requires that the further appointment of members be phased.

Should Council wish to extend their tenures the following wording is provided:

That Council resolve to extend the phased engagement, as Independent External Members of the Audit Risk and Improvement Committee, of:

a John Gordon until the end of December 2023; and

b Carl Millington until the end of December 2024.

Financial Considerations

At its meeting held 19 October 2020, Council resolved the following:

1036/20 That any motions put before Council for the remainder of this term of Council that have financial implications require the Chief Executive Officer to provide a report on how those additional costs will be met.

The following statement is provided in response to this resolution of Council.

The recommendations contained in this report will not impose any additional spending by Council in the current or following financial year over and above what is already planned and resolved by Council at the 27 April 2020 Ordinary Council Meeting which stated, in part:

318/20 *That Council determines that the current remuneration for the three Independent External Members be maintained for the term of their re-appointment, with the Independent External Members receiving $20,920 per annum and the Chair receiving an additional 15% or $3,138 per annum.*

Link to Community Strategic Plan

Theme 4: Responsible

Goal G: Good governance and great partnerships

R-G2: Communicate openly and honestly with the community to build a relationship based on transparency, understanding, trust and respect.

Attachments

Nil

Item No: 4.3

Title: Draft Gifts and Benefits Policy and Procedures

Department: Governance

30 November 2020 Ordinary Council Meeting

Reference: F2010/00234 - D14292371

Author: James Taylor, Section Manager Governance

Manager: Shane Sullivan, Unit Manager, Governance and Business Services

Executive: Krystie Bryant, Executive Manager, People and Culture

Report purpose

To consider a new Gifts and Benefits Policy and Procedure for Central Coast Council.

Executive Summary

Council currently has an outdated Gifts and Benefits Policy which is the former Wyong Shire Council's Gifts and Benefits Policy. As part of the policy consolidation project, a new draft Gifts and Benefits Policy (Attachment 1) and Gifts and Benefits Procedures (Attachment 2) have been developed based on Council's Code of Conduct.

It is recommended that the attached draft Policy be placed on public exhibition for the purpose of public comment and the provision of a further report.

Governance Recommendation

1 *That the draft Gifts and Benefits Policy (Attachment 1 to this report) be placed on public exhibition for a period of 28 days.*

2 *That the draft Gifts and Benefits Policy (Attachment 1 to this report) and draft Gifts and Benefits Procedures (Attachment 2 to this report) be provided to Council's Audit Risk and Improvement Committee for its review and comment.*

3 *That a further report be presented to the 8 March 2021 Ordinary Council Meeting Council to adopt the Gifts and Benefits Policy, for consideration of any submissions received.*

Background

A draft Gifts and Benefits Policy (Attachment 1) and a Gifts and Benefits Procedures (Attachment 2) have been developed based on Council's Code of Conduct. Part 6 "Personal Benefit" of Council's Code of Conduct, which contain the provisions that the Policy and Procedures are based on, is Attachment 3 to this report.

The draft Policy and Procedures capture the updated requirements in Council's new Code of Conduct adopted by Council on 14 September 2020 Ordinary Council Meeting in response to

the revised Model Code of Conduct issued to Councils by the Office of Local Government on 14 August 2020.

Councillor comment on the draft Policy was sought in the Councillor Support update on Friday 9 October 2020, which requested Councillors provide any feedback by 30 October 2020. No feedback was received from Councillors.

Current Status

It is now recommended to place the draft Gift and Benefits Policy on public exhibition for a period of 28 days.

The approval authority for the Policy is the Council. The Procedures support the Policy and set out the operational requirements. It is appropriate for the procedures to be reviewed and adopted by the Chief Executive Officer as required. They are provided here for the information of Council.

Options

Council has the option to:

1 Place the draft Gift and Benefits Policy on public exhibition for 28 days and consider any submissions received in a future Council Report. (recommended)

2 Adopt the draft Gift and Benefits Policy for Central Coast without public exhibition. There is no requirement for public exhibition and the proposed Policy aligns to the Code of Conduct. This would be an acceptable option.

3 Resolve not to adopt a Gift and Benefits Policy and Procedures for Central Coast Council. It is recommended that there be an updated Policy that aligns to the Code of Conduct to support Central Coast Council officials in the performance of their duties.

Consultation

The draft Policy will be placed on public exhibition for a period of 28 days. A further report will be prepared for Council's consideration at the 8 March 2021 Ordinary Council Meeting, incorporating feedback collected and considering any submissions received.

Financial Considerations

At its meeting held 19 October 2020, Council resolved the following:

1036/20 That any motions put before Council for the remainder of this term of Council that have financial implications require the Chief Executive Officer to provide a report on how those additional costs will be met.

The following statement is provided in response to this resolution of Council.

There is no financial implication associated with the recommended action.

Link to Community Strategic Plan

Theme 4: Responsible

Goal G: Good governance and great partnerships

R-G2: Communicate openly and honestly with the community to build a relationship based on transparency, understanding, trust and respect.

Critical Timeframes

Council's current Gifts and Benefits Policy does not reflect the updated Code of Conduct, so it is recommended that the Gifts and Benefits Policy be updated as soon as practicable.

Attachments

1	Draft Gifts and Benefits Policy October 2020	D14226000
2	Draft Gifts and Benefits Procedure October 2020	D14226010
3	Part 6 Personal Benefit of the Code of Conduct	D14297228

Central Coast Council

Gifts and Benefits **Policy**

October 2020
Policy No: CCC095

Policy owner:	Governance and Business Services, Office of the CEO
Approved by:	Directorate
Date of approval:	Day/Month/2020
Policy category:	Strategic
Content Manager No:	D#########
Review date:	DD/MM/YY

Contents

Purpose

1. This Policy provides guidance to all Council Officials in dealing with gifts and benefits offered in the course of their duties, and/or an individual's role and responsibility with Central Coast Council (Council).

2. The purpose is of this Policy is to:
   a) provide clear guidelines for all Council Officials to enable them to deal appropriately with any offer of a gift or benefit;
   b) protect Council Officials from being compromised and to avoid the public perception of bias;
   c) demonstrate to suppliers, the public and other agencies that Council will deal with all matters in an impartial, open and accountable manner.

Scope

3. This Policy covers:
   a) all Council Officials as defined in Council's Code of Conduct;
   b) any person or organisation contracted to or acting on behalf of Council;
   c) any person or organisation employed to work on Council premises or facilities,
   d) any company or other body of which the Council Official, or their nominee, relative, partner or employer, is a shareholder or a member.
   e) someone personally associated as stated in clause 6.1 Council's Code of Conduct with a person covered under 3 a), b), c) and d).

4. For the avoidance of doubt, Council will treat gifts and benefits offered or received to a relative(s) of a person covered under this Policy as it being offered or received by the Council Official if there is a reasonable link to Council Business or Council Operations.

5. This Policy should be read in conjunction with Council's Code of Conduct and Council's *Gift and Benefit Policy Procedures*.

Background

6. This Policy has been produced to guide those covered under this Policy who may be offered gifts and benefits during the course of their official duties.

7. In carrying out their roles within Council, those covered under this Policy may from time to time be offered gifts to establish a business relationship, to display appreciation or demonstrate good faith in an emerging or ongoing business or other relationship.

8. The acceptance of gifts and/or other benefits has the potential to compromise those covered under this Policy position by creating a sense of obligation in the receiver and could compromise the recipient's ability to act objectively and impartially.

9. The public has a right to expect that those covered under this Policy will carry out their duties with honesty and integrity.

General

10. For the purposes of this Policy, a gift or a benefit is something offered to or received by a person covered under this Policy for their personal use and enjoyment.

11. All people covered under this Policy must avoid situations that would give rise to the appearance that a person or body is attempting to secure favourable treatment from you or from Council, through the provision of gifts, benefits or hospitality of any kind to you or someone personally associated with you.

12. In accordance with clause 6.2 of Council's Code of Conduct, a gift or benefit under this Policy is not:
    a) an item with a value of $10 or less;
    b) a political donation for the purposes of the *Electoral Funding Act 2018*;
    c) a gift provided to Council as part of a cultural exchange or sister-city relationship that is not converted for the personal use or enjoyment of any individual covered under this Policy;
    d) a benefit or facility provided by Council to an employee or Councillor;
    e) attendance by a person covered under this Policy to a work-related event or function for the purposes of performing their official duties; or
    f) free or subsidised meals, beverages or refreshments provided to a person covered under this Policy in conjunction with the performance of their official duties such as, but not limited to:
        i) the discussion of official business;
        ii) work-related events such as council-sponsored or community events, training, education sessions or workshops;
        iii) conferences;
        iv) council functions or events; and
        v) social functions organised by groups, such as council committees and community organisations.

13. It is the personal responsibility of all people covered under this Policy to have knowledge of, and to ensure compliance with this Policy and Council's Code of Conduct.

14. All people covered under this Policy should never solicit personal gifts or accept any payment, gift or benefit, bribe or other improper inducement intended or likely to influence them to stray from their official duties.

15. All people covered under this Policy must not take advantage of their official position to improperly influence other Council Officials or members of the public in the performance of

their public or professional duties for the purpose of securing a private benefit for themselves or for others.

16. Accepting money or offers of money, or cash-like gifts or benefits, regardless of the amount is strictly prohibited in all circumstances and be must be declined and declared.

17. Cash-like gifts or benefits include, in accordance with clause 6.13 of Council's Code of Conduct, but are not limited to:
    a) gift vouchers;
    b) credit cards;
    c) debit cards with credit on them;
    d) prepayments such as phone or internet credit;
    e) lottery tickets;
    f) memberships;
    g) or entitlements to discounts that are not available:
        i) to the general public; or
        ii) a broad class of persons;

18. Accepting money or offers of money, or cash-like gifts or benefits in any form is a breach of Council's Code of Conduct, may be seen as an attempt at bribery and is a crime which may be reportable to the Independent Commission against Corruption (ICAC).

19. Any gift or benefit received because of a purchase incentive scheme will become the property of Council. For example if purchases from a specific supplier reach a certain value which results in a gift being rewarded, this gift will become the property of the Council.

20. Council's supplier discounts offered to those covered under this Policy for their personal purchase of goods and services is prohibited.

21. All people covered under this Policy who are making purchasing decisions or involved in evaluating contracts, expressions of interest, tenders or other proposals for or on behalf of Council, must not accept any form of gift, benefit or hospitality from the supplier/consultant/ contractor.

22. All people covered under this Policy must not participate in competitions for prizes where eligibility is based on Council being in or entering into a customer-supplier relationship with the competition organiser.

23. All people covered under this Policy must not personally benefit from reward points programs when purchasing for or on behalf of Council.

24. Council business cards or people covered under this Policy's details are not to be submitted for the purposes of participating in prize draws, such as at conferences or seminars or events or the like.

Acceptance of gifts or benefits

25. All people covered under this Policy must avoid situations that would give rise to the appearance that a person or body is attempting to secure favourable treatment through the provision of gifts, benefits or hospitality of any kind. In normal circumstances, gifts and benefits offered to a person covered under this Policy whilst undertaking Council duties should, if possible, be declined.

26. All people covered under this Policy must not accept any gift or benefit that may create a sense of obligation on their part or may be perceived to be intended or likely to influence them in carrying out their public duty.

27. It is acknowledged that there may be rare occasions when to refuse a gift or benefit is not practicable. In these circumstances a person covered under this Policy may accept gifts and benefits of a token value.

28. Where a person covered under this Policy receive a gift or benefit of more than token value that cannot reasonably be refused or returned, the gift or benefit must be surrendered to Council, as set out under clause 38, unless the nature of the gift or benefit makes this impractical.

29. In accordance with clause 6.8 of Council's Code of Conduct, gifts and benefits of token value are one or more gifts or benefits received from a person or organisation over a 12-month period that, when aggregated, do not exceed a value of $100. They include, but are not limited to:
    a) invitations to and attendance at local social, cultural or sporting events with a ticket value that does not exceed $100;
    b) gifts of alcohol that do not exceed a value of $100;
    c) ties, scarves, coasters, tie pins, diaries, chocolates or flowers or the like;
    d) prizes or awards that do not exceed $100 in value.

30. In accordance with clause 6.11 of Council's Code of Conduct, where a gift or benefit of token value has been accepted from a person or organisation, a further gift or benefit from the same person or organisation or another person associated with that person or organisation, must not be accepted within a single 12 month period where the value of the gift, added to the value of earlier gifts received from the same person or organisation, or a person associated with that person or organisation, during the same 12 month period would exceed $100 in value.

Gifts and benefits of more than token value

31. In accordance with clause 6.9 of Council's Code of Conduct, gifts or benefits that exceed $100 in value are gifts or benefits of more than token value and they must not be accepted.

32. In accordance with clause 6.10 of Council's Code of Conduct, gifts and benefits of more than token value include, but are not limited to, tickets to major sporting events (such as international matches or matches in national sporting codes) with a ticket value that exceeds $100, corporate hospitality at a corporate facility at major sporting events, free or discounted products or services for personal use provided on terms that are not available to the general public or a broad class of persons, the use of holiday homes, artworks, free or discounted travel.

33. In accordance with clause 6.12 of Council's Code of Conduct, the value of a gift or benefit is the monetary value of the gift or benefit inclusive of GST.

Declarations and the Gifts and Benefits Register

34. When any gift or benefit of any value other than one referred to in clause 12 is offered (even if declined) or received, it must be declared in accordance with clause 35.

35. Declarations made under clause 34 must be completed in writing (via the Gifts and Benefits Declaration Form see the *Gifts and Benefits Procedures*) and must contain the following details as a minimum:
    a) the name and details of the recipient;
    b) the nature of the gift or benefit;
    c) the estimated monetary value of the gift or benefit;
    d) the name and agency or organisation of the person who provided the gift or benefit;
    e) details of any previous gift offered by the individual, agency or organisation or related entity in the last 12 months;
    f) the date on which the gift or benefit was received or declined;
    g) details of when the gift or benefit was offered;
    h) reason for the gift; and
    i) action proposed to be taken with the Gift or benefit pending approval.

36. All gifts or benefits offered or received are subject to the approval process as set out in this Policy and Council's *Gift and Benefits Procedures*.

37. The Gifts and Benefits Coordinator is responsible for the Gifts and Benefits Register which will be located on Council's website and which will record, as a minimum, the information provided under clause 35.

38. A gift or benefit received of more than token value that cannot be reasonably refused or returned, must be surrendered/handed to Council's Gifts and Benefits Coordinator.

Review

Compliance, monitoring and review

39. Any breach of this Policy is a potential breach of Council's Code of Conduct and must be reported to the Chief Executive Officer for action in accordance with the Code of Conduct.

40. Failure to report reasonable suspected corrupt conduct promptly could lead to a range of adverse outcomes. A wilful failure to report corruption could in itself constitute corrupt conduct and amount to a criminal offence.

41. This Policy will be reviewed as required or at least every four years.

Records management

42. Staff must maintain all records relevant to administering this Policy in a recognised Council recordkeeping system.

Definitions

43. In this policy:

Benefits: Non-tangible items of value and include, but are not limited to the following:

a) invitation to sponsored events;
b) hospitality, such as at a corporate facility or sporting venue (eg race meetings, football matches);
c) free or discounted use of facilities such as a gymnasium or holiday home;
d) free or discounted travel, frequent flyer points and free training sessions;
e) accommodation and hire care discounts; and
f) relationship with a contractor that provides a discount for private work.

Cash-like gift/benefit: A gift that may be used in a manner similar to cash, for example gift vouchers, gift cards, lottery tickets, scratchies, shares, credit cards, debit cards with credit on them, membership and prepayments such as phone or internal credit. Such gifts cannot be accepted in any circumstances.

Council Official: the same meaning it has in Council's Code of Conduct.

Gifts and Benefit Register: the register maintained by Council containing all declared gifts and benefits. The register is a requirement of the Code of Conduct and enables Council to identify trends in the types of gifts and benefits being received and their sources. A copy of the Gift and Benefits Register will be placed on Council's website.

Gifts, examples of: Example of gifts include, but are not limited to, the following:

a) Clothing items;
b) Products;
c) Tickets;
d) Chocolates;
e) Cakes;
f) Flowers;
g) Wrapped gift presented as a result of attending a seminar / course / conference; and
h) Free or subsidised meals.

Note: A political donation is not a gift under this policy.

Gifts and Benefits Coordinator: as set out in Council's Gift and Benefit Procedures

Related resources

44. Legislation:

a) Local Government Act 1993 (NSW)
b) Local Government Amendment (Governance and Planning) Act 2016;
c) Crimes Act 1900 (NSW) (in particular ss.249B & 249H);
d) Independent Commission Against Corruption Act 1988; and
e) Public Interest Disclosures Act 1994.

45. Associated/Internal documents:

a) Council's Code of Conduct;
b) Council's Gifts and Benefits Procedures;
c) Council's Procurement Policy;
d) Council's Statement of Business Ethics;
e) Office of Local Government – Circular No 10-12, 4 June 2010;
f) ICAC and Public Sector Organisations – Corruption Prevention Publications & Guidelines.

History of revisions

Amendment history	Details
Original approval authority details	XX/XX/20XX <insert Council Meeting date and 'minute number' of resolution adopting the policy
	CM document number
	Creation of Policy

Central Coast Council

Gifts and Benefits

Procedure

October 2020

Version: 1

Document owner:	Governance and Business Services, Office of the CEO
Approved by:	Central Coast Council / Gary Murphy CEO
Date of approval:	Day Month 2020
Content Manager No:	D#########
Review date:	DD/MM/YY

Contents

Purpose

1. The purpose of this procedure is to set out guidelines for Staff and Councillors regarding Council's *Gifts and Benefits Policy* (the Policy).

Scope

2. This procedure covers all people covered under clause 3 of the Policy.

Procedure

Roles and responsibilities for Staff

3. All offers of gifts or benefits offered and received must be declared by the recipient on Council's Gifts and Benefits Declaration Form (the Declaration Form) .

4. If the recipient is a person or entity in accordance with clause 4 of the Policy, the Declaration Form must be completed by the relevant person covered under the Policy.

5. To access the Declaration Form:

    a) for staff please click on the linked Declaration Form to access - this form it is also available via the Intranet; and

    b) for all other people covered under the policy (apart from Councillors – see below) and who are not covered in a) please contact Council's Governance Team.

6. Once completed, click SAVE at the top of the Declaration Form and it will be escalated to the recipient's supervisor.

7. The relevant supervisor is to review the Declaration Form, make any appropriate comments, click SAVE at the top of the Declaration Form and it will be escalated to Council's Gifts and Benefits Coordinator.

8. Council's Gifts and Benefits Coordinator will, within ten business days of receiving a completed Declaration Form:
    a) review the Declaration Form to approve or decline;
    b) make any appropriate comments;
    c) communicate the determination back to the recipient and relevant Supervisor;
    d) enter the details into Council's Gifts and Benefits Register; and
    e) raise any relevant issues with the Chief Executive Officer.

9. If the Gifts and Benefits Coordinator is offered or receives a Gift or Benefit that is required to be declared, the Gifts and Benefits Coordinator will notify Council's Senior Internal Ombudsman who will carry out the requirement of Clause 8 above.

Roles and responsibilities for Councillors

10. All offers of gifts or benefits must be declared by Councillors on Council's Gifts and Benefits Declaration Form.

11. If the recipient is a person or entity in accordance with clause 10 of the Gifts and Benefits Policy, the Declaration Form must be completed by the Councillor.

12. Councillors can access the Declaration Form via the Councillor Hub or via contacting Councillor Support.

13. The completed Declaration Form is to be sent to Councillor Support who will register the completed Declaration Form in Content Manager.

14. Councillor Support will task the completed Declaration Form to the Chief Executive Officer in Content Manager.

15. The Chief Executive Officer is to review the Declaration Form, make any appropriate comments, and reassign a task in Content Manager to the Gifts and Benefits Coordinator.

16. Council's Gifts and Benefits Coordinator will, within ten business days of receiving a completed Declaration Form:
    a) review the Declaration Form to approve or decline;
    b) make any appropriate comments;
    c) communicate the determination back to the Councillor and relevant Supervisor;
    d) enter the details into Council's Gifts and Benefits Register; and
    e) raise any relevant issues with the Chief Executive Officer.

General

17. Council's Gifts and Benefits Coordinator is Council's **Unit Manager Governance and Business Services**.

18. Council's Gifts and Benefits Register will record, as a minimum, the information provided in Clause 35 of the Policy, as well as the determination made in relation to the gift or benefit.

19. If the gift or benefit is of token value (please refer to the Gifts and Benefits Policy) the gift or benefit may be retained and shared amongst staff if possible.

20. If the gift or benefit is of more than token value, and cannot be reasonably refused or returned, it must be surrendered to the Gifts and Benefits Coordinator.

21. The Gifts and Benefits Coordinator will make every reasonable attempt to return the surrendered gift or benefit with an appropriately worded letter setting out the expectation in Council's Gifts and Benefits Policy.

22. If the surrendered gift or benefit cannot be returned, the Gifts and Benefits Coordinator is authorised under these Procedures to undertake any of the following, or a combination of the following:
    a) retain the gift or benefit to be used for official Council's purposes, or
    b) raffle the gift or benefit with the funds going to a local approved (by the Chief Executive Officer) charity; or
    c) allocate the gift or benefit to a local approved (by the Chief Executive Officer) charity group; or
    d) dispose of/destroy the gift or benefit.

23. If the gift or benefit is a gift or benefit that cannot be accepted by a Council Official, the matter will either be referred by the Gifts and Benefits Coordinator to the Chief Executive Officer (or their delegate) or the appropriate NSW authority to deal with.

24. If aggrieved about a determination that Council's Gifts and Benefits Coordinator has made, the recipient can seek a review from the Chief Executive Officer (or their Delegate).

Review

Compliance, monitoring and review

25. Non-compliance with the Gifts and Benefits Policy will be dealt with under Council's Code of Conduct.

Records management

26. Staff must maintain all records relevant to administering this policy in a recognised Council recordkeeping system.

Definitions

27. In this procedure:

Benefits: Non-tangible items of value and include, but are not limited to the following:

a) invitation to sponsored events;
b) hospitality, such as at a corporate facility or sporting venue (eg race meetings, football matches);
c) free or discounted use of facilities such as a gymnasium or holiday home;
d) free or discounted travel, frequent flyer points and free training sessions;
e) accommodation and hire care discounts; and
f) relationship with a contractor that provides a discount for private work.

Council Official: the same meaning it has in Council's Code of Conduct.

Gifts and Benefit Register: the register maintained by Council containing all declared gifts and benefits. The register is a requirement of the Code of Conduct and enables Council to identify trends in the types of gifts and benefits being received and their sources. A copy of the Gift and Benefits Register will be placed on Council's website.

Gifts, examples of: Example of gifts include, but are not limited to, the following:

a) Clothing items;
b) Products;
c) Tickets;
d) Chocolates;
e) Cakes;
f) Flowers;
g) Wrapped gift presented as a result of attending a seminar / course / conference; and
h) Free or subsidised meals.

Related resources

28. **Legislation:**

a) Local Government Act 1993 (NSW)

29. **Associated/Internal documents:**

a) Code of Conduct
b) Gifts and Benefits Policy

History of revisions

Amendment history	Details
Approval authority	Gary Murphy, Chief Executive Officer
	CM document number
	Creation of Procedures to align with Gifts and Benefits Policy.

6 Personal Benefit

1.1 For the purposes of this Part, a gift or a benefit is something offered to or received by a council official or someone personally associated with them for their personal use and enjoyment.

1.2 A reference to a gift or benefit in this Part does not include:

a) items with a value of $10 or less
b) a political donation for the purposes of the Electoral Funding Act 2018
c) a gift provided to the council as part of a cultural exchange or sister-city relationship that is not converted for the personal use or enjoyment of any individual council official or someone personally associated with them
d) a benefit or facility provided by the council to an employee or councillor
e) attendance by a council official at a work-related event or function for the purposes of performing their official duties, or
f) free or subsidised meals, beverages or refreshments provided to council officials in conjunction with the performance of their official duties such as, but not limited to:
    i) the discussion of official business
    ii) work-related events such as council-sponsored or community events, training, education sessions or workshops
    iii) conferences
    iv) council functions or events
    v) social functions organised by groups, such as council committees and community organisations.

Gifts and benefits

1.3 You must avoid situations that would give rise to the appearance that a person or body is attempting to secure favourable treatment from you or from the council, through the provision of gifts, benefits or hospitality of any kind to you or someone personally associated with you.

1.4 A gift or benefit is deemed to have been accepted by you for the purposes of this Part, where it is received by you or someone personally associated with you.

How are offers of gifts and benefits to be dealt with?

1.5 You must not:

a) seek or accept a bribe or other improper inducement
b) seek gifts or benefits of any kind

c) accept any gift or benefit that may create a sense of obligation on your part, or may be perceived to be intended or likely to influence you in carrying out your public duty
d) subject to clause 6.7, accept any gift or benefit of more than token value as defined by clause 6.9
e) accept an offer of cash or a cash-like gift as defined by clause 6.13, regardless of the amount
f) participate in competitions for prizes where eligibility is based on the council being in or entering into a customer–supplier relationship with the competition organiser
g) personally benefit from reward points programs when purchasing on behalf of the council.

1.6 Where you receive a gift or benefit of any value other than one referred to in clause 6.2, you must disclose this promptly to your manager or the chief executive officer in writing. The recipient, manager, or chief executive officer must ensure that, at a minimum, the following details are recorded in the council's gift register:
a) the nature of the gift or benefit
b) the estimated monetary value of the gift or benefit
c) the name of the person who provided the gift or benefit, and
d) the date on which the gift or benefit was received.

1.7 Where you receive a gift or benefit of more than token value that cannot reasonably be refused or returned, the gift or benefit must be surrendered to the council, unless the nature of the gift or benefit makes this impractical.

Gifts and benefits of token value

1.8 You may accept gifts and benefits of token value. Gifts and benefits of token value are one or more gifts or benefits received from a person or organisation over a 12-month period that, when aggregated, do not exceed a value of $100. They include, but are not limited to:
a) invitations to and attendance at local social, cultural or sporting events with a ticket value that does not exceed $100
b) gifts of alcohol that do not exceed a value of $100
c) ties, scarves, coasters, tie pins, diaries, chocolates or flowers or the like
d) prizes or awards that do not exceed $100 in value.

Gifts and benefits of more than token value

1.9 Gifts or benefits that exceed $100 in value are gifts or benefits of more than token value for the purposes of clause 6.5(d) and, subject to clause 6.7, must not be accepted.

1.10 Gifts and benefits of more than token value include, but are not limited to, tickets to major sporting events (such as international matches or matches in national sporting codes) with a ticket value that exceeds $100, corporate hospitality at a corporate facility at major sporting events, free or discounted products or services for personal use provided on terms that are not available to the general public or a broad class of persons, the use of holiday homes, artworks, free or discounted travel.

1.11 Where you have accepted a gift or benefit of token value from a person or organisation, you must not accept a further gift or benefit from the same person or organisation or another person associated with that person or organisation within a single 12-month period where the value of the gift, added to the value of earlier gifts received from the same person or organisation, or a person associated with that person or organisation, during the same 12-month period would exceed $100 in value.

1.12 For the purposes of this Part, the value of a gift or benefit is the monetary value of the gift or benefit inclusive of GST.

"Cash-like gifts"

1.13 For the purposes of clause 6.5(e), "cash- like gifts" include, but are not limited to, gift vouchers, credit cards, debit cards with credit on them, prepayments such as phone or internet credit, lottery tickets, memberships or entitlements to discounts that are not available to the general public or a broad class of persons.

Improper and undue influence

1.14 You must not use your position to influence other council officials in the performance of their official functions to obtain a private benefit for yourself or for somebody else. A councillor will not be in breach of this clause where they seek to influence other council officials through the proper exercise of their role as prescribed under the LGA.

1.15 You must not take advantage (or seek to take advantage) of your status or position with council, or of functions you perform for council, in order to obtain a private benefit for yourself or for any other person or body.

Item No: 4.4

Title: Draft Lobbying Policy

Department: Governance

30 November 2020 Ordinary Council Meeting

Reference: F2017/01495 - D14293529
Author: James Taylor, Section Manager Governance
Manager: Shane Sullivan, Unit Manager, Governance and Business Services
Executive: Krystie Bryant, Executive Manager, People and Culture

Report purpose

To consider a draft Lobbying Policy for Central Coast Council.

Executive Summary

At its meeting held 14 September 2020 Council resolved:

> *459/20* *With a view to aligning to the Code of Conduct that a further report be provided to Council regarding a potential Lobbying Policy that sets out (amongst other requirements) the need for staff to appropriately document interactions with developers and lobby groups and considers the Independent Commission Against Corruption reports into Lobbying and any relevant advice from the Office of Local Government.*

As a result a draft Lobbying Policy has been developed for consideration.

It is recommended that the attached draft Policy be placed on public exhibition for the purpose of public comment and the provision of a further report to consider submissions received.

Governance Recommendation

1 *That the draft Lobbying Policy (Attachment 1 to this report) be placed on public exhibition for a period of 28 days.*

2 *That the draft Lobbying Policy be provided to Council's Audit Risk and Improvement Committee for its review and comment.*

3 *That a further report be presented to the 8 March 2021 Ordinary Council Meeting to adopt the Lobbying Policy and consider any submissions received.*

Background

At its meeting held on 14 September 2020 Council resolved as follows:

> *459/20* *With a view to aligning to the Code of Conduct that a further report be provided to Council regarding a potential Lobbying Policy that sets out (amongst other requirements) the need for staff to appropriately document interactions with developers and lobby groups and considers the Independent Commission Against Corruption reports into Lobbying and any relevant advice from the Office of Local Government.*

Councillor comment on the draft Policy was sought in the Councillor Support update on Friday 9 October 2020, which requested Councillors provide any feedback by 30 October 2020. No feedback was received from Councillors.

Report

The Lobbying Policy has been drafted based on:

- Council's Code of Conduct,
- the consolidation of two other NSW Local Council's Lobbying Policies (Inner West Council and Burwood Council) and
- the *Independent Commission Against Corruption interim reports into Lobbying*.

The draft Policy captures the updated requirements in Council's new Code of Conduct adopted by Council on 14 September 2020 Ordinary Council Meeting in response to the revised Code of Conduct issued by the Office of Local Government on 14 August 2020.

By adopting a Lobbying Policy, Council is ensuring that community expectations are met in relation to the conduct of ethical and transparent lobbying activities of Council officials. The Policy also provides the safeguard to ensure that there is no misunderstanding regarding Council's adopted position in relation to the engagement of lobbyists.

Options

Council has the option to:

1 Place the draft Lobbying Policy on public exhibition for 28 days and consider any submissions received in a future Council Report. (recommended)

2 Adopt the draft Lobbying Policy for Central Coast without public exhibition. Council is able to adopt the policy without public exhibition, however it is recommended to seek public comment as this is a new policy for Central Coast Council.

3 Resolve not to adopt a Lobbying Policy for Central Coast Council.

Consultation

The draft Policy is recommended to be placed on public exhibition for a period of 28 days. A further report will be prepared for Council's consideration at the 8 March 2021 Ordinary Council Meeting, incorporating feedback collected and considering any submissions received.

Financial Considerations

At its meeting held 19 October 2020, Council resolved the following:

> *1036/20 That any motions put before Council for the remainder of this term of Council that have financial implications require the Chief Executive Officer to provide a report on how those additional costs will be met.*

The following statement is provided in response to this resolution of Council.

There is no financial implication associated with the recommended action.

Link to Community Strategic Plan

Theme 4: Responsible

Goal G: Good governance and great partnerships

R-G2: Communicate openly and honestly with the community to build a relationship based on transparency, understanding, trust and respect.

Attachments

1 Draft Lobbying Policy October 2020 D14226128

Central Coast Council

Lobbying **Policy**

September 2020
Policy No: CCC 096

Policy owner:	Governance and Business Services, Office of the CEO
Approved by:	Gary Murphy CEO / Council [Min. No. XX/20)?
Date of approval:	Day/Month/2020
Policy category:	Strategic
Content Manager No:	D#########
Review date:	DD/MM/YY

Contents

Purpose

1. This Policy is to ensure that:

   a) community expectations are met in relation to the conduct of ethical and transparent lobbying activities of Council Officials.

   b) there is no misunderstanding regarding Council's adopted position in relation to the engagement of lobbyists for its own purposes.

Scope

2. This Policy covers:
   a) all Council Officials as defined in Council's Code of Conduct;
   b) any person or organisation contracted to or acting on behalf of Council;
   c) any person or organisation employed to work on Council premises or facilities,
   d) any company or other body of which the Council Official, or their nominee, relative, partner or employer, is a shareholder or a member.
   e) someone personally associated as stated in clause 6.1 Council's Code of Conduct with a person covered under 3 a), b), c) and d).

3. All Councillors, Council Officers and contractors are responsible for complying with the provisions of this Policy.

4. This Policy should be read in conjunction with Council's Code of Conduct.

Background

5. It is in the public interest that lobbying is fair and does not undermine public confidence in impartial decision-making.

6. The actions of those covered under this Policy when lobbied must reduce the likelihood of perceptions of corrupt or inappropriate conduct and comply with appropriate probity principles

General

Provisions

7. All lobbyists, as defined by this Policy, are required to complete the Lobbyist Registration Form (Appendix 1) for each matter on which they intend to lobby Council. The register will be published on Council's website.

8. Attempts at inappropriate or unlawful conduct on the part of someone lobbying those covered under this Policy may constitute corrupt conduct.

9. Any attempts made to those covered under this Policy, or of which those covered under this Policy become aware, that those covered under this Policy believe to fall under Part 3 Section 7 and 8 *Independent Commission Against Corruption Act 1988* definition of corrupt conduct must be reported in accordance with the Internal Reporting Policy for corrupt conduct, maladministration and waste.

10. Those covered under this Policy must avoid conduct during the lobbying process that would be considered inappropriate. Examples of inappropriate conduct include:
    a) accepting undisclosed payment or benefits whilst making a decision that affects the gift giver's interests;
    b) accepting a political donation in return for the favourable exercise of discretion during decision-making. Ideally, Councillors should keep the lobbying and fundraising activities in which they are involved quite separate to avoid even the perception that a political donation could influence their decision-making;
    c) granting or facilitating access to a particular individual or group while unreasonably denying similar access requested by another party;
    d) fettering discretion by giving undertakings in any form, to an interested party prior to considering all the information relevant to a decision;
    e) Councillors are under a particular obligation to give real and open consideration to all mandated matters when dealing with statutory powers such as Section 4.15 of the *Environmental Planning and Assessment Act 1979*;
    f) acting in a manner that exceeds the role of those covered under this Policy as a result of being lobbied;
    g) disclosing confidential information or information not in the public domain whilst being lobbied;
    h) being influenced by factors that are irrelevant to the merits of the matter under consideration; and
    i) those covered under this Policy who are lobbied over Council matters by close friends, associates or relatives should also consider whether the nature of their relationship with the proponent and the impact of the matter on the proponent's interests give rise to a pecuniary or nonpecuniary interest. In such cases the matter should be managed in accordance with the provisions of the *Local Government Act 1993*, Council's Code of Conduct and Related Party Disclosures (Australian Accounting Standard Board 124).

Transparency

11. Those covered under this Policy should exercise judgement when deciding whether to be involved in private meetings with people seeking to influence a Council decision.

12. Suspicions of inappropriate lobbying can occur when lobbying is not open to public scrutiny. Regardless of whether such suspicions are justified, they still have the potential to undermine public confidence in Council decision-making and adversely affect a person's reputation.

13. Transparency is a useful means of governing accountability and perceptions of fairness in lobbying processes.

14. There are several ways those covered under this Policy can help ensure transparency whilst being lobbied. These include:
    a) ensuring that lobbyists are registered on Council's Lobbyist Register and publishing the details on Council's website;
    b) documenting meetings and significant telephone conversations with lobbyists, development proponents, supporters and objectors and providing a copy to the Chief Executive Officer prior to any subsequent Council Meeting where the matter may be reported;
    c) generally, conducting meetings in official locations such as Council premises;
    d) having other people present during meetings;
    e) asking people who have requested a meeting to put their arguments in writing;
    f) inviting applicants, supporters or objectors and lobbyists who have approached them for a meeting to discuss a significant development to write to Council seeking a meeting with all Councillors and relevant Council Officers;
    g) not discussing or negotiating on an individual basis, any possible compensatory conditions, or other development related matters. All such issues must be referred to the Internal Ombudsman for proper consideration and assessment;
    h) providing copies of information presented during lobbying meetings to Council Officers for consideration and assessment, distributing to other Councillors and filing as part of Council's records prior to any subsequent Council meeting where the matter may be reported;
    i) providing copies to the Chief Executive Officer, of emails and correspondence to and from parties to a Development Application, or other significant matter, prior to any subsequent Council Meeting where the matter may be reported;
    j) Council Officers documenting and notifying their Manager about lobbying to them that is not part of Council's formal processes; and
    k) Councillors making a declaration at a Council Meeting about lobbying to them that is not part of Council's formal processes.

Transparency

15. The conditions which govern a tender process is based on a request for tender (RFT). Council RFTs contain a statement prohibiting tenderers from approaching those covered under this Policy, other than the nominated contact person, during a tender process.

Council's Lobbying Activities

16. Council will not engage professional lobbyists to advocate on its behalf in any circumstances.

17. Council Officials, such as the Mayor, Chief Executive Officer and other senior officers, will continue the practice of lobbying politicians, government officials and other relevant parties in relation to issues affecting Council, the Central Coast Community, and Local Government as a whole.

Review

Compliance, monitoring and review

18. All covered under this Policy are responsible for reporting any inappropriate lobbying or efforts to unduly influence the decision-making process to the Internal Ombudsman.

19. All lobbyists, as defined by this Policy, are responsible for registering with the Council and complying with the Registration Procedures and Protocols and Council's Code of Conduct – Contractors, their staff and business associates.

20. The Chief Executive Officer is responsible for taking action as per the Council's Code of Conduct where breaches of the Policy are reported.

21. The Chief Executive Officer is also responsible for reporting any suspected unlawful conduct to the ICAC.

22. This Policy will be reviewed every four years.

Records management

23. Those covered under this Policy must maintain all records relevant to administering of this Policy in Council's Content Manager system.

Definitions

24. In this policy:

Inappropriate conduct: Includes conduct that is:

a) on the part of someone lobbying those covered under this Policy, this usually involves an attempt to obtain preferential consideration or treatment based on factors other than the merits of a matter.
b) is also the engagement of professional Lobbyists on Council's behalf.

Lobbying: Includes:

a) representations made to those covered under this Policy either by an individual or group with a direct interest in a matter; by an advocate acting on behalf of others.
b) Council advocating on issues affecting Council, the Central Coast Community, and Local Government as a whole.

Lobbyist: Any person, body corporate, unincorporated association, partnership or firm whose business includes being contracted or engaged to represent the interests of a third party, but does not include:

a) applicants or owners for a Development Application;
b) charitable, religious and non-profit organisations;
c) individuals making representations to inform the Council of their views on matters of public interest;
d) peak industry bodies and professional organisations who represent the interests of their members;
e) professionals, such as accountants, architects, engineers, private certifiers, lawyers, surveyors and town planners, where contact with Council on behalf of a client may be an incidental but necessary part of their usual work in order to provide their technical or professional services to their client; and
f) Council Officials, such as the Mayor, Chief Executive Officer and other senior officers, in the process of lobbying politicians, government officials and other relevant parties in relation to issues affecting Council, the Central Coast Community, and Local Government as a whole.

Lobbyist Register: A system of registering lobbyists as defined in this Policy for the purposes of transparency.

Related resources

25. Legislation:

    a. *Australian Accounting Standards Board 124*

    b. *Environmental Planning and Assessment Act 1979*

    c. *Independent Commission Against Corruption Act 1998*

    d. *Lobbying Local Government Councillors – A Guide for Councillors, Constituents and other interested parties, August 2006 (ICAC)*

    e. *Local Government Act 1993 (NSW)*

    f. *Public Interest Disclosures Act 1994*

26. Associated/Internal documents:

    a. Access to Council Information

    b. Code of Conduct and Administration of the Code of Conduct

    c. Code of Meeting Practice

    d. Community Strategic Plan

    e. Councillor and Staff Interaction Policy

    f. Information Records Management Policy

    g. Internal Reporting Policy

Appendix 1: Lobbyist Registration Form

Lobbyist Registration Form

This form must be completed in accordance with Council's Lobbying Policy

IMPORTANT INFORMATION

1. Addresses, telephone number and email addresses may be used by Council Officials to contact Lobbyists but will not be published on the register.
2. Lobbyists are reminded of their obligations under Section 10.4 of the *Environmental Planning and Assessment Act 1979* to disclose certain gifts and political donations.
3. For additional information and electronic copies of this form, please refer to Council's website at www.centralcoast.nsw.gov.au.

DETAILS OF APPLICANT

Full Name of Individual or Organisation:

Postal Address:

Contact: Phone:

(Person/s who will be undertaking lobbying activities if different from above) Mobile:

Email:

LOBBYING DETAILS

Outline the issue or matter on which you will be lobbying Council:

Details of the individual, organisation or business who has engaged you to lobby:

Full Name of Individual or Organisation:

Postal Address:

Contact: Phone:

(Person/s who will be undertaking lobbying activities if different from above) Mobile:

DECLARATION

I declare that the above details are true and correct.

Signature: Date:

History of revisions

Amendment history	Details
Original approval authority details (this version)	XX/XX/20XX <insert Council Meeting date and minute number of resolution adopting the policy <remove if not needed>
	CM document number
	Created to supplement Code of Conduct, following Council Resolution 459/20 at 14 September 2020 Ordinary Council Meeting.

Item No:	4.5
Title:	Governance Lighthouse report as at 30 September 2020
Department:	Governance

30 November 2020 Ordinary Council Meeting

Reference:	F2020/02182 - D14296075
Author:	Shane Sullivan, Unit Manager, Governance and Business Services
Executive:	Krystie Bryant, Executive Manager, People and Culture

Report purpose

To provide a Governance Lighthouse report for the information of Council.

Executive Summary

A Governance Lighthouse report has been developed and is now provided to Council for information. The report will be provided to Council each quarter.

Governance Recommendation

That Council note the Governance Lighthouse report as at 30 September 2020 as provided as an Attachment to this report.

Background

At its meeting held 27 July 2020, Council resolved as follows:

695/20 *That Council receive and note the report on Actions in response to Resolution – Integrity and Ethical Standards.*

696/20 *That Council request the Chief Executive Officer provide a further report to Council in early 2021 assessing if the actions identified have achieved the desired outcomes.*

697/20 *That the Dashboard be discussed at a Councillor Briefing before the end of September 2020 for the purpose of ensuring the dashboard includes appropriate Governance focused measures and processes for reporting to Council.*

A Governance report has been created reporting against measures using the structure of the NSW Audit Office Governance Lighthouse. As well as quantitative information, the document will include commentary to provide context. It is also planned to provide rolling data for the purpose of identifying trends and patterns.

The report will be updated at the end of each quarter and be provided to the Audit, Risk and Improvement Committee and then to Council. It is proposed to seek regular feedback regarding the report and the measures included so that improvements can be made as required.

The delay in providing this report as at September 2020 is due to the need to consult with Councillors and the Audit, Risk and Improvement Committee regarding the report content and format.

Consultation

In accordance with resolution 697/20 a Councillor Briefing was conducted on 21 September 2020. As a result, a report was prepared and provided to Councillors for comment in the Councillor Support Update on 23 October 2020.

The report was also provided to the Audit, Risk and Improvement Committee for comment on 6 November 2020.

Financial Considerations

At its meeting held 19 October 2020, Council resolved the following:

> *1036/20 That any motions put before Council for the remainder of this term of Council that have financial implications require the Chief Executive Officer to provide a report on how those additional costs will be met.*

The following statement is provided in response to this resolution of Council.

There is no financial impact as a result of this report.

Link to Community Strategic Plan

Theme 4: Responsible

Goal G: Good governance and great partnerships

R-G2: Communicate openly and honestly with the community to build a relationship based on transparency, understanding, trust and respect.

Attachments

1 Governance Lighthouse - Report as at 30 September 2020 D14254737

Governance Report Card - Central Coast Council

This quarterly report is based upon the Governance Lighthouse. (NSW Audit Office). It covers eight principles and 17 key governance components.

Report date: Quarter 1 – 2020/2021

General Comments:

Quarter ending 30 September 2020

- A third party review was undertaken of Council's activation of the Business Continuity Plan in response to COVID-19. As a result of the post implementation review a number of actions have been identified for improvement of the Business Continuity Plan.
- The Model Code of Conduct was reviewed by the Office of Local Government and Council subsequently adopted the changes at its meeting held 14 September 2020.
- At its meeting held 14 September 2020, Council adopted a draft Councillor Expenses and Facilities Policy for the purpose of public exhibition.
- At its meeting held 28 September 2020, Council adopted a revised Code of Meeting Practice following a public exhibition period.
- Throughout the period a number of Policies have been reported to Council for revocation or consolidation. This is part of the ongoing work to align all Central Coast Council policies.

Actions for next quarter

- Implementation of 100 Day Plan to Recovery and appropriate governance structrue, controls and oversight.
- Agreement of actions in response to Fraud and Corruption Maturity Assessment for reporting

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Governance Report Card - Central Coast Council

Light house principle: **Stakeholder rights**

Measure: Number of Code of Conduct complaints
Reporting cycle: Quarterly
Current as at: 30-Sep-20 Data provided by: Office of the Internal Ombudsman

	17/18	18/19	19/20	Q1 20/21
# complaints (total)	8	23	25	5
% Upheld	37%	43%	32%	40%
# complaints (Clrs + CEO)	3	8	13	2
% Upheld	67%	63%	15%	50%

Commentary: In 2017/18 one complaint regarding Councillors or the CEO was resolved at the outset by alternative means.

In 2018/19 one complaint regarding Councillors or the CEO remained unresolved and two were resolved at the outset by alternative means.

Governance Report Card - Central Coast Council

Measure: % of Tier 1 customer complaints resolved at first point of contact
Reporting cycle: Quarterly
Current as at: 30-Sep-20 Data provided by: Customer Experience Coordinator

	17/18*	18/19	19/20	Q1 20/21
Number of complaints	285	1049	596	119
% resolved at fpoc	NA	NA	NA	100%

Commentary:

*CX (Council's Customer Relationship Management tool) started end of 2017 so the data for 2017/18 is not for a full 12 months.

Complaints for 2018/19 are significantly higher as general feedback service requests were included in the complaints data. Due to a change in resourcing, complaints were forwarded to departments, not reviewed or triaged, therefore reporting is not reflective of the true number of community complaints and included generic customer comments.

Prior to 2020/21 the percentage of complaints resolved at first point of contact have not been tracked.

There is one fpoc request from Q2 19/20 that was redirected to the Internal Ombudsman for review which is still not resolved.

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Governance Report Card - Central Coast Council

Light house principle: **Risk management**

Measure: % of Government Public Access Act decisions overturned on review
Reporting cycle: Quarterly
Current as at: 30-Sep-20 Data provided by: Section Manager, Governance Services

	2018/19	2019/20	Q1 19/20	Q2 19/20	Q3 19/20	Q4 19/20	Q1 20/21	Trend
GIPA applications	116	112	25	35	30	22	31	↑
Number of reviews	NA	8	3	3	2	0	2	-
Informal information requests	1,286	1,380	387	337	295	361	450	↑
Average days to complete	35	25	15	20	20	25	40	↑

Commentary:

A GIPA application is a formal application under the Government Information (Public Access) Act. A review under that Act is a formal request by an applicant or third party to review the decision made. The review can be conducted by another staff member or the Office of the Information and Privacy Commissioner.

An information information request is a request for information held by Council. There is no statutory timeframe for completing these requests. Council has a self determined target that 90% of informal requests are competed within 45 days.

Reviews can be internal review, NCAT reviews or a review by the IPC. In Q1 of 20/21 there were two internal reviews one in which the decision was the same as the Formal Decision and the other resulted in a variation to the Formal Decision.

In 2018/19 there was one instance of a deemed refusal where the timeframe for response was missed. Details of review numbers and outcomes were not collected in 2018/19.

In 2019/20 there were no instances of deemed refusal of a formal GIPA due to a missed timerame. 92.5% of informal requests were completed within 45 days.

In Q1 of 2020/21 79% of information requests were completed within 45 days. The reduction in turn around time is due to reduced resource levels. The focus remains on formal applications due to the statutory timeframes and requirements.

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Governance Report Card - Central Coast Council

Measure: % of risk management actions completed within timeframes
Reporting cycle: Quarterly
Current as at: 30/09/2020 Data provided by: Enterprise Risk Manager

Total number of operational risks	216
Total number of Extreme risks	2
Total number of High risks	19
Total number of Medium risks	84
Total number of Low risks	111

Risk by Type	
Asset	28
Business	45
Fraud and Corruption	10
Governance	22
HR	6
IM	23
Legal	12
Operational	70

Commentary:

The Enterprise Risk Management Framework has been operating since April 2019. There have been three reviews of risks during the last 18 months focussed on developing an understanding of idnetifying risks and effectively managing them. Of the 20 highest risks current identified: three are asset related, six are business related, one is human resources related, two are information management related, two are legal related and six relate to operations.

These risks and associated controls are currently under review as the organisation works towards reducing them to an acceptable level.

Controlled Risks Heat Map

	CONSEQUENCE				
LIKELIHOOD	Catastrophic	Major	Moderate	Minor	Insignificant
Almost Certain	0	1	6	3	61
Likely	2	3	7	19	5
POSSIBLE	1	3	13	28	10
Unlikely	1	5	5	3	9
Rare	2	2	1	13	10

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Governance Report Card - Central Coast Council

Light house principle:	**Remuneration**
Measure:	Council determines Councillor remuneration annually by 30 June
Reporting cycle:	Annual
Current as at:	13-Jul-20 Data provided by: Unit Manager, Governance and Business Services

	17/18	18/19	19/20	20/21
Date resolved	23/10/2017	26/06/2018	10/06/2019	13/07/2020
In time	No*	Yes	Yes	No**

Commentary:

Council is required to determine the Remuneration for Councillors each year prior to 30 June 2020. This is based upon the annual determination made by the Local Government Remuneration Tribunal.

*In 2017 the annual determination was made after 30 June 2020 due to the conduct of the Local Government Election in September 2017.

**In 2020 the annual determination was made after 30 June 2020 due to the Remuneration Tribunal decision being delayed as a result of COVID-19.

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Governance Report Card - Central Coast Council

Light house principle:	**Disclosure**
Measure:	% of annual disclosures completed within statutory timeframes
Reporting cycle:	Annual
Current as at:	30/09/2020 Data provided by: Section Manager, Governance Services

	17/18	18/19	19/20
% completed by 30 Sep (staff)	97%	96%	100%
% completed by 30 Sep (Clrs)	100%	100%	100%
% completed by 30 Sep (ARIC)	NA	NA	100%

Commentary:

The Councillor returns upon election were tabled on 12 February 2018.

Returns for the period of 2017/18 were tabled on 29 October 2018. Nine returns for staff were not tabled due to those staff being on extended leave. These returns were subsequently completed.

Returns for the period of 2018/19 were tabled on 28 October 2019. Seven returns for staff were not tabled due to those staff being on extended leave. These returns were subsequently completed.

Prior to the tabling of returns for 2019/20, the list of designated persons was reviewed in accordance with the relevant Office of Local Government circular. This resulted in a reduced number of staff being identified as designated persons. Returns for the period of 2019/20 will be tabled on 24 October 2020.

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Governance Report Card - Central Coast Council

Light house principle:	**Corporate reporting**
Measure:	Financial statements completed within timeframes
Reporting cycle:	Annual
Current as at:	30/09/2020 Data provided by: Financial Controller, Performance and Partnering

	16/17	17/18	18/19
Date resolved	26/03/2018	10/12/2018	9/03/2020

Commentary:

The legislated deadline for the finalisation of the Financial Statements is 30 November each year. However, the Office of Local Government grants extensions where there are valid reasons why that timeframe cannot be met.

The lodgement of the Financial Statements for the years ended 30 June 2017, 30 June 2018 and 30 June 2019 were approved by the OLG. Copies of these approvals are held on file. The main reasons for the requested extensions were:

Financial year ended 30 June 2017
- The requirement for newly elected councillors to gain an understanding of deficiencies in the former Gosford City Council's financial controls and assurance as to their effect on the Financial Statements
- The requirement to consolidate the former Gosford City and Wyong Shire Council's 2016-17 Financial Statements
- Additional Audit Office queries requiring additional time and resources to address.

Financial year ended 30 June 2018
- New ERP (financial systems) implemented during 2017-18 financial year which has taken staff longer than normal to prepare the Financial Statements
- Reduced finance resources through provision of support for the IPART pricing submission
- Delay in receiving asset revaluation information from the appointed valuer.

Financial year ended 30 June 2019
- Ongoing issues associated with the amalgamation and the additional testing and samples required by the Audit Office relating to implementation of a single IT system and Council's controls.

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Governance Report Card - Central Coast Council

Measure: Management Actions identified as part of audits completed by risk rating
Reporting cycle: Quarterly
Current as at: 28/09/2020 Data provided by: Chief Internal Auditor

	Extreme	High	Medium	Low	Total	Date	
2020/2021	**0**	**30**	**27**	**4**			
Contract Management	0	6	6	0	12	Jun-20	Internal Audit
Leadership Allowance and Expenses	0	11	6	1	18	Sep-20	Internal Audit
Complaints Management	0	11	6	1	18	Pending	Internal Audit
IT Governance	0	2	9	2	13	Pending	Internal Audit
2019/2020	**0**	**40**	**43**	**11**			
Procurement of IT Goods	0	11	1	0	12	Jul-19	Internal Audit
NHV Accreditation (2017/18)	0	3	4	1	8	Jul-19	Internal Audit
Cash Management (Waste Services)	0	11	3	0	14	Jul-19	Internal Audit
Seniors Centres	0	11	6	0	17	Sep-19	Internal Audit
Cash Management (Library Services)	0	2	4	0	6	Oct-19	Internal Audit
Interim Audit 30/6/19	0	0	16	7	23	Jan-20	NSW Audit Office
Final Audit 30/6/19	0	2	9	3	14	Mar-20	NSW Audit Office
Infrastructure contributions	NA	NA	NA	NA	*13	Mar-20	NSW Audit Office
2018/19	**0**	**20**	**10**	**0**			
CCTV	0	11	3	0	14	Aug-18	Internal Audit
RMS Drives (2017/18)	0	9	7	0	16	Sep-18	Internal Audit

Commentary:

NSW Audit Office Actions were not captured in reporting until 2020/21 this is because the NSW Audit Office became Council's external auditor from 2018/19 year.

Details of the Management actions are reported to the Audit, Risk and Improvement Committee every meeting.

*In March 2020, the NSW Audit Office finalised a performance audit of *Governance and internal controls over local infrastructure contributions*. The Audit made 13 recommendations for Central Coast Council. These recommendations were not identified by risk level.

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Governance Report Card - Central Coast Council

Light house principle:	**Ethics**
Measure:	No instances of failure to meet legislative deadlines
Reporting cycle:	Quarterly
Current as at:	30/09/2020 Data provided by: Section Manager, Governance Services

	Q1 20/21
# of missed deadlines	2

Commentary:

On 2 July 2020 a Legislative Compliance Policy (Operational) was adopted.

From 1 July 2020 a Legislative Compliance Register was established and implemented.

As at the end of Q1 20/21 there were no instances of failure to meet legislative deadlines, however there were two instances where the legislative deadlines were completed late. The two legislative deadlines completed late were:

1.Enviroment and Planning - R.186 – Reporting of all regulatory activities relating to food premises eg: Number of inspections, compliance, notices was completed one day late on 1 October 2020.

2.Road Transport Drainage and Waste RTDW.326 – Roads and Maritime Services - Regional Roads Expenditure" – was completed on 12 days late on 12 October 2020.

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Governance Report Card - Central Coast Council

Light house principle:	**Structure**
Measure:	# of Council actions completed
Reporting cycle:	Quarterly
Current as at:	30/09/2020 Data provided by: Section Manager, Councillor Support

	Q1 19/20	Q2 19/20	Q3 19/20	Q4 19/20	Q1 20/21	
Number of open actions	101	93	71	76	86	(at the end of the quarter)
Number closed actions	13	131	78	77	62	(at the end of the quarter)
Open and overdue	NA	NA	9	6	14	(at the end of the quarter)

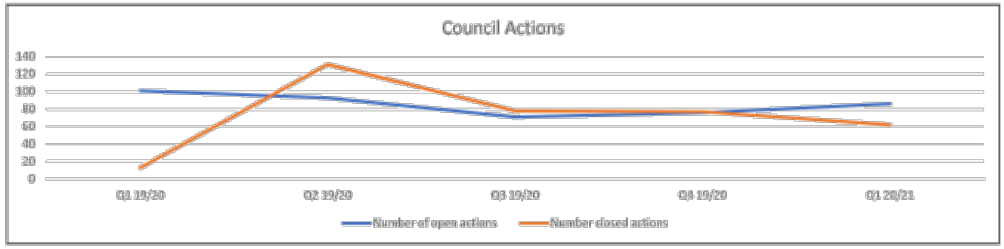
Commentary:

Open, closed and overdue actions are as at the end of each quarter.

During the period from October to December 2019, a review was undertaken of open Council Actions. As a result of this review a significant number were closed as the action had been taken but had not been updated in the system. For transparency, a report of all resolutions of Council since the conduct of the 2017 Local Government election was provied to all Councillors on 24 April 2020 with a status comment.

Quarterly reports were provided on 22 May 2020 (for period ending 31 March 2020) and 24 July 2020 (for period ending 30 June 2020)

Reports of overdue actions at the end of each quarter were not created until January 2020



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Governance Report Card - Central Coast Council

Measure: % of items considered in Confidential Session of Council
Reporting cycle: Quarterly
Current as at: 30/09/2020 Data provided by: Section Manager, Councillor Support

	Q1 19/20	Q2 19/20	Q3 19/20	Q4 19/20	Q1 20/21	Trend
Total number of items	122	170	106	108	90	
% in closed session	3%	1%	7%	5%	2%	↑

Commentary: In 2019/20 there were a total of 17 items resolved by Council to be confidential.

In the past quarter there has been a focus on providing as much as practicable in open Council by using Confidential attachments.

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Governance Report Card - Central Coast Council

Light house principle:	**Management oversight**
Measure:	% of actions delivered against Community Strategic Plan
Reporting cycle:	Annual
Current as at:	30/09/2020 Data provided by: Section Manager, Corporate Planning and Reporting

	18/19	19/20
Actions due to be completed	157	147
Number of actions completed	121	109

Commentary:

The Community Strategic Plan was adopted by Council in May 2018 and was implemented from 1 July 2018.

Q1 2020/21 information will be available 19 October and reported to Council in November. The 2019-20 figures are draft as they form part of the Annual report which will be provided to Council on 14 December 2020.

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Item No: 5.1

Title: Tuggerah to Wyong Economic Corridor Strategy

Department: Innovation and Futures

30 November 2020 Ordinary Council Meeting

Reference: CPA/271459 - D14175620

Author: Lynda Hirst, Senior Strategic Planner
Breanne Bryant, Acting Section Manager, Urban Planning and Development

Manager: Shari Driver, Unit Manager, Strategic Planning

Executive: Ricardo Martello, Executive Manager Innovation and Futures

Report purpose

To outline the outcomes of public exhibition and seek Council's endorsement and adoption of the draft Tuggerah to Wyong Economic Corridor Strategy (the Strategy).

Executive Summary

The Strategy was prepared to implement the Central Coast Regional Plan 2036 (CCRP), specifically Direction 2 to "*focus economic development in the Southern and Northern Growth Corridors*". The Strategy was placed on public exhibition from 11 March to 8 May 2020 with 98 community submissions and seven government agency submissions received. The Strategy has been amended to address issues raised in the submissions.

It is recommended that Council adopt the Strategy as it will guide growth and investment in the Corridor to ensure it meets anticipated population and employment growth for the next 20 years.

Innovation and Futures Recommendation

1 *That Council adopt the draft Tuggerah to Wyong Economic Corridor Strategy as amended in response to public exhibition as outlined in Attachment 1 to this report.*

2 *That Council notify those persons who lodged submissions of Council's decision.*

Background

The draft Strategy has been prepared in response to the CCRP and was reported to Council on 11 November 2019. Council resolved to prepare a Transport Study for the Corridor, remove reference to the airport and exhibit the draft strategy for 40 days. Further background is attached to this report

Attached (under separate cover) to this report are the following:

Attachment 1 – The Tuggerah to Wyong Economic Corridor Strategy recommended for Council adoption.
Attachment 2 – The Tuggerah to Wyong Economic Corridor Strategy – Transport Study which forms part of the overall Strategy.
Attachment 3 – A summary document setting out the key aspects of the Strategy.
Attachment 4 – A summary of submissions received during the public exhibition period and any response or changes.

Current Status

The draft Strategy was prepared by Council in conjunction with a consultant team comprising Architectus (Strategic Planning and Urban Design), SGS Economics and Planning (Economics) and GTA Consultants (Transport Planning).

Report

The Strategy has been informed by an Economic Analysis and Transport Study. The Economic Analysis concludes that the current planning controls within the Tuggerah to Wyong Economic Corridor provide:

1 Sufficient capacity to support the projected demand for additional dwellings to 2036; and
2 Sufficient employment land supply to support the projected demand for additional jobs to 2036.

As such, there are no proposed changes to land use zones or planning controls as part of the Strategy. Instead, the Strategy focuses on directions and actions to guide decision making and promote future development within the Tuggerah to Wyong Economic Corridor.

The Transport Study provided at Attachment 2 and identifies a number of opportunities and actions for improvements to the existing transport network including 10 walking and cycling actions, seven public transport actions, seven road and transport actions and three parking actions. The relevant actions will be included in future updates to Council's Development Contributions Plan's works schedule for funding.

Implementation

An Implementation Program is included in the Strategy which identifies actions, responsibility, and delivery. To ensure that the actions are implemented, and the Strategy responds to changing government policy it is recommended that the Strategy be reviewed after five years.

Financial Considerations

At its meeting held 19 October 2020, Council resolved the following:

1036/20 That any motions put before Council for the remainder of this term of Council that have financial implications require the Chief Executive Officer to provide a report on how those additional costs will be met.

The following statement is provided in response to this resolution of Council.

The cost to Council has been the Consultant's fees for assisting in the preparation of the Strategy and Transport Study which are now complete. Any actions arising from the Strategy that require funding are "non-essential" for the short to medium term. Opportunities for funding of these actions include government grants. Relevant actions will also be included in future updates to Council's Development Contribution Plans.

Link to the Interim Local Strategic Planning Statement

The Strategy has strong links with Planning Priority 3 – Grow the Regional Economic Corridors, to support a strong local economy. The adoption of the Strategy will implement the relevant action of this Planning Priority which aims to promote the Corridor as a key location for economic growth, investment and sustainable transport.

Link to Community Strategic Plan

Theme 2: Smart

Goal C: A growing and competitive region

S-C1: Target economic development in growth areas and major centres and provide incentives to attract businesses to the Central Coast.

S-C3: Facilitate economic development to increase local employment opportunities and provide a range of jobs for all residents.

Risk Management

There have been no risks identified from the adoption of the Strategy.

Options

1 Adopt the Strategy; or
2 Defer adoption of the Strategy until implementation resources are available.

Option 1 is recommended as this will provide greater development certainty to landowners within the Corridor and promote the development of key opportunity sites.

Option 2 is not recommended as there is little benefit in delaying the adoption of the Strategy. Most short-term actions have already commenced within existing budgets.

Alternate funding will be sought and internal resources utilised for any medium to long term actions.

Critical Dates or Timeframes

There are no critical dates associated with the adoption of the Strategy.

Conclusion

The draft Strategy sets a 20-year vision for the Tuggerah to Wyong Economic Corridor and has been prepared by Council with input from the community and key stakeholders. It will guide growth and investment within the Corridor and also implements the directions and actions of the NSW Government's CCRP.

Attachments

1	Tuggerah to Wyong Economic Corridor Strategy (FINAL)	Provided Under Separate Cover	D14197039
2	Tuggerah to Wyong Economic Corridor Strategy - Transport Study (FINAL)	Provided Under Separate Cover	D14198680
3	Summary Report Tuggerah to Wyong Economic Corridor Strategy	Provided Under Separate Cover	D14291769
4	Summary of Submissions - Draft Tuggerah to Wyong Economic Corridor Strategy	Provided Under Separate Cover	D14197131

Item No:	5.2
Title:	Classification of Land at 40 Fairmont Boulevard, Lot 97 DP 1261646, Hamlyn Terrace
Department:	Innovation and Futures

30 November 2020 Ordinary Council Meeting

Reference:	SC/50/2019 - D14271552
Author:	Joe O'Connor, Property Development Manager
Manager:	Jamie Barclay, Unit Manager, Economic Development and Project Delivery
Executive:	Ricardo Martello, Executive Manager Innovation and Futures

Report Purpose

To advise Council that the time period to classify 40 Fairmont Boulevard Hamlyn Terrace operational has lapsed and the land is now classified as community.

Executive Summary

A 97-lot subdivision at 580 Pacific Highway Hamlyn Terrace, included the dedication to Council of a 4.9 hectare lot. This lot, being known as 40 Fairmont Boulevard, contains a large area of environmental land as well as a water quality pond.

As Council acquired the land, it had the option of allowing the land to default to community land, or otherwise by resolution of Council seek the land be operational classified land.

As the deposited plan described the lot as a "Drainage Reserve", a report was put to Council seeking that the land be classified operational land. However, Council resolved to receive a further report which would provide the "benefits and ramifications" of classifying the land as either operational or community land.

While Council had 3 months from acquisition to classify the land, it was unachievable for staff to satisfy the requirements of this resolution and do all the necessary actions required under the Act to classify the lot as operational land. As such, the 3-month period lapsed and the land was taken as community classified land.

In this instance, there is marginal benefit for the land to be now reclassified operational, and as such it is recommended that the land remain as community classified.

Innovation and Futures Recommendation

That Council note and accept that the land known as 40 Fairmont Boulevard, Lot 97 DP 1261646, Hamlyn Terrace has been classified community land pursuant to the Local Government Act 1993.

Background

The development of a 97-lot subdivision at 580 Pacific Highway Hamlyn Terrace Lot required that the land owner dedicate 40 Fairmont Boulevard, Lot 97 DP 1261646, Hamlyn Terrace, to Council. This Lot was acquired by Council as per the requirements of the Warnervale District Contributions Plan.

It can be seen in Figure 1 below, that a large portion of the land is environmental land (E2 and E3 zone), and a water quality pond is located to the southern end of the lot.

Figure 1: 40 Fairmont Boulevard, Hamlyn Terrace

A Council report at the Ordinary meeting of 22 June 2020, recommended that the land be classified as operational land given the deposited plan describes the land as "Drainage Reserve" (refer to **Attachment 1**). However, at this meeting it was resolved:

> *546/20 That Council defer consideration of this item to allow a further report to be provided setting out the reasons for which the categorisation is recommended with an emphasis of the benefits and ramifications of either option – operational or community.*

Current Status

The land known as 40 Fairmont Boulevard, Lot 97 DP 1261646, Hamlyn Terrace has been classified community land.

Report

While Council had 3-months to classify the land as operational, resolution 546/20 (as noted above) requested staff provide a further report. This resolution diminished the opportunity for Council to satisfy the resolution and then do all things necessary under the Act to classify the land as operational. In this instance the timeframe was missed, and the land was taken to be community classified land.

Even though the previous staff report recommended the land be classified operational, it is also appropriate for the land to remain as community classified land. This is because under Section 51 of the Local Government Act 1993, the use of a "drainage reserve" as environmental land would not conflict with its notated use on title.

One of the benefits of classifying land operational over community is the flexibility it provides Council to determine the most appropriate future use for land. Once this is determined the land can be classified community by way of Council resolution with the identified future use and a Plan of management (PoM) developed in line with the determined future use.

Where land defaults to community, a plan of management (PoM) needs to be developed detailing specific uses and management of this land. In this case the community use requires Council to identify an asset owner and immediately develop a plan of management. The land cannot be used for any purpose without the plan of management. As this is dedicated land and not purchased land, the strategic value of the land has not been adequately assessed and if it is determined that it is to be classified operational, it will require an amendment to the Local Environment Plan. Given the minor benefit that this would achieve, it is considered unnecessary for Council to pursue this matter any further.

Consultation

This report sought consultation from Council's Property Information Services Unit and Strategic Planning.

Financial Considerations

At its meeting held 19 October 2020, Council resolved the following:

> *1036/20 That any motions put before Council for the remainder of this term of Council that have financial implications require the Chief Executive Officer to provide a report on how those additional costs will be met.*

The following statement is provided in response to this resolution of Council.

There is no financial impact should Council resolve to maintain the classification of the land as community, as contained within Option 1 – the preferred option.

However, should Council wish to pursue an amendment to the Local Environmental Plan and reclassify the land as operational, there would be costs associated with staff time in preparing the proposal, and there may be other costs associated with the necessary public hearing and notification requirements.

Link to Community Strategic Plan

Theme 4: Responsible

Goal E: Environmental resources for the future

R-G2: Communicate openly and honestly with the community to build a relationship based on transparency, understanding, trust and respect.

Options

Option 1:

Council note and accept that the land known as 40 Fairmont Boulevard, Lot 97 DP 1261646, Hamlyn Terrace is classified as community land. On this basis, Resolution 546/20 will be closed and no further action will be taken by Council on this matter. This is the preferred option.

Option 2:

Council seek to amend the Local Environmental Plan to reclassify the land known as 40 Fairmont Boulevard, Lot 97 DP 1261646, Hamlyn Terrace. This would require an appropriately detailed planning proposal to the Department of Planning.

Risk Management

Should Council wish to pursue Option 2, to reclassify the land – Council would be required to undertake a planning proposal and public hearing. This option is not recommended as it would result in additional costs which are unbudgeted.

Critical Dates or Timeframes

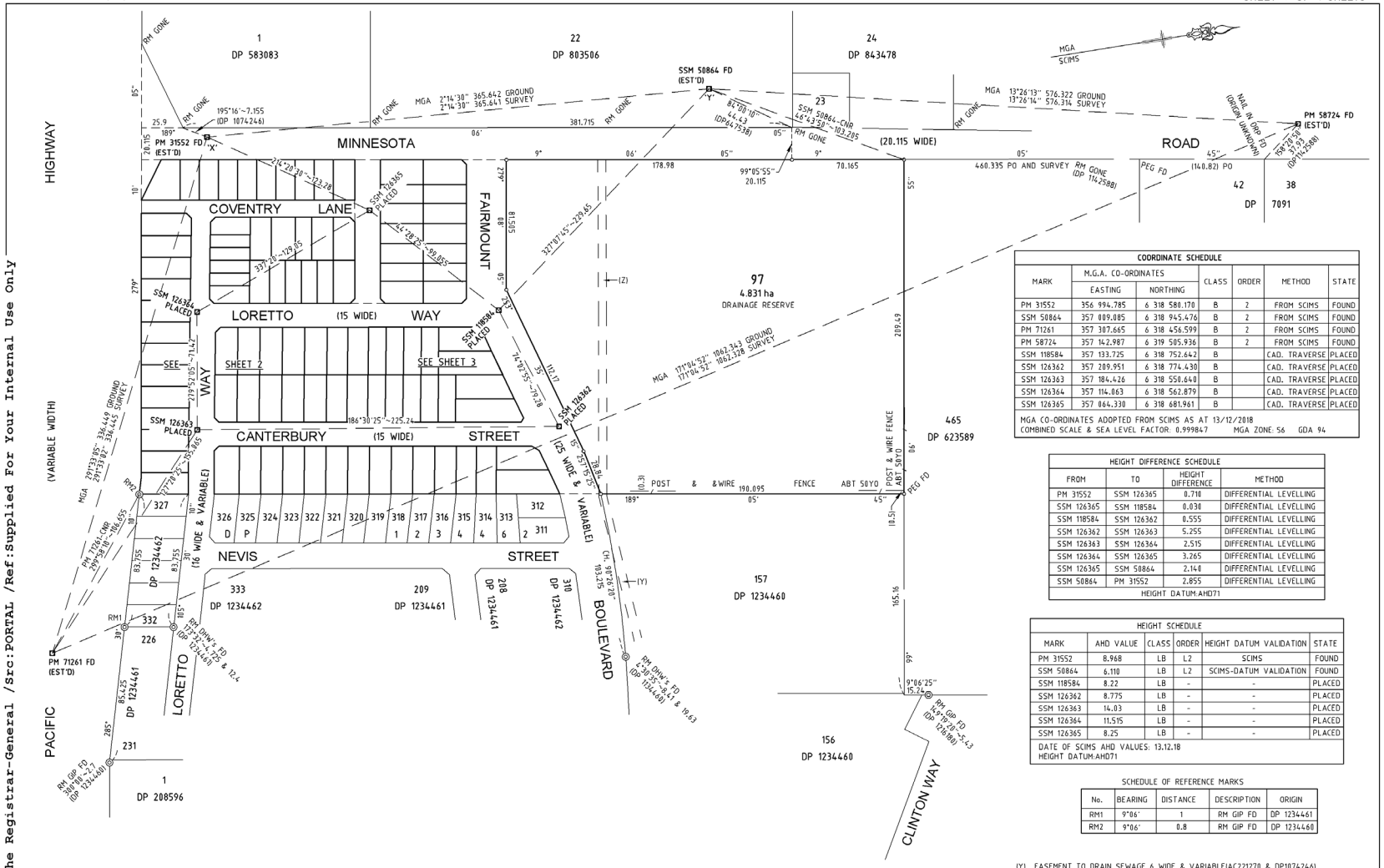
This matter is not time critical, however for procedural requirements, the resolution needs to be addressed.

Attachments

1 Deposited Plan of 40 Fairmont Boulevard D13957250

Box:e-DeX /Doc:DP 1261646 P /Rev:06-Mar-2020 /NSW LRS /Pgs:ALL /Prt:07-Mar-2020 01:11 /Seq:1 of 10
© Office of the Registrar-General /Src:PORTAL /Ref:Supplied For Your Internal Use Only

PLAN FORM 2 (A2) DP1261646 WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION ePlan SHEET 1 OF 3 SHEETS



COORDINATE SCHEDULE						
MARK	M.G.A. CO-ORDINATES EASTING	M.G.A. CO-ORDINATES NORTHING	CLASS	ORDER	METHOD	STATE
PM 31552	356 994.785	6 318 580.170	B	2	FROM SCIMS	FOUND
SSM 50864	357 009.085	6 318 945.476	B	2	FROM SCIMS	FOUND
PM 71261	357 307.665	6 318 456.599	B	2	FROM SCIMS	FOUND
PM 58724	357 142.987	6 319 505.936	B	2	FROM SCIMS	FOUND
SSM 118584	357 133.725	6 318 752.642	B		CAD. TRAVERSE	PLACED
SSM 126362	357 209.951	6 318 774.430	B		CAD. TRAVERSE	PLACED
SSM 126363	357 184.426	6 318 550.640	B		CAD. TRAVERSE	PLACED
SSM 126364	357 114.063	6 318 562.879	B		CAD. TRAVERSE	PLACED
SSM 126365	357 064.330	6 318 681.961	B		CAD. TRAVERSE	PLACED

MGA CO-ORDINATES ADOPTED FROM SCIMS AS AT 13/12/2018
COMBINED SCALE & SEA LEVEL FACTOR: 0.999847 MGA ZONE: 56 GDA 94

HEIGHT DIFFERENCE SCHEDULE			
FROM	TO	HEIGHT DIFFERENCE	METHOD
PM 31552	SSM 126365	0.710	DIFFERENTIAL LEVELLING
SSM 126365	SSM 118584	0.030	DIFFERENTIAL LEVELLING
SSM 118584	SSM 126362	0.555	DIFFERENTIAL LEVELLING
SSM 126362	SSM 126363	5.255	DIFFERENTIAL LEVELLING
SSM 126363	SSM 126364	2.515	DIFFERENTIAL LEVELLING
SSM 126364	SSM 126365	3.265	DIFFERENTIAL LEVELLING
SSM 126365	SSM 50864	2.148	DIFFERENTIAL LEVELLING
SSM 50864	PM 31552	2.855	DIFFERENTIAL LEVELLING
HEIGHT DATUM:AHD71			

HEIGHT SCHEDULE					
MARK	AHD VALUE	CLASS	ORDER	HEIGHT DATUM VALIDATION	STATE
PM 31552	8.968	LB	L2	SCIMS	FOUND
SSM 50864	6.110	LB	L2	SCIMS-DATUM VALIDATION	FOUND
SSM 118584	8.22	LB	-	-	PLACED
SSM 126362	8.775	LB	-	-	PLACED
SSM 126363	14.03	LB	-	-	PLACED
SSM 126364	11.515	LB	-	-	PLACED
SSM 126365	8.25	LB	-	-	PLACED
DATE OF SCIMS AHD VALUES: 13.12.18 HEIGHT DATUM:AHD71					

SCHEDULE OF REFERENCE MARKS

No.	BEARING	DISTANCE	DESCRIPTION	ORIGIN
RM1	9°06'	1	RM GIP FD	DP 1234461
RM2	9°06'	0.8	RM GIP FD	DP 1234460

(Y) EASEMENT TO DRAIN SEWAGE 6 WIDE & VARIABLE)AC221270 & DP1074246)
(Z) EASEMENT TO DRAIN SEWAGE 5 WIDE (AB373832 & DP1074246)

SURVEYOR:	PLAN HEADING		REGISTERED	
Name: DAVID A SMITH Date: 03.06.19 Reference: 1801667-DP-001-B	PLAN OF SUBDIVISION OF LOT 1DP 181839	LGA: CENTRAL COAST Locality: HAMLYN TERRACE Reduction Ratio: 1: 1500 Lengths are in metres	6/03/2020	DP1261646

Item No:	5.3
Title:	Planning Proposal 81/2015 for 893 The Entrance Road, Wamberal
Department:	Innovation and Futures

30 November 2020 Ordinary Council Meeting

Reference:	F2020/00039 - D14190735
Author:	Bruce Ronan, Town Planner
	Scott Duncan, Section Manager, Land Use and Policy
Manager:	Shari Driver, Unit Manager, Strategic Planning
Executive:	Ricardo Martello, Executive Manager Innovation and Futures

Report purpose

To recommend refusal of Planning Proposal 81/2015 to permit a "residential care facility".

Executive Summary

On June 2019, Council deferred consideration of this report without a determination of the Planning Proposal. This report provides an assessment of information submitted by the applicant and other actions undertaken since June 2019. The original Council report is Attachment 1.

The proposal seeks to enable a site-specific zoning change to permit a "residential care facility" on the subject property. The proposal is fundamentally inappropriate given the site's flood context, the potential impacts on a sensitive land use and unresolved potential risks.

On 1 October 2020, the Department of Planning, Industry and Environment (DPIE) directed Council to determine all Planning Proposals over four years old, which have not yet been finalised, by 31 December 2020. This Planning Proposal is one of those longstanding Proposals. Hence, this report recommends refusal of the Planning Proposal due to:

1 the flooding constraints on the property; and
2 the proposal is contrary to the gateway determination delegations; and
3 the gateway determination, initially issued to amend Interim Development Order 122 (IDO 122), has now lapsed hence an amendment to IDO 122 is no longer possible.

Innovation and Futures Recommendation

1 That Council refuse the Planning Proposal on Lot 4 DP 603395 (No 893 The Entrance Road, Wamberal) to enable a residential care facility for the following reasons:

(a) The Planning Proposal is inconsistent with the Ministerial Direction 4.3 Flood Prone Land issued under section 9.1 of the Environmental Planning and Assessment Act 1979 as it proposes to rezone land located within the flood planning area to a more intense land use;

(b) The Planning Proposal is inconsistent with the NSW Floodplain Development Manual.

(c) The impact of the filling on the site has not been shown to have a negligible effect on adjoining and nearby land in the locality.

(d) The Planning Proposal has not been shown to have a negligible effect on the site including potential impacts on flora and fauna.

(e) The Planning Proposal cannot be progressed by Council under IDO 122 due to the expiry of the gateway delegation issued by the Department of Planning, Industry and Environment.

2 That Council request the Minister for Planning and Public Spaces to determine that the Planning Proposal not proceed in accordance with Section 3.35(4) of the Environmental Planning and Assessment Act 1979.

3 That Council instruct the Acting Chief Executive Officer to advise the applicant of its decision.

Current Status

Since June 2019, Council staff and the applicant have held meetings and discussions in order to give consideration to the additional flooding information. A full assessment report can be found in Attachment 2.

In July 2020, the proponent advised Council that they were discussing the status of the Planning Proposal with the DPIE Planning Delivery Unit.

On 1 October 2020, DPIE, notified Council that longstanding Planning Proposals (including this one) must be finalised by 31 December 2020.

On 19 October 2020, Councillors and staff undertook a site inspection.

On 26 October 2020, the applicant and proponent met with Council officers to discuss the Proposal. Council staff advised that the submitted information does not overcome Council's fundamental flooding concerns nor adequately address the Ministerial Direction related to flood prone land. The applicant was encouraged by staff to withdraw the proposal.

Report

As detailed in the Attachments the land is affected by the Probable Maximum Flood (PMF) and "Residential Care Facilities", as a sensitive land use, is required to be located above the PMF level. The applicant proposes to fill the site to a level above the PMF however the cumulative impact of such fill within the catchment has not been satisfactorily addressed. Hence Council staff maintain their objection to this Planning Proposal.

Consultation

The Proposal has not been placed on public exhibition due to the unresolved flooding issues.

Financial Considerations

At its meeting held 19 October 2020, Council resolved the following:

1036/20 That any motions put before Council for the remainder of this term of Council that have financial implications require the Chief Executive Officer to provide a report on how those additional costs will be met.

The following statement is provided in response to this resolution of Council.

The direct cost to Council is the preparation of the Planning Proposal and the fee has been paid that covers this service. There is no financial impact if the Planning Proposal is refused.

Central Coast Community Strategic Plan

Theme 1: Belonging

Goal A: Our community spirit is our strength
B-A4: Enhance community safety within neighbourhoods, public spaces and places.

Theme 3: Green

Goal F: Cherished and protected natural beauty
G-F2: Promote greening and the wellbeing of communities through the protection of local bushland, urban trees, and expansion of the Coastal Open Space System (COSS).

Theme 4: Responsible

Goal I: Balanced and sustainable development
R-I3: Ensure land use planning and development is sustainable and environmentally sound and considers the importance of local habitat, green corridors, energy efficiency and stormwater management.

Central Coast Local Strategic Planning Statement

The interim Central Coast Local Strategic Planning Statement (LSPS) was not considered when the matter was originally reported to Council as it was not in effect at that time. Priorities applicable to the Planning Proposal are identified in Attachment 2.

Risk Management

There are flood risks identified to the natural and built environment as well as to human life.

Options

The following options are available:

1 Refuse the planning proposal as recommended.
2 Support the planning proposal contrary to the recommendation. Reasons for support would need to address the technical aspects including flooding. Even if this Option was taken by Council, the Planning Proposal would not be able to be finalised by 31 December 2020 resulting in the DPIE making the decision to discontinue the proposal.
3 Defer the decision. However, if Council does not determine this Planning Proposal by 31 December 2020, the DPIE will make the decision to discontinue the proposal.

Critical Dates or Timeframes

If a determination is not made by 31 December 2020, the DPIE will make the decision as the Gateway delegation expired in 2019 (following multiple previous gateway extensions).

Conclusion

The Gateway Determination lapsed over 18 months ago and refusal of the proposal is recommended as there is no strategic merit in pursuing a residential care facility on this site due to its fundamental flooding constraints.

Residential care facilities are required on the Central Coast to meet the needs of an aging population. However, this location could result in adverse flooding impacts on property and place future resident's lives at risk as well as endanger the lives of facility staff and emergency support to assist those aged residents due to evacuations or floods.

Attachments

1	Council Report of 24 June 2019	D13494437
2	Planning Proposal Assessment	D14291575
3	Strategic Assessment	D14188572
4	Councillor Site Inspection Summary	D14250694

Item No: 2.2

Title: Planning Proposal 81/2015 for 893 The Entrance Road, Wamberal

Department: Environment and Planning

24 June 2019 Ordinary Council Meeting

Trim Reference: F2019/00041-004 - D13494437
Author: Bruce Ronan, Town Planner
Manager: Scott Duncan, Section Manager, Land Use and Policy
Executive: Scott Cox, Director Environment and Planning

Report Purpose

The purpose of this report is for Council to consider refusal of a current Planning Proposal which cannot be progressed due to the flooding constraints on the property. The subject land, Lot 4 DP 603395 (No 893 The Entrance Road, Wamberal), is zoned part 7(a) Conservation and Scenic Protection (Conservation) and part 7(c2) Conservation and Scenic Protection (Scenic Protection – Rural Small Holdings) under *Interim Development Order No 122 – Gosford*. The Planning Proposal seeks to enable a residential care facility on the subject property.

Recommendation

That Council defer this report for consideration at a later date with the provision of additional information.

Background

At the Ordinary Meeting held on 8 December 2015, the former Gosford City Council resolved:

A *Council initiate the Local Environmental Plan 'Gateway' process pursuant to Section 55 Environmental Planning and Assessment Act by endorsing the preparation of a Planning Proposal for Part of Lot 4 DP 603395,No. 893 The Entrance Road Wamberal to rezone the land E2 – Environmental Conservation and R2 – Low Density Residential subject to agreement to dedicate as outlined in Part G.*

B *Council notify the Department of Planning & Environment of Council's resolution requesting a 'Gateway' determination pursuant to Section 56(1) Environmental Planning and Assessment Act and forward the Planning Proposal and all necessary documentation according to their requirements and this report.*

C Council requests that the Gateway determination include a requirement to undertake the following studies prior to exhibition, which will be required to be carried out by the applicant:

- *A Water & Sewer systems capacity analysis*
- *A Flooding & Drainage analysis*
- *Identification of EEC extent (zone boundary)*
- *Bushfire Threat Analysis*
  advice as to the dedication of COSS land in light of the betterment provided by the Planning Proposal.

D After public exhibition of the Planning Proposal, should the Minister for Planning support it, if no submissions objecting to the Planning Proposal are received, the Planning Proposal is to be processed in order to make the plan.

E The applicant be advised of Council's resolution.

F Council seeks delegations from the Department of Planning & Environment for this Planning Proposal.

Any delegation to Council is to be delegated to the Chief Executive Officer - Paul Anderson, per s381 of the Local Government Act 1993, who will complete the "Authorisation" on behalf of Council and submit to the Department of Planning & Environment.

G That Council request the CEO, or his representative, to meet with the proponent of the Planning Proposal to discuss the dedication of the part of the lot proposed to be zoned E2 to Council as part of the Coastal Open Space System as a public benefit associated with the proposed rezoning of the land.

A Gateway Determination dated 23 March 2016 was issued to Council by the former Department of Planning and Environment (DP&E) for the proposal.

Council's request to rezone the site to part R2 Low Density Residential and apply a 550m^2 minimum lot size was not supported. It was considered appropriate to retain the existing 7(a) Conservation and Scenic Protection (Conservation) and 7(c2) Conservation and Scenic Protection (Rural Small Holdings) zones and existing development standards for subdivision on the site and to allow the proposed use for a "residential care facility" through an enabling clause in *Interim Development Order No 122 – Gosford* (IDO 122).

The Gateway Extension lapsed on 30 March 2019.

The Site

The subject site has frontage to the Central Coast Highway and to Carbeen Road, Wamberal (Figure 1). The current use is a nursery and landscape supply business which is located on the western part of the property. The eastern half of the subject land (approximately 1.6 Ha)

accommodates an Endangered Ecological Community (EEC) comprising Swamp Sclerophyll Forest on Coastal Floodplains.

Figure 1: *Subject Site Aerial Locality/Context Plan*

The lot has a total area of 3.715 Ha with 0.915 Ha zoned 7(a) Conservation and Scenic Protection (Conservation) and 2.8 Ha zoned 7(c2) Conservation and Scenic Protection (Scenic Protection – Rural Small Holdings) under IDO 122 (Figure 2).

That part of the site zoned 7(a) Conservation is identified as proposed Coastal Open Space System (COSS).

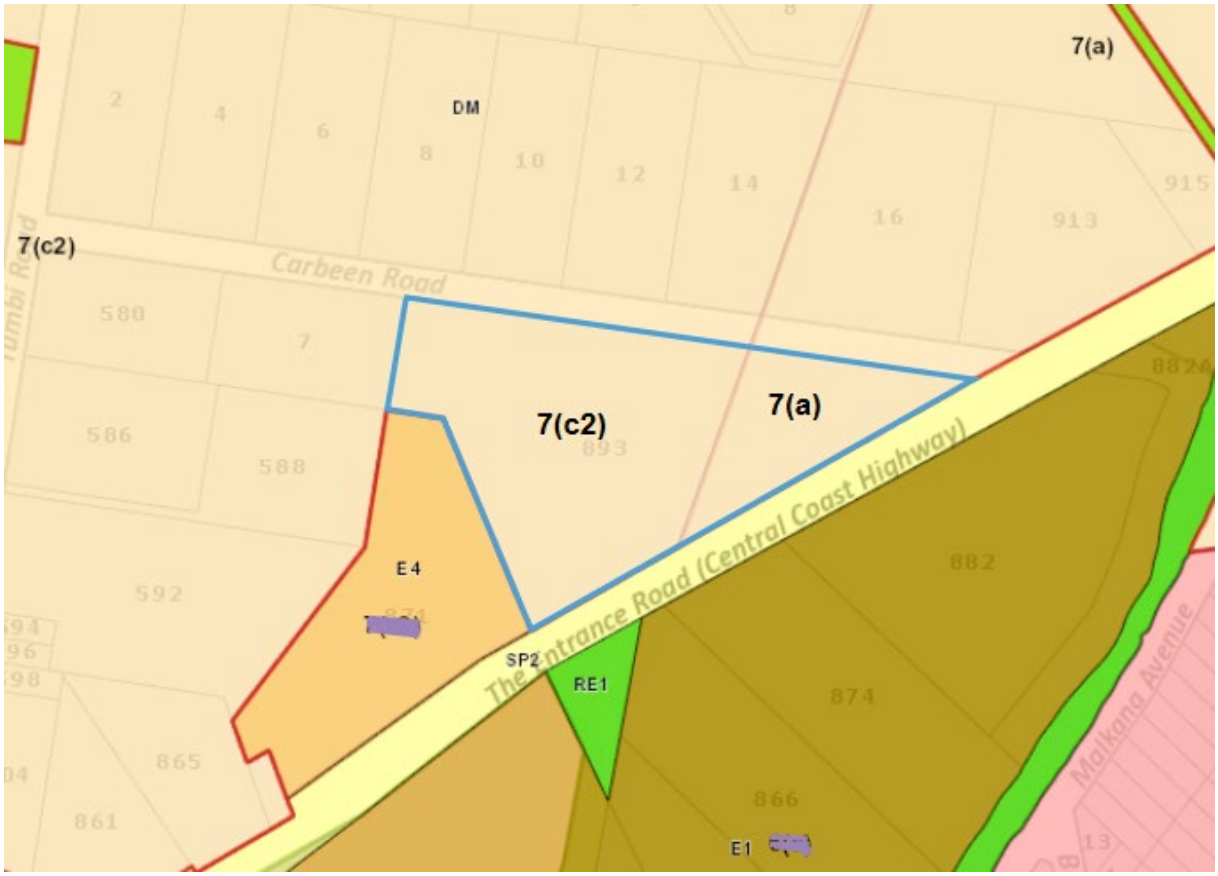


Figure 2: *Existing Zoning under IDO 122*

The draft Central Coast Local Environmental Plan (CCLEP) proposes to zone the land part E4 Environmental Living and part E2 Environmental Conservation (Figure 3).

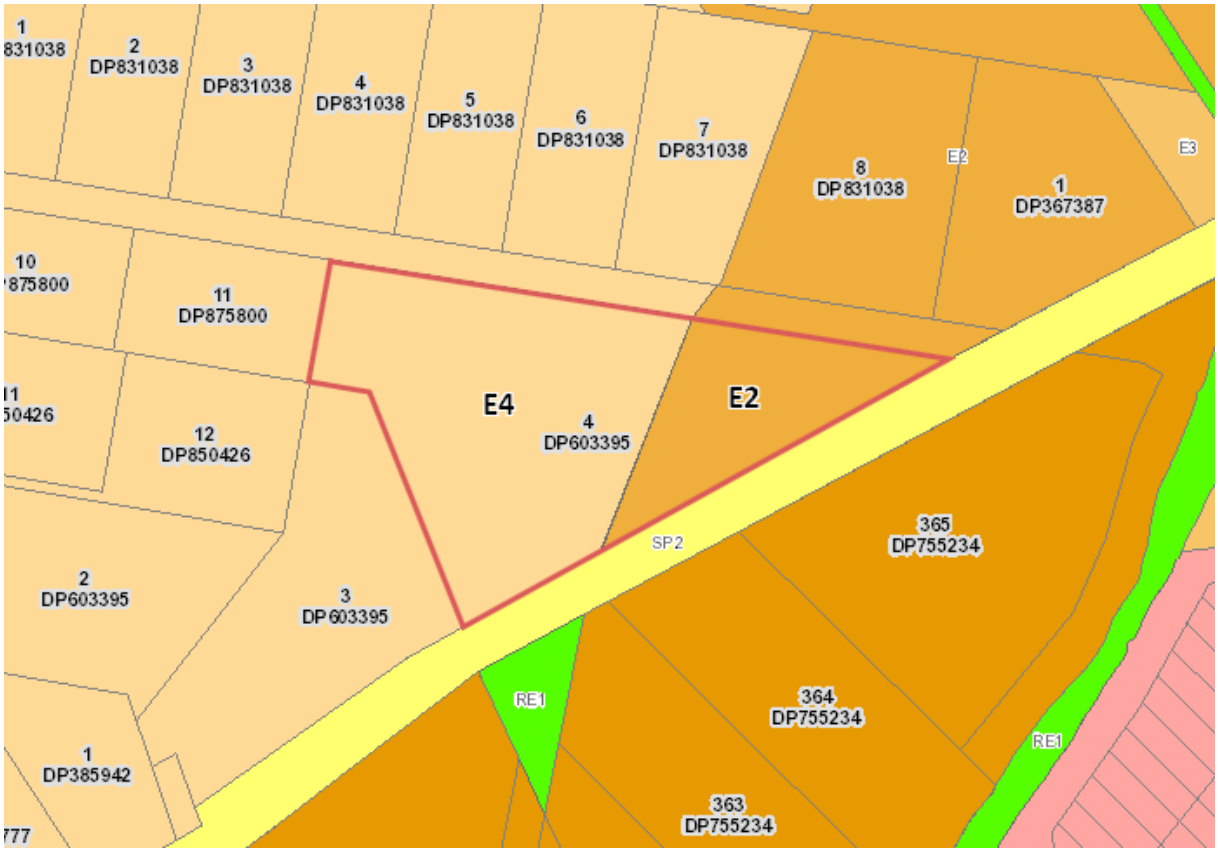


Figure 3: *Proposed Zoning under the draft CCLEP*

The Proposal

In accordance with the Gateway Determination, the proposal seeks to insert an enabling clause to IDO 122 to permit a residential care facility on Lot 4 DP 603395. The underlying zoning of 7(c2) Conservation and Scenic Protection (Scenic Protection – Rural Small Holdings) and 7(a) Conservation and Scenic Protection (Conservation) would remain unchanged.

> "Residential care facility" means accommodation for seniors or people with a disability that includes:
> a) meals and cleaning services, and
> b) personal care or nursing care, or both, and
> c) appropriate staffing, furniture, furnishings and equipment for the provision of that accommodation and care,
> but does not include a dwelling, hostel, hospital or psychiatric facility.

The eastern half of the subject land (approximately 1.6 Ha) accommodates an Endangered Ecological Community (EEC) comprising Swamp Sclerophyll Forest on Coastal Floodplains. The owner has agreed to dedicate 1.45 Ha of this land to Council under a Voluntary Planning Agreement (Figure 4).

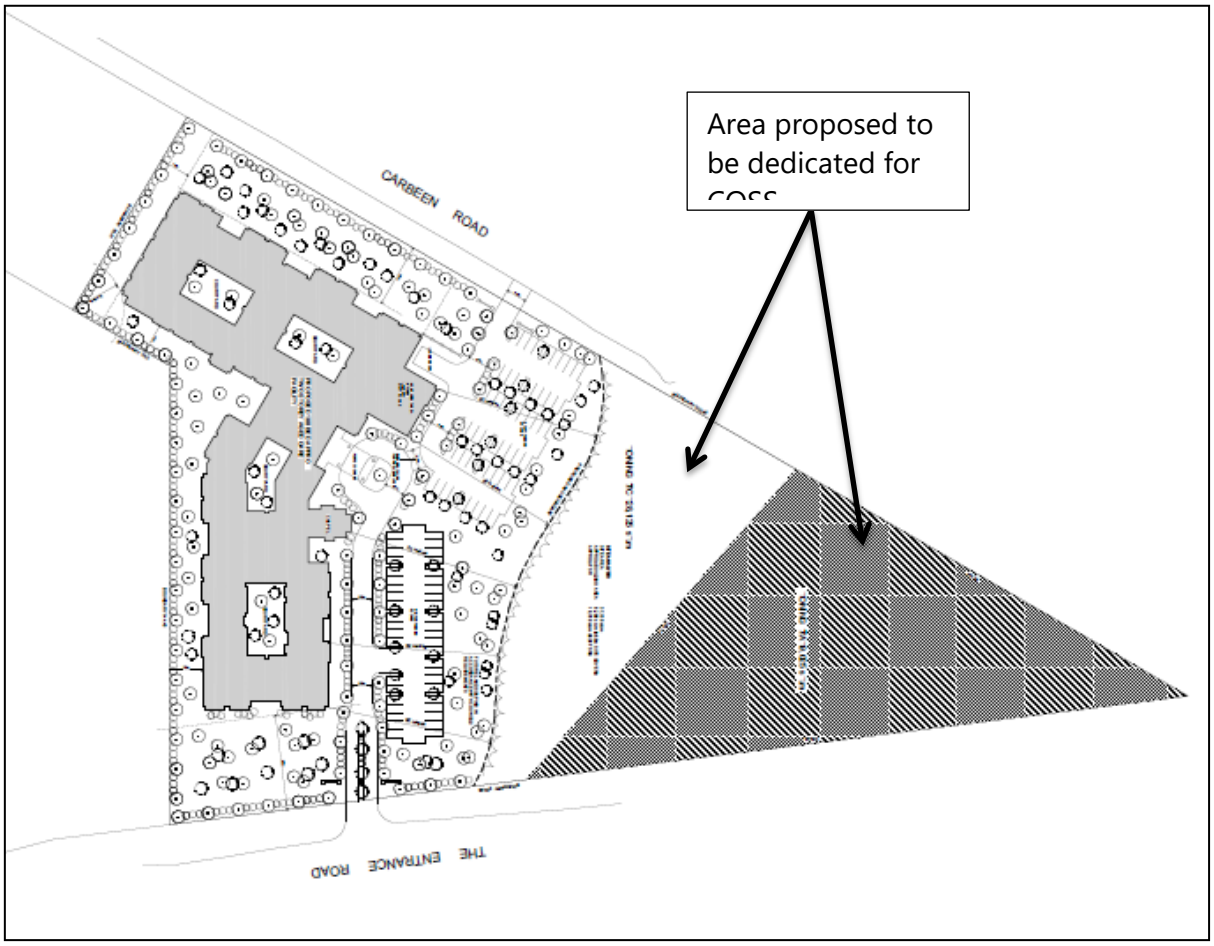


Figure 4: *Proposed Development*

Assessment

The proposed residential care facility is proposed to be located on the western part of the site which is generally cleared and disturbed by the existing plant nursery and landscaping uses. The eastern part of the site contains EEC vegetation and is proposed to be protected by dedication to Council for inclusion in the Coastal Open Space System (COSS).

This is a reasonable outcome and formed the basis for the resolution by the fGCC. However this resolution and the subsequent Gateway Determination required that a flood study be undertaken as part of the assessment process.

A Flood Study was undertaken by the applicant and it found that the land is affected by the Probable Maximum Flood (PMF) which is unsuitable for residential care facilities.

The applicant was subsequently advised to revise the flood study on two occasions to address concerns from Council's flooding engineer and the Office of Environment and Heritage (now part of Department of Planning and Industry).

However the latest revision is still unacceptable. With an objection from a public authority the planning proposal is unlikely to progress, so it serves no purpose to proceed to public exhibition. Hence it is being referred to Council for consideration.

Statutory Compliance and Strategic Justification

The proposal has been assessed having regard for all State Environmental Planning Policies, Ministerial Directions and relevant guidelines set out within the Central Coast Regional Plan 2036 as detailed in Attachment 2.

The proposal is considered to be inconsistent with Direction 4.3 Flood Prone Land, therefore is unsuitable to proceed.

Internal Consultation

Internal consultation for the current Planning Proposal has been undertaken as summarised below.

Waterways

The proposal is inconsistent with the NSW Government's Flood Prone Land policy and the principles of the NSW Floodplain Development Manual for the following reasons:

- In the PMF event, the proposed site is at risk of Intermediate to High Provisional Flood Hazard conditions in the vicinity of most of the proposed building footprint. An open channel has been proposed to convey flooding away from the site. This not only does not reduce the risk on the lot but also poses the associated risk of a potential high hazard (Hazard Vulnerability classification H5) open channel to people. It is noted that the in proposed flood mitigation channel, in the PMF event the floodwaters reach depths in excess of 1.5 m and velocities in excess of 2 metres per second with the flows extending the eastern side of the site and potential for further blockage under the Central Coast Highway.

- Those parts of the site which are not assumed to be filled or part of the flood mitigation drain are inundated to depths up to 1.2 m. These depths are not safe for children or for elderly.

- The Planning Proposal will significantly affect properties located in the western end of Carbeen Road. The flood report notes an increase from Hazard Vulnerability classification H3 to H4 on the eastern boundary of No 7 Carbeen Road, adjoining the subject property.

- Site access is lost during the PMF, as Carbeen Road and The Entrance Road are cut by floodwaters with Hazard Vulnerability classification of H3 and above.

- The report justifies by explaining that since the PMF Hazard Vulnerability classification of H4 to H5 in the pre- and post-development scenarios has not changed, the proposed development does not materially impact on the flood affectation of Carbeen Road. The Planning Proposal does not reduce the vulnerable nature of the proposed facility and the risks associated with that.

Environmental Strategies

The Ecological Assessment indicates that the proposed aged care facility is likely to require clearing of 0.15ha of Swamp Sclerophyll Forest EEC. This was estimated to equate to 0.03% of the local occurrence of this vegetation community and approx. 1.45ha of EEC is proposed for retention within the subject site. The threatened species assessment concluded that this would not likely have a significant impact on the EEC and this conclusion is generally supported.

The proposed aged care facility will be located primarily in the existing disturbed and cleared areas of the site. The impacts to the EEC vegetation will be limited to the edge between the cleared area and the vegetated area in order to accommodate a bushfire Asset Protection Zone (APZ). It is considered that many trees can be retained in this edge area whilst still meeting APZ standards. The remainder of the vegetation is proposed for dedication to Council's COSS Reserve. The condition of the EEC vegetation is not currently suitable for Council to accept.

Transport Planning

From a transport planning perspective there is no objection to the Planning Proposal. The proposed access arrangements to the site via Tumbi Road and the Central Coast Highway would result in minimal overall impact on the road network.

The site is accessible by public transport as a bus service is available along the Central Coast Highway with a bus stop in front of the subject site.

Water and Sewer

Water is available to the land. The property is located within Councils defined water service area and a 100mm water supply main is located adjacent to the property in Carbeen Road. Connection to the water supply trunk main located within The Entrance Road will not be permitted.

Sewer is not available to the land. Lot 4 DP603395 is located outside Councils defined sewer service area. Council's sewer reticulation system is located within existing developed residentially zoned land located approximately 600 metres to the south of Lot 4 DP603395. Council undertook a preliminary assessment of the capacity of the existing sewer pump station SPS C15 into which development loads shall be discharged.
The analysis identified the SPS C15 as having reached capacity and any additional loads from this and other Planning Proposal sites would require augmentation of the Sewer Pumping Station and other sewer infrastructure.

External Consultation

Government agency consultation was undertaken in relation to the current Planning Proposal. The Gateway Determination required consultation with the Office of Environment

and Heritage (OEH), Roads and Maritime Services (RMS), the Rural Fire Service (RFS), Transport for NSW and National Parks and Wildlife Service (NPWS).

Office of Environment and Heritage (now Department of Planning and Industry)

The Planning Proposal is inconsistent with the Local Planning Direction 4.3 Flood Prone Land issued under Section 9.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) as it proposes to rezone land located within the flood planning area to a more intense land use.

The information provided in the Flood Study (by ACOR Consultants) indicates that most of the site is below the design 1% AEP (annual exceedance probability) level and that the entire site is at or below the flood planning level. The proponent has indicated that up to two metres of fill would be required on site to facilitate this development and achieve flood free developable areas. Therefore the planning proposal is inconsistent with Direction 4.3 Flood Prone Land under Section 9.1 of the EP&A Act.

Council should satisfy itself that the Planning Proposal will not result in an intensification of land use within the flood prone area to ensure consistency with Direction 4.3 Flood Prone Land.

National Parks and Wildlife Service (now Department of Planning and Industry)

All impacts of the development must be contained within the development footprint (i.e. measures should be put in place to ensure that there are no indirect impacts on the Wamberal Lagoon Nature Reserve). For example, NPWS requests that all fire mitigation measures are contained within the development footprint, and that no on-going requirements for fire mitigation beyond present requirements are given to NPWS. Furthermore there should be no changes to the hydrology, nor quality of water entering the reserve.

Roads and Maritime Services (now Department of Transport)

Roads and Maritime has reviewed the information and requests that the following matters be considered by Council and addressed by the proponent within a future development application:

- Future development be designed to provide vehicular access for all traffic generated by the development from Carbeen Road, consistent with the objectives of Clause 101 of *State Environmental Planning Policy (infrastructure) 2007*. As the subject land benefits from practical access to a local road connection, the vehicular access to the land via Carbeen Road should be provided as the primary access. Any existing access to the Central Coast Highway, a classified road, should be removed.

- Future development should ensure that discharged stormwater does not exceed the capacity of the stormwater drainage system on The Entrance Road.

- Take into account Ministerial Direction 3.4 Integrating Land Use Development and Transport in relation to the provision of adequate access to public transport and opportunities for pedestrian and cyclist connection to the surrounding area.

- Be aware of potential for road traffic noise generated by The Entrance Road to impact the development.

Rural Fire Service (now Department of Family and Community Services and Justice)

Based upon an assessment of the information provided, NSW RFS raises no objections to the proposal subject to a requirement that the future development of the land complies with *Planning for Bush Fire Protection 2006*.

Transport for NSW (now Department of Transport)

Transport for NSW has reviewed the documentation presented in support of the Planning Proposal and has no further comments on this proposal.

Financial Impact

The direct cost to Council is the preparation of the Planning Proposal and Council's fee has been paid for this service.

Social Impacts

The Planning Proposal for the residential care facility provides the type of facility that is required to meet the needs of an aging population. However the potential creation of a residential care facility in this location could result in an adverse impact on residents in a flood event.

Environmental Impacts

These have been outlined in the body of the report.

Link to Community Strategic Plan

Theme 1: Belonging

Goal A: Our community spirit is our strength

B-A4: Enhance community safety within neighbourhoods, public spaces and places.

Theme 3: Green

Goal F: Cherished and protected natural beauty

G-F2: Promote greening and the wellbeing of communities through the protection of local bushland, urban trees, and expansion of the Coastal Open Space System (COSS).

Theme 4: Responsible

Goal I: Balanced and sustainable development

R-I3: Ensure land use planning and development is sustainable and environmentally sound and considers the importance of local habitat, green corridors, energy efficiency and stormwater management.

Risk Management

There have been risks identified to the natural and built environment if this Planning Proposal is supported by Council as previously discussed in this report.

Conclusion

The Planning Proposal to enable the additional use of a residential care facility on the land does not have strategic planning merit as it does not comply with the relevant Ministerial Direction 4.3 Flood Prone Land or the NSW Government's Flood Prone Land policy or the principles of the NSW Floodplain Development Manual.

It is recommended that the Council not proceed with the preparation of a planning proposal for this site.

Attachments

1 Proposal Summary D13519506
2 Strategic Assessment D13519508

Planning Proposal Assessment

Proposal Summary

Applicant	Doug Sneddon Planning Pty Ltd
Owner	D J Thompson Pty Ltd
Application Number	PP 81/2015
Description of Land subject of planning proposal	*Property Description:* 893 The Entrance Road, Wamberal *Legal Description:* Lot 4 DP 603395
Site Area	3.715 Ha
Existing Use	A plant nursery and landscaping business

Proposed Amendments – Interim Development Order No 122		
Provisions	***IDO 122***	***Outcome (Supported/Not Supported)***
Existing Zoning	7(a) Conservation / 7(c2) Rural Small Holdings	Supported
Existing Minimum Lot Size	40 Ha / 2 Ha	Supported
Proposed Additional Permitted Use	Residential Care Facility	Not Supported

Proposal Report

Background

At the Ordinary Meeting held on 8 December 2015, the former Gosford City Council (fGCC) resolved to endorse the preparation of a Planning Proposal to rezone the land part R2 Low Density Residential and part E2 Environmental Conservation subject to the dedication of the E2 zoned land to Council as part of the Coastal Open Space System (Attachment 1).

The fGCC's request to rezone the site to part R2 Low Density Residential was not supported by the then Department of Planning and Environment. The Gateway Determination, dated 23 March 2016, required that the land retain the existing 7(a) Conservation and Scenic Protection (Conservation) and 7(c2) Conservation and Scenic Protection (Rural Small Holdings) zones and existing development standards for subdivision on the site and to allow the proposed use for a "residential care facility" through an enabling clause in IDO 122.

The latest Gateway Extension lapsed on 30 March 2019.

A report was submitted to Council on 24 June 2019 (Attachment 1) outlining the flooding issues associated with permitting a residential care facility on this flood prone site. Upon the applicant's request, Council resolved:

> *566/19 That Council defer this report for consideration at a later date with the provision of additional information.*

Since June 2019 Parliamentary Counsel, the body that provides legal assent to all NSW legislation, including LEPs, has advised that it is no longer amending old planning instruments such as IDOs. Therefore, as the Gateway determination has lapsed and the PP cannot be made in its current form, Council is not a position to proceed with the current Planning Proposal in any case.

Current Status

In addition to Council's assessment of flooding issues relating to the subject land, the Department of Planning, Industry and Environment (DPIE), on 1 October 2020, notified Council of a number of Planning Proposals that are yet to be finalised after four (4) years, with PP 81/2015 included on the list. These longstanding Planning Proposals are to be finalised by 31 December 2020.

If Council does not determine this Planning Proposal, DPIE will determine the Planning Proposal after 31 December 2020.

Assessment

Following the report to Council on 24 June 2019, and a subsequent meeting in August 2019 between all parties, a revised flood study was submitted in November 2019.

Waterways

Ministerial Direction 4.3 Flood Prone Land highlights that there needs to be consistency with the NSW Floodplain Development Manual, 2005. Specific issues that need to be addressed for any proposal for the filling of flood prone land are:

- Flood Prone Land is all land inundated by the Probable Maximum Flood (PMF) event.
- Filling is potentially limited to areas categorised as Flood Fringe. Filling of Floodway and Flood Storage area is not supported.
- Assessment of flood impacts resulting from filling must include a test for Cumulative Impacts.

Following several requests for a cumulative impact assessment, the applicant's flood consultant submitted a letter dated 9 July 2020, justifying why they do not require a cumulative impact assessment. In essence the consultant advice said:

> *We understand that Council incorrectly contemplate the proposed application should consider the flood related cumulative impacts associated with the ultimate development of all properties within the floodplain. This is not the intent of Section 1.6 [of the NSW Floodplain Management Manual] in relation to an infill development.*

The pertinent part of Section 1.6 states:

> *Case-by-case decision making cannot account for the cumulative impacts on flood behaviour and risks caused by individual developments or works. This form of ad hoc assessment contravenes the principles of the manual.*

That part of Section 1.6 above is the main reason that the cumulative impact would need to be assessed to ensure that whilst filling on one single lot may not have a major effect, if a number of lots are to be filled the impact of the total fill downstream would need to be considered overall.

For this reason, that the application fails to adequately address the impacts of the cumulative filling upon other properties with regard to flood levels, velocities, flow distributions, erosion and scouring.

Previous advice specifically requested that the consultant address the requirements relating to cumulative impact. This information has not been provided.

Therefore, the Waterways Section retains their objection to the Planning Proposal.

Strategic Planning

Prior to the report going to the 24 June 2019 Council meeting, the applicant made representations requesting Council to defer its consideration of this matter to enable further discussions with Council's flood engineers.

Further discussions have ensued, however Council's requests to submit a Cumulative Flood Impact Assessment are unresolved. Comments provided by Council's Waterways Section indicated that there are still problems with the amount of fill required on the site to raise the land level above the PMF (residential care facilities are required to be above the PMF) and not adversely affect adjoining land.

However, instead of addressing the issue of cumulative impact of filling, the applicant in June 2020, submitted a modification of a development consent to amend the previously approved DA 43234/2012 for the nursery and landscaping activity. The amendment related to filling the land to a level above the PMF as per the intention of the Planning Proposal. The amendment to DA 43234/2012 was refused by Council on 15 September 2020.

Furthermore, the Gateway Determination has lapsed and a new Gateway Determination is required to progress the Planning Proposal. Based on DPIE's advice that all longstanding Planning Proposals are to be finalised by 31 December 2020, it will not issue a new Gateway Determination for this particular Planning Proposal to allow it to continue past this date. As a result of these considerations, the Planning Proposal is recommended for refusal.

Central Coast Local Strategic Planning Statement

The interim Central Coast Local Strategic Planning Statement (LSPS) was not considered when the matter was originally reported to Council as it was not in effect at that time. The Interim LSPS sets a clear vision for the future and a proactive framework for delivering a growing and sustainable Region with a strong network of Centres and thriving and connected communities.

The following priorities outlined in the LSPS are applicable to this Planning Proposal.

Housing		
8	**Priority**	**Assessment**
	Provide for the housing needs of our growing region	The planning proposal seeks to provide aged care housing which would meet the changing needs of the community. However, such housing should not be located in locations which are subject to significant natural hazards.

Environment		
24	**Priority**	**Assessment**
	Map, protect and cherish natural areas and ecosystems	The planning proposal seeks to restrict the residential care facility to cleared land and proposes to dedicate a small area of bushland on the eastern part of the site to Council for inclusion in the COSS thus retaining the vegetated areas and protecting ecosystems.
25	**Priority**	**Assessment**
	Manage floodplains, coastal areas and bushland to improve community resilience to natural hazards	The planning proposal seeks to permit a residential care facility on this site which is adversely affected by flooding which could place vulnerable people's lives and safety at risk.

Central Coast Council

Strategic Planning Framework Assessment

893 The Entrance Road, Wamberal

PP/81/2015;
October 2020

(a)

Relationship to strategic planning framework

Where a regional or sub-regional plan is in place:

1. Is the planning proposal consistent with the objectives and actions of the applicable regional, sub-regional or district plan (including any exhibited draft plans or strategies)?

Central Coast Regional Plan 2036

The *Central Coast Regional Strategy 2036 (CCRP)* applies to the Central Coast local government area (LGA).

The CCRP is to provide the basis of planning by the local government and sets out a number of actions. The table below demonstrates that the Planning Proposal is inconsistent with some relevant actions identified in the CCRP:

12	**Direction 12: Protect and manage environmental values**	
	Action	**Assessment**
12.1	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.	The proposed location of the residential care facility on the cleared western part of the lot aims to protect EEC vegetation on the eastern part of the site.
14	**Direction 14: Protect the coast and manage natural hazards and climate change**	
	Action	**Assessment**
14.2	Review and update floodplain risk and coastal management programs to manage flood risk and protect the coast, particularly where urban growth is being investigated.	The land has been reviewed with regards to flood risk and it has been determined that the land is flood prone and therefore is unsuitable for a residential care facility.

***Table 1**: Central Coast Regional Plan Assessment*

2. Is the planning proposal consistent with the local Council's Community Strategic Plan, or other local strategic plan?

Central Coast Community Strategic Plan – One: Central Coast

The *Central Coast Community Strategic Plan* outlines a set of guiding principles, aspirations and values for the community. These reflect on social, economic, environmental and governance aspects for now and the future.

The following strategies outlined in the Community Strategic Plan are applicable to this Planning Proposal:

Theme - Belonging	
Focus Area – Our Community Spirit is Our Strength	
Strategies	Assessment
A4 – Enhance community safety within neighbourhoods, public spaces and places.	The proposed additional permitted use to allow a residential care facility on the land would not enhance the safety of future residents as the land is affected by flooding.
Theme - Green	
Focus Area – Cherished and Protected Natural Beauty	
Strategies	Assessment
F2 – Promote greening and ensure the wellbeing of communities through the protection of local bushland, urban trees, tree canopies and expansion of the Coastal Open Space System (COSS)	The proposed rezoning to allow the residential care facility development would result in the protection of bushland via dedication of bushland on the eastern part of the site to Council for inclusion in the COSS.
Theme - Responsible	
Focus Area – Balanced and Sustainable Development	
Strategies	Assessment
I3 – Ensure land use planning and development is sustainable and environmentally sound and considers the importance of local habitat, green corridors, energy efficiency and stormwater management.	To permit a residential care facility on this site is not responsible land use planning as it is adversely affected by flooding.
I4 – Provide a range of housing options to meet the diverse and changing needs of the community including adequate affordable housing.	The planning proposal seeks to provide aged care housing which would meet the changing needs of the community. However such housing should not be provided at the expense of resident safety.

Table 2 *– Community Strategic Plan Assessment*

Local Strategic Planning Statement

The interim Central Coast Local Strategic Planning Statement (LSPS) sets a clear vision for the future and a proactive framework for delivering a growing and sustainable Region with a strong network of Centres and thriving and connected communities.

The following priorities outlined in the LSPS are applicable to this Planning Proposal.

Housing		
8	**Priority**	**Assessment**
	Provide for the housing needs of our growing region	The planning proposal seeks to provide aged care housing which would meet the changing needs of the community. However, such housing should not be provided at the expense of resident safety.
Environment		
24	**Priority**	**Assessment**
	Map, protect and cherish natural areas and ecosystems	The planning proposal seeks to restrict the residential care facility to the area already cleared of vegetation and dedication of bushland on the eastern part of the site to Council for inclusion in the COSS thus retaining the vegetated areas and protecting ecosystems.
25	**Priority**	**Assessment**
	Manage floodplains, coastal areas and bushland to improve community resilience to natural hazards	The planning proposal seeks to permit a residential care facility on this site which is adversely affected by flooding. This is not responsible management of the floodplain as is putting people's safety at risk.

Biodiversity Strategy

The Biodiversity Strategy provides a framework and guide for the management of biodiversity in Gosford area that is consistent with regional, state, national and international strategies, plans and policies. The following Action in the Biodiversity Strategy is applicable to the Planning Proposal:

> *7 Focus development around existing urban centres to maintain the urban development in the existing urban footprint to protect agricultural and environmentally sensitive land.*

The subject land is not within the urban footprint so permitting an urban use such as a residential care facility on this site is contrary to the Biodiversity Strategy.

Coastal Open Space System Strategy

The COSS Strategy identifies that part of the subject site zoned 7(a) Conservation as being required for the Coastal Open Space System. The land does adjoin Current and Proposed COSS land located on the northern side of Carbeen Road.

3. Is the planning proposal consistent with applicable state environmental planning policies?

The proposal has been considered against the relevant State Environmental Planning Policies (SEPP) as detailed below.

State Environmental Planning Policy	Comment
SEPP No 19 – Bushland in Urban Areas	
The general aim of this Policy is to protect and preserve bushland within the urban areas referred to in Schedule 1 because of: (a) its value to the community as part of the natural heritage, (b) its aesthetic value, and (c) its value as a recreational, educational and scientific resource. The specific aims of this policy are: (a) to protect the remnants of plant communities which were once characteristic of land now within an urban area, (b) to retain bushland in parcels of a size and configuration which will enable the existing plant and animal communities to survive in the long term, (c) to protect rare and endangered flora and fauna species, (d) to protect habitats for native flora and fauna, (e) to protect wildlife corridors and vegetation links with other nearby bushland, (f) to protect bushland as a natural stabiliser of the soil surface, (g) to protect bushland for its scenic values, and to retain the unique visual identity of the landscape, (h) to protect significant geological features, (i) to protect existing landforms, such as natural drainage lines, watercourses and foreshores, (j) to protect archaeological relics, (k to protect the recreational potential of bushland, (l) to protect the educational potential of bushland, (m) to maintain bushland in locations which are readily accessible to the community, and	The applicant has proposed protection of the existing EEC wetland on site by dedication of the area to Council for inclusion in COSS and location of the residential care facility on the cleared part of the site. However the proposal proposes to change the existing landform and thus the overland drainage line. The Planning Proposal is therefore considered to be inconsistent with the SEPP.

State Environmental Planning Policy	Comment
(n) to promote the management of bushland in a manner which protects and enhances the quality of the bushland and facilitates public enjoyment of the bushland compatible with its conservation.	
SEPP (Coastal Management) 2018	
The aim of this Policy is promote an integrated and co-ordinated approach to land use planning in the coastal zone in a manner consistent with the objects of the Coastal Management Act 2016 by: (a) managing development in the coastal zone and protecting the environmental assets of the coast, and (b) establishing a framework for land use planning to guide decision-making in the coastal zone, and (c) mapping the 4 coastal management areas which comprise the NSW coastal zone, in accordance with the definitions in the Coastal Management Act 2016.	The area of Lot 4 DP 603395 along the frontage to The Entrance Road to a depth of 65m is identified as within "proximity area for coastal wetlands". Development must not be granted to development on such land unless the consent authority is satisfied that the proposed development will not significantly impact on: - the biophysical, hydrological or ecological integrity of the adjacent coastal wetland, or - the quantity and quality of surface and groundwater flows to and from the adjacent coastal wetland. The whole of Lot 4 DP 603395 is located within the Coastal Environment Area. Consent must not be granted for development within this area if the proposed development is likely to cause adverse impacts on: - the integrity and resilience of the biophysical, hydrological and ecological environment; - coastal environmental values and natural coastal processes; - the water quality, in particular the cumulative impacts on the sensitive coastal lakes, in this case Wamberal Lagoon; - marine vegetation, native vegetation and fauna and their habitats; - Aboriginal cultural heritage, practices and places. Council's Waterways Unit and OEH have advised that the site is flood liable and the proposed development would alter the hydrology of the site. The ecological integrity of the coastal wetland has not been fully assessed

State Environmental Planning Policy	Comment
	as the flooding matter has not been satisfactorily addressed. The Planning Proposal is therefore considered to be inconsistent with the SEPP.

***Table 3** – State Environmental Planning Policy Assessment*

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

The proposal has been considered against the relevant Ministerial Directions as summarised below. The full assessment of these Directions is contained within the Attachments of this proposal.

No.	Direction	Applicable	Consistent
Employment & Resources			
1.1	Business & Industrial Zones	N	N/A
1.2	Rural Zones	N	N/A
1.3	Mining, Petroleum Production and Extractive Industries	N	N/A
1.4	Oyster Aquaculture	N	N/A
1.5	Rural Lands	Y	Y
Environment & Heritage			
2.1	Environmental Protection Zones	Y	Y
2.2	Coastal Protection	Y	N
2.3	Heritage Conservation	Y	Y
2.4	Recreation Vehicle Areas	N	N/A
2.5	Application of E2 and E3 Zones and Environmental Overlays in Far North Coast LEPs	N	N/A
2.6	Remediation of Contaminated Land	Y	Y
Housing, Infrastructure & Urban Development			
3.1	Residential Zones	Y	N
3.2	Caravan Parks and Manufactured Home Estates	N	N/A
3.3	Home Occupations	Y	Y

No.	Direction	Applicable	Consistent
3.4	Integrating Land Use & Transport	Y	Y
3.5	Development Near Licensed Aerodromes	N	N/A
3.6	Shooting Ranges	N	N/A
3.7	Reduction in non-hosted short-term rental accommodation period	N	N/A
Hazard & Risk			
4.1	Acid Sulfate Soils	Y	Y
4.2	Mine Subsidence and Unstable Land	N	N/A
4.3	Flood Prone Land	Y	N
4.4	Planning for Bushfire Protection	Y	Y
Regional Planning			
5.1	Implementation of Regional Strategies	N	N/A
5.2	Sydney Drinking Water Catchments	N	N/A
5.3	Farmland of State and Regional Significance on the NSW Far North Coast	N	N/A
5.4	Commercial and Retail Development along the Pacific Highway, North Coast	N	N/A
5.8	Sydney's Second Airport: Badgery's Creek:	N	N/A
5.9	North West Rail Link Corridor Strategy	N	N/A
5.10	Implementation of Regional Plans	Y	N
5.11	Development of Aboriginal Land Council lands	N	N/A
Local Plan Making			
6.1	Approval and Referral Requirements	Y	Y
6.2	Reserving Land for Public Purposes	Y	Y
6.3	Site Specific Provisions	Y	Y
Metropolitan Planning			
7.1	Implementation of A Plan for Growing Sydney	N	N/A
7.2	Implementation of Greater Macarthur Land Release Investigation	N	N/A

No.	Direction	Applicable	Consistent
7.3	Parramatta Road Corridor Urban Transformation Strategy	N	N/A
7.4	Implementation of North West Priority Growth Area Land Use and Infrastructure Implementation Plan	N	N/A
7.5	Implementation of Greater Parramatta Priority Growth Area Interim Land Use and Infrastructure Implementation Plan	N	N/A
7.6	Implementation of Wilton Priority Growth Area Interim Land Use and Infrastructure Implementation Plan	N	N/A
7.7	Implementation of Glenfield to Macarthur Urban Renewal Corridor	N	N/A
7.8	Implementation of Western Sydney Aerotropolis Interim Land Use and Infrastructure Implementation Plan	N	N/A
7.9	Implementation of Bayside West Precincts 2036 Plan	N	N/A
7.10	Implementation of Planning Principles for the Cooks Cove Precinct	N	N/A

***Table 4** – S9.1Ministerial Direction Compliance*

Ministerial Section 9.1 Directions

Direction	Comment
Employment & Resources	
1.5 Rural Lands	
Aims to protect the agricultural production value of rural land, facilitate the economic use and development of rural lands, assist in the proper management, development and protection of rural lands, minimise the potential for land fragmentation and land use conflict. Applies when a relevant planning authority prepares a planning proposal that will affect land within an existing or proposed rural or environmental protection zone or changes the existing minimum lot	The subject land is within an environmental protection zone and is currently used for plant nursery and landscape activity. The Planning Proposal seeks to apply the additional permitted use of a residential care facility to that part of the site within the 7(c2) zone. The environmental values of the site, especially the vegetated land in the 7(c2) and 7(a) zoned land, have been considered, as it proposed to dedicate this land

Direction	Comment
size on land within a rural or environmental protection zone. A Planning Proposal must be consistent with any applicable strategic plan, identify and protect environmental values, consider the natural and physical constraints of the land, consider measures to minimise fragmentation of rural land and reduce the risk of land use conflict, consider the social, economic and environmental interests of the community. Where the Planning Proposal is for rural residential purposes; is appropriately located taking into account the availability of human services, utility infrastructure, transport and proximity to existing centres; and is necessary taking account of existing and future demand and supply of rural residential land.	to Council for COSS. In this way the environmental quality of the site would be protected. However the planning proposal has to also consider any natural and physical constraints on the land. As the subject land is flood liable the proposed use is unsuitable for this site. The Planning Proposal is inconsistent with this Direction.
Environment & Heritage	
2.1 Environmental Protection Zones	
Aims to protect and conserve environmentally sensitive areas. Applies when the relevant planning authority prepares a planning proposal. A planning proposal must include provisions that facilitate the protection and conservation of environmentally sensitive areas. A planning proposal that applies to land within an environment protection zone or land otherwise identified for environment protection purposes in a LEP must not reduce the environmental protection standards that apply to the land (including by modifying development standards that apply to the land). This requirement does not apply to a change to a development standard for minimum lot size for a dwelling in accordance with clause (5) of Direction 1.5 *"Rural Lands*".	The western part of the subject site is cleared of vegetation and it is proposed to build the residential care facility on this part of the site. The eastern part of the site accommodates EEC vegetation and the owner has proposed to dedicate this area to Council for inclusion in the COSS. The environmental protection standards applying to the land would not be reduced and hence be consistent with this Direction.
2.2 Coastal Protection	
Aims to protect and manage coastal areas of NSW. Applies when a relevant planning authority prepares a planning proposal that applies to land within the coastal zone as identified by SEPP (Coastal Management) 2018. A planning proposal must include provisions that give effect to and are consistent with:	The objects of the Coastal Management Act 2016 are to manage the coastal environment of New South Wales in a manner consistent with the principles of ecologically sustainable development for the social, cultural and economic well-being of the people of the State. The whole site is located within the coastal zone. As the residential care facility is proposed to be located

Direction	Comment
(a) the objects of the Coastal Management Act 2016 and the objectives of the of the relevant coastal management areas, and (b) the NSW Coastal Management Manual and associated toolkit, (c) the NSW Coastal Design Guidelines 2003. A planning proposal must not rezone land which would enable increased development or more intensive land use on land: (a) within a coastal vulnerability area identified by the SEPP (Coastal Management) 2018, or (b) that has been identified as land affected by current or future coastal hazard in a LEP or DCP, or a study or assessment undertaken by a public authority or a relevant planning authority.	on the cleared section of the site and the vegetated part of the site is proposed to be dedicated to Council, there is unlikely to be an adverse impact on the natural character of the area. The NSW Coastline Management Manual provides "information to assist present and potential users and occupiers of the coastline to understand the nature of coastline hazards and the options available for their management." As the site is not subject to immediate coastal processes it is not relevant to the Planning Proposal. The Coastal Design Guidelines relates to design of dwellings and location of new settlements and is not strictly relevant to this Planning Proposal. The following objectives are however pertinent to this Planning Proposal: - To protect and enhance the cultural, ecological and visual characteristics of a locality. - To limit coastal sprawl by establishing separation and greenbelts between settlements. - To integrate new development with surrounding land uses. The proposed dedication to Council of the existing EEC vegetation on site will protect the ecological characteristics of the site. However the proposed residential care facility outside of the urban footprint does not represent integration with the surrounding land uses.
2.3 Heritage Conservation	
Aims to conserve items, areas, objects and places of environmental heritage significance and indigenous heritage significance. Applies when the relevant planning authority prepares a planning proposal. A planning proposal must contain provisions that facilitate the conservation of items, places, buildings, works, relics, moveable objects or precincts of environmental heritage significance to an area, in relation to the historical, scientific, cultural, social archaeological, architectural, natural or aesthetic value of the item, area, object or place, identified in a study of the environmental heritage of the area. This includes items, areas, objects and places of indigenous heritage significance.	No items of European Heritage have been identified in any planning instrument as being located on the site. As the ground surface of the site has been extensively disturbed/modified, the likelihood of Aboriginal objects being present is low. It is therefore considered that in this instance, the Aboriginal assessment could be undertaken at development stage.

Direction	Comment
2.6 Remediation of Contaminated Land	
Aims to reduce the risk of harm to human health and the environment by ensuring that contamination and remediation are considered by planning proposal authorities. Applies to: (a) land that is within an investigation area within the meaning of the Contaminated Land Management Act 1997, (b) land on which development for a purpose referred to in Table 1 to the contaminated land planning guidelines is being, or is known to have been, carried out, (c) the extent to which it is proposed to carry out development on it for residential, educational, recreational or childcare purposes, or for the purposes of a hospital – land: (i) in relation to which there is no knowledge (or incomplete knowledge) as to whether development for a purpose referred to in Table 1 to the contaminated land planning guidelines has been carried out, and (ii) on which it would have been lawful to carry out such development during any period in respect of which there is no knowledge (or incomplete knowledge).	As the land is proposed to be used for a residential care facility for the elderly a preliminary contamination report was prepared. This report concludes that the site can be made suitable for the proposed rezoning to allow residential care facility. It also includes some recommendations to address identified contamination on the site.
Housing, Infrastructure and Urban Development	
3.1 Residential Zones	
Aims to encourage a variety of housing choice, to make efficient use of existing infrastructure and services, ensure new housing has appropriate access to infrastructure and services, and to minimise the impact of residential development on the environment. This Direction applies when a planning proposal affects land within an existing or proposed residential zone. The draft LEP shall include provisions that will broaden the choice of building types, make more efficient use of existing infrastructure and services, reduce the consumption of land for housing on the urban fringe and be of good design. The Direction also requires that residential development is not permitted until land is	The Planning Proposal to permit a residential care facility on the site would result in a variety of housing choice in the locality. However the proposal will consume marginal land on the urban fringe. The land is serviced by water but not by sewer. Due to the additional loads created by the proposed residential care facility, works will have to be undertaken towards the augmentation of the sewer system.

Direction	Comment
adequately serviced (or arrangements satisfactory to the council, or other appropriate authority, have been made to service it).	
3.3 Home Occupations	
Aims to encourage the carrying out of low impact small business in dwelling houses. Applies when the relevant planning authority prepares a planning proposal.	The proposal does not impact on the permissibility of home occupations.
3.4 Integrating Land Use and Transport	
Aims to ensure that urban structures, building forms, land use locations, development designs, subdivision and street layouts to achieve: improving access to housing, jobs and services by walking, cycling and public transport; increasing choice of available transport and reducing transport on cars; reducing travel demand; supporting efficient and viable public transport services; and provide for efficient movement of freight. Applies when a planning proposal creates alters or moves a zone or provision relating to urban land, including land zoned for residential, business, industrial, village or tourist purposes.	The Planning Proposal is located on The Entrance Road and near Tumbi Road. Both roads support regular bus services to major nodes such as Gosford, Erina Fair and The Entrance. Due to availability of these services the Planning Proposal is considered to be consistent with this Direction
Hazard & Risk	
4.1 Acid Sulfate Soils	
Aims to avoid significant adverse environmental impacts from the use of land that has a probability of containing acid sulfate soils. Applies when a relevant planning authority prepares a planning proposal that will apply to land having a probability of containing acid sulfate soils.	The land is identified on the Acid Sulfate Soils Planning Maps as having a probability of acid sulfate soils (Class 5). Class 5 is where works within 500 metres of adjacent Class 1, 2, 3 or 4 land that is below 5 metres Australian Height Datum and by which the watertable is likely to be lowered below 1 metre Australian Height Datum on adjacent Class 1, 2, 3 or 4 land. The subject land is within 500m (i.e. 100m) from land with Acid Sulfate Soils Class 3, however the land on which the residential care facility is proposed to be located is above 5m AHD. That part of the site which is below 5m AHD is proposed to be dedicated as COSS.
4.3 Flood Prone Land	
Aims to ensure that development of flood prone land is consistent with the NSW Government's Flood Prone Land Policy and the principles of the Floodplain Development Manual 2005, and ensure that the provisions of an LEP on flood prone land is	The information provided in the Flood Study indicates that most of the site is below the design 1% AEP level. The Study indicates that the entire site is at or below the flood planning level. The proponent has indicated that up to 2 metres of fill would be

Direction	Comment
commensurate with flood hazard and includes consideration of the potential flood impacts both on and off the subject land. Applies when a relevant planning authority prepares a planning proposal that creates, removes or alters a zone or a provision that affects flood prone land.	required on-site to facilitate this development and achieve flood free developable areas. Therefore the Planning Proposal is inconsistent with this Direction.
4.4 Planning for Bushfire Protection	
Aims to protect life, property and the environment from bushfire hazards, and encourage sound management of bushfire prone areas. Applies when a planning proposal affects or is in proximity to land mapped as bushfire prone land.	The subject land is classified as Rural Fire Service Bushfire Category 1 and Vegetation Buffer. The RFS has advised that it raises no objections to the proposal subject to a requirement that the future subdivision of the land complies with *Planning for Bush Fire Protection 2006*.
Regional Planning	
5.10 Implementation of Regional Plans	
Aims to give legal effect to the vision, land use strategy, policies, outcomes and actions contained within regional strategies. Applies when the relevant planning authority prepares a planning proposal that is located on land addressed within the Far North Regional Strategy, Lower Hunter Regional Strategy, Central Coast Regional Strategy, Illawarra	The Planning Proposal will provide housing choice for aged care within the Wamberal area. The existing EEC vegetation on site is proposed to be protected by dedication of the vegetated land to Council for COSS. However the land has been reviewed with regards to flood risk and it has been determined that it is unsuitable for a residential care facility.
Local Plan Making	
6.1 Approval and Referral Requirements	
Aims to ensure that LEP provisions encourage the efficient and appropriate assessment of development. This Direction requires a Planning Proposal to minimise the inclusion of concurrence/consultation provisions and not identify development as designated development.	The planning proposal will not increase the need for referrals for development applications.
6.2 Reserving Land for Public Purposes	
Aims to facilitate the provision of public services and facilities by reserving land for public purposes and facilitate the removal of reservations for public purposes where the land is no longer required for acquisition. Applies when the relevant planning authority prepares a planning proposal.	The Planning Proposal does not seek to create, alter or reduce existing zonings or reservations of land for public purposes.

Direction	Comment
A planning proposal must not create, alter or reduce existing zonings or reservations of land for public purposes without the approval of the relevant public authority and the Director-General of the Department of Planning.	
6.3 Site Specific Provisions	
Aims to discourage unnecessarily restrictive site specific planning controls. Applies when the relevant planning authority prepares a planning proposal to allow particular development to be carried out. The Planning Proposal must use an existing zone already applying in an environmental planning instrument and not impose any development standards in addition to those already contained in the environmental planning instrument. The proposal shall not contain or refer to drawings/concept plans that show details of the proposed development.	It is proposed that the relevant mapping be updated only subsequent to this proposal and no additional development standards than currently exist would be applied. The proposal shall not contain or refer to drawings/concept plans that show details of the proposed development.

Table 5: S9.1 Ministerial Direction Assessment

Site Inspection Summary

A site inspection was undertaken on 19 October 2020. The site inspection was attended by the following Council staff

- Scott Duncan – Section Manager Local Planning and Policy
- Bruce Ronan – Strategic Planner

and the following Councillors:

- Mayor Matthews
- Deputy Mayor Smith
- Councillor Greenaway
- Councillor Pilon

The following questions were raised by Councillors and responses provided by staff during the site inspection:

Councillor Question

1 What is the current use on the site?

Staff Comment

The current use on the site is a plant nursery and landscaping supply business. The use has Development Approval.

Councillor Question

2 What is the proposed use for the site?

Staff Comment

The Planning Proposal seeks to permit a residential care facility on the cleared portion of the site. As the site is within the Probable Maximum Flood (PMF) level, it is proposed to fill the area proposed to be developed.

Councillor Question

3 How many beds are proposed?

Staff Comment

On-site, staff were uncertain how many beds are proposed. Following the meeting research of the Planning Proposal file revealed that the residential care facility is proposed to comprise 180 beds.

Councillor Question

4 What is the recommendation?

Staff Comment

The recommendation is for refusal. The Department of Planning, Industry and Environment (DPIE) has recently directed Council to determine longstanding Planning Proposals (i.e. over 4 years old) by 31 December 2020. As this Planning Proposal cannot be finalised by this date and as there are unresolved flooding issues, the recommendation is for refusal. The applicant has not addressed the cumulative impact of filling the site.

Councillor Question

5 Can Planning Proposals be appealed?

Staff Comment

No, Planning Proposals cannot be taken to the Land and Environment Court.

Councillor Question

6 Has there been any recent development proposals on this site?

Staff Comment

Yes, a recent development application was submitted to permit the same level of fill that is required under the Planning Proposal. The development application was refused.

Councillor Question

7 When is the report going to Council?

Staff Comment

The report is going to Council on 9 November 2020.

Item No: 5.4

Title: Deferred item - Proposal to Purchase Land known as the Davistown Wetland

Department: Innovation and Futures

30 November 2020 Ordinary Council Meeting

Reference: F2020/00878 - D14117624

Author: Joe O'Connor, Property Development Manager

Manager: Jamie Barclay, Unit Manager, Economic Development and Project Delivery

Executive: Ricardo Martello, Executive Manager Innovation and Futures

Report purpose

To recommend that Council cease efforts to acquire land known as the Davistown Wetland.

Executive Summary

In response to growing community concern, Council made resolution 1204/19 at the Ordinary meeting of 25 November 2019, to commence negotiations to purchase by agreement, eight lots in Davistown having an area of 19.26ha, being wetlands for environmental protection purposes. However, the vendor's asking price was considerably higher than Council's two market valuations, and as such Council's offer was not accepted.

There was a sum of $1,436,049 specifically allocated by the former Gosford City Council to purchase wetland parcels. This was to be held in restricted funds under the name of "Davistown Wetlands." These funds were to be used to purchase this land, however it is unclear if these funds are still available. It is also unclear if Council has the financial capacity to manage these lands in perpetuity.

Given the stalemate between Council and the vendor, Council considered compulsory acquisition. Council is required to justify how compulsory acquisition is legally sound to the Minister for Local Government.

The risk of the land being developed is extremely low due to the current planning restrictions including ecology and flooding that severely constrain this land.

Due to the low risk of it being developed, the uncertainty of available funds, and the legislative compliance for compulsory acquisition, it is recommended to discontinue any acquisition (by agreed price or compulsory acquisition) for the present time.

Innovation and Futures Recommendation

1 That Council discontinue any negotiations to purchase by agreement the land known as the Davistown Wetlands.

2 That Council note the report with regard to compulsory acquisition of the land known as the Davistown Wetland and not proceed with compulsory acquisition at this time.

3 That Council resolve, pursuant to section 11(3) of the Local Government Act 1993, that Attachments 1-5 to this report remain confidential in accordance with section 10A(2)(d) of the Local Government Act as it contains commercial information of a confidential nature that would, if disclosed would confer a commercial advantage on a competitor of the Council and because consideration of the matter in open Council would on balance be contrary to the public interest as it would affect Councils ability to obtain value for money services for the Central Coast community.

Background

The Davistown Wetlands (the land) includes the following lots:

- 11 Lilli Pilli Street Davistown - Lot 1 DP547660
- 51 Pine Avenue Davistown - Lot 30 DP 456234
- 1 Cross Road Davistown - Lot 31 DP 5820
- 3 Cross Road Davistown - Lot 32 DP 5820
- 10-20 Kincumber Crescent - Lot 52 DP 6014
- 11-29 Kincumber Crescent Davistown - Lot 53 DP 6014
- 108A Malinya Road Davistown - Lot 92 DP 12206
- 83 Malinya Road Davistown - Lot 93 DP 12206

The vendor, being *Illoura Waters Pty Ltd,* has had the land on the market since October 2017. The community became concerned that the land could become developed and approached Council to acquire the land for environmental protection and to "keep it out of the hands of developers."

The land appears to be severely constrained by environmental protection legislation and flood affectation, making the land difficult to develop. Council refused a development application lodged in 1991 for construction of 16 residential lots on one of the lots due to unresolved environmental and flooding issues.

Community groups have been petitioning Council to acquire the land for environmental protection and management. There are opportunities for the land to be managed as a natural asset, protected (from introduced flora and fauna pest species) and the ecological value of the land improved.

While previously there was a sum of $1,436,049 allocated in restricted funds under the name of "Davistown Wetlands," considering the current financial audit, it is unclear if these funds are still available. Further, this fund was established for *all* the wetlands in the Davistown area, not just these eight (8) lots. While Council has considered what these costs may include, currently the management and the further protection of the land has not been appropriately costed.

Figure 1: The land, being eight lots considered for purchase by Council

Current Status

The land is still "on the market," and the vendor is determined that Council increase its offer in line with their asking price. In accordance with the Land Transaction Policy, Council is unable to agree to a purchase price higher than the independent valuations received. Should Council wish to acquire the land for its purposes pursuant to the Local Government Act 1993 and Land Acquisition (Just Terms Compensation) Act 1991, then Council could commence compulsory acquisition.

Refer to Attachment 1 and 2 which provides the two independent valuations which Council has commissioned. Attachment 3 provides a copy of the offer which Council has submitted to the vendor and Attachments 4 and 5 provides details of the failed negotiations with the vendor of the land.

Report

At Council's Ordinary Meeting of 10 August 2020, it was resolved:

727/20 That the Chief Executive Officer continue to pursue an acquisition by agreement of the land known as Davistown Wetlands.

728/20 That the Chief Executive Officer initiate investigations regarding the eligibility of the land known as Davistown Wetlands for a compulsory acquisition process and provide a report back to Council with the outcome of these investigations.

729/20 That Council reopen dialogue with the land owner/representatives during the 12-week period.

Regarding resolutions 727/20 and 729/20, Council has been unsuccessful in negotiating a price by agreement. The current stalemate suggests that Council should discontinue any further negotiations. Refer to Attachment 5 for the latest correspondence received from the vendor rejecting Council's offer.

Regarding resolution 728/20, Council can commence the process of compulsory acquisition, however the eligibility is determined by the Minister for Local Government and/or the Governor. The application would require Council's Environmental Management Unit (as the future asset manager) to develop a case for the potential purpose of the land, being a natural reserve. For example, Council could create a public environmental reserve over the Land, "The Davistown Wetland Environmental Reserve" contributing to tourism and conversation of the natural area.

Consultation

The following areas of Council have been consulted in the writing of this report:

- Legal;
- Property Information Services;
- Environment Management;
- Natural Assets and Biodiversity;
- Finance.

Additional discussions have occurred with the vendor and vendor's representative, *Illoura Waters Pty Ltd* and Council's consultant property valuer.

Financial Considerations

At its meeting held 19 October 2020, Council resolved the following:

1036/20 That any motions put before Council for the remainder of this term of Council that have financial implications require the Chief Executive Officer to provide a report on how those additional costs will be met.

The following statement is provided in response to this resolution of Council.

There was a sum of $1,436,049 specifically allocated by the former Gosford City Council to purchase wetland parcels. This was to be held in restricted funds under the name of "Davistown Wetlands." These funds were to be used to purchase this land, however it is unclear if these funds are still available. It is also unclear if Council has the financial capacity to manage these lands in perpetuity.

Link to Community Strategic Plan

Theme 4: Responsible

Goal I: Balanced and sustainable development

R-G4: Serve the community by providing great customer experience, value for money and quality services.

Risk Management

There is considerable reputational risk should Council proceed to acquire the Davistown Wetlands given Council's financial situation and it may be considered unnecessary by the community. This is given:

- the unsuccessful negotiations to date;
- the uncertainty as to whether Council can demonstrate a valid purpose for the land in exercising its functions;
- the existing environmental and planning legislation that regulates the development of the site.

Options

Option 1: That Council discontinue any acquisition of the land known as Davistown Wetlands for the time being. This is the preferred option.

On the basis that negotiations have failed to date, Council is left with the option of doing nothing and not proceeding with the acquisition. Council has indicated that the land could be acquired for environmental protection and not be developed. At the present time, it is unclear whether the land has much development potential. The current planning legislation affords the land various protection mechanisms against much, if any development. Further, the acquisition would come at a cost to Council and require on-going maintenance costs. Given the current financial uncertainty of Council and perception in the community, any forced compulsory acquisition would further compromise Council's reputation.

Option 2: Council compulsorily acquire the land.

Should Council wish to compulsorily acquire the land, the following recommendations are provided:

1 *That Council commission a further valuation in line with Land Acquisition (Just Terms Compensation) Act 1991 (JTC Act) requirements, and provide a budget for the on-going maintenance, to ascertain that Council has sufficient funds for the purchase (including associated transaction fees), and maintenance costs;*

2 *That Council develop a 'Purpose of acquisition' statement and confirm details of any proposed environmental reserve;*

3 *That Council resolve to compulsorily acquire the land known as Davistown Wetlands including:*

- *11 Lilli Pilli Street Davistown - Lot 1 DP547660*
- *51 Pine Avenue Davistown - Lot 30 DP 456234*
- *1 Cross Road Davistown - Lot 31 DP 5820*
- *3 Cross Road Davistown - Lot 32 DP 5820*
- *10-20 Kincumber Crescent - Lot 52 DP 6014*
- *11-29 Kincumber Crescent Davistown - Lot 53 DP 6014*
- *108A Malinya Road Davistown - Lot 92 DP 12206*
- *83 Malinya Road Davistown - Lot 93 DP 12206*

4 *That Council issue an Opening Letter to Illoura Waters Pty Ltd pursuant to the JTC Act, to commence the required six (6) month negotiation period;*

5 *That Council authorise the necessary applications to the Minister and/or the Governor to approve the compulsory acquisition of the Davistown Wetlands;*

6 *Should the Minister approve the application for compulsory acquisition, that pursuant to the JTC Act, Council follow the required processes for acquisition of this land.*

Critical Dates or Timeframes

The acquisition of the Davistown Wetlands is not considered time critical given the land has been on the market since October 2017 and no willing buyer apart from Council has come forth to date. The process for compulsory acquisition may take between 18 months and 2 years to complete.

Attachments

1 Confidential - Valuation 1 (dated 20-02-2019) - D14000335

2	Confidential - Valuation 2 (dated 05-02-2020) -	Provided under separate cover	D13837202
3	Confidential - Letter of offer to Illoura Waters P/L -	Provided under separate cover	D13994050
4	Confidential - Summary of Response from Illoura Waters P/L -	Provided under separate cover	D14017691
5	Confidential - Email to Illoura Waters and confirmation of price -	Provided under separate cover	D14310688

Item No: 5.5

Title: Sale of Council Operational Assets

Department: Innovation and Futures

30 November 2020 Ordinary Council Meeting

Reference: F2004/09073 - D14304824

Author: Joe O'Connor, Property Development Manager

Manager: Jamie Barclay, Unit Manager, Economic Development and Project Delivery

Executive: Ricardo Martello, Executive Manager Innovation and Futures

Due notice is given of this matter in accordance with Council's Code of Meeting Practice. The report and any relevant attachments will be provided prior to the Ordinary Meeting of 30 November 2020. The reason for providing this report as a late item is so that it can reflect as far as practicable the current situation with regard to Council's actions and response.

Item No:	6.1
Title:	Management of the Obstacle Limitation Surface (OLS) at Warnervale Aircraft Landing Area (ALA)
Department:	Roads Transport Drainage and Waste

30 November 2020 Ordinary Council Meeting

Reference:	F2004/06700-002 - D14247456
Author:	Janine McKenzie, Unit Manager, Business Enterprise
Executive:	Boris Bolgoff, Director Roads Transport Drainage and Waste

Report purpose

To update Council on the progress of Council resolutions 723/19 and 724/19, as required in resolution 725/19 on the management of trees that are impinging into the recommended Obstacle Limitation Surface (OLS) at both ends of the runway at the Warnervale Aircraft Landing Area (ALA).

Executive Summary

All actions from the resolutions of Council from 12 August 2020 are now completed and approval is now sought to prune the trees at the northern end of the runway as a more permanent solution to managing the risks of aircrafts colliding with these trees.

Roads Transport Drainage and Waste Recommendation

That Council undertake the pruning of trees on the lands to the north of the Warnervale ALA to maintain an obstacle limitation surface of 3.3% to the north, in line with the guideline for night flight operations in the Civil Aviation Advisory Publication 92-1: Guideline for Aircraft Landing Areas (CAAP 92-1).

Background

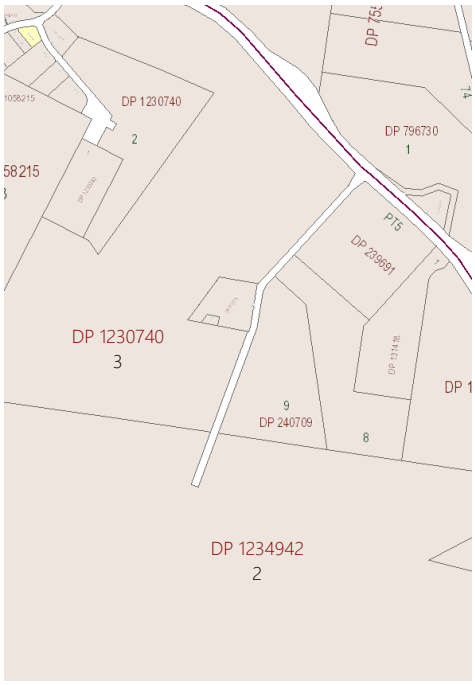
Council operates the Warnervale Aircraft Landing Area (ALA).

The ALA is predominantly used by the Central Coast Aero Club (CCAC) and its members. CCAC also operate a flight training business, Warnervale Air Pty Limited. It is also used by itinerant private aircraft travelling to and from the Central Coast, and occasionally for emergency and other services.

The Warnervale ALA is located on portions of two larger lots, Lot 3 DP1230740 and Lot 2 DP1204942, and is bordered to the south by the Porters Creek Wetland and to the north by Sparks Road (see figures 1 and 2).

Figure 1: Warnervale ALA - Aerial View

Figure 2: Warnervale ALA – Cadastre View



On 8 July 2019, Council resolved:

660/19 That Council request the Chief Executive Officer;

a Ensure that Council not cause or permit mowing, slashing or trimming of vegetation within 100 metres of the land referred to in minute number 659/19 part A without first obtaining consent or carrying out environmental assessment as required under the EP&A Act.

b Ensure that Development Applications and/or any activities (as defined under the EP&A Act) on land owned or under the care control and management of Council within 200 metres of the northern boundary of Warnervale Airport and 200 metres from the southern end of the runway are referred to Council for determination.

On 12 August 2019, Council received a report that assessed the risk of trees at both ends of the airfield have grown into the recommended Obstacle Limitation Surface (OLS).

An OLS is the imaginary surface that extends from the ends and sides of a runway above which should be free from obstacles that would present a hazard to aircraft. For aircraft landing areas, there are no legislated or regulatory requirements to maintain a defined OLS, but the Civil Aviation Advisory Publication 92-1: Guidelines for Aircraft Landing Areas (CAAP 92-1) recommends an OLS gradient at the runway ends of 5% for day operations and 3.3% for night operations. CAAP92-1 states that there is no legal requirement to observe the details set out in that publication and that decisions around the landing or taking off at an

ALA are the responsibility of the pilot in command having regard to the circumstances of the proposed landing or take off.

As a result of the report, on 12 August 2019, Council resolved:

723/19 That Council engage an external specialist to undertake an up-to-date survey and analysis of the Obstacle Limitation Surfaces (OLS) at the southern and northern ends of the Central Coast Airport runway for both the 5% OLS and 3.33% OLS.

724/19 That Council commence the environmental studies required to seek approval to manage the tree heights at the northern and the southern ends of the Central Coast Airport runway.

725/19 That Council request the Chief Executive Officer to provide a further report on the outcomes of 723/19 and 724/19 as soon as possible.

Subsequent to the resolution, the NSW Government has undertaken a review of the Warnervale Airport (Restrictions) Act 1996, with their final recommendations published in July 2020. While the Act itself has nothing to do with management of the OLS at the ALA, the final report recommended that:

> *While unrelated to the Review Terms of Reference, the Review Team identified a real safety issue resulting from the trees at the northern end of the aerodrome, along Sparks Road, intruding into the Obstacle Limitation Surface (OLS) of the runway. The Reviewers recommend that the tree height be reduced as a matter of urgency.*

On 7 September 2020, Council implemented displaced thresholds at both ends of the runway to ensure an OLS of 5% at:

- 243 metres from the southern end of the runway
- 398 metres from the northern end of the runway.

From 5 October 2020, Council closed the ALA for all night operations. These measures will remain in place until the trees can be pruned to accommodate the recommended OLS.

If the trees are not trimmed and continue to grow, regular OLS surveys will be required and the displaced thresholds will need to be continually extended to maintain a 5% gradient for the OLS. Over time, without other intervention to manage the trees, the airfield becomes less and less usable for aircraft.

It should be noted that prior to the implementation of these temporary displaced thresholds, there was a permanent displaced threshold at 210 metres from the northern end of the runway, this is required to create an Obstacle Limitation surface clear of the built structures to the north of the airfield.

Current Status

Council staff have completed the actions as per the above resolutions 723/19 and 724/19, the updated OLS survey and environmental studies are attached to this report.

In addition, further advice has been sought on the appropriate pathways for obtaining approval to prune the trees impinging on the OLS.

Based on the advice, the pruning of the trees at the northern end of the runway can be carried out in accordance with Part 5 of the Environmental Planning and Assessment Act 1979 (EP&A Act).

The issue of pruning the trees at the southern end of the runway is much more complex. There is currently no clear approval pathway to do this work without changes to either local or state planning instruments or legislation.

Part 5 Assessment for the Northern End

A review of environmental factors has been completed (EMS Form Environmental Assessment – Level 2 attached) and has been approved. However, under Council resolution 660/19(b), and as part of the proposed pruning is on Council land within 200 metres of the northern boundary of the Warnervale ALA, this is now being referred to Council for determination.

Because the works can be approved under a Part 5 Environmental Assessment, it does not trigger any mandatory participation in the Biodiversity Offset Scheme.

To date, three written quotes have been received for the works, but a preferred provided has not yet been determined. Given that the quoting process remains live, the current quotes are provided to Council as confidential attachments so as not to advantage or disadvantage any potential service providers.

Assessment of Options for the Southern End

As there is currently no approval pathway available to prune the trees at the southern end of the runway. Council will maintain a temporary displaced threshold at the southern end until an approval pathway is available, and the trees are pruned.

A Briefing will be scheduled to provide Council with more detail on legal advice and options provided on the management of the OLS at the southern end of the runway.

Impact on ALA Operations

Implementing the recommendation to prune the trees to the north and maintain a 3.3% OLS, will provide an available runway length for aircraft taking off to the north of 897 metres.

(1,193m total runway length, less the 210m permanent displaced threshold at the north and the 86m unusable runway at the south due to currently being unable to maintain this area as it is in the 100m buffer zone of the SEPP Coastal Management Wetland). This is an additional 188 metres from the current available runway of 709 metres under the displaced thresholds.

For aircraft taking off to the south, the available runway remains 950 metres (1,193m less the 243m temporary displaced threshold).

Financial Considerations

At its meeting held 19 October 2020, Council resolved the following:

> *1036/20 That any motions put before Council for the remainder of this term of Council that have financial implications require the Chief Executive Officer to provide a report on how those additional costs will be met.*

The following statement is provided in response to this resolution of Council.

Costs have already been incurred actioning the resolutions of 12 August 2019. The below table outlines the costs to date of works undertaken to manage the obstacle limitation surfaces. It does not include the costs of internal staff time on this matter, which include staff from Business Enterprise, Environmental Reporting and Legal.

Table 1: Costs already incurred

Updated OLS Survey	$6,700
Environmental Studies & Part 5 Assessment	$53,800
Legal Advice (approximately)	$13,000
Temporary displaced thresholds	$13,868
Total costs to date:	**$87,368**

To implement the recommendation of this report, costs will be incurred to undertake pruning of the trees. As the quoting process for the tree works is live at the time this report was written, the quotes received for this work has been provided as a confidential attachment, as has some further correspondence from the quoting service provider on the costs to maintain the trees at that height level.

A further approximately $7,000 would be required to return the runway markings at the northern end to the permanent 210m displaced threshold.

It should also be noted that if Council resolves to maintain the current displaced thresholds at 5% OLS and not trim the trees, annual OLS surveys and line marking adjustments would be required, incurring estimated cost of approximately $20,500pa.

Costs incurred for the ALA are funded from Council's General Fund.

Link to Community Strategic Plan

Theme 2: Smart

Goal C: A growing and competitive region

S-C3: Facilitate economic development to increase local employment opportunities and provide a range of jobs for all residents.

Risk Management

As this is an aviation operation, both Council's Enterprise Risk Management Framework and the Civil Aviation Safety Authority (CASA) Risk Matrix are referenced for risk assessment purposes.

Prior to the implementation of the temporary displaced thresholds in September 2020 and the temporary closure of night operations in October 2020, the risk rating on the OLS was assessed at high under Council's risk assessment and CASA's Risk Matrix. See Figure 3 and Figure 4.

Figure 3: Risk rating prior to displaced thresholds as per Council's Enterprise Risk Management Framework

Likelihood	Unlikely
Consequence	Catastrophic
Overall Rating	High

Figure 4: Risk rating prior to displaced thresholds as per CASA's Risk Matrix

Likelihood	Unlikely
Consequence	Severe
Overall Rating	High

With the implementation of the temporary displaced thresholds the risk reduced to medium under the Council's Enterprise Risk Management Framework, while the risk rating did not change under CASA's risk matrix (even though the likelihood reduced to rare). See Figure 5 and Figure 6.

Figure 5: Current risk rating as per Council's Enterprise Risk Management Framework

Likelihood	Rare
Consequence	Catastrophic
Overall Rating	Medium

Figure 6: Current risk rating as per CASA's Risk Matrix

Likelihood	Rare
Consequence	Severe
Overall Rating	High

CASA's Risk Management Framework identified the principle of ALARP (as low as reasonably possible), and states "all efforts should be made to reduce the risks to the lowest level possible until a point is reached at which the cost of introducing a further safety measure significantly outweighs the benefit." According to this framework a risk is tolerable if it is controlled to keep the residual risk ALARP.

The implemented displaced thresholds bring the residual risk to as low as reasonably possible (ALARP).

The recommendation to prune the trees at the northern end will maintain the current assessed risk ratings, but will also enable a return to the normal level of operations and accessibility for aircraft at the Warnervale ALA. This may attract back organisations like MedAir to the airfield, who have recently advised that they could not use the airfield at the shorter available runway created by the temporary displaced thresholds.

While the risk ratings don't change between the displaced thresholds and the tree trimming, the greater runway available with the trees pruned as per the recommendation does provide an additional margin of safety, which is helpful particularly in flight training operations.

Recommendation

That Council resolve pursuant to 11(3) of the Local Government Act that the attachment # be treated as confidential because it relates 10A (2) (C) section and public interest test. Information that would, if disclosed, confer a commercial advantage on a person with whom the Council is conducting (or proposes to conduct) business.

Consideration of the matter in open Council would, on balance be contrary to the public interest as it would affect Council's ability to manage legal matters effectively and in the best interests of the Central Coast community.

Attachments

1	2019 Obstacle Limitation Surface (OLS) Survey		D14247534
2	Biodiversity Assessment Report - North		D14207509
3	Biodiversity Assessment Report - South		D14207510
4	Confidential: Tree pruning works - Quote 1 -	Provided under separate cover	D14248005
5	Confidential: Tree pruning works - Quote 2 -	Provided under separate cover	D14287898
6	Confidential: Tree pruning works - Quote 3 -	Provided under separate cover	D14287903
7	Privileged and Confidential Legal Advice - Warnervale ALA OLS Tree Maintenance -	Provided under separate cover	D14293606
8	Environmental Assessment Part 5 - Level 2 - Warnervale ALA North Vegetation Works - Sep 2020		D14218872

AIRPORT SURVEYS

Airport Surveys Pty Ltd
PO Box 306
Chirnside Park VIC 3116
Mobile: 0407 360 008
Email: bryan@airportsurveys.com.au

WARNERVALE AERODROME

OBSTACLE LIMITATION

SURVEY

6th NOVEMBER 2019

AIRPORT SURVEYS

Airport Surveys Pty Ltd
PO Box 306
Chirnside Park VIC 3116
Mobile: 0407 360 008
Email: bryan@airportsurveys.com.au

30th May 2020

Ms. Janine McKenzie
Unit Manager
Business Enterprise
Central Coast Council
P.O. Box 21 Gosford,
NSW 2250

WARNERVALE AERODROME
OBSTACLE LIMITATION SURVEY

Dear Janine,

A Survey of the Approach, Take Off and Transitional Surfaces at the Warnervale Aerodrome was carried out on the 6th of November 2019.

The results of this survey are attached, which includes a list of the Obstacles surveyed on each Approach, and their relationship to the respective Approach and Take Off splays. A photograph showing the obstacles surveyed is also attached.

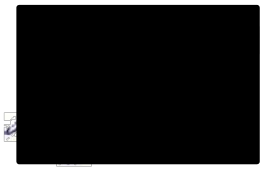
This survey has been conducted with the purpose of identifying the critical obstacles at each runway end to determine the extent of obstructions to the Obstacle Limitation Surfaces.
The survey results have been assessed against the standards for an Aerodrome Landing Area (ALA), and both the 5% and 3.33% grades were assessed, based on both the current runway ends and the Displaced Thresholds at both ends.

You should be aware that the highest trees only have been surveyed. Other trees in the vicinity of surveyed obstacles noted as obstructions may also require attention.

As requested, an Autocad file showing the location of the obstacles, and also a Google Earth file are included.

Please contact me on the above number if any further information is required, or if you require any clarification of these results.

Yours Faithfully,



Bryan Fitzgerald.

WARNERVALE AERODROME

RUNWAY : 02/20

(ALA CODE RUNWAY)

Surveyor : Bryan Fitzgerald

Date of Survey : 06/11/2019

AIRPORT SURVEYS

Calculations based on: the Runway end being at the Displaced Threshold (210 metres from the Runway end) at the 02 Take Off end
the Runway end being at the Runway End at the 20 Take Off end

Runway Length : 983 metres
Runway Strip Width : 90 metres

RWY 02		RWY 20	
TODA :	983 metres	TODA :	983 metres
Take Off SFC Origin RL :	10.68 AHD	Take Off SFC Origin RL :	5.26 AHD
20 Threshold RL :	10.68 AHD	02 Threshold RL :	5.26 AHD
20 Threshold Displaced :	0m	02 Threshold Displaced :	0m

APPROACH / TAKE OFF SPECIFICATIONS USED FOR SURVEY

TAKE OFF SURFACES:	
60m	INNER EDGE
5%	DIVERGENCE
900m	LENGTH
5%	GRADIENT

APPROACH SURFACES:	RWY 02	RWY 20
	(Non-Inst Apch)	*(Non- Inst Apch)*
INNER EDGE	90m	90m
DIVERGENCE	5%	5%
LENGTH	900m	900m
GRADIENT	3.30%	3.30%
TRANSITIONAL SLOPE	1 in 5	1 in 5

TAKE-OFF RUNWAY No.	Surveyed Point No.	DESCRIPTION	DIST. FROM END OF CLEARWAY	HEIGHT OF OBSTACLE ABOVE CWY END	TAKE-OFF GRADIENT TO OBST.	OBST. R.L.	DIST. FROM START OF TAKE OFF	OFFSET FROM RWY C/L	RELATIONSHIP TO OBSTACLE LIMITATION SURFACES 5% Take Off grade (Positive figures - Above / Negative figures - Below.)	3.30% Apch grade	Transitional Surfaces
02	1	EUC. TREE	436.0	29.19	6.70%	216.10	1419.0	49.5 L	***7.4***	***14.8***	***Obstructs the Apch SFC***
02	2	EUC. TREE	415.6	24.67	5.94%	213.60	1398.6	72.9 L	OUTSIDE		***Obstructs Trans SFC by 9.5m***
02	3	EUC. TREE	427.0	27.14	6.36%	214.70	1410.0	10.4 R	***5.8***	***13.0***	***Obstructs the Apch SFC***
02	4	EUC. TREE	435.7	26.62	6.11%	214.30	1418.7	34.1 R	***4.8***	***12.2***	***Obstructs the Apch SFC***
02	5	EUC. TREE	407.4	25.71	6.32%	214.70	1390.4	35.1 R	***5.3***	***12.3***	***Obstructs the Apch SFC***
02	6	EUC. TREE	387.3	27.39	7.08%	213.40	1370.3	56.7 R	OUTSIDE	***14.6***	***Obstructs the Apch SFC***
02	7	EUC. TREE	376.1	25.21	6.71%	213.40	1359.1	72.4 R	OUTSIDE		***Obstructs Trans SFC by 11.1m***
02	8	EUC. TREE	376.5	27.21	7.23%	212.10	1359.5	95.2 R	OUTSIDE		***Obstructs Trans SFC by 8.5m***
02	9	EUC. TREE	465.5	32.55	7.00%	214.70	1448.5	134.6 L	OUTSIDE		***Obstructs Trans SFC by 3.9m***
02	10	EUC. TREE	469.6	32.37	6.90%	213.50	1452.6	113.2 L	OUTSIDE		***Obstructs Trans SFC by 7.9m***
02	11	POWER POLE	361.3	12.46	3.45%	212.60	1344.3	91.5 R	OUTSIDE		Below Trans SFC by 5.1m
02	12	POWER POLE	379.7	11.58	3.05%	212.50	1362.7	50.5 R	OUTSIDE	-1.0	
02	13	POWER POLE	399.3	11.33	2.84%	225.66	1382.3	7.8 R	-8.6	-1.8	
02	14	FENCE	327.4	2.67	0.82%	229.40	1310.4	5.0 L	-13.7	-8.1	
02	15	FENCE	316.5	2.61	0.83%	211.94	1299.5	53.1 R	OUTSIDE	-7.8	
02	16	FENCE	314.2	2.70	0.86%	211.13	1297.2	65.4 R	OUTSIDE		Below Trans SFC by 8.6m
02	17	EUC. TREE	317.7	19.90	6.27%	211.10	1300.7	92.7 L	OUTSIDE		***Obstructs Trans SFC by 3.1m***
02	18	EUC. TREE	282.3	21.63	7.67%	210.91	1265.3	106.5 L	OUTSIDE		***Obstructs Trans SFC by 2.8m***
02	19	EUC. TREE	238.8	21.96	9.20%	211.03	1221.8	144.6 L	OUTSIDE		Below Trans SFC by 3.5m
02	20	EUC. TREE	181.2	23.73	N/A	211.03	1164.2	122.9 L	OUTSIDE		***Obstructs Trans SFC by 4.0m***
02	21	GL at proposed Fence	352.9	1.74	0.50%	211.03	1335.9	20.8 R	-15.9	-9.9	
02	22	GL at proposed Fence	330.7	1.27	0.39%	211.03	1313.7	24.9 R	-15.3	-9.6	
02	23	GL at proposed Fence	349.1	1.81	0.52%	211.03	1332.1	37.2 R	-15.6	-9.7	
02	24	GL at proposed Fence	339.8	1.81	0.54%	211.03	1322.8	75.5 R	OUTSIDE		Below Trans SFC by 12.1m
02	25	GL at proposed Fence	334.0	1.71	0.52%	211.03	1317.0	102.6 R	OUTSIDE		Below Trans SFC by 17.5m
02	26	GL at proposed Fence	329.6	1.72	0.53%	211.03	1312.6	122.9 R	OUTSIDE		Below Trans SFC by 21.4m
02	27	BUILDING	594.7	12.49	2.11%	211.03	1577.7	56.4 R	-17.2	-7.1	
02	28	BUILDING	618.6	15.97	2.59%	211.03	1601.6	44.0 R	-15.0	-4.4	
02	29	AERIAL ON SHED	664.4	28.61	4.31%	211.03	1647.4	133.9 R	OUTSIDE		Below Trans SFC by 4.5m

WARNERVALE AERODROME

RUNWAY : 02/20

(ALA CODE RUNWAY)

Surveyor : Bryan Fitzgerald

Date of Survey : 06/11/2019

AIRPORT SURVEYS

TAKE-OFF RUNWAY No.	Surveyed Point No.	DESCRIPTION	DIST. FROM END OF CLEARWAY	HEIGHT OF OBSTACLE ABOVE CWY END	TAKE-OFF GRADIENT TO OBST.	OBST. R.L.	DIST. FROM START OF TAKE OFF	OFFSET FROM RWY C/L	RELATIONSHIP TO OBSTACLE LIMITATION SURFACES 5% Take Off grade (Positive figures - Above)	3.30% Apch grade / Negative figures - Below.)	Transitional Surfaces
20	1	EUC. TREE	172.9	13.00	7.52%	199.50	1155.9	42.0 R	OUTSIDE	***7.3***	***Obstructs the Apch SFC***
20	2	EUC. TREE	176.4	12.76	7.24%	198.60	1159.4	20.6 R	***3.9***	***6.9***	***Obstructs the Apch SFC***
20	3	EUC. TREE	181.7	15.51	8.54%	198.60	1164.7	6.2 R	***6.4***	***9.5***	***Obstructs the Apch SFC***
20	4	EUC. TREE	193.1	17.25	8.94%	198.10	1176.1	16.0 L	***7.6***	***10.9***	***Obstructs the Apch SFC***
20	5	SHEOAK	192.3	17.35	9.03%	199.50	1175.3	30.0 L	***7.7***	***11.0***	***Obstructs the Apch SFC***
20	6	EUC. TREE	156.4	14.59	9.33%	196.70	1139.4	30.0 L	***6.8***	***9.4***	***Obstructs the Apch SFC***
20	7	EUC. TREE	146.5	21.00	N/A	196.40	1129.5	70.0 L	OUTSIDE		***Obstructs Trans SFC by 12.6m***
20	8	EUC. TREE	126.2	24.37	N/A	195.80	1109.2	107.6 L	OUTSIDE		***Obstructs Trans SFC by 8.9m***
20	9	EUC. TREE	102.0	18.79	N/A	195.50	1085.0	83.6 L	OUTSIDE		***Obstructs Trans SFC by 8.7m***
20	10	EUC. TREE	46.4	15.77	N/A	196.20	1029.4	87.3 L	OUTSIDE		***Obstructs Trans SFC by 6.2m***
20	11	EUC. TREE	-25.8	19.94	N/A	209.70	957.2	110.0 L	OUTSIDE		***Obstructs Trans SFC by 6.9m***
20	12	EUC. TREE	-53.0	17.74	N/A	196.50	930.0	114.3 L	OUTSIDE		***Obstructs Trans SFC by 3.9m***
20	13	EUC. TREE	-93.2	16.83	N/A	198.00	889.8	129.4 L	OUTSIDE		Below Trans SFC by 0.1m
20	14	EUC. TREE	212.4	12.43	5.86%	197.50	1195.4	70.5 R	OUTSIDE		***Obstructs Trans SFC by 2.4m***
20	15	EUC. TREE	190.2	9.81	5.16%	200.80	1173.2	92.7 R	OUTSIDE		Below Trans SFC by 4.1m

WARNERVALE AERODROME

RUNWAY : 02/20

(ALA CODE RUNWAY)

Surveyor : Bryan Fitzgerald

Date of Survey : 06/11/2019

AIRPORT SURVEYS

TRANSITIONAL SURFACE

NOTE: Calculations are based on a 1:5 Transitional Surface from the edge of the 90 metres wide Runway Strip.

RUNWAY No.	Surveyed Point No.	DESCRIPTION	PERP. DIST FROM 13 RWS END	OFFSET FROM C/L	HEIGHT ABOVE C/L	HEIGHT OF T/S	HEIGHT DIFF. + Above - Below	NOTES
02 - 20	1	Euc. Tree - West Side	86	138.4	14.81	18.68	-3.87	
02 - 20	2	Euc. Tree - West Side	249	158.0	22.19	22.60	-0.41	
02 - 20	3	Euc. Tree - West Side	494	151.6	17.00	21.32	-4.32	
02 - 20	4	Windsock - East Side	620	96.7	10.10	10.34	-0.24	
02 - 20	5	Hangar - East Side	684	136.0	6.55	18.20	-11.65	
02 - 20	6	Shed - East Side	669	115.2	5.29	14.04	-8.75	
02 - 20	7	Aerial - East Side	742	81.4	6.30	7.28	-0.98	
02 - 20	8	Terminal - East Side	742	81.0	4.71	7.20	-2.49	
02 - 20	9	Palm Tree - East Side	751	81.8	8.07	7.36	***0.71***	***Obstructs the Transition Surface.***

WARNERVALE AERODROME

RUNWAY : 02/20
(ALA CODE RUNWAY)

Surveyor : Bryan Fitzgerald
Date of Survey : 06/11/2019

AIRPORT SURVEYS

Calculations based on: **the Runway end being at the Displaced Threshold (210 metres from the Runway end) at the 02 Take Off end**
the Runway end being at the Displaced Threshold (86 metres from the Runway end) at the 20 Take Off end

Runway Length : 897 metres
Runway Strip Width : 90 metres

RWY 02		**RWY 20**	
TODA :	897 metres	TODA :	897 metres
Take Off SFC Origin RL :	10.68 AHD	Take Off SFC Origin RL :	5.93 AHD
20 Threshold RL :	10.68 AHD	02 Threshold RL :	5.93 AHD
20 Threshold Displaced :	0m	02 Threshold Displaced :	0m

APPROACH / TAKE OFF SPECIFICATIONS USED FOR SURVEY

TAKE OFF SURFACES:	
60m	INNER EDGE
5%	DIVERGENCE
900m	LENGTH
5%	GRADIENT

APPROACH SURFACES:	**RWY 02**	**RWY 20**
	(Non-Inst Apch)	*(Non- Inst Apch)*
INNER EDGE	90m	90m
DIVERGENCE	5%	5%
LENGTH	900m	900m
GRADIENT	3.30%	3.30%
TRANSITIONAL SLOPE	1 in 5	1 in 5

TAKE-OFF RUNWAY No.	Surveyed Point No.	DESCRIPTION	DIST. FROM END OF CLEARWAY	HEIGHT OF OBSTACLE ABOVE CWY END	TAKE-OFF GRADIENT TO OBST.	OBST. R.L.	DIST. FROM START OF TAKE OFF	OFFSET FROM RWY C/L	RELATIONSHIP TO OBSTACLE LIMITATION SURFACES 5% Take Off grade (Positive figures - Above / Negative figures - Below.)	3.30% Apch grade	Transitional Surfaces
02	1	EUC. TREE	436.0	29.19	6.70%	216.10	1333.0	49.5 L	***7.4***	***14.8***	***Obstructs the Apch SFC***
02	2	EUC. TREE	415.6	24.67	5.94%	213.60	1312.6	72.9 L	OUTSIDE		***Obstructs Trans SFC by 9.5m***
02	3	EUC. TREE	427.0	27.14	6.36%	214.70	1324.0	10.4 R	***5.8***	***13.0***	***Obstructs the Apch SFC***
02	4	EUC. TREE	435.7	26.62	6.11%	214.30	1332.7	34.1 R	***4.8***	***12.2***	***Obstructs the Apch SFC***
02	5	EUC. TREE	407.4	25.71	6.32%	214.70	1304.4	35.1 R	***5.3***	***12.3***	***Obstructs the Apch SFC***
02	6	EUC. TREE	387.3	27.39	7.08%	213.40	1284.3	56.7 R	OUTSIDE	***14.6***	***Obstructs the Apch SFC***
02	7	EUC. TREE	376.1	25.21	6.71%	213.40	1273.1	72.4 R	OUTSIDE		***Obstructs Trans SFC by 11.1m***
02	8	EUC. TREE	376.5	27.21	7.23%	212.10	1273.5	95.2 R	OUTSIDE		***Obstructs Trans SFC by 8.5m***
02	9	EUC. TREE	465.5	32.55	7.00%	214.70	1362.5	134.6 L	OUTSIDE		***Obstructs Trans SFC by 3.9m***
02	10	EUC. TREE	469.6	32.37	6.90%	213.50	1366.6	113.2 L	OUTSIDE		***Obstructs Trans SFC by 7.9m***
02	11	POWER POLE	361.3	12.46	3.45%	212.60	1258.3	91.5 R	OUTSIDE		Below Trans SFC by 5.1m
02	12	POWER POLE	379.7	11.58	3.05%	212.50	1276.7	50.5 R	OUTSIDE	-1.0	
02	13	POWER POLE	399.3	11.33	2.84%	225.66	1296.3	7.8 R	-8.6	-1.8	
02	14	FENCE	327.4	2.67	0.82%	229.40	1224.4	5.0 L	-13.7	-8.1	
02	15	FENCE	316.5	2.61	0.83%	211.94	1213.5	53.1 R	OUTSIDE	-7.8	
02	16	FENCE	314.2	2.70	0.86%	211.13	1211.2	65.4 R	OUTSIDE		Below Trans SFC by 8.6m
02	17	EUC. TREE	317.7	19.90	6.27%	211.10	1214.7	92.7 L	OUTSIDE		***Obstructs Trans SFC by 3.1m***
02	18	EUC. TREE	282.3	21.63	7.67%	210.91	1179.3	106.5 L	OUTSIDE		***Obstructs Trans SFC by 2.8m***
02	19	EUC. TREE	238.8	21.96	9.20%	211.03	1135.8	144.6 L	OUTSIDE		Below Trans SFC by 3.5m
02	20	EUC. TREE	181.2	23.73	N/A	211.03	1078.2	122.9 L	OUTSIDE		***Obstructs Trans SFC by 4.0m***
02	21	GL at proposed Fence	352.9	1.74	0.50%	211.03	1249.9	20.8 R	-15.9	-9.9	
02	22	GL at proposed Fence	330.7	1.27	0.39%	211.03	1227.7	24.9 R	-15.3	-9.6	
02	23	GL at proposed Fence	349.1	1.81	0.52%	211.03	1246.1	37.2 R	-15.6	-9.7	
02	24	GL at proposed Fence	339.8	1.81	0.54%	211.03	1236.8	75.5 R	OUTSIDE		Below Trans SFC by 12.1m
02	25	GL at proposed Fence	334.0	1.71	0.52%	211.03	1231.0	102.6 R	OUTSIDE		Below Trans SFC by 17.5m
02	26	GL at proposed Fence	329.6	1.72	0.53%	211.03	1226.6	122.9 R	OUTSIDE		Below Trans SFC by 21.4m
02	27	BUILDING	594.7	12.49	2.11%	211.03	1491.7	56.4 R	-17.2	-7.1	
02	28	BUILDING	618.6	15.97	2.59%	211.03	1515.6	44.0 R	-15.0	-4.4	
02	29	AERIAL ON SHED	664.4	28.61	4.31%	211.03	1561.4	133.9 R	OUTSIDE		Below Trans SFC by 4.5m

WARNERVALE AERODROME

RUNWAY : 02/20

(ALA CODE RUNWAY)

Surveyor : Bryan Fitzgerald

Date of Survey : 06/11/2019

AIRPORT SURVEYS

TAKE-OFF RUNWAY No.	Surveyed Point No.	DESCRIPTION	DIST. FROM END OF CLEARWAY	HEIGHT OF OBSTACLE ABOVE CWY END	TAKE-OFF GRADIENT TO OBST.	OBST. R.L.	DIST. FROM START OF TAKE OFF	OFFSET FROM RWY C/L	RELATIONSHIP TO OBSTACLE LIMITATION SURFACES 5% Take Off grade (Positive figures - Above)	3.30% Apch grade / Negative figures - Below.)	Transitional Surfaces
20	1	EUC. TREE	258.9	12.33	4.77%	199.50	1155.9	42.0 R	-0.6	***3.8***	***Obstructs the Apch SFC***
20	2	EUC. TREE	262.4	12.09	4.61%	198.60	1159.4	20.6 R	-1.0	***3.4***	***Obstructs the Apch SFC***
20	3	EUC. TREE	267.7	14.84	5.55%	198.60	1164.7	6.2 R	***1.5***	***6.0***	***Obstructs the Apch SFC***
20	4	EUC. TREE	279.1	16.58	5.95%	198.10	1176.1	16.0 L	***2.6***	***7.4***	***Obstructs the Apch SFC***
20	5	SHEOAK	278.3	16.68	6.00%	199.50	1175.3	30.0 L	***2.8***	***7.5***	***Obstructs the Apch SFC***
20	6	EUC. TREE	242.4	13.92	5.75%	196.70	1139.4	30.0 L	***1.8***	***5.9***	***Obstructs the Apch SFC***
20	7	EUC. TREE	232.5	20.33	8.75%	196.40	1129.5	70.0 L	OUTSIDE		***Obstructs Trans SFC by 10.0m***
20	8	EUC. TREE	212.2	23.70	N/A	195.80	1109.2	107.6 L	OUTSIDE		***Obstructs Trans SFC by 6.3m***
20	9	EUC. TREE	188.0	18.12	9.64%	195.50	1085.0	83.6 L	OUTSIDE		***Obstructs Trans SFC by 6.1m***
20	10	EUC. TREE	132.4	15.10	N/A	196.20	1029.4	87.3 L	OUTSIDE		***Obstructs Trans SFC by 3.6m***
20	11	EUC. TREE	60.2	19.27	N/A	209.70	957.2	110.0 L	OUTSIDE		***Obstructs Trans SFC by 4.9m***
20	12	EUC. TREE	33.0	17.07	N/A	196.50	930.0	114.3 L	OUTSIDE		***Obstructs Trans SFC by 2.5m***
20	13	EUC. TREE	-7.2	16.16	N/A	198.00	889.8	129.4 L	OUTSIDE		Below Trans SFC by 0.7m
20	14	EUC. TREE	298.4	11.76	3.95%	197.50	1195.4	70.5 R	OUTSIDE		Below Trans SFC by 0.2m
20	15	EUC. TREE	276.2	9.14	3.32%	200.80	1173.2	92.7 R	OUTSIDE		Below Trans SFC by 6.7m

WARNERVALE AERODROME

RUNWAY : 02/20

(ALA CODE RUNWAY)

Surveyor : Bryan Fitzgerald

Date of Survey : 06/11/2019

AIRPORT SURVEYS

TRANSITIONAL SURFACE

NOTE: Calculations are based on a 1:5 Transitional Surface from the edge of the 90 metres wide Runway Strip.

RUNWAY No.	Surveyed Point No.	DESCRIPTION	PERP. DIST FROM 13 RWS END	OFFSET FROM C/L	HEIGHT ABOVE C/L	HEIGHT OF T/S	HEIGHT DIFF. + Above - Below	NOTES
02 - 20	1	Euc. Tree - West Side	86	138.4	14.81	18.68	-3.87	
02 - 20	2	Euc. Tree - West Side	249	158.0	22.19	22.60	-0.41	
02 - 20	3	Euc. Tree - West Side	494	151.6	17.00	21.32	-4.32	
02 - 20	4	Windsock - East Side	620	96.7	10.10	10.34	-0.24	
02 - 20	5	Hangar - East Side	684	136.0	6.55	18.20	-11.65	
02 - 20	6	Shed - East Side	669	115.2	5.29	14.04	-8.75	
02 - 20	7	Aerial - East Side	742	81.4	6.30	7.28	-0.98	
02 - 20	8	Terminal - East Side	742	81.0	4.71	7.20	-2.49	
02 - 20	9	Palm Tree - East Side	751	81.8	8.07	7.36	***0.71***	***Obstructs the Transition Surface.***

WARNERVALE AERODROME

POINT CO-ORDINATES

AIRPORT SURVEYS

Surveyor : Bryan Fitzgerald
Date of Survey : 06/11/2019

HORIZONTAL DATUM: MGA94 Zone 56
VERTICAL DATUM: AUSTRALIAN HEIGHT DATUM

02 Take-Off Splay Origin Coordinates:	E 353925.95	N 6321265.26	10.68 AHD

TAKE-OFF RUNWAY No.	Surveyed Point No.	DESCRIPTION	DIST. FROM END OF CLEARWAY	OFFSET FROM RWY C/L	OBST. R.L.	E	N
02	1	EUC. TREE	436.0	49.5 L	39.87	354138.1	6321649.4
02	2	EUC. TREE	415.6	72.9 L	35.35	354107.2	6321646.3
02	3	EUC. TREE	427.0	10.4 R	37.82	354181.7	6321607.3
02	4	EUC. TREE	435.7	34.1 R	37.30	354206.1	6321600.7
02	5	EUC. TREE	407.4	35.1 R	36.39	354190.5	6321577.1
02	6	EUC. TREE	387.3	56.7 R	38.07	354196.5	6321548.2
02	7	EUC. TREE	376.1	72.4 R	35.89	354202.8	6321529.9
02	8	EUC. TREE	376.5	95.2 R	37.89	354221.6	6321517.1
02	9	EUC. TREE	465.5	134.6 L	43.23	354085.8	6321722.7
02	10	EUC. TREE	469.6	113.2 L	43.05	354105.6	6321713.7
02	11	POWER POLE	361.3	91.5 R	23.14	354209.8	6321506.8
02	12	POWER POLE	379.7	50.5 R	22.26	354187.0	6321545.6
02	13	POWER POLE	399.3	7.8 R	22.01	354163.5	6321586.3
02	14	FENCE	327.4	5.0 L	13.35	354111.5	6321535.1
02	15	FENCE	316.5	53.1 R	13.29	354152.5	6321492.5
02	16	FENCE	314.2	65.4 R	13.38	354161.2	6321483.5
02	17	EUC. TREE	317.7	92.7 L	30.58	354034.4	6321577.9
02	18	EUC. TREE	282.3	106.5 L	32.31	354002.6	6321557.1
02	19	EUC. TREE	238.8	144.6 L	32.64	353946.3	6321543.7
02	20	EUC. TREE	181.2	122.9 L	34.41	353930.7	6321484.2
02	21	GL at proposed Fence	352.93	20.8 R	12.42	354147.3	6321541.0
02	22	GL at proposed Fence	330.72	24.9 R	11.95	354137.7	6321520.5
02	23	GL at proposed Fence	349.1	37.2 R	12.49	354158.4	6321528.3
02	24	GL at proposed Fence	339.78	75.5 R	12.49	354184.3	6321498.5
02	25	GL at proposed Fence	334.02	102.6 R	12.39	354203.0	6321478.2
02	26	GL at proposed Fence	329.59	122.9 R	12.40	354217.0	6321462.8
02	27	BUILDING	594.67	56.4 R	23.17	354316.3	6321717.4
02	28	BUILDING	618.58	44.0 R	26.65	354320.0	6321744.1
02	29	AERIAL ON SHED	664.44	133.9 R	39.29	354419.9	6321729.4

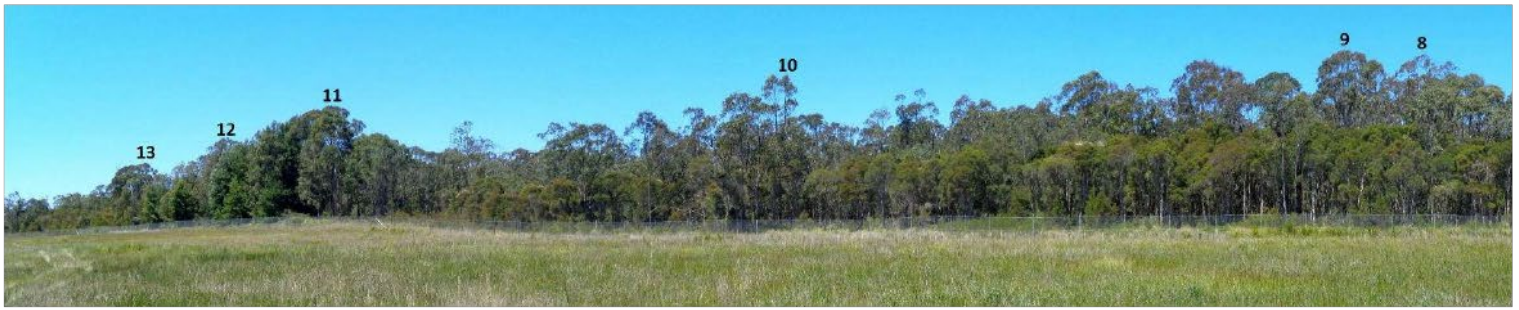
20 Take-Off Splay Origin Coordinates:	E 353356.47	N 6320463.52	5.26 AHD

TAKE-OFF RUNWAY No.	Surveyed Point No.	DESCRIPTION	DIST. FROM END OF CLEARWAY	OFFSET FROM RWY C/L	OBST. R.L.	E	N
20	1	EUC. TREE	172.9	42.0 R	18.26	353222.1	6320346.9
20	2	EUC. TREE	176.4	20.6 R	18.02	353237.5	6320331.6
20	3	EUC. TREE	181.7	6.2 R	20.77	353246.2	6320319.0
20	4	EUC. TREE	193.1	16.0 L	22.51	353257.7	6320296.8
20	5	SHEOAK	192.3	30.0 L	22.61	353269.6	6320289.4
20	6	EUC. TREE	156.4	30.0 L	19.85	353290.4	6320318.6
20	7	EUC. TREE	146.5	70.0 L	26.26	353328.7	6320303.5
20	8	EUC. TREE	126.2	107.6 L	29.63	353371.1	6320298.3
20	9	EUC. TREE	102.0	83.6 L	24.05	353365.6	6320332.0
20	10	EUC. TREE	46.4	87.3 L	21.03	353400.8	6320375.1
20	11	EUC. TREE	-25.8	110.0 L	25.20	353461.1	6320420.9
20	12	EUC. TREE	-53.0	114.3 L	23.00	353480.3	6320440.5
20	13	EUC. TREE	-93.2	129.4 L	22.09	353515.9	6320464.6
20	14	EUC. TREE	212.4	70.5 R	17.69	353176.0	6320331.2
20	15	EUC. TREE	190.2	92.7 R	15.07	353170.8	6320362.1

WARNERVALE AERODROME – NOVEMBER 2019

02 TAKE OFF END

WARNERVALE AERODROME – NOVEMBER 2019



20 TAKE OFF END

WARNERVALE AERODROME – NOVEMBER 2019

02/20 TRANSITIONAL SURFACE

BIODIVERSITY DEVELOPMENT ASSESSMENT REPORT

PROPOSED VEGETATION MANAGEMENT WORKS

WARNERVALE AIRCRAFT LANDING AREA

NORTHERN OBSTACLE LIMITATION SURFACE

SEPTEMBER 2020
REF: 9101

BIODIVERSITY DEVELOPMENT ASSESSMENT REPORT

PROPOSED VEGETATION MANAGEMENT WORKS

WARNERVALE AIRCRAFT LANDING AREA

NORTHERN OBSTACLE LIMITATION SURFACE

SEPTEMBER 2020

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PREFACE

This Biodiversity Development Assessment Report has been prepared by *Conacher Consulting* for the proposed vegetation management works associated with the management of the northern obstacle limitation surface for the Warnervale Aircraft Landing Area. This Biodiversity Development Assessment Report has been prepared in accordance with the requirements of the *Biodiversity Conservation Act* (2016).

REPORT CERTIFICATION

This Biodiversity Development Assessment Report has been prepared by *Conacher Consulting Pty Ltd* on the basis of the requirements of (and information provided under) the Biodiversity Assessment Method on 3 September 2020.

PROJECT TEAM

Personnel	Qualifications	Title	Tasks Completed
PHILLIP ANTHONY [redacted]	CONACHER B.Sc.(Hons), Dip.Urb Reg Planning, M.Nat.Res	Project Director	Project Director Document review Targeted threatened species survey
JACOB MANNERS [redacted]	B.Sc, MWldMgt. Biodiversity Assessment Method Assessor Accreditation No. BAAS17099	Senior Ecologist Project Manager	Accredited BAM Assessor Report preparation Flora survey Targeted threatened species surveys
BRYAN FURCHURT	BBioCons Biodiversity Assessment Method Assessor Accreditation No. BAAS18095	Botanist	Botanical plot surveys
ASHLEY MULLAHEY		GIS & Field Survey Technician	Map production Field survey assistant
DEAN CONACHER		GIS & Field Survey Technician	Field survey assistant

Project Team Member CVs are provided in Appendix 6

DOCUMENT DETAILS

Version	Issue Date	Details
Draft V1	17 June 2020	Draft Report for Client Review / Additional Information Required
Final Report V2	3 September 2020	Final Report

GLOSSARY OF TERMS AND ACRONYMS

Acronym	Term	Description
BAM	Biodiversity Assessment Method	The method established under Part 6 of the BC Act (2016) for the purpose of assessing certain impacts on threatened species and threatened ecological communities (TECs), and their habitats, and the impact on biodiversity values, where required under the BC Act (2016), Local Land Services Act 2013 (LLS Act) or the State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017
BAM Calculator	Biodiversity Assessment Method Calculator	An online application of the Biodiversity Assessment Method (BAM). The calculator uses the rules and calculations outlined in the BAM, and allows the user to apply the BAM at a site and observe the results of the assessment.
BC Act	Biodiversity Conservation Act	The Act administered by the NSW Government which contains the NSW biodiversity protection and impact assessment provisions
BCF	Biodiversity Conservation Fund	The fund which receives money paid by proponents to meet offset obligations under the NSW Biodiversity Offsets Scheme
BCT	Biodiversity Conservation Trust	Established under the BC Act to oversee private land conservation programs and establish Biodiversity Stewardship Agreements as part of the Biodiversity Offsets Scheme. The credits generated by these agreements can then be sold to offset development impacts.
BDAR	Biodiversity Development Assessment Report	For the purposes of the biodiversity offsets scheme, a biodiversity development assessment report is a report prepared by an accredited person in relation to proposed development or activity that would be authorised by a planning approval, or proposed clearing that would be authorised by a vegetation clearing approval, that: a) assesses in accordance with the biodiversity assessment method the biodiversity values of the land subject to the proposed development, activity or clearing, and (b) assesses in accordance with that method the impact of proposed development, activity or clearing on the biodiversity values of that land, and (c) sets out the measures that the proponent of the proposed development, activity or clearing proposes to take to avoid or minimise the impact of the proposed development, activity or clearing, and (d) specifies in accordance with that method the number and class of biodiversity credits that are required to be retired to offset the residual impacts on biodiversity values of the actions to which the biodiversity offsets scheme applies.
-	Biodiversity Credit	A biodiversity credit created by (and in accordance with) a biodiversity stewardship agreement.

Acronym	Term	Description
BOS	Biodiversity Offsets Scheme	A transparent, consistent and scientifically based approach to biodiversity assessment and offsetting for all types of development that are likely to have a significant impact on biodiversity and a scheme for establishing biodiversity stewardship agreements, which are voluntary in-perpetuity agreements entered into by landholders, to secure offset sites
BSSAR	Biodiversity Stewardship Site Assessment Report	For the purposes of the biodiversity offsets scheme, a biodiversity stewardship site assessment report is a report prepared by an accredited person in relation to a proposed biodiversity stewardship agreement under Part 5 that: (a) assesses the biodiversity values of the proposed biodiversity stewardship site in accordance with the biodiversity assessment method, and (b) sets out the management actions proposed to be carried out on the proposed site, and (c) specifies in accordance with the biodiversity assessment method the number and class of biodiversity credits that may be created in respect of those management actions.
BV MAP	Biodiversity Values Map	Development within an area identified on the map requires assessment using the BAM.
DoEE	Department of the Environment and Energy	Commonwealth Department which administers the EPBC Act
EPBC Act	Environment Protection and Biodiversity Conservation Act	Commonwealth legislation which contains biodiversity protection and impact assessment provisions
IBRA	Interim Biogeographic Regionalisation For Australia	A classification system for Australia's landscape which separates areas which are geographically distinct into Regions (based on common climate, geology landform and biodiversity characteristics) and Subregions (based on localised geomorphology patterns).
NSW DPIE	NSW Department of Planning, Infrastructure and Environment	NSW Department which administers the BC Act
PCT	Plant Community Type	The vegetation classification unit used for vegetation communities in the BAM from the Bionet Vegetation Classification (NSW DPIE 2020)
	Prescribed Impact	Impacts identified as prescribed under the BC Regulation which are required to be assessed but not for the purposes of calculating credits

Acronym	Term	Description
SAII	Serious and irreversible impact	An impact is to be regarded as serious and irreversible if it is likely to contribute significantly to the risk of a threatened species or ecological community becoming extinct for the reasons identified in the BC Regulation. For Part 4 development the consent authority must refuse to grant consent if it is of the opinion that the proposed development is likely to have serious and irreversible impacts on biodiversity values.
TEC	Threatened Ecological Community	Means a critically endangered ecological community (CEEC), an endangered ecological community (EEC) or a vulnerable ecological community (VEC) listed in Schedule 2 of the BC Act.
TS	Threatened Species	Means a critically endangered species, an endangered species or a vulnerable species listed in Schedule 1. For the purposes of the BAM these are further separated into ecosystem credit and species credit type threatened species

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SECTION 1

INTRODUCTION AND BACKGROUND

1.1 INTRODUCTION

Conacher Consulting has been engaged to prepare a Biodiversity Development Assessment Report (BDAR) for the vegetation management works associated with the northern obstacle limitation surface (OLS) for the Warnervale Aircraft Landing Area (ALA).

The proposed works are to be assessed under Part 5 of the *EP&A Act* (1979) and Central Coast Council has chosen to opt-in to the Biodiversity Offsets Scheme and assess the proposal under the Biodiversity Assessment Method.

A separate BDAR has also been prepared by Conacher Consulting (2020), for the vegetation management works required for the obstacle limitation surface at the southern end of the runway.

This Report has been prepared to provide an assessment of the biodiversity values of the subject land and an assessment of the impact of the proposed development in accordance with the Biodiversity Assessment Methodology (BAM).

This Report:

i. Sets out the measures that the proponent of the proposed development proposes to take to avoid and minimise the impact of the proposal; and
ii. Specifies the number and class of biodiversity credits that are required to be retired to offset the residual impacts on biodiversity values under the NSW Biodiversity Offsets Scheme.

1.2 SITE CHARACTERISTICS

The planning and cadastral details of the subject site are provided in Table 1.1.

TABLE 1.1
SITE DETAILS

Location	Lots 69 & 74 DP 755245 Lot 1 DP 796760 Lot 96 DP 867428
Local Government Area	Central Coast
Existing Land Use	Vacant land, industrial and rural residential
Zoning	IN1 Industrial & E2 Environmental Conservation
Included on Biodiversity Values Map	Yes
Assessment Method Used	Full BAM Method

1.3 PROPOSED DEVELOPMENT

The proposed works assessed in this report are the tree management works for the maintenance of the obstacle limitation surface for the northern end of the runway for the Warnervale Aircraft Landing Area.

A plan of the proposed works impact footprint assessed in this Report is provided as Figures 1.1a and 1.1b. The proposed works are to be further informed by a Vegetation Management Plan which is to be prepared to document the methods for undertaking the proposed works and suitable impact avoidance and minimisation measures.

1.4 BIODIVERSITY VALUES MAP

Part of the proposed development footprint is included on the Biodiversity Values Map, as shown in Figure 1.2.

1.5 LITERATURE REVIEW & INFORMATION SOURCES

Details on the previous ecological surveys and assessments reviewed and utilised for this report are outlined as follows. Additional documents referred to in the text are listed in the References Section of this Report.

i. **Ecological Investigations (Version 2) Wyong Employment Zone – Warnervale Business Park. Warnervale Airport Lands, Precincts 11 & 13 and Precinct 14 (Bell and Murray 2007).**

This report contains the results of threatened species surveys and literature reviews of previous surveys relevant to the current study. The results of the previous studies incorporated into this Report by Bell and Murray (2007) include a Species Impact Statement for the adjoining allotment to the west (Bell and Murray 2004).

The following threatened species were identified in the study area for the Wyong Employment Lands:

- *Angophora inopina*
- *Caladenia tessellata* (From Gunninah 2003, citing Payne 1997a)
- *Grevillea parviflora* subsp. *parviflora*
- *Melaleuca biconvexa*
- *Tetratheca juncea*
- *Eucalyptus parramattensis* subsp. *parramattensis* endangered population
- Glossy Black-Cockatoo
- Powerful Owl
- Masked Owl
- Squirrel Glider
- Yellow-bellied Glider (discounted identification made from misidentification of a hair sample)
- Grey-headed Flying-fox
- Eastern Freetail-bat
- Little Bent-winged Bat
- Large Bent-winged Bat
- Large-footed Myotis
- Eastern False Pipistrelle (Tentative identification only)
- Greater Broad-nosed Bat

- Eastern Chestnut Mouse (tentative identification /escaped prior to formal identification).
- Wallum Froglet
- Green-thighed Frog (tentative identification from call by Payne 1996 / no individuals captured)

Bell and Murray (2007) have mapped the vegetation within the subject site as Map Unit 19 Alluvial Woollybutt – Melaleuca Sedge Forest and Map Unit 20f Alluvial Floodplain Shrub Swamp Forest (Sedge Scrub Variant). Map Unit 19 has been identified as part of the River Flat Eucalypt Forest EEC and Map Unit 20f has been identified as part of the Swamp Sclerophyll Forest EEC.

ii. Wyong Vegetation Map 2016 V1 (Eco Logical Australia 2016)

Eco Logical Australia (2016) have mapped most of the site as Alluvial Woolly butt Melaleuca Sedge Forest with minor areas of Alluvial Floodplain Shrub Swamp Forest and Floodplain Wet Heath.

iii. The Natural Vegetation of the Wyong Local Government Area (Bell 2002)

Bell (2002) has mapped the entire site as Alluvial Floodplain Shrub Swamp Forest.

iv. Bionet Atlas of NSW Wildlife

The Bionet Atlas of NSW Wildlife (NSW DPIE 2020) was checked to determine whether any threatened species have been recorded within the subject site or the 1500m buffer area surrounding the site.

The threatened flora species, the Biconvex Paperbark (*Melaleuca biconvexa*) has been recorded within the site on the Bionet Atlas of NSW Wildlife (NSW DPIE 2020). A list of the threatened species recorded within 1500m of the site are provided in Table 1.2. Threatened species observed during the current site surveys are documented in Section 4.4 of this Report. Species listed within Table 1.2 with potential to occur within the site has been included in the assessments undertaken in Section 4 of this Report.

TABLE 1.2
THREATENED SPECIES RECORDED ON THE BIONET ATLAS WITHIN 1500m

Species Name	Common Name	Number of Individuals Recorded	Date of Last Record	Potential for occurrence within impact area
Angophora inopina	Charmhaven Apple	97	19/12/2019	Yes
Eucalyptus camfieldii	Camfield's Stringybark	2	9/07/2005	Yes
Grevillea parviflora subsp. parviflora	Small-flower Grevillea	167	16/12/2019	Yes
Melaleuca biconvexa	Biconvex Paperbark	178	14/01/2020	Yes
Rutidosis heterogama	Heath Wrinklewort	36	19/10/2018	Yes
Tetratheca juncea	Black-eyed Susan	131	9/10/2018	Yes
Callocephalon fimbriatum	Gang-gang Cockatoo	2	16/04/2008	Yes
Crinia tinnula	Wallum Froglet	45	17/03/2016	Yes

Daphoenositta chrysoptera	Varied Sittella	2	16/04/2008	Yes
Falsistrellus tasmaniensis	Eastern False Pipistrelle	2	9/03/2004	Yes
Haliaeetus leucogaster	White-bellied Sea-Eagle	2	16/04/2008	Yes
Litoria aurea	Green and Golden Bell Frog	2	1/01/1984	Yes
Litoria brevipalmata	Green-thighed Frog	2	1/01/1984	Yes
Micronomus norfolkensis	Eastern Coastal Free-tailed Bat	6	13/11/2014	Yes
Miniopterus australis	Little Bent-winged Bat	5	24/08/2017	Yes
Miniopterus orianae oceanensis	Large Bent-winged Bat	11	24/08/2017	Yes
Myotis macropus	Southern Myotis	4	13/11/2014	Yes
Ninox strenua	Powerful Owl	6	2/11/2017	Yes
Pandion cristatus	Eastern Osprey	2	16/04/2008	Yes
Petauroides volans	Greater Glider	2	3/04/1993	Yes
Petaurus norfolcensis	Squirrel Glider	28	1/11/2016	Yes
Phascolarctos cinereus	Koala	2	7/08/2007	Yes
Pteropus poliocephalus	Grey-headed Flying-fox	10	2/11/2017	Yes
Ptilinopus superbus	Superb Fruit-Dove	1	29/03/1985	Yes
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	2	31/12/1992	Yes
Scoteanax rueppellii	Greater Broad-nosed Bat	8	13/11/2014	Yes
Tyto novaehollandiae	Masked Owl	8	23/06/2015	Yes
Tyto tenebricosa	Sooty Owl	2	2/11/2017	Yes

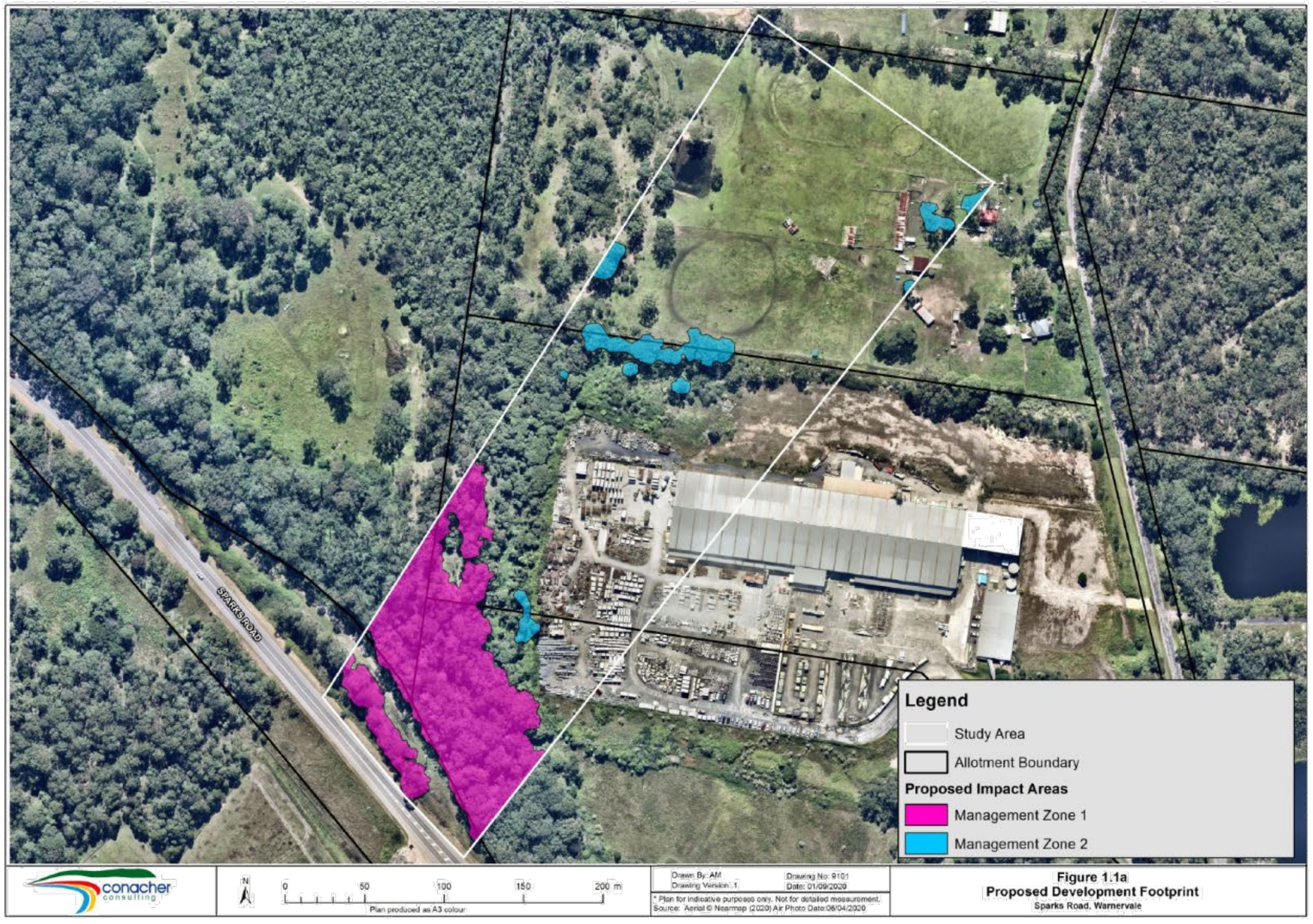


Figure 1.1a
Proposed Development Footprint
Sparks Road, Warnervale

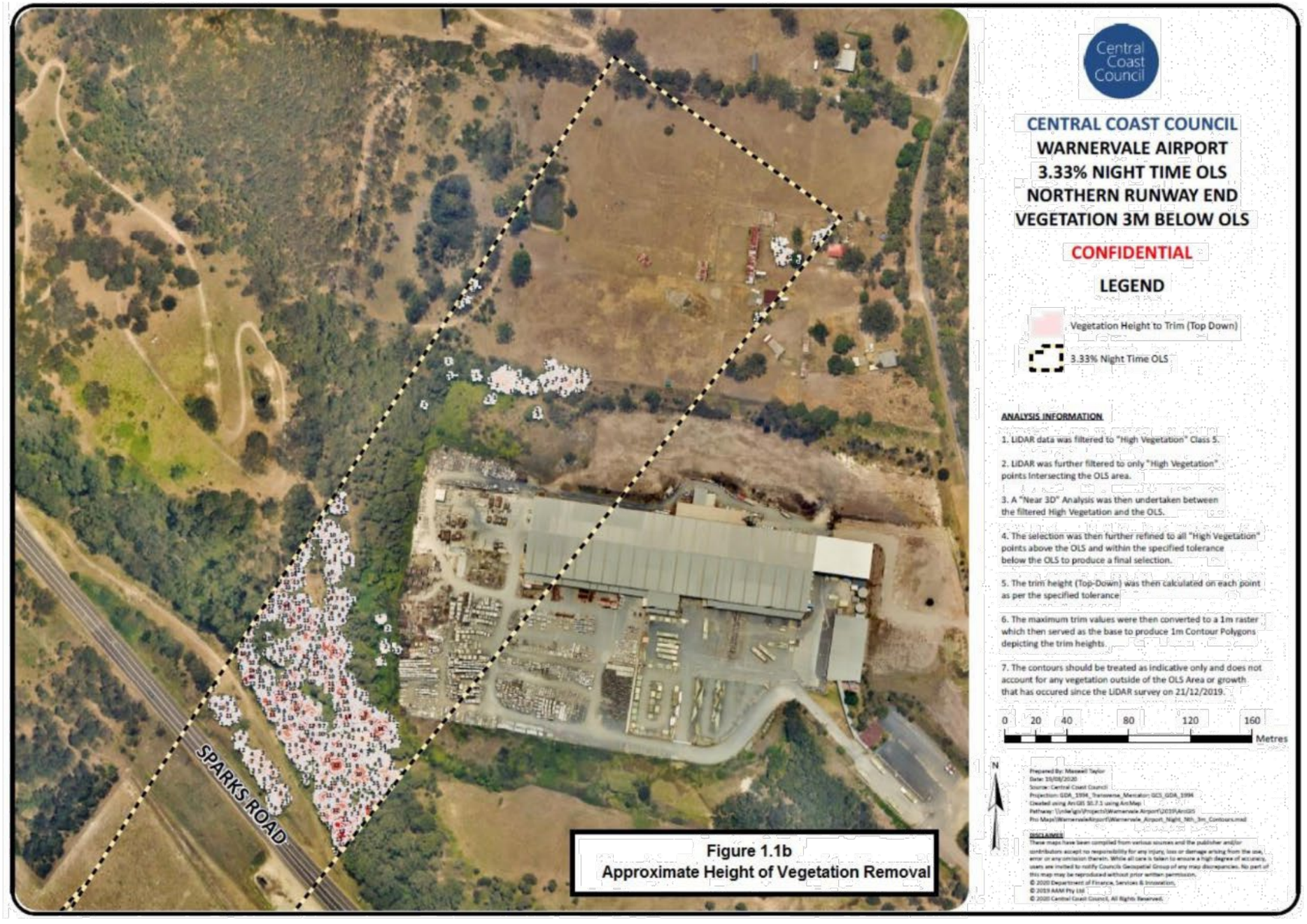
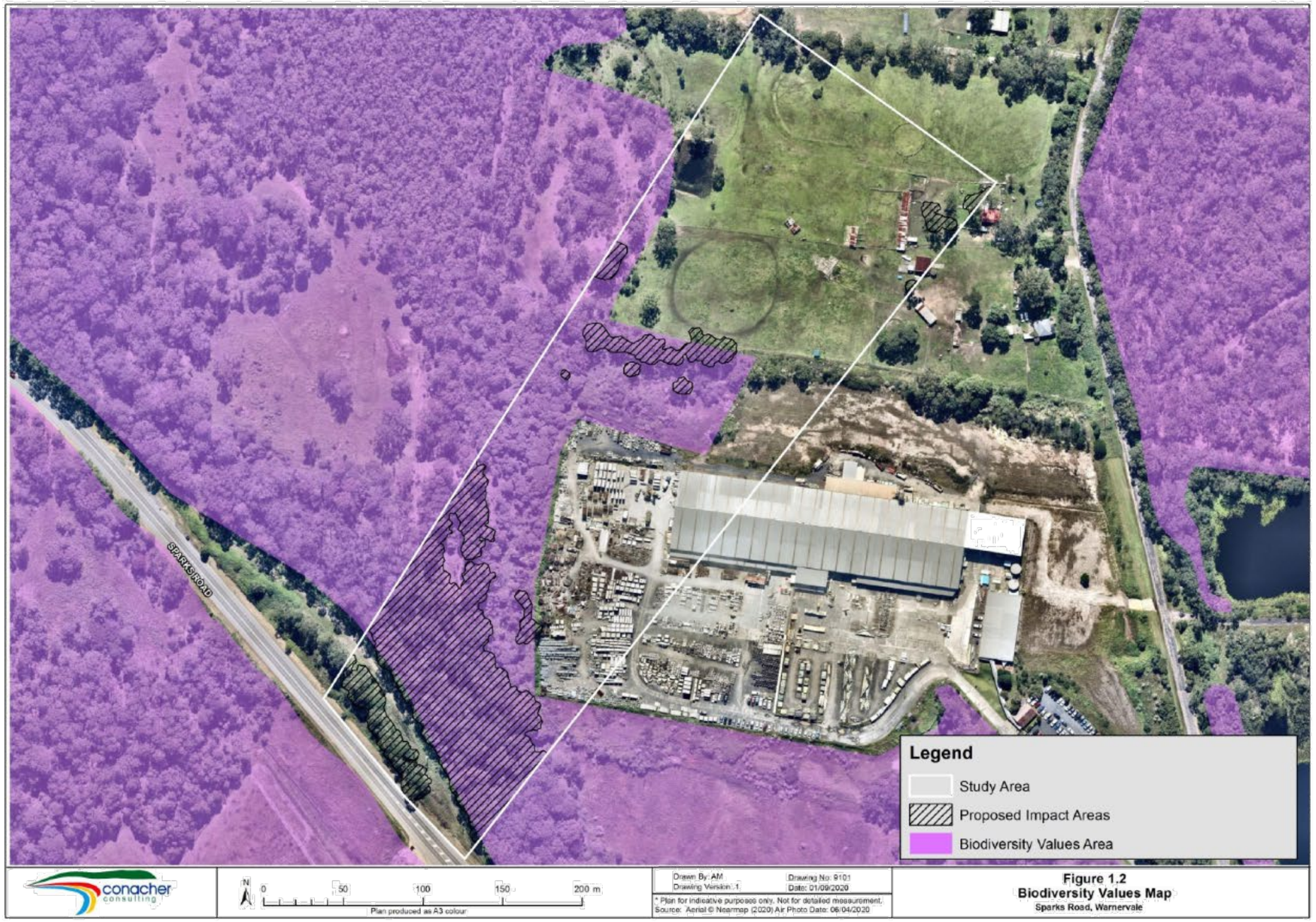


Figure 1.1b
Approximate Height of Vegetation Removal


SPARKS ROAD
Legend
Study Area
Proposed Impact Areas
Biodiversity Values Area
conacher consulting
N
0
50
100
150
200 m
Plan produced as A3 colour
Drawn By: AM
Drawing Version: 1
Drawing No: 9101
Date: 01/09/2020
* Plan for indicative purposes only. Not for detailed measurement.
Source: Aerial © Nearmap (2020) Air Photo Date: 06/04/2020
Figure 1.2
Biodiversity Values Map
Sparks Road, Warnervale

SECTION 2

LANDSCAPE FEATURES AND SITE CONTEXT

2.1 LANDSCAPE FEATURES

The Site Map is provided as Figure 2.1 and a Location Map is provided as Figure 2.2. The landscape features relevant to the site are identified as follows.

i. IBRA BIOREGION & SUBREGION

- IBRA Bioregion: Sydney Basin
- IBRA Subregion: Wyong
- Refer to Figure 2.2.

ii. NSW LANDSCAPE REGION

- Sydney – Newcastle Coastal Alluvial Plains
- Refer to Figure 2.2.

iii. RIVERS, STREAMS AND ESTUARIES

Buttonderry Creek flows through the site and consists of third and fourth order sections. The locations of these features within the site and within 1500m of the development site are mapped in Figure 2.3.

iv. IMPORTANT AND LOCAL WETLANDS

The proposed works area does not include any important or local wetlands. Porters Creek Wetland is located to the south and a watercourse which flows through the site drains to Porters Creek Wetland.

v. HABITAT CONNECTIVITY

The proposed works area intersects existing east-west connectivity along Buttonderry Creek, which flows approximately parallel to Sparks Road. The proposed works area also intersects north-south connectivity within Lot 96 DP 867428, Lot 74 DP 755245 and Lot 1 796730.

vi. AREAS OF GEOLOGICAL SIGNIFICANCE AND SOIL HAZARD FEATURES

The development site does not contain any karst, caves, crevices, cliffs or other areas of geological significance.

The development site does not contain any identified soil hazard features. The site is mapped as no known occurrence of acid sulphate soils on Council's Acid Sulphate Soil map.

vii. AREAS OF OUTSTANDING BIODIVERSITY VALUE

The development site does not contain any areas of Outstanding Biodiversity Value, declared by the Minister.

2.2 SITE CONTEXT FEATURES

The site context features of native vegetation cover and patch size have been identified from an inspection of the site and GIS assessment of available aerial imagery and shapefiles using ArcMap software. These features are used to determine the biodiversity values that are important for identifying the site context and habitat suitability of the proposed development site for the purposes of impact assessment.

i. ASSESSMENT METHOD APPLIED

The site-based assessment method was utilised for this assessment.

ii. NATIVE VEGETATION COVER

The native vegetation cover within the 1500m buffer of the proposed development site has been determined from aerial imagery obtained from Near Map (dated 04/08/2020) and has been mapped as 63.93% cover as shown in Figure 2.4.

iii. PATCH SIZE

The patch size associated with the subject development site is greater than 100 hectares.

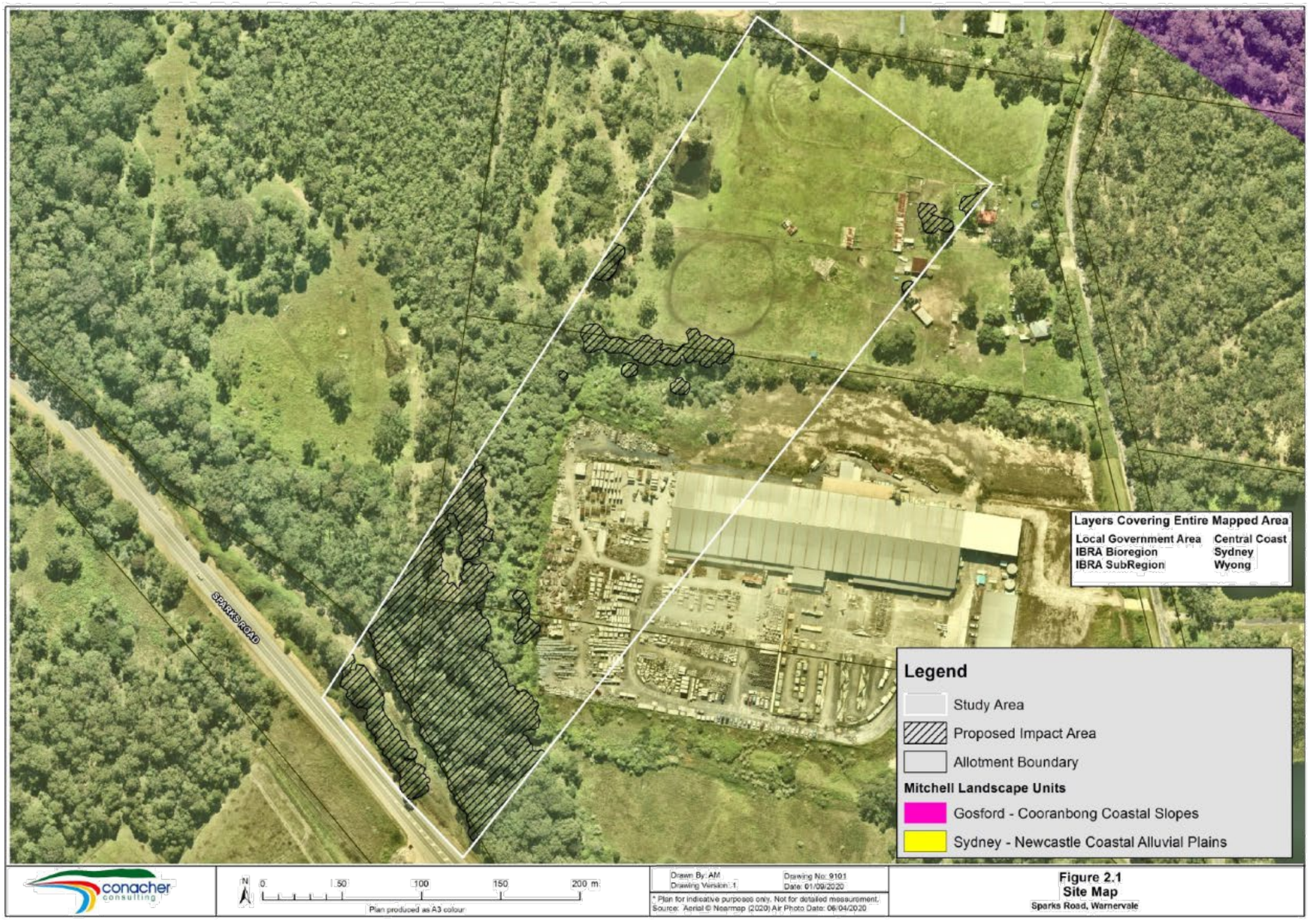


Figure 2.1
Site Map
Sparks Road, Warnervale

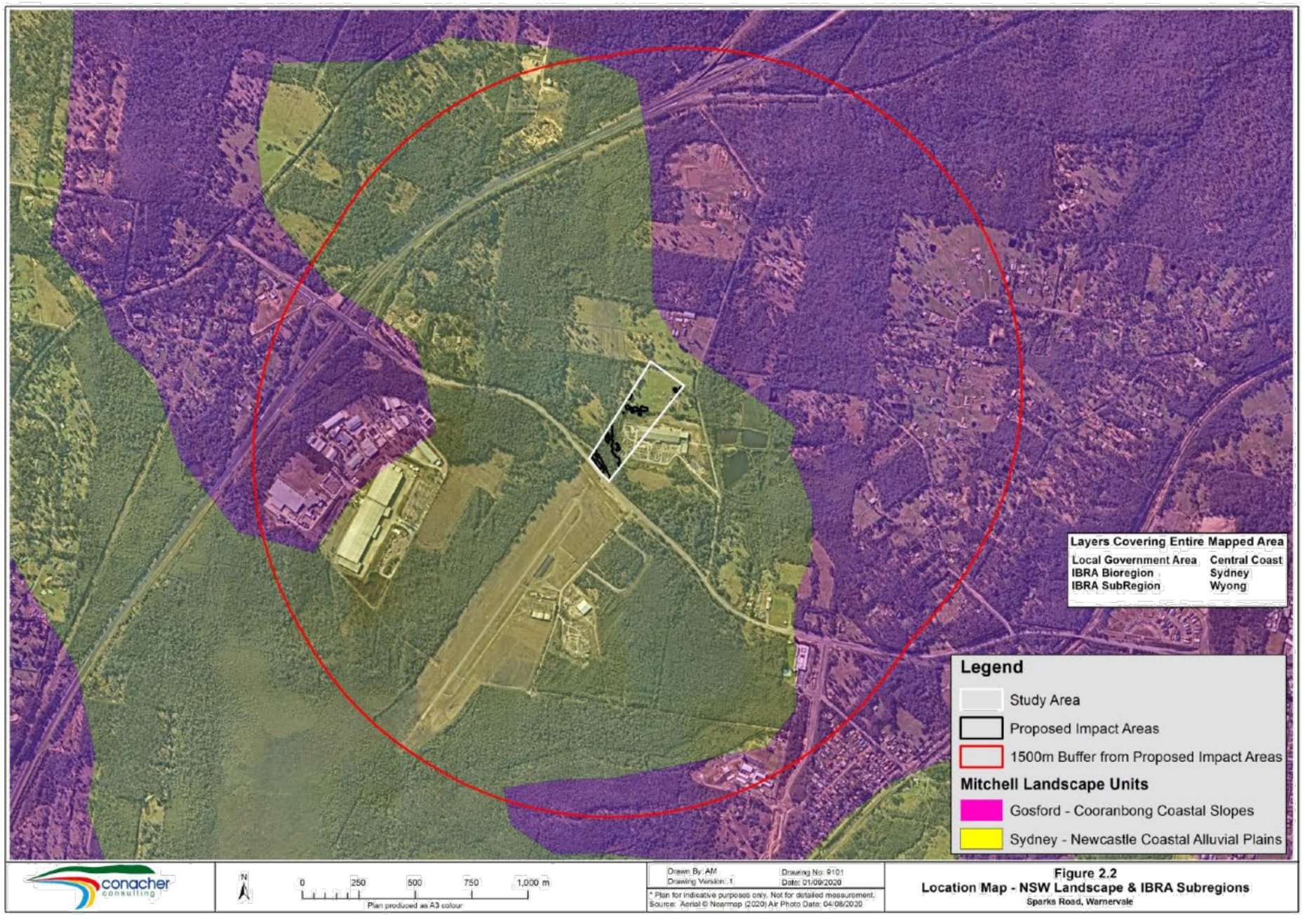


Figure 2.2
Location Map - NSW Landscape & IBRA Subregions
Sparks Road, Warnervale

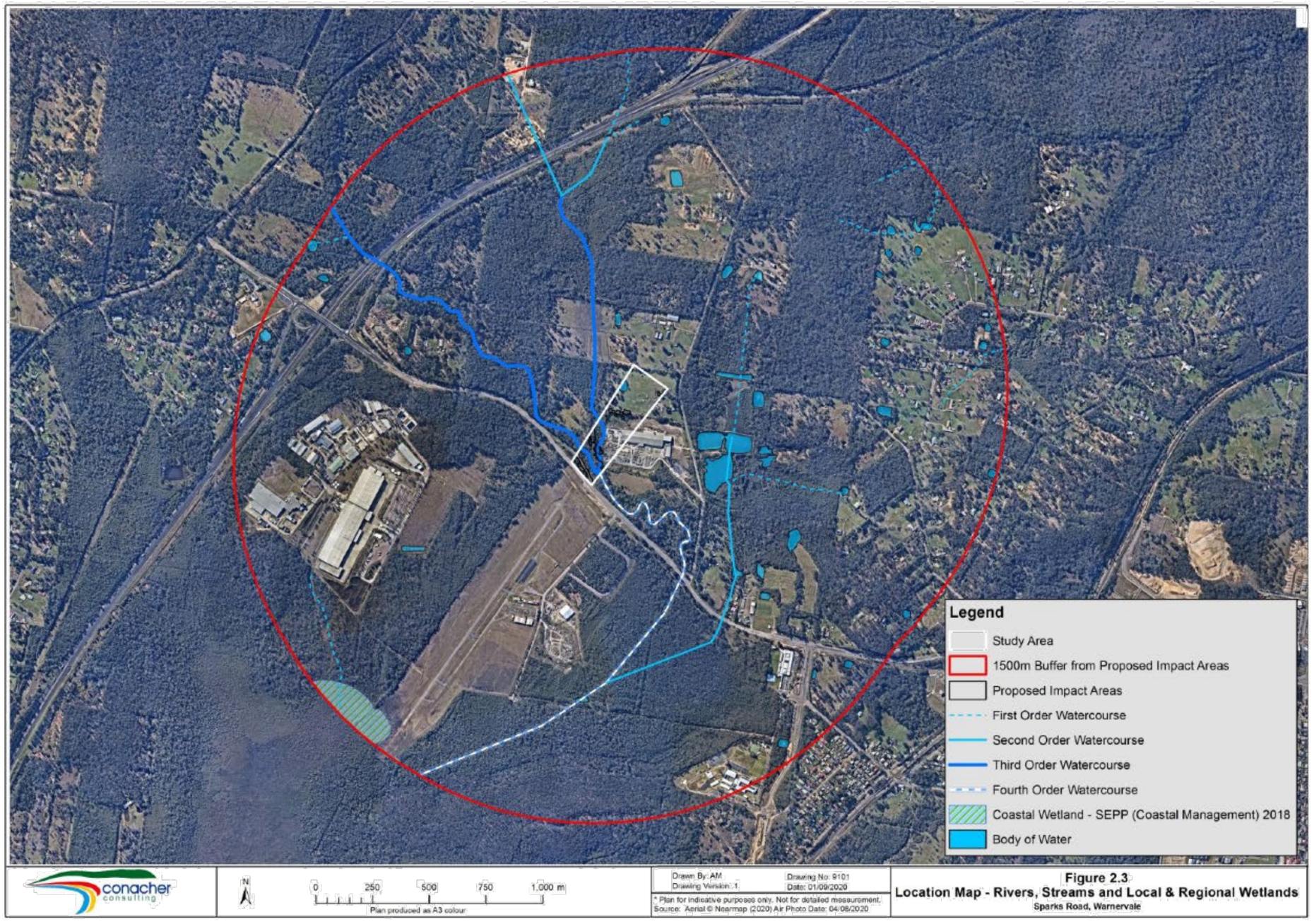


Figure 2.3
Location Map - Rivers, Streams and Local & Regional Wetlands
Sparks Road, Warnervale

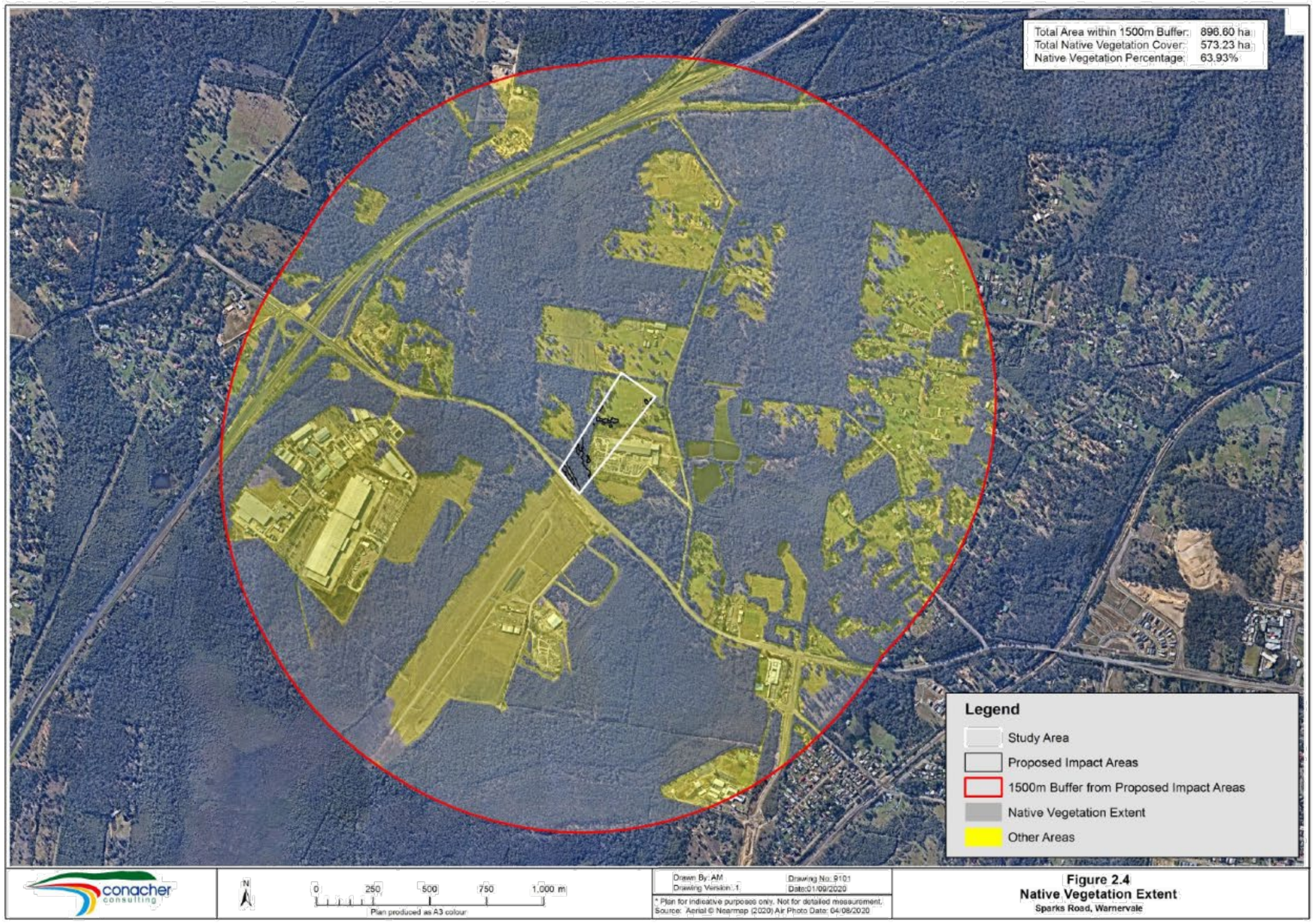


Figure 2.4
Native Vegetation Extent
Sparks Road, Warnervale

SECTION 3

NATIVE VEGETATION & VEGETATION INTEGRITY ASSESSMENT

3.1 NATIVE VEGETATION AND PLANT COMMUNITY TYPES

i. Plant Community and Floristic Survey Methods

Current aerial imagery of the site and the previous reports and vegetation mapping documented in Section 1.5 of this Report were initially reviewed. A field survey, which included a belt transect search across the site, was then completed to determine the dominant flora species present and to produce a map of the plant communities present.

A stratified plot-based vegetation survey of the subject site was completed for each plant community mapped in accordance with the requirements of the BAM. The dominant flora species observed within the plots were entered into the Bionet Vegetation Classification (NSW DPIE 2020) to develop a list of potentially corresponding plant community types (PCTs). This list was then reviewed to determine the PCTs present with consideration of:

- Vegetation formation
- Vegetation class
- Dominant and main associated species,
- Descriptive attributes and diagnostic features,
- Landscape position,
- Geographic distribution.

Plants recorded within plots which were not readily identified in the field were photographed and/or sampled for further identification. Any specimens of plants tentatively identified as threatened species were sent to the Sydney Royal Botanic Gardens for confirmation of the identification.

All vascular plants were identified using keys, nomenclature and/or information in The Royal Botanic Gardens and Domain Trust (2020) and Richardson *et al.*, (2016). Wherever they were known, changes to nomenclature and classification have been incorporated into the results.

The PCTs, associated zones and threatened ecological communities and stratified survey effort completed is documented in Table 3.1, PCT locations are mapped in Figure 3.1.

TABLE 3.1
DETAILS OF PLANT COMMUNITY TYPES AND SURVEY EFFORT STRATIFICATION

PCT	Vegetation Zone	Corresponding Threatened Ecological Communities	Area within Proposed Impact Footprint (ha)	Plots Completed
PCT 1619 Smooth-barked Apple - Red Bloodwood - Brown Stringybark - Hairpin Banksia heathy open forest of coastal lowlands	Zone 1 – Disturbed / Grazed condition	None	0.04	Plot 1

TABLE 3.1 DETAILS OF PLANT COMMUNITY TYPES AND SURVEY EFFORT STRATIFICATION				
PCT	**Vegetation Zone**	**Corresponding Threatened Ecological Communities**	**Area within Proposed Impact Footprint (ha)**	**Plots Completed**
1718 Swamp Mahogany - Flax-leaved Paperbark swamp forest on coastal lowlands of the Central Coast	Zone 1 – Disturbed / Grazed condition	Swamp Sclerophyll Forest on Coastal Floodplains	0.12	Plot 2
PCT 1720 Cabbage Gum - Forest Red Gum - Flax-leaved Paperbark Floodplain Forest of the Central Coast	Zone 1 – Intact condition	River-flat Eucalypt Forest on Coastal Floodplains / Swamp Sclerophyll Forest on Coastal Floodplains	0.18	Plot 3
PCT 1915 Coastal flats tall moist forest	Zone 1 – Intact condition	River-flat Eucalypt Forest on Coastal Floodplains	1.01	Plot 4

ii. Description of Plant Community Types Present

The following description in Table 3.2 is provided for the plant community type observed within the site. The location of this PCT is mapped in Figure 3.1 and the corresponding endangered ecological community is mapped in Figure 3.2.

TABLE 3.2a DESCRIPTION FOR PCT 1619 SMOOTH-BARKED APPLE - RED BLOODWOOD - BROWN STRINGYBARK - HAIRPIN BANKSIA HEATHY OPEN FOREST OF COASTAL LOWLANDS	
Vegetation Formation	Dry Sclerophyll Forests (Shrubby sub-formation)
Vegetation Class	Sydney Coastal Dry Sclerophyll Forests
Vegetation Zones	One Zone – Disturbed / grazed condition
Extent within Study Area (ha)	0.27 ha
Extent within Impact Area (ha)	0.04 ha
Dominant Native Tree Species	*Angophora costata* *Eucalyptus capitellata*
Dominant Native Shrub Species	*Kunzea ambigua* *Melaleuca nodosa*
Dominant Native Groundcover Species	*Eragrostis brownii* *Microlaena stipoides var. stipoides* *Oplismenus imbecillis*
Justification for PCT identification	**Justification for chosen PCT:** Corresponds with the dominant eucalypts and recorded in several other nearby locations locally. **Other PCTs considered and justification for exclusion:** No other similar PCTs identified
Threatened Ecological Community Status	None
Estimate of PCT percentage cleared value	45%
Correlation with aerial photograph and mapped extent	Yes
Patch Size	>100ha

TABLE 3.2b DESCRIPTION FOR PCT 1718 SWAMP MAHOGANY - FLAX-LEAVED PAPERBARK SWAMP FOREST ON COASTAL LOWLANDS OF THE CENTRAL COAST	
Vegetation Formation	Forested Wetlands
Vegetation Class	Coastal Swamp Forests
Vegetation Zones	One Zone – Disturbed / grazed condition
Extent within Study Area (ha)	0.59 ha
Extent within Impact Area (ha)	0.16 ha
Dominant Native Tree Species	*Eucalyptus robusta*
Dominant Native Shrub Species	*Kunzea ambigua* *Melaleuca nodosa* *Breynia oblongifolia* *Persoonia linearis*
Dominant Native Groundcover Species	*Cynodon dactylon* *Eragrostis leptostachya* *Juncus cognatus*
Justification for PCT identification	**Justification for chosen PCT:** Corresponds with the dominant eucalypts **Other PCTs considered and justification for exclusion:** No other similar PCTs identified
Threatened Ecological Community Status	Swamp Sclerophyll Forest on Coastal Floodplains
Estimate of PCT percentage cleared value	74%
Correlation with aerial photograph and mapped extent	Yes
Patch Size	>100ha

TABLE 3.2c DESCRIPTION FOR PCT 1720 CABBAGE GUM - FOREST RED GUM - FLAX-LEAVED PAPERBARK FLOODPLAIN FOREST OF THE CENTRAL COAST	
Vegetation Formation	Forested Wetlands
Vegetation Class	Coastal Floodplain Wetlands
Vegetation Zones	One Zone – Intact condition
Extent within Study Area (ha)	0.94 ha
Extent within Impact Area (ha)	0.2 ha
Dominant Native Tree Species	*Eucalyptus amplifolia* *Corymbia maculata* *Eucalyptus resinifera* *Eucalyptus siderophloia* *Angophora floribunda*
Dominant Native Shrub Species	*Melaleuca linariifolia* *Melaleuca nodosa* *Melaleuca sieberi* *Melaleuca decora*
Dominant Native Groundcover Species	*Gahnia clarkei* *Imperata cylindrica* *Themeda triandra* *Juncus usitatus* *Entolasia marginata*
Justification for PCT identification	**Justification for chosen PCT:** Corresponds with the dominant eucalypts **Other PCTs considered and justification for exclusion:** No other similar PCTs identified

TABLE 3.2c DESCRIPTION FOR PCT 1720 CABBAGE GUM - FOREST RED GUM - FLAX-LEAVED PAPERBARK FLOODPLAIN FOREST OF THE CENTRAL COAST	
Threatened Ecological Community Status	River-Flat Eucalypt Forest on Coastal Floodplains of the NSW North Coast| Sydney Basin and South East Corner bioregions
Estimate of PCT percentage cleared value	90%
Correlation with aerial photograph and mapped extent	Yes
Patch Size	>100ha

TABLE 3.2d DESCRIPTION FOR PCT 1915 COASTAL FLATS TALL MOIST FOREST	
Vegetation Formation	Wet Sclerophyll Forest (Shrubby sub-formation)
Vegetation Class	North Coast Wet Sclerophyll Forest
Vegetation Zones	One Zone – Intact condition
Extent within Study Area (ha)	1.2 ha
Extent within Impact Area (ha)	1.14 ha
Dominant Native Tree Species	*Eucalyptus saligna* *Eucalyptus globoidea* *Eucalyptus siderophloia* *Allocasuarina torulosa* *Angophora floribunda*
Dominant Native Shrub Species	*Melaleuca biconvexa* *Notelaea longifolia f. longifolia* *Polyscias sambucifolia subsp. Bipinnate leaves* *Acacia irrorata subsp. irrorata* *Breynia oblongifolia* *Zieria smithii*
Dominant Native Groundcover Species	*Gahnia clarkei* *Imperata cylindrica* *Themeda triandra* *Juncus usitatus* *Entolasia marginata*
Justification for PCT identification	**Justification for chosen PCT:** Corresponds with the dominant eucalypts **Other PCTs considered and justification for exclusion:** No other similar PCTs identified
Threatened Ecological Community Status	River-flat Eucalypt Forest on Coastal Floodplains
Estimate of PCT percentage cleared value	82%
Correlation with aerial photograph and mapped extent	Yes
Patch Size	>100ha

iii. Floristic Plot Results

The flora species observed within the plots surveyed and the corresponding cover and abundance scores are provided in Table 3.3.

TABLE 3.3
FLORISTIC SURVEY PLOT RESULTS

Family	Scientific Name	Common Name	1c	1a	1s	2c	2a	2s	3c	3a	3s	4c	4a	4s
Native Trees														
Casuarinaceae	*Allocasuarina torulosa*	Forest Oak										4.0	2	1
Myrtaceae	*Angophora costata*	Sydney Red Gum	1.0	1	1									
Myrtaceae	*Angophora floribunda*	Rough-barked Apple										2.0	2	1
Myrtaceae	*Corymbia maculata*	Spotted Gum							10.0	3	1			
Myrtaceae	*Eucalyptus amplifolia subsp. amplifolia*								10.0	2	1			
Myrtaceae	*Eucalyptus capitellata*	Brown Stringybark	10.0	5	1									
Myrtaceae	*Eucalyptus capitellata x pilularis*		5.0	1	1									
Myrtaceae	*Eucalyptus globoidea*	White Stringybark										20.0	8	1
Myrtaceae	*Eucalyptus resinifera subsp. resinifera*								0.8	1	1			
Myrtaceae	*Eucalyptus robusta*	Swamp Mahogany				15.0	15	1						
Myrtaceae	*Eucalyptus saligna*	Sydney Blue Gum										10.0	3	1
Myrtaceae	*Eucalyptus siderophloia*	Northern Grey Ironbark							5.0	2	1	15.0	7	1
Oleaceae	*Notelaea longifolia f. longifolia*											5.0	20	1
Phyllanthaceae	*Glochidion ferdinandi var. ferdinandi*	Cheese Tree	0.1	1	1	0.1	2	1						
		Totals	**16.1**		**4.0**	**15.1**		**2.0**	**25.8**		**4.0**	**56.0**		**6.0**
Native Shrubs														
Araliaceae	*Polyscias sambucifolia subsp. Bipinnate leaves*	Ferny Panax										2.0	20	1
Araliaceae	*Polyscias sambucifolia subsp. Long leaflets*											0.3	5	1
Asteraceae	*Ozothamnus diosmifolius*	White Dogwood										0.2	2	1
Dilleniaceae	*Hibbertia obtusifolia*	Hoary Guinea Flower										0.5	30	1
Fabaceae (Faboideae)	*Daviesia ulicifolia*	Gorse Bitter Pea										0.2	1	1
Fabaceae (Mimosoideae)	*Acacia irrorata subsp. irrorata*	Green Wattle										4.0	3	1
Fabaceae (Mimosoideae)	*Acacia longifolia subsp. longifolia*	Sydney Golden Wattle							0.3	2	1			
Fabaceae (Mimosoideae)	*Acacia terminalis subsp. Long inflorescences*					0.3	1	1						
Goodeniaceae	*Goodenia ovata*	Hop Goodenia										0.5	4	1
Myrtaceae	*Kunzea ambigua*	Tick Bush	1.0	2	1	1.0	4	1						
Myrtaceae	*Leptospermum polygalifolium subsp. cismontanum*											0.4	1	1
Myrtaceae	*Melaleuca linariifolia*	Flax-leaved Paperbark							15.0	25	1			
Myrtaceae	*Melaleuca nodosa*		5.0	20	1	0.5	1	1	30.0	30	1			
Myrtaceae	*Melaleuca sieberi*								2.0	3	1			
Myrtaceae	*Melaleuca thymifolia*	Thyme Honey-myrtle				0.2	1	1						
Phyllanthaceae	*Breynia oblongifolia*	Coffee Bush	0.1	1	1	0.5	5	1				2.0	15	1
Pittosporaceae	*Pittosporum revolutum*	Rough Fruit Pittosporum							0.3	2	1			
Pittosporaceae	*Pittosporum undulatum*	Sweet Pittosporum	0.2	1	1							0.1	1	1
Proteaceae	*Persoonia linearis*	Narrow-leaved Geebung				0.5	1	1						
Rutaceae	*Zieria smithii*	Sandfly Zieria										1.0	10	1
Sapindaceae	*Dodonaea triquetra*	Large-leaf Hop-bush										0.3	3	1
Thymelaeaceae	*Pimelea linifolia subsp. linifolia*					0.1	1	1						
		Totals	**6.3**		**4.0**	**3.1**		**7.0**	**47.6**		**5.0**	**11.5**		**12.0**
Native Grasses and Grass-like Plants														
Cyperaceae	*Carex inversa*	Knob Sedge	0.1	5	1				0.1	10	1			
Cyperaceae	*Carex longebrachiata*					0.1	2	1	0.1	3	1			
Cyperaceae	*Cyperus polystachyos*					0.1	20	1						
Cyperaceae	*Fimbristylis dichotoma*	Common Fringe-sedge				0.1	10	1						
Juncaceae	*Juncus planifolius*					0.1	5	1						
Juncaceae	*Juncus usitatus*					0.2	20	1	1.0	50	1			
Lomandraceae	*Lomandra gracilis*											0.1	5	1
Lomandraceae	*Lomandra longifolia*	Spiny-headed Mat-rush										15.0	50	1
Poaceae	*Cynodon dactylon*	Common Couch				1.0	100	1						
Poaceae	*Dichelachne micrantha*	Shorthair Plumegrass				0.1	20	1						
Poaceae	*Entolasia marginata*	Bordered Panic							5.0	1,000	1	1.0	200	1
Poaceae	*Entolasia stricta*	Wiry Panic	0.1	10	1									
Poaceae	*Eragrostis brownii*	Brown's Lovegrass	0.5	50	1	0.1	30	1						
Poaceae	*Eragrostis leptostachya*	Paddock Lovegrass				0.5	50	1						
Poaceae	*Hemarthria uncinata var. uncinata*					0.3	20	1						

TABLE 3.3
FLORISTIC SURVEY PLOT RESULTS

Family	Scientific Name	Common Name	1c	1a	1s	2c	2a	2s	3c	3a	3s	4c	4a	4s
Poaceae	*Imperata cylindrica*	Blady Grass							5.0	1,000	1			
Poaceae	*Microlaena stipoides var. stipoides*	Weeping Grass	1.0	100	1				3.0	500	1	1.0	100	1
Poaceae	*Oplismenus imbecillis*		0.3	50	1							30.0	3,000	1
Poaceae	*Panicum simile*	Two-colour Panic	0.1	10	1									
Poaceae	*Paspalidium distans*											0.1	20	1
Poaceae	*Paspalum distichum*	Water Couch	0.1	50	1									
Poaceae	*Rytidosperma pallidum*	Redanther Wallaby Grass				0.1	1	1						
Poaceae	*Themeda triandra*											1.0	100	1
		Totals	**2.2**		**7.0**	**2.7**		**11.0**	**14.2**		**6.0**	**47.2**		**6.0**
Native Forbs														
Acanthaceae	*Pseuderanthemum variabile*	Pastel Flower										0.1	20	1
Amaranthaceae	*Alternanthera denticulata*	Lesser Joyweed							0.1	20	1			
Apiaceae	*Centella asiatica*	Indian Pennywort	0.2	200	1	0.1	50	1				0.1	20	1
Asteraceae	*Epaltes australis*	Spreading Nut-heads				0.1	5	1	0.1	10	1			
Asteraceae	*Euchiton sphaericus*	Star Cudweed	0.1	5	1	0.1	5	1						
Campanulaceae	*Lobelia purpurascens*	whiteroot	0.1	100	1	0.1	50	1	0.1	50	1	0.1	100	1
Clusiaceae	*Hypericum japonicum*					0.1	10	1						
Commelinaceae	*Commelina cyanea*	Native Wandering Jew							0.5	50	1			
Convolvulaceae	*Dichondra repens*	Kidney Weed							0.1	50	1	0.1	20	1
Goodeniaceae	*Goodenia paniculata*		0.1	10	1	0.1	10	1						
Oxalidaceae	*Oxalis perennans*											0.1	2	1
Phormiaceae	*Dianella caerulea var. caerulea*								0.3	10	1	0.1	1	1
Phormiaceae	*Dianella caerulea var. producta*					0.1	5	1	0.1	1	1	0.1	2	1
Ranunculaceae	*Ranunculus inundatus*	River Buttercup							0.1	20	1			
Ranunculaceae	*Ranunculus lappaceus*	Common Buttercup							0.1	1	1			
Ranunculaceae	*Ranunculus sessiliflorus*	Small-flowered Buttercup							0.1	2	1			
		Totals	**0.5**		**4.0**	**0.7**		**7.0**	**1.6**		**10.0**	**0.7**		**7.0**
Native Ferns and Fern Allies														
Adiantaceae	*Adiantum aethiopicum*	Common Maidenhair										1.0	100	1
Dennstaedtiaceae	*Pteridium esculentum*	Bracken										10.0	200	1
		Totals										**11.0**		**2.0**
Other Native Plants														
Apocynaceae	*Parsonsia straminea*	Common Silkpod							0.2	10	1	0.3	10	1
Convolvulaceae	*Polymeria calycina*											0.1	5	1
Dilleniaceae	*Hibbertia scandens*	Climbing Guinea Flower										0.3	1	1
Fabaceae (Faboideae)	*Glycine clandestina*	Twining glycine										0.1	20	1
Fabaceae (Faboideae)	*Glycine microphylla*	Small-leaf Glycine	0.2	30	1	0.1	5	1	0.1	10	1	0.1	10	1
Lauraceae	*Cassytha glabella*											0.2	50	1
Ranunculaceae	*Clematis aristata*	Old Man's Beard										0.2	10	1
Rubiaceae	*Gynochthodes jasminoides*	Sweet Morinda										0.1	5	1
		Totals	**0.2**		**1.0**	**0.1**		**1.0**	**0.3**		**2.0**	**1.4**		**8.0**
High Threat Exotic Plants														
Asparagaceae	*Asparagus aethiopicus*	Asparagus Fern										0.1	2	1
Caprifoliaceae	*Lonicera japonica*	Japanese Honeysuckle							60.0	2,000	1	0.2	1	1
Clusiaceae	*Hypericum perforatum*	St. Johns Wort	0.1	10	1	0.2	20	1						
Poaceae	*Andropogon virginicus*	Whisky Grass				25.0	1,000	1						
Poaceae	*Axonopus fissifolius*	Narrow-leafed Carpet Grass	35.0	3,000	1	30.0	3,000	1	5.0	500	1			
Poaceae	*Paspalum dilatatum*	Paspalum	0.1	20	1	5.0	500	1	1.0	30	1			
Verbenaceae	*Lantana camara*	Lantana							0.5	3	1	4.0	20	1
		Totals	**35.2**			**60.2**			**66.5**			**4.3**		
Other Exotic Plants														
Asteraceae	*Conyza bonariensis*	Flaxleaf Fleabane				0.1	3	1						
Asteraceae	*Cyanthillium cinereum var. cinereum*											0.1	5	1
Asteraceae	*Gamochaeta americana*	Purple Cudweed	0.1	100	1									
Asteraceae	*Gamochaeta americana*	Purple Cudweed				0.1	100	1						
Asteraceae	*Hypochoeris radicata*	Catsear	0.1	50	1	0.1	100	1						
Fabaceae (Caesalpinioideae)	*Senna pendula var. glabrata*								0.3	3	1			
Fabaceae (Faboideae)	*Trifolium repens*	White Clover	0.1	1	1									
Juncaceae	*Juncus cognatus*		0.1	10	1	2.0	50	1						
Malvaceae	*Sida rhombifolia*	Paddy's Lucerne	0.1	5	1				0.1	2	1	0.1	1	1

TABLE 3.3
FLORISTIC SURVEY PLOT RESULTS

Family	Scientific Name	Common Name	1c	1a	1s	2c	2a	2s	3c	3a	3s	4c	4a	4s
Plantaginaceae	*Plantago lanceolata*	Lamb's Tongues	0.1	20	1	0.1	20	1	0.1	5	1			
Poaceae	*Briza maxima*	Quaking Grass				0.1	10	1						
Poaceae	*Setaria parviflora*		2.0	500	1	1.0	100	1	0.5	100	1			
Poaceae	*Vulpia bromoides*	Squirrel Tail Fesque				0.1	5	1						
Rubiaceae	*Richardia brasiliensis*	Mexican Clover	1.0	1,000	1									
Rubiaceae	*Richardia humistrata*					0.2	100	1						
Verbenaceae	*Verbena bonariensis*	Purpletop	0.1	2	1	0.1	1	1						

3.2 VEGETATION INTEGRITY DETAILS

i. Vegetation Integrity Survey Methods

A vegetation integrity assessment was completed for each plot in accordance with the requirements of Section 5.3 of the BAM.

ii. Plot Function Results

The habitat function data collected during the field assessment is presented in Table 3.4.

TABLE 3.4
PCT COMPOSITION CONDITION DATA / SPECIES RICHNESS

PCT and Zone	PCT 1619	PCT 1718	PCT 1720	PCT 1915
Plot Reference	**Plot 1**	**Plot 2**	**Plot 3**	**Plot 4**
Trees	4	2	4	6
Shrubs	4	7	5	12
Grass & Grass Like Plants	7	11	6	6
Forbs	4	7	10	7
Ferns	0	0	0	2
Other Species	1	1	2	8

iii. Vegetation Integrity Scores

The habitat structure data collected during the field assessment is presented in Table 3.5.

TABLE 3.5
PCT STRUCTURE CONDITION DATA / COVER

PCT and Zone	PCT 1619	PCT 1718	PCT 1720	PCT 1915
Plot Reference	**Plot 1**	**Plot 2**	**Plot 3**	**Plot 4**
Trees	16.1	15.1	25.8	56
Shrubs	6.3	3.1	47.6	11.5
Grass & Grass Like Plants	2.2	2.7	14.2	47.2
Forbs	0.5	0.7	1.6	0.7
Ferns	0	0	0	11
Other Species	0.2	0.1	0.3	1.4

iv. Plot Function Condition Data

The habitat function condition data collected during the field assessment is presented in Table 3.6.

TABLE 3.6
PCT FUNCTION CONDITION DATA

PCT and Zone	PCT 1619	PCT 1718	PCT 1720	PCT 1915
Plot Reference	**Plot 1**	**Plot 2**	**Plot 3**	**Plot 4**
TREE DBH Size Classes				
Trees DBH <5cm	Present	Present	Present	Present
Trees DBH 5-9cm	Present	Present	Present	Present
Trees DBH 10-19cm	Present	Present	Present	Present
Trees DBH 20-29cm	Present	Present	Present	Present
Trees DBH 30-49cm	Present	Present	Present	Present

TABLE 3.6 PCT FUNCTION CONDITION DATA				
PCT and Zone	**PCT 1619**	**PCT 1718**	**PCT 1720**	**PCT 1915**
Plot Reference	**Plot 1**	**Plot 2**	**Plot 3**	**Plot 4**
No. trees DBH 50-79cm	1	1	Absent	2
No. trees DBH ≥80cm	Absent	1	Absent	Absent
Sum of trees DBH >50cm	1	2	0	2
No. Hollow-bearing Trees	0	0	0	0
Average Litter Cover	14	7	28	30
Fallen Log Length (m)	0	6	38	1
High Threat Weed Cover	35.2	60.2	66.5	4.3

v. Vegetation Integrity Scores

The vegetation integrity scores were determined in accordance with Section 5.4 of the BAM and are provided in Table 3.7.

TABLE 3.7 PCT VEGETATION INTEGRITY SCORES				
PCT and Zone	**PCT 1619**	**PCT 1718**	**PCT 1720**	**PCT 1915**
Composition Score	33.3	69.1	85	85.3
Structure Score	9.8	19.3	79.5	55.6
Function Score	41.4	45.4	63.2	67.2
Vegetation Integrity Score	23.8	39.3	75.3	68.3

vi. Use of Local Data

No additional local data was used for the purposes of assessing benchmark condition.

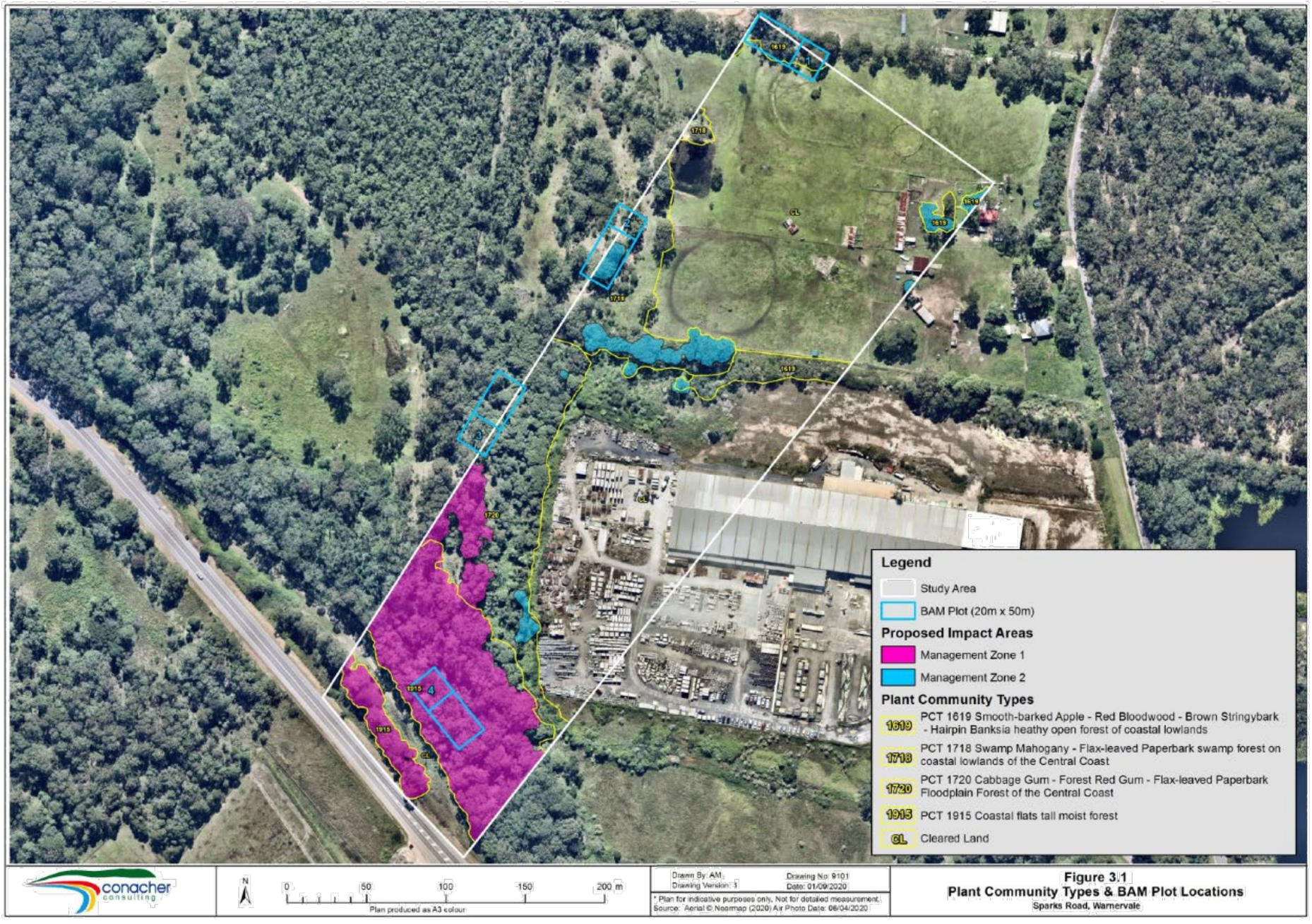


Figure 3.1
Plant Community Types & BAM Plot Locations
Sparks Road, Warnervale

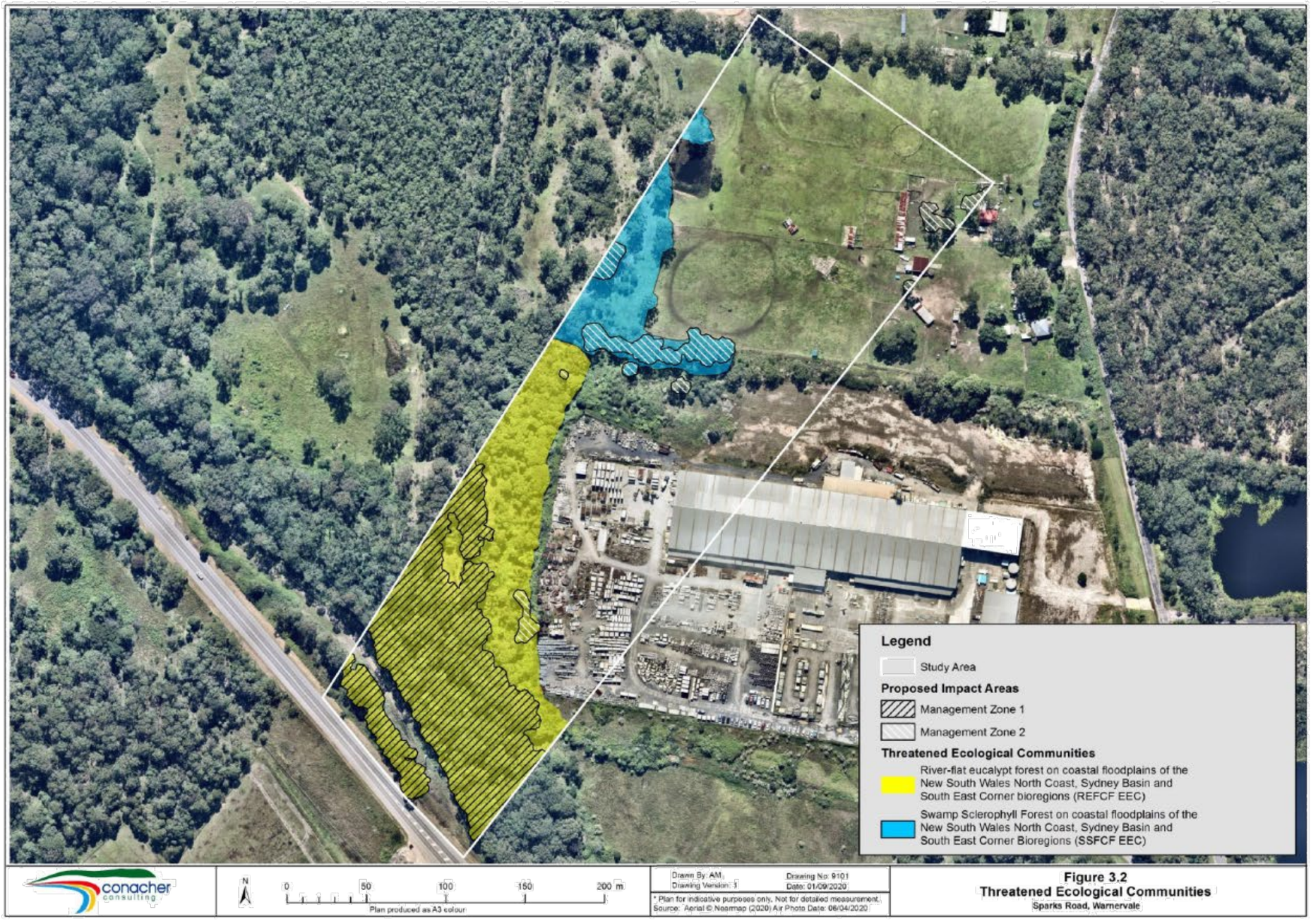


Figure 3.2
Threatened Ecological Communities
Sparks Road, Warnervale

SECTION 4

THREATENED SPECIES DETAILS

4.1 HABITAT FEATURES PRESENT

The development site contains disturbed habitats for fauna species. Details of the micro-habitat features observed are provided in Table 4.1. Mapping of hollow bearing-tree locations is provided in Figure 4.2. No hollow bearing trees were observed within the impact footprint during surveys.

TABLE 4.1
FAUNA HABITATS PRESENT

Key habitat Type	Presence	Comments
Hollow bearing trees	No	No hollow bearing trees were observed within the development footprint
Mature trees	Yes	Numerous present
Culverts	No	None observed
Rock Shelters / Caves / Crevices	No	None observed
Acacia shrubs	Yes	Detected within survey plots
Banksia shrubs	No	None detected within survey plots
Native Grasses	Yes	Native Understory grasses are present
Man-made features	No	None observed
The native vegetation types present	Yes	See Section 3.1
Areas of cleared land and exotic vegetation	Yes	See Figure 3.1
Any exposed areas of bush rock including outcrops	No	None observed
Natural burrows	No	None observed
Large trees with basal cavities	No	None observed
Logs	Yes	Logs observed
Wetlands, streams, and waterbodies etc.	Yes	Buttonderry Creek intersects the site
Nests and roosts	No	None observed
Wombat burrows	No	None observed
Dens used by Petaurus gliders	No	None observed, potential for presence
Petaurus glider sap feed trees	No	None observed
Distinctive scats	No	None observed
Latrine and den sites pf the Spotted-tailed Quoll	No	None observed
Allocasuarina spp. trees	Yes	*Allocasuarina torulosa* is present
Flying-fox camps	No	None observed
Micro chiropteran bat subterranean roosts (culverts, tunnels and disused mineshafts	No	None observed
Regent Honeyeater feed or nest trees;	No site use observed	Suitable feed trees present
Swift Parrot feed trees;	No site use observed	Suitable feed trees present
Winter-flowering eucalypts	Yes	*Eucalyptus robusta i*s present.
Mistletoes	Yes	Mistletoe is present.
Permanent soaks and seepages	Yes	Parts of the site are subject to ephemeral inundation.
Areas that can act as corridors for plant and animal species / corridor values	Yes	See habitat connectivity details provided in Section 2.1

4.2 THREATENED SPECIES DETAILS

i. *Ecosystem Credit Species*

The threatened species for which the likelihood of occurrence or elements of habitat can be predicted by vegetation surrogates and landscape features, or for which targeted surveys are likely to have a low probability for detection, are identified as 'Ecosystem Credit' species. The list of these species has been compiled from the results of non-targeted survey observations, previous survey results, Bionet Atlas records (NSW DPIE (2020) and through the BAM Calculator.

The Ecosystem Credit Species predicted to occur are listed in Table 4.2, a determination of suitable habitat presence based on habitat constraints, geographic constraints and microhabitats is provided.

The Little Lorikeet and the Grey-headed Flying-fox were observed during surveys.

The Little Lorikeet was observed multiple times within PCT 1915, including on 24 October 2019 (3 individuals foraging) and 30 April 2020 (approximately 40 individuals foraging).

Approximately 6 Grey-headed Flying-foxes were observed on 7 November 2019 during spotlighting surveys.

TABLE 4.2
ECOSYSTEM CREDIT SPECIES & SITE HABITAT SUITABILITY

Species	Habitat Constraints	Geographic Limitations	Sensitivity to Gain Class	BC Act Listing Status	EPBC Act Listing Status	Confirmed Predicted Species	Predicted PCTs and Vegetation Zones with Suitable Habitat	Predicted PCTs and Vegetation Zones with No Suitable Habitat
Anthochaera phrygia Regent Honeyeater (Foraging)	-	-	High	CE	CE	Yes	PCT 1718 PCT 1915	-
Artamus cyanopterus cyanopterus Dusky Woodswallow	-	-	Moderate	V	-	Yes	PCT 1915	-

TABLE 4.2 ECOSYSTEM CREDIT SPECIES & SITE HABITAT SUITABILITY								
Species	**Habitat Constraints**	**Geographic Limitations**	**Sensitivity to Gain Class**	**BC Act Listing Status**	**EPBC Act Listing Status**	**Confirmed Predicted Species**	**Predicted PCTs and Vegetation Zones with Suitable Habitat**	**Predicted PCTs and Vegetation Zones with No Suitable Habitat**
Callocephalon fimbriatum Gang-gang Cockatoo (Foraging)	-	-	Moderate	V	-	Yes	PCT 1619	-
Calyptorhynchus lathami Glossy Black-Cockatoo (Foraging)	Presence of Allocasuarina and casuarina species	-	High	V	-	Yes	PCT 1619	-
Chthonicola sagittata Speckled Warbler	-	-	High	V	-	Yes	PCT 1619	
Climacteris picumnus victoriae Brown Treecreeper (eastern subspecies)	-	-	High	V	-	Yes	PCT 1619	
Daphoenositta chrysoptera Varied Sittella	-	-	Moderate	V	-	Yes	PCT 1619 PCT 1718 PCT 1720 PCT 1915	-
Dasyurus maculatus Spotted-tailed Quoll	-	-	High	V	E	Yes	PCT 1619 PCT 1718 PCT 1720 PCT 1915	-
Falsistrellus tasmaniensis Eastern False Pipistrelle	-	-	High	V	-	Yes	PCT 1619 PCT 1718	-

TABLE 4.2 ECOSYSTEM CREDIT SPECIES & SITE HABITAT SUITABILITY								
Species	**Habitat Constraints**	**Geographic Limitations**	**Sensitivity to Gain Class**	**BC Act Listing Status**	**EPBC Act Listing Status**	**Confirmed Predicted Species**	**Predicted PCTs and Vegetation Zones with Suitable Habitat**	**Predicted PCTs and Vegetation Zones with No Suitable Habitat**
Glossopsitta pusilla Little Lorikeet	-	-	High	V	-	Yes	PCT 1619 PCT 1718 PCT 1915	-
Grantiella picta Painted Honeyeater	Mistletoes present at a density of greater than 5 per hectare.	-	Moderate	V	V	No	PCT 1619	Habitat constraints not met.
Haliaeetus leucogaster White-bellied Sea-Eagle (Foraging)	Waterbodies or within 1km of a river, lake, large dam, creek, wetland or coastline	-	High	V	-	Yes	PCT 1619 PCT 1718 PCT 1720	-
Hieraaetus morphnoides Little Eagle	-	-	Moderate	V	-	Yes	PCT 1619 PCT 1718 PCT 1915	-
Ixobrychus flavicollis Black Bittern	Waterbodies Land within 40m of freshwater and estuarine wetlands in areas of permanent water and dense vegetation	-	Moderate	V	-	Yes	PCT 1718 PCT 1720 PCT 1915	-

TABLE 4.2 ECOSYSTEM CREDIT SPECIES & SITE HABITAT SUITABILITY								
Species	**Habitat Constraints**	**Geographic Limitations**	**Sensitivity to Gain Class**	**BC Act Listing Status**	**EPBC Act Listing Status**	**Confirmed Predicted Species**	**Predicted PCTs and Vegetation Zones with Suitable Habitat**	**Predicted PCTs and Vegetation Zones with No Suitable Habitat**
Lathamus discolor Swift Parrot (Foraging)	-	-	Moderate	E	CE	Yes	PCT 1619 PCT 1718 PCT 1915	-
Lophoictinia isura Square-tailed Kite (Foraging)	-	-	Moderate	V	-	Yes	PCT 1619 PCT 1915	-
Melithreptus gularis gularis Black-chinned Honeyeater (eastern subspecies)	-	-	Moderate	V	-	Yes	PCT 1619	-
Micronomus norfolkensis Eastern Coastal Free-tailed Bat	-	-	High	V	-	Yes	PCT 1619 PCT 1718 PCT 1915	-
Miniopterus australis Little Bent-winged Bat (Foraging)	-	-	High	V	-	Yes	PCT 1619 PCT 1718 PCT 1915	-
Miniopterus orianae oceanensis Large Bent-winged Bat (Foraging)	-	-	High	V	-	Yes	PCT 1619 PCT 1718 PCT 1915	-
Neophema pulchella Turquoise Parrot	-	-	High	V	-	Yes	PCT 1619	

TABLE 4.2 ECOSYSTEM CREDIT SPECIES & SITE HABITAT SUITABILITY								
Species	**Habitat Constraints**	**Geographic Limitations**	**Sensitivity to Gain Class**	**BC Act Listing Status**	**EPBC Act Listing Status**	**Confirmed Predicted Species**	**Predicted PCTs and Vegetation Zones with Suitable Habitat**	**Predicted PCTs and Vegetation Zones with No Suitable Habitat**
Ninox connivens Barking Owl (Foraging)	-	-	High	V	-	Yes	PCT 1619 PCT 1718 PCT 1720 PCT 1915	-
Ninox strenua Powerful Owl (Foraging)	-	-	High	V	-	Yes	PCT 1619 PCT 1915	-
Pandion cristatus Eastern Osprey (Foraging)	-	-	Moderate	V	-	Yes	PCT 1619 PCT 1718 PCT 1720	-
Petaurus australis Yellow-bellied Glider	Hollow bearing trees >25cm diameter hollows	-	High	V	-	No	PCT 1619	Habitat constraints not met
Petroica boodang Scarlet Robin	-	-	Moderate	V	-	Yes	PCT 1619	-
Phascolarctos cinereus Koala (Foraging)	-	-	High	V	V	Yes	PCT 1619 PCT 1718 PCT 1915	-
Phoniscus papuensis Golden-tipped Bat	-	-	High	V	-	Yes	PCT 1619 PCT 1718	-
Pomatostomus temporalis temporalis Grey-crowned Babbler (eastern subspecies)	-	-	Moderate	V	-	Yes	PCT 1619	-

TABLE 4.2
ECOSYSTEM CREDIT SPECIES & SITE HABITAT SUITABILITY

Species	Habitat Constraints	Geographic Limitations	Sensitivity to Gain Class	BC Act Listing Status	EPBC Act Listing Status	Confirmed Predicted Species	Predicted PCTs and Vegetation Zones with Suitable Habitat	Predicted PCTs and Vegetation Zones with No Suitable Habitat
Pseudomys gracilicaudatus Eastern Chestnut Mouse	-	-	High	V	-	Yes	PCT 1619 PCT 1718	-
Pteropus poliocephalus Grey-headed Flying-fox (Foraging)	-	-	High	V	V	Yes	PCT 1619 PCT 1718 PCT 1915	-
Ptilinopus regina Rose-crowned Fruit-Dove	-	-	Moderate	V	-	Yes	PCT 1915	
Superb Fruit-Dove *Ptilinopus superbus*	-	-	Moderate	V	-	Yes	PCT 1915	
Saccolaimus flaviventris Yellow-bellied Sheathtail-bat	-	-	High	V	-	Yes	PCT 1619 PCT 1718 PCT 1915	-
Scoteanax rueppellii Greater Broad-nosed Bat	-	-	High	V	-	Yes	PCT 1619 PCT 1718	-
Tyto novaehollandiae Masked Owl (Foraging)*	-	-	High	V	-	Yes	PCT 1619 PCT 1915	-
Tyto tenebricosa Sooty Owl (Foraging)*	-	-	High	V	-	Yes	PCT 1619 PCT 1718 PCT 1720 PCT 1915	-

* = Additional species not predicted by the BAM Calculator

ii. *Species Credit Species*

'Species credit' species are threatened species which can be reliably detected by survey and for which the likelihood of occurrence or elements of suitable habitat cannot be confidently predicted by vegetation surrogates and landscape features. Some threatened species may also be assessed partly for ecosystem credits and partly for species credits where part of the habitat is assessed as a species credit (such as breeding habitat, or important habitat locations).

An assessment of the candidate species credit type threatened species to determine those for targeted surveys has been completed and is documented in Table 4.3. The species listed include those predicted by the BAM Calculator with suitable habitat present and any threatened species credit species previously identified from the site, if known from previous reports or recorded on the Bionet Atlas (NSW DPIE 2020). The details of individual species habitats, constraints and justifications for any exclusions have been provided based on information obtained from the BAM Calculator, NSW Bionet Threatened Biodiversity Data Collection (NSW DPIE 2020) and additional relevant references, where listed.

TABLE 4.3
CANDIDATE THREATENED SPECIES (SPECIES CREDITS)

Name	Threatened Biodiversity Data Collection Information			Sensitivity to Gain Class	BC Act Status	EPBC Act Status	Suitable Habitat Determination	Justification (if excluded)
	Habitat Description	Habitat Constraints	Geographic Limitations					
Acacia bynoeana Bynoe's Wattle	**Preferred Habitat:** Heath or dry sclerophyll forest on sandy soils. Associated canopy species include Red Bloodwood, Scribbly Gum, Parramatta Red Gum, Saw Banksia and Narrow-leaved Apple. Prefers disturbed areas.	None listed	None listed	High	E	V	Yes	-
Angophora inopina Charmhaven Apple*	Occurs most frequently in four main vegetation communities: (i) *Eucalyptus haemastoma–Corymbia gummifera–Angophora inopina* woodland/forest; (ii) *Hakea teretifolia–Banksia oblongifolia* wet heath; (iii) *Eucalyptus resinifera–Melaleuca sieberi–Angophora inopina* sedge woodland; (iv) *Eucalyptus capitellata–Corymbia gummifera–Angophora inopina* woodland/forest. Populations occur from Toronto to Warnervale and at Karuah	None listed	South of Wootton	High	V	V	Yes	-
Anthochaera phrygia Regent Honeyeater (Breeding)	As per mapped areas	As per mapped areas	As per mapped areas	High	CE	CE	No	Site is not mapped

TABLE 4.3
CANDIDATE THREATENED SPECIES (SPECIES CREDITS)

Name	Threatened Biodiversity Data Collection Information			Sensitivity to Gain Class	BC Act Status	EPBC Act Status	Suitable Habitat Determination	Justification (if excluded)
	Habitat Description	Habitat Constraints	Geographic Limitations					
Astrotricha crassifolia Thick-leaf Star-hair	Occurs in dry sclerophyll woodland on sandstone near Patonga and in the Royal National Park.			Very high	V	V	Yes	-
Burhinus grallarius Bush Stone-curlew	Mainly western slopes and plains and the Riverina. Occurs on the Central and North Coast and Tweed Valley, particularly around larger estuaries.	Fallen/standing dead timber including logs.	None listed	High	E	-	Yes	-
*Caladenia tessellata**	Generally found in grassy sclerophyll woodland on clay loam or sandy soils. Known from Warnervale from one old record, the population has not been relocated.	None listed	None listed	High	V	V	Yes (precautionary inclusion only)	-
Callistemon linearifolius Netted Bottle Brush	Dry sclerophyll forest on the coast and adjacent ranges.	None listed	None listed	High	V	-	Yes	-
Callocephalon fimbriatum Gang-gang Cockatoo (Breeding)	Generally found in tall mountain forests and woodlands in spring and summer. Inhabit lower altitudes in drier more open eucalypt forests and woodlands in autumn and winter.	Eucalypts with hollows >9cm diameter	None listed	High	V	-	No	Habitat constraints not met
Calyptorhynchus lathami Glossy Black-Cockatoo (Breeding)*	Inhabits open forest and woodlands of the coast and the Great Dividing Range where stands of sheoak occur (*Allocasuarina littoralis* and *Allocasuarina torulosa*).	Eucalypts with hollows >15cm diameter >5m off the ground	None listed	High	V	-	No	Habitat constraints not met

TABLE 4.3
CANDIDATE THREATENED SPECIES (SPECIES CREDITS)

Name	Threatened Biodiversity Data Collection Information			Sensitivity to Gain Class	BC Act Status	EPBC Act Status	Suitable Habitat Determination	Justification (if excluded)
	Habitat Description	Habitat Constraints	Geographic Limitations					
Cercartetus nanus Eastern Pygmy-possum	Found in a broad range of habitats from rainforest through sclerophyll (including Box-Ironbark) forest and woodland to heath, but in most areas woodlands and heath appear to be preferred, except in north-eastern NSW where they are most frequently encountered in rainforest. Feeds largely on nectar and pollen collected from banksias, eucalypts and bottlebrushes	None listed	None listed	High	V	-	Yes	-
Chalinolobus dwyeri Large-eared Pied Bat	Found in well-timbered areas containing gullies.	Cliffs or within two kilometres of rocky areas containing caves, overhangs, escarpments, outcrops, or crevices, or within two kilometres of old mines or tunnels.	None listed	Very High	V	V	No	Habitat constraints are not present.

TABLE 4.3
CANDIDATE THREATENED SPECIES (SPECIES CREDITS)

Name	Threatened Biodiversity Data Collection Information			Sensitivity to Gain Class	BC Act Status	EPBC Act Status	Suitable Habitat Determination	Justification (if excluded)
	Habitat Description	Habitat Constraints	Geographic Limitations					
Corunastylis sp. Charmhaven (NSW896673)	Currently only known from the Wyong Shire of NSW where it is restricted to a few locations in the Charmhaven, Warnervale and Tooheys Road (Bushells Ridge) areas. Occurs within low woodland to heathland with a shrubby understorey and ground layer	None listed	None listed	High	CE	CE	Yes (Particularly PCT 1619)	-
Crinia tinnula Wallum Froglet	Acidic swamps on coastal sand plains. They typically occur in sedgelands and wet heathlands. They can also be found along drainage lines within other vegetation communities and disturbed areas, and occasionally in swamp sclerophyll forests.	None listed	None listed-	Moderate	V	-	Yes	-
Cryptostylis hunteriana Leafless Tongue Orchid	Does not have well defined habitat preferences and occurs in a range of communities including swamp-heath and woodland. Larger populations typically occur in woodland dominated by Scribbly Gum (*Eucalyptus sclerophylla*), Silvertop Ash (*E. sieberi*), Red Bloodwood (*Corymbia gummifera*) and Black Sheoak (*Allocasuarina littoralis*); appears to prefer open areas in the understorey.	None listed	None listed	High Sensitivity to Potential Gain	V	V	Yes	-

TABLE 4.3
CANDIDATE THREATENED SPECIES (SPECIES CREDITS)

Name	Threatened Biodiversity Data Collection Information			Sensitivity to Gain Class	BC Act Status	EPBC Act Status	Suitable Habitat Determination	Justification (if excluded)
	Habitat Description	Habitat Constraints	Geographic Limitations					
Diuris praecox Rough Doubletail	Grows on hills and slopes of near-coastal districts in open forests which have a grassy to fairly dense understorey.	None listed	Within the Parish boundaries of Newcastle, Kahibah, Wallarah, Tuggerah and Kincumber	Moderate	V	V	No	Geographic limitations not met
*Eucalyptus camfieldii** Camfield's Stringybark	Poor coastal country in shallow sandy soils overlying Hawkesbury sandstone. Coastal heath mostly on exposed sandy ridges.	None listed	None listed	High	V	V	Yes	-
Eucalyptus oblonga population at Bateau Bay, Forresters Beach and Tumbi Umbi in the Wyong local government area	See geographic limitations	None listed	Bateau Bay, Forresters Beach and Tumbi Umbi areas in the Central Coast Council LGA	High	E. Pop	-	No	Geographic limitations not met
Eucalyptus parramattensis subsp. decadens	Dry sclerophyll woodland with dry heath understorey on deep, low-nutrient sands, often those subject to periodic inundation or where water tables are relatively high.	None listed	None listed	High	V	V	Yes	-

TABLE 4.3
CANDIDATE THREATENED SPECIES (SPECIES CREDITS)

Name	Threatened Biodiversity Data Collection Information			Sensitivity to Gain Class	BC Act Status	EPBC Act Status	Suitable Habitat Determination	Justification (if excluded)
	Habitat Description	Habitat Constraints	Geographic Limitations					
Eucalyptus parramattensis subsp. parramattensis Endangered Population in the Wyong and Lake Macquarie Local Government Areas*	See geographic limitations	None listed	Wyong and Lake Macquarie LGAs	High	E. Pop	-	Yes	-
Genoplesium insigne Variable Midge Orchid	Appears to be associated with PCT 1636 Scribbly Gum – Red Bloodwood – Angophora inopina (not always present) heathy woodland on lowlands of the Central Coast and variations containing Angophora costata (Smooth-barked Apple). Emergence is related to disturbance. Grows in patches of *Themeda triandra*. Other associated species include, but are not limited to, *Mirbelia speciosa, Ptilothrix deusta, Leptospermum trinervium* and *Leptospermum juniperinum* in wet (seasonal) heath settings, *Banksia spinulosa* and *Xanthorrhoea latifolia*, and *Xanthorrhoea media*.	None listed	None listed	High	CE	CE	Yes (particularly PCT 1619)	-

TABLE 4.3
CANDIDATE THREATENED SPECIES (SPECIES CREDITS)

Name	Threatened Biodiversity Data Collection Information			Sensitivity to Gain Class	BC Act Status	EPBC Act Status	Suitable Habitat Determination	Justification (if excluded)
	Habitat Description	Habitat Constraints	Geographic Limitations					
Grevillea parviflora subsp. parviflora Small-flower Grevillea*	Grows in a range of vegetation types in sandy or light clay soils usually over thin shales, often with lateritic ironstone gravels and nodules. Associated with open disturbed areas.	None listed	None listed	High	V	V	Yes	-
Haliaeetus leucogaster White-bellied Sea-Eagle (Breeding)	Breeding habitat consists of mature tall open forest, open forest, tall woodland, and swamp sclerophyll forest close to foraging habitat. Nest trees are typically large emergent eucalypts and often have emergent dead branches or large dead trees nearby which are used as 'guard roosts'. Nests are large structures built from sticks and lined with leaves or grass.	Living or dead mature trees within suitable vegetation within 1km of a rivers, lakes, large dams or creeks, wetlands and coastlines	None listed	High	V	-	Yes	-
Heleioporus australiacus Giant Burrowing Frog	Species is dependent on hanging swamps on the top of sandstone plateaus and deeply dissected gullies that occur as erosion features in the Sydney Basin.	None listed	None listed	Moderate	V	V	No	The microhabitats (sandstone hanging swamps and drainage lines) which this species requires are not present to support this species.

TABLE 4.3
CANDIDATE THREATENED SPECIES (SPECIES CREDITS)

Name	Threatened Biodiversity Data Collection Information			Sensitivity to Gain Class	BC Act Status	EPBC Act Status	Suitable Habitat Determination	Justification (if excluded)
	Habitat Description	Habitat Constraints	Geographic Limitations					
Hieraaetus morphnoides Little Eagle (Breeding)	Nests in tall living trees within a remnant patch, where pairs build a large stick nest in winter. This species is not likely to nest in isolated trees or tolerate human disturbance within at least 50m (Marchant & Higgins 1993; Debus *et al*. 2007).	Suitable nest trees - live (occasionally dead) large old trees within vegetation.	None listed	Moderate	V	-	Yes	-
Hoplocephalus bitorquatus Pale-headed Snake	Found mainly in dry eucalypt forests and woodlands, cypress forest and occasionally in rainforest or moist eucalypt forest. Shelters during the day between loose bark and tree-trunks, or in hollow trunks and limbs of dead trees.	None listed	None listed	High	V	-	Yes	-
Lathamus discolor Swift Parrot (Important Habitat)	As per mapped areas	As per mapped areas	As per mapped areas	Moderate	E	CE	No DPIE have advised that the site is not mapped as important habitat	-
Litoria aurea Green and Golden Bell Frog	Optimum habitat includes water-bodies that are unshaded, free of predatory fish such as Plague Minnow (*Gambusia holbrooki*), have a grassy area nearby and diurnal sheltering sites available.	Semi-permanent / ephemeral wet areas and areas within 1km of water bodies.	None listed	High	E	V	Yes	-

TABLE 4.3
CANDIDATE THREATENED SPECIES (SPECIES CREDITS)

Name	Threatened Biodiversity Data Collection Information			Sensitivity to Gain Class	BC Act Status	EPBC Act Status	Suitable Habitat Determination	Justification (if excluded)
	Habitat Description	Habitat Constraints	Geographic Limitations					
Litoria brevipalmata Green-thighed Frog	Occur in a range of habitats from rainforest and moist eucalypt forest to dry eucalypt forest and heath. Breeding occurs following heavy rainfall from spring to autumn, with larger temporary pools and flooded areas preferred. Occurs in isolated localities along the coast and ranges from just north of Wollongong to south-east Queensland.	None listed	None listed	Moderate	V	-	Yes	
Lophoictinia isura Square-tailed Kite (Breeding)	Nesting is in a tree fork or horizontally angled limb generally near a watercourse or wetland.	Suitable nest trees	None listed	Moderate	V	-	Yes	-
Maundia triglochinoides	Grows in swamps, lagoons, dams, channels, creeks or shallow freshwater 30 - 60 cm deep on heavy clay, low nutrients.	Riparian areas/drainage lines, water ponding, man-made dams and drainage channels up to 1 m deep	None listed	High	V	-	Yes	-
Melaleuca biconvexa Biconvex Paperbark	Damp places, often near streams or low-lying areas on alluvial soils of low slopes or sheltered aspects.	None listed	None listed	High	V	V	Yes	-

TABLE 4.3
CANDIDATE THREATENED SPECIES (SPECIES CREDITS)

Name	Threatened Biodiversity Data Collection Information			Sensitivity to Gain Class	BC Act Status	EPBC Act Status	Suitable Habitat Determination	Justification (if excluded)
	Habitat Description	Habitat Constraints	Geographic Limitations					
Melaleuca groveana Grove's Paperbark	Grows in heath and shrubland, often in exposed sites, in low coastal hills, escarpment ranges and tablelands on outcropping granite, rhyolite and sandstone on rocky outcrops and cliffs.	None listed	None listed	High	V	-	Yes	-
Miniopterus australis Little-bent-winged Bat (Breeding)	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.	Cave, tunnel, mine, culvert or other structure known or suspected to be used for breeding including species records in BioNet with microhabitat code 'IC – in cave'; observation type code 'E nest-roost'; with numbers of individuals >500; or from the scientific literature.	None listed	Very High	V	-	No	Habitat constraints are not met.

TABLE 4.3
CANDIDATE THREATENED SPECIES (SPECIES CREDITS)

Name	Threatened Biodiversity Data Collection Information			Sensitivity to Gain Class	BC Act Status	EPBC Act Status	Suitable Habitat Determination	Justification (if excluded)
	Habitat Description	Habitat Constraints	Geographic Limitations					
Miniopterus orianae oceanensis Large Bent-winged Bat (Breeding)	Caves are the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings and other man-made structures.	Cave, tunnel, mine, culvert or other structure known or suspected to be used for breeding including species records with microhabitat code "IC - in cave;" observation type code "E nest-roost," with numbers of individuals >500	None listed	Very High	V	-	No	Habitat constraints are not met.
Mixophyes balbus Stuttering Frog	Found in rainforest and wet, tall open forest in the foothills and escarpment on the eastern side of the Great Dividing Range.	None listed	None listed	Very High	E	V	Yes	-
Mixophyes iteratus Giant Barred Frog	Freshwater streams with permanent or semi-permanent water, generally (but not always) at lower elevation.	Land within 50m of semi permanent and permanent drainages	None listed	Moderate	E	E	Yes	-

TABLE 4.3
CANDIDATE THREATENED SPECIES (SPECIES CREDITS)

Name	Threatened Biodiversity Data Collection Information			Sensitivity to Gain Class	BC Act Status	EPBC Act Status	Suitable Habitat Determination	Justification (if excluded)
	Habitat Description	Habitat Constraints	Geographic Limitations					
Myotis macropus Southern Myotis	Forage over streams and pools and roost close to water in caves mine shafts, hollow-bearing trees, storm water channels, buildings, under bridges and in dense foliage.	Within 200 m of riparian zone Bridges, caves or artificial structures within 200 m of riparian zone Includes rivers, creeks, billabongs, lagoons, dams and other waterbodies on or within 200m of the site)	None listed	High	V	-	Yes	-
Ninox connivens Barking Owl (Breeding)	Inhabits woodland and open forest, including fragmented remnants and partly cleared farmland	Living or dead trees with hollows greater than 20 cm diameter and greater than 4m above the ground.	None listed	High	V	-	No	Habitat constraints are not met.
Ninox strenua Powerful Owl (Breeding)*	Nest in large tree hollows (at least 0.5 m deep), in large eucalypts (diameter at breast height of 80-240 cm) that are at least 150 years old. While the female and young are in the nest hollow the male Powerful Owl roosts nearby (10-200 m).	Living or dead trees with hollow greater than 20cm diameter.	None listed	High	V	-	No	Habitat constraints are not met.

TABLE 4.3
CANDIDATE THREATENED SPECIES (SPECIES CREDITS)

Name	Threatened Biodiversity Data Collection Information			Sensitivity to Gain Class	BC Act Status	EPBC Act Status	Suitable Habitat Determination	Justification (if excluded)
	Habitat Description	Habitat Constraints	Geographic Limitations					
Pandion cristatus Eastern Osprey (Breeding)	Nests are made high up in dead trees, in dead crowns of live trees, or in artificial structures, usually within one kilometre of the sea. .	Presence of stick-nests in living and dead trees (>15m) or artificial structures within 100m of a floodplain for nesting	None listed	Moderate	V	-	Yes	Habitat constraints are not met / no stick nests present.
Persicaria elatior Tall Knotweed	Grows in damp places, especially beside streams and lakes. Occasionally in swamp forest or associated with disturbance.	Semi-permanent/ephemeral wet areas / within 50m of wet areas, swamps or waterbodies	None listed	Moderate	V	V	Yes	-
Petalura gigantea Giant Dragonfly	Lives in permanent swamps and bogs with some free water and open vegetation. The species does not utilise areas of standing water, although it may utilise suitable boggy areas adjacent to open water wetlands.	Swamps and within 500 m of swamps	None listed	Very High	E	-	Yes	-
Petaurus norfolcensis Squirrel Glider*	Prefers mixed species stands of forest or woodland with a shrub or Acacia midstorey.	None listed	None listed	High	V	-	Yes	-

TABLE 4.3
CANDIDATE THREATENED SPECIES (SPECIES CREDITS)

Name	Threatened Biodiversity Data Collection Information			Sensitivity to Gain Class	BC Act Status	EPBC Act Status	Suitable Habitat Determination	Justification (if excluded)
	Habitat Description	Habitat Constraints	Geographic Limitations					
Petrogale penicillata Brush-tailed Rock-wallaby	Occupy rocky escarpments, outcrops and cliffs with complex structures such as fissures, caves and ledges, often facing north.	Land within 1 km of rocky escarpments, gorges, steep slopes, boulder piles, rock outcrops or clifflines	None listed	Very High	E	V	No	Habitat constraints not met.
Phascogale tapoatafa Brush-tailed Phascogale	Prefer dry sclerophyll open forest with sparse groundcover of herbs, grasses, shrubs or leaf litter. Also inhabits heath, swamps, rainforest and wet sclerophyll forest.	None listed	None listed	High	V	-	No	Site is too disturbed due to habitat fragmentation between the site and occupied areas. There are no records for this species on the Central Coast LGA east of the M1 Motorway
Phascolarctos cinereus Koala (Important Habitat)*	Inhabit eucalypt woodlands and forests.	Areas identified via survey as important habitat by the density of koalas and quality of habitat	None listed	High	V	V	Yes	-

TABLE 4.3
CANDIDATE THREATENED SPECIES (SPECIES CREDITS)

Name	Threatened Biodiversity Data Collection Information			Sensitivity to Gain Class	BC Act Status	EPBC Act Status	Suitable Habitat Determination	Justification (if excluded)
	Habitat Description	Habitat Constraints	Geographic Limitations					
Planigale maculata Common Planigale	Inhabits rainforest, eucalypt forest, heathland, marshland, grassland and rocky areas where there is surface cover, and usually close to water. The species reaches its confirmed southern distribution limit on the NSW lower north coast	None listed	None listed	High	V	-	Yes	-
Potorous tridactylus Long-nosed Potoroo	Inhabits coastal heaths and dry and wet sclerophyll forests. Dense understorey with occasional open areas is an essential part of habitat, and may consist of grass-trees, sedges, ferns or heath, or of low shrubs of tea-trees or melaleucas. A sandy loam soil is also a common feature.	Dense shrub layer or alternatively high canopy cover exceeding 70%.	None listed	High	V	V	Yes	-
Prostanthera askania Tranquility Mintbush	Occurs over a very restricted geographic range (of less than 12 km) mainly in the upper reaches of creeks that flow into Tuggerah Lake or Brisbane Water within the Wyong and Gosford local government areas.	-	South of Wyong River in Central Coast LGA	High	E	E	No	Geographic constraints not met

TABLE 4.3
CANDIDATE THREATENED SPECIES (SPECIES CREDITS)

Name	Threatened Biodiversity Data Collection Information			Sensitivity to Gain Class	BC Act Status	EPBC Act Status	Suitable Habitat Determination	Justification (if excluded)
	Habitat Description	Habitat Constraints	Geographic Limitations					
Pseudophryne australis Red-crowned Toadlet	Occurs in open forests, mostly on Hawkesbury and Narrabeen Sandstones. Inhabits periodically wet drainage lines below sandstone ridges that often have shale lenses or cappings	None listed	None listed	Moderate	V	-	No	The microhabitats which this species requires are not present (periodically wet drainage lines below sandstone ridges on Hawkesbury and Narrabeen Sandstone).
Pteropus poliocephalus Grey-headed Flying-fox (Breeding)*	Roosting camps are generally located within 20 km of a regular food source and are commonly found in gullies, close to water, in vegetation with a dense canopy.	Breeding camps	None listed	High	V	V	No	Habitat constraints are not met
Rhodamnia rubescens Scrub Turpentine	Found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest usually on volcanic and sedimentary soils.	None listed	None listed	High	CE	-	Yes	

TABLE 4.3
CANDIDATE THREATENED SPECIES (SPECIES CREDITS)

Name	Threatened Biodiversity Data Collection Information			Sensitivity to Gain Class	BC Act Status	EPBC Act Status	Suitable Habitat Determination	Justification (if excluded)
	Habitat Description	Habitat Constraints	Geographic Limitations					
Rhodomyrtus psidioides Native Guava	Pioneer species found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest often near creeks and drainage lines.	None listed	None listed	High	CE	-	Yes	
Rutidosis heterogama Heath Wrinklewort	Grows in heath on sandy soils and moist areas in open forest, and has been recorded along disturbed roadsides.	None listed	None listed	High	V	-	Yes	
Tetratheca glandulosa	Shale-sandstone transition, associated soil landscapes such as Lucas Heights, Gymea, Lambert and Faulconbridge.	None listed	None listed	High	V	-	Yes	-
Tetratheca juncea Black-eyed Susan	Found in low open forest/woodland with a mixed shrub understorey and grassy groundcover. However, it has also been recorded in heathland and moist forest.	None listed	None listed	High	V	V	Yes	-
Thelymitra adorata Wyong Sun Orchid*	Most records occur in Spotted Gum – Ironbark Forest, some records where Alluvial Redgum Footslopes Forest and Alluvial Floodplain Shrub Swamp Forest adjoins Dooralong Spotted Gum - Ironbark Forest.	None listed	None listed	High	CE	CE	Yes	-

TABLE 4.3
CANDIDATE THREATENED SPECIES (SPECIES CREDITS)

Name	Threatened Biodiversity Data Collection Information			Sensitivity to Gain Class	BC Act Status	EPBC Act Status	Suitable Habitat Determination	Justification (if excluded)
	Habitat Description	Habitat Constraints	Geographic Limitations					
Tyto novaehollandiae Masked Owl (Breeding)	Roosts and breeds in moist eucalypt forested gullies, using large tree hollows or sometimes caves for nesting.	Living or dead trees with hollows greater than 20cm diameter.	None listed	High	V	-	No	Habitat constraints not present.
*Tyto tenebricosa** Sooty Owl (Breeding)	Occurs in rainforest, including dry rainforest, subtropical and warm temperate rainforest, as well as moist eucalypt forests.	Caves or clifflines/ledges|Hollow bearing trees. Living or dead trees with hollows greater than 20cm diameter	None listed.	Very High	V	-	No	Habitat constraints not present
Uperoleia mahonyi Mahony's Toadlet	Inhabits ephemeral and semi-permanent swamps and swales on the coastal fringe of its range. Known records occur in heath or wallum habitats almost exclusively associated with leached (highly nutrient impoverished) white sand. Commonly associated with acid paperbark swamps	None listed	None listed	High	E	-	Yes	-

*= Additional non BAM predicted candidate species
V = Vulnerable, E = Endangered. CE = Critically Endangered, E.Pop = Endangered Population

4.3 THREATENED SPECIES TARGETED SURVEY METHODS

i. *Threatened Flora Surveys Completed*

Targeted surveys were completed for all threatened flora species were generally in accordance with the NSW Guide to Surveying Threatened Plants (NSW OEH 2020). Parallel field traverses of approximately 5-10m width were undertaken throughout the areas of the site which contain suitable habitat for the target threatened flora species. Details on the targeted surveys completed for candidate threatened flora species are listed in Table 4.4 and survey locations are shown in Figure 4.1.

TABLE 4.4
THREATENED FLORA SURVEY DETAILS

Survey Date	Survey Method	Time Spent	Surveyor
26 September 2019	Parallel field traverses	2hrs 1200-1400	AM/DC
30 September 2019	Parallel field traverses	2.5hrs 1330-1600	JM/DC
24 October 2019	Parallel field traverses	4hrs 1300-1700	JM/AM
19 November 2019	Parallel field traverses	2.5hrs 0900-1130	JM/AM
15 January 2020	Parallel field traverses	2.5hrs 1000-1230	JM/AM
25 February 2020	Parallel field traverses	5.5hrs 0830-1400	JM/AM/BF
12 March 2020	Parallel field traverses	2.5hrs 1600-1830	JM/AM

ii. *Fauna Surveys Completed*

Targeted surveys were completed for the candidate threatened species identified in Table 4.3. The surveys undertaken were generally in accordance with the following survey methods:

- Field Survey methods – Field survey methods for environmental consultants and surveyors when assessing proposed development or other activities on sites containing threatened species (NSW DEC 2004a)
- Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities (DEC 2004b)
- 'Species Credit' Threatened Bats and their Habitats – NSW Survey Guide for the Biodiversity Assessment Method (NSW OEH 2018)
- Bat Calls of NSW – Region Based Guide to the echolocation calls of microchiropteran bats (Pennay *et al.*, 2004)
- Threatened species survey and assessment guidelines: field survey methods for fauna – Amphibians (DECC NSW 2009)

The fauna surveys completed included the following:

- Habitat assessment and hollow bearing tree search / assessment;
- Diurnal census including:
  - Nest site searches for candidate raptor species;
  - Diurnal site traverses and census surveys;
  - Searches for microbat roost sites;
  - Diurnal amphibian habitat searches and tadpole searches;
- Nocturnal census including:
  - Nocturnal Spotlighting; and
  - Threatened nocturnal fauna call playback.
- Remote detection surveys

- Arboreal and terrestrial mammal baited remote camera survey; and
- Ultrasonic microbat call recording.

Fauna survey effort details are provided in Table 4.5 and the locations of targeted threatened species surveys are mapped in Figure 4.1. Additional details on weather conditions are provided in Appendix 3.

TABLE 4.5
FAUNA SURVEY DETAILS

Survey Type	Date	Survey Method	Weather Conditions	Survey Effort/Time
Diurnal Surveys	26 September 2019	Candidate threatened species search Amphibian search Hollow bearing tree search Raptor stick nest search	Fine, 22°C (heavy rain in week prior)	2hrs x 2 persons 1200-1400
	24 October 2019	Candidate threatened species search Hollow bearing tree search Raptor stick nest search	Warm and fine, 24°C	4hrs x 2 persons 1300-1700
	19 November 2019	Candidate threatened species search Hollow bearing tree search Raptor stick nest search	Warm and fine, 26°C	2.5hrs x 2 persons 0900-1130
	15 January 2020	Candidate threatened species search Hollow bearing tree search Raptor stick nest search	Warm and fine, 27°C	2.5hrs x 2 persons 1000-1230
	11 February 2020	Amphibian search	Warm 26°C, heavy rain for 4 days prior. Light showers during survey	1hr x 2 persons 1700-1845
	25 February 2020	Candidate threatened species search Hollow bearing tree search Raptor stick nest search	Warm and fine, 28°C	5.5hrs x 2 persons 0830-1400
	12 March 2020	Candidate threatened species search Hollow bearing tree search Raptor stick nest search	Overcast, 24°C	2.5hrs x 2 persons 1600-1830
Nocturnal Surveys	9 October 2019	Spotlighting Amphibian search Listening for calls Call playback for threatened nocturnal fauna	Overcast, light showers, 17°C	1.25hrs x 1 person 1845-2000

TABLE 4.5
FAUNA SURVEY DETAILS

Survey Type	Date	Survey Method	Weather Conditions	Survey Effort/Time
	7 November 2019	Spotlighting Amphibian search Listening for calls Call playback for threatened nocturnal fauna	Warm, 27°C, pools of water present within the creek, rain 2 and 3 days prior.	1hr x 1 person 1930-2100
	21 January 2020	Spotlighting Amphibian search Listening for calls Call playback for threatened nocturnal fauna	Overcast, rain 1,2 and 3 days prior. Pools of water present within the creek	1.5hrs x 1 person 2000-2130
	20 February 2020	Spotlighting Amphibian search Listening for calls Call playback for threatened nocturnal fauna	Overcast, 23°C, Extensive rainfall experienced in 2 weeks prior. Wet ground conditions	2hrs x 2 persons 1900-2100
Remote Detection & Trapping Surveys	20 February 2020 to 29 February 2020	Ultrasonic bat call recording x 2 units	Variable	18 nights (9 nights continuous overnight recording)
	21 April 2020 to 9 June 2020	Baited remote arboreal camera trapping (checked and rebaited 20 May 2020)	Variable	9 cameras x 49 nights (441 camera trap nights)
	21 July 2020 to 6 August 2020	Baited remote terrestrial camera trapping	Variable	5 cameras x 16 nights (80 camera trap nights)

Figure 4.1a
Threatened Species Meander Search Locations
Sparks Road, Warnervale

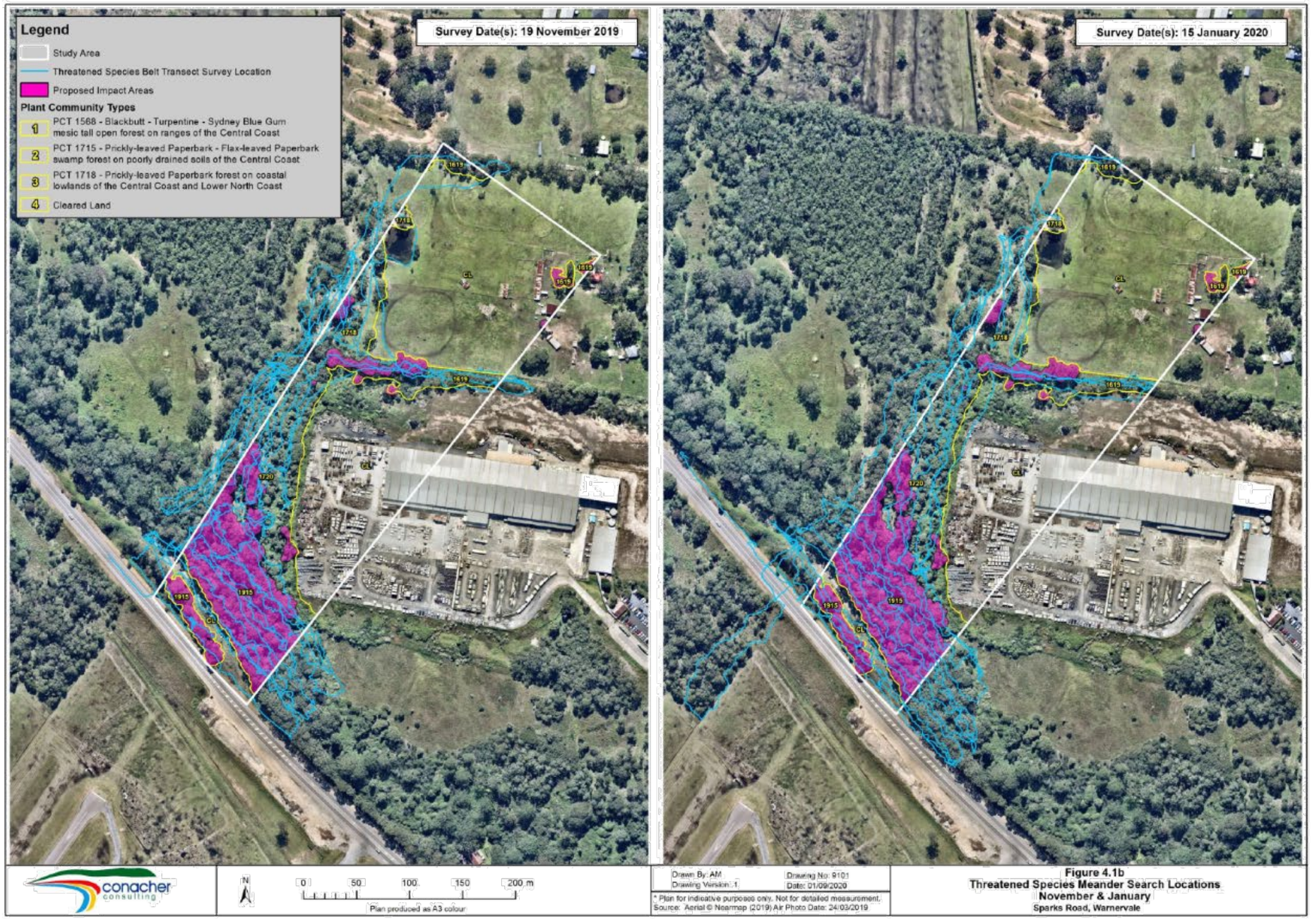


Figure 4.1b
Threatened Species Meander Search Locations
November & January
Sparks Road, Warnervale

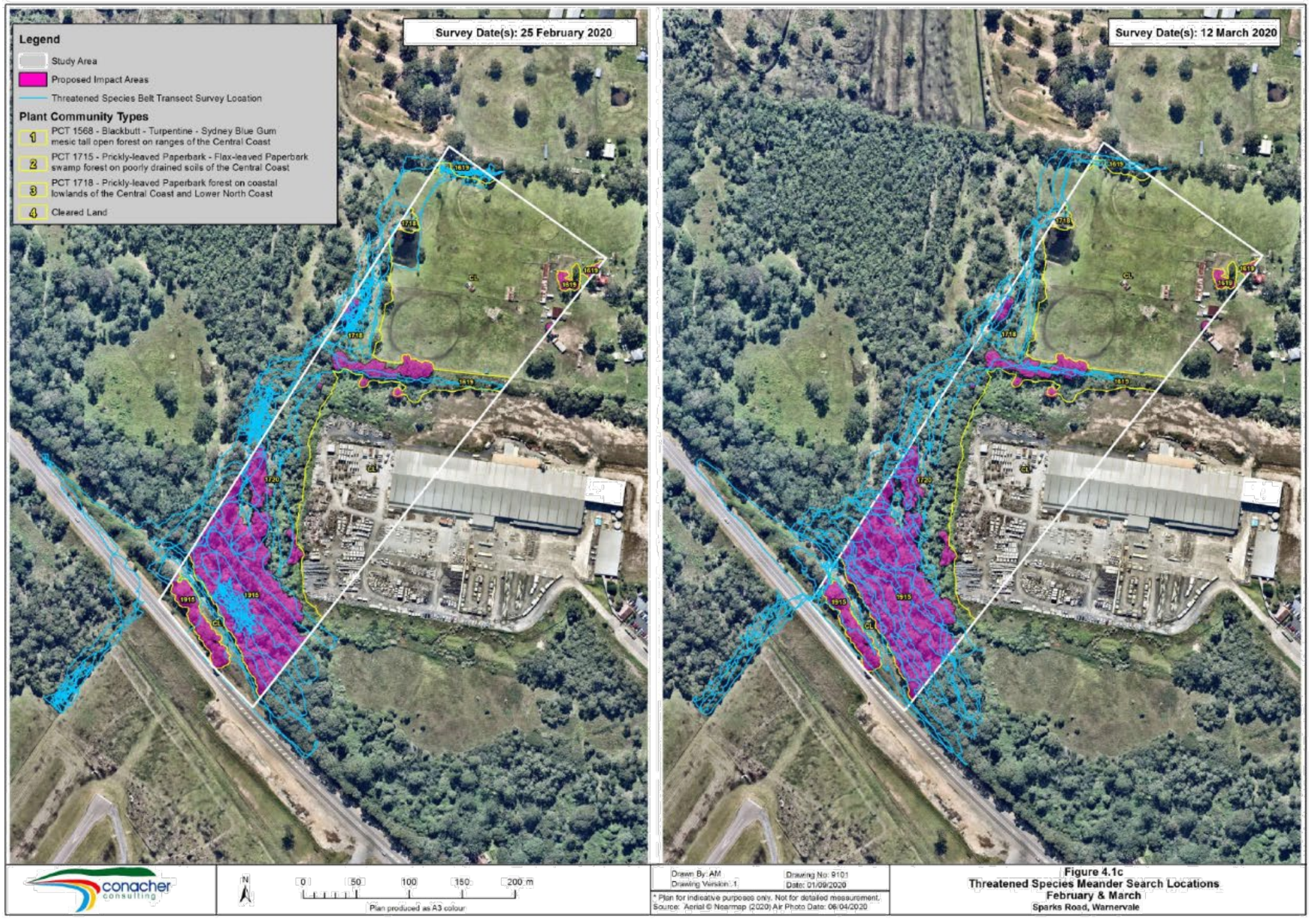


Figure 4.1c
Threatened Species Meander Search Locations
February & March
Sparks Road, Warnervale

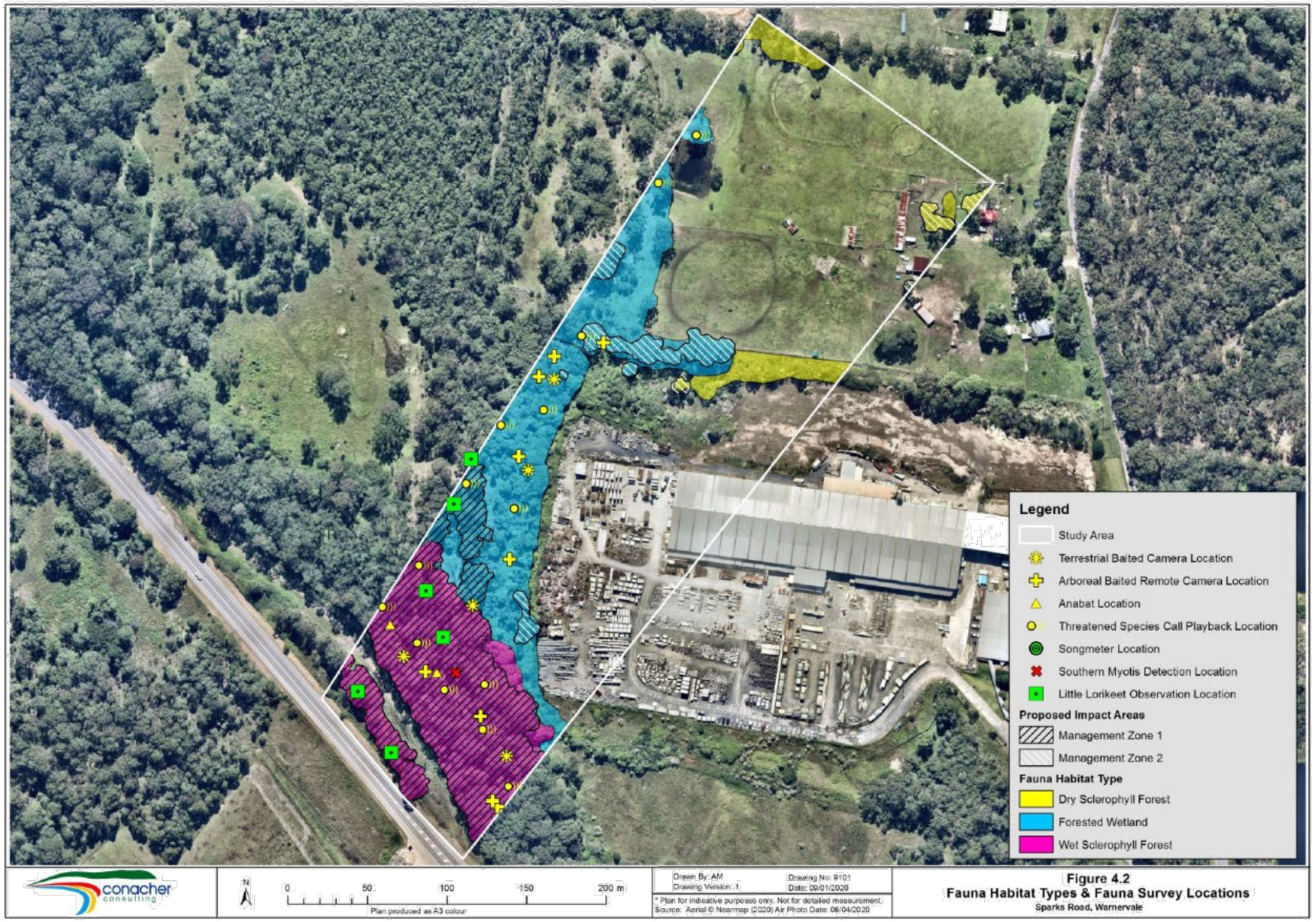


Figure 4.2
Fauna Habitat Types & Fauna Survey Locations
Sparks Road, Warnervale

4.4 THREATENED SPECIES SURVEY RESULTS

i. *Candidate Threatened Species Targeted Survey Results*

A summary of the survey effort and details of the survey results and potential occurrence for the candidate threatened species is provided in Table 4.6.

TABLE 4.6
CANDIDATE THREATENED SPECIES SURVEY RESULTS

Species	Survey Period	Survey Methods Applied	Observation Details
Acacia bynoeana Bynoe's Wattle	All year	Parallel Field Searches 30 September 2019 15 January 2020	Not observed
Angophora inopina Charmhaven Apple*	All year	Parallel Field Searches 15 January 2020 2.5 hrs x 2 persons) 25 February 2020 (5.5hrs x 3 persons)	Not observed
Astrotricha crassifolia Thick-leaf Star-hair	July to December	Parallel Field Searches 19 November 2019 2.5hrs x 2 persons 0900-1130	Not observed and no populations located nearby
Burhinus grallarius Bush Stone-curlew	All year	Diurnal search 26 September 2019 2hrs x 2 persons 1200-1400 Nocturnal searches / spotlighting 9 October 2019 1.25hrs x 1 person 1845-2000 7 November 2019 1hr x 1 person 1930-2100 21 January 2020 1.5hrs x 1 person 2000-2130 20 February 2020 2hrs x 2 persons 1900-2100	Not observed
*Caladenia tessellata** Thick-lipped Spider-orchid	September	Parallel Field Searches 26 September 2019 (2hrs x 2 persons) 30 September 2019 (2.5hrs x 2 persons)	Not observed
Callistemon linearifolius Netted Bottle Brush	October to January (x 2 surveys)	Parallel Field Searches 19 November 2019 2.5hrs x 2 persons) 15 January 2020 2.5 hrs x 2 persons)	Not observed

TABLE 4.6 CANDIDATE THREATENED SPECIES SURVEY RESULTS			
Species	**Survey Period**	**Survey Methods Applied**	**Observation Details**
Cercartetus nanus Eastern Pygmy-possum	December to March	Spotlighting 21 January 2020 1.5hrs x 1 person 2000-2130 20 February 2020 2hrs x 2 persons 1900-2100 Baited Remote Camera Trapping 441 Arboreal trap nights (April to June 2020) 80 terrestrial trap nights (July to August 2020)	Not observed Extended survey undertaken on shoulder of peak survey period / outside of peak season.
Corunastylis sp. Charmhaven (NSW896673)	Survey when a nearby reference population is in flower, somewhere between Nov - Apr. Survey in Nov - Dec. If not found survey again in Jan - Feb and again in Mar - Apr, 2 weeks after a rainfall event.	Parallel Field Searches 19 November 2019 2.5hrs x 2 persons) 15 January 2020 2.5 hrs x 2 persons) 25 February 2020 (5.5hrs x 3 persons) 12 March 2020 2.5hrs x 2 persons)	Not observed

TABLE 4.6
CANDIDATE THREATENED SPECIES SURVEY RESULTS

Species	Survey Period	Survey Methods Applied	Observation Details
Crinia tinnula Wallum Froglet	All year	Diurnal searches / Opportunistic call detection and call playback 26 September 2019 2hrs x 2 persons 1200-1400 24 October 2019 4hrs x 2 persons 1300-1700 19 November 2019 2.5hrs x 2 persons 0900-1130 15 January 2020 2.5hrs x 2 persons 1000-1230 11 February 2020 1hr x 2 persons 1700-1845 25 February 2020 5.5hrs x 2 persons 0830-1400 12 March 2020 2.5hrs x 2 persons 1600-1830 Nocturnal searches / spotlighting / call playback 9 October 2019 1.25hrs x 1 person 1845-2000 7 November 2019 1hr x 1 person 1930-2100 21 January 2020 1.5hrs x 1 person 2000-2130 20 February 2020 2hrs x 2 persons 1900-2100	Not observed
Cryptostylis hunteriana Leafless Tongue Orchid	November to December	Parallel Field Searches 19 November 2019 2.5hrs x 2 persons) 15 January 2020 2.5 hrs x 2 persons)	Not observed

TABLE 4.6
CANDIDATE THREATENED SPECIES SURVEY RESULTS

Species	Survey Period	Survey Methods Applied	Observation Details
Eucalyptus parramattensis subsp. decadens	All year	Parallel Field Searches 30 September 2019 (2.5hrs x 2 persons) 25 February 2020 (5.5hrs x 3 persons)	Not observed
Eucalyptus parramattensis subsp. parramattensis Endangered Population in the Wyong and Lake Macquarie Local Government Areas*	All year	Parallel Field Searches 30 September 2019 (2.5hrs x 2 persons) 25 February 2020 (5.5hrs x 3 persons)	Not observed
Genoplesium insigne Variable Midge Orchid	Survey when a nearby reference population is in flower. Survey Sep to early Oct. If not located, survey again in mid-Oct to Nov.	Parallel Field Searches 26 September 2019 (2hrs x 2 persons) 30 September 2019 (2.5hrs x 2 persons) 24 October 2019 (4hrs x 2 persons) 19 November 2019 2.5hrs x 2 persons)	Not observed
Grevillea parviflora subsp. parviflora Small-flower Grevillea	August - November	24 October 2019 (4hrs x 2 persons) 19 November 2019 2.5hrs x 2 persons)	Not observed
Haliaeetus leucogaster White-bellied Sea-Eagle (Breeding)	July - December	Diurnal nest searches and species census 26 September 2019 2hrs x 2 persons 1200-1400 24 October 2019 4hrs x 2 persons 1300-1700	Not observed
Hieraaetus morphnoides Little Eagle (Breeding)	August - October	Diurnal nest searches and species census 26 September 2019 2hrs x 2 persons 1200-1400 24 October 2019 4hrs x 2 persons 1300-1700	Not observed

TABLE 4.6
CANDIDATE THREATENED SPECIES SURVEY RESULTS

Species	Survey Period	Survey Methods Applied	Observation Details
Hoplocephalus bitorquatus Pale-headed Snake	November to March	Nocturnal searches / spotlighting 7 November 2019 1hr x 1 person 1930-2100 21 January 2020 1.5hrs x 1 person 2000-2130 20 February 2020 2hrs x 2 persons 1900-2100	Not observed
Litoria aurea Green and Golden Bell Frog	November - March	Diurnal searches / Opportunistic call detection and call playback 19 November 2019 2.5hrs x 2 persons 0900-1130 15 January 2020 2.5hrs x 2 persons 1000-1230 11 February 2020 1hr x 2 persons 1700-1845 25 February 2020 5.5hrs x 2 persons 0830-1400 12 March 2020 2.5hrs x 2 persons 1600-1830 Nocturnal searches / spotlighting / call playback 7 November 2019 1hr x 1 person 1930-2100 21 January 2020 1.5hrs x 1 person 2000-2130 20 February 2020 2hrs x 2 persons 1900-2100	Not observed

TABLE 4.6
CANDIDATE THREATENED SPECIES SURVEY RESULTS

Species	Survey Period	Survey Methods Applied	Observation Details
Litoria brevipalmata Green-thighed Frog	October - March	Diurnal searches / Opportunistic call detection and call playback 24 October 2019 4hrs x 2 persons 1300-1700 19 November 2019 2.5hrs x 2 persons 0900-1130 15 January 2020 2.5hrs x 2 persons 1000-1230 11 February 2020 1hr x 2 persons 1700-1845 25 February 2020 5.5hrs x 2 persons 0830-1400 12 March 2020 2.5hrs x 2 persons 1600-1830 Nocturnal searches / spotlighting / call playback Nocturnal searches / spotlighting / call playback 9 October 2019 1.25hrs x 1 person 1845-2000 7 November 2019 1hr x 1 person 1930-2100 21 January 2020 1.5hrs x 1 person 2000-2130 20 February 2020 2hrs x 2 persons 1900-2100	Not observed

TABLE 4.6
CANDIDATE THREATENED SPECIES SURVEY RESULTS

Species	Survey Period	Survey Methods Applied	Observation Details
Lophoictinia isura Square-tailed Kite (Breeding)*	September to January	Diurnal nest searches and species census 26 September 2019 2hrs x 2 persons 1200-1400 24 October 2019 4hrs x 2 persons 1300-1700	Not observed
*Maundia triglochinoides**	November - March	15 January 2020 2.5 hrs x 2 persons) 25 February 2020 (5.5hrs x 3 persons)	Not observed
Melaleuca biconvexa Biconvex Paperbark	All year	24 October 2019 (4hrs x 2 persons) 19 November 2019 2.5hrs x 2 persons)	Observed during surveys
Melaleuca groveana Grove's Paperbark	All year	24 October 2019 (4hrs x 2 persons) 19 November 2019 2.5hrs x 2 persons 0900-1130	Not observed

TABLE 4.6
CANDIDATE THREATENED SPECIES SURVEY RESULTS

Species	Survey Period	Survey Methods Applied	Observation Details
Mixophyes balbus Stuttering Frog	September to March	Diurnal searches / Opportunistic call detection and call playback 26 September 2019 2hrs x 2 persons 1200-1400 24 October 2019 4hrs x 2 persons 1300-1700 19 November 2019 2.5hrs x 2 persons 0900-1130 15 January 2020 2.5hrs x 2 persons 1000-1230 11 February 2020 1hr x 2 persons 1700-1845 25 February 2020 5.5hrs x 2 persons 0830-1400 12 March 2020 2.5hrs x 2 persons 1600-1830 Nocturnal searches / spotlighting / call playback Nocturnal searches / spotlighting / call playback 9 October 2019 1.25hrs x 1 person 1845-2000 7 November 2019 1hr x 1 person 1930-2100 21 January 2020 1.5hrs x 1 person 2000-2130 20 February 2020 2hrs x 2 persons 1900-2100	Not observed

TABLE 4.6
CANDIDATE THREATENED SPECIES SURVEY RESULTS

Species	Survey Period	Survey Methods Applied	Observation Details
Mixophyes iterus Giant Barred Frog	October to March	Diurnal searches / Opportunistic call detection and call playback 24 October 2019 4hrs x 2 persons 1300-1700 19 November 2019 2.5hrs x 2 persons 0900-1130 15 January 2020 2.5hrs x 2 persons 1000-1230 11 February 2020 1hr x 2 persons 1700-1845 25 February 2020 5.5hrs x 2 persons 0830-1400 12 March 2020 2.5hrs x 2 persons 1600-1830 Nocturnal searches / spotlighting / call playback Nocturnal searches / spotlighting / call playback 9 October 2019 1.25hrs x 1 person 1845-2000 7 November 2019 1hr x 1 person 1930-2100 21 January 2020 1.5hrs x 1 person 2000-2130 20 February 2020 2hrs x 2 persons 1900-2100	Not observed.
Myotis macropus Southern Myotis*	October to March	18 nights of Ultrasonic bat call recording 2 units x 9 nights (February 2020)	Recorded during surveys

TABLE 4.6
CANDIDATE THREATENED SPECIES SURVEY RESULTS

Species	Survey Period	Survey Methods Applied	Observation Details
Pandion cristatus Eastern Osprey	April - November	Diurnal nest searches and species census 26 September 2019 2hrs x 2 persons 1200-1400 24 October 2019 4hrs x 2 persons 1300-1700	Not observed
Persicaria elatior Tall Knotweed	December to May	15 January 2020 2.5 hrs x 2 persons) 25 February 2020 (5.5hrs x 3 persons)	Not observed
Petalura gigantea Giant Dragonfly	December to January	Diurnal search 15 January 2020 2.5hrs x 2 persons 1000-1230	Not observed
Petaurus norfolcensis Squirrel Glider*	All year	Spotlighting 9 October 2019 1.25hrs x 1 person 1845-2000 7 November 2019 1hr x 1 person 1930-2100 21 January 2020 1.5hrs x 1 person 2000-2130 20 February 2020 2hrs x 2 persons 1900-2100 Baited Remote Camera Trapping 441 Arboreal trap nights (April to June 2020) 80 terrestrial trap nights (July to August 2020)	Possible individual recorded during camera trapping. Known to occur in the area and assumed to occur on site.
Phascolarctos cinereus Koala (Breeding)	All year	Diurnal searches / Opportunistic call detection 26 September 2019 2hrs x 2 persons 1200-1400 24 October 2019 4hrs x 2 persons 1300-1700 19 November 2019	Not observed

TABLE 4.6
CANDIDATE THREATENED SPECIES SURVEY RESULTS

Species	Survey Period	Survey Methods Applied	Observation Details
		2.5hrs x 2 persons 0900-1130 15 January 2020 2.5hrs x 2 persons 1000-1230 11 February 2020 1hr x 2 persons 1700-1845 25 February 2020 5.5hrs x 2 persons 0830-1400 12 March 2020 2.5hrs x 2 persons 1600-1830 Nocturnal searches / spotlighting / call playback 9 October 2019 1.25hrs x 1 person 1845-2000 7 November 2019 1hr x 1 person 1930-2100 21 January 2020 1.5hrs x 1 person 2000-2130 20 February 2020 2hrs x 2 persons 1900-2100 Baited Remote Camera Trapping 441 Arboreal trap nights (April to June 2020) 80 terrestrial trap nights (July to August 2020)	
Planigale maculata Common Planigale	All year	Baited Remote Camera Trapping 441 Arboreal trap nights (April to June 2020) 80 terrestrial trap nights (July to August 2020)	Not observed

TABLE 4.6
CANDIDATE THREATENED SPECIES SURVEY RESULTS

Species	Survey Period	Survey Methods Applied	Observation Details
Potorous tridactylus Long-nosed Potoroo	All year	Nocturnal searches / spotlighting 9 October 2019 1.25hrs x 1 person 1845-2000 7 November 2019 1hr x 1 person 1930-2100 21 January 2020 1.5hrs x 1 person 2000-2130 20 February 2020 2hrs x 2 persons 1900-2100 Baited Remote Camera Trapping 80 terrestrial trap nights (July to August 2020)	Not observed
Rhodamnia rubescens Scrub Turpentine	All year	24 October 2019 (4hrs x 2 persons) 19 November 2019 2.5hrs x 2 persons)	Not observed
Rhodomyrtus psidioides Native Guava	All year	24 October 2019 (4hrs x 2 persons) 19 November 2019 2.5hrs x 2 persons)	Not observed
Rutidosis heterogama	All year	30 September 2019 (2.5hrs x 2 persons) 24 October 2019 (4hrs x 2 persons) 19 November 2019 2.5hrs x 2 persons)	
Tetratheca glandulosa	August to November	30 September 2019 (2.5hrs x 2 persons) 24 October 2019 (4hrs x 2 persons)	Not observed
Tetratheca juncea Black-eyed Susan	September to October	30 September 2019 (2.5hrs x 2 persons) 24 October 2019 (4hrs x 2 persons) 19 November 2019 2.5hrs x 2 persons)	Not observed

TABLE 4.6
CANDIDATE THREATENED SPECIES SURVEY RESULTS

Species	Survey Period	Survey Methods Applied	Observation Details
Thelymitra adorata Wyong Sun Orchid*	September to October	26 September 2019 (2hrs x 2 persons) 30 September 2019 (2.5hrs x 2 persons) 24 October 2019 (4hrs x 2 persons)	Not observed
Uperoleia mahonyi Mahony's Toadlet	October to March	Diurnal searches / Opportunistic call detection and call playback 24 October 2019 4hrs x 2 persons 1300-1700 19 November 2019 2.5hrs x 2 persons 0900-1130 15 January 2020 2.5hrs x 2 persons 1000-1230 11 February 2020 1hr x 2 persons 1700-1845 25 February 2020 5.5hrs x 2 persons 0830-1400 12 March 2020 2.5hrs x 2 persons 1600-1830 Nocturnal searches/ spotlighting / call playback 9 October 2019 1.25hrs x 1 person 1845-2000 7 November 2019 1hr x 1 person 1930-2100 21 January 2020 1.5hrs x 1 person 2000-2130 20 February 2020 2hrs x 2 persons 1900-2100	Not observed

i. *Candidate threatened Species Observations and Species Polygons*

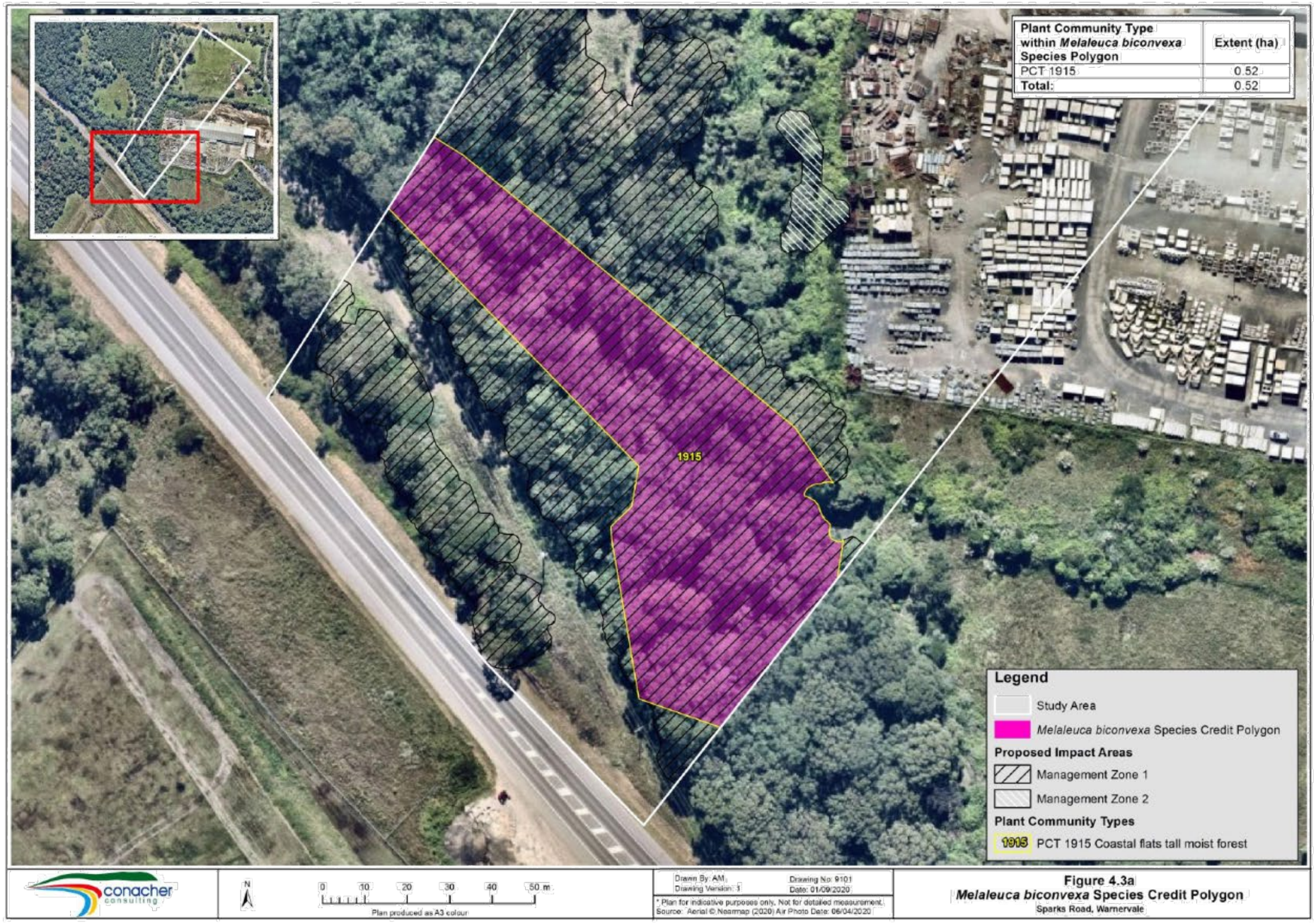
The following candidate species credit threatened species were observed during surveys:

- Biconvex Paperbark (*Melaleuca biconvexa*)
- Squirrel Glider (*Petaurus norfolcensis*)
- Southern Myotis (*Myotis macropus*)

Biconvex Paperbark (*Melaleuca biconvexa*)

The Threatened Biodiversity Data Collection identifies this species ggenerally grows in damp places, often near streams or low-lying areas on alluvial soils of low slopes or sheltered aspects.

A patch of *Melaleuca biconvexa* was observed and recorded by GPS in the southern section of the site. This species occupies approximately 0.52 ha within the proposed impact area as mapped in Figure 4.3a.


Plant Community Type within Melaleuca biconvexa Species Polygon
Extent (ha)
PCT 1915
0.52
Total:
0.52
1915
Legend
Study Area
Melaleuca biconvexa Species Credit Polygon
Proposed Impact Areas
Management Zone 1
Management Zone 2
Plant Community Types
1915 PCT 1915 Coastal flats tall moist forest
conacher consulting
N
0 10 20 30 40 50 m
Plan produced as A3 colour
Drawn By: AM
Drawing Version: 1
Drawing No: 9101
Date: 01/09/2020
* Plan for indicative purposes only, Not for detailed measurement.
Source: Aerial © Nearmap (2020) Air Photo Date: 06/04/2020
Figure 4.3a
Melaleuca biconvexa Species Credit Polygon
Sparks Road, Warnervale

Southern Myotis (*Myotis macropus*)
The Southern Myotis was recorded during ultrasonic bat call recording surveys within the site.

The Threatened Biodiversity Data Collection identifies the following in relation to the habitat features utilised by this species:

- It generally roosts 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.

- It forages over streams and pools catching insects and small fish by raking their feet across the water surface.

The species polygon for this species is calculated in accordance with the requirements of the '*Species Credit' threatened bats and their habitats NSW Survey Guide for the Biodiversity Assessment Method* (NSW OEH 2018). The guide identifies that the species polygon for the Southern Myotis is to include:

All habitat on the subject land where the subject land is within 200m of a waterbody with pools/ stretches 3m or wider including rivers, creeks, billabongs, lagoons, dams and other waterbodies on the subject land.

All PCTs within 200m of waterbodies at least 3m wide (as determined from site surveys) were included within the Southern Myotis species polygon, which is mapped in Figure 4.3b and occupies approximately 1.54 ha.

Plant Community Type within Southern Myotis Species Polygon	Extent (ha)
PCT 1619	0.04
PCT 1718	0.16
PCT 1720	0.20
PCT 1915	1.14
Total:	1.54

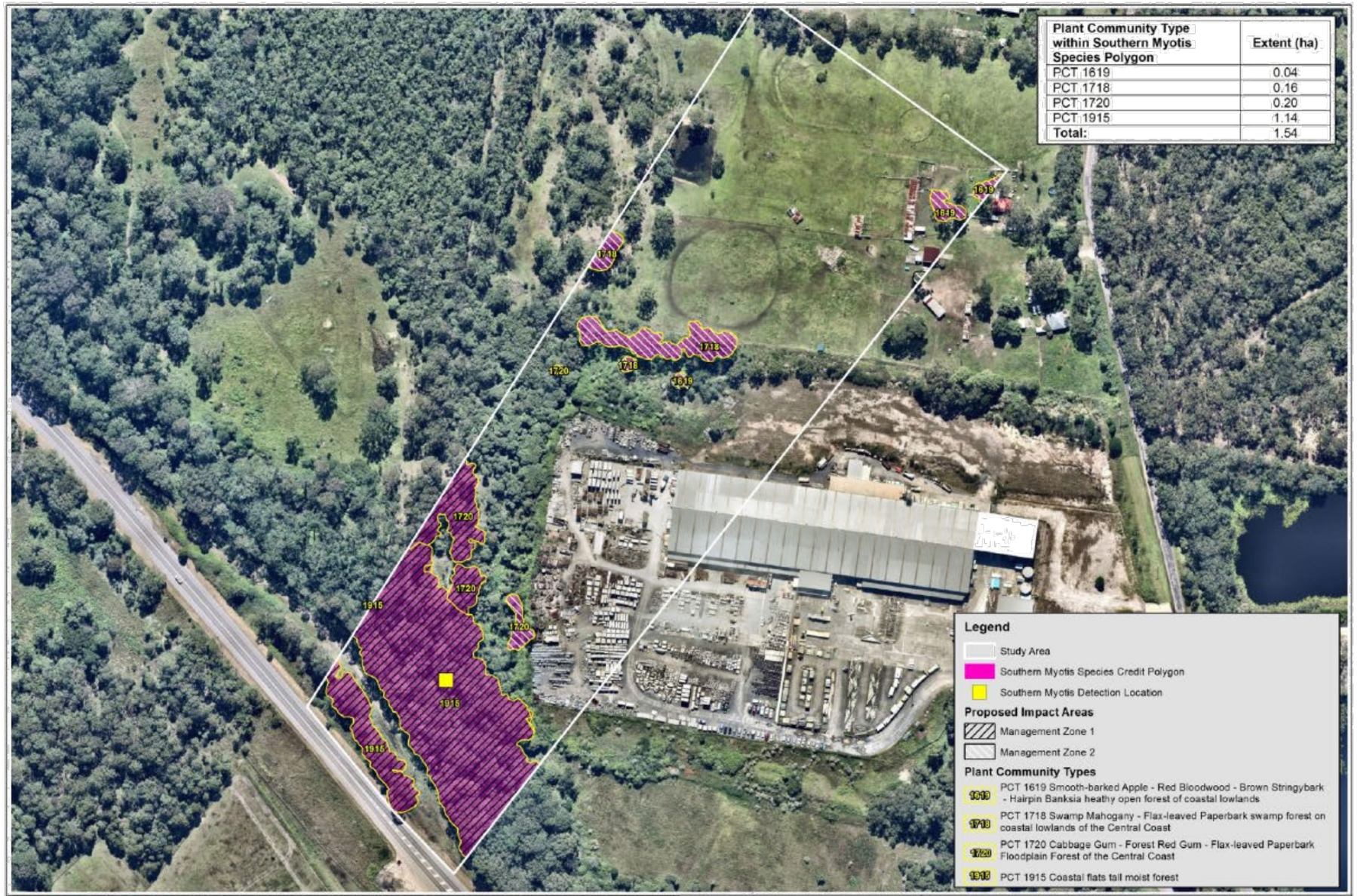


Figure 4.3b
Soutehrn Myotis Species Credit Polygon
Sparks Road, Warnervale

Squirrel Glider (*Petaurus norfolcensis)*
A photograph which has been identified as a possible Squirrel Glider was captured during baited remote camera surveys at the location mapped in Figure 4.3c. This species is known to occur in the locality with previous records within 1500m of the site and based on the habitats present it is has been assessed as occurring on the site.

The Threatened Biodiversity Data Collection identifies the following in relation to the habitat features utilised by this species:

- It relies on large old trees with hollows for breeding and nesting. These trees are also critical for movement and typically need to be closely-connected (i.e. no more than 50 m apart).
- Inhabits 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.
- Prefers mixed species stands with a shrub or Acacia midstorey.
- 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.

There area of suitable habitat for this species within the subject site has been mapped as approximately 1.54 ha and is shown in Figure 4.3c.

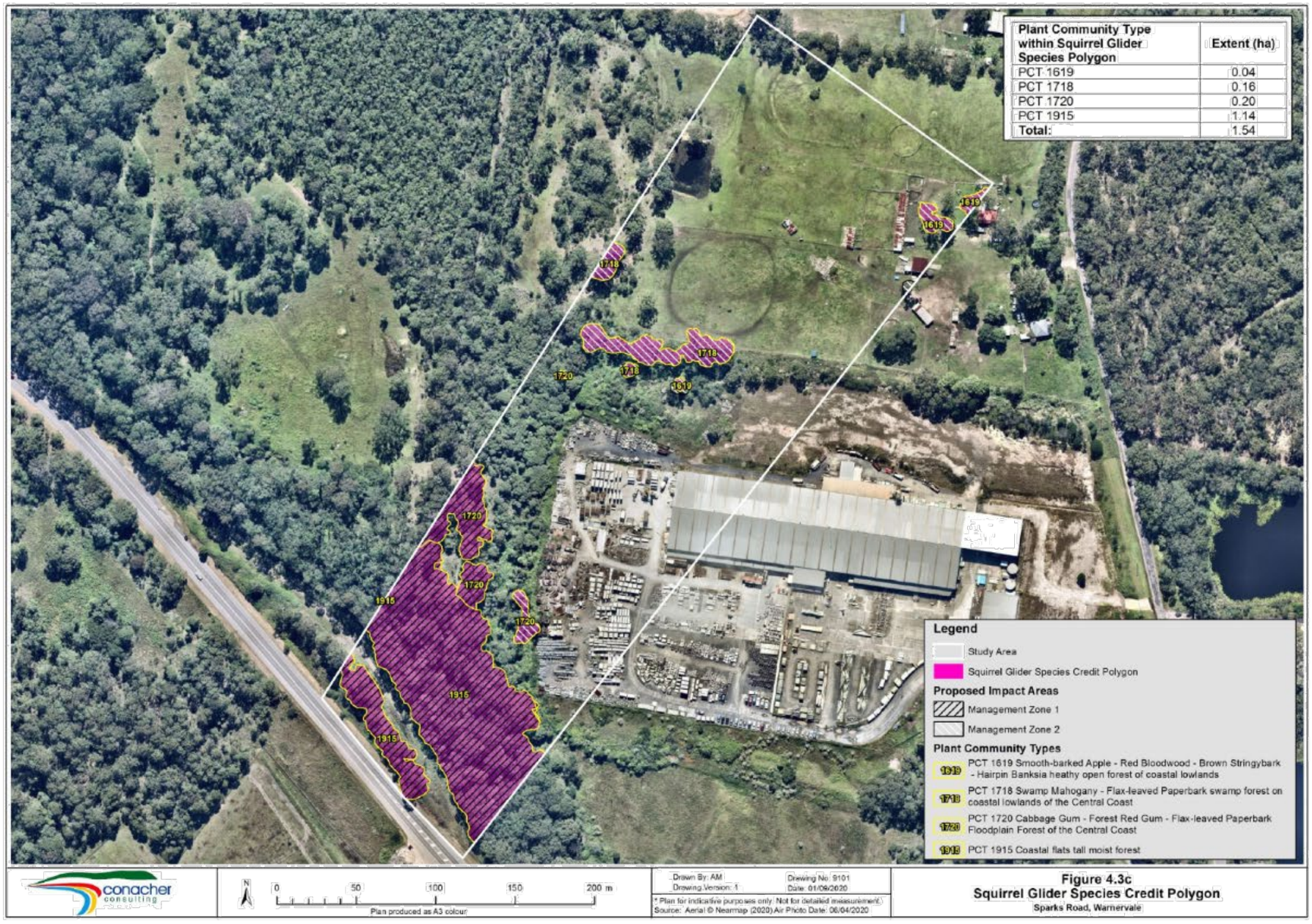


Figure 4.3c
Squirrel Glider Species Credit Polygon
Sparks Road, Warnervale

SECTION 5

IMPACT AVOIDANCE AND MINIMISATION ASSESSMENT

5.1 IMPACT AVOIDANCE AND MINIMISATION CONSIDERATIONS

5.1.1 *Avoidance and Minimisation of Impacts on Native Vegetation and Habitats*

The following considerations are provided in relation to avoidance and minimisation measures for direct and indirect impacts associated with the project and ancillary features relating to native vegetation and habitats.

i. Locating the project areas and ancillary facilities in areas where there are no biodiversity values (BAM Sections 8.1.1.3 (a) and 8.1.2.1 (b)).

The impact area has been determined based on the management of vegetation 3m below an obstacle limitation surface gradient of 3.33% for night time flying. The obstacle limitation surface area if fixed in relation to the existing runway at the Warnervale Aircraft Landing Area. The project area (obstacle limitation surface) cannot be relocated to an area where there are no biodiversity values. Any ancillary facilities required to undertake the works will be located in areas with no biodiversity values. These may include locations for parking of vehicles and site machinery and any site facilities required during the completion of the works.

ii. Locating the project and ancillary facilities in areas where the native vegetation or threatened species habitat is in the poorest condition (i.e. areas that have a lower vegetation integrity score) (BAM Sections 8.1.1.3 (b) and 8.1.2.1 (c))

The impact area has been determined based on the management of vegetation 3m below an obstacle limitation surface gradient of 3.33% for night time flying. The obstacle limitation surface area if fixed in relation to the existing runway at the Warnervale Aircraft Landing Area. The project area (obstacle limitation surface) cannot be relocated to an area where there are no biodiversity values. Any ancillary facilities required to undertake the works will be located in areas with no biodiversity values. These ancillary facilities may include locations for parking of vehicles and site machinery and any site facilities required during the completion of the works.

iii. Locating the project and ancillary facilities in areas that avoid habitat for species that have a high biodiversity risk weighting or native vegetation that is a critically endangered ecological community (CEEC) or an endangered ecological community (EEC) (BAM Sections 8.1.1.3 (c) and 8.1.2.1 (d))

The project area (obstacle limitation surface location) does include habitat for species with a high biodiversity risk weighting and areas of the Swamp Sclerophyll Forest on Coastal Floodplains and River-flat Eucalypt Forest on Coastal Floodplains EECs.

The impact area has been determined based on the management of vegetation 3m below an obstacle limitation surface gradient of 3.33% for night time flying. The obstacle limitation surface area if fixed in relation to the existing runway at the Warnervale Aircraft Landing Area. The project area (obstacle limitation surface) cannot be relocated to an area where there are no biodiversity values. Any ancillary facilities required to undertake the works will be located in areas with no biodiversity values, outside of areas which provide habitat for threatened species with a high biodiversity risk weighting and outside of locations of

endangered ecological communities. These ancillary facilities may include locations for parking of vehicles and site machinery and any site facilities required during the completion of the works.

iv. Reducing the clearing footprint of the project (BAM Section 8.1.2.1 (a))

The impact area has been determined based on the management of vegetation 3m below an obstacle limitation surface gradient of 3.33% for night time flying. The management of vegetation to a height of 5m below the obstacle limitation surface was considered as part of the impact footprint determination. A comparison of the impact footprints of these two separate management scenarios is provided in Figure 5.1.

A height of 3m was chosen to reduce the clearing footprint required, despite the likely increased costs and management frequency required to maintain the obstacle limitation surface. The management of the vegetation to a height of 3m compared to a height of 5m below the obstacle limitation surface has reduced the overall area of the impact footprint proposed as well as the intensity of the impact.

v. Justifications for project location decisions should identify any other site constraints that the proponent has considered in determining the location and design of the project, e.g. bushfire protection requirements including clearing for asset protection zones, flood planning levels, servicing constraints (BAM Section 8.1.1.5)

The impact area has been determined based on the management of vegetation 3m below an obstacle limitation surface gradient of 3.33% for night time flying. The obstacle limitation surface area if fixed in relation to the existing runway at the Warnervale Aircraft Landing Area.

vi. Making provision for the demarcation, ecological restoration, rehabilitation and/or ongoing maintenance of retained native vegetation habitat on the development site (BAM Section 8.1.2.1 (f))

This matter will be dealt with through a Vegetation Management Plan which is proposed to be prepared for the works.

5.1.2 *Avoidance and Minimisation of Prescribed Biodiversity Impacts*

The following consideration is provided in relation to avoidance and minimisation measures for prescribed impacts.

i. ***Locating the envelope of surface works to avoid direct impacts on the following habitat features (BAM Section 8.2.2.1(a)):***
   - ***karst, caves, crevices, cliffs and other geological features of significance, or***
   - ***rocks, or***
   - ***human made structures, or***
   - ***non-native vegetation***

The footprint of the proposal does not contain areas of these features other than areas of managed non-native vegetation. The non-native vegetation within the site does not provide identified habitat for threatened biodiversity.

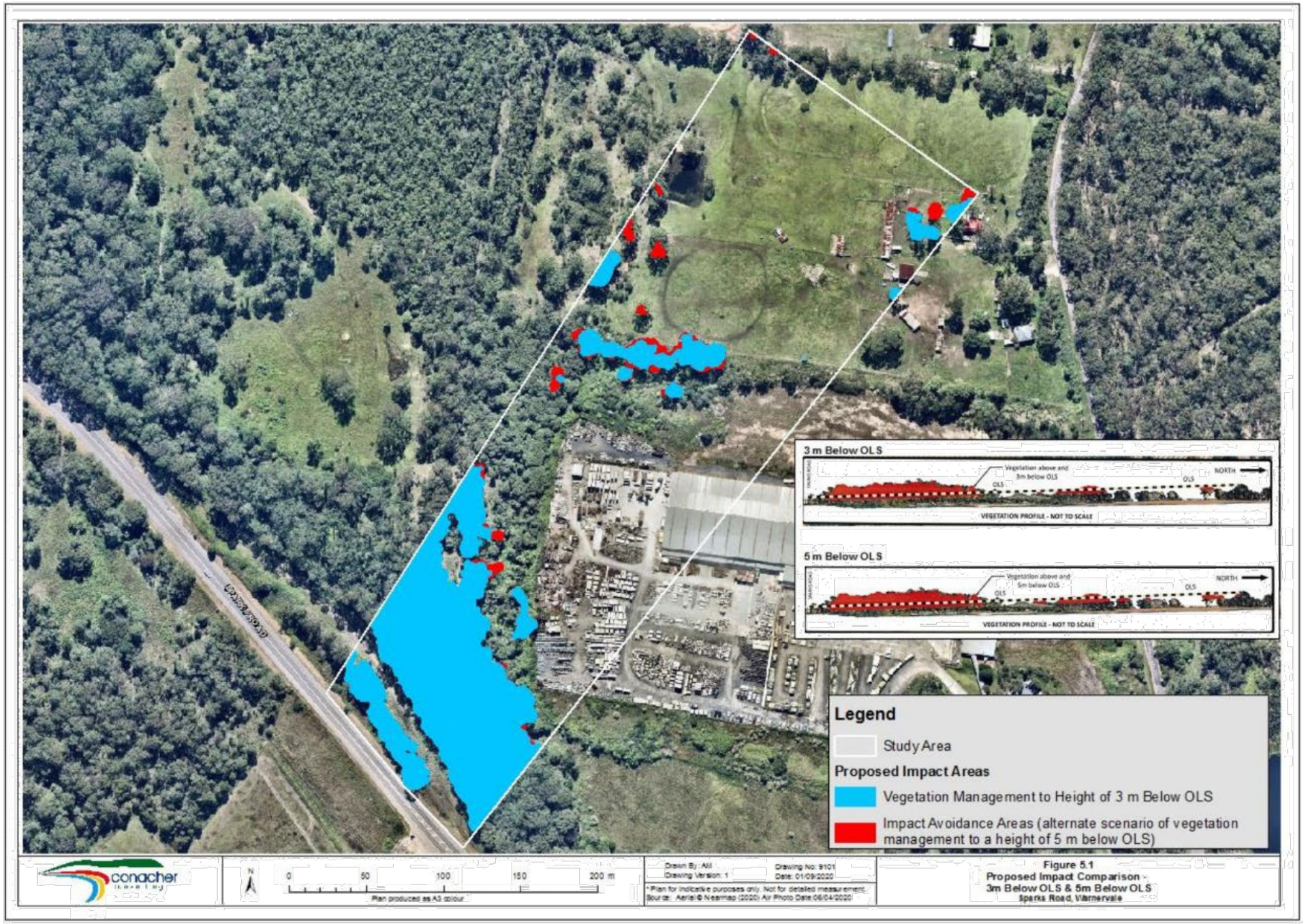


Figure 5.1
Proposed Impact Comparison -
3m Below OLS & 5m Below OLS
Sparks Road, Warnervale

ii. ***Locating the envelope of sub-surface works, both in the horizontal and vertical plane, to avoid and minimise operations beneath the habitat features identified in Paragraph 8.2.1.2, e.g. locating longwall panels away from geological features of significance or water dependent plant communities and their supporting aquifers (BAM Section 8.2.2.1(b)).***

The proposal is not likely to result in any sub-surface works beneath retained habitat features.

iii. ***Locating the project to avoid severing or interfering with corridors connecting different areas of habitat, migratory flight paths to important habitat or local movement pathways (BAM Section 8.2.2.1(c).***

The project impact footprint is fixed and cannot be avoided. Total clearing of native vegetation is not proposed and existing connecting corridors and movement pathways are likely to be maintained.

iv. ***Optimising project layout to minimise interactions with threatened species and ecological communities, e.g. designing turbine layout to allow buffers around features that attract and support aerial species, such as forest edges, riparian corridors and wetlands, ridgetops and gullies (BAM Section 8.2.2.1(d))***

The location of the obstacle limitation surface is fixed, any ancillary facilities required to complete the works will be located to avoid threatened species and EEC locations.

v. ***Locating the project to avoid direct impacts on water bodies (BAM Section 8.2.2.1(e))***

Buttonderry Creek intersects the impact footprint. The management of tree canopies above the creek may have an indirect impact on light and water temperature, however direct impacts to the creek bed, banks and water flow are not proposed.

vi. ***An analysis of alternative modes or technologies that would avoid or minimise prescribed biodiversity impacts and justification for selecting the proposed mode or technology (BAM Section 8.2.2.2(a))***

No alternative modes or technologies that would avoid or minimise prescribed biodiversity impacts have been identified.

vii. ***An analysis of alternative routes that would avoid or minimise prescribed biodiversity impacts and justification for selecting the proposed route (BAM Section 8.2.2.2(b))***

There are no feasible alternative routes that would further minimise prescribed impacts. The assessed obstacle limitation surface is associated with an existing runway.

viii. ***An analysis of alternative locations that would avoid or minimise prescribed biodiversity impacts and justification for selecting the proposed location (BAM Section 8.2.2.2(c))***

There are no feasible alternative locations that would further minimise prescribed impacts. The assessed obstacle limitation surface is associated with an existing runway.

ix. ***An analysis of alternative sites within a property on which the project is proposed that would avoid or minimise prescribed biodiversity impacts and justification for selecting the proposed site (BAM Section 8.2.2.2(d))***

There are no feasible alternative sites within the properties assessed that would further minimise prescribed impacts as the assessed obstacle limitation surface is associated with an existing runway.

x. ***Justifications for project location decisions should identify any other site constraints that the proponent has considered in determining the location and design of the project, e.g. bushfire protection requirements including clearing for asset protection zones, flood planning levels, servicing constraints (BAM Section 8.2.2.3)***

The impact area has been determined based on the management of vegetation 3m below an obstacle limitation surface gradient of 3.33% for night time flying. The obstacle limitation surface area if fixed in relation to the existing runway at the Warnervale Aircraft Landing Area.

xi. ***Avoidance and minimisation through application of engineering solutions, e.g. proven techniques to minimise fracturing of bedrock underlying features of geological significance, water dependent communities and their supporting aquifers, proven engineering solutions to restore connectivity and favoured movement pathways (BAM Section 8.2.3.1(a))***

There are no identified engineering solutions which would further minimise the impacts associated with the proposal.

xii. ***Avoidance and minimisation through design of project elements to minimise interactions with threatened and protected species and ecological communities, e.g. designing turbines to dissuade perching and minimise the diameter of the rotor swept area, designing fencing to prevent animal entry to transport corridors (BAM Section 8.2.3.1(b))***

The location of the obstacle limitation surface is fixed, any ancillary facilities required to complete the works will be located to avoid threatened species and EEC locations.

xiii. ***Avoidance and minimisation through design of the project to maintain environmental processes critical to the formation and persistence of habitat features not associated with native vegetation (BAM Section 8.2.3.1(c))***

It is recommended that the proposed works do not remove or destroy vegetation below the ground surface and that the works do not impact on the existing hydrological characteristics of the site.

xiv. ***Avoidance and minimisation through design of the project to maintain hydrological processes that sustain threatened species and TECs (BAM Section 8.2.3.1(d))***

It is recommended that direct and indirect impacts on hydrological processes will be avoided and minimised through the implementation of suitable erosion and sediment controls and avoidance of any substantial ground surface disturbance such as excavation of filling works.

xv. ***Avoidance and minimisation through design of the project to avoid and minimise downstream impacts on rivers, wetlands and estuaries by control of the quality of water released from the site (BAM Section 8.2.3.1(e))***

It is recommended that coordinated low impact work practices are utilised and suitable erosion and sediment controls are installed and maintained where necessary to avoid and minimise downstream impacts on rivers, wetlands and estuaries. This matter is to be further addressed in a Vegetation Management Plan to be prepared for the works.

5.2 IMPACT MITIGATION & MANAGEMENT MEASURES

The following measures identified in Table 5.1 will be undertaken to mitigate and manage impacts following project approval and as part of the works and operation of the site.

TABLE 5.1
PROPOSED IMPACT MITIGATION & MANAGEMENT MEASURES

IMPACT	MITIGATION MEASURE	TIMING	MONITORING SCHEDULE	OUTCOME	RESPONSIBILITY
All impacts associated with the works	**Biodiversity Measure 1:** Completion of a Vegetation Management Plan	Tasks to be specified for pre, during and post works monitoring	Various	Minimisation of impacts Implement vegetation protection and management protocols Implementation of erosion and sediment controls Application of correct tree pruning techniques and specific management treatment for the different management zones assessed Completion of works by appropriately qualified and experienced Arborists Minimisation of noise and dust during works Implementation of biodiversity procedures to prevent transfer of waste, weed propagules and pathogens Ensure that works are completed by competent Arborists (AQF Level 3 minimum) under the supervision of an Ecologist and Consulting Arborist AQF Level 5 minimum. Ensure that appropriate site monitoring of vegetation is undertaken during and between management events.	Site Manager Project Ecologist Project Arborist

SECTION 6

ASSESSMENT OF RESIDUAL DIRECT AND INDIRECT IMPACTS

6.1 PROPOSED DEVELOPMENT IMPACTS

i. Impact Assessment

The areas of vegetation removal, modification and retention within the site are shown in Figure 6.1. The extent of removal proposed for each PCT zone is listed in Table 6.1.

TABLE 6.1
PLANT COMMUNITY TYPE IMPACT AREAS ASSESSED

Plant Community Type	Zone	Area of Impact Management Zone 1	Area of Impact Management Zone 2	Total Area of Impact
PCT 1619 Smooth-barked Apple - Red Bloodwood - Brown Stringybark - Hairpin Banksia heathy open forest of coastal lowlands	Zone 1 – Disturbed / Grazed condition	0	0.04	0.04
1718 Swamp Mahogany - Flax-leaved Paperbark swamp forest on coastal lowlands of the Central Coast	Zone 1 – Disturbed / Grazed condition	0	0.16	0.16
PCT 1720 Cabbage Gum - Forest Red Gum - Flax-leaved Paperbark Floodplain Forest of the Central Coast	Zone 1 – Intact condition	0.17	0.03	0.2
PCT 1915 Coastal flats tall moist forest	Zone 1 – Intact condition	1.14	0	1.14

There are two management areas within the development footprint these are shown in Figure 6.1 and have been assessed as:

Management Zone 1: The tree and shrub values for composition and structure scores and the number of large trees and stem size classes for the function scores have been reduced to zero. All other values have been maintained as the ground layer vegetation and other values are not proposed to be impacted by the works.

Management Zone 2: All composition, structure and function scores have been maintained for each value for this zone as the proposed works are limited to tree pruning of selected trees which is not likely to result in tree mortality. No impacts are likely to occur to the understorey vegetation through the implementation of suitable work practices.

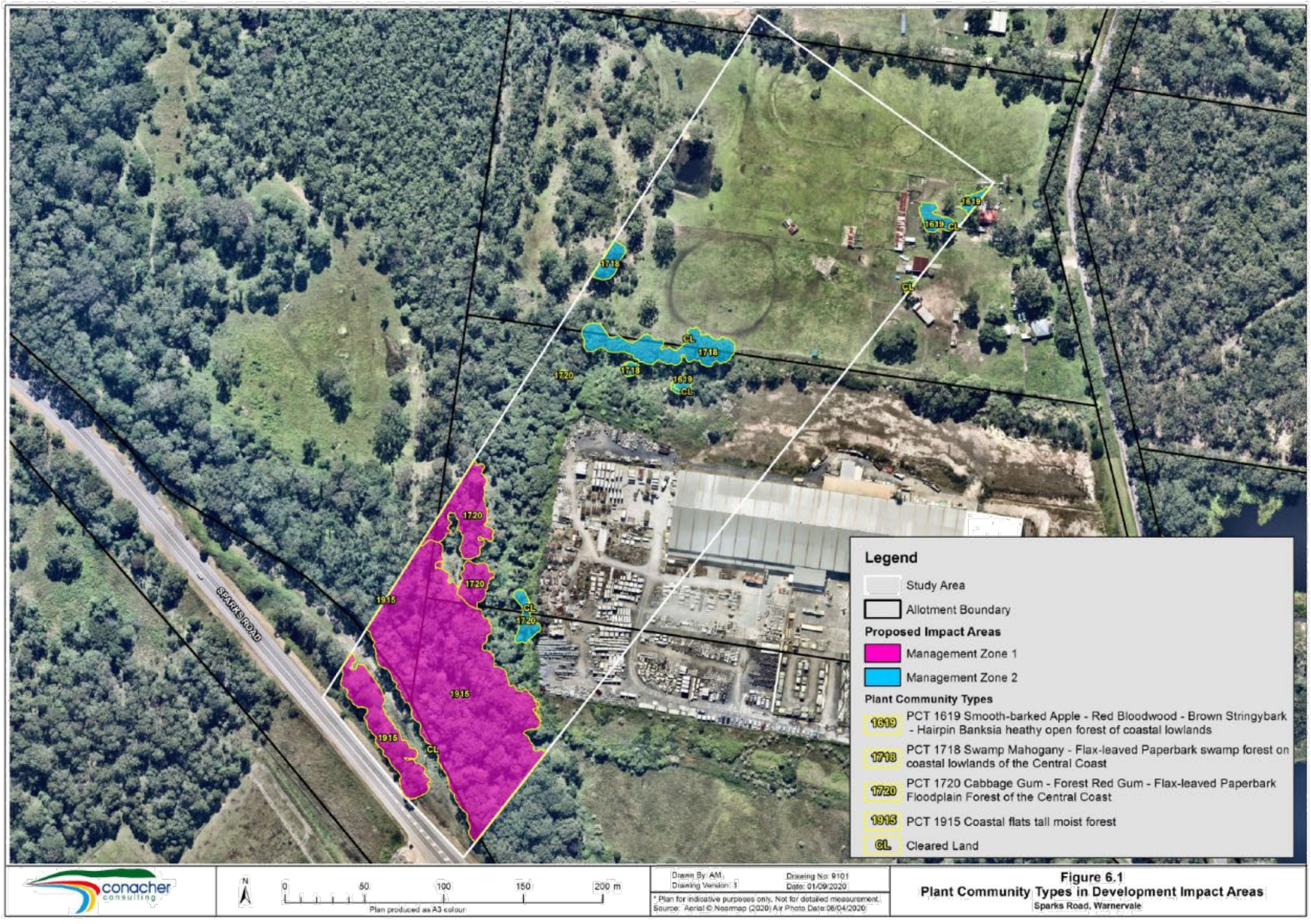


Figure 6.1
Plant Community Types in Development Impact Areas
Sparks Road, Warnervale

Specific direct and indirect impacts required to be assessed under Section 9.1 and 9.2 of the BAM, including prescribed impacts, are assessed in Table 6.2.

TABLE 6.2
ASSESSMENT OF POTENTIAL IMPACTS

Potential Impact	Impact Nature and Extent	Impact Frequency /Duration / timing	Impact Consequence	Threatened Biodiversity Likely to be Affected
Direct impacts to vegetation	Removal of tree and shrub cover for Management Zone 1 and removal of tree cover for Management Zone 2	Annually or as required	Loss of tree and shrub cover	*Melaleuca biconvexa* Squirrel Glider Southern Myotis Predicted Ecosystem credit species
Direct impacts to hollow-bearing trees	No hollow bearing trees observed	NA	NA	NA
Impacts to serious and irreversible impact entities	No potential SAII species observed.	NA	NA	NA
Indirect impacts on adjacent vegetation and habitat during construction	Not likely to occur, adjoining areas will be protected with fencing.	NA	NA	NA
Indirect impact on adjacent vegetation and habitat during operation	Increased light levels may affect adjacent vegetation following vegetation management works	Ongoing	Altered stream temperatures Reduction in habitat structure and suitability	*Melaleuca biconvexa* Squirrel Glider Southern Myotis Predicted Ecosystem credit species
Impacts on adjacent vegetation and habitat arising from a change in land-use patterns	Not likely to occur as the impact area is already within the runway OLS.	NA	NA	NA
Inadvertent impact on adjacent habitat or vegetation	Impacts to adjacent vegetation will be avoided through implementation of a Vegetation Management Plan to manage inadvertent impacts	NA	NA	NA

TABLE 6.2 ASSESSMENT OF POTENTIAL IMPACTS				
Potential Impact	**Impact Nature and Extent**	**Impact Frequency /Duration / timing**	**Impact Consequence**	**Threatened Biodiversity Likely to be Affected**
Reduced viability of adjacent habitat due to edge effects	Not likely to occur as vegetation will be retained under the OLS management height	NA	NA	NA
Reduced viability of adjacent habitat due to noise, dust or light spill	Impacts to adjacent vegetation will be avoided through implementation of a Vegetation Management Plan to manage inadvertent impacts	NA	NA	NA
Transport of weeds and pathogens from the site to adjacent vegetation	Impacts to adjacent vegetation will be avoided through implementation of a Vegetation Management Plan to manage inadvertent impacts	NA	NA	NA
Increased risk for fauna of starvation, exposure and loss of shade or shelter	Potential to occur due to removal of canopy and shrub layer in areas which require removal of most of the existing tree and/or shrub layer	Ongoing	Reduction in population size and/or reduced site use	*Melaleuca biconvexa* Squirrel Glider Southern Myotis Predicted Ecosystem credit species
Loss of breeding habitats	No threatened fauna species have been detected breeding within the site	NA	NA	NA
Trampling of threatened flora species	Trampling of *Melaleuca biconvexa* may occur during works	Ongoing during works	Reduction in population size	*Melaleuca biconvexa*
Inhibition of nitrogen fixation and increased soil salinity	Not likely to occur.	NA	NA	NA
Fertiliser drift	Not likely to occur.	NA	NA	NA
Rubbish dumping	Any rubbish is likely to be minor and will be managed as part of the ongoing operations as documented under the Vegetation Management Plan	NA	NA	NA
Wood collection	Not likely to occur as a result of the proposal.	NA	NA	NA
Bush rock removal and disturbance	None present and not likely to occur as a result of the proposal.	NA	NA	NA

TABLE 6.2 ASSESSMENT OF POTENTIAL IMPACTS				
Potential Impact	**Impact Nature and Extent**	**Impact Frequency /Duration / timing**	**Impact Consequence**	**Threatened Biodiversity Likely to be Affected**
Increase in predatory species populations	Not likely to occur as a direct result of the proposal.	NA	NA	NA
Increase in pest animal populations	Not likely to occur as a direct result of the proposal.	NA	NA	NA
Increased risk of fire	Not likely to occur as a result of the proposal.	NA	NA	NA
Disturbance to specialist breeding and foraging habitat, e.g. Beach nesting for shorebirds.	Eucalypt trees which provide foraging habitat for the Little Lorikeet and Squirrel Glider will be impacted by the proposal. Foraging habitats for the Southern Myotis will also be affected by removal of the overstorey vegetation which may reduce the quality of the foraging habitat present.	Management works will be ongoing as necessary	Reduction in habitat foraging areas	Southern Myotis Squirrel Glider Little Lorikeet and other Ecosystem credit threatened species
Impacts to karst, caves, crevices, cliffs and other features of geological significance	The site does not contain karst, caves or cliffs of significance and does not contain any other geological features of significance.	NA	NA	NA
Impacts to man-made structures	Not likely to occur as a result of the proposal.	NA	NA	NA
Impacts to non-native vegetation	The vegetation to be impacted is predominantly native. Some impacts to non-native vegetation may occur	One-off / permanent / during construction	Minor loss of habitat	Not likely to be used by threatened biodiversity
Habitat connectivity & movement patterns	The existing connectivity and movement patterns are not likely to be substantially impacted as complete vegetation clearing is not proposed.	NA	NA	NA
Water quality, water bodies and hydrological processes	Potential for sedimentation of downstream habitats	Sporadic / during rainfall following management events	Minor, impact will be suitably managed through installation of appropriate controls	Potential for impacts to offsite EEC vegetation
Wind turbine strikes	Will not occur.	NA	NA	NA

TABLE 6.2 ASSESSMENT OF POTENTIAL IMPACTS				
Potential Impact	**Impact Nature and Extent**	**Impact Frequency /Duration / timing**	**Impact Consequence**	**Threatened Biodiversity Likely to be Affected**
Vehicle strikes	Not likely to occur within as a direct result of the works. May occur if species migrate from the site to other areas of non-impacted habitat south of Sparks Road.	During or following works	Potential for roadkill . mortality	Squirrel Glider Ecosystem credit threatened species

ii. Plant Community Type Impact Summary

The impact summary details required for the plant community types identified at the development site are documented in Table 6.3.

TABLE 6.3 PLANT COMMUNITY TYPE IMPACT SUMMARY					
Impact Summary Considerations	**PCT 1619 Management Zone 2**	**PCT 1718 Management Zone 2**	**PCT 1720 Management Zone 1**	**PCT 1720 Management Zone 2**	**PCT 1915 Management Zone 1**
Area (ha)	0.04	0.16	0.17	0.03	1.14
Current Vegetation Integrity Score	23.8	39.3	75.3	75.3	68.3
Future Vegetation Integrity Score	23.8	39.3	75.3	42.7	16.6
Change in Vegetation Integrity Score	0	0	0	-32.6	-51.7
Total Change in VI Score	0	0	-27.7		-51.7
Sensitivity to Gain	High	High	High		High
Biodiversity Risk Weighting	1.5	2	2	2	2
BC Act Listing Status	Not listed	EEC	EEC	EEC	EEC
Ecosystem Credits	1	1	3		29

iii. Threatened Species Impact Summary

A summary of the threatened species impacts is provided in Table 6.4.

TABLE 6.4
SPECIES CREDIT IMPACT SUMMARY

Species	Vegetation Zone	Habitat condition loss	Area/ Count	Biodiversity Risk Weighting	Candidate SAII	Credits Required
Melaleuca biconvexa	PCT 1915	51.7	0.52 ha	2	False	13
Southern Myotis	PCT 1619	15.5	0.04ha	2	False	0
	PCT 1718	32.6	0.16 ha	2	False	3
	PCT 1720	31.1	0.2ha	2	False	3
	PCT 1915	51.7	1.14 ha	2	False	29
Squirrel Glider	PCT 1619	15.5	0.04ha	2	False	0
	PCT 1718	32.6	0.16 ha	2	False	3
	PCT 1720	31.1	0.2ha	2	False	3
	PCT 1915	51.7	1.14 ha	2	False	29

iv. Biodiversity Credit Report

A Biodiversity Credit Report is provided in Appendix 1.

6.2 SERIOUS AND IRREVERSIBLE IMPACTS

No serious and irreversible impact entities are likely to be impacted by the proposed development.

6.3 IMPACTS WHICH DO NOT REQUIRE AN OFFSET

Areas of mapped cleared land within the study area do not vegetation management works and do not require offsets.

SECTION 7

CONCLUDING COMMENTS

7.1 SURVEY AND ASSESSMENT CONCLUSIONS

Based on the field surveys completed and information provided in this report it is concluded that:

i. The following ecosystem credits have been calculated to offset and achieve a no net loss outcome for the proposed impacts:

- 1 ecosystem credit for PCT 1619-Smooth-barked Apple - Red Bloodwood - Brown Stringybark - Hairpin Banksia heathy open forest of coastal lowlands;
- 1 ecosystem credit for PCT 1718-Swamp Mahogany - Flax-leaved Paperbark swamp forest on coastal lowlands of the Central Coast;
- 3 ecosystem credits for 1720-Cabbage Gum - Forest Red Gum - Flax-leaved Paperbark Floodplain Forest of the Central Coast;
- 29 ecosystem credits for PCT1915-Coastal flats tall moist forest

ii. The following species credits have been calculated to offset and achieve a no net loss outcome for the proposed impacts:

- 13 species credits for *Melaleuca biconvexa*
- 35 species credits for the Southern Myotis
- 35 species credits for the Squirrel Glider

iii. It is considered that the proposal is not likely to have a Serious and Irreversible Impact, as no potential Serious and Irreversible Impact Entities were observed during surveys; and

iv. The impact avoidance and minimisation measures outlined in Section 5.2 of this Report should be implemented for the proposal.

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APPENDIX 1 – BAM BIODIVERSITY CREDIT REPORT

BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00020760/BAAS17099/20/00021700	Warnervale ALA North OLS Management Works	20/08/2020
Assessor Name	Assessor Number	BAM Data version *
Jacob Manners	BAAS17099	30
Proponent Names	Report Created	BAM Case Status
Stephen Watkins	03/09/2020	Finalised
Assessment Revision	Assessment Type	Date Finalised
0	Part 5 Activities	03/09/2020

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Potential Serious and Irreversible Impacts

Nil

Nil

Additional Information for Approval

PCTs With Customized Benchmarks

No Changes

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BAM Biodiversity Credit Report (Like for like)

Predicted Threatened Species Not On Site

No Changes

Ecosystem Credit Summary (Number and class of biodiversity credits to be retired)

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	Number of credits to be retired
1619-Smooth-barked Apple - Red Bloodwood - Brown Stringybark - Hairpin Banksia heathy open forest of coastal lowlands	Not a TEC	0.0	1.00
1718-Swamp Mahogany - Flax-leaved Paperbark swamp forest on coastal lowlands of the Central Coast	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	0.2	1.00
1720-Cabbage Gum - Forest Red Gum - Flax-leaved Paperbark Floodplain Forest of the Central Coast	River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	0.2	3.00
1915-Coastal flats tall moist forest	Not a TEC	1.1	29.00

1619-Smooth-barked Apple - Red Bloodwood - Brown Stringybark - Hairpin Banksia heathy open forest of coastal lowlands	**Like-for-like credit retirement options**			
	Class	Trading group	HBT	IBRA region

BAM Biodiversity Credit Report (Like for like)

	Sydney Coastal Dry Sclerophyll Forests This includes PCT's: 1083, 1138, 1156, 1181, 1183, 1250, 1253, 1619, 1620, 1621, 1623, 1624, 1625, 1627, 1632, 1636, 1638, 1642, 1643, 1681, 1776, 1777, 1778, 1780, 1782, 1783, 1785, 1786, 1787	Sydney Coastal Dry Sclerophyll Forests <50%	Yes	Wyong, Hunter, Pittwater and Yengo. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
1718-Swamp Mahogany - Flax-leaved Paperbark swamp forest on coastal lowlands of the Central Coast	**Like-for-like credit retirement options**			
	Name of offset trading group	Trading group	HBT	IBRA region
	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions This includes PCT's: 837, 839, 971, 1064, 1092, 1227, 1230, 1231, 1232, 1235, 1649, 1715, 1716, 1717, 1718, 1719, 1721, 1722, 1723, 1724, 1725, 1730, 1795, 1798	-	Yes	Wyong, Hunter, Pittwater and Yengo. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

BAM Biodiversity Credit Report (Like for like)

1720-Cabbage Gum - Forest Red Gum - Flax-leaved Paperbark Floodplain Forest of the Central Coast	**Like-for-like credit retirement options**			
	Name of offset trading group	Trading group	HBT	IBRA region
	River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions This includes PCT's: 686, 828, 835, 839, 941, 971, 1064, 1108, 1109, 1212, 1228, 1232, 1293, 1318, 1326, 1386, 1522, 1556, 1594, 1618, 1646, 1648, 1720, 1794	-	No	Wyong, Hunter, Pittwater and Yengo. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
1915-Coastal flats tall moist forest	**Like-for-like credit retirement options**			
	Class	Trading group	HBT	IBRA region
	North Coast Wet Sclerophyll Forests This includes PCT's: 1237, 1504, 1915	North Coast Wet Sclerophyll Forests >=70% and <90%	Yes	Wyong, Hunter, Pittwater and Yengo. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

BAM Biodiversity Credit Report (Like for like)

Species Credit Summary

Species	Area	Credits
Melaleuca biconvexa / Biconvex Paperbark	0.5	13.00
Myotis macropus / Southern Myotis	1.5	35.00
Petaurus norfolcensis / Squirrel Glider	1.5	35.00

Melaleuca biconvexa/ Biconvex Paperbark	1915_Intact	**Like-for-like credit retirement options**	
		Spp	IBRA region
		Melaleuca biconvexa/Biconvex Paperbark	Any in NSW
Myotis macropus/ Southern Myotis	1619_Intact	**Like-for-like credit retirement options**	
		Spp	IBRA region
		Myotis macropus/Southern Myotis	Any in NSW
	1718_Intact	**Like-for-like credit retirement options**	
		Spp	IBRA region

BAM Biodiversity Credit Report (Like for like)

		Myotis macropus/Southern Myotis	Any in NSW
	1720_Intact	**Like-for-like credit retirement options**	
		Spp	IBRA region
		Myotis macropus/Southern Myotis	Any in NSW
	1915_Intact	**Like-for-like credit retirement options**	
		Spp	IBRA region
		Myotis macropus/Southern Myotis	Any in NSW
Petaurus norfolcensis/ Squirrel Glider	1619_Intact	**Like-for-like credit retirement options**	
		Spp	IBRA region
		Petaurus norfolcensis/Squirrel Glider	Any in NSW

Assessment Id: 00020760/BAAS17099/20/00021700

Proposal Name: Warnervale ALA North OLS Management Works

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BAM Biodiversity Credit Report (Like for like)

Petaurus norfolcensis/ Squirrel Glider	1619_Intact		
	1718_Intact	**Like-for-like credit retirement options**	
		Spp	IBRA region
		Petaurus norfolcensis/Squirrel Glider	Any in NSW
	1720_Intact	**Like-for-like credit retirement options**	
		Spp	IBRA region
		Petaurus norfolcensis/Squirrel Glider	Any in NSW
	1915_Intact	**Like-for-like credit retirement options**	
		Spp	IBRA region
		Petaurus norfolcensis/Squirrel Glider	Any in NSW

Biodiversity payment summary report

Assessment Id	Payment data version	Assessment Revision	Report created
00020760/BAAS17099/20/00021700	68	0	03/09/2020

Assessor Name	Assessor Number	Proposal Name	BAM Case Status
Jacob Manners	BAAS17099	Warnervale ALA North OLS Management Works	Finalised

Assessment Type	Date Finalised
Part 5 Activities	03/09/2020

PCT list

Price calculated	PCT common name	Credits
Yes	**1619 -** Smooth-barked Apple - Red Bloodwood - Brown Stringybark - Hairpin Banksia heathy open forest of coastal lowlands	1
Yes	**1718 -** Swamp Mahogany - Flax-leaved Paperbark swamp forest on coastal lowlands of the Central Coast	1
Yes	**1720 -** Cabbage Gum - Forest Red Gum - Flax-leaved Paperbark Floodplain Forest of the Central Coast	3
Yes	**1915 -** Coastal flats tall moist forest	29

Species list

Price calculated	Species	Credits
Yes	***Melaleuca biconvexa*** (Biconvex Paperbark)	13
Yes	***Myotis macropus*** (Southern Myotis)	35
Yes	***Petaurus norfolcensis*** (Squirrel Glider)	35

Biodiversity payment summary report

Assessment Id	Proposal Name	Page 2 of 8
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Biodiversity payment summary report

Ecosystem credits for plant communities types (PCT), ecological communities & threatened species habitat

IBRA sub region	PCT common name	Threat status	Offset trading group	Risk premium	Administrative cost	Methodology adjustment factor	Price per credit	No. of ecosystem credits	Final credits price
Wyong	**1619** - Smooth-barked Apple – Red Bloodwood - Brown Stringybark - Hairpin Banksia heathy open forest of coastal lowlands	No	Sydney Coastal Dry Sclerophyll Forests <50%	20.69%	$178.44	1.7815	$5,562.48	1	$5,562.48
Wyong	**1718** - Swamp Mahogany - Flax-leaved Paperbark swamp forest on coastal lowlands of the Central Coast	Yes	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	18.83%	$130.43	2.7038	$4,005.11	1	$4,005.11

Assessment Id: 00020760/BAAS17099/20/00021700

Proposal Name: Warnervale ALA North OLS Management Works

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Biodiversity payment summary report

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Biodiversity payment summary report

Wyong	**1720** - Cabbage Gum - Forest Red Gum - Flax-leaved Paperbark Floodplain Forest of the Central Coast	Yes	River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	18.83%	$301.63	2.0720	$9,262.32	3	$27,786.95
Wyong	**1915** - Coastal flats tall moist forest	No	North Coast Wet Sclerophyll Forests >=70% and <90%	19.23%	$412.27	2.2537	$ 12,701.00	29	$368,329.02
								Subtotal (excl. GST)	**$405,683.56**
								GST	**$40,568.36**
								Total ecosystem credits (incl. GST)	**$446,251.92**

Species credits for threatened species

Biodiversity payment summary report

Biodiversity payment summary report

Species profile ID	Species	Threat status	Price per credit	Risk premium	Administrative cost	No. of species credits	Final credits price
10514	***Melaleuca biconvexa*** (Biconvex Paperbark)	Vulnerable	$86.51	20.6900%	$80.00	13	$2,397.32
10549	***Myotis macropus*** (Southern Myotis)	Vulnerable	$741.31	20.6900%	$80.00	35	$34,114.05
10604	***Petaurus norfolcensis*** (Squirrel Glider)	Vulnerable	$495.24	20.6900%	$80.00	35	$23,719.68
						Subtotal (excl. GST)	**$60,231.05**
						GST	**$6,023.10**
						Total species credits (incl. GST)	**$66,254.16**
						Grand total	**$512,506.08**

Assessment Id: 00020760/BAAS17099/20/00021700
Proposal Name: Warnervale ALA North OLS Management Works
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Biodiversity payment summary report

Assessment Id	Proposal Name	Page 8 of 8
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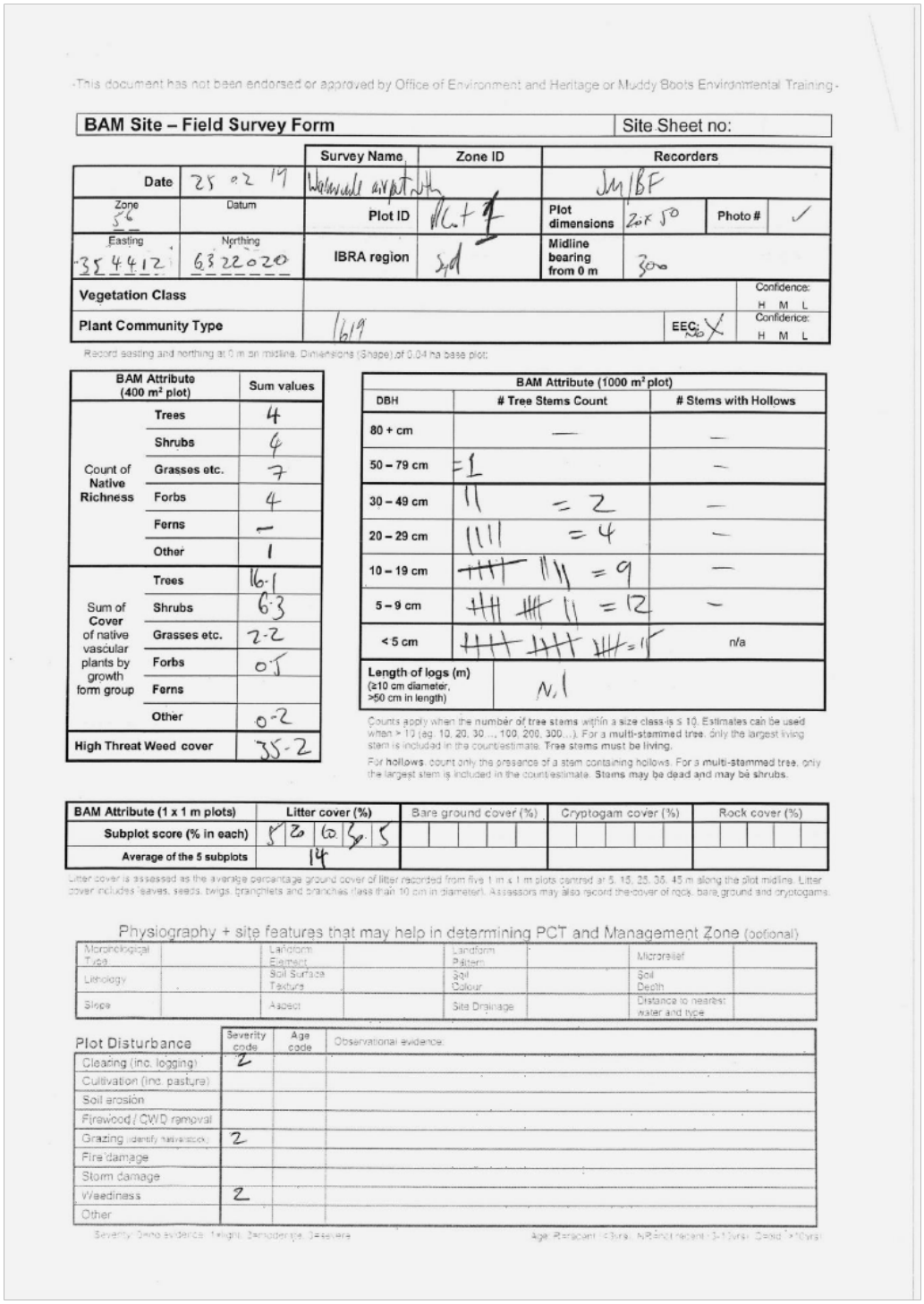
APPENDIX 2 – BAM PLOT FIELD DATA AND PLOT PHOTOGRAPHS

BAM PLOT 1



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BAM Site – Field Survey Form | Site Sheet no:

		Survey Name	Zone ID	Recorders			
Date	25.02.19	Warnervale airport		JM/BF			
Zone 56	Datum	Plot ID	Plot 1	Plot dimensions	20x50	Photo #	✓
Easting 354412	Northing 6322020	IBRA region	Syd	Midline bearing from 0 m	300		
Vegetation Class							Confidence: H M L
Plant Community Type	1619			EEC: No X			Confidence: H M L

Record easting and northing at 0 m on midline. Dimensions (Shape) of 0.04 ha base plot:

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	4
	Shrubs	4
	Grasses etc.	7
	Forbs	4
	Ferns	–
	Other	1
Sum of Cover of native vascular plants by growth form group	Trees	16.1
	Shrubs	6.3
	Grasses etc.	2.2
	Forbs	0.5
	Ferns	
	Other	0.2
High Threat Weed cover		35.2

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm	—	—
50 – 79 cm	=1	–
30 – 49 cm	11 =2	—
20 – 29 cm	1111 =4	–
10 – 19 cm	1111 111 =9	—
5 – 9 cm	1111 1111 11 =12	–
< 5 cm	1111 1111 1111 =15	n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)	N.1	

Counts apply when the number of tree stems within a size class is ≤ 10. Estimates can be used when > 10 (eg. 10, 20, 30 ..., 100, 200, 300...). For a multi-stemmed tree, only the largest living stem is included in the count/estimate. Tree stems must be living.

For hollows, count only the presence of a stem containing hollows. For a multi-stemmed tree, only the largest stem is included in the count/estimate. Stems may be dead and may be shrubs.

BAM Attribute (1 x 1 m plots)	Litter cover (%)					Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)
Subplot score (% in each)	5	30	60	30	5			
Average of the 5 subplots	14							

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type		Landform Element		Landform Pattern		Microrelief	
Lithology		Soil Surface Texture		Soil Colour		Soil Depth	
Slope		Aspect		Site Drainage		Distance to nearest water and type	

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)	2		
Cultivation (inc. pasture)			
Soil erosion			
Firewood / CWD removal			
Grazing (identify native/exotic)	2		
Fire damage			
Storm damage			
Weediness	2		
Other			

Severity: 0=no evidence, 1=slight, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), D=old (>10yrs)

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400 m² plot: Sheet 1 of 1	Survey Name	Plot Identifier	Recorders
Date 25 0220	Warnervale	1	B F J M

GF Code	Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species: Full species name where practicable	N, E or HTE	Cover	Abund	stratum	voucher
	Glycine micro		0.2	20		
	Rich. brasil.		1	1000		
	Eragrost. brown.		0.5	50		
	Euc. capitellata		20 10	65		
	Angophora costata		1	1		
	Arthropodus fiss.		35	3000		
	~~Paspalum dil.~~ Panicum simile		0.1	10		
	Setaria parv.		2	500		
	Juncus cognat.		0.1	10		
	~~Centella asiatica~~					
	Goodenia panicul.		0.1	10		
	Aspalidium distans		0.1	50		
	Hypochaeris radicata		0.1	50		
	Microlaena stip. stip		1	100		
	Hypericum perf.		0.1	10		
	Plantago lanceol.		0.1	20		
	Eucht. los sphaer.		0.1	5		
	Melaleuca nodosa		5	20		
	~~[illegible]~~ Kunzea ambigua		1	2		
	Lobelia purpurascens		0.1	100		
	Verbena bonariensis		0.1	2		
	Sida rhomb.		0.1	5		
	Breynia oblong		0.1	1		
	Paspalum dilatatum	-	0.1	20		
	Carex inversa		0.1	5		
	Trifolium repens		0.1	1		
	~~Glycine microph~~		~~0.1~~	~~10~~		
	Cymbopogon americanus		0.1	100		
	Pittosporum undulatum		0.2	1		
	Glochid. ferd.		0.1	1		
	Entol. stricta		0.1	10		
	Oplismenus imbecilis		0.25	50		
	Centella asiatica		0.2	200		
	Eucalyptus pilularis x capitellata		0.05	1		

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.

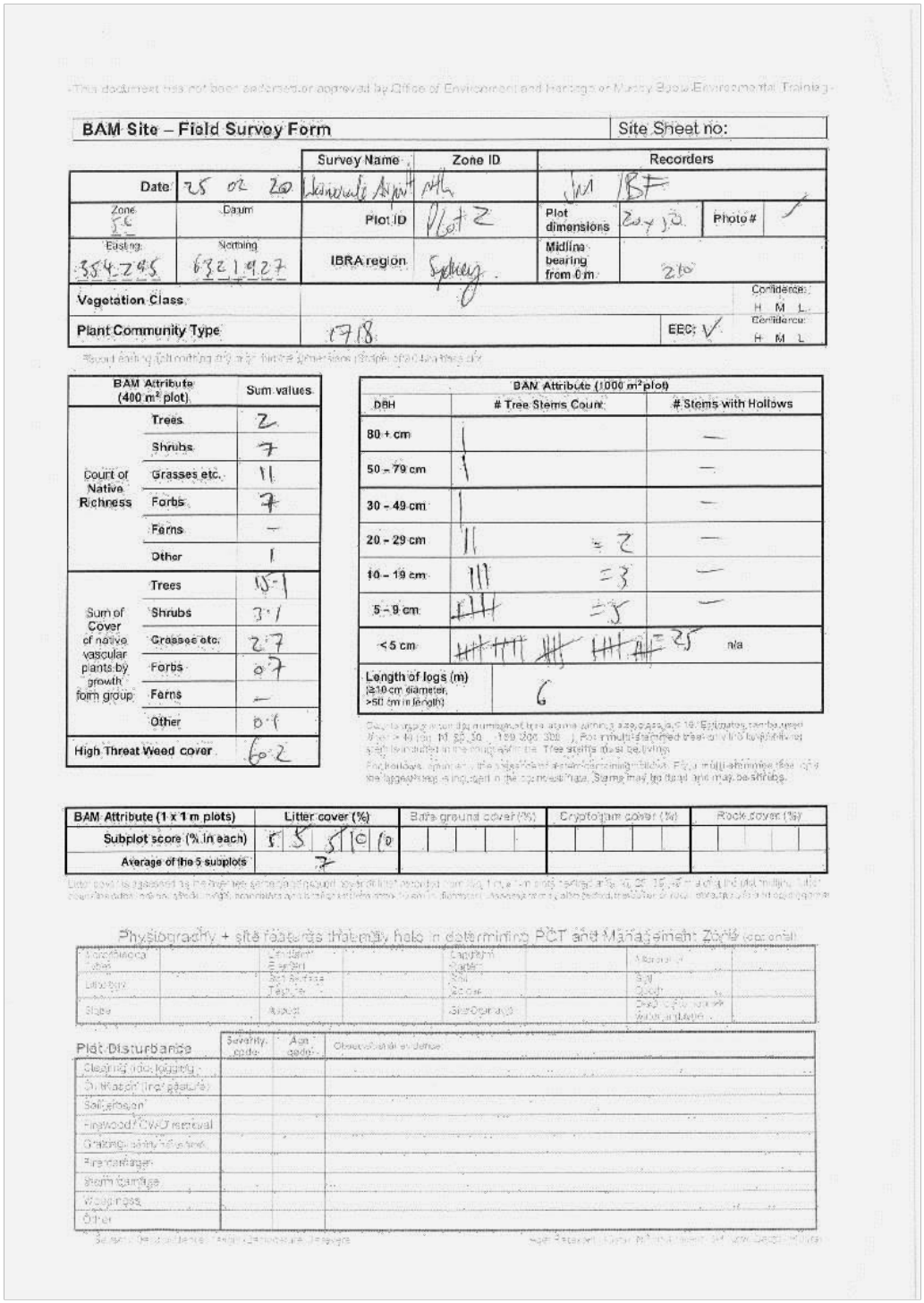
Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); *Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*

Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

BAM Plot 1 - Photo 1

BAM Plot 1 - Photo 2

BAM PLOT 2



BAM Site – Field Survey Form — Site Sheet no:

		Survey Name	Zone ID	Recorders			
Date: 25 02 20		Warnervale Airport	MGA	JM	IBF		
Zone: 56	Datum:	Plot ID: Plot 2		Plot dimensions: 20 x 50		Photo #:	
Easting: 354295	Northing: 6321927	IBRA region: Sydney		Midline bearing from 0 m: 210°			
Vegetation Class:						Confidence: H M L	
Plant Community Type: 1718				EEC: ✓		Confidence: H M L	

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	2
	Shrubs	7
	Grasses etc.	11
	Forbs	7
	Ferns	–
	Other	1
Sum of Cover of native vascular plants by growth form group	Trees	15.1
	Shrubs	3.1
	Grasses etc.	2.7
	Forbs	0.7
	Ferns	–
	Other	0.1
High Threat Weed cover		6.2

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm	1	–
50 – 79 cm	1	–
30 – 49 cm	1	–
20 – 29 cm	11 = 2	–
10 – 19 cm	111 = 3	–
5 – 9 cm	1111 = 5	–
< 5 cm	11 1111 111 1111 11 = 25	n/a
Length of logs (m) (≥10 cm diameter, ≥50 cm in length)	6	

BAM Attribute (1 x 1 m plots)	Litter cover (%)	Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)
Subplot score (% in each)	5 5 5 10 10			
Average of the 5 subplots	7			

Physiography + site features that may help in determining PCT and Management Zone (continued)

Landform pattern		Landform element	Drainage type	Aspect
Lithology		Soil Surface Texture	Soil Colour	Soil Depth
Slope		Aspect	Site Drainage	Soil Disturbance

Plot Disturbance	Severity code	Age code	Observation or Notes
Clearing / logging			
Cultivation (ing/pasture)			
Soil erosion			
Firewood / CWD removal			
Grazing (stock/feral/native)			
Fire damage			
Storm damage			
Weed / pest			
Other			

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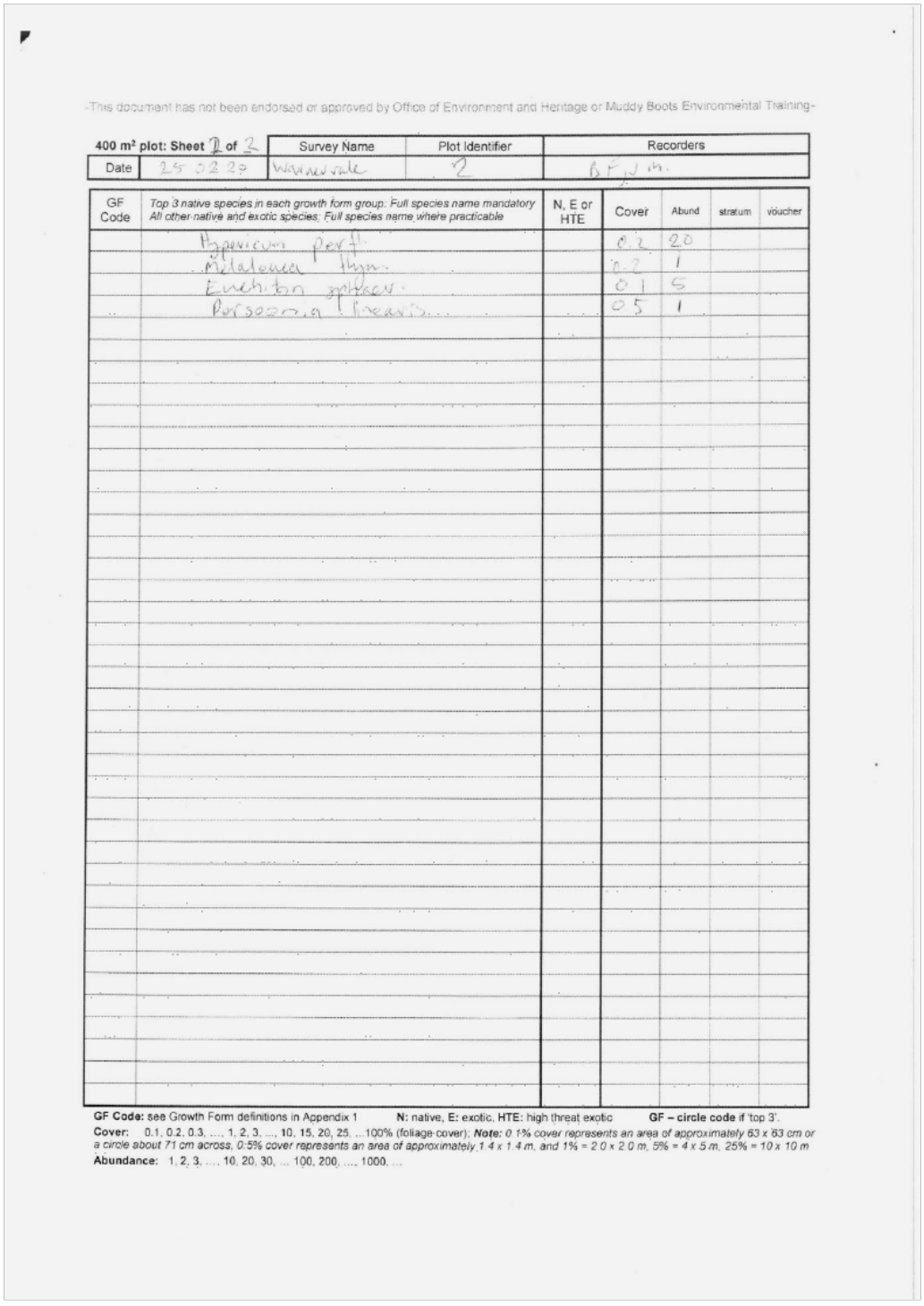
400 m² plot: Sheet 1 of 2	Survey Name	Plot Identifier	Recorders
Date 25 02 20	Warnervale	2	B.F.

GF Code	Top 3 native species in each growth form group: Full species name mandatory. All other native and exotic species: Full species name where practicable	N, E or HTE	Cover	Abund	stratum	voucher
	Juncus cognatus		2	50		
	Plantago lanceolata		0.1	20		
	Paspalum dilat.		5	500		
	Eucalyptus robusta		15	15		
	Luzula ambigua		1	4		
	Richardia humistrata		0.2	100		
	Axonopus fissifol.		30	3000		
	Hypericum ~~[illegible]~~ japonicum		0.1	10		
	Hypochaeris radic.		0.1	100		
	Andropogon virgin.		25	1000		
	Juncus planifolius		0.1	5		
	Eragrostis lepto		0.5	50		
	~~Plantago lanceolata~~ Juncus usitat.		0.2	20		
	Gamochaeta americana		0.1	100		
	Centella asiatica		0.1	50		
	Setaria parv.		1	100		
	Vulpia brom.		0.1	5		
	Conyza bon.		0.1	3		
	Melaleuca nodosa		0.5	1		
	Carex longebrach.		0.1	2		
	Eragrostis brownii HS		0.1	30		
	Verbena bonariensis		0.1	1		
	Lobelia purpurascens		0.1	50		
	Briza mad.		0.1	10		
	~~Centella asiatica~~ 1/3/20					
	Goodenia paniculata		0.1	10		
	Epaltes australis		0.1	5		
	Cyperus polystachyos		0.1	20		
	~~Paspalum dilatatum~~					
	Cynodon dactylon		1	100		
	Dichelachne micrantha		0.1	20		
	Glycine micro.		0.1	5		
	Brunonia oblong.		0.5	5		
	Pimelea linifol. subsp. linifolia		0.1	1		W06
	Fimbristylis dichotom.		0.1	10		
	Oplismenus ferdin.		0.1	2		
	Dianella caer. prod.		0.1	5		
	Hemarth. uncin. uncin.		0.25	20		
	Rytidosp. pallid.		0.1	1		
	Acacia longifolia subsp. longissima		0.25	1		W07

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.
Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*
Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...



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400 m² plot: Sheet 1 of 3	Survey Name	Plot Identifier	Recorders
Date 25 02 20	Warnervale	2	BF, JM.

GF Code	Top 3 native species in each growth form group. Full species name mandatory All other native and exotic species: Full species name where practicable	N, E or HTE	Cover	Abund	stratum	voucher
	Hypericum perf.		0.2	20		
	Melaleuca thym.		0.2	1		
	Eucalyptus sp.		0.1	5		
	Persoonia linearis		0.5	1		

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.
Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*
Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

BAM Plot 2 - Photo 1

BAM Plot 2 - Photo 2

BAM PLOT 3

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BAM Site – Field Survey Form | Site Sheet no:

		Survey Name	Zone ID	Recorders			
Date	25 02 20	Warnervale airport nth		JM / BF			
Zone 56	Datum	Plot ID	Plot 3	Plot dimensions	20x50	Photo #	✓
Easting 354193	Northing 6321780	IBRA region	Sydney	Midline bearing from 0 m	30		
Vegetation Class						Confidence: H M L	
Plant Community Type		1720			EEC: ✓	Confidence: H M L	

Record easting and northing at 0 m on midline. Dimensions (Shape) of 0.04 ha base plot.

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	4
	Shrubs	5
	Grasses etc.	6
	Forbs	10
	Ferns	–
	Other	2
Sum of Cover of native vascular plants by growth form group	Trees	25.8
	Shrubs	47.6
	Grasses etc.	14.2
	Forbs	1.6
	Ferns	–
	Other	0.3
High Threat Weed cover		16.5

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm	—	M1
50 – 79 cm	—	
30 – 49 cm	𝍸 = 5	
20 – 29 cm	𝍸 III = 8	
10 – 19 cm	50	
5 – 9 cm	20	
< 5 cm	III = 3	n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)	(15) - fallen ironbark - still alive (excluded) + 5+5+3 +4+8 +4 +1 +3+3 +3 = (38)	

Counts apply when the number of tree stems within a size class is ≤ 10. Estimates can be used when > 10 (eg. 10, 20, 30, ..., 100, 200, 300, ...). For a **multi-stemmed tree**, only the largest living stem is included in the count/estimate. **Tree stems must be living.**

For **hollows**, count only the presence of a stem containing hollows. For a **multi-stemmed tree**, only the largest stem is included in the count/estimate. **Stems may be dead and may be shrubs.**

BAM Attribute (1 x 1 m plots)	Litter cover (%)					Bare ground cover (%)					Cryptogam cover (%)					Rock cover (%)				
Subplot score (% in each)	40	60	5	10	15															
Average of the 5 subplots	28																			

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type		Landform Element		Landform Pattern		Microrelief	
Lithology		Soil Surface Texture		Soil Colour		Soil Depth	
Slope		Aspect		Site Drainage		Distance to nearest water and type	

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood / CWD removal			
Grazing (genetic/native/stock)			
Fire damage			
Storm damage			
Weediness	2		
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe | Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

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400 m² plot: Sheet 1 of 1	Survey Name	Plot Identifier	Recorders
Date 25 02 20	Warnervale	3	B F, J M.

GF Code	Top 3 native species in each growth form group: Full species name mandatory. All other native and exotic species: Full species name where practicable	N, E or HTE	Cover	Abund	stratum	voucher
	~~Aromatus fiss~~					
	Lonicera japon.		60	1000		
	Stevia parv.		0.5	100		
	Melaleuca sieberi		2	3		
	Embelia margin.		5	1000		
	Commelina cyanea		0.5	50		
	Eucl. amplexicaul.		10	2		
	Melaleuca nodosa		30 ~~30~~	30		
	Imperata cylind.		5	1000		
	Acacia longifolia		0.3	2		
	Paraserianthes lophant.		0.2	10		
	Platysace linearifolia		0.1	5		
	Sida rhombifolia		0.1	2		
	Lantana camara		0.5	3		
	Pseudognaphalium obtusifolium		1	30		
	Dichondra repens		0.1	50		
	Carex appressa		0.1	10		
	Lobelia purpurascens		0.1	50		
	Juncus usitatus		1	~~50~~ 50		
	Dianella caerulea		0.1	1		
	Acacia elongata		0.3	10		
	Microlaena stipoides		3	500		
	Pittosporum revolutum		0.25	2		
	Melaleuca linariifolia		15	25		
	Alternanthera denticulata		0.1	20		WES
	Araujia sericifera		5	~~500~~		
	Hardenbergia violacea		0.1	20		
	Casuarina glauca		0.1	3		
	~~Commelina cyanea~~					
	Corymbia maculata		10	3		
	Eucalyptus sideroph.		5	2		
	Senna pendula		0.25	3		
	~~Eucalyptus~~ Eucalyptus acmenoides		0.1	10		
	Banksia plebeia		0.1	1		
	Banksia oblongifolia		0.1	2		
	Glycine microphylla		0.1	10		
	Eucalyptus resinifera		0.1	1		

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.

Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across. 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*

Abundance: 1, 2, 3, ..., 10, 20, 30, ..., 100, 200, ..., 1000, ...

BAM Plot 3 Photo 1.

BAM Plot 3 Photo 2

BAM PLOT 4

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BAM Site – Field Survey Form				Site Sheet no:		
		Survey Name	Zone ID	Recorders		
Date	25 2 20	[illegible]		JM IBF		
Zone 56	Datum	Plot ID	4	Plot dimensions	20 x 50	Photo # ✓
Easting 354163	Northing 6321639	IBRA region	Syd.	Midline bearing from 0 m	140	
Vegetation Class						Confidence: H M L
Plant Community Type	[illegible] 1915				EEC: ✓	Confidence: H M L

Record easting and northing at 0 m on midline. Dimensions (Shape) of 0.04 ha base plot.

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	6
	Shrubs	12
	Grasses etc.	6
	Forbs	7
	Ferns	2
	Other	8
Sum of Cover of native vascular plants by growth form group	Trees	56
	Shrubs	1.5
	Grasses etc.	47.2
	Forbs	0.7
	Ferns	11
	Other	1.4
High Threat Weed cover		4.3

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm		Nil
50 – 79 cm	|| 2	
30 – 49 cm	[tally] = 16	
20 – 29 cm	[tally] = 15	
10 – 19 cm	[tally] = 35	
5 – 9 cm	[tally] = 13	
< 5 cm	||| = 3	n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)	1	

Counts apply when the number of tree stems within a size class is ≤ 10. Estimates can be used when > 10 (eg: 10, 20, 30 … 100, 200, 300…). For a multi-stemmed tree, only the largest living stem is included in the count/estimate. Tree stems must be living.

For hollows, count only the presence of a stem containing hollows. For a multi-stemmed tree, only the largest stem is included in the count/estimate. Stems may be dead and may be shrubs.

BAM Attribute (1 x 1 m plots)	Litter cover (%)					Bare ground cover (%)					Cryptogam cover (%)					Rock cover (%)				
Subplot score (% in each)	40	10	35	60	25															
Average of the 5 subplots	30																			

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type		Landform Element		Landform Pattern		Microrelief	
Lithology		Soil Surface Texture		Soil Colour		Soil Depth	
Slope		Aspect		Site Drainage		Distance to nearest water and type	

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood / CWD removal			
Grazing (identify native/stock)			
Fire damage			
Storm damage			
Weediness			
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

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400 m² plot: Sheet 1 of 2	Survey Name	Plot Identifier	Recorders
Date 250220	Warnervale	4	B.F. J.M.

GF Code	Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species: Full species name where practicable	N, E or HTE	Cover	Abund	stratum	voucher
	Lomandra long		15	50		
	Polyscias sambuc. bipinnate		2	20		
	Cassytha glab		0.2	50		
	Cy ~~[illegible]~~ ~~[illegible]~~ Cyanthill. (cinerea)		0.1	5		
	Adiantum aethiopic.		1	100		
	Acacia irror. irror.		4	3		W01a
	Oplismenus imbecillis		30	3000		
	Entolasia marginata		1	200		
	Hibbertia scandens		0.25	1		
	Dodonaea triquetra		0.3	3		
	Pteridium esculentum		10	200		
	Ozothamnus diosmifol.		0.2	2		
	Breynia oblong		2	15		
	Notelaea long.		5	20		
	Lobelia purpur.		0.1	100		
	Parsonsia straminea		0.3	10		
	Hibbertia ~~[illegible]~~ obtus.		0.5	30		W01b
	Lomandra gracil.		0.1	5		
	Pseuderanthemum variabile		0.1	20		
	Angophora flor.		2	2		
	Euc. siderophloia		15	7		W02
	Zieria smithii		1	10		
	Themeda tri.		1	100		
	Pittosporum undulatum		0.1	1		
	Glycine clandestina		0.1	20		
	Polymeria calyc.		0.1	5		
	Lantana camara		4	20		
	Gymnostachys jasminoides		0.1	5		
	Allocasuarina torul.		4	2		
	Eucalyptus glob.		20	8		W03
	Leptospermum polygal. subsp. cis.		0.5	1		
	Glycine microphylla		0.1	10		
	Eucalyptus saligna		10	3		
	Dianella caerulea caerulea		0.1	1		
	Clematis arist.		0.2	10		
	Paspalidium distans		0.1	20		
	Centella asiatica		0.1	20		
	Microlaena stip. stip.		1	100		
	Goodenia ovata		0.5	4		
	Oxalis perennans		0.1	2		W04

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.

Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across. 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*

Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

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400 m² plot: Sheet 2 of 2	Survey Name	Plot Identifier	Recorders
Date 25 02 20	Warnervale	L4	B.F., J.M.

GF Code	Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species: Full species name where practicable	N, E or HTE	Cover	Abund	stratum	voucher
	Asparagus aeth.		0.1	3		
	Pteridium esculentum		0.1	20		
	Banksia spin. prost.		0.1	2		
	Lomatia japon.		0.2	1		
	Daviesia ulicif.		0.2	1		NOS
	Sida rhomb.		0.1	1		
	Polycias samb. Lory.		0.3	5		

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.
Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*
Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

Corymbia mac. + Mel. Melaleuca adjacent

APPENDIX 3

WEATHER CONDITIONS DURING SURVEY PERIODS

Norah Head, New South Wales
September 2019 Daily Weather Observations

Australian Government
Bureau of Meteorology

Date	Day	Temps		Rain	Evap	Sun	Max wind gust			9am						3pm					
		Min	Max				Dirn	Spd	Time	Temp	RH	Cld	Dirn	Spd	MSLP	Temp	RH	Cld	Dirn	Spd	MSLP
		°C	°C	mm	mm	hours		km/h	local	°C	%	eighths		km/h	hPa	°C	%	eighths		km/h	hPa
1	Su	11.7	21.0	17.8			SW	28	00:51	15.0	78		WSW	9	1021.9	18.3	77		E	13	1018.7
2	Mo	11.4	20.0	0.2			S	50	16:42	16.8	69		SSW	13	1017.5	17.8	73		S	37	1016.8
3	Tu	11.2	20.7	0			W	19	01:42	17.1	62		SW	4	1017.9	19.4	54		ESE	9	1014.3
4	We	13.0	23.3	0			W	19	23:49	18.7	72		N	6	1015.6	21.1	67		NE	13	1011.2
5	Th	15.1	22.1	0.2			SSW	35	03:53	18.0	82		SSW	7	1016.8	19.5	71		ESE	13	1013.3
6	Fr	14.7	28.3	0.2			W	65	19:29	17.5	83		N	9	1007.7	19.6	86		NNE	19	998.2
7	Sa	11.3	19.5	1.0			WNW	50	13:19	15.7	47		WNW	15	1008.7	18.7	29		WNW	15	1007.0
8	Su	10.4	18.9	0			SW	39	11:07	14.6	46		WSW	17	1012.7	18.6	30		WSW	13	1009.5
9	Mo	11.0	17.0	0			SSW	72	23:05	13.6	43		WSW	17	1010.5	14.5	48		SSW	26	1012.0
10	Tu	9.7	15.6	1.0			SSW	61	12:40	12.2	56		SW	20	1024.3	13.5	87		S	35	1024.6
11	We	9.5	19.5	0.6			NNE	28	20:12	15.5	66		WSW	9	1031.3	17.4	63		ENE	17	1027.9
12	Th	9.8	26.5	0.2			S	30	20:35	17.3	62		NW	7	1023.7	25.6	24		WNW	6	1018.6
13	Fr	14.9	21.6	0			S	46	01:54	18.4	73		S	30	1024.2	17.7	63		ESE	11	1020.9
14	Sa	11.8	19.6	0			SSW	41	08:10	18.0	63		SSW	24	1023.0	17.6	65		SSE	22	1021.9
15	Su	10.6	24.5	0			NNE	37	17:56	18.4	63		NNW	9	1023.1	20.0	70		NE	20	1018.4
16	Mo	12.9	26.7	0			S	70	16:51	22.1	48		NNW	4	1015.8	22.0	52		NE	11	1012.1
17	Tu	9.5	17.6	9.8			SSE	81	15:16	10.2	100		SW	15	1020.6	15.0	100		S	59	1017.1
18	We	10.1	20.2	39.4			SSE	76	00:11	17.2	94		SSE	35	1023.2	19.4	82		SE	22	1022.7
19	Th	15.0	21.9	9.6			NNE	37	22:48	17.4	99		S	6	1027.0	19.8	84		ENE	19	1024.7
20	Fr	16.3	23.5	0.4			NE	56	18:29	19.8	86		NE	28	1027.0	20.6	79		NE	35	1022.6
21	Sa	17.2	21.4	0			NNE	50	01:37	18.0	85		NNE	28	1022.3	19.6	88		NNE	33	1018.1
22	Su	17.3	22.3	0.2			S	35	12:24	18.6	94		ENE	2	1021.1	20.6	70		SE	15	1019.8
23	Mo	13.9	22.1	0			S	41	18:02	18.3	53		W	7	1023.5	20.5	28		SW	20	1019.7
24	Tu	10.2	19.6	0			N	26	20:42	16.8	52		SSW	7	1027.3	18.0	55		ENE	19	1023.7
25	We	11.2	21.1	0			SSE	28	15:19	16.9	50		SSW	15	1027.9	19.3	55		SE	22	1025.1
26	Th	14.7	23.6	0			NE	33	18:28	20.6	67		ENE	15	1026.7	18.8	74		ENE	22	1022.3
27	Fr	14.6	23.4	0			ENE	26	13:53	19.7	71		WNW	6	1019.5	19.9	78		E	19	1014.1
28	Sa	14.4	18.5	0			S	56	13:58	17.7	70		S	28	1015.9	17.4	59		S	46	1015.0
29	Su	11.5	22.3	0			SE	28	22:27	18.4	66		S	4	1019.1	19.3	62		ENE	20	1016.0
30	Mo	15.2	18.5	1.2			S	50	14:50	15.4	89		NW	9	1023.8	15.4	85		SSE	41	1024.2
Statistics for September 2019																					
Mean		12.7	21.4							17.2	69			13	1020.6	18.8	65			22	1017.6
Lowest		9.5	15.6							10.2	46		ENE	2	1007.7	13.5	24		WNW	6	998.2
Highest		17.3	28.3	39.4			SSE	81		22.1	100		SSE	35	1031.3	25.6	100		S	59	1027.9
Total				81.8																	

Observations were drawn from Norah Head AWS (station 061366)

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Norah Head, New South Wales
October 2019 Daily Weather Observations

Australian Government
Bureau of Meteorology

Date	Day	Temps		Rain	Evap	Sun	Max wind gust			9am						3pm					
		Min	Max				Dirn	Spd	Time	Temp	RH	Cld	Dirn	Spd	MSLP	Temp	RH	Cld	Dirn	Spd	MSLP
		°C	°C	mm	mm	hours		km/h	local	°C	%	eighths		km/h	hPa	°C	%	eighths		km/h	hPa
1	Tu	13.4	22.5	10.8			NNE	44	21:50	16.6	87		NW	2	1031.5	20.5	59		NE	22	1028.6
2	We	12.7	23.9	0			NE	35	15:59	20.2	72		NNE	7	1029.3	21.0	74		NE	28	1024.7
3	Th	13.2	26.7	0			NNE	28	16:28	20.3	74		SSW	9	1024.9	21.9	75		NE	17	1020.8
4	Fr	16.0	33.3	0			SSW	61	15:15	26.4	36		NW	4	1018.7	20.9	84		SSW	37	1015.1
5	Sa	16.0	20.4	6.2			SSE	31	09:07	16.1	98		S	24	1023.8	17.7	79		S	15	1021.8
6	Su	15.4	22.1	6.0			NNE	50	18:36	17.0	85		N	22	1019.3	20.5	82		NNE	39	1012.2
7	Mo	16.9	22.3	0			SSW	28	07:09	18.8	92		SSW	19	1011.8	21.0	84		S	19	1009.8
8	Tu	17.2	24.8	0.2			SSW	63	15:17	18.6	89		WSW	4	1010.9	18.3	77		S	41	1008.1
9	We	11.8	17.8	3.2			S	56	17:38	14.6	62		SW	19	1021.7	16.7	65		S	41	1021.1
10	Th	12.5	18.3	0			S	50	13:14	16.0	72		SSW	20	1022.8	17.5	75		S	31	1020.6
11	Fr	12.7	20.5	1.2			SSE	35	21:01	15.9	74			Calm	1019.7	17.5	66		SE	24	1016.5
12	Sa	12.1	18.7	34.2			SSE	44	15:08	15.8	72		SE	30	1018.0	16.7	66		SE	33	1016.8
13	Su	13.0	20.2	0.2			SSW	31	07:53	14.8	87		SSW	22	1021.1	17.9	69		SE	17	1019.2
14	Mo	12.6	23.7	0.2			NNE	35	19:06	17.3	76		N	7	1017.9	22.2	65		NE	26	1014.0
15	Tu	15.5	25.9	0			NE	46	17:58	19.1	82			Calm	1013.4	25.0	70		NE	15	1010.3
16	We	15.6	22.7	0.2			SSW	35	06:45	18.1	100		SSW	22	1012.7	20.1	83		SSE	13	1009.0
17	Th	17.7	27.7	0.8			N	54	00:15	20.9	77		W	6	1005.9	23.8	77		ENE	17	1004.5
18	Fr	12.2	21.7	0			NNE	39	18:47	17.4	40		WNW	6	1017.6	20.0	49		E	26	1015.2
19	Sa	12.9	29.6	0			S	61	21:33	20.5	48		NNW	4	1015.8	29.0	17		W	13	1010.4
20	Su	13.2	21.8	0			SSW	48	01:04	17.2	48		SSW	15	1022.1	19.4	50		ESE	17	1020.7
21	Mo	13.6	21.9	0			E	24	14:33	19.1	70		S	4	1026.9	20.9	61		E	19	1024.6
22	Tu	14.3	25.3	0			NE	33	17:10	19.3	71		ENE	2	1026.1	23.7	61		NE	22	1022.5
23	We	17.9	25.8	0			NE	44	17:58	22.0	76		NNE	15	1024.1	23.7	70		NE	31	1018.9
24	Th	17.1	25.4	0.2			SSW	24	05:43	19.1	91		SSW	15	1018.9	23.5	76		SE	13	1016.0
25	Fr	17.3	34.3	0.2			NE	78	17:05	25.3	55		NNW	7	1013.3	25.8	49		NE	28	1008.0
26	Sa	20.2	32.7	0			WNW	70	13:39	26.9	31		NNW	30	1004.2	31.4	24		WNW	28	1001.4
27	Su	14.9	23.3	0			NE	30	18:50	19.1	92		SW	7	1015.8	20.1	39		E	20	1014.1
28	Mo	15.0	24.2	0			SE	43	16:04	19.3	73		SSW	11	1020.8	21.4	69		SE	20	1021.3
29	Tu	15.6	26.6	0			NE	48	17:09	19.4	76		N	2	1023.8	23.8	67		NE	31	1019.5
30	We	15.5	23.5	0			NNE	24	22:16	18.6	84			Calm	1018.5	22.2	76		ENE	9	1016.1
31	Th	17.0	26.5	0.2			NE	43	19:57	21.2	89		NE	4	1017.5	24.4	70		NE	28	1015.3
Statistics for October 2019																					
Mean		14.9	24.3							19.1	71			10	1019.0	21.6	65			23	1016.0
Lowest		11.8	17.8							14.6	31		Calm		1004.2	16.7	17		ENE	9	1001.4
Highest		20.2	34.3	34.2			NE	78		26.9	100		#	30	1031.5	31.4	84		S	41	1028.6
Total				63.8																	

Observations were drawn from Norah Head AWS (station 061366)

IDCJDW2099.201910 Prepared at 13:00 UTC on 8 Jun 2020
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Norah Head, New South Wales
November 2019 Daily Weather Observations

Australian Government
Bureau of Meteorology

Date	Day	Temps		Rain	Evap	Sun	Max wind gust			9am					3pm					
		Min	Max				Dirn	Spd	Time	Temp	RH	Cld	Dirn	Spd	MSLP	Temp	RH	Cld	Dirn	Spd	MSLP
		°C	°C	mm	mm	hours		km/h	local	°C	%	eighths		km/h	hPa	°C	%	eighths		km/h	hPa
1	Fr	17.1	26.0	0.4			NE	61	17:22	20.0	80		NNE	6	1018.0	22.7	73		NE	39	1014.1
2	Sa	17.4	23.3	0.2			NE	57	17:15	19.7	82		NNE	30	1017.2	21.8	75		NE	43	1013.6
3	Su	16.9	24.5	0			NNE	46	15:05	20.8	80		NE	22	1013.9	21.0	78		NNE	31	1009.0
4	Mo	16.1	23.3	17.0			SSW	31	01:29	20.1	75		SSW	7	1014.4	21.0	78		ESE	11	1013.3
5	Tu	15.0	19.0	2.6			S	61	13:33	17.0	56		SW	31	1013.8	16.9	71		S	50	1014.3
6	We	11.7	25.7	1.6			NNE	48	17:27	18.9	63		NW	9	1014.5	22.1	59		ENE	22	1008.1
7	Th	15.9	31.4	0			WNW	41	11:21	23.3	50		NNE	7	1005.4	21.6	69		S	22	1002.7
8	Fr	15.8	31.2	0			WSW	52	19:31	24.3	45		NNW	9	1003.2	30.4	22		WNW	13	997.7
9	Sa	13.3	19.5	0.2			SSW	57	23:21	16.1	33		SW	17	1011.8	18.5	49		SSE	28	1009.8
10	Su	13.1	23.6	0			SSE	43	12:23	18.7	38		WSW	15	1012.6	21.3	54		SSE	31	1010.9
11	Mo	14.8	25.7	0			NNE	46	16:03	20.0	72		N	13	1016.9	24.0	64		ENE	26	1013.1
12	Tu	15.6	36.2	0			SSW	72	22:11	24.4	47		N	24	1008.7	34.9	13		NW	15	1001.1
13	We	15.0	22.6	0			S	63	23:13	19.1	35		W	13	1013.4	20.2	42		SE	22	1012.1
14	Th	13.9	25.7	0			NNE	35	18:40	21.3	36		S	7	1016.0	21.6	49		ENE	17	1012.5
15	Fr	14.5	29.3	0			S	44	22:57	24.7	34		WNW	9	1010.9	22.6	61		ESE	13	1006.2
16	Sa	17.9	24.4	0			SSW	54	23:47	22.0	66		SSE	17	1016.0	22.3	64		SE	19	1014.5
17	Su	18.6	23.1	0			SSE	50	14:19	19.6	87		SSW	22	1014.1	20.2	77		SSE	43	1014.9
18	Mo	16.4	26.7	0			NE	41	15:45	20.9	65		N	9	1019.6	24.0	63		NE	31	1013.9
19	Tu	16.1	31.5	0			SSW	59	21:41	26.7	35		WNW	4	1012.6	24.2	56		NE	24	1008.7
20	We	18.5	24.7	0			S	50	23:01	19.7	77		S	30	1017.3	23.8	60		SSE	24	1016.1
21	Th	17.3	28.3	0			NE	52	17:15	22.3	85		N	6	1016.6	25.9	72		NE	30	1011.2
22	Fr	19.9	21.7	0			SSW	54	08:52	21.5	88		SSW	26	1011.8	20.2	88		S	28	1012.8
23	Sa	19.2	25.0	0			S	43	22:49	19.9	88		SSW	17	1015.5	23.0	72		SE	17	1013.0
24	Su	17.9	23.1	0.6			S	52	01:28	19.2	86		S	24	1018.8	22.8	71		S	24	1016.1
25	Mo	18.9	27.9	0			NNE	57	18:48	21.5	81			Calm	1012.7	27.0	62		NE	31	1007.7
26	Tu	19.1	34.5	2.0			N	67	11:33	23.5	80		NNE	28	1004.6	23.3	76		W	9	1000.5
27	We	14.0	23.2	2.4			NNE	41	21:28	18.4	41		SSW	15	1016.4	20.9	50		E	15	1015.2
28	Th	15.6	27.2	0			NE	54	20:41	20.8	66		NNE	6	1016.9	25.7	64		ENE	26	1014.5
29	Fr	19.4	27.2	0			NE	37	23:01	21.4	81		NW	2	1014.9	25.7	70		ENE	19	1010.9
30	Sa	20.4	22.0	0			S	57	11:37	20.6	93		S	24	1008.1	19.8	85		SSW	22	1007.5
Statistics for November 2019																					
	Mean	16.5	25.9							20.9	64			14	1013.6	23.0	62			24	1010.5
	Lowest	11.7	19.0							16.1	33			Calm	1003.2	16.9	13		W	9	997.7
	Highest	20.4	36.2	17.0			SSW	72		26.7	93		SW	31	1019.6	34.9	88		S	50	1016.1
	Total			27.0																	

Observations were drawn from Norah Head AWS (station 061360)

IDCJDW2069.201911 Prepared at 16:00 UTC on 7 Jun 2020
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Norah Head, New South Wales
January 2020 Daily Weather Observations

Australian Government
Bureau of Meteorology

Date	Day	Temps		Rain	Evap	Sun	Max wind gust			9am					3pm					
		Min	Max				Dirn	Spd	Time	Temp	RH	Cld	Dirn	Spd	MSLP	Temp	RH	Cld	Dirn	Spd	MSLP
		°C	°C	mm	mm	hours		km/h	local	°C	%	eighths		km/h	hPa	°C	%	eighths		km/h	hPa
1	We	19.3	26.3	0			SW	48	23:51	20.8	75		SSW	11	1014.7	24.1	70		SE	17	1013.1
2	Th	19.1	23.2	0			S	37	01:28	20.9	84		SSW	15	1019.2	22.6	76		SSW	19	1017.0
3	Fr	20.7	27.5	0			NE	37	17:53	22.1	96		SSW	9	1017.4	25.8	79		E	17	1013.3
4	Sa	20.2	29.5	0			SSW	67	22:55	24.7	82		NNE	11	1011.2	26.5	69		NE	30	1006.0
5	Su	21.0	23.7	0			SSW	81	23:39	21.5	83		SSW	26	1017.9	23.1	77		SSW	33	1017.3
6	Mo	20.2	24.0	0			SE	44	23:33	22.0	81		SE	13	1020.2	21.7	85		ESE	20	1017.8
7	Tu	21.1	26.4	4.6			NNE	41	17:57	23.1	94		N	4	1016.5	25.1	88		ENE	17	1012.3
8	We	21.5	24.0	0			S	44	11:26	22.1	90		SSW	31	1015.4	23.6	84		SSW	33	1013.6
9	Th	21.1	23.6	0			SSW	39	02:24	21.5	94		SSW	22	1017.4	22.5	87		S	26	1016.5
10	Fr	21.2	30.6	0.2			NE	48	16:03	23.3	91		N	2	1014.1	28.6	67		NE	30	1007.5
11	Sa	20.0	22.2	0.2			SSW	76	03:09	20.1	95		S	37	1011.0	20.8	75		SSW	26	1012.6
12	Su	19.0	26.6	0.8			SSE	46	15:53	22.1	65		SSE	24	1017.8	24.0	60		SSE	13	1017.8
13	Mo	20.1	26.7	0			SE	28	01:08	23.3	61		SSE	7	1019.5	25.2	64		ESE	13	1017.5
14	Tu	20.2	28.2	0			E	20	15:49	23.9	82		S	9	1017.8	26.0	70		E	17	1015.8
15	We	20.4	27.3	0			NE	37	21:12	22.4	90		SSW	7	1014.8	25.9	72		E	13	1011.3
16	Th	21.6	27.4	0			NNE	30	14:48	23.5	99			Calm	1008.4	24.6	85		NE	17	1005.8
17	Fr	21.7	25.5	0			SSW	48	12:55	23.6	86		SSE	26	1007.4	21.1	100		SSW	31	1008.0
18	Sa	20.2	22.3	25.0			SSW	48	12:48	21.0	100		SW	17	1008.6	20.9	92		SSW	30	1008.3
19	Su	19.5	25.6	1.0			S	39	12:56	21.6	91		SSW	17	1008.2	23.7	86		S	28	1005.6
20	Mo	20.6	30.8	0.4			SSW	74	19:28	25.4	83		NE	9	1004.1	23.9	100		NNE	28	998.9
21	Tu	20.4	31.2	3.8			SSE	37	13:15	27.0	57		NNW	6	1007.3	28.6	57		SE	24	1005.7
22	We	21.0	30.6	0			NNE	44	21:12	25.0	81		S	6	1011.5	28.2	76		ENE	24	1007.6
23	Th	21.5	40.7	0			N	69	11:46	32.5	51		N	41	1004.1	37.9	25		N	39	999.2
24	Fr	24.1	27.4	0			SSW	37	10:48	26.0	79		SSW	11	1008.8	26.3	75		SSW	19	1010.0
25	Sa	23.5	26.8	0			SE	24	04:28	24.4	89		E	7	1014.6	24.9	98		SSW	4	1012.6
26	Su	23.5	32.4	0			N	61	17:26	25.5	91		NNE	6	1012.8	28.8	84		NE	26	1009.5
27	Mo	23.0	29.1	0			SSW	44	03:26	23.9	89		SSW	20	1014.1	28.5	77		S	15	1012.3
28	Tu	22.5	31.4	0			W	41	16:41	25.4	86		NNE	4	1012.8	29.9	72		NE	17	1009.6
29	We	23.6	28.1	0			SSW	43	10:06	24.1	88		SSW	22	1015.5	26.9	76		S	19	1015.3
30	Th	21.9	30.6	0			NE	28	16:55	25.2	77		SSW	6	1018.0	27.4	71		E	17	1015.1
31	Fr	23.4	33.6	0			NE	57	17:27	27.1	86		NE	11	1015.9	30.9	64		NE	35	1012.1
Statistics for January 2020																					
	Mean	21.2	27.8							23.6	83			14	1013.5	25.7	76			22	1011.2
	Lowest	19.0	22.2							20.1	51			Calm	1004.1	20.8	25		SSW	4	998.9
	Highest	24.1	40.7	25.0			SSW	81		32.5	100		N	41	1020.2	37.9	100		N	39	1017.8
	Total			36.0																	

Observations were drawn from Norah Head AWS (station 061360)

IDCJDW2069.202001 Prepared at 13:00 UTC on 5 Jun 2020
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Norah Head, New South Wales
February 2020 Daily Weather Observations

Australian Government
Bureau of Meteorology

Date	Day	Temps		Rain	Evap	Sun	Max wind gust			9am						3pm					
		Min	Max				Dirn	Spd	Time	Temp	RH	Cld	Dirn	Spd	MSLP	Temp	RH	Cld	Dirn	Spd	MSLP
		°C	°C	mm	mm	hours		km/h	local	°C	%	eighths		km/h	hPa	°C	%	eighths		km/h	hPa
1	Sa	23.8	31.2	0.2			NE	43	18:10	26.3	83		NNE	26	1011.7	28.9	70		NE	24	1007.6
2	Su	23.0	27.8	0			S	63	18:11	24.3	86		SSW	19	1008.9	25.5	91		SSE	20	1004.2
3	Mo	22.8	27.1	17.6			S	74	19:28	23.9	100		SSE	2	1005.9	26.8	81		SSE	22	1003.5
4	Tu	19.5	24.9	0			S	67	02:06	20.5	63		S	31	1019.6	23.4	56		SSE	22	1020.3
5	We	18.4	26.8	0			NE	31	17:32	22.2	72		SSE	2	1020.8	25.1	64		E	20	1018.2
6	Th	20.4	23.9	1.2			ENE	59	22:35	21.4	100		SE	20	1021.3	23.4	84		NE	20	1020.5
7	Fr	19.4	21.9	94.8			ESE	69	18:00	20.3	100		E	31	1019.6	20.8	100		E	31	1017.4
8	Sa	19.4	23.6	81.4			E	57	19:39	21.2	100		ENE	26	1017.9	22.2	88		E	33	1016.2
9	Su	20.4	22.3	45.8			SE	89	07:23	21.0	100		SE	65	1010.1	21.3	100		ENE	41	1006.6
10	Mo	20.2	26.2	72.0			ESE	33	23:01	22.0	100		N	6	1009.8	24.2	93		SE	17	1007.7
11	Tu	19.8	28.5	1.0			NE	41	15:35	23.1	100		N	7	1009.3	25.2	81		ENE	26	1007.5
12	We	20.7	24.9	0			SE	24	15:59	22.6	100		SSE	4	1009.2	24.0	97		SE	4	1008.8
13	Th	21.9	27.0	0.4			SSE	24	19:00	23.5	100		SSW	11	1011.0	24.5	94		SE	9	1010.0
14	Fr	21.8	25.2	2.2			S	39	10:35	23.6	85		SSW	22	1009.3	24.4	75		S	24	1006.5
15	Sa	18.4	27.9				SSE	20	11:57	22.8	79		NNE	2	1005.9	24.2	71		SSE	15	1006.4
16	Su	20.4	25.3	2.6			S	31	14:17	22.9	89		SSW	19	1014.0	24.5	80		S	28	1013.8
17	Mo	21.4	24.7	0.6			S	30	11:05	22.1	97		SSW	11	1014.6	22.5	100		S	11	1012.5
18	Tu	20.5	30.6	11.2			SW	65	22:28	24.3	90		N	7	1010.1	28.9	74		NE	30	1005.7
19	We	20.9	28.6	22.2			S	41	18:03	23.9	54		W	9	1003.0	28.1	53		S	13	1002.5
20	Th	18.3	24.3	0			S	39	10:29	22.1	63		SW	9	1010.2	23.4	63		S	28	1010.9
21	Fr	20.8	26.8	0			SE	28	22:41	22.6	70		ENE	4	1018.4	23.9	65		E	13	1015.7
22	Sa	19.0	23.0	13.2			SE	43	01:39	20.7	90		S	26	1023.1	21.1	91		SSW	17	1022.9
23	Su	19.1	27.1	3.0			ENE	41	01:38	22.8	75		NNE	24	1024.2	23.5	68		NE	17	1023.0
24	Mo	20.3	29.6	0			NNE	30	22:33	22.7	79		NW	2	1021.3	27.5	62		NE	13	1019.4
25	Tu	21.1	30.1	0			NE	48	18:46	24.6	77		NNE	19	1016.9	28.5	68		NE	28	1013.5
26	We	21.3	33.9	0			SSW	74	20:08	25.6	80		N	7	1007.8	28.1	59		WSW	9	1004.0
27	Th	20.3	27.2	1.2			S	54	23:10	21.3	76		S	19	1011.3	24.9	67		ENE	6	1008.9
28	Fr	18.9	23.4	0			SSE	44	18:27	21.7	66		SSW	19	1010.3	22.9	72		SSW	30	1011.8
29	Sa	18.6	27.3	0.2			NE	26	18:11	21.1	81		SSW	7	1017.3	25.5	65		ENE	17	1014.9
Statistics for February 2020																					
	Mean	20.4	26.6							22.7	84			15	1013.4	24.7	76			20	1011.8
	Lowest	18.3	21.9							20.3	54		#	2	1003.0	20.8	53		SE	4	1002.5
	Highest	23.8	33.9	94.8			SE	89		26.3	100		SE	65	1024.2	28.9	100		ENE	41	1023.0
	Total			370.8																	

Observations were drawn from Norah Head AWS (station 061366)

IDCJDW2099.202002 Prepared at 13:00 UTC on 4 Jun 2020
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Norah Head, New South Wales
March 2020 Daily Weather Observations

Australian Government
Bureau of Meteorology

Date	Day	Temps		Rain	Evap	Sun	Max wind gust			9am						3pm					
		Min	Max				Dirn	Spd	Time	Temp	RH	Cld	Dirn	Spd	MSLP	Temp	RH	Cld	Dirn	Spd	MSLP
		°C	°C	mm	mm	hours		km/h	local	°C	%	eighths		km/h	hPa	°C	%	eighths		km/h	hPa
1	Su	20.2	29.7	0			NE	48	17:52	23.7	85			Calm	1014.5	28.3	70		NE	24	1010.8
2	Mo	21.2	36.4	0			S	69	17:01	26.0	75		NNW	4	1009.5	30.3	57		E	17	1007.8
3	Tu	20.8	22.6	0.2			SSW	46	23:22	21.6	81		SSW	20	1018.6	21.6	84		SSW	22	1018.7
4	We	19.8	26.4	26.8			NE	46	08:43	21.2	100		NE	37	1018.7	25.7	78		NE	26	1016.1
5	Th	21.2	24.6	1.4			NNE	57	14:04	22.0	100		NNE	15	1012.0	21.8	100		NNE	37	1007.6
6	Fr	20.4	29.0	22.8			S	50	20:37	24.0	100		NNW	9	1007.1	23.7	86		S	22	1008.0
7	Sa	19.7	23.1	1.0			S	61	21:59	21.3	92		S	15	1018.5	21.7	81		S	30	1018.8
8	Su	17.8	21.9	1.4			SSE	43	00:49	19.6	91		SSW	19	1020.7	21.5	77		SSW	17	1018.8
9	Mo	18.6	24.3	0.2			SSE	37	21:14	19.7	89		S	28	1020.9	23.5	66		SSE	22	1020.0
10	Tu	17.3	23.4	0			SE	37	00:37	18.7	83		SSW	13	1021.3	22.9	69		S	24	1020.0
11	We	16.4	24.8	0			SSE	33	09:05	20.6	80		SW	6	1022.8	22.6	67		S	11	1022.8
12	Th	17.7	26.6	0			E	24	18:45	22.2	65		ENE	15	1025.0	24.5	60		ENE	13	1023.4
13	Fr	16.5	25.3	0			NNE	33	20:49	20.3	74		SSW	6	1020.8	24.2	64		E	13	1016.4
14	Sa	17.0	20.3	0			S	80	06:17	20.3	88		S	67	1013.9	15.7	99		SSW	39	1016.7
15	Su	14.1	21.1	14.0			S	63	00:18	18.2	72		S	44	1020.5	19.0	81		S	28	1021.1
16	Mo	16.6	23.1	8.0			S	61	15:06	20.0	81		SSE	28	1023.6	21.7	73		SSE	30	1023.8
17	Tu	15.4	22.8	7.0			SSE	43	23:01	17.6	95		WSW	9	1027.0	21.8	79		S	22	1025.8
18	We	16.1	25.6	0			NNE	43	18:34	19.9	75		W	2	1027.0	25.2	66		ENE	20	1023.0
19	Th	16.5	28.7	0			NE	26	16:49	21.0	77		N	4	1022.0	28.2	63		ENE	13	1020.0
20	Fr	18.9	33.6	0			SSW	43	21:49	24.5	64		NW	7	1016.1	32.7	37		NNW	11	1011.7
21	Sa	20.2	26.8	0			SSW	39	23:02	23.5	73		SSE	17	1019.6	25.3	70		SSE	17	1019.1
22	Su	19.3	27.7	0			S	54	21:22	22.2	87		NW	4	1018.5	25.1	77		SE	13	1016.1
23	Mo	17.7	24.6	1.6			S	50	01:54	19.8	78		S	20	1024.6	21.3	69		SSE	22	1023.9
24	Tu	17.9	25.1	0.2			NE	43	18:09	20.1	90		ESE	9	1024.2	24.3	69		ENE	19	1021.3
25	We	17.4	24.1	0.2			NNE	43	23:24	21.2	79		N	11	1019.0	19.7	87		W	9	1019.2
26	Th	18.1	21.2	20.0			SSE	63	04:05	18.6	88		S	48	1023.9	20.1	88		SSW	28	1024.0
27	Fr	17.5	23.9	3.2			SE	37	02:03	20.4	70		SE	22	1026.3	21.7	68		SSW	7	1025.3
28	Sa	16.1	23.4	0			NNE	46	17:43	18.9	81		SW	7	1025.1	19.2	93		SSE	17	1023.0
29	Su	18.2	26.8	30.8			NNE	57	03:50	21.4	90		NNE	33	1020.3	24.0	82		NE	22	1017.6
30	Mo	18.5	24.0	1.8			N	28	10:54	18.8	100		N	6	1014.9	22.0	81		NW	6	1012.8
31	Tu	18.4	26.5	0.6			SSE	26	15:19	20.9	83		WNW	7	1016.4	24.9	74		SSE	20	1015.2
Statistics for March 2020																					
	Mean	18.1	25.4							21.0	83			17	1019.8	23.4	74			20	1018.3
	Lowest	14.1	20.3							17.6	64			Calm	1007.1	15.7	37		NW	6	1007.6
	Highest	21.2	36.4	30.8			S	80		26.0	100		S	67	1027.0	32.7	100		SSW	39	1025.8
	Total			141.2																	

Observations were drawn from Norah Head AWS (station 061366)

IDCJDW2099.202003 Prepared at 13:00 UTC on 3 Jun 2020
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APPENDIX 4

PROJECT TEAM CURRICULA VITAE

PHILLIP CONACHER

Qualifications

- Masters Degree of Natural Resources (University of New England)
- Bachelor of Science (1st Class Honours) (UNE)
- Diploma of Urban and Regional Planning (UNE)
- Graduate Certificate of Applied Science - Ornithology (CSU)
- Certificate of Air Photograph Interpretation (Bathurst School of Civil Engineering)

Professional Affiliations

- Environmental Institute of Australia
- Ecological Consultants Association of Australia
- Soil Science Society of Australia

Fields of Expertise

- Biodiversity Planning and Advice
- Environmental Impact Assessment
- Flora and Fauna Surveys and Habitat Assessment
- Extractive Industry Management
- Site Rehabilitation Planning
- Soil Conservation - Urban, Rural
- Bushfire Hazard Assessment

Employment History

2014- Current	Project Director at ***Conacher Consulting Pty Ltd***
2008-2013	Director at ***Conacher Environmental Group***
1998-2007	Director at ***Conacher Travers Pty Ltd***
1991	Established ***Integrated Site Planning and Management***, an Environmental and Land Management Consultancy Business.
1990-91	***Travers Morgan Pty Ltd***. (Planning and Management Consultants). Held position of Senior Consultant and Manager of the Gosford Office.
1980-90	***Soil Conservation Service of New South Wales***. Held various positions including: • Officer In Charge - Sydney District 1984-1985 • Secondment to DMR Freeway Construction 1986-1988 • Officer In Charge - Central Coast District 1989-1990 • Catchment Management Projects - Sydney 1989
1979-80	Technical Officer (Scientific) – ***National Herbarium of NSW***

Project Experience

1) Ecological Assessment

- Biodiversity Conservation Assessment and Management Strategy - Valla Urban Growth Area
- Ecological Site Assessment Report for residential development - Riverside Teagardens
- Ecological Site Assessment Report for residential development - Parkside Terrigal
- Species Impact Statement for Northlakes Residential Estate - Wallsend (Masked Owl / Squirrel Glider)
- Species Impact Statement for Pambulong Forest - Wallsend (Masked Owl / Squirrel Glider)
- Species Impact Statement for Landcom Estate Teralba (Squirrel Glider / Powerful Owl)
- Species Impact Statement for Retirement Village - Salamander Bay (Squirrel Glider / Bats)
- Species Impact Statement for Tourist Resort - Mulbring (Comb Crested Jacana)
- Wadalba Residential Release Area - 6 Separate SIS Reports (Squirrel Glider / Masked Owl)
- Species Impact Statement for Industrial Development for Belrose (Duffy's Forest / Southern Brown Bandicoot)
- Species Impact Statement for Prestons Industrial Estate (Cumberland Plain Woodland / Cumberland Plain Snail)
- Species Impact Statement for Residential Estate Landcom Campbelltown (Koala / Cumberland Plain Snail)
- Ku-ring-gai Biodiversity Survey – Ku-ring-gai Municipal Council
- Gosford Biodiversity Surveys– Gosford City Council

2) Bushfire Assessment

- Bushfire Assessment for 105 Lot Residential Subdivision – Johns Road Wadalba
- Bushfire Assessment for 89 Lot Residential Subdivision – Pacific Highway Wadalba
- Bushfire Assessment for 48 Lot Residential Subdivision – Hamlyn Road Hamlyn Terrace
- Bushfire Assessment for 109 Lot Residential Subdivision – Central Coast Highway Forresters Beach
- Bushfire Assessment for Rezoning for 46 Lot Residential Subdivision - Bakali Road Forresters Beach
- Bushfire Assessments for 55 Public schools throughout NSW for Bovis Lend Lease
- Bushfire Assessment for 97 Lot Residential Subdivision - UrbanGrowth Myall Road, Hillsborough
- Land and Environment Court Expert Witness for Bushfire Matters – 7 Lot Rural Residential Subdivision Bensville

3) Site Rehabilitation Plans/ Landscape Plans

I have completed site rehabilitation, revegetation and landscape management plans for the following extractive industries.

• Kincumber Quarry	Kerta Rd, Kincumber
• Springfield Quarry	Clarence Rd, Springfield
• Nells Road Quarry	Nells Rd, West Gosford
• Narellan Sand Quarry	Springs Rd, Narellan
• Dripstone Roadside Quarry	Mumbil Rd, Dripstone
• Suntop Roadside Quarry	Guerie Rd, Suntop
• Stuart Town Diggings	Burrendong Dam, Stuart Town
• Mangrove Mountain Quarry	Wiseman's Ferry Rd, Mangrove Mountain
• Martin's Creek Quarry	Station Street, Martin's Creek
• Point Clare Sandstone Quarry	Manooka, Pont Clare

4) Environmental Audits and Supervision

- Mangrove to Mardi Link project – WSC contracted Environmental Officer
- Woy Woy Commuter Carpark – NSW Government Transport Construction Authority contracted Environmental Representative
- Ardglen Basalt Quarry, New England Highway, Ardglen (Major Project No.06/0264) – Audit team member.

5) Environmental Management Plans – Extractive Industries

I have completed Environmental Management Plans incorporating monitoring, compliance with consent conditions, ongoing works and site rehabilitation for the following quarries:

- Somersby Quarry Ongoing Annual Reporting — Kangoo Rd, Somersby
- Piles Creek Quarry Ongoing Annual Reporting — Old Pacific Highway, Somersby
- Kangoo Road Quarry Ongoing Annual Reporting — Somersby
- Debenham Road Quarry Ongoing Annual Reporting — Kariong
- Mount White Quarry Ongoing Annual Reporting — Ashbrookes Rd, Mount White
- Calga Quarry Ongoing Annual Reporting — Peats Ridge Rd, Calga
- Kurrajong Quarry Ongoing Annual Reporting — Bull's Ridge Rd, East Kurrajong
- Cattai Quarry Ongoing Annual Reporting — Wiseman's Ferry Rd, Cattai
- Luddenham Quarry Ongoing Annual Reporting — Adams Rd, Luddenham (P91/02045)
- Mangrove Mtn Quarry Ongoing Annual Reporting — Wiseman's Ferry Rd, Mangrove Mtn

6) Pollution Incident Response Management Plans

I have prepared the necessary documentation and reporting for the Pollution Incident Response Management Plans to address Part 5.7A of the *Protection of the Environment Operations Act* (1997) for the following licenced premises.

- Cattai Quarry — Wiseman's Ferry Rd, Cattai
- Kurrajong Quarry — Bull's Ridge Rd, East Kurrajong
- Narallen Sand Quarry — Springs Rd, Narrallen

7) Large Scale Site Rehabilitation Works

I was involved in the following large scale landform reshaping and revegetation projects in either a supervisory, planning or management role:

- Botany Bay (Southern Foreshore) Sand Drift and Revegetation Project
  Captain Cooks Landing Place / Kamay Botany Bay National Park
- Kurnell Dune Rehabilitation Project
  Captain Cooks Landing Place / Kamay Botany Bay National Park
- Cape Bailey Lighthouse Dune Stabilization
- Cronulla Beach Dune Stabilization
- Soldiers Beach Dune Reshaping and Revegetation
- Wamberal Dune Blowout Revegetation
- Lakes Beach Dune Reshaping and Revegetation
- ANZAC Rifle Range Revegetation
- Wahroonga to Berowra F3 Revegetation and Erosion Control
- Trees by the Sea – Coastal Parks Landscaping and Vegetation Plantings
- Warnervale Town Centre Construction (Site Clearing, Earthworks, Revegetation)

JACOB MANNERS

SENIOR ECOLOGIST / PROJECT MANAGER

Jacob Manners has over ten years of experience in the biodiversity assessment and management industry as a private consultant. He has provided advice and prepared assessments and management reports for a variety of projects including major sandstone and hard rock quarries, local government infrastructure works, industrial estates and facilities, residential subdivisions and dwellings, estuarine seagrass studies and road upgrade projects. the following selected project experience is provided.

- Biodiversity Development Assessment Report 2019 – Industrial Development West Gosford
- Biodiversity Development Assessment Report 2019 – Industrial Development Annangrove Road Rouse Hill
- Biodiversity Development Assessment Report 2019– Hallidays Point NSW
- Species Impact Statement – 60 Lot Residential Subdivision Warnervale Road Warnervale
- Flora and Fauna Addendum Assessment 2019 – Industrial Development Somersby
- Flora and Fauna Assessment Report 2019 – Residential Dwelling Great North Road Murrays Run
- Flora and Fauna Assessment Report 2009 – Australian Post Facility, Sunnybank Road Lisarow
- Flora and Fauna Assessment Report 2018 – Aged Care Facility Woy Woy
- Flora and Fauna Assessment Report & Vegetation Management Plan Seniors Living Facility St Ives
- Flora and Fauna Assessment Report 2018 – Residential Flat Building - Gosford
- Biodiversity Offset Assessment Options Report – Blackhill NSW
- Biodiversity Offset and Habitat Rehabilitation Plan – Sand Quarry Development Somersby
- Biodiversity Management Plan –6 Lot Rural-residential subdivision, Wisemans Ferry Rd Somersby
- Vegetation Management Plan –18 Lot Residential Subdivision at Anderson Road Glenning Valley
- Riparian Corridor Vegetation Management Plan –79 Lot Subdivision at Macpherson Street Warriewood
- Flora and Fauna Management Plan for a 9 Lot Subdivision at Reeves Street Somersby
- Conservation Area Management Plan – 200 Lot Residential Subdivision at Sandy Beach
- Flora and Fauna Assessment Report - Road Upgrade Chain Valley Bay, for Central Coast Council
- Flora and Fauna Assessment - Shared Pathway at Charmhaven for Central Coast Council
- Flora and Fauna Assessment - Road and Drainage Upgrade – Buff Point, for Wyong Shire
- Flora and Fauna Assessment - Kanangra Drive Upgrade, Crangan Bay for Wyong Shire Council
- Flora Offset Monitoring Reports 2011-2014 - Warnervale Business Park Offset for Wyong Shire Council
- Biodiversity Assessment Report – Sparks Road & Warnervale Town Centre Intersection Upgrade.

Jacob has a strong passion for the natural environment and holds a Masters Degree in Wildlife Management. He is an accredited BAM Assessor under the *Biodiversity Conservation Act* (2016) and has skills in advanced plant identification and fauna survey. A full list of his qualifications is provided below.

- Master of Wildlife Management – Macquarie University
- Bachelor of Science - University of Newcastle
- OEH Accredited Biodiversity Assessment Method Assessor
- Advanced Plant Identification Skills for Research & Environmental Assessment, UNSW
- Nocturnal Bird and Mammal: Species Identification & Survey Skills workshop.
- Frog, Bat and Reptile: Species Identification and Survey Skills Workshop, NSW DPI
- Shorebird identification Workshop - Birds Australia
- Woodland Birds Identification & Ecology Workshop. DPI Forests NSW
- Commercial Photography Certificate III - TAFE Ultimo Campus
- OHS General Induction for Construction Work in NSW - Workcover NSW
- Open Water Dive Certificate (PADI)
- NPWS Registered Flora and Fauna Surveyor

ASHLEY MULLAHEY

Research Assistant and GIS Technician

Ashley has over four years of experience as a Research Assistant and GIS Technician at Conacher Consulting since 2015. His key areas of expertise are GIS mapping and analysis, fauna surveys including experience in trapping and remote camera deployment and identification, amphibian surveys, microbat call identification, threatened flora searches and reporting assistance. Ashely has completed a number of university levels courses of relevance to ecological consulting including chemistry, environmental science, biology, GIS, ecology, marine science and statistics.

Selected Project Experience

GIS Mapping

- BAL and APZ mapping for 105 Lot Residential Subdivision – Johns Road Wadalba
- BAL and APZ mapping for 109 Lot Residential Subdivision – Central Coast Highway Forresters Beach
- BAL and APZ mapping for Rezoning & 46 Lot Residential Subdivision - Bakali Road Forresters Beach
- Flora and Fauna Mapping Martins Creek Quarry SSD
- Bushfire and Flora and Fauna Mapping – Multi Lot Rural Residential Development Somersby
- Soil & Water Management Plan - Somersby

Fauna Survey Experience

- Field Survey Assistant for Species Impact Statement– Warnervale Road Warnervale NSW
- Red-crowned Toadlet Survey – Arcadia NSW
- Red-crowned Toadlet Survey Mangrove Mountain NSW
- Wallum Froglet Survey – Chain Valley Bay NSW
- Remote Camera Trapping for Heath Monitor– Oxford Falls NSW
- Remote Camera Survey – Lake Munmorah NSW
- Remote Camera Survey – Tacoma NSW
- Elliot Trapping –Empire Bay NSW
- Elliot Trapping – Green Point NSW
- Hair Tube & Nest Box Survey – Somersby NSW
- Large Forest Owl Nest Tree Survey Assistant– Hillsborough
- Large Forest Owl Nest Tree Survey Assistant– Wyong
- Remote camera survey – Wyong

Flora Survey Experience

- *Rutidosis heterogama* Monitoring Survey Assistant –Chelmsford Road Charmhaven
- *Tetratheca juncea* Survey Assistant – Wyee Road Morisset
- *Tetratheca glandulosa* Survey Assistant – Bell Road Mangrove Mountain
- *Pimelea spicata* Survey Assistant – Lodges Road Narellan
- *Prostanthera junonis* Survey Assistant– Grants Road Somersby
- *Melaleuca biconvexa Survey Assistant* – Springfield Road, Springfield
- *Melaleuca biconvexa Survey Assistant* – Oyster Shell Road Lower Mangrove
- Threatened Orchid Survey Assistant – Martins Creek
- Threatened Orchid Survey Assistant – Pacific Highway Lake Munmorah
- Threatened Orchid Survey Assistant – Sparks Road Halloran
- Threatened Orchid Survey Assistant – Empire Bay Drive Bensville
- Threatened Orchid Survey Assistant – Warnervale Road, Warnervale

Bryan Furchert

Botanist

Bryan Furchert is a Project Manager and Botanist at Cumberland Ecology, based in Sydney. He has a Bachelor of Biodiversity and Conservation.

Bryan has been with Cumberland Ecology since 2013, and prior to his current role has six years' experience in bushland restoration as a Team Leader.

Bryan has extensive experience undertaking botanical surveys of vegetation communities throughout the Sydney Basin Bioregion and the Brigalow Belt South Bioregion in New South Wales, and within the Northern Brigalow Belt Bioregion in Queensland. He has undertaken vegetation mapping and detailed collection of floristic data across project sites ranging from small urban properties to large areas of land for mining sites and biodiversity offset properties.

Bryan also has experience in Geospatial Information Systems (MapInfo), threatened flora species and community monitoring.

Recent consultancy work has included:

- Vegetation Management Plans;
- Flora and fauna impact assessment;
- Species Impact Statements; and
- Monitoring studies.

Fields of Competence

- NSW *Biosecurity Act 2015*;
- Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*;
- NSW *Biodiversity Conservation Act 2016*;
- Weeds of National Significance (WoNS) – identification and control; and
- Botanical surveys.

Key Industry Sectors

- Urban development;
- Industrial and logistics;
- Infrastructure; and
- Extraction.

Education

Bachelor of Biodiversity and Conservation, Macquarie University, 2012.

Diploma of Conservation and Land Management, Belmont TAFE, 2009.

Completed professional development courses have included:

- Biodiversity Offsets Scheme training;
- Recognising Water Weeds (DPI), and
- Aboriginal Site Awareness (The Aboriginal Heritage Office).

Key Projects

Botanical Surveys

Bryan regularly undertakes botanical surveying for site and Biodiversity Assessment Methodology assessments, targeted threatened species searches, and identification and mapping of Critically Endangered and Endangered Ecological Communities.

State Significant Projects and Development Applications

Bryan has undertaken vegetation mapping and botanical surveys for large state significant extraction projects and prepared Vegetation Management Plans, Ecological Constraints Analyses, Ecological Impact Assessments, Flora and Fauna Assessments and Species Impact Statements for Development Applications.

He has worked extensively on the Epping to Thornleigh Third Track upgrade over three years, with works including botanical surveys, vegetation mapping, and preparation of Flora and Fauna Assessments and 7 Part Tests for threatened species and ecological communities for ancillary works related to the project.

Long-term Monitoring

Bryan has also undertaken flora monitoring and reporting for long term restoration projects for urban bushland remnants, and large biodiversity offset areas.

BIODIVERSITY DEVELOPMENT ASSESSMENT REPORT

PROPOSED VEGETATION MANAGEMENT WORKS

WARNERVALE AIRCRAFT LANDING AREA

SOUTHERN OBSTACLE LIMITATION SURFACE

SEPTEMBER 2020
REF: 9102

BIODIVERSITY DEVELOPMENT ASSESSMENT REPORT

PROPOSED VEGETATION MANAGEMENT WORKS

WARNERVALE AIRCRAFT LANDING AREA

NORTHERN OBSTACLE LIMITATION SURFACE

SEPTEMBER 2020

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PREFACE

This Biodiversity Development Assessment Report has been prepared by *Conacher Consulting* for the proposed vegetation management works associated with the management of the southern obstacle limitation surface for the Warnervale Aircraft Landing Area. This Biodiversity Development Assessment Report has been prepared in accordance with the requirements of the *Biodiversity Conservation Act* (2016).

REPORT CERTIFICATION

This Biodiversity Development Assessment Report has been prepared by *Conacher Consulting Pty Ltd* on the basis of the requirements of (and information provided under) the Biodiversity Assessment Method on 3 September 2020.

PROJECT TEAM

Personnel	Qualifications	Title	Tasks Completed
PHILLIP ANTHONY 	CONACHER B.Sc.(Hons), Dip.Urb Reg Planning, M.Nat.Res	Project Director	Project Director Document review Targeted threatened species survey
JACOB MANNERS 	B.Sc, MWldMgt. Biodiversity Assessment Method Assessor Accreditation No. BAAS17099	Senior Ecologist Project Manager	Accredited BAM Assessor Report preparation Flora survey Targeted threatened species surveys
BRYAN FURCHURT	BBioCons Biodiversity Assessment Method Assessor Accreditation No. BAAS18095	Botanist	Botanical plot surveys
ASHLEY MULLAHEY		GIS & Field Survey Technician	Map production Field survey assistant
DEAN CONACHER		GIS & Field Survey Technician	Field survey assistant

Project Team Member CVs are provided in Appendix 6

DOCUMENT DETAILS

Version	Issue Date	Details
Draft V1	17 June 2020	Draft Report for Client Review / Additional Information Required
Final Report V2	3 September 2020	Final Report

GLOSSARY OF TERMS AND ACRONYMS

Acronym	Term	Description
BAM	Biodiversity Assessment Method	The method established under Part 6 of the BC Act (2016) for the purpose of assessing certain impacts on threatened species and threatened ecological communities (TECs), and their habitats, and the impact on biodiversity values, where required under the BC Act (2016), Local Land Services Act 2013 (LLS Act) or the State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017
BAM Calculator	Biodiversity Assessment Method Calculator	An online application of the Biodiversity Assessment Method (BAM). The calculator uses the rules and calculations outlined in the BAM, and allows the user to apply the BAM at a site and observe the results of the assessment.
BC Act	Biodiversity Conservation Act	The Act administered by the NSW Government which contains the NSW biodiversity protection and impact assessment provisions
BCF	Biodiversity Conservation Fund	The fund which receives money paid by proponents to meet offset obligations under the NSW Biodiversity Offsets Scheme
BCT	Biodiversity Conservation Trust	Established under the BC Act to oversee private land conservation programs and establish Biodiversity Stewardship Agreements as part of the Biodiversity Offsets Scheme. The credits generated by these agreements can then be sold to offset development impacts.
BDAR	Biodiversity Development Assessment Report	For the purposes of the biodiversity offsets scheme, a biodiversity development assessment report is a report prepared by an accredited person in relation to proposed development or activity that would be authorised by a planning approval, or proposed clearing that would be authorised by a vegetation clearing approval, that: a) assesses in accordance with the biodiversity assessment method the biodiversity values of the land subject to the proposed development, activity or clearing, and (b) assesses in accordance with that method the impact of proposed development, activity or clearing on the biodiversity values of that land, and (c) sets out the measures that the proponent of the proposed development, activity or clearing proposes to take to avoid or minimise the impact of the proposed development, activity or clearing, and (d) specifies in accordance with that method the number and class of biodiversity credits that are required to be retired to offset the residual impacts on biodiversity values of the actions to which the biodiversity offsets scheme applies.
-	Biodiversity Credit	A biodiversity credit created by (and in accordance with) a biodiversity stewardship agreement.

Acronym	Term	Description
BOS	Biodiversity Offsets Scheme	A transparent, consistent and scientifically based approach to biodiversity assessment and offsetting for all types of development that are likely to have a significant impact on biodiversity and a scheme for establishing biodiversity stewardship agreements, which are voluntary in-perpetuity agreements entered into by landholders, to secure offset sites
BSSAR	Biodiversity Stewardship Site Assessment Report	For the purposes of the biodiversity offsets scheme, a biodiversity stewardship site assessment report is a report prepared by an accredited person in relation to a proposed biodiversity stewardship agreement under Part 5 that: (a) assesses the biodiversity values of the proposed biodiversity stewardship site in accordance with the biodiversity assessment method, and (b) sets out the management actions proposed to be carried out on the proposed site, and (c) specifies in accordance with the biodiversity assessment method the number and class of biodiversity credits that may be created in respect of those management actions.
BV MAP	Biodiversity Values Map	Development within an area identified on the map requires assessment using the BAM.
DoEE	Department of the Environment and Energy	Commonwealth Department which administers the EPBC Act
EPBC Act	Environment Protection and Biodiversity Conservation Act	Commonwealth legislation which contains biodiversity protection and impact assessment provisions
IBRA	Interim Biogeographic Regionalisation For Australia	A classification system for Australia's landscape which separates areas which are geographically distinct into Regions (based on common climate, geology landform and biodiversity characteristics) and Subregions (based on localised geomorphology patterns).
NSW DPIE	NSW Department of Planning, Infrastructure and Environment	NSW Department which administers the BC Act
PCT	Plant Community Type	The vegetation classification unit used for vegetation communities in the BAM from the Bionet Vegetation Classification (NSW DPIE 2020)
	Prescribed Impact	Impacts identified as prescribed under the BC Regulation which are required to be assessed but not for the purposes of calculating credits

Acronym	Term	Description
SAII	Serious and irreversible impact	An impact is to be regarded as serious and irreversible if it is likely to contribute significantly to the risk of a threatened species or ecological community becoming extinct for the reasons identified in the BC Regulation. For Part 4 development the consent authority must refuse to grant consent if it is of the opinion that the proposed development is likely to have serious and irreversible impacts on biodiversity values.
TEC	Threatened Ecological Community	Means a critically endangered ecological community (CEEC), an endangered ecological community (EEC) or a vulnerable ecological community (VEC) listed in Schedule 2 of the BC Act.
TS	Threatened Species	Means a critically endangered species, an endangered species or a vulnerable species listed in Schedule 1. For the purposes of the BAM these are further separated into ecosystem credit and species credit type threatened species

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SECTION 1

INTRODUCTION AND BACKGROUND

1.1 INTRODUCTION

Conacher Consulting has been engaged to prepare a Biodiversity Development Assessment Report (BDAR) for the vegetation management works associated with the southern obstacle limitation surface (OLS) for the Warnervale Aircraft Landing Area (ALA).

The proposed works are to be assessed under Part 5 of the *EP&A Act* (1979) and Central Coast Council has chosen to opt-in to the Biodiversity Offsets Scheme and assess the proposal under the Biodiversity Assessment Method.

A separate BDAR has also been prepared by Conacher Consulting (2020), for the vegetation management works required for the obstacle limitation surface at the northern end of the runway.

This Report has been prepared to provide an assessment of the biodiversity values of the subject land and an assessment of the impact of the proposed development in accordance with the Biodiversity Assessment Methodology (BAM).

1.2 SITE CHARACTERISTICS

The planning and cadastral details of the subject site are provided in Table 1.1.

TABLE 1.1
SITE DETAILS

Location	Part Lot 2 DP 1234942, Jack Grant Avenue, Warnervale.
Local Government Area	Central Coast
Existing Land Use	Vacant land, industrial and rural residential
Zoning	E2 Environmental Conservation
Included on Biodiversity Values Map	Yes
BAM Assessment Method Used	Full BAM Method

1.3 PROPOSED DEVELOPMENT

The proposed works assessed in this report are the tree management works for the maintenance of the obstacle limitation surface for the southern end of the runway for the Warnervale Aircraft Landing Area.

A plan of the proposed works impact footprint assessed in this Report is provided as Figures 1.1a and 1.1b. The proposed works are to be further informed by a Vegetation Management Plan which is to be prepared to document the methods for undertaking the proposed works and suitable impact avoidance and minimisation measures.

1.4 BIODIVERSITY VALUES MAP

Part of the proposed development footprint is included on the Biodiversity Values Map, as shown in Figure 1.2.

1.5 LITERATURE REVIEW & INFORMATION SOURCES

Details on the previous ecological surveys and assessments reviewed and utilised for this report are outlined as follows. Additional documents referred to in the text are listed in the References Section of this Report.

i. Ecological Investigations (Version 2) Wyong Employment Zone – Warnervale Business Park. Warnervale Airport Lands, Precincts 11 & 13 and Precinct 14 (Bell and Murray 2007).

This report contains the results of threatened species surveys and literature reviews of previous surveys relevant to the current study. The results of the previous studies incorporated into this Report by Bell and Murray (2007) include a Species Impact Statement for the adjoining allotment to the west (Bell and Murray 2004).

The following threatened species were identified in the study area for the Wyong Employment Lands:

- *Angophora inopina*
- *Caladenia tessellata* (From Gunninah 2003, citing Payne 1997a)
- *Grevillea parviflora* subsp. *parviflora*
- *Melaleuca biconvexa*
- *Tetratheca juncea*
- *Eucalyptus parramattensis* subsp. *parramattensis* endangered population
- Glossy Black-Cockatoo
- Powerful Owl
- Masked Owl
- Squirrel Glider
- Yellow-bellied Glider (discounted identification made from misidentification of a hair sample)
- Grey-headed Flying-fox
- Eastern Freetail-bat
- Little Bent-winged Bat
- Large Bent-winged Bat
- Large-footed Myotis
- Eastern False Pipistrelle (Tentative identification only)
- Greater Broad-nosed Bat

- Eastern Chestnut Mouse (tentative identification /escaped prior to formal identification).
- Wallum Froglet
- Green-thighed Frog (tentative identification from call by Payne 1996 / no individuals captured)

This study has mapped the vegetation within the subject site as Map Unit 19 Alluvial Woollybutt – Melaleuca Sedge Forest and Map Unit 20f Alluvial Floodplain Shrub Swamp Forest (Sedge Scrub Variant). Map Unit 19 has been identified as part of the River Flat Eucalypt Forest EEC and Map Unit 20f has been identified as part of the Swamp Sclerophyll Forest EEC.

ii. Wyong Vegetation Map 2016 V1 (Eco Logical Australia 2016)

Eco Logical Australia (2016) have mapped most of the site as Alluvial Woolly butt Melaleuca Sedge Forest with minor areas of Alluvial Floodplain Shrub Swamp Forest and Floodplain Wet Heath.

iii. The Natural Vegetation of the Wyong Local Government Area (Bell 2002)

Bell (2002) has mapped the entire site as Alluvial Floodplain Shrub Swamp Forest.

iv. Bionet Atlas of NSW Wildlife

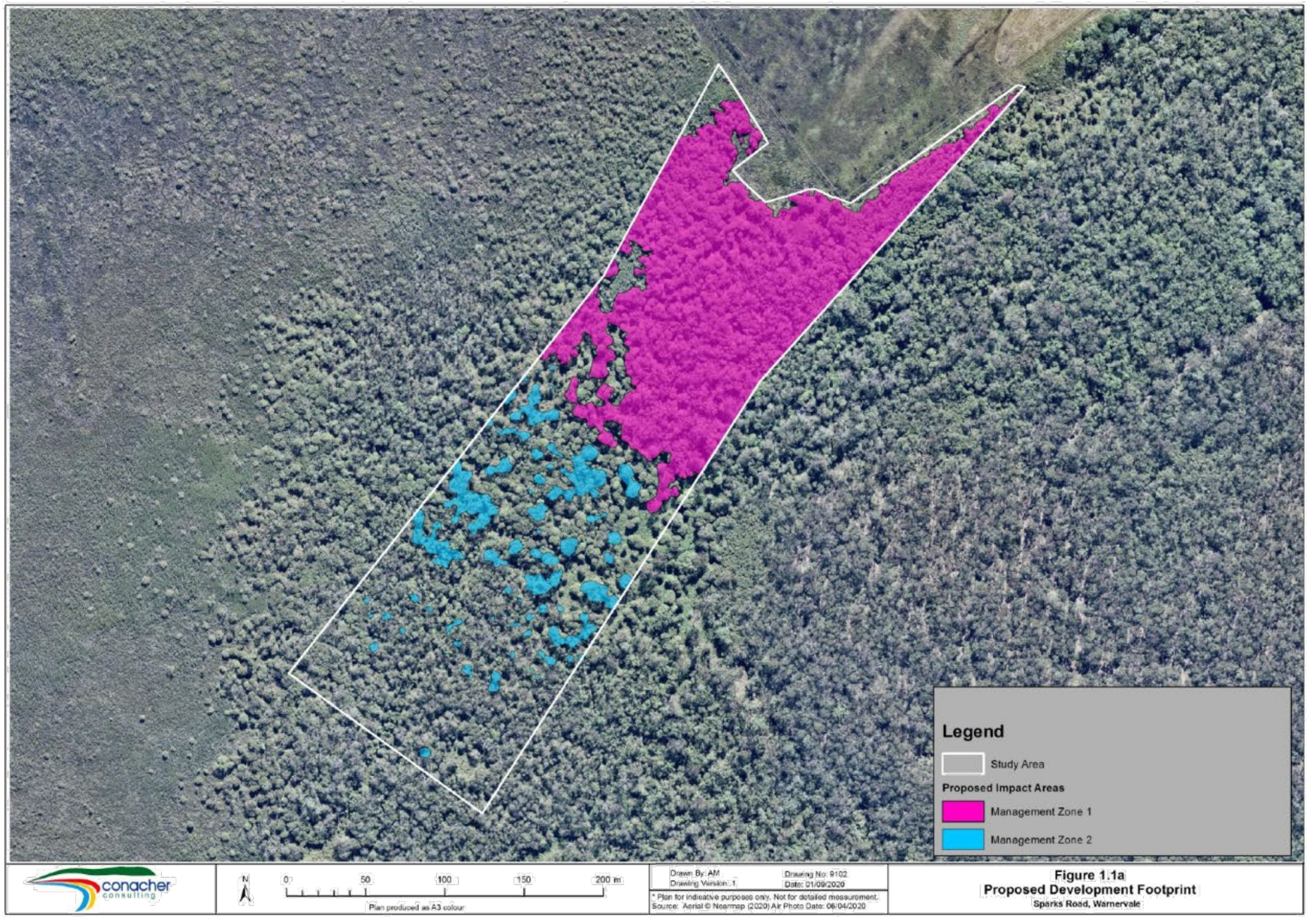
The Bionet Atlas of NSW Wildlife (NSW DPIE 2020) was checked to determine whether any threatened species have been recorded within the subject site or the 1500m buffer area surrounding the site.

The Wallum Froglet has been recorded within the site on the Bionet Atlas of NSW Wildlife (NSW DPIE 2020). A list of the threatened species recorded within 1500m of the site are provided in Table 1.2. Threatened species observed during the current site surveys are documented in Section 4.4 of this Report. Species listed within Table 1.2 with potential to occur within the site has been included in the assessments undertaken in Section 4 of this Report.

TABLE 1.2
THREATENED SPECIES RECORDED ON THE BIONET ATLAS WITHIN 1500m

Scientific Name	Common Name	Potential for Occurrence within Site
Angophora inopina	Charmhaven Apple	Yes
Eucalyptus parramattensis subsp. parramattensis	*Eucalyptus parramattensis* subsp. *parramattensis* endangered population in the Wyong and Lake Macquarie Local Government Areas	Yes
Grevillea parviflora subsp. *parviflora*	Small-flower Grevillea	Yes
Maundia triglochinoides		Yes
Melaleuca biconvexa	Biconvex Paperbark	Yes
Tetratheca juncea	Black-eyed Susan	Yes
Thelymitra adorata	Wyong Sun Orchid	Yes
Crinia tinnula	Wallum Froglet	Yes

TABLE 1.2 THREATENED SPECIES RECORDED ON THE BIONET ATLAS WITHIN 1500m		
Scientific Name	**Common Name**	**Potential for Occurrence within Site**
Botaurus poiciloptilus	Australasian Bittern	Yes
Haliaeetus leucogaster	White-bellied Sea-Eagle	Yes
Callocephalon fimbriatum	Gang-gang Cockatoo	Yes
Ninox strenua	Powerful Owl	Yes
Tyto novaehollandiae	Masked Owl	Yes
Lathamus discolour	Swift Parrot	Yes
Tyto tenebricosa	Sooty Owl	Yes – foraging habitat only
Daphoenositta chrysoptera	Varied Sittella	Yes
Phascolarctos cinereus	Koala	Yes
Petaurus norfolcensis	Squirrel Glider	Yes
Pteropus poliocephalus	Grey-headed Flying-fox	Yes
Micronomus norfolkensis	Eastern Coastal Free-tailed Bat	Yes
Falsistrellus tasmaniensis	Eastern False Pipistrelle	Yes
Myotis macropus	Southern Myotis	Yes
Scoteanax rueppellii	Greater Broad-nosed Bat	Yes
Miniopterus orianae oceanensis	Large Bent-winged Bat	Yes
Miniopterus australis	Little Bent-winged Bat	Yes


Legend
Study Area
Proposed Impact Areas
Management Zone 1
Management Zone 2
conacher consulting
N
0
50
100
150
200 m
Plan produced as A3 colour
Drawn By: AM
Drawing Version: 1
Drawing No: 9102
Date: 01/09/2020
* Plan for indicative purposes only. Not for detailed measurement.
Source: Aerial © Nearmap (2020) Air Photo Date: 06/04/2020
Figure 1.1a
Proposed Development Footprint
Sparks Road, Warnervale

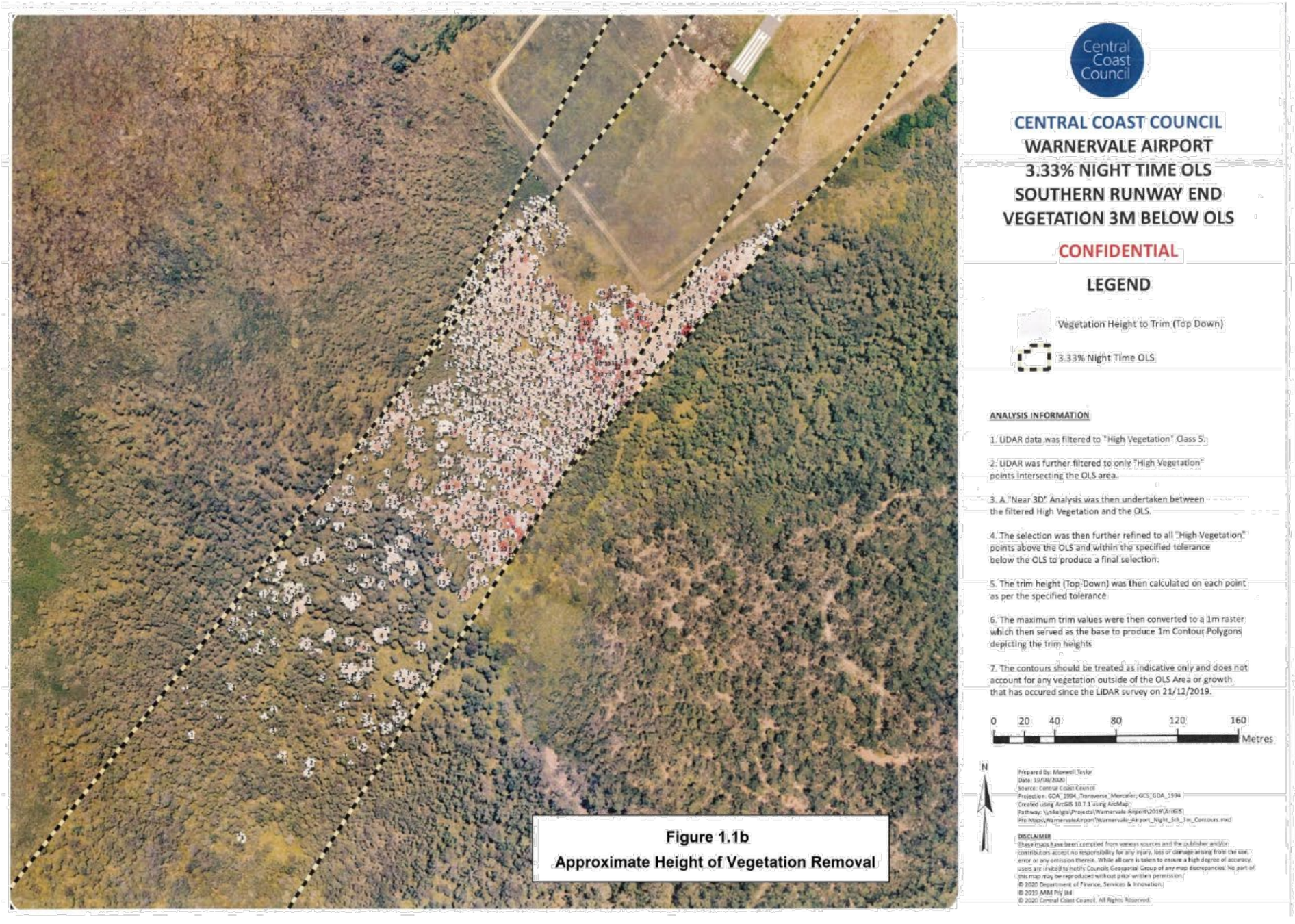
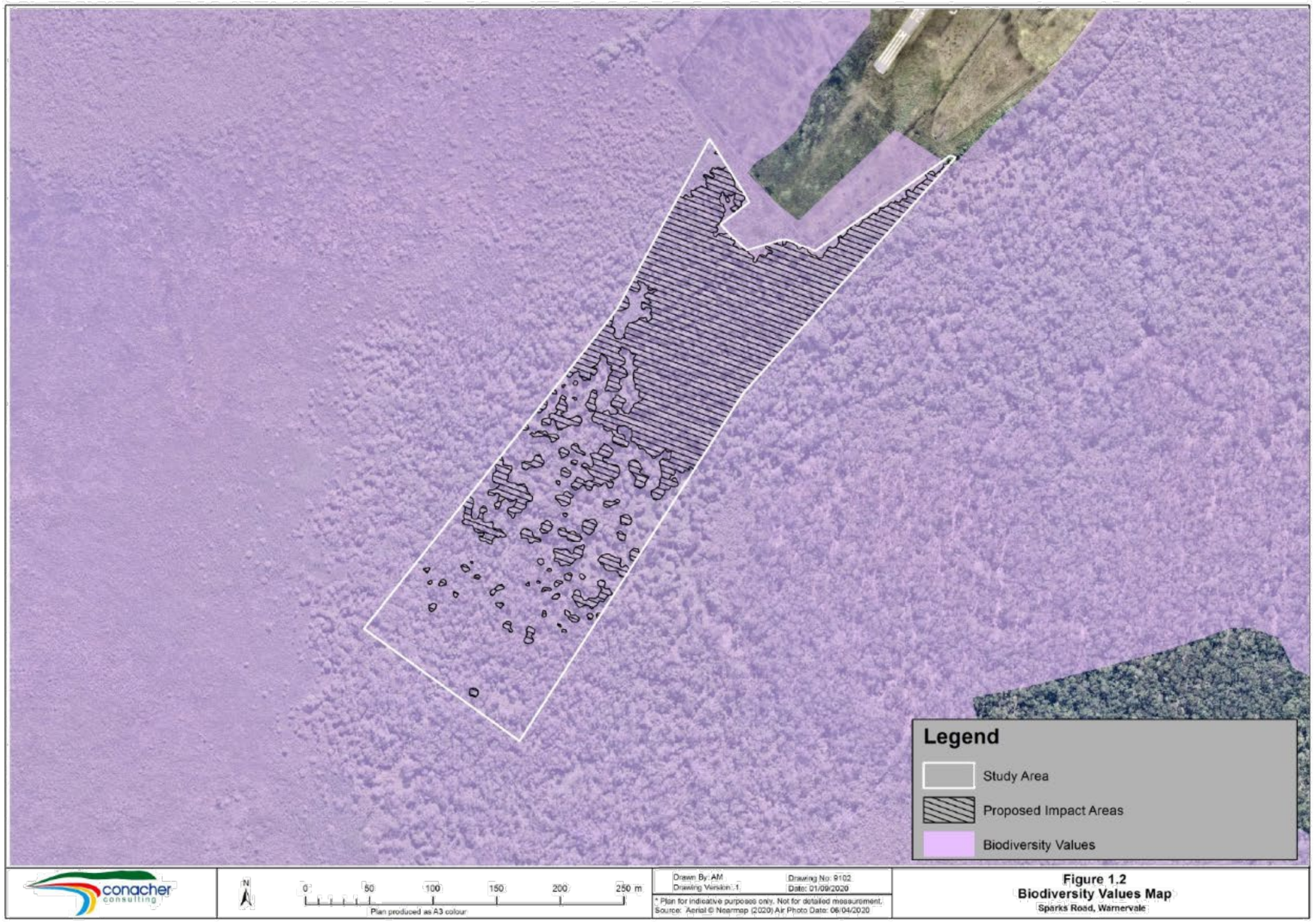


Figure 1.1b
Approximate Height of Vegetation Removal


Legend
Study Area
Proposed Impact Areas
Biodiversity Values
conacher consulting
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Plan produced as A3 colour
Drawn By: AM
Drawing Version: 1
Drawing No: 9102
Date: 01/09/2020
* Plan for indicative purposes only. Not for detailed measurement.
Source: Aerial © Nearmap (2020) Air Photo Date: 06/04/2020
Figure 1.2
Biodiversity Values Map
Sparks Road, Warnervale

SECTION 2

LANDSCAPE FEATURES AND SITE CONTEXT

2.1 LANDSCAPE FEATURES

The Site Map is provided as Figure 2.1 and a Location Map is provided as Figure 2.2. The landscape features relevant to the site are identified as follows.

i. IBRA BIOREGION & SUBREGION

- IBRA Bioregion: Sydney Basin
- IBRA Subregion: Wyong
- Refer to Figure 2.2.

ii. NSW LANDSCAPE REGION

- Sydney – Newcastle Coastal Alluvial Plains
- Refer to Figure 2.2.

iii. RIVERS, STREAMS AND ESTUARIES

There are no rivers, streams or estuaries mapped within the site. The locations of these features within 1500m of the development site are mapped in Figure 2.3.

iv. IMPORTANT AND LOCAL WETLANDS

The proposed works area is located within a mapped SEPP Coastal Management Wetland, this area forms part of the Porters Creek Wetland.

v. HABITAT CONNECTIVITY

The proposed works area is located on the edge of a large area of native vegetation associated with the Porters Creek Wetland. The land to the north of the works location is cleared and managed as part of the Central Coast Airport, direct vegetation connectivity is present to all other aspects.

vi. AREAS OF GEOLOGICAL SIGNIFICANCE AND SOIL HAZARD FEATURES

The development site does not contain any karst, caves, crevices, cliffs or other areas of geological significance.

The development site does not contain any identified soil hazard features. The site is mapped as having a low probability of acid sulphate soil occurrence on Council's Acid Sulphate Soils Map.

vii. AREAS OF OUTSTANDING BIODIVERSITY VALUE

The development site does not contain any areas of Outstanding Biodiversity Value, declared by the Minister.

2.2 SITE CONTEXT FEATURES

The site context features of native vegetation cover and patch size have been identified from an inspection of the site and GIS assessment of available aerial imagery and shapefiles using ArcMap software. These features are used to determine the biodiversity values that are important for identifying the site context and habitat suitability of the proposed development site for the purposes of impact assessment.

i. ASSESSMENT METHOD APPLIED

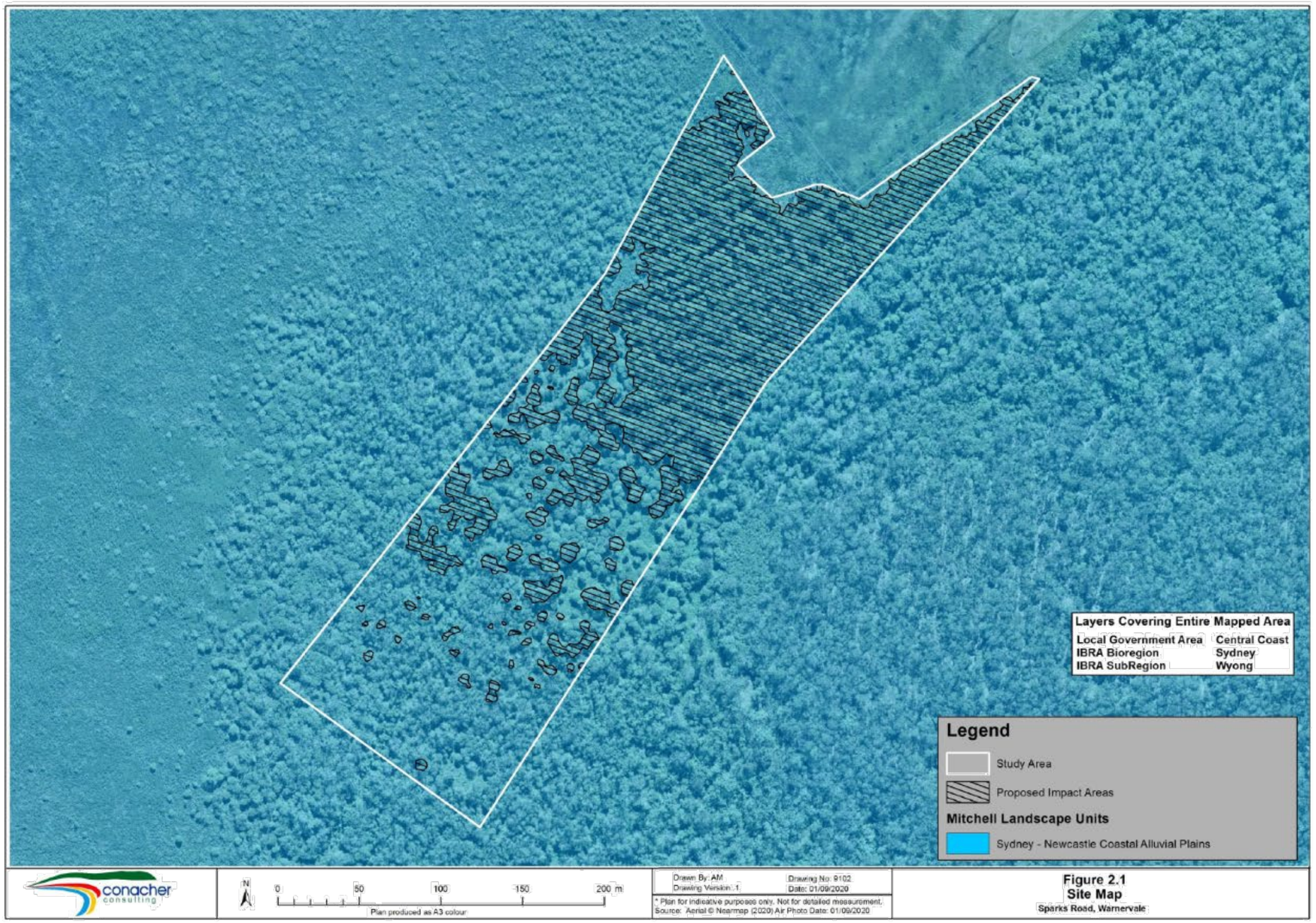
The site-based assessment method was utilised for this assessment.

ii. NATIVE VEGETATION COVER

The native vegetation cover within the 1500m buffer of the proposed development site has been determined from aerial imagery obtained from Six Maps (NSW Department of Finances and Services 2019) and has been mapped as 81.23% cover as shown in Figure 2.4.

iii. PATCH SIZE

The patch size associated with the subject development site is greater than 100 hectares.


Layers Covering Entire Mapped Area
Local Government Area Central Coast
IBRA Bioregion Sydney
IBRA SubRegion Wyong
Legend
Study Area
Proposed Impact Areas
Mitchell Landscape Units
Sydney - Newcastle Coastal Alluvial Plains
conacher consulting
N
0 50 100 150 200 m
Plan produced as A3 colour
Drawn By: AM
Drawing Version: 1
Drawing No: 9102
Date: 01/09/2020
* Plan for indicative purposes only. Not for detailed measurement.
Source: Aerial © Nearmap (2020) Air Photo Date: 01/09/2020
Figure 2.1
Site Map
Sparks Road, Warnervale

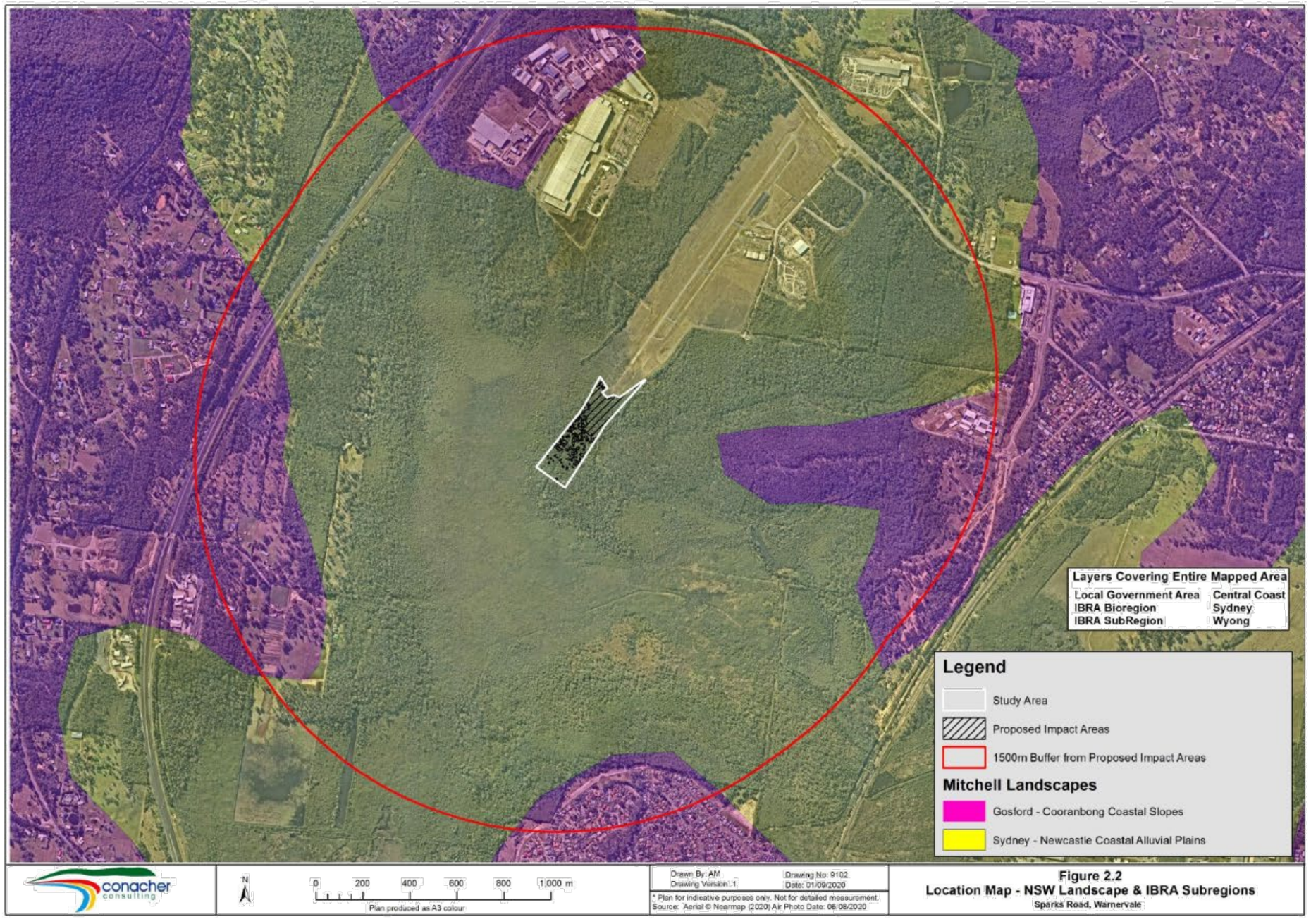
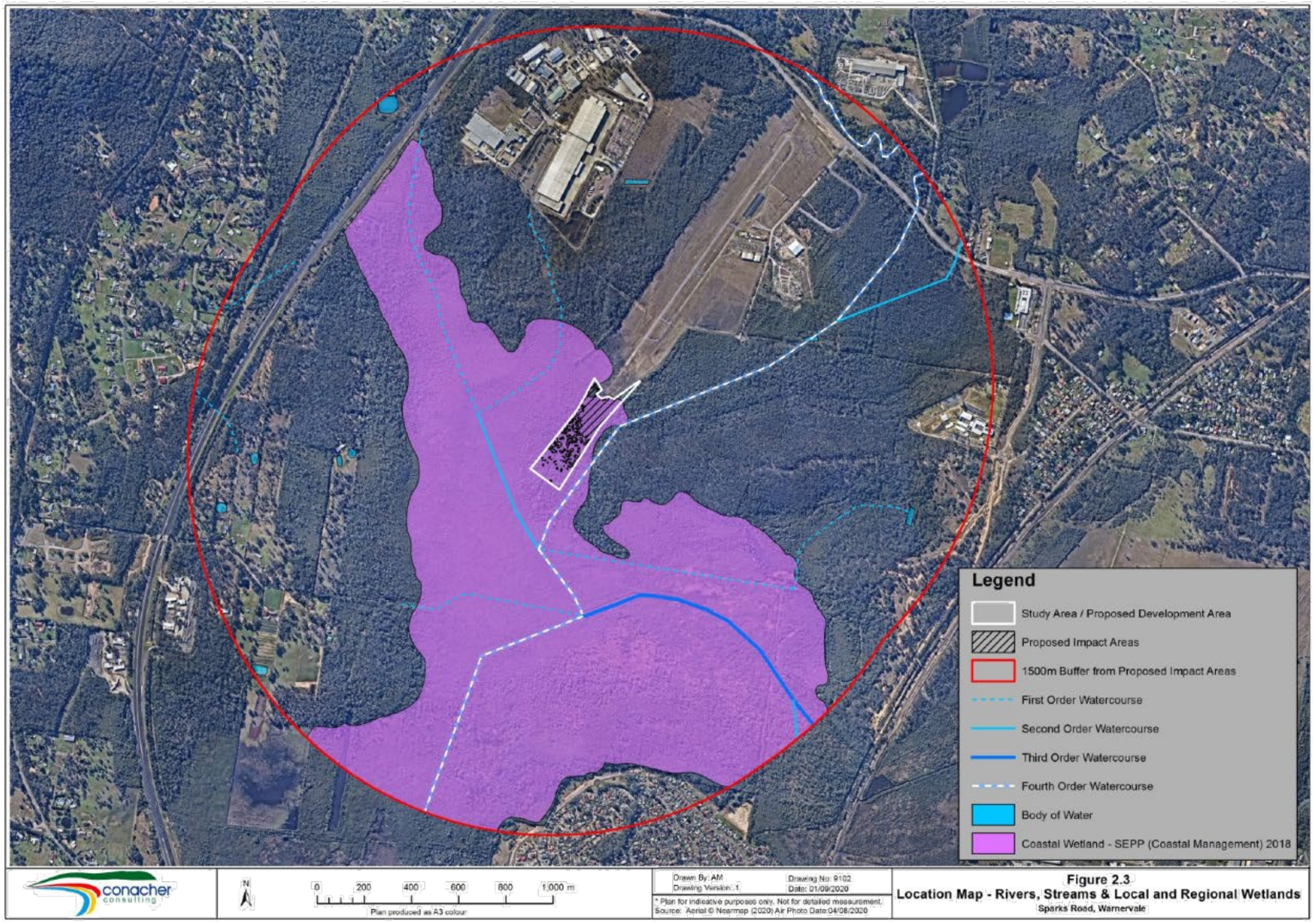


Figure 2.2
Location Map - NSW Landscape & IBRA Subregions
Sparks Road, Warnervale


Legend
Study Area / Proposed Development Area
Proposed Impact Areas
1500m Buffer from Proposed Impact Areas
First Order Watercourse
Second Order Watercourse
Third Order Watercourse
Fourth Order Watercourse
Body of Water
Coastal Wetland - SEPP (Coastal Management) 2018
conacher consulting
N
0 200 400 600 800 1,000 m
Plan produced as A3 colour
Drawn By: AM
Drawing Version: 1
Drawing No: 9102
Date: 01/09/2020
* Plan for indicative purposes only. Not for detailed measurement.
Source: Aerial © Nearmap (2020) Air Photo Date:04/08/2020
Figure 2.3
Location Map - Rivers, Streams & Local and Regional Wetlands
Sparks Road, Warnervale

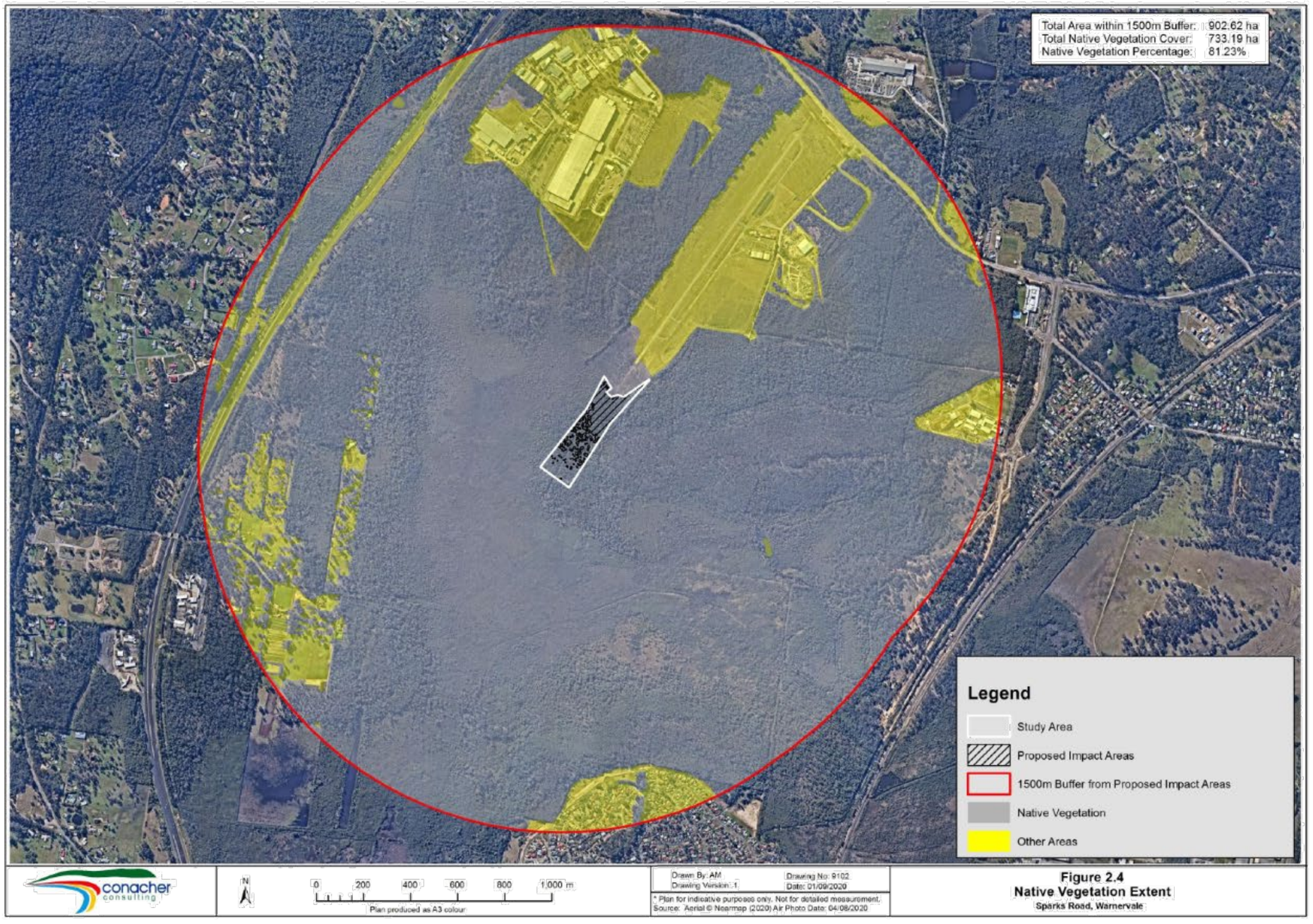


Figure 2.4
Native Vegetation Extent
Sparks Road, Warnervale

SECTION 3

NATIVE VEGETATION & VEGETATION INTEGRITY ASSESSMENT

3.1 NATIVE VEGETATION AND PLANT COMMUNITY TYPES

i. Plant Community and Floristic Survey Methods

Current aerial imagery of the site and the previous reports and vegetation mapping documented in Section 1.5 of this Report were initially reviewed. A field survey, which included a belt transect search across the site, was then completed to determine the dominant flora species present and to produce a map of the plant communities present.

A stratified plot-based vegetation survey of the subject site was completed for each plant community mapped in accordance with the requirements of the BAM. The dominant flora species observed within the plots were entered into the Bionet Vegetation Classification (NSW DPIE 2020) to develop a list of potentially corresponding plant community types (PCTs). This list was then reviewed to determine the PCTs present with consideration of:

- Vegetation formation
- Vegetation class
- Dominant and main associated species,
- Descriptive attributes and diagnostic features,
- Landscape position,
- Geographic distribution.

Plants recorded within plots which were not readily identified in the field were photographed and/or sampled for further identification. Any specimens of plants tentatively identified as threatened species were sent to the Sydney Royal Botanic Gardens for confirmation of the identification.

All vascular plants were identified using keys, nomenclature and/or information in The Royal Botanic Gardens and Domain Trust (2020) and Richardson *et al.*, (2016). Wherever they were known, changes to nomenclature and classification have been incorporated into the results.

The PCTs, associated zones and threatened ecological communities and stratified survey effort completed is documented in Table 3.1, PCT locations are mapped in Figure 3.1.

TABLE 3.1
DETAILS OF PLANT COMMUNITY TYPES AND SURVEY EFFORT STRATIFICATION

PCT	Vegetation Zone	Corresponding Threatened Ecological Communities	Area within Footprint (ha)	Plots Completed
PCT 1715 Prickly-leaved Paperbark - Flax-leaved Paperbark swamp forest on poorly drained soils of the Central Coast	Zone 1 – Intact condition	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	0.08	1 plot completed (Plot 9 - 27 February 2020)

TABLE 3.1 DETAILS OF PLANT COMMUNITY TYPES AND SURVEY EFFORT STRATIFICATION				
PCT	**Vegetation Zone**	**Corresponding Threatened Ecological Communities**	**Area within Footprint (ha)**	**Plots Completed**
PCT 1719 – Paperbarks – Woollybutt swamp forest on coastal lowlands of the Central Coast.	Zone 1 – Intact condition	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	2.86	3 Plots (Plots 6, 7 & 8 – 27 February 2020)

ii. Description of Plant Community Types Present

The following description in Table 3.2 is provided for the plant community type observed within the site. The location of this PCT is mapped in Figure 3.1 and the corresponding endangered ecological community is mapped in Figure 3.2.

TABLE 3.2a DESCRIPTION FOR PCT 1715 – PRICKLY-LEAVED PAPERBARK - FLAX-LEAVED PAPERBARK SWAMP FOREST ON POORLY DRAINED SOILS OF THE CENTRAL COAST	
Vegetation Formation	Forested Wetlands
Vegetation Class	Coastal Floodplain Wetlands
Vegetation Zones	One Zone - (Intact Condition)
Extent within Study Area (ha)	0.17 ha
Extent within Development Footprint (ha)	0.08 ha
Dominant Native Tree Species	*Eucalyptus tereticornis*
Dominant Native Shrub Species	*Melaleuca linariifolia* *Melaleuca ericifolia* *Melaleuca sieberi*
Dominant Native Groundcover Species	*Lomandra longifolia* *Entolasia marginata* *Imperata cylindrica* *Lepidosperma longitudinale*
Justification of PCT identification	The chosen PCT conforms to the diagnostic species and structure of the site vegetation.
Threatened Ecological Community Status	Yes, Swamp sclerophyll forest on coastal floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions
Estimate of PCT percentage cleared value	56%
Correlation with aerial photograph and mapped extent	Yes
Patch Size	>100ha

TABLE 3.2b DESCRIPTION FOR PCT 1719 – PAPERBARKS – WOOLYBUTT SWAMP FOREST ON COASTAL LOWLANDS OF THE CENTRAL COAST	
Vegetation Formation	Forested Wetlands
Vegetation Class	Coastal Swamp Forests
Vegetation Zones	One Zone - (Intact Condition)
Extent within Study Area (ha)	6.04 ha
Extent within Development Footprint (ha)	2.86 ha
Dominant Native Tree Species	*Eucalyptus robusta* *Eucalyptus longifolia* *Eucalyptus tereticornis*
Dominant Native Shrub Species	*Melaleuca linariifolia* *Melaleuca ericifolia* *Melaleuca sieberi*
Dominant Native Groundcover Species	*Lomandra longifolia* *Entolasia marginata* *Imperata cylindrica* *Ischaemum australe* *Chorizandra cymbaria* *Gahnia clarkei*
Justification of PCT identification	**Justification for chosen PCT:** Six of the seven diagnostic species listed are present All characteristic upper stratum species are present (*Eucalyptus robusta* & *Eucalyptus longifolia*), with *E. longifolia* being more widespread than indicated by the plot data. The following middle stratum characteristic species are present within the plots: - *Melaleuca linariifolia* - *Pultenaea villosa* - *Melaleuca ericifolia* Others are likely to be present outside of plots. The following characteristic ground stratum species are present within plots: - *Chorizandra cymbaria* - *Lomandra longifolia* - *Hemarthria uncinata* - *Entolasia stricta* - *Imperata cylindrica* - *Gahnia clarkei* **Other PCTs considered and justification for exclusion:** 1718 Swamp Mahogany - Flax-leaved Paperbark swamp forest on coastal lowlands of the Central Coast Only 4 of 8 diagnostic species are present - *Eucalyptus longifolia* and *Eucalyptus tereticornis* are identified as upper stratum species within this PCT

TABLE 3.2b DESCRIPTION FOR PCT 1719 – PAPERBARKS – WOOLYBUTT SWAMP FOREST ON COASTAL LOWLANDS OF THE CENTRAL COAST	
	- The chosen PCT provides a better floristic match 1064 Paperbark swamp forest of the coastal lowlands of the NSW North Coast Bioregion and Sydney Basin Bioregion - Not listed for IBRA subregion - No diagnostic species listed - *Melaleuca quinquenervia* is not present on site and typically dominates this PCT. 1598 Forest Red Gum grassy open forest on floodplains of the lower Hunter - Eucalyptus robusta and middle stratum melaleuca component not described for this PCT, however present on site. - The diagnostic species Eucalyptus punctata is not present on site. 1715 Prickly-leaved Paperbark - Flax-leaved Paperbark swamp forest on poorly drained soils of the Central Coast - The dominant eucalypts present are not represented by this PCT and Melaleuca nodosa was not recorded within the plots sampled. - Four of six diagnostic species are present. 1716 Prickly-leaved Paperbark forest on coastal lowlands of the Central Coast and Lower North Coast - The dominant eucalypts present are not represented by this PCT and Melaleuca nodosa was not recorded within the plots sampled. - Five of eight diagnostic species are present. 1720 Cabbage Gum - Forest Red Gum - Flax-leaved Paperbark Floodplain Forest of the Central Coast - *Eucalyptus robusta* and *Eucalyptus longifolia* are not represented in this PCT - No diagnostic species are present. 1721 Swamp Mahogany - Broad-leaved Paperbark - Saw Sedge - Yellow Marsh Flower swamp forest of coastal lowlands - *Melaleuca quinquenervia* is not present on the site - Only two of six diagnostic species are present (*Gahnia clarkei* and *Entolasia marginata*). 1722 Swamp Mahogany - Paperbarks - Harsh Ground Fern swamp forest of the Central Coast - Only one diagnostic species, Gahnia clarkei,

TABLE 3.2b DESCRIPTION FOR PCT 1719 – PAPERBARKS – WOOLYBUTT SWAMP FOREST ON COASTAL LOWLANDS OF THE CENTRAL COAST	
	is present, Eucalyptus tereticornis and Eucalyptus longifolia are not represented in the upper stratum of this PCT. PCT 1726 Flax-leaved Paperbark - Tall Sedge shrubland of the Sydney Basin - Only 1 of 6 diagnostic species are present (*Entolasia marginata*). - The characteristic species for the upper stratum do not match the site vegetation. 1795 - Coastal flats Swamp Mahogany forest - Although no diagnostic species are listed for PCT, many of the characteristic species for this PCT do not occur within the sampled plots, with only 4 of 19 species recorded.
Threatened Ecological Community Status	Yes, Swamp sclerophyll forest on coastal floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions
Estimate of PCT percentage cleared value	56%
Correlation with aerial photograph and mapped extent	Yes
Patch Size	>100ha

iii. Floristic Plot Results

The flora species observed within the plots surveyed and the corresponding cover and abundance scores are provided in Table 3.3.

TABLE 3.3
FLORISTIC SURVEY PLOT RESULTS

Scientific Name	Common Name	Plot 6			Plot 7			Plot 8			Plot 9		
		Cover	Abundance	Species Richness	Cover	Abundance	Species Richness	Cover	Abundance	Species Richness	Cover	Abundance	Species Richness
Native Trees													
Eucalyptus longifolia	Woollybutt	10.0	2	1									
Eucalyptus robusta	Swamp Mahogany				15.0	3	1	10.0	2	1			
Eucalyptus tereticornis	Forest Red Gum	15.0	5	1	10.0	5	1	25.0	15	1	3.0	1	1
	Totals	25.0		2.0	25.0		2.0	35.0		2.0	3.0		1.0
Native Shrubs													
Pultenaea villosa		0.3	3	1							5.0	30	1
Melaleuca ericifolia	Swamp Paperbark	2.0	10	1							5.0	15	1
Melaleuca linariifolia	Flax-leaved Paperbark	40.0	50	1	20.0	20	1	40.0	55	1	30.0	50	1
Melaleuca sieberi		1.0	1	1				0.5	1	1	5.0	10	1
	Totals	43.3		4.0	20.0		1.0	40.5		2.0	45.0		4.0
Native Grass and Grass-like Plants													
Carex inversa	Knob Sedge				0.1	10	1						
Chorizandra cymbaria		2.0	200	1				0.2	20	1			
Gahnia clarkei	Tall Saw-sedge	1.0	10	1	1.0	5	1	1.0	10	1	10.0	100	1
Lepidosperma longitudinale	Pithy Sword-sedge							0.2	40	1	60.0	5,000	1
Juncus mollis					0.1	20	1	0.1	10	1	0.1	10	1
Lomandra longifolia	Spiny-headed Mat-rush	75.0	200	1	90.0	500	1	85.0	400	1	5.0	25	1
Entolasia marginata	Bordered Panic	5.0	500	1	5.0	500	1	5.0	500	1	1.0	100	1
Entolasia stricta	Wiry Panic	0.1	5	1							0.1	10	1
Hemarthria uncinata var. uncinata		0.1	20	1				0.1	20	1	1.0	100	1
Imperata cylindrica	Blady Grass	10.0	2,000	1	10.0	1,000	1	5.0	500	1	15.0	1,500	1
Ischaemum australe		0.5	30	1	3.0	200	1	2.0	200	1			
Plinthanthesis paradoxa					0.3	30	1						
	Totals	93.7		8.0	109.5		8.0	98.6		9.0	92.2		8.0
Native Forbs													
Alternanthera denticulata	Lesser Joyweed	0.1	10	1							0.1	5	1
Caesia parviflora var. parviflora								0.1	2	1			
Centella asiatica	Indian Pennywort	0.1	50	1	0.1	50	1	0.1	100	1	0.1	20	1
Hydrocotyle laxiflora	Stinking Pennywort	0.1	30	1	0.1	10	1	0.1	50	1	0.1	20	1
Centipeda minima	spreading sneezeweed				0.1	2	1						
Eclipta platyglossa	Yellow Twin-heads	0.1	50	1	0.5	100	1	0.3	100	1	0.1	10	1
Lobelia anceps					0.1	2	1						
Lobelia purpurascens	whiteroot							0.1	10	1			
Dichondra repens	Kidney Weed				0.1	10	1						

TABLE 3.3
FLORISTIC SURVEY PLOT RESULTS

Scientific Name	Common Name	Plot 6			Plot 7			Plot 8			Plot 9		
		Cover	Abundance	Species Richness	Cover	Abundance	Species Richness	Cover	Abundance	Species Richness	Cover	Abundance	Species Richness
Goodenia paniculata		0.1	3	1				0.1	20	1			
Gonocarpus tetragynus	Poverty Raspwort	0.2	30	1							0.3	50	1
Haloragis heterophylla	Variable Raspwort	0.1	50	1	0.1	20	1	0.1	20	1	0.1	20	1
Ranunculus inundatus	River Buttercup	0.1	2	1	0.1	5	1						
Ranunculus lappaceus	Common Buttercup	0.1	1	1				0.1	10	1	0.1	20	1
Viola betonicifolia	Native Violet	0.1	10	1	0.1	20	1	0.1	10	1	0.1	10	1
	Totals	1.1		10.0	1.3		9.0	1.1		9.0	1.0		8.0
Other Native Plants													
Parsonsia straminea	Common Silkpod	0.2	5	1	0.1	5	1	0.2	4	1	0.1	2	1
Glycine microphylla	Small-leaf Glycine				0.1	10	1	0.1	5	1	0.1	10	1
Cassytha glabella		0.1	10	1							0.1	10	1
Cassytha pubescens	Downy Dodder-laurel	0.1	20	1	0.1	30	1				0.2	100	1
	Totals	0.4		3.0	0.3		3.0	0.3		2.0	0.5		4.0
High Threat Exotic Plants													
Axonopus fissifolius	Narrow-leafed Carpet Grass				0.1	1	1						
	Totals	0.0		0.0	0.1		1.0	0.0		0.0	0.0		0.0
Other Exotics													
Hypochoeris radicata	Catsear										0.1	2	1
Rubus fruticosus	Blackberry complex										0.1	1	1

3.2 VEGETATION INTEGRITY DETAILS

i. Vegetation Integrity Survey Methods

A vegetation integrity assessment was completed for each plot in accordance with the requirements of Section 5.3 of the BAM.

ii. Plot Function Results

The habitat function data collected during the field assessment is presented in Table 3.4.

TABLE 3.4
PCT COMPOSITION CONDITION DATA / SPECIES RICHNESS

PCT and Zone	PCT 1715	PCT 1719		
Plot Reference	**9**	**6**	**7**	**8**
Trees	1	2	2	2
Shrubs	4	4	1	2
Grass & Grass Like Plants	8	8	8	9
Forbs	8	10	9	9
Ferns	0	0	0	0
Other Species	4	3	3	2

iii. Vegetation Integrity Scores

The habitat structure data collected during the field assessment is presented in Table 3.5.

TABLE 3.5
PCT STRUCTURE CONDITION DATA / COVER

PCT and Zone	PCT 1715	PCT 1719		
Plot Reference	**9**	**6**	**7**	**8**
Trees	3	25	25	35
Shrubs	45	43.3	20	40.5
Grass & Grass Like Plants	92.2	93.7	109.5	98.6
Forbs	1	1.1	1.3	1.1
Ferns	0	0	0	0
Other Species	0.5	0.4	0.3	0.3

iv. Plot Function Condition Data

The habitat function condition data collected during the field assessment is presented in Table 3.6.

TABLE 3.6
PCT FUNCTION CONDITION DATA

PCT and Zone	PCT 1715	PCT 1719		
Plot Reference	**9**	**6**	**7**	**8**
TREE DBH Size Classes				
Trees DBH <5cm	Present	Present	Present	Present
Trees DBH 5-9cm	Present	Present	Present	Present
Trees DBH 10-19cm	Present	Present	Present	Present
Trees DBH 20-29cm	Absent	Present	Present	Present
Trees DBH 30-49cm	Absent	Present	Present	Present
No. trees DBH 50-79cm	Absent	0	0	0
No. trees DBH ≥80cm	Absent	0	0	0
Sum of trees DBH >50cm	0	0	0	0
No. Hollow-bearing Trees	0	0	0	0
Average Litter Cover	36	11	17	16
Fallen Log Length (m)	3	100	41	63
High Threat Weed Cover	0.1	0	0.1	0

v. Vegetation Integrity Scores

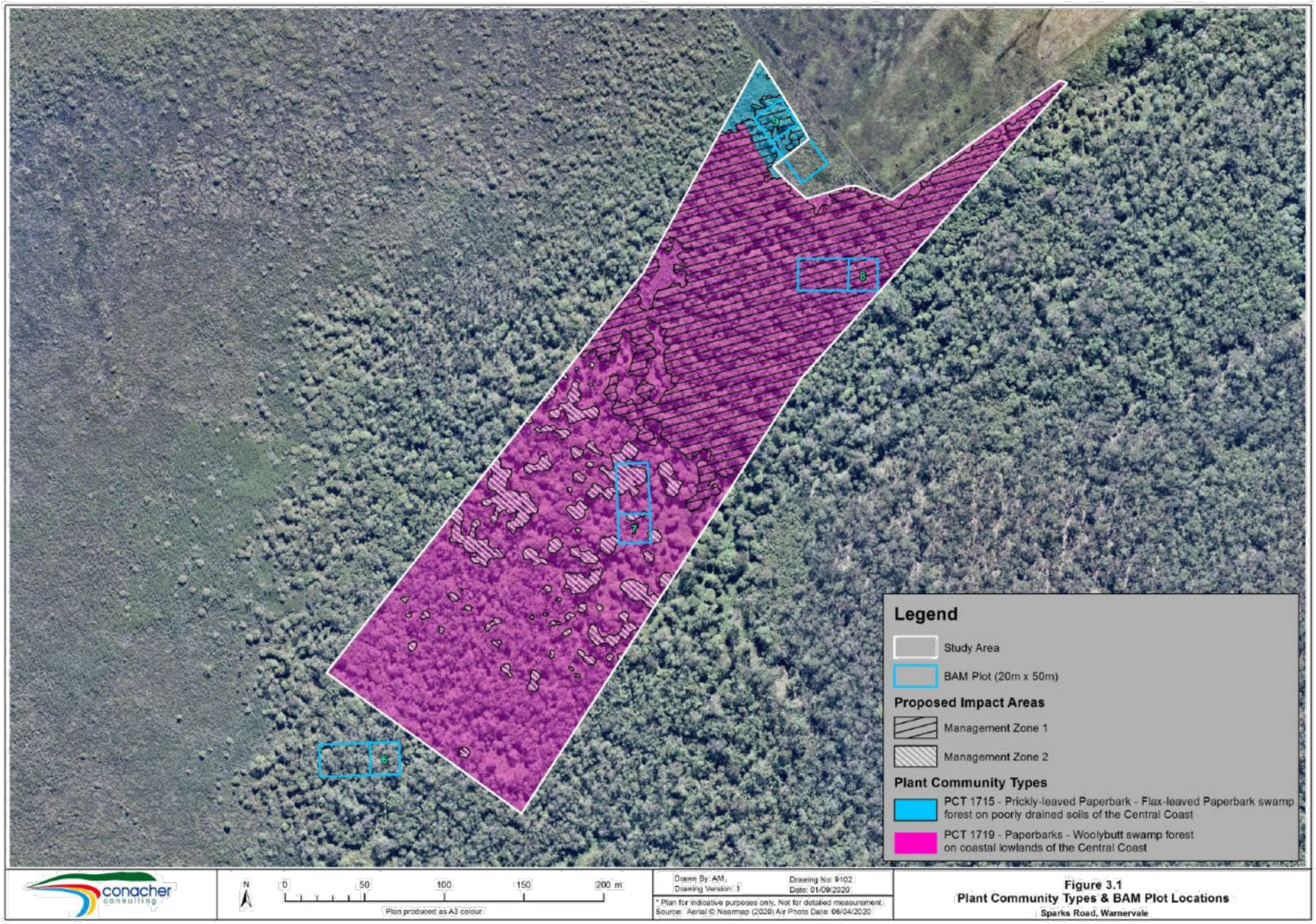
The vegetation integrity scores were determined in accordance with Section 5.4 of the BAM and are provided in Table 3.7.

TABLE 3.7
PCT VEGETATION INTEGRITY SCORES

PCT and Zone	PCT 1715	PCT 1719
Composition Score	72.8	55.7
Structure Score	80.2	94.6
Function Score	41.6	54.1
Vegetation Integrity Score	62.4	65.8

vi. Use of Local Data

No additional local data was used for the purposes of assessing benchmark condition.


9
8
7
6
Legend
Study Area
BAM Plot (20m x 50m)
Proposed Impact Areas
Management Zone 1
Management Zone 2
Plant Community Types
PCT 1715 - Prickly-leaved Paperbark - Flax-leaved Paperbark swamp forest on poorly drained soils of the Central Coast
PCT 1719 - Paperbarks - Woolybutt swamp forest on coastal lowlands of the Central Coast
conacher consulting
N
0
50
100
150
200 m
Plan produced as A3 colour
Drawn By: AM
Drawing Version: 1
Drawing No: 9102
Date: 01/09/2020
* Plan for indicative purposes only. Not for detailed measurement.
Source: Aerial © Nearmap (2020) Air Photo Date: 06/04/2020
Figure 3.1
Plant Community Types & BAM Plot Locations
Sparks Road, Warnervale

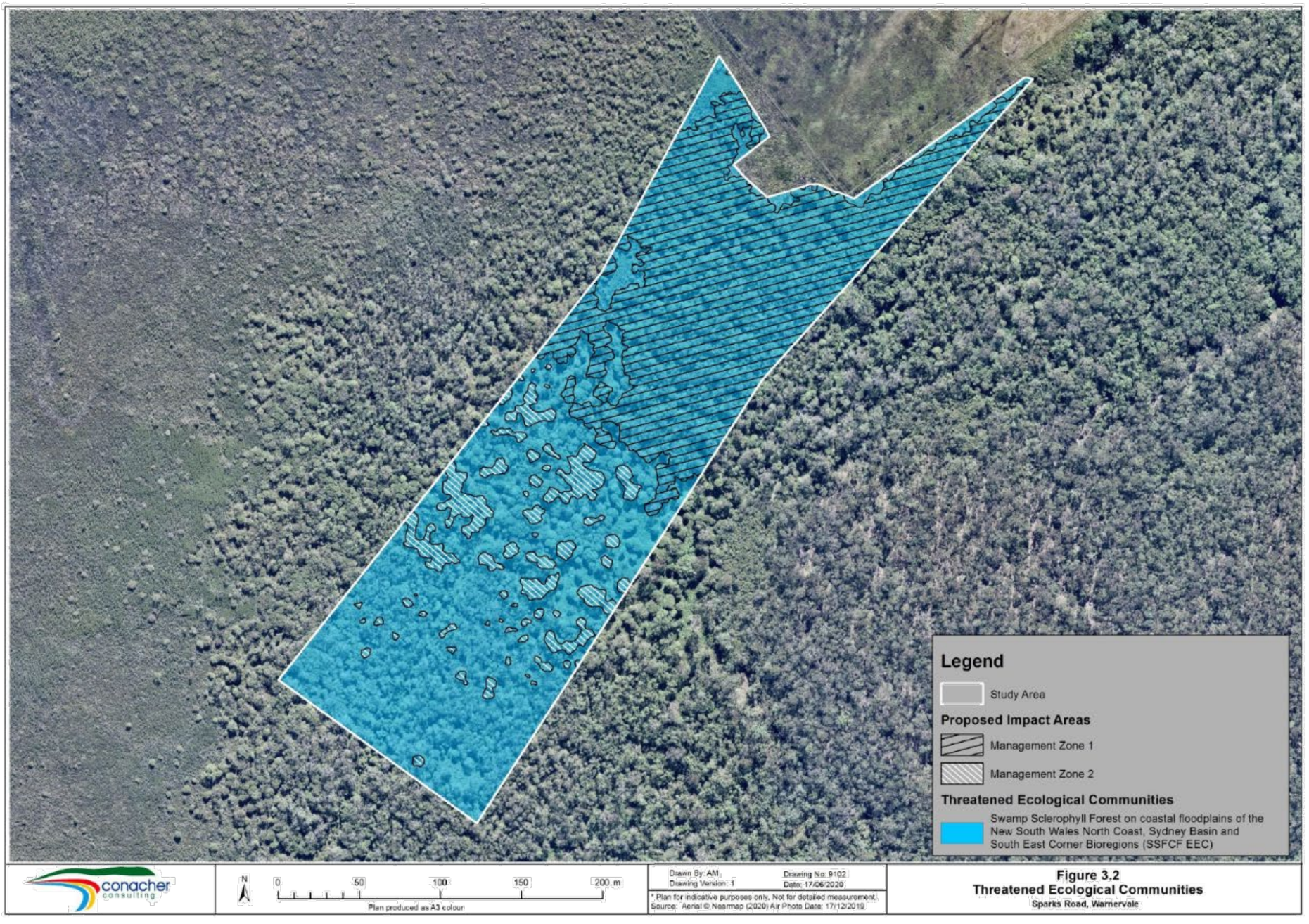


Figure 3.2
Threatened Ecological Communities
Sparks Road, Warnervale

SECTION 4

THREATENED SPECIES DETAILS

4.1 HABITAT FEATURES PRESENT

Site surveys were conducted, as shown in Figure 4.1, to determine habitat features. The development site contains disturbed habitats for fauna species. Details of the micro-habitat features observed are provided in Table 4.2. Mapping of hollow bearing-tree locations is provided in Figure 4.2.

TABLE 4.1
FAUNA HABITATS PRESENT

Key habitat Type	Presence	Comments
Hollow bearing trees	No	None observed within impact area
Mature trees	Yes	Numerous present
Culverts	No	None observed
Rock Shelters / Caves / Crevices	No	None observed
Acacia shrubs	No	None detected within survey plots
Banksia shrubs	No	None detected within survey plots
Native Grasses	Yes	Native Understory grasses are present
Man-made features	No	None observed
The native vegetation types present	Yes	See Section 3.1
Areas of cleared land and exotic vegetation	No	None observed
Any exposed areas of bush rock including outcrops	No	None observed
Natural burrows	No	None observed
Large trees with basal cavities	No	None observed
Logs	Yes	Logs observed, many ground logs are present due to historical felling of trees.
Wetlands, streams, and waterbodies etc.	Yes	Site is part of the Porters Creek Wetland
Nests and roosts	No	None observed
Wombat burrows	No	None observed
Dens used by Petaurus gliders	No	None observed, potential for presence
Petaurus glider sap feed trees	No	None observed
Distinctive scats	No	None observed
Latrine and den sites pf the Spotted-tailed Quoll	No	None observed
Allocasuarina spp. trees	No	None observed within plots, Casuarina glauca is present in very low densities
Flying-fox camps	No	None observed
Micro chiropteran bat subterranean roosts (culverts, tunnels and disused mineshafts	No	None observed
Regent Honeyeater feed or nest trees;	No site use observed	Suitable feed trees present
Swift Parrot feed trees;	No site use observed	Suitable feed trees present
Winter-flowering eucalypts	Yes	*Eucalyptus robusta, Eucalyptus longifolia* and *Eucalyptus tereticornis* are present.
Mistletoes	Yes	Potential presence
Permanent soaks and seepages	No	Site is subject to ephemeral inundation.
Areas that can act as corridors for plant and animal species / corridor values	Yes	See habitat connectivity details provided in Section 2.1

4.2 THREATENED SPECIES DETAILS

i. *Ecosystem Credit Species*

The threatened species for which the likelihood of occurrence or elements of habitat can be predicted by vegetation surrogates and landscape features, or for which targeted surveys are likely to have a low probability for detection, are identified as 'Ecosystem Credit' species. The list of these species has been compiled from the results of non-targeted survey observations, previous survey results, Bionet Atlas records (NSW DPIE (2020) and through the BAM Calculator.

The Ecosystem Credit Species predicted to occur are listed in Table 4.2, a determination of suitable habitat presence based on habitat constraints, geographic constraints and microhabitats is provided.

The Little Lorikeet was observed to the south of the impact area and the Masked Owl was also observed during call playback and spotlighting surveys.

TABLE 4.2
ECOSYSTEM CREDIT SPECIES & SITE HABITAT SUITABILITY

Species	Habitat Constraints	Geographic Limitations	Sensitivity to Gain Class	BC Act Listing Status	EPBC Act Listing Status	Confirmed Predicted Species	Predicted PCTs and Vegetation Zones with Suitable Habitat	Predicted PCTs and Vegetation Zones with No Suitable Habitat
Callocephalon fimbriatum Gang-gang Cockatoo (Foraging)	-	-	Moderate	V	-	Yes	PCT 1719	-
Daphoenositta chrysoptera Varied Sittella	-	-	Moderate	V	-	Yes	PCT 1715 PCT 1719	-
Dasyurus maculatus Spotted-tailed Quoll	-	-	High	V	E	Yes	PCT 1715 PCT 1719	-
Falsistrellus tasmaniensis Eastern False Pipistrelle	-	-	High	V	-	Yes	PCT 1715	-

TABLE 4.2
ECOSYSTEM CREDIT SPECIES & SITE HABITAT SUITABILITY

Species	Habitat Constraints	Geographic Limitations	Sensitivity to Gain Class	BC Act Listing Status	EPBC Act Listing Status	Confirmed Predicted Species	Predicted PCTs and Vegetation Zones with Suitable Habitat	Predicted PCTs and Vegetation Zones with No Suitable Habitat
Glossopsitta pusilla Little Lorikeet	-	-	High	V	-	Yes	PCT 1715	-
Haliaeetus leucogaster White-bellied Sea-Eagle (Foraging)	Waterbodies or within 1km of a river, lake, large dam, creek, wetland or coastline	-	High	V	-	Yes	PCT 1715 PCT 1719	-
Hieraaetus morphnoides Little Eagle	-	-	Moderate	V	-	Yes	PCT 1715 PCT 1719	-
Ixobrychus flavicollis Black Bittern	Waterbodies Land within 40m of freshwater and estuarine wetlands in areas of permanent water and dense vegetation	-	Moderate	V	-	Yes	PCT 1715 PCT 1719	-
Lathamus discolor Swift Parrot (Foraging)	-	-	Moderate	E	CE	Yes	PCT 1715	-
Lophoictinia isura Square-tailed Kite* (Foraging)	-	-	Moderate	V	-	Yes	PCT 1715 PCT 1719	-

TABLE 4.2 ECOSYSTEM CREDIT SPECIES & SITE HABITAT SUITABILITY								
Species	**Habitat Constraints**	**Geographic Limitations**	**Sensitivity to Gain Class**	**BC Act Listing Status**	**EPBC Act Listing Status**	**Confirmed Predicted Species**	**Predicted PCTs and Vegetation Zones with Suitable Habitat**	**Predicted PCTs and Vegetation Zones with No Suitable Habitat**
Micronomus norfolkensis Eastern Coastal Free-tailed Bat	-	-	High	V	-	Yes	PCT 1715 PCT 1719	-
Miniopterus australis Little Bent-winged Bat (Foraging)	-	-	High	V	-	Yes	PCT 1715	-
Miniopterus orianae oceanensis Large Bent-winged Bat (Foraging)	-	-	High	V	-	Yes	PCT 1715	-
Ninox connivens Barking Owl (Foraging)	-	-	High	V	-	Yes	PCT 1715	-
Ninox strenua Powerful Owl* (Foraging)	-	-	High	V	-	Yes	PCT 1715	-
Pandion cristatus Eastern Osprey (Foraging)	-	-	Moderate	V	-	Yes	PCT 1715	-
Phascolarctos cinereus Koala* (Foraging)	-	-	High	V	V	Yes	PCT 1715 PCT 1719	-
Phoniscus papuensis Golden-tipped Bat	-	-	High	V	-	Yes	PCT 1715	-

TABLE 4.2
ECOSYSTEM CREDIT SPECIES & SITE HABITAT SUITABILITY

Species	Habitat Constraints	Geographic Limitations	Sensitivity to Gain Class	BC Act Listing Status	EPBC Act Listing Status	Confirmed Predicted Species	Predicted PCTs and Vegetation Zones with Suitable Habitat	Predicted PCTs and Vegetation Zones with No Suitable Habitat
Phoniscus papuensis Golden-tipped Bat	-	-	High	V	-	Yes	PCT 1715	-
Pseudomys gracilicaudatus Eastern Chestnut Mouse	-	-	High	V	-	Yes	PCT 1715	-
Pteropus poliocephalus Grey-headed Flying-fox (Foraging)	-	-	High	V	V	Yes	PCT 1715	-
Saccolaimus flaviventris Yellow-bellied Sheathtail-bat	-	-	High	V	-	Yes	PCT 1715	-
Scoteanax rueppellii Greater Broad-nosed Bat	-	-	High	V	-	Yes	PCT 1715	-
Tyto novaehollandiae Masked Owl* (Foraging)*	-	-	High	V	-	Yes	PCT 1715 PCT 1719	-
Tyto tenebricosa Sooty Owl (Foraging)*	-	-	High	V	-	Yes	PCT 1715 PCT 1719	-

* = Additional species not predicted by the BAM Calculator

ii. *Species Credit Species*

'Species credit' species are threatened species which can be reliably detected by survey and for which the likelihood of occurrence or elements of suitable habitat cannot be confidently predicted by vegetation surrogates and landscape features. Some threatened species may also be assessed partly for ecosystem credits and partly for species credits where part of the habitat is assessed as a species credit (such as breeding habitat, or important habitat locations).

An assessment of the candidate species credit type threatened species to determine those for targeted surveys has been completed and is documented in Table 4.3. The species listed include those predicted by the BAM Calculator with suitable habitat present and any threatened species credit species previously identified from the site, if known from previous reports or recorded on the Bionet Atlas (NSW DPIE 2020). The details of individual species habitats, constraints and justifications for any exclusions have been provided based on information obtained from the BAM Calculator, NSW Bionet Threatened Biodiversity Data Collection (NSW DPIE 2020) and additional relevant references, where listed.

TABLE 4.3
CANDIDATE THREATENED SPECIES (SPECIES CREDITS)

Name	Threatened Biodiversity Data Collection Information			Sensitivity to Gain Class	BC Act Status	EPBC Act Status	Suitable Habitat Determination	Justification (if excluded)
	Habitat Description	Habitat Constraints	Geographic Limitations					
Angophora inopina Charmhaven Apple*	Occurs most frequently in four main vegetation communities: (i) *Eucalyptus haemastoma–Corymbia gummifera–Angophora inopina* woodland/forest; (ii) *Hakea teretifolia–Banksia oblongifolia* wet heath; (iii) *Eucalyptus resinifera–Melaleuca sieberi–Angophora inopina* sedge woodland; (iv) *Eucalyptus capitellata–Corymbia gummifera–Angophora inopina* woodland/forest. Populations occur from Toronto to Warnervale and at Karuah	None listed	South of Wootton	High	V	V	Yes	-
*Caladenia tessellata**	Generally found in grassy sclerophyll woodland on clay loam or sandy soils. Known from Warnervale from one old record, the population has not been relocated.	None listed	None listed	High	V	V	Yes (precautionary inclusion only)	-
Callocephalon fimbriatum Gang-gang Cockatoo (Breeding)	Generally found in tall mountain forests and woodlands in spring and summer. Inhabit lower altitudes in drier more open eucalypt forests and woodlands in autumn and winter.	Eucalypts with hollows >9cm diameter	None listed	High	V	-	No	Habitat constraints not met

TABLE 4.3
CANDIDATE THREATENED SPECIES (SPECIES CREDITS)

Name	Threatened Biodiversity Data Collection Information			Sensitivity to Gain Class	BC Act Status	EPBC Act Status	Suitable Habitat Determination	Justification (if excluded)
	Habitat Description	Habitat Constraints	Geographic Limitations					
Cercartetus nanus Eastern Pygmy-possum	Found in a broad range of habitats from rainforest through sclerophyll (including Box-Ironbark) forest and woodland to heath, but in most areas woodlands and heath appear to be preferred, except in north-eastern NSW where they are most frequently encountered in rainforest. Feeds largely on nectar and pollen collected from banksias, eucalypts and bottlebrushes	None listed	None listed	High	V	-	Yes	-
Chalinolobus dwyeri Large-eared Pied Bat	Found in well-timbered areas containing gullies.	Cliffs or within two kilometres of rocky areas containing caves, overhangs, escarpments, outcrops, or crevices, or within two kilometres of old mines or tunnels.	None listed	Very High	V	V	No	Habitat constraints are not present.

TABLE 4.3
CANDIDATE THREATENED SPECIES (SPECIES CREDITS)

Name	Threatened Biodiversity Data Collection Information			Sensitivity to Gain Class	BC Act Status	EPBC Act Status	Suitable Habitat Determination	Justification (if excluded)
	Habitat Description	Habitat Constraints	Geographic Limitations					
Crinia tinnula Wallum Froglet	Acidic swamps on coastal sand plains. They typically occur in sedgelands and wet heathlands. They can also be found along drainage lines within other vegetation communities and disturbed areas, and occasionally in swamp sclerophyll forests.	None listed	None listed-	Moderate	V	-	Yes	-
Cryptostylis hunteriana Leafless Tongue Orchid	Does not have well defined habitat preferences and occurs in a range of communities including swamp-heath and woodland. Larger populations typically occur in woodland dominated by Scribbly Gum (*Eucalyptus sclerophylla*), Silvertop Ash (*E. sieberi*), Red Bloodwood (*Corymbia gummifera*) and Black Sheoak (*Allocasuarina littoralis*); appears to prefer open areas in the understorey.	None listed	None listed	High Sensitivity to Potential Gain	V	V	Yes	-
Diuris praecox Rough Doubletail	Grows on hills and slopes of near-coastal districts in open forests which have a grassy to fairly dense understorey.	None listed	Within the Parish boundaries of Newcastle, Kahibah, Wallarah, Tuggerah and Kincumber	Moderate	V	V	No	Geographic limitations not met

TABLE 4.3
CANDIDATE THREATENED SPECIES (SPECIES CREDITS)

Name	Threatened Biodiversity Data Collection Information			Sensitivity to Gain Class	BC Act Status	EPBC Act Status	Suitable Habitat Determination	Justification (if excluded)
	Habitat Description	Habitat Constraints	Geographic Limitations					
Eucalyptus parramattensis subsp. decadens	Dry sclerophyll woodland with dry heath understorey on deep, low-nutrient sands, often those subject to periodic inundation or where water tables are relatively high.	None listed	None listed	High	V	V	Yes	-
Eucalyptus parramattensis subsp. parramattensis Endangered Population in the Wyong and Lake Macquarie Local Government Areas*	See geographic limitations	None listed	Wyong and Lake Macquarie LGAs	High	E. Pop	-	Yes	-
Grevillea parviflora subsp. parviflora Small-flower Grevillea*	Grows in a range of vegetation types in sandy or light clay soils usually over thin shales, often with lateritic ironstone gravels and nodules. Associated with open disturbed areas.	None listed	None listed	High	V	V	Yes	-
Haliaeetus leucogaster White-bellied Sea-Eagle (Breeding)	Breeding habitat consists of mature tall open forest, open forest, tall woodland, and swamp sclerophyll forest close to foraging habitat. Nest trees are typically large emergent eucalypts and often have emergent dead branches or large dead trees nearby which are used as 'guard roosts'. Nests are large structures built from sticks and lined with leaves or grass.	Living or dead mature trees within suitable vegetation within 1km of a rivers, lakes, large dams or creeks, wetlands and coastlines	None listed	High	V	-	Yes	-

TABLE 4.3
CANDIDATE THREATENED SPECIES (SPECIES CREDITS)

Name	Threatened Biodiversity Data Collection Information			Sensitivity to Gain Class	BC Act Status	EPBC Act Status	Suitable Habitat Determination	Justification (if excluded)
	Habitat Description	Habitat Constraints	Geographic Limitations					
Hieraaetus morphnoides Little Eagle (Breeding)	Nests in tall living trees within a remnant patch, where pairs build a large stick nest in winter. This species is not likely to nest in isolated trees or tolerate human disturbance within at least 50m (Marchant & Higgins 1993; Debus *et al*. 2007).	Suitable nest trees - live (occasionally dead) large old trees within vegetation.	None listed	Moderate	V	-	Yes	-
Hoplocephalus bitorquatus Pale-headed Snake	Found mainly in dry eucalypt forests and woodlands, cypress forest and occasionally in rainforest or moist eucalypt forest. Shelters during the day between loose bark and tree-trunks, or in hollow trunks and limbs of dead trees.	None listed	None listed	High	V	-	Yes	-
Lathamus discolor Swift Parrot (Important Habitat)	As per mapped areas	As per mapped areas	As per mapped areas	Moderate	E	CE	No DPIE have advised that the site is not mapped as important habitat	-
Litoria aurea Green and Golden Bell Frog	Optimum habitat includes water-bodies that are unshaded, free of predatory fish such as Plague Minnow (*Gambusia holbrooki*), have a grassy area nearby and diurnal sheltering sites available.	Semi-permanent / ephemeral wet areas and areas within 1km of water bodies.	None listed	High	E	V	Yes	-

TABLE 4.3
CANDIDATE THREATENED SPECIES (SPECIES CREDITS)

Name	Threatened Biodiversity Data Collection Information			Sensitivity to Gain Class	BC Act Status	EPBC Act Status	Suitable Habitat Determination	Justification (if excluded)
	Habitat Description	Habitat Constraints	Geographic Limitations					
Litoria brevipalmata Green-thighed Frog	Occur in a range of habitats from rainforest and moist eucalypt forest to dry eucalypt forest and heath. Breeding occurs following heavy rainfall from spring to autumn, with larger temporary pools and flooded areas preferred. Occurs in isolated localities along the coast and ranges from just north of Wollongong to south-east Queensland.	None listed	None listed	Moderate	V	-	Yes	
Lophoictinia isura Square-tailed Kite (Breeding)	Nesting is in a tree fork or horizontally angled limb generally near a watercourse or wetland.	Suitable nest trees	None listed	Moderate	V	-	Yes	-
Maundia triglochinoides	Grows in swamps, lagoons, dams, channels, creeks or shallow freshwater 30 - 60 cm deep on heavy clay, low nutrients.	Riparian areas/drainage lines, water ponding, man-made dams and drainage channels up to 1 m deep	None listed	High	V	-	Yes	-
Melaleuca biconvexa Biconvex Paperbark	Damp places, often near streams or low-lying areas on alluvial soils of low slopes or sheltered aspects.	None listed	None listed	High	V	V	Yes	-

TABLE 4.3
CANDIDATE THREATENED SPECIES (SPECIES CREDITS)

Name	Threatened Biodiversity Data Collection Information			Sensitivity to Gain Class	BC Act Status	EPBC Act Status	Suitable Habitat Determination	Justification (if excluded)
	Habitat Description	Habitat Constraints	Geographic Limitations					
Miniopterus australis Little-bent-winged Bat (Breeding)	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.	Cave, tunnel, mine, culvert or other structure known or suspected to be used for breeding including species records in BioNet with microhabitat code 'IC – in cave'; observation type code 'E nest-roost'; with numbers of individuals >500; or from the scientific literature.	None listed	Very High	V	-	No	Habitat constraints are not met.
Mixophyes balbus Stuttering Frog	Found in rainforest and wet, tall open forest in the foothills and escarpment on the eastern side of the Great Dividing Range.	None listed	None listed	Very High	E	V	Yes	-
Mixophyes iteratus Giant Barred Frog	Freshwater streams with permanent or semi-permanent water, generally (but not always) at lower elevation.	Land within 50m of semi permanent and permanent drainages	None listed	Moderate	E	E	Yes	-

TABLE 4.3
CANDIDATE THREATENED SPECIES (SPECIES CREDITS)

Name	Threatened Biodiversity Data Collection Information			Sensitivity to Gain Class	BC Act Status	EPBC Act Status	Suitable Habitat Determination	Justification (if excluded)
	Habitat Description	Habitat Constraints	Geographic Limitations					
Myotis macropus Southern Myotis	Forage over streams and pools and roost close to water in caves mine shafts, hollow-bearing trees, storm water channels, buildings, under bridges and in dense foliage.	Within 200 m of riparian zone Bridges, caves or artificial structures within 200 m of riparian zone Includes rivers, creeks, billabongs, lagoons, dams and other waterbodies on or within 200m of the site)	None listed	High	V	-	Yes	-
Ninox connivens Barking Owl (Breeding)	Inhabits woodland and open forest, including fragmented remnants and partly cleared farmland	Living or dead trees with hollows greater than 20 cm diameter and greater than 4m above the ground.	None listed	High	V	-	No	Habitat constraints are not met.
Ninox strenua Powerful Owl (Breeding)*	Nest in large tree hollows (at least 0.5 m deep), in large eucalypts (diameter at breast height of 80-240 cm) that are at least 150 years old. While the female and young are in the nest hollow the male Powerful Owl roosts nearby (10-200 m).	Living or dead trees with hollow greater than 20cm diameter.	None listed	High	V	-	No	Habitat constraints are not met.

TABLE 4.3
CANDIDATE THREATENED SPECIES (SPECIES CREDITS)

Name	Threatened Biodiversity Data Collection Information			Sensitivity to Gain Class	BC Act Status	EPBC Act Status	Suitable Habitat Determination	Justification (if excluded)
	Habitat Description	Habitat Constraints	Geographic Limitations					
Pandion cristatus Eastern Osprey (Breeding)	Nests are made high up in dead trees, in dead crowns of live trees, or in artificial structures, usually within one kilometre of the sea. .	Presence of stick-nests in living and dead trees (>15m) or artificial structures within 100m of a floodplain for nesting	None listed	Moderate	V	-	Yes	Habitat constraints are not met / no stick nests present.
Persicaria elatior Tall Knotweed	Grows in damp places, especially beside streams and lakes. Occasionally in swamp forest or associated with disturbance.	Semi-permanent/ephemeral wet areas / within 50m of wet areas, swamps or waterbodies	None listed	Moderate	V	V	Yes	-
Petalura gigantea Giant Dragonfly	Lives in permanent swamps and bogs with some free water and open vegetation. The species does not utilise areas of standing water, although it may utilise suitable boggy areas adjacent to open water wetlands.	Swamps and within 500 m of swamps	None listed	Very High	E	-	Yes	-
Petaurus norfolcensis Squirrel Glider*	Prefers mixed species stands of forest or woodland with a shrub or Acacia midstorey.	None listed	None listed	High	V	-	Yes	-

TABLE 4.3
CANDIDATE THREATENED SPECIES (SPECIES CREDITS)

Name	Threatened Biodiversity Data Collection Information			Sensitivity to Gain Class	BC Act Status	EPBC Act Status	Suitable Habitat Determination	Justification (if excluded)
	Habitat Description	Habitat Constraints	Geographic Limitations					
Phascogale tapoatafa Brush-tailed Phascogale	Prefer dry sclerophyll open forest with sparse groundcover of herbs, grasses, shrubs or leaf litter. Also inhabits heath, swamps, rainforest and wet sclerophyll forest.	None listed	None listed	High	V	-	No	Site is too disturbed due to habitat fragmentation between the site and occupied areas. There are no records for this species on the Central Coast LGA east of the M1 Motorway
Phascolarctos cinereus Koala (Important Habitat)*	Inhabit eucalypt woodlands and forests.	Areas identified via survey as important habitat by the density of koalas and quality of habitat	None listed	High	V	V	Yes	-
Planigale maculata Common Planigale	Inhabits rainforest, eucalypt forest, heathland, marshland, grassland and rocky areas where there is surface cover, and usually close to water. The species reaches its confirmed southern distribution limit on the NSW lower north coast	None listed	None listed	High	V	-	Yes	-

TABLE 4.3
CANDIDATE THREATENED SPECIES (SPECIES CREDITS)

Name	Threatened Biodiversity Data Collection Information			Sensitivity to Gain Class	BC Act Status	EPBC Act Status	Suitable Habitat Determination	Justification (if excluded)
	Habitat Description	Habitat Constraints	Geographic Limitations					
Potorous tridactylus Long-nosed Potoroo	Inhabits coastal heaths and dry and wet sclerophyll forests. Dense understorey with occasional open areas is an essential part of habitat, and may consist of grass-trees, sedges, ferns or heath, or of low shrubs of tea-trees or melaleucas. A sandy loam soil is also a common feature.	Dense shrub layer or alternatively high canopy cover exceeding 70%.	None listed	High	V	V	Yes	-
Pteropus poliocephalus Grey-headed Flying-fox (Breeding)*	Roosting camps are generally located within 20 km of a regular food source and are commonly found in gullies, close to water, in vegetation with a dense canopy.	Breeding camps	None listed	High	V	V	No	Habitat constraints are not met
Tetratheca juncea Black-eyed Susan	Found in low open forest/woodland with a mixed shrub understorey and grassy groundcover. However, it has also been recorded in heathland and moist forest.	None listed	None listed	High	V	V	Yes	-
Thelymitra adorata *Wyong Sun Orchid**	Most records occur in Spotted Gum – Ironbark Forest, some records where Alluvial Redgum Footslopes Forest and Alluvial Floodplain Shrub Swamp Forest adjoins Dooralong Spotted Gum - Ironbark Forest.	None listed	None listed	High	CE	CE	Yes	-

TABLE 4.3
CANDIDATE THREATENED SPECIES (SPECIES CREDITS)

Name	Threatened Biodiversity Data Collection Information			Sensitivity to Gain Class	BC Act Status	EPBC Act Status	Suitable Habitat Determination	Justification (if excluded)
	Habitat Description	Habitat Constraints	Geographic Limitations					
Tyto novaehollandiae Masked Owl* (Breeding)	Roosts and breeds in moist eucalypt forested gullies, using large tree hollows or sometimes caves for nesting.	Living or dead trees with hollows greater than 20cm diameter.	None listed	High	V	-	No	Habitat constraints not present.
*Tyto tenebricosa** Sooty Owl (Breeding)	Occurs in rainforest, including dry rainforest, subtropical and warm temperate rainforest, as well as moist eucalypt forests.	Caves or clifflines/ledges|Hollow bearing trees. Living or dead trees with hollows greater than 20cm diameter	None listed.	Very High	V	-	No	Habitat constraints not present
Uperoleia mahonyi Mahony's Toadlet	Inhabits ephemeral and semi-permanent swamps and swales on the coastal fringe of its range. Known records occur in heath or wallum habitats almost exclusively associated with leached (highly nutrient impoverished) white sand. Commonly associated with acid paperbark swamps	None listed	None listed	High	E	-	Yes	-

*= Additional non BAM predicted candidate species
V = Vulnerable, E = Endangered. CE = Critically Endangered, E.Pop = Endangered Population

4.3 THREATENED SPECIES TARGETED SURVEY METHODS

i. *Threatened Flora Surveys Completed*

Targeted surveys were completed for all threatened flora species were generally in accordance with the NSW Guide to Surveying Threatened Plants (NSW OEH 2020). Targeted Parallel field traverses of 5-10m width were undertaken throughout the areas of the site which contain suitable habitat for the target threatened flora species. Details on the targeted surveys completed for candidate threatened flora species are listed in Table 4.4 and survey locations are shown in Figures 4.1(a), 4.1(b) and 4.1(c).

Targeted Parallel Field Traverses of 5-10m width were undertaken throughout the areas of the site which contain suitable habitat for the target threatened flora species, as detailed in Table 4.4.

TABLE 4.4
THREATENED FLORA SURVEY DETAILS

Survey Date	Survey Method	Time Spent	Surveyor
19 September 2019	Parallel Field Traverse	7hrs x 2 persons 0900-1600	JM / AM
17 October 2019	Parallel Field Traverse	7hrs x 2 persons 0830-1530	JM / AM
14 November 2019	Parallel Field Traverse	7hrs x 2 persons 0830-1530	JM / AM
14 January 2020	Parallel Field Traverse	6.75hrs x 2 persons 0915-1600	JM / AM
27 February 2020	Parallel Field Traverse BAM Plot surveys	6.25hrs x 2 persons 0900-1515	JM / AM / BF

ii. *Fauna Surveys Completed*

Targeted surveys were completed for the candidate threatened species identified in Table 4.3. The surveys undertaken were generally in accordance with the following survey methods:

- Field Survey methods – Field survey methods for environmental consultants and surveyors when assessing proposed development or other activities on sites containing threatened species (NSW DEC 2004a)
- Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities (DEC 2004b)
- 'Species Credit' Threatened Bats and their Habitats – NSW Survey Guide for the Biodiversity Assessment Method (NSW OEH 2018)
- Bat Calls of NSW – Region Based Guide to the echolocation calls of microchiropteran bats (Pennay *et al.*, 2004)
- Threatened species survey and assessment guidelines: field survey methods for fauna – Amphibians (DECC NSW 2009)

The fauna surveys completed included the following:

- Habitat assessment and hollow bearing tree search / assessment;
- Diurnal census including:
  - Nest site searches for candidate raptor species;
  - Diurnal site traverses and census surveys;
  - Searches for microbat roost sites;
  - Diurnal amphibian habitat searches and tadpole searches;
- Nocturnal census including:
  - Nocturnal Spotlighting; and

-Threatened nocturnal fauna call playback.

- Remote detection surveys
  - Arboreal mammal baited remote camera survey; and
  - Ultrasonic microbat call recording.

Fauna survey effort details are provided in Table 4.5 and the locations of targeted threatened species surveys are mapped in Figure 4.1. Additional details on weather conditions are provided in Appendix 3.

TABLE 4.5
FAUNA SURVEY DETAILS

Survey Type	Date	Survey Method	Weather Conditions	Survey Effort/Time
Diurnal Surveys	19 September 2019	Diurnal fauna census Hollow bearing tree search Stick nest search	Overcast with light intermittent showers, very wet ground conditions	7hrs x 2 persons 0900-1600
	17 October 2019	Diurnal fauna census Hollow bearing tree search Stick nest search	Fine and sunny, wet ground conditions	7hrs x 2 persons 0830-1530
	7 November 2019	Diurnal fauna census Hollow bearing tree search Stick nest search	Fine, mostly dry ground conditions	1.5hrs x 2 persons 1800-1930
	14 November 2019	Diurnal fauna census Hollow bearing tree search Stick nest search	Fine, dry ground conditions	7hrs x 2 persons 0830-1530
	11 February 2020	Diurnal fauna census Hollow bearing tree search Stick nest search	Overcast, very wet ground conditions	1hr x 2 persons 1800-1900
	27 February 2020	Diurnal fauna census Hollow bearing tree search Stick nest search	Overcast, very wet ground conditions	6.25hrs x 2 persons 0900-1515
	8 July 2020	Diurnal fauna census Hollow bearing tree search Stick nest search	Overcast, very wet ground conditions	1.5hrs x 2 persons 1600-1730
Nocturnal Surveys	7 November 2019	Spotlighting Listening for calls Call playback for threatened nocturnal fauna	Fine, dry ground conditions with some remnant pools of water detected	1hr x 2 persons 1930-2030

TABLE 4.5
FAUNA SURVEY DETAILS

Survey Type	Date	Survey Method	Weather Conditions	Survey Effort/Time
	21 January 2020	Spotlighting Listening for calls Call playback for threatened nocturnal fauna	Fine, dry ground conditions with some remnant pools of water detected	2hrs x 2 persons 2000-2200
	11 February 2020	Spotlighting Listening for calls Call playback for threatened nocturnal fauna	Fine, wet ground conditions	1hr x 2 persons 1900-2000
	12 March 2020	Spotlighting Listening for calls Call playback for threatened nocturnal fauna	Fine, wet ground conditions	1.5hrs x 2 persons 1930-2100
	8 July 2020	Spotlighting Listening for calls Call playback for threatened nocturnal fauna	Overcast, very wet ground conditions	2hrs x 2 persons 1730-1930
Remote Detection & Trapping Surveys	20 January 2020 to 11 February 2020	Ultrasonic bat call recording x 1 unit	Variable	22 nights / continuous overnight recording
	14 January 2020 to 11 February 2020	Baited remote arboreal camera trapping	Variable	9 cameras x 28 nights (252 camera trap nights)
	21 July 2020 to 6 August 2020	Baited remote terrestrial camera trapping	Variable	5 cameras x 16 nights (80 camera trap nights)

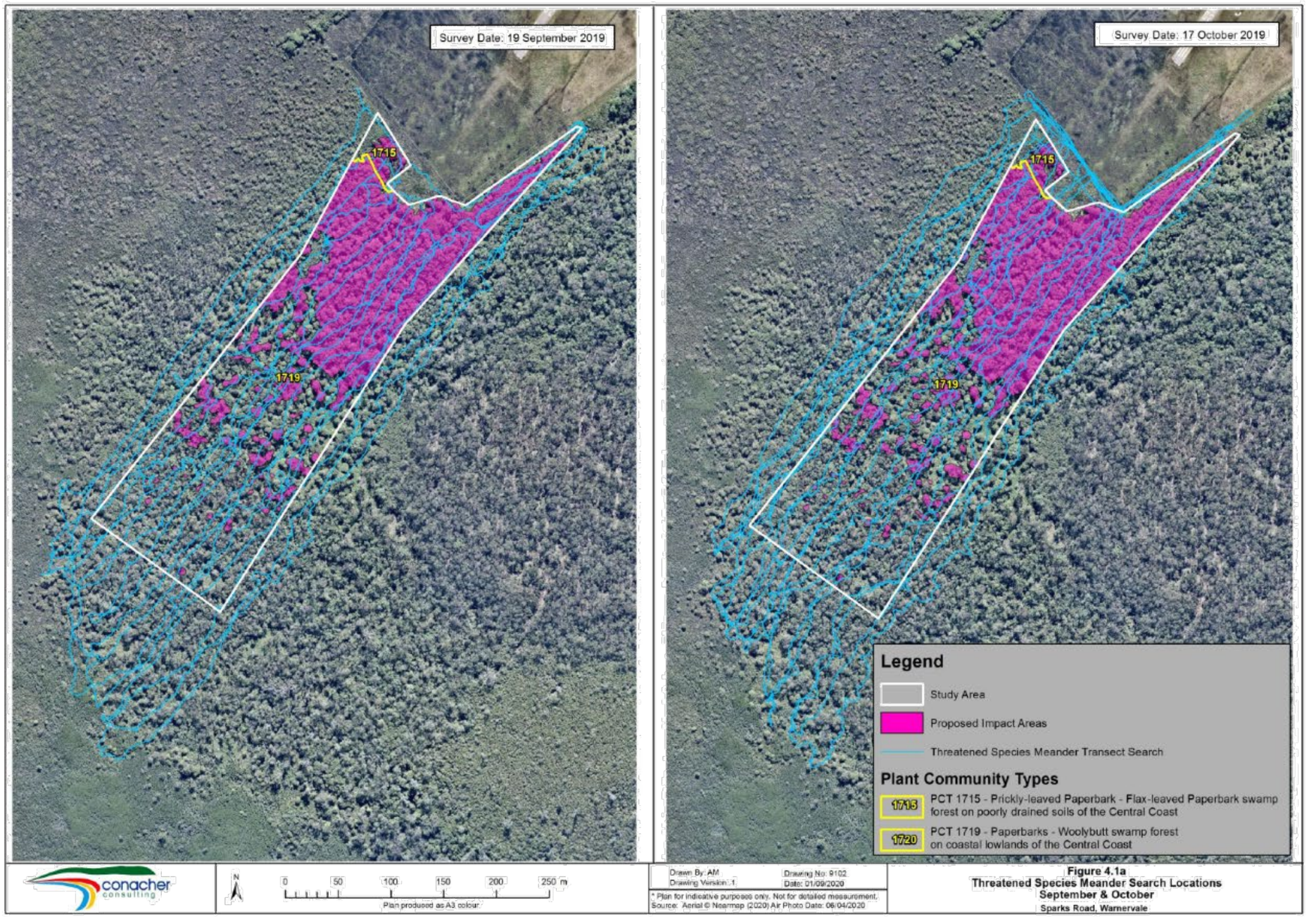


Figure 4.1a
Threatened Species Meander Search Locations
September & October
Sparks Road, Warnervale

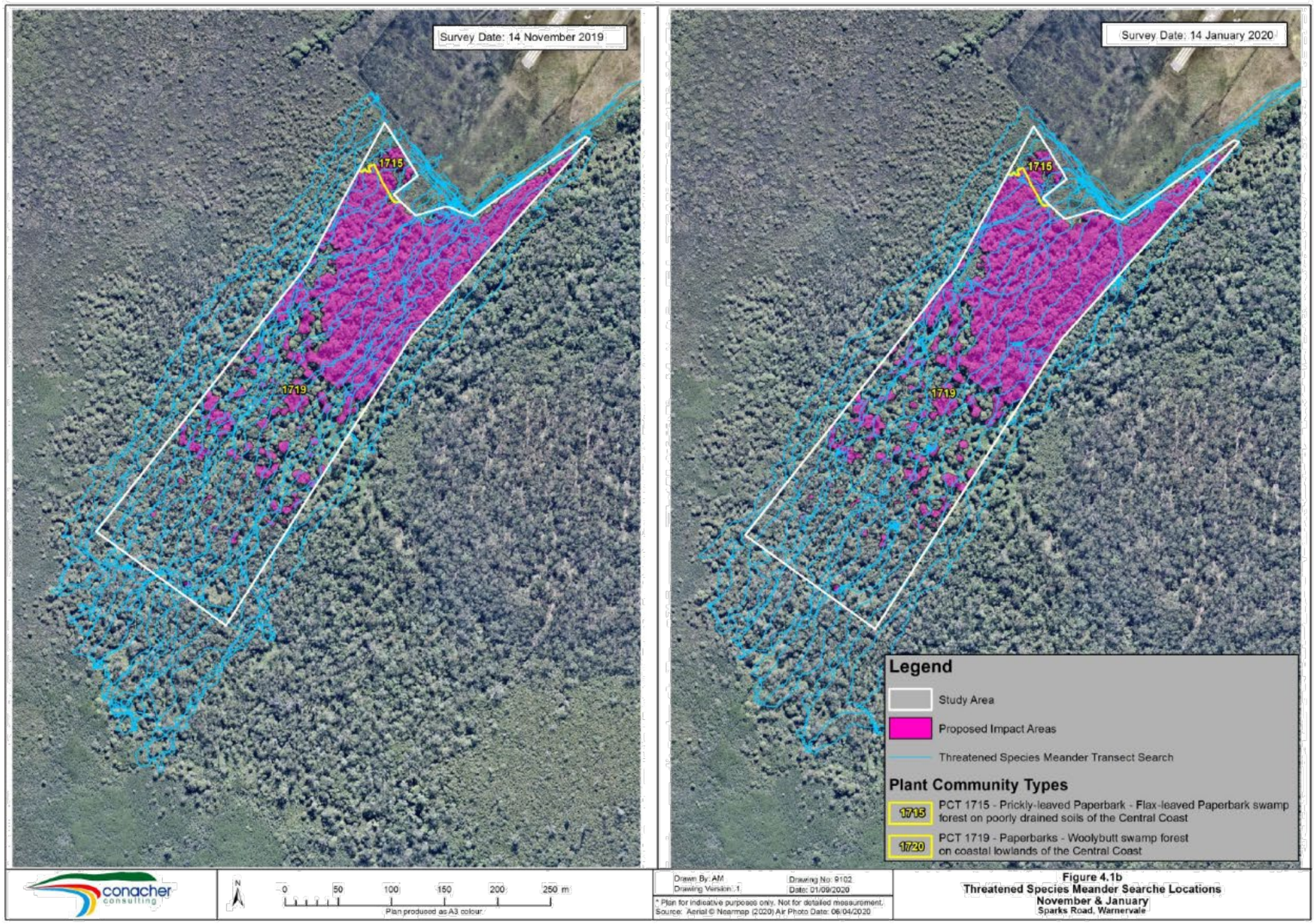
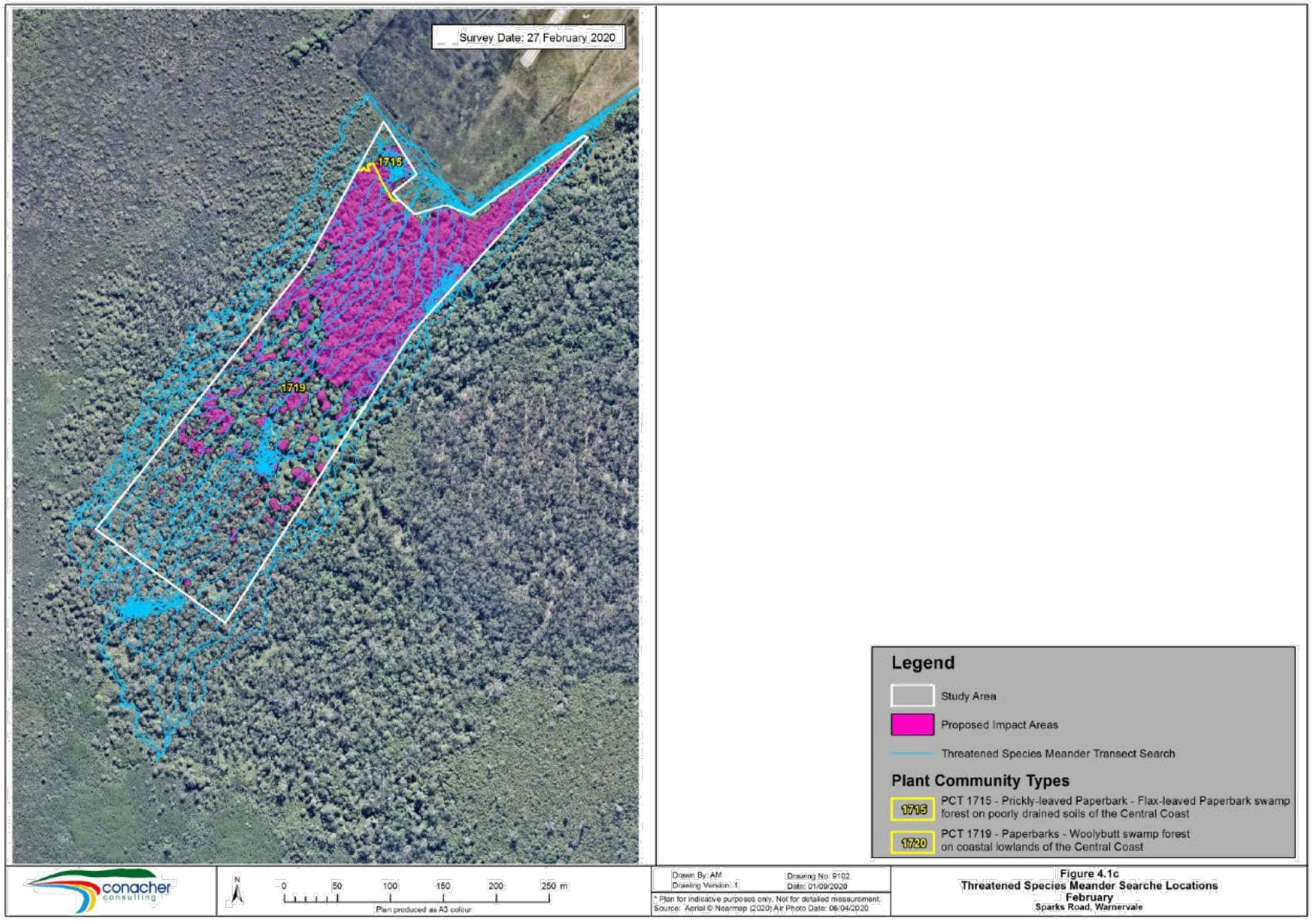


Figure 4.1b
Threatened Species Meander Searche Locations
November & January
Sparks Road, Warnervale


Survey Date: 27 February 2020
1715
1719
Legend
Study Area
Proposed Impact Areas
Threatened Species Meander Transect Search
Plant Community Types
1715
PCT 1715 - Prickly-leaved Paperbark - Flax-leaved Paperbark swamp forest on poorly drained soils of the Central Coast
1720
PCT 1719 - Paperbarks - Woolybutt swamp forest on coastal lowlands of the Central Coast
conacher consulting
N
0 50 100 150 200 250 m
Plan produced as A3 colour
Drawn By: AM
Drawing Version: 1
Drawing No: 9102
Date: 01/09/2020
* Plan for indicative purposes only. Not for detailed measurement.
Source: Aerial © Nearmap (2020) Air Photo Date: 06/04/2020
Figure 4.1c
Threatened Species Meander Searche Locations
February
Sparks Road, Warnervale

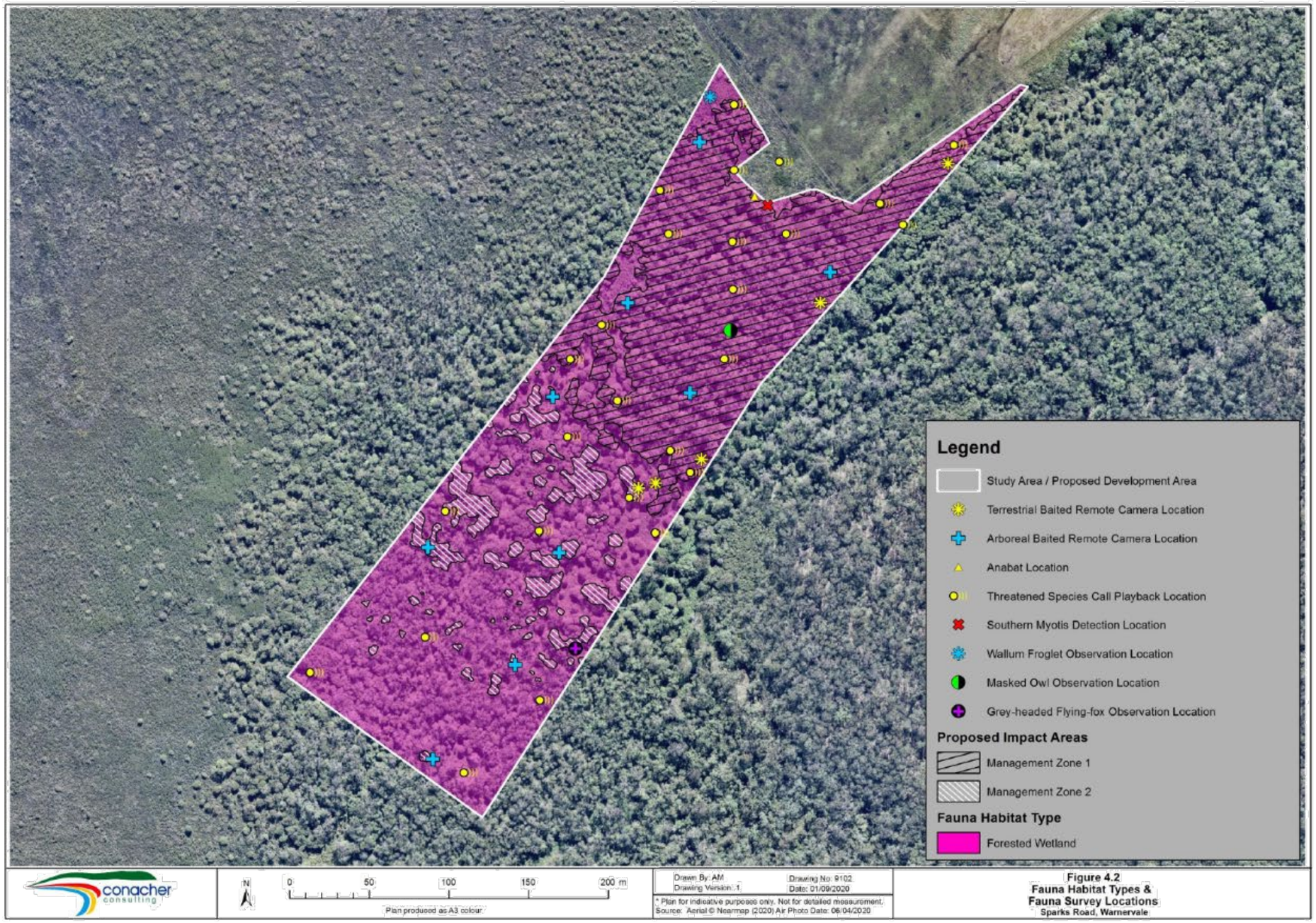


Figure 4.2
Fauna Habitat Types & Fauna Survey Locations
Sparks Road, Warnervale

4.4 THREATENED SPECIES SURVEY RESULTS

i. *Candidate Threatened Species Targeted Survey Results*

A summary of the survey effort and details of the survey results and potential occurrence for the candidate threatened species is provided in Table 4.6.

TABLE 4.6
CANDIDATE THREATENED SPECIES SURVEY RESULTS

Species	Survey Period	Survey Methods Applied	Observation Details
Angophora inopina Charmhaven Apple*	All year	Parallel field traverses -19 September 2019 (7hrs x 2 persons) -17 October 2019 (7hrs x 2 persons) -14 November 2019 (7hrs x 2 persons) -14 January 2020 (6.75hrs x 2 persons) -27 February 2020 (6.25hrs x 3 persons)	Not observed
*Caladenia tessellata** Thick-lipped Spider-orchid	September	Parallel field traverses -19 September 2019 (7hrs x 2 persons)	Not observed
Cercartetus nanus Eastern Pygmy-possum	October to March	Arboreal camera trapping 14 January – 11 February 2020 9 cameras x 28 nights (252 camera trap nights)	Not observed

TABLE 4.6
CANDIDATE THREATENED SPECIES SURVEY RESULTS

Species	Survey Period	Survey Methods Applied	Observation Details
Crinia tinnula Wallum Froglet	All year	Diurnal searches / call playback -19 September 2019 (7hrs x 2 persons) -17 October 2019 (7hrs x 2 persons) -14 November 2019 (7hrs x 2 persons) -14 January 2020 (6.75hrs x 2 persons) -27 February 2020 (6.25hrs x 3 persons) Nocturnal searches / call playback -7 November 2019 (1 hr x 2 persons) -21 January 2020 (2hrs x 2 persons) -11 February 2020 (1hr x 2 persons) -12 March 2020 (1.5hrs x 2 persons)	Observed during surveys
Cryptostylis hunteriana	November to January	-14 November 2019 (7hrs x 2 persons) -14 January 2020 (6.75hrs x 2 persons)	Not observed
Eucalyptus parramattensis subsp. decadens	All year	Parallel field traverses -19 September 2019 (7hrs x 2 persons) -17 October 2019 (7hrs x 2 persons) -14 November 2019 (7hrs x 2 persons) -14 January 2020 (6.75hrs x 2 persons) -27 February 2020 (6.25hrs x 3 persons)	

TABLE 4.6
CANDIDATE THREATENED SPECIES SURVEY RESULTS

Species	Survey Period	Survey Methods Applied	Observation Details
Eucalyptus parramattensis subsp. parramattensis Endangered Population in the Wyong and Lake Macquarie Local Government Areas*	All year	Parallel field traverses -19 September 2019 (7hrs x 2 persons) -17 October 2019 (7hrs x 2 persons) -14 November 2019 (7hrs x 2 persons) -14 January 2020 (6.75hrs x 2 persons) -27 February 2020 (6.25hrs x 3 persons)	Not observed
Grevillea parviflora subsp. parviflora Small-flower Grevillea*	August - November	Parallel field traverses -19 September 2019 (7hrs x 2 persons) -17 October 2019 (7hrs x 2 persons) -14 November 2019 (7hrs x 2 persons)	Not observed
Haliaeetus leucogaster White-bellied Sea-Eagle (Breeding)	July - December	Diurnal nest searches and species census -19 September 2019 (7hrs x 2 persons) -17 October 2019 (7hrs x 2 persons) -14 November 2019 (7hrs x 2 persons) -8 July 2020 (1.5hrs x 2 persons)	Not observed
Hieraaetus morphnoides Little Eagle (Breeding)	August - October	Diurnal nest searches and species census -19 September 2019 (7hrs x 2 persons) -17 October 2019 (7hrs x 2 persons)	Not observed

TABLE 4.6 CANDIDATE THREATENED SPECIES SURVEY RESULTS			
Species	**Survey Period**	**Survey Methods Applied**	**Observation Details**
Hoplocephalus bitorquatus Pale-headed Snake	November to March	Nocturnal searches -7 November 2019 (1 hr x 2 persons) -21 January 2020 (2hrs x 2 persons) -11 February 2020 (1hr x 2 persons) -12 March 2020 (1.5hrs x 2 persons)	Not observed
Lathamus discolor Swift Parrot (Important Habitat)	Map checking only	Not applicable	Site is mapped as Swift parrot Important Habitat Area
Litoria aurea Green and Golden Bell Frog	November - March	Diurnal searches / call playback -17 October 2019 (7hrs x 2 persons) -14 November 2019 (7hrs x 2 persons) -14 January 2020 (6.75hrs x 2 persons) -27 February 2020 (6.25hrs x 3 persons) Nocturnal searches / call playback -7 November 2019 (1 hr x 2 persons) -21 January 2020 (2hrs x 2 persons) -11 February 2020 (1hr x 2 persons) -12 March 2020 (1.5hrs x 2 persons)	Not observed

TABLE 4.6 CANDIDATE THREATENED SPECIES SURVEY RESULTS			
Species	**Survey Period**	**Survey Methods Applied**	**Observation Details**
Litoria brevipalmata Green-thighed Frog	October - March	Diurnal searches / call playback -17 October 2019 (7hrs x 2 persons) -14 November 2019 (7hrs x 2 persons) -14 January 2020 (6.75hrs x 2 persons) -27 February 2020 (6.25hrs x 3 persons) Nocturnal searches / call playback -7 November 2019 (1 hr x 2 persons) -21 January 2020 (2hrs x 2 persons) -11 February 2020 (1hr x 2 persons) -12 March 2020 (1.5hrs x 2 persons)	Not observed
Lophoictinia isura Square-tailed Kite (Breeding)	September to January	Diurnal nest searches and species census -19 September 2019 (7hrs x 2 persons) -17 October 2019 (7hrs x 2 persons) -14 November 2019 (7hrs x 2 persons) -14 January 2020 (6.75hrs x 2 persons)	Not observed
*Maundia triglochinoides**	November - March	Parallel field traverses -14 November 2019 (7hrs x 2 persons) -14 January 2020 (6.75hrs x 2 persons) -27 February 2020 (6.25hrs x 3 persons)	Not observed

TABLE 4.6
CANDIDATE THREATENED SPECIES SURVEY RESULTS

Species	Survey Period	Survey Methods Applied	Observation Details
Melaleuca biconvexa Biconvex Paperbark	All year	Parallel field traverses -19 September 2019 (7hrs x 2 persons) -17 October 2019 (7hrs x 2 persons) -14 November 2019 (7hrs x 2 persons) -14 January 2020 (6.75hrs x 2 persons) -27 February 2020 (6.25hrs x 3 persons)	Not observed
Myotis macropus Southern Myotis*	October to March	Ultrasonic bat call recording x 1 unit x 22 nights -20 January 2020 to 11 February 2020	Recorded during surveys
Pandion cristatus Eastern Osprey	April - November	Diurnal nest searches and species census -19 September 2019 (7hrs x 2 persons) -17 October 2019 (7hrs x 2 persons) -14 November 2019 (7hrs x 2 persons) -8 July 2020 (1.5hrs x 2 persons)	Not observed
Persicaria elatior Tall Knotweed	December to May	Parallel field traverses -14 January 2020 (6.75hrs x 2 persons) -27 February 2020 (6.25hrs x 3 persons)	Not observed
Petalura gigantea Giant Dragonfly	December to January	Diurnal search -14 January 2020 (6.75hrs x 2 persons)	Not observed

TABLE 4.6
CANDIDATE THREATENED SPECIES SURVEY RESULTS

Species	Survey Period	Survey Methods Applied	Observation Details
Petaurus norfolcensis Squirrel Glider*	All year	Spotlighting -7 November 2019 (1 hr x 2 persons) -21 January 2020 (2hrs x 2 persons) -11 February 2020 (1hr x 2 persons) -12 March 2020 (1.5hrs x 2 persons) Baited remote arboreal camera trapping (252 camera trap nights) -14 January 2020 to 11 February 2020	Observed during surveys
Phascolarctos cinereus Koala (Breeding)	All year	Diurnal searches -19 September 2019 (7hrs x 2 persons) -17 October 2019 (7hrs x 2 persons) -14 November 2019 (7hrs x 2 persons) -14 January 2020 (6.75hrs x 2 persons) -27 February 2020 (6.25hrs x 3 persons) Nocturnal searches / spotlighting -7 November 2019 (1 hr x 2 persons) -21 January 2020 (2hrs x 2 persons) -11 February 2020 (1hr x 2 persons) -12 March 2020 (1.5hrs x 2 persons) Baited remote arboreal camera trapping (252 camera trap nights) -14 January 2020 to 11 February 2020	Not observed

TABLE 4.6
CANDIDATE THREATENED SPECIES SURVEY RESULTS

Species	Survey Period	Survey Methods Applied	Observation Details
Planigale maculata Common Planigale	All year	Baited remote arboreal camera trapping (252 camera trap nights) -14 January 2020 to 11 February 2020 Baited remote terrestrial camera trapping (80 camera trap nights) -21 July to 6 August 2020	Not observed
Potorous tridactylus Long-nosed Potoroo	All year	Baited remote terrestrial camera trapping (80 camera trap nights) -21 July to 6 August 2020	Not observed
Tetratheca juncea Black-eyed Susan	September to October	Parallel field traverses -19 September 2019 (7hrs x 2 persons) -17 October 2019 (7hrs x 2 persons)	Not observed
Thelymitra adorata Wyong Sun Orchid*	September to October	Parallel field traverses -19 September 2019 (7hrs x 2 persons) -17 October 2019 (7hrs x 2 persons)	Not observed
Uperoleia mahonyi Mahony's Toadlet	October to March	Diurnal searches / call playback -17 October 2019 (7hrs x 2 persons) -14 November 2019 (7hrs x 2 persons) -14 January 2020 (6.75hrs x 2 persons) -27 February 2020 (6.25hrs x 3 persons) Nocturnal searches / call playback -7 November 2019 (1 hr x 2 persons) -21 January 2020 (2hrs x 2 persons) -11 February 2020 (1hr x 2 persons) -12 March 2020 (1.5hrs x 2 persons)	Not observed

i. *Candidate threatened Species Observations and Species Polygons*

The following candidate species credit threatened species were observed during surveys:

- Wallum Froglet (*Crinia tinnula*)
- Biconvex Paperbark (*Melaleuca biconvexa*)
- Southern Myotis (*Myotis macropus*)
- Squirrel Glider (*Petaurus norfolcensis*)

The proposed impact area is also located within the Swift Parrot Important Habitat Map area.

Details on the above species are provided below.

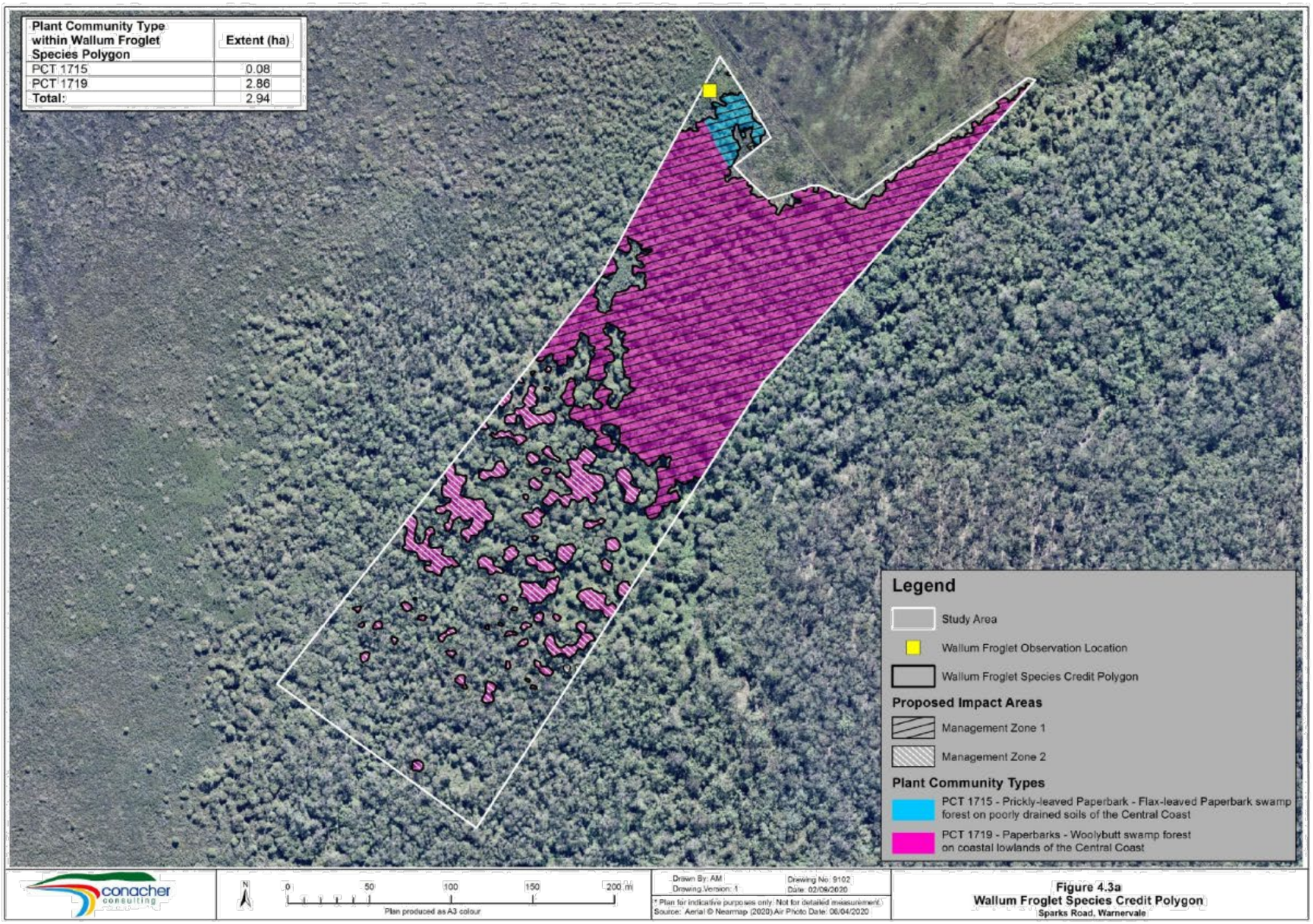
Wallum Froglet (*Crinia tinnula*)
The Threatened Biodiversity Data Collection identifies the following in relation to the habitat features utilised by this species:

- Wallum Froglets are found in a wide range of habitats, usually associated with acidic swamps on coastal sand plains. They typically occur in sedgelands and wet heathlands. They can also be found along drainage lines within other vegetation communities and disturbed areas, and occasionally in 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. Eggs of 1.1-1.2mm are deposited in water with a pH of <6 and tadpoles take 2-6 months to develop into frogs.

- 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.

During surveys the Wallum Froglet was observed calling on several dates. There area of suitable habitat for this species within the subject site has been mapped as approximately 2.94 ha and is shown in Figure 4.3a.


Plant Community Type within Wallum Froglet Species Polygon
Extent (ha)
PCT 1715
0.08
PCT 1719
2.86
Total:
2.94
Legend
Study Area
Wallum Froglet Observation Location
Wallum Froglet Species Credit Polygon
Proposed Impact Areas
Management Zone 1
Management Zone 2
Plant Community Types
PCT 1715 - Prickly-leaved Paperbark - Flax-leaved Paperbark swamp forest on poorly drained soils of the Central Coast
PCT 1719 - Paperbarks - Woolybutt swamp forest on coastal lowlands of the Central Coast
conacher consulting
N
0
50
100
150
200 m
Plan produced as A3 colour
Drawn By: AM
Drawing Version: 1
Drawing No: 9102
Date: 02/09/2020
* Plan for indicative purposes only. Not for detailed measurement.
Source: Aerial © Nearmap (2020) Air Photo Date: 06/04/2020
Figure 4.3a
Wallum Froglet Species Credit Polygon
Sparks Road, Warnervale

Swift Parrot (*Lathamus discolor*)
Swift Parrot Important Habitat Areas are mapped by the Department of Planning, Industry and the Environment based on Swift Parrot sighting records and suitable plant community types. The Swift Parrot Important Habitat map provided by DPIE is reproduced as Plate 1. This species is a serious and irreversible impact entity. There are 2.94 ha of Important Swift Parrot Habitat mapped within the proposed impact area, as shown in Figure 4.3b.

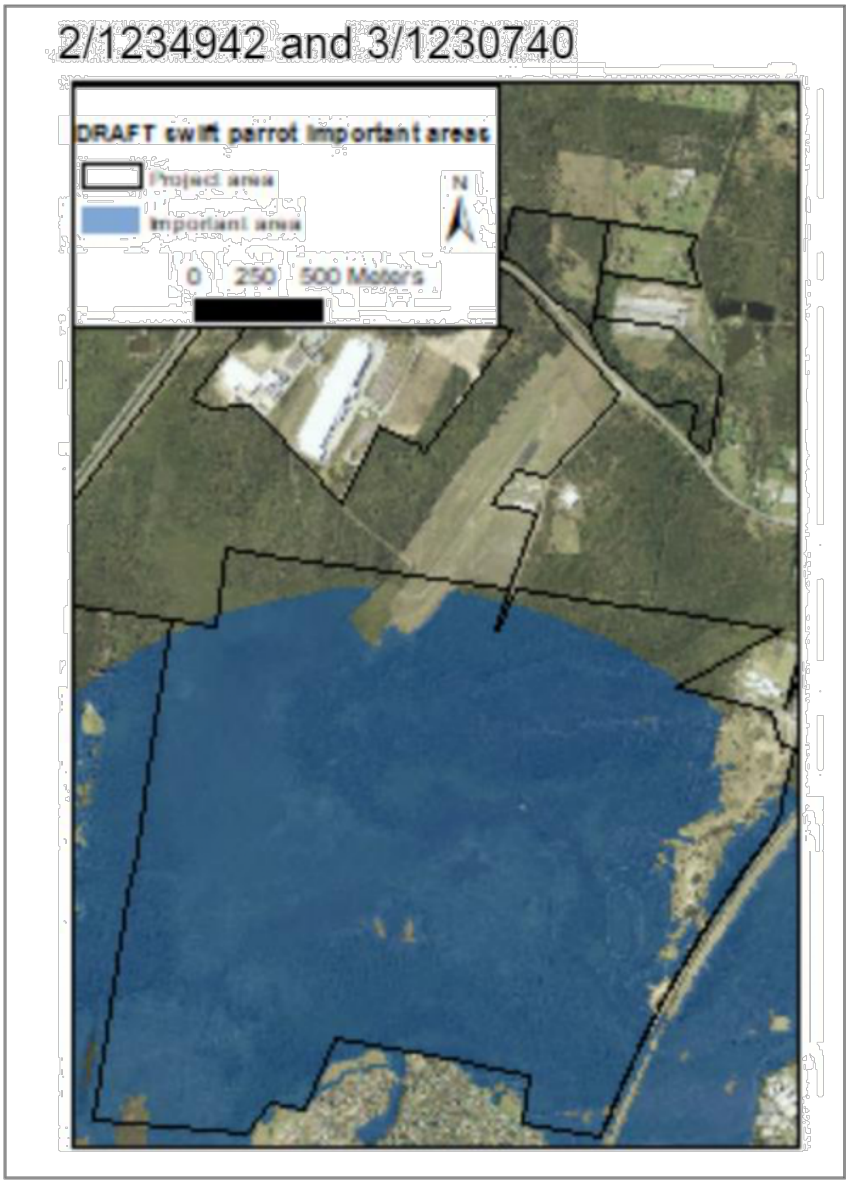


Plate 1. DPIE Swift Parrot Important Habitat map.

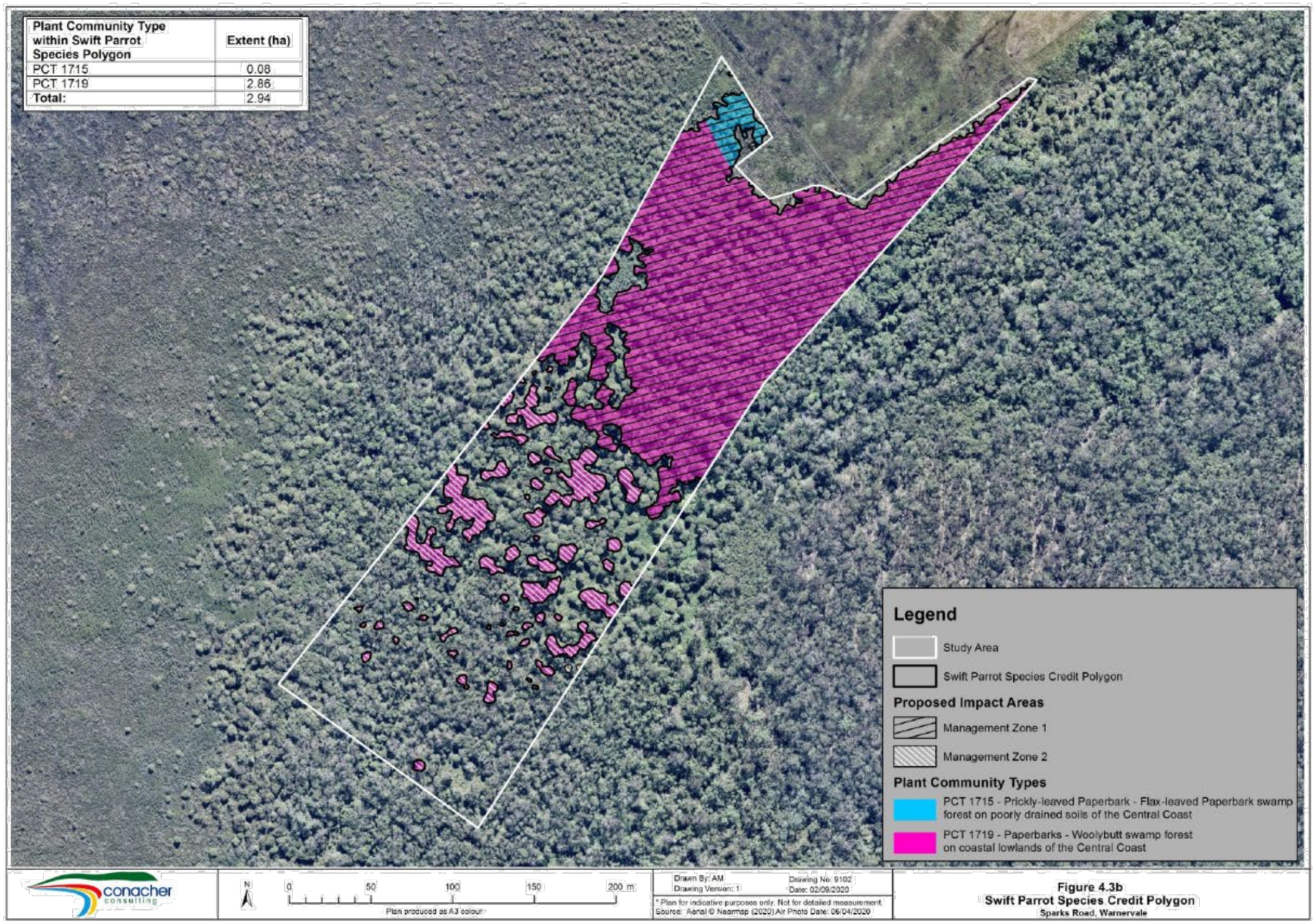


Figure 4.3b
Swift Parrot Species Credit Polygon
Sparks Road, Warnervale

Biconvex Paperbark (*Melaleuca biconvexa*)

The Threatened Biodiversity Data Collection identifies this species ggenerally grows in damp places, often near streams or low-lying areas on alluvial soils of low slopes or sheltered aspects.

A small patch of Melaleuca biconvexa was observed in the north-eastern section of the site and occupies approximately 0.003 ha, as shown in Figure 4.3c.

Figure 4.3c
***Melaleuca biconvexa* Species Credit Polygon**
Sparks Road, Warnervale

Southern Myotis (*Myotis macropus*)

The Southern Myotis was recorded during ultrasonic bat call recording surveys within the site.

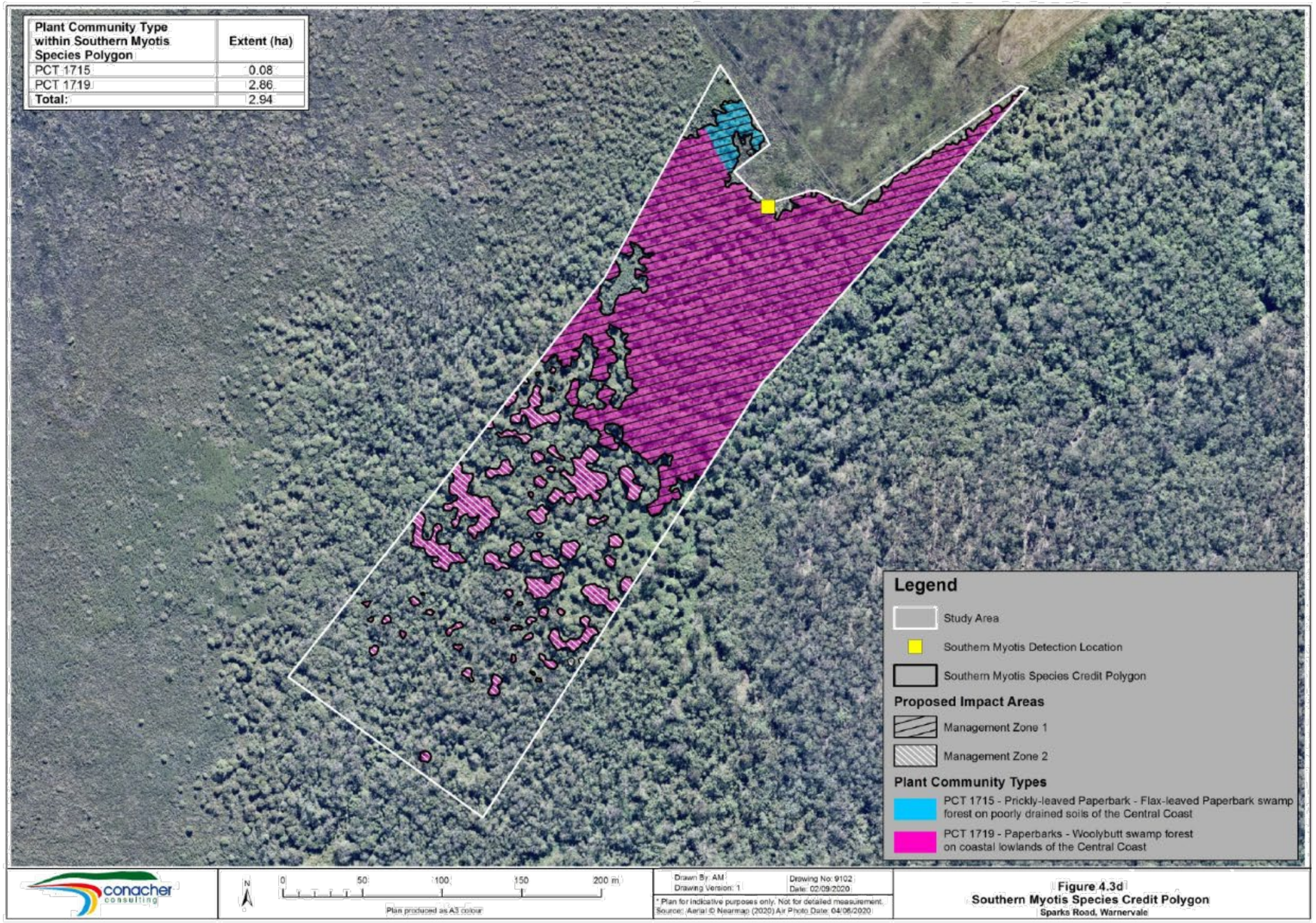
The Threatened Biodiversity Data Collection identifies the following in relation to the habitat features utilised by this species:

- It generally roosts 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.
- It forages over streams and pools catching insects and small fish by raking their feet across the water surface.

The species polygon for this species is calculated in accordance with the requirements of the '*Species Credit' threatened bats and their habitats NSW Survey Guide for the Biodiversity Assessment Method* (NSW OEH 2018). The guide identifies that the species polygon for the Southern Myotis is to include:

All habitat on the subject land where the subject land is within 200m of a waterbody with pools/ stretches 3m or wider including rivers, creeks, billabongs, lagoons, dams and other waterbodies on the subject land.

All PCTs within 200m of waterbodies at least 3m wide (as determined from site surveys) were included within the Southern Myotis species polygon, which is mapped in Figure 4.3d and occupies approximately 2.94 ha.


Plant Community Type within Southern Myotis Species Polygon
Extent (ha)
PCT 1715
0.08
PCT 1719
2.86
Total:
2.94
Legend
Study Area
Southern Myotis Detection Location
Southern Myotis Species Credit Polygon
Proposed Impact Areas
Management Zone 1
Management Zone 2
Plant Community Types
PCT 1715 - Prickly-leaved Paperbark - Flax-leaved Paperbark swamp forest on poorly drained soils of the Central Coast
PCT 1719 - Paperbarks - Woolybutt swamp forest on coastal lowlands of the Central Coast
conacher consulting
N
0 50 100 150 200 m
Plan produced as A3 colour
Drawn By: AM
Drawing Version: 1
Drawing No: 9102
Date: 02/09/2020
* Plan for indicative purposes only. Not for detailed measurement.
Source: Aerial © Nearmap (2020) Air Photo Date: 04/06/2020
Figure 4.3d
Southern Myotis Species Credit Polygon
Sparks Road, Warnervale

Squirrel Glider (*Petaurus norfolcensis*)
A photograph which has been identified as a probable Squirrel Glider was captured during baited remote camera surveys at the location mapped in Figure 4.3e. This species is known to occur in the locality with previous records within 1500m of the site and based on the habitats present it is has been assessed as occurring on the site.

The Threatened Biodiversity Data Collection identifies the following in relation to the habitat features utilised by this species:

- It relies on large old trees with hollows for breeding and nesting. These trees are also critical for movement and typically need to be closely-connected (i.e. no more than 50 m apart).
- Inhabits 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.
- Prefers mixed species stands with a shrub or Acacia midstorey.
- 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.

There area of suitable habitat for this species within the subject site has been mapped as approximately 2.94 ha and is shown in Figure 4.3e.

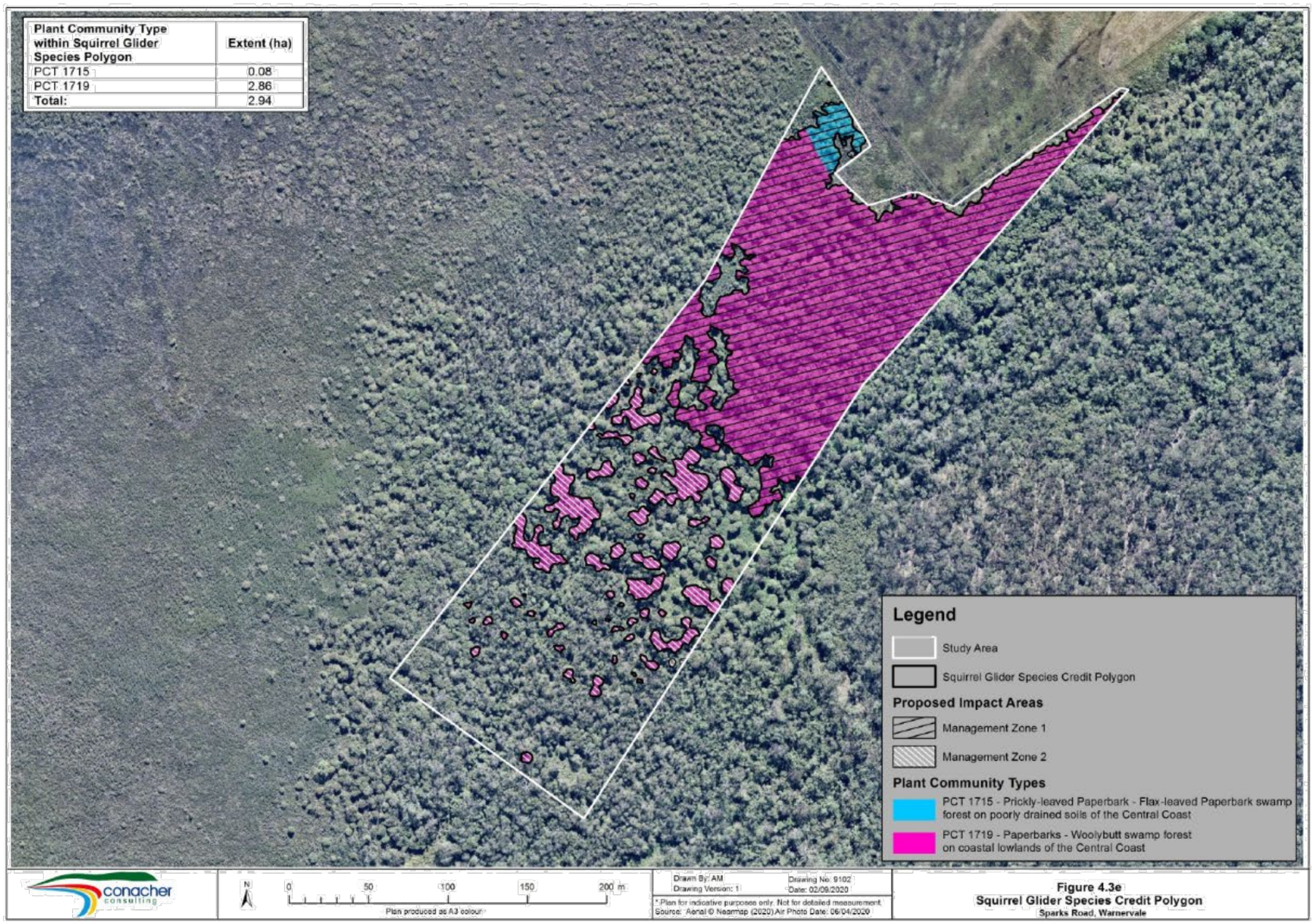


Figure 4.3e
Squirrel Glider Species Credit Polygon
Sparks Road, Warnervale

SECTION 5

IMPACT AVOIDANCE AND MINIMISATION ASSESSMENT

5.1 IMPACT AVOIDANCE AND MINIMISATION CONSIDERATIONS

5.1.1 *Avoidance and Minimisation of Impacts on Native Vegetation and Habitats*

The following considerations are provided in relation to avoidance and minimisation measures for direct and indirect impacts associated with the project and ancillary features relating to native vegetation and habitats.

i. Locating the project areas and ancillary facilities in areas where there are no biodiversity values (BAM Sections 8.1.1.3 (a) and 8.1.2.1 (b)).

The impact area has been determined based on the management of vegetation 3m below an obstacle limitation surface gradient of 3.33% for night time flying. The obstacle limitation surface area if fixed in relation to the existing runway at the Warnervale Aircraft Landing Area. The project area (obstacle limitation surface) cannot be relocated to an area where there are no biodiversity values. Any ancillary facilities required to undertake the works will be located in areas with no biodiversity values. These may include locations for parking of vehicles and site machinery and any site facilities required during the completion of the works.

ii. Locating the project and ancillary facilities in areas where the native vegetation or threatened species habitat is in the poorest condition (i.e. areas that have a lower vegetation integrity score) (BAM Sections 8.1.1.3 (b) and 8.1.2.1 (c))

The impact area has been determined based on the management of vegetation 3m below an obstacle limitation surface gradient of 3.33% for night time flying. The obstacle limitation surface area if fixed in relation to the existing runway at the Warnervale Aircraft Landing Area. The project area (obstacle limitation surface) cannot be relocated to an area where there are no biodiversity values. Any ancillary facilities required to undertake the works will be located in areas with no biodiversity values. These ancillary facilities may include locations for parking of vehicles and site machinery and any site facilities required during the completion of the works.

iii. Locating the project and ancillary facilities in areas that avoid habitat for species that have a high biodiversity risk weighting or native vegetation that is a critically endangered ecological community (CEEC) or an endangered ecological community (EEC) (BAM Sections 8.1.1.3 (c) and 8.1.2.1 (d))

The project area (obstacle limitation surface location) does include habitat for species with a high biodiversity risk weighting and areas of the Swamp Sclerophyll Forest on Coastal Floodplains and River-flat Eucalypt Forest on Coastal Floodplains EECs.

The impact area has been determined based on the management of vegetation 3m below an obstacle limitation surface gradient of 3.33% for night time flying. The obstacle limitation surface area if fixed in relation to the existing runway at the Warnervale Aircraft Landing Area. The project area (obstacle limitation surface) cannot be relocated to an area where there are no biodiversity values. Any ancillary facilities required to undertake the works will be located in areas with no biodiversity values, outside of areas which provide habitat for threatened species with a high biodiversity risk weighting and outside of locations of endangered ecological communities. These ancillary facilities may include locations for

parking of vehicles and site machinery and any site facilities required during the completion of the works.

iv. Reducing the clearing footprint of the project (BAM Section 8.1.2.1 (a))

The impact area has been determined based on the management of vegetation 3m below an obstacle limitation surface gradient of 3.33% for night time flying. The management of vegetation to a height of 5m below the obstacle limitation surface was considered as part of the impact footprint determination. A comparison of the impact footprints of these two separate management scenarios is provided in Figure 5.1.

A height of 3m was chosen to reduce the clearing footprint required, despite the likely increased costs and management frequency required to maintain the obstacle limitation surface. The management of the vegetation to a height of 3m compared to a height of 5m below the obstacle limitation surface has reduced the overall area of the impact footprint proposed as well as the intensity of the impact.

v. Justifications for project location decisions should identify any other site constraints that the proponent has considered in determining the location and design of the project, e.g. bushfire protection requirements including clearing for asset protection zones, flood planning levels, servicing constraints (BAM Section 8.1.1.5)

The impact area has been determined based on the management of vegetation 3m below an obstacle limitation surface gradient of 3.33% for night time flying. The obstacle limitation surface area if fixed in relation to the existing runway at the Warnervale Aircraft Landing Area.

vi. Making provision for the demarcation, ecological restoration, rehabilitation and/or ongoing maintenance of retained native vegetation habitat on the development site (BAM Section 8.1.2.1 (f))

This matter will be dealt with through a Vegetation Management Plan which is proposed to be prepared for the works.

5.1.2 *Avoidance and Minimisation of Prescribed Biodiversity Impacts*

The following consideration is provided in relation to avoidance and minimisation measures for prescribed impacts.

i. ***Locating the envelope of surface works to avoid direct impacts on the following habitat features (BAM Section 8.2.2.1(a)):***

- ***karst, caves, crevices, cliffs and other geological features of significance, or***
- ***rocks, or***
- ***human made structures, or***
- ***non-native vegetation***

The footprint of the proposal does not contain areas of these features.

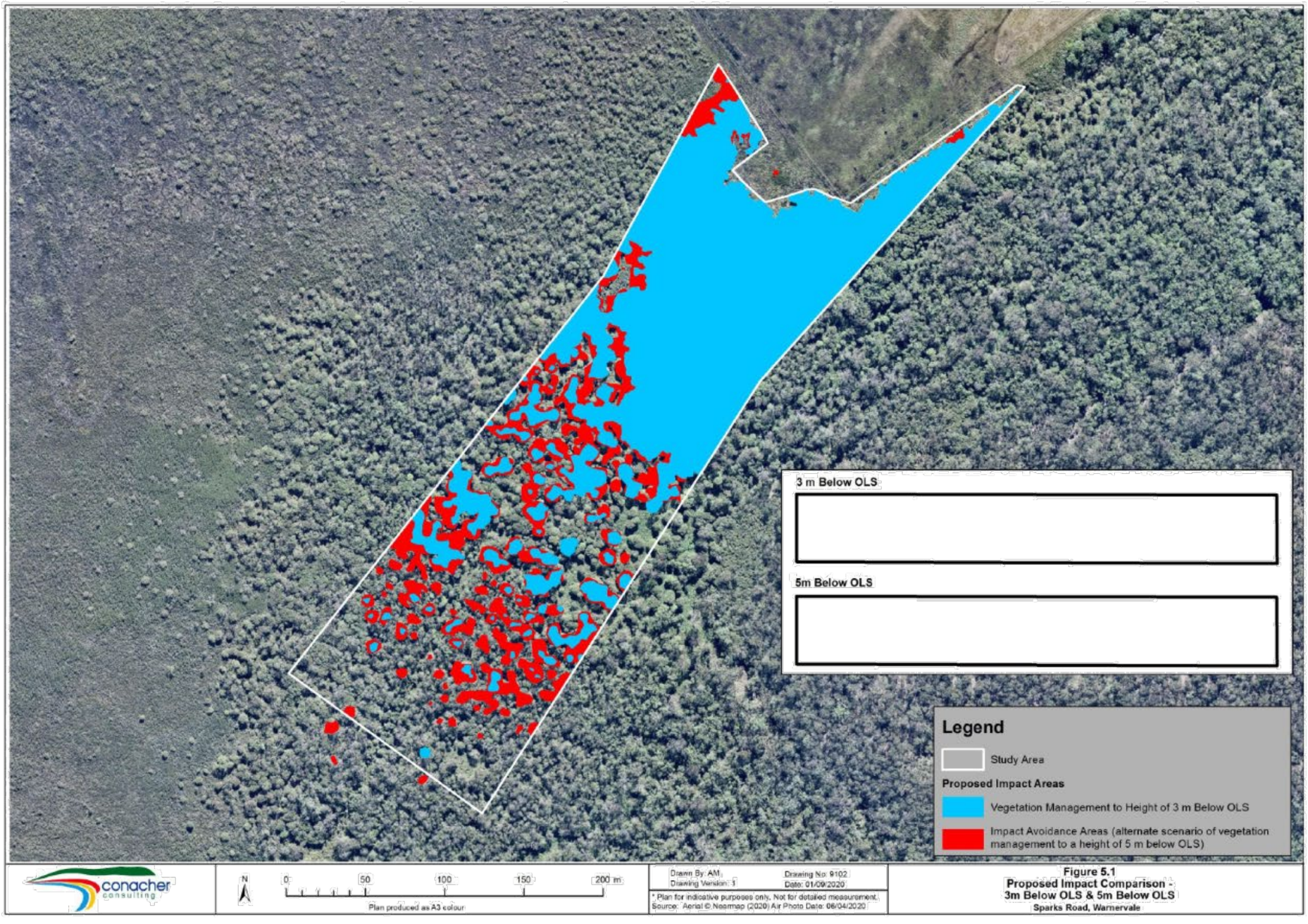


Figure 5.1
Proposed Impact Comparison - 3m Below OLS & 5m Below OLS
Sparks Road, Warnervale

ii. ***Locating the envelope of sub-surface works, both in the horizontal and vertical plane, to avoid and minimise operations beneath the habitat features identified in Paragraph 8.2.1.2, e.g. locating longwall panels away from geological features of significance or water dependent plant communities and their supporting aquifers (BAM Section 8.2.2.1(b)).***

The proposal is not likely to result in any sub-surface works beneath retained habitat features.

iii. ***Locating the project to avoid severing or interfering with corridors connecting different areas of habitat, migratory flight paths to important habitat or local movement pathways (BAM Section 8.2.2.1(c).***

The project impact footprint is fixed and cannot be avoided. Total clearing of native vegetation is not proposed and existing connecting corridors and movement pathways are likely to be maintained.

iv. ***Optimising project layout to minimise interactions with threatened species and ecological communities, e.g. designing turbine layout to allow buffers around features that attract and support aerial species, such as forest edges, riparian corridors and wetlands, ridgetops and gullies (BAM Section 8.2.2.1(d))***

The location of the obstacle limitation surface is fixed, any ancillary facilities required to complete the works will be located to avoid threatened species and EEC locations.

v. ***Locating the project to avoid direct impacts on water bodies (BAM Section 8.2.2.1(e))***

The site is part of the Porters Creek Wetland. Direct impacts to water flow are not proposed.

vi. ***An analysis of alternative modes or technologies that would avoid or minimise prescribed biodiversity impacts and justification for selecting the proposed mode or technology (BAM Section 8.2.2.2(a))***

No alternative modes or technologies that would avoid or minimise prescribed biodiversity impacts have been identified.

vii. ***An analysis of alternative routes that would avoid or minimise prescribed biodiversity impacts and justification for selecting the proposed route (BAM Section 8.2.2.2(b))***

There are no feasible alternative routes that would further minimise prescribed impacts. The assessed obstacle limitation surface is associated with an existing runway.

viii. ***An analysis of alternative locations that would avoid or minimise prescribed biodiversity impacts and justification for selecting the proposed location (BAM Section 8.2.2.2(c))***

There are no feasible alternative locations that would further minimise prescribed impacts. The assessed obstacle limitation surface is associated with an existing runway.

ix. ***An analysis of alternative sites within a property on which the project is proposed that would avoid or minimise prescribed biodiversity impacts and justification for selecting the proposed site (BAM Section 8.2.2.2(d))***

There are no feasible alternative sites within the properties assessed that would further minimise prescribed impacts as the assessed obstacle limitation surface is associated with an existing runway.

x. ***Justifications for project location decisions should identify any other site constraints that the proponent has considered in determining the location and design of the project, e.g. bushfire protection requirements including clearing for asset protection zones, flood planning levels, servicing constraints (BAM Section 8.2.2.3)***

The impact area has been determined based on the management of vegetation 3m below an obstacle limitation surface gradient of 3.33% for night time flying. The obstacle limitation surface area if fixed in relation to the existing runway at the Warnervale Aircraft Landing Area.

xi. ***Avoidance and minimisation through application of engineering solutions, e.g. proven techniques to minimise fracturing of bedrock underlying features of geological significance, water dependent communities and their supporting aquifers, proven engineering solutions to restore connectivity and favoured movement pathways (BAM Section 8.2.3.1(a))***

There are no identified engineering solutions which would further minimise the impacts associated with the proposal.

xii. ***Avoidance and minimisation through design of project elements to minimise interactions with threatened and protected species and ecological communities, e.g. designing turbines to dissuade perching and minimise the diameter of the rotor swept area, designing fencing to prevent animal entry to transport corridors (BAM Section 8.2.3.1(b))***

The location of the obstacle limitation surface is fixed, any ancillary facilities required to complete the works will be located to avoid threatened species and EEC locations.

xiii. ***Avoidance and minimisation through design of the project to maintain environmental processes critical to the formation and persistence of habitat features not associated with native vegetation (BAM Section 8.2.3.1(c))***

It is recommended that the proposed works do not remove or destroy vegetation below the ground surface and that the works do not impact on the existing hydrological characteristics of the site.

xiv. ***Avoidance and minimisation through design of the project to maintain hydrological processes that sustain threatened species and TECs (BAM Section 8.2.3.1(d))***

It is recommended that direct and indirect impacts on hydrological processes will be avoided and minimised through the implementation of suitable erosion and sediment controls and avoidance of any substantial ground surface disturbance such as excavation of filling works.

xv. ***Avoidance and minimisation through design of the project to avoid and minimise downstream impacts on rivers, wetlands and estuaries by control of the quality of water released from the site (BAM Section 8.2.3.1(e))***

It is recommended that specific low impact work practices are utilised and suitable erosion and sediment controls are installed and maintained where necessary to avoid and minimise

downstream impacts on rivers, wetlands and estuaries. This matter is to be further addressed in a Vegetation Management Plan to be prepared for the works.

5.2 IMPACT MITIGATION & MANAGEMENT MEASURES

The following measures identified in Table 5.1 will be undertaken to mitigate and manage impacts following project approval and as part of the works and operation of the site.

TABLE 5.1
PROPOSED IMPACT MITIGATION & MANAGEMENT MEASURES

IMPACT	MITIGATION MEASURE	TIMING	MONITORING SCHEDULE	OUTCOME	RESPONSIBILITY
All impacts associated with the works	**Biodiversity Measure 1:** Completion of a Vegetation Management Plan	Tasks to be specified for pre, during and post works monitoring	Various	Minimisation of impacts Implement vegetation protection and management protocols Implementation of erosion and sediment controls Application of correct tree pruning techniques and specific management treatment for the different management zones assessed Completion of works by appropriately qualified and experienced Arborists Minimisation of noise and dust during works Implementation of biodiversity procedures to prevent transfer of waste, weed propagules and pathogens Ensure that works are completed by competent Arborists (AQF Level 3 minimum) under the supervision of an Ecologist and Consulting Arborist AQF Level 5 minimum. Ensure that appropriate site monitoring of vegetation is undertaken during and between management events.	Site Manager Project Ecologist Project Arborist

SECTION 6

ASSESSMENT OF RESIDUAL DIRECT AND INDIRECT IMPACTS

6.1 PROPOSED DEVELOPMENT IMPACTS

i. Impact Assessment

The areas of vegetation removal, modification and retention within the site are shown in Figure 6.1. The extent of removal proposed for each PCT zone is listed in Table 6.1.

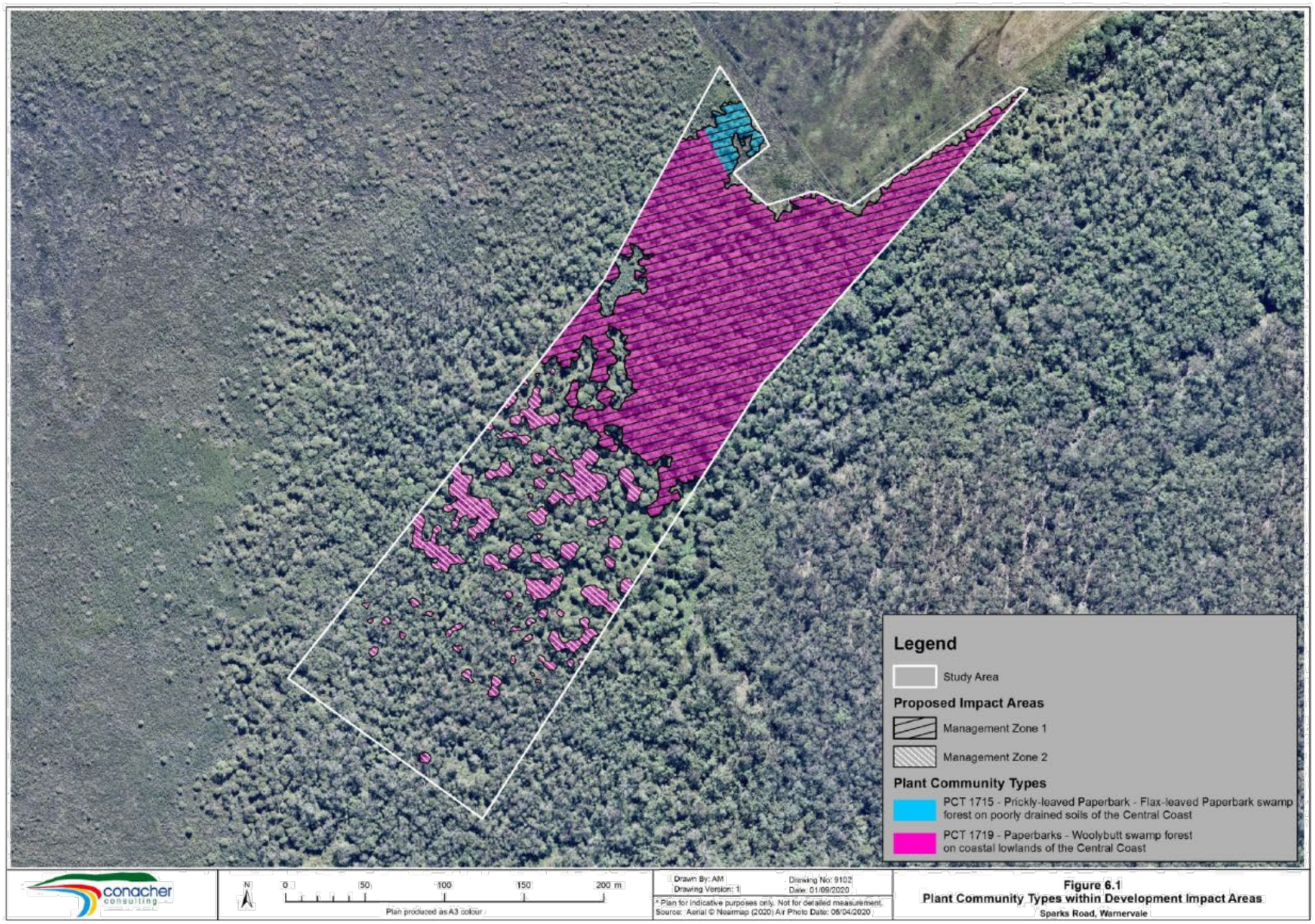
TABLE 6.1
PLANT COMMUNITY TYPE IMPACT AREAS ASSESSED

Plant Community Type	Zone	Area of Impact Management Zone 1	Area of Impact Management Zone 2	Total Area of Impact
1715-Prickly-leaved Paperbark - Flax-leaved Paperbark swamp forest on poorly drained soils of the Central Coast	Zone 1 – Intact condition	0.08	0.00	0.08
1719-Paperbarks - Woollybutt swamp forest on coastal lowlands of the Central Coast	Zone 1 – Intact condition	2.40	0.46	2.86

There are two management areas within the development footprint these are shown in Figure 6.1 and have been assessed as:

Management Zone 1: The tree and shrub values for composition and structure scores and the number of large trees and stem size classes for the function scores have been reduced to zero. All other values have been maintained as the ground layer vegetation and other values are not proposed to be impacted by the works.

Management Zone 2: All composition, structure and function scores have been maintained for each value for this zone as the proposed works are limited to tree pruning of selected trees which is not likely to result in tree mortality. No impacts are likely to occur to the understorey vegetation through the implementation of suitable work practices.


Legend
Study Area
Proposed Impact Areas
Management Zone 1
Management Zone 2
Plant Community Types
PCT 1715 - Prickly-leaved Paperbark - Flax-leaved Paperbark swamp forest on poorly drained soils of the Central Coast
PCT 1719 - Paperbarks - Woolybutt swamp forest on coastal lowlands of the Central Coast
N
0
50
100
150
200 m
Plan produced as A3 colour
Drawn By: AM
Drawing Version: 1
Drawing No: 9102
Date: 01/09/2020
* Plan for indicative purposes only. Not for detailed measurement.
Source: Aerial © Nearmap (2020) Air Photo Date: 06/04/2020
Figure 6.1
Plant Community Types within Development Impact Areas
Sparks Road, Warnervale

Specific direct and indirect impacts required to be assessed under Section 9.1 and 9.2 of the BAM, including prescribed impacts, are assessed in Table 6.2.

TABLE 6.2
ASSESSMENT OF POTENTIAL IMPACTS

Potential Impact	Impact Nature and Extent	Impact Frequency /Duration / timing	Impact Consequence	Threatened Biodiversity Likely to be Affected
Direct impacts to vegetation	Removal of tree and shrub cover for Management Zone 1 and removal of tree cover for Management Zone 2	Annually or as required	Loss of tree and shrub cover	*Melaleuca biconvexa* Squirrel Glider Southern Myotis Swift Parrot Predicted and observed Ecosystem credit species
Direct impacts to hollow-bearing trees	No hollow bearing trees observed	NA	NA	NA
Impacts to serious and irreversible impact entities	No potential SAII species observed.	NA	NA	NA
Indirect impacts on adjacent vegetation and habitat during construction	Not likely to occur, adjoining areas will be protected with fencing.	NA	NA	NA
Indirect impact on adjacent vegetation and habitat during operation	Increased light levels may affect adjacent vegetation following vegetation management works	Ongoing	Altered / reduced shade Reduction in habitat structure and suitability	*Melaleuca biconvexa* Squirrel Glider Southern Myotis Swift Parrot Predicted and observed Ecosystem credit species
Impacts on adjacent vegetation and habitat arising from a change in land-use patterns	Not likely to occur as the impact area is already within the runway OLS.	NA	NA	NA

TABLE 6.2 ASSESSMENT OF POTENTIAL IMPACTS				
Potential Impact	**Impact Nature and Extent**	**Impact Frequency /Duration / timing**	**Impact Consequence**	**Threatened Biodiversity Likely to be Affected**
Inadvertent impact on adjacent habitat or vegetation	Impacts to adjacent vegetation will be avoided through implementation of a Vegetation Management Plan to manage inadvertent impacts	NA	NA	NA
Reduced viability of adjacent habitat due to edge effects	Not likely to occur as vegetation will be retained under the OLS management height	NA	NA	NA
Reduced viability of adjacent habitat due to noise, dust or light spill	Impacts to adjacent vegetation will be avoided through implementation of a Vegetation Management Plan to manage inadvertent impacts	NA	NA	NA
Transport of weeds and pathogens from the site to adjacent vegetation	Impacts to adjacent vegetation will be avoided through implementation of a Vegetation Management Plan to manage inadvertent impacts	NA	NA	NA
Increased risk for fauna of starvation, exposure and loss of shade or shelter	Potential to occur due to removal of canopy and shrub layer in areas which require removal of most of the existing tree and/or shrub layer	Ongoing	Reduction in population size and/or reduced site use	*Melaleuca biconvexa* Squirrel Glider Southern Myotis Swift Parrot Predicted and observed Ecosystem credit species
Loss of breeding habitats	No threatened fauna species have been detected breeding within the site	NA	NA	NA
Trampling of threatened flora species	Trampling of *Melaleuca biconvexa* may occur during works	Ongoing during works	Reduction in population size	*Melaleuca biconvexa*
Inhibition of nitrogen fixation and increased soil salinity	Not likely to occur.	NA	NA	NA
Fertiliser drift	Not likely to occur.	NA	NA	NA

TABLE 6.2
ASSESSMENT OF POTENTIAL IMPACTS

Potential Impact	Impact Nature and Extent	Impact Frequency /Duration / timing	Impact Consequence	Threatened Biodiversity Likely to be Affected
Rubbish dumping	Any rubbish is likely to be minor and will be managed as part of the ongoing operations as documented under the Vegetation Management Plan	NA	NA	NA
Wood collection	Not likely to occur as a result of the proposal.	NA	NA	NA
Bush rock removal and disturbance	None present and not likely to occur as a result of the proposal.	NA	NA	NA
Increase in predatory species populations	Not likely to occur as a direct result of the proposal.	NA	NA	NA
Increase in pest animal populations	Not likely to occur as a direct result of the proposal.	NA	NA	NA
Increased risk of fire	Not likely to occur as a result of the proposal.	NA	NA	NA
Disturbance to specialist breeding and foraging habitat, e.g. Beach nesting for shorebirds.	Eucalypt trees which provide foraging habitat for the Little Lorikeet and Squirrel Glider will be impacted by the proposal. Foraging habitats for the Southern Myotis will also be affected by removal of the overstorey vegetation which may reduce the quality of the foraging habitat present.	Management works will be ongoing as necessary	Reduction in habitat foraging areas	Southern Myotis Squirrel Glider Swift Parrot Little Lorikeet and other Ecosystem credit threatened species
Impacts to karst, caves, crevices, cliffs and other features of geological significance	The site does not contain karst, caves or cliffs of significance and does not contain any other geological features of significance.	NA	NA	NA
Impacts to man-made structures	Not likely to occur as a result of the proposal.	NA	NA	NA
Impacts to non-native vegetation	The vegetation to be impacted is predominantly native.	One-off / permanent / during construction	Minor loss of habitat	Not likely to be used by threatened biodiversity
Habitat connectivity & movement patterns	The existing connectivity and movement patterns are not likely to be substantially impacted as complete vegetation clearing is not proposed.	NA	NA	NA

TABLE 6.2 ASSESSMENT OF POTENTIAL IMPACTS				
Potential Impact	**Impact Nature and Extent**	**Impact Frequency /Duration / timing**	**Impact Consequence**	**Threatened Biodiversity Likely to be Affected**
Water quality, water bodies and hydrological processes	Potential for sedimentation of downstream habitats	Sporadic / during rainfall following management events	Minor, impact will be suitably managed through installation of appropriate controls	Potential for impacts to offsite EEC vegetation
Wind turbine strikes	Will not occur.	NA	NA	NA
Vehicle strikes	Not likely to occur due to the sites separation from existing roads	NA	NA	NA

ii. Plant Community Type Impact Summary

The impact summary details required for the plant community types identified at the development site are documented in Table 6.3.

TABLE 6.3 PLANT COMMUNITY TYPE IMPACT SUMMARY			
Impact Summary Considerations	**PCT 1715 Management Zone 1**	**PCT 1719 Management Zone 1**	**PCT 1719 Management Zone 2**
Area (ha)	0.08	2.40	0.46
Current Vegetation Integrity Score	62.4	65.8	65.8
Future Vegetation Integrity Score	39.5	39.4	65.9
Change in Vegetation Integrity Score	22.9	26.4	0
Total Change in VI Score	-22.9	-26.4	
Sensitivity to Gain	High	High	
Biodiversity Risk Weighting	2	2	2
BC Act Listing Status	EEC	EEC	EEC
Ecosystem Credits	1	32	

iii. Threatened Species Impact Summary

A summary of the threatened species impacts is provided in Table 6.4.

TABLE 6.4
SPECIES CREDIT IMPACT SUMMARY

Species	PCT	Habitat condition loss	Area/ Count	Biodiversity Risk Weighting	Candidate SAII	Credits Required
Wallum Froglet	1715	22.9	0.08 ha	1.5	False	1
	1719	22.1	2.86 ha	1.5	False	24
Swift Parrot	1715	22.9	0.08 ha	3	True	1
	1719	22.1	2.86 ha	3	True	48
Melaleuca biconvexa	1719	22.1	0.01 ha	2	False	0
Southern Myotis	1715	22.9	0.08 ha	2	False	1
	1719	22.1	2.86 ha	2	False	32
Squirrel Glider	1715	22.9	0.08 ha	2	False	1
	1719	22.1	2.86 ha	2	False	32

iv. Biodiversity Credit Report

A Biodiversity Credit Report is provided in Appendix 1.

6.2 SERIOUS AND IRREVERSIBLE IMPACTS

Mapped important Swift Parrot habitat is classed as a potential serious and irreversible impact entity and is likely to be impacted by the proposal.

The principles identified in Clause 6.7 of the Biodiversity Conservation Regulation (2017) would need to be triggered for Council to determine that the proposal is likely to have a serious and irreversible impact.

An impact is to be regarded as serious and irreversible if it is likely to contribute significantly to the risk of a threatened species or ecological community becoming extinct because:

a) It will cause a further decline of the species or ecological community that is currently observed, estimated, inferred or reasonably suspected to be in a rapid rate of decline, or

b) It will further reduce the population size of the species or ecological community that is currently observed, estimated, inferred or reasonably suspected to have a very small population size, or

c) It is an impact on the habitat of the species or ecological community that is currently observed, estimated, inferred or reasonably suspected to have a very limited geographic distribution, or

d) The impacted species or ecological community is unlikely to respond to measures to improve its habitat and vegetation integrity and therefore its members are not replaceable.

The additional impact assessment provisions for ecological communities are addressed in Table 6.5.

TABLE 6.5 ADDITIONAL IMPACT ASSESSMENT PROVISIONS FOR POTENTIAL SAII ECOLOGICAL COMMUNITIES	
Assessment Provision	**Assessment Details**
the action and measures taken to avoid the direct and indirect impact on the potential entity for an SAII	A vegetation clearing scenario of only 3m below the OLS has been adopted over a 5m scenario. This has resulting in the direct avoidance of impacts to areas of mapped important Swift Parrot Habitat.
the size of the local population directly and indirectly impacted by the development, clearing or biodiversity certification	The Swift Parrot is a nomadic migratory species and does not form a local population in the context of the site. Populations estimates identify that there are approximately 2000 mature individuals in the wild.
the extent to which the impact exceeds any threshold for the potential entity that is specified in the Guidance to assist a decision-maker to determine a serious and irreversible impact	There is no threshold listed for this species in the Guidance to assist a decision-maker to determine a SAII.
the likely impact (including direct and indirect impacts) that the development, clearing or biodiversity certification will have on the habitat of the local population, including but not limited to:	
• an estimate of the change in habitat available to the local population as a result of the proposed development	The proposal will remove or modify approximately 2.94 ha of Mapped Important habitat for this species.
• the proposed loss, modification, destruction or isolation of the available habitat used by the local population, and	This species forages widely along the east coast of Australia. There are vast areas of suitable habitat available for this species. It does not form a local population in the context of the site.
• modification of habitat required for the maintenance of processes important to the species' life cycle (such as in the case of a plant – pollination, seed set, seed dispersal, germination), genetic diversity and long-term evolutionary development.	The proposal will result in the modification of coastal foraging habitats for this species.
the likely impact on the ecology of the local population. At a minimum, address the following: (i) for fauna: – breeding – foraging – roosting, and – dispersal or movement pathways	The proposal will not impact breeding habitat or dispersal or movement pathways. The proposal will result in the removal of relatively small area of suitable foraging habitat for this species.
a description of the extent to which the local population will become fragmented or isolated as a result of the proposed development	There are no local populations of this species, there is one global population. The proposal will not isolated or fragment habitat for this species.
the relationship of the local population to other population/populations of the species. This must include consideration of the interaction and importance of the local population to other population/populations for factors such as breeding, dispersal and genetic viability/diversity, and whether the local population is at the limit of the species' range	There are no local populations of this species, there is one global population. This species is not at the limit of its range within the site.

the extent to which the proposed development will lead to an increase in threats and indirect impacts, including impacts from invasive flora and fauna, that may in turn lead to a decrease in the viability of the local population	There are no local populations of this species, there is one global population. The proposal will result in the removal of a relatively small area of suitable foraging habitat for this species.
an estimate of the area, or number of populations and size of populations that is in the reserve system in NSW, the IBRA region and the IBRA subregion	This species is migratory and nomadic, it does not occur exclusively in any reserve system, although suitable foraging habitat for this species is contains in reserve in the IBRA region and IBRA subregion.
the measure/s proposed to contribute to the recovery of the species in the IBRA subregion.	The offsets payable for the proposed residual impacts are intended to be spent on achieving a no net loss outcome for Swift Parrot Habitat.

6.3 IMPACTS WHICH DO NOT REQUIRE AN OFFSET

The impacted area for *Melaleuca biconvexa* is too small to generate an offset credit requirement.

SECTION 7

CONCLUDING COMMENTS

7.1 SURVEY AND ASSESSMENT CONCLUSIONS

Based on the field surveys completed and information provided in this report it is concluded that:

i. The following ecosystem credits have been calculated to offset and achieve a no net loss outcome for the proposed impacts:

- 1 ecosystem credit for PCT 1715 - Prickly-leaved Paperbark - Flax-leaved Paperbark swamp forest on poorly drained soils of the Central Coast;
- 32 ecosystem credits for PCT 1719 - Paperbarks - Woollybutt swamp forest on coastal lowlands of the Central Coast;

ii. The following species credits have been calculated to offset and achieve a no net loss outcome for the proposed impacts:

- 25 species credits for the Wallum Froglet
- 49 species credits for the Swift Parrot
- 13 species credits for *Melaleuca biconvexa*
- 33 species credits for the Southern Myotis
- 35 species credits for the Squirrel Glider

iii. The impact avoidance and minimisation measures outlined in Section 5.2 of this Report should be implemented for the proposal.

REFERENCES

Australian Government Department of the Environment 2013, *EPBC Act Policy Statement 1.1 Significant Impact Guidelines, Matters of National Environmental Significance*, Commonwealth of Australia.

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NSW Office of Environment and Heritage 2018b "Species Credit' Threatened Bats and their Habitats NSW Survey Guide for the Biodiversity Assessment Method, NSW Office of Environment and Heritage, Sydney.

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APPENDIX 1 – BAM BIODIVERSITY CREDIT REPORT

BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00021749/BAAS17099/20/00021750	Warnervale Airport South OLS Management Works	20/08/2020
Assessor Name	Assessor Number	BAM Data version *
Jacob Manners	BAAS17099	30
Proponent Names	Report Created	BAM Case Status
Stephen Watkins	03/09/2020	Finalised
Assessment Revision	Assessment Type	Date Finalised
0	Part 5 Activities	03/09/2020

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Potential Serious and Irreversible Impacts

Nil

Species
Lathamus discolor / Swift Parrot
Lathamus discolor / Swift Parrot

Additional Information for Approval

PCTs With Customized Benchmarks

BAM Biodiversity Credit Report (Like for like)

No Changes

Predicted Threatened Species Not On Site

No Changes

Ecosystem Credit Summary (Number and class of biodiversity credits to be retired)

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	Number of credits to be retired
1715-Prickly-leaved Paperbark - Flax-leaved Paperbark swamp forest on poorly drained soils of the Central Coast	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	0.1	1.00
1719-Paperbarks - Woollybutt swamp forest on coastal lowlands of the Central Coast	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	2.9	32.00

1715-Prickly-leaved Paperbark - Flax-leaved Paperbark swamp forest on poorly drained soils of the Central Coast	**Like-for-like credit retirement options**			
	Name of offset trading group	Trading group	HBT	IBRA region

BAM Biodiversity Credit Report (Like for like)

	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions This includes PCT's: 837, 839, 971, 1064, 1092, 1227, 1230, 1231, 1232, 1235, 1649, 1715, 1716, 1717, 1718, 1719, 1721, 1722, 1723, 1724, 1725, 1730, 1795, 1798	-	No	Wyong, Hunter, Pittwater and Yengo. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
1719-Paperbarks - Woollybutt swamp forest on coastal lowlands of the Central Coast	**Like-for-like credit retirement options**			
	Name of offset trading group	Trading group	HBT	IBRA region
	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions This includes PCT's: 837, 839, 971, 1064, 1092, 1227, 1230, 1231, 1232, 1235, 1649, 1715, 1716, 1717, 1718, 1719, 1721, 1722, 1723, 1724, 1725, 1730, 1795, 1798	-	No	Wyong, Hunter, Pittwater and Yengo. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

BAM Biodiversity Credit Report (Like for like)

1719-Paperbarks - Woollybutt swamp forest on coastal lowlands of the Central Coast

Species Credit Summary

Species	Area	Credits
Crinia tinnula / Wallum Froglet	2.9	25.00
Lathamus discolor / Swift Parrot	2.9	49.00
Melaleuca biconvexa / Biconvex Paperbark	0.0	0.00
Myotis macropus / Southern Myotis	2.9	33.00
Petaurus norfolcensis / Squirrel Glider	2.9	33.00

Crinia tinnula/ Wallum Froglet	1715_Classname1	**Like-for-like credit retirement options**	
		Spp	IBRA region
		Crinia tinnula/Wallum Froglet	Any in NSW
	1719_Classname1	**Like-for-like credit retirement options**	
		Spp	IBRA region
		Crinia tinnula/Wallum Froglet	Any in NSW

Assessment Id: 00021749/BAAS17099/20/00021750

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BAM Biodiversity Credit Report (Like for like)

Crinia tinnula/ Wallum Froglet	1719_Classname1	
Lathamus discolor/ Swift Parrot	1715_Classname1	**Like-for-like credit retirement options**
		Spp: **Lathamus discolor**/Swift Parrot — IBRA region: Any in NSW
	1719_Classname1	**Like-for-like credit retirement options**
		Spp: **Lathamus discolor**/Swift Parrot — IBRA region: Any in NSW
Melaleuca biconvexa/ Biconvex Paperbark	1719_Classname1	**Like-for-like credit retirement options**
		Spp: **Melaleuca biconvexa**/Biconvex Paperbark — IBRA region: Any in NSW

BAM Biodiversity Credit Report (Like for like)

Myotis macropus/ Southern Myotis	1715_Classname1	**Like-for-like credit retirement options**	
		Spp	IBRA region
		Myotis macropus/Southern Myotis	Any in NSW
	1719_Classname1	**Like-for-like credit retirement options**	
		Spp	IBRA region
		Myotis macropus/Southern Myotis	Any in NSW
Petaurus norfolcensis/ Squirrel Glider	1715_Classname1	**Like-for-like credit retirement options**	
		Spp	IBRA region
		Petaurus norfolcensis/Squirrel Glider	Any in NSW
	1719_Classname1	**Like-for-like credit retirement options**	
		Spp	IBRA region

Assessment Id: 00021749/BAAS17099/20/00021750

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BAM Biodiversity Credit Report (Like for like)

		Petaurus norfolcensis/Squirrel Glider	Any in NSW

Biodiversity payment summary report

Assessment Id	Payment data version	Assessment Revision	Report created
00021749/BAAS17099/20/00021750	68	0	03/09/2020

Assessor Name	Assessor Number	Proposal Name	BAM Case Status
Jacob Manners	BAAS17099	Warnervale Airport South OLS Management Works	Finalised

Assessment Type	Date Finalised
Part 5 Activities	03/09/2020

PCT list

Price calculated	PCT common name	Credits
Yes	**1715** - Prickly-leaved Paperbark - Flax-leaved Paperbark swamp forest on poorly drained soils of the Central Coast	1
Yes	**1719** - Paperbarks - Woollybutt swamp forest on coastal lowlands of the Central Coast	32

Species list

Price calculated	Species	Credits
Yes	***Crinia tinnula*** (Wallum Froglet)	25
Yes	***Lathamus discolor*** (Swift Parrot)	49
Yes	***Melaleuca biconvexa*** (Biconvex Paperbark)	0
Yes	***Myotis macropus*** (Southern Myotis)	33
Yes	***Petaurus norfolcensis*** (Squirrel Glider)	33

Biodiversity payment summary report

Assessment Id	Proposal Name	Page 2 of 8
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Biodiversity payment summary report

Ecosystem credits for plant communities types (PCT), ecological communities & threatened species habitat

IBRA sub region	PCT common name	Threat status	Offset trading group	Risk premium	Administrative cost	Methodology adjustment factor	Price per credit	No. of ecosystem credits	Final credits price
Wyong	**1715** - Prickly-leaved Paperbark - Flax-leaved Paperbark swamp forest on poorly drained soils of the Central Coast	Yes	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	18.83%	$130.43	2.7038	$4,005.11	1	$4,005.11

Biodiversity payment summary report

Assessment Id	Proposal Name	Page 4 of 8
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Biodiversity payment summary report

Wyong	**1719 -** Paperbarks - Woollybutt swamp forest on coastal lowlands of the Central Coast	Yes	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	18.83%	$130.43	2.7038	$4,005.11	32	$128,163.40

Subtotal (excl. GST)	**$132,168.51**
GST	**$13,216.85**
Total ecosystem credits (incl. GST)	**$145,385.36**

Species credits for threatened species

Species profile ID	Species	Threat status	Price per credit	Risk premium	Administrative cost	No. of species credits	Final credits price
10183	***Crinia tinnula*** (Wallum Froglet)	Vulnerable	$495.24	20.6900%	$80.00	25	$16,942.63
10455	***Lathamus discolor*** (Swift Parrot)	Endangered	$309.97	20.6900%	$80.00	49	$22,251.04

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Proposal Name: Warnervale Airport South OLS Management Works
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Biodiversity payment summary report

Biodiversity payment summary report

10514	***Melaleuca biconvexa*** (Biconvex Paperbark)	Vulnerable	$86.51	20.6900%	$80.00	0	Contact BCT for pricing
10549	***Myotis macropus*** (Southern Myotis)	Vulnerable	$741.31	20.6900%	$80.00	33	$32,164.67
10604	***Petaurus norfolcensis*** (Squirrel Glider)	Vulnerable	$495.24	20.6900%	$80.00	33	$22,364.27
						Subtotal (excl. GST)	**$93,722.61**
						GST	**$9,372.26**
				Total species credits (incl. GST)			**$103,094.87**
						Grand total	**$248,480.23**

Assessment Id: 00021749/BAAS17099/20/00021750
Proposal Name: Warnervale Airport South OLS Management Works
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Biodiversity payment summary report

APPENDIX 2 – BAM PLOT FIELD DATA AND PLOT PHOTOGRAPHS

BAM PLOT 6

BAM Site – Field Survey Form | Site Sheet no:

		Survey Name	Zone ID	Recorders		
Date 27/2/20		Warnervale sth		JM / BF		
Zone 56	Datum	Plot ID	Plot X6	Plot dimensions 20 x 50	Photo #	
Easting -33.24942	Northing 151.42181	IBRA region		Midline bearing from 0 m 270		
Vegetation Class					Confidence: H M L	
Plant Community Type				EEC:	Confidence: H M L	

352998.3 6319972.53

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	2
	Shrubs	4
	Grasses etc.	8
	Forbs	10
	Ferns	0
	Other	3
Sum of Cover of native vascular plants by growth form group	Trees	25
	Shrubs	43.3
	Grasses etc.	93.7
	Forbs	1.1
	Ferns	0
	Other	0.4
High Threat Weed cover		—

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm	—	—
50 – 79 cm	—	—
30 – 49 cm	11	—
20 – 29 cm	30	—
10 – 19 cm	50	—
5 – 9 cm	100	—
< 5 cm	50	n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)	13+9+13+5+3 13+6+9 13+5+3+7+2+8+1+5+13 =100	

Counts apply when the number of tree stems within a size class is ≤ 10. Estimates can be used when > 10 (eg. 10, 20, 30 … 100, 200, 300 …). For a multi-stemmed tree, only the largest living stem is included in the count/estimate. Tree stems must be living.

For hollows, count only the presence of a stem containing hollows. For a multi-stemmed tree, only the largest stem is included in the count/estimate. Stems may be dead and may be shrubs.

BAM Attribute (1 x 1 m plots)	Litter cover (%)	Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)
Subplot score (% in each)	20 15 10 5 5			
Average of the 5 subplots	11			

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (< 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type		Landform Element		Landform Pattern		Microrelief	
Lithology		Soil Surface Texture		Soil Colour		Soil Depth	
Slope		Aspect		Site Drainage		Distance to nearest water and type	

Plot Disturbance	Severity code	Age code	Observational evidence
Clearing (inc. logging)	1	0	Historical clearing of large eucalypts
Cultivation (inc. pasture)			
Soil erosion			
Firewood / CWD removal			
Grazing			
Fire damage			
Storm damage			
Weediness			
Other			

E

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400 m² plot: Sheet 1 of 1	Survey Name	Plot Identifier	Recorders
Date 27 02 20	Wunerwale	11 (6)	BT, JM.

GF Code	Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species: Full species name where practicable	N, E or HTE	Cover	Abund	stratum	voucher
	Eucalyptus tereticornis		15	5		
	Entolasia marginata		5	500		
	Melaleuca linariifolia		40	50		
	Gahnia clarkei		1	10		
	Lomandra long.		75	200		
	Haloragis tet.		0.1	50		
	Centella asiatica		0.1	50		
	Hydrocotyle lax. f		0.1	30		WA02
	Parsonsia straminea		0.2	5		
	~~[illegible]~~ Cassytha pubescens		0.1	20		
	"twirk sedge" "cymbalum" / Chorizandra cymbaria		R	200		WA01
	Eucalyptus longifolia		10	2		
	Gonocarpus tet.		0.2	30		
	Ento. strict		0.1	5		
	Ranunculus inund		0.1	2		
	Imperata cylind.		10	2000		
	Alternanthera dentic		0.1	10		
	Melaleuca cr.c? ✓		2	10		WA0?
	Melaleuca styph.		1	1		
	Hemarth. uncin		0.1	20		
	Eclipta platyglossa		0.1	50		
	Viola betonic.		0.1	10		WA03a
	Pultenaea villosa		0.3	3		
	Ranunculus ~~plebeia~~ lappaceus		0.1	1		WA03b
	"Swamp grass" "yellow" / Ischaemum australe		0.5	30		WA04
	Goodenia panic		0.1	3		
	Cassytha glab.		0.1	10		

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.
Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*
Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

Plot 6 Photo 1.

Plot 6 Photo 2.

BAM PLOT 7

BAM Site – Field Survey Form	Site Sheet no:

		Survey Name	Zone ID	Recorders			
Date	27/2/20	Warnervale Sth		JM / BF			
Zone	Datum	Plot ID	ALx67	Plot dimensions	20x50	Photo #	
Easting -33.24825	Northing 151.42326	IBRA region		Midline bearing from 0 m	0		
Vegetation Class						Confidence: H M L	
Plant Community Type					EEC:	Confidence: H M L	

353146.04 6320107.78

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	2
	Shrubs	1
	Grasses etc.	8
	Forbs	9
	Ferns	0
	Other	3
Sum of Cover of native vascular plants by growth form group	Trees	25
	Shrubs	20
	Grasses etc.	109.5
	Forbs	1.3
	Ferns	0
	Other	6.3
High Threat Weed cover		–

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm	–	–
50 – 79 cm	–	–
30 – 49 cm	7	–
20 – 29 cm	50	–
10 – 19 cm	50	–
5 – 9 cm	15	–
< 5 cm	20	n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)	7+5+3+17+5+3+1=41	

Counts apply when the number of tree stems within a size class is ≤ 10. Estimates can be used when > 10 (eg 10, 20, 30 ... 100, 200, 300 ...). For a multi-stemmed tree, only the largest living stem is included in the count estimate. Tree stems must be living.

For hollows, count only the presence of a stem containing hollows. For a multi-stemmed tree, only the largest stem is included in the count estimate. Stems may be dead and may be shrubs.

BAM Attribute (1 x 1 m plots)	Litter cover (%)					Bare ground cover (%)					Cryptogam cover (%)					Rock cover (%)				
Subplot score (% in each)	15	20	5	15	30															
Average of the 5 subplots	17																			

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type		Landform Element		Landform Pattern		Microrelief	
Lithology		Soil Surface Texture		Soil Colour		Soil Depth	
Slope		Aspect		Site Drainage		Distance to nearest water & type	

Plot Disturbance	Severity code	Age code	Observational evidence
Clearing (inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood / CWD removal			
Grazing			
Fire damage			
Storm damage			
Weediness			
Other			

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400 m² plot: Sheet 1 of 1	Survey Name	Plot Identifier	Recorders
Date 27 02 20	Warnervale	12 (7)	B.F., J.M.

GF Code	Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species: Full species name where practicable	N, E or HTE	Cover	Abund	stratum	voucher
	Eucalyptus tereticornis		10	5		
	Eucalyptus robusta		15	3		
	Entolasia margin		5	500		
	Centella asiatica		0.1	[illegible] 50		
	Imperata cylind.		10	1000		
	Pithantes paradoxa		0.3	30		WA05
	Eclipta platyglossa		0.5	100		
	Viola [illegible]		0.1	20		
	Hydrocotyle lax.		0.1	10		
	Haloragis tet.		0.1	20		
	Ranunculus inund		0.1	5		
	Lomandra long		90	500		
	[illegible] grass ? Ischaemum [illegible]		3	200		WA04
	Gahnia clarkei		1	5		
	Centipeda min		0.1	2		WA06
	Persoonia [illegible]		0.1	5		
	Dichondra repens		0.1	10		
	Melaleuca linariifolia		20	20		
	Cassytha pubescens		0.1	30		
	Juncus [illegible] ?		0.1	20		WA07
	Aotus fissifol		0.1	1		
	Carex inversa		0.1	10		
	Glycine microphylla		0.1	10		
	Lobelia anceps		0.1	2		

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.
Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*
Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

Plot 7 Photo 1.

Plot 7 Photo 2.

BAM PLOT 8

BAM Site – Field Survey Form | Site Sheet no:

		Survey Name	Zone ID	Recorders		
Date	27 02 20	Warnervale Sth		JM / BF		
Zone	Datum	Plot ID	Plot 8	Plot dimensions	20 x 50	Photo #
Easting: -33.24687	Northing: 151.42493	IBRA region		Midline bearing from 0 m	270	
Vegetation Class						Confidence: H M L
Plant Community Type				EEC:		Confidence: H M L

-353297.80 632027.574

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	2
	Shrubs	2
	Grasses etc.	9
	Forbs	9
	Ferns	0
	Other	2
Sum of Cover of native vascular plants by growth form group	Trees	35
	Shrubs	40.5
	Grasses etc.	92.6
	Forbs	1.1
	Ferns	0
	Other	0.3
High Threat Weed cover		–

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm	–	–
50 – 79 cm	–	–
30 – 49 cm	|||| ||||	–
20 – 29 cm	20	–
10 – 19 cm	100	–
5 – 9 cm	80	–
< 5 cm	50	n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)	2+15+4+3+7+3+2+1+8+5+1 12 = 63	

Counts apply when the number of tree stems within a size class is ≤ 10. Estimates can be used when > 10 (eg. 10, 20, 30 ... 100, 200, 300 ...). For a multi-stemmed tree, only the largest living stem is included in the count/estimate. Tree stems must be living.

For hollows, count only the presence of a stem containing hollows. For a multi-stemmed tree, only the largest stem is included in the count/estimate. Stems may be dead and may be shrubs.

BAM Attribute (1 x 1 m plots)	Litter cover (%)	Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)
Subplot score (% in each)	1, 5, 30, 10, 20			
Average of the 5 subplots	16			

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type		Landform Element		Landform Pattern		Microrelief	
Lithology		Soil Surface Texture		Soil Colour		Soil Depth	
Slope		Aspect		Site Drainage		Distance to nearest water and type	

Plot Disturbance	Severity code	Age code	Observational evidence
Clearing (inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood / CWD removal			
Grazing			
Fire damage			
Storm damage			
Weediness			
Other			

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400 m² plot: Sheet 1 of 1		Survey Name	Plot Identifier	Recorders
Date	27 02 20	Warnervale	13 (8)	BF, JM.

GF Code	Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species: Full species name where practicable	N, E or HTE	Cover	Abund	stratum	voucher
	Eucalyptus tereticornis		25	15		
	Melaleuca linariifolia		40	55		
	Melaleuca sieberi		0.5	1		
	Lomandra lon		85	400		
	Entolasia marginata		85	500		
	Eucalyptus robusta		10	2		
	Hydrocotyle lax.		0.1	50		
	Imperata cyl.		5	500		
	"Cymbopogon" [illegible]		0.2	20		WA01
	Viola hederacea		0.1	10		
	Eclipta plat.		0.3	100		
	Haloragis het.		0.1	20		
	Ranunculus lappaceus		0.1	10		WA0[illegible]
	~~Entolasia margi~~					
	Juncus "yellow"		0.1	10		
	~~Hydrocotyle lax.~~		~~0.1~~			
	Baumea sp. [illegible]		0.2	40		WA0[illegible]
	"swamp grass" [illegible]		2	200		WA0[illegible]
	Goodenia panic.		0.1	20		
	Glycine micro.		0.1	5		
	Gahnia clarkei		1	10		
	Centella asiatica		0.1	100		
	Persicaria strig.		0.2	4		
	Cassia [illegible] subsp. [illegible]		0.1	2		WA09
	Hemarthria unc.		0.1	20		
	Lobelia purp.		0.1	10		

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.
Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:** 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*
Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

Plot 8 Photo 1.

Plot 8 Photo 2

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BAM Site – Field Survey Form					Site Sheet no:	
		Survey Name	Zone ID	Recorders		
Date	27 02 20	[illegible]		JM / BF		
Zone: __	Datum:	Plot ID	Plot ~~8~~ 9	Plot dimensions	20 x 50	Photo #
Easting: -33.24575	Northing: 151.42466	IBRA region		Midline bearing from 0 m		
Vegetation Class						Confidence: H M L
Plant Community Type					EEC:	Confidence: H M L

Record easting and northing at 0 m on midline. Dimensions (Shape) of 0.04 ha base plot.

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
Sum of Cover of native vascular plants by growth form group	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
High Threat Weed cover		

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm	—	—
50 – 79 cm	—	—
30 – 49 cm	—	—
20 – 29 cm	—	—
10 – 19 cm	40	—
5 – 9 cm	200	—
< 5 cm	500	n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)	<3	

Counts apply when the number of tree stems within a size class is ≤ 10. Estimates can be used when > 10 (eg. 10, 20, 30 ..., 100, 200, 300 ...). For a multi-stemmed tree, only the largest living stem is included in the count/estimate. Tree stems must be living.

For hollows, count only the presence of a stem containing hollows. For a multi-stemmed tree, only the largest stem is included in the count/estimate. Stems may be dead and may be shrubs.

BAM Attribute (1 x 1 m plots)	Litter cover (%)					Bare ground cover (%)					Cryptogam cover (%)					Rock cover (%)				
Subplot score (% in each)	40	40	40	80	70															
Average of the 5 subplots																				

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type		Landform Element		Landform Pattern		Microrelief	
Lithology		Soil Surface Texture		Soil Colour		Soil Depth	
Slope		Aspect		Site Drainage		Distance to nearest water and type	

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood / CWD removal			
Grazing (identify native stock)			
Fire damage			
Storm damage			
Weediness			
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe   Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

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400 m² plot: Sheet 1 of 1		Survey Name	Plot Identifier	Recorders
Date	27 02 20	Warnervale	14 (9)	R.F. J.M.

GF Code	Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species: Full species name where practicable	N, E or HTE	Cover	Abund	stratum	voucher
	Cassytha pub.		0.2	100		
	Gonocarpus teucr.		0.3	50		
	Haloragis het.		0.1	20		
	Melaleuca ericifolia		5	15		
	Melaleuca sieberi		5	10		
	Imperata cylindrica		15	1500		
	Melaleuca linariifolia		20	50		
	Baumea sp. Lepidosperma [illegible]		60	5000		
	Pultenaea villosa		5	30		
	Viola hederacea		0.1	10		
	Empodisma marginata		1	100		
	Eclipta platyglossa		0.1	20		
	Glycine microphylla		0.1	10		
	Hemarthria uncinata		1	100		
	Centella asiatica		0.1	20		
	Entolasia stricta		0.1	10		
	Gahnia clarkei		10	100		
	Hypochaeris radic.		0.1	2		
	Hydrocotyle lax.		0.1	20		
	Eucalyptus tereticornis		3	1		
	~~Centella asiatica~~					
	Alternanthera denticul.		0.1	5		
	Cassytha glabella		0.1	10		
	~~Centella asiatica~~					
	Rubus fruct.		0.1	1		
	Juncus ~~[illegible]~~		0.1	10		[illegible]
	~~Veronica ?~~ Ranunc. pleb		0.1	20		
	Lomandra long.		5	25		
	Persoonia stricta		0.1	2		

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.
Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*
Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

APPENDIX 3

WEATHER CONDITIONS DURING SURVEY PERIODS

Norah Head, New South Wales
September 2019 Daily Weather Observations

Australian Government
Bureau of Meteorology

Date	Day	Temps		Rain	Evap	Sun	Max wind gust			9am						3pm					
		Min	Max				Dirn	Spd	Time	Temp	RH	Cld	Dirn	Spd	MSLP	Temp	RH	Cld	Dirn	Spd	MSLP
		°C	°C	mm	mm	hours		km/h	local	°C	%	eighths		km/h	hPa	°C	%	eighths		km/h	hPa
1	Su	11.7	21.0	17.8			SW	28	00:51	15.0	78		WSW	9	1021.9	18.3	77		E	13	1018.7
2	Mo	11.4	20.0	0.2			S	50	16:42	16.8	69		SSW	13	1017.5	17.8	73		S	37	1016.8
3	Tu	11.2	20.7	0			W	19	01:42	17.1	62		SW	4	1017.9	19.4	54		ESE	9	1014.3
4	We	13.0	23.3	0			W	19	23:49	18.7	72		N	6	1015.6	21.1	67		NE	13	1011.2
5	Th	15.1	22.1	0.2			SSW	35	03:53	18.0	82		SSW	7	1016.8	19.5	71		ESE	13	1013.3
6	Fr	14.7	28.3	0.2			W	65	19:29	17.5	83		N	9	1007.7	19.6	86		NNE	19	998.2
7	Sa	11.3	19.5	1.0			WNW	50	13:19	15.7	47		WNW	15	1008.7	18.7	29		WNW	15	1007.0
8	Su	10.4	18.9	0			SW	39	11:07	14.6	46		WSW	17	1012.7	18.6	30		WSW	13	1009.5
9	Mo	11.0	17.0	0			SSW	72	23:05	13.6	43		WSW	17	1010.5	14.5	48		SSW	26	1012.0
10	Tu	9.7	15.6	1.0			SSW	61	12:40	12.2	56		SW	20	1024.3	13.5	87		S	35	1024.6
11	We	9.5	19.5	0.6			NNE	28	20:12	15.5	66		WSW	9	1031.3	17.4	63		ENE	17	1027.9
12	Th	9.8	26.5	0.2			S	30	20:35	17.3	62		NW	7	1023.7	25.6	24		WNW	6	1018.6
13	Fr	14.9	21.6	0			S	46	01:54	18.4	73		S	30	1024.2	17.7	63		ESE	11	1020.9
14	Sa	11.8	19.6	0			SSW	41	08:10	18.0	63		SSW	24	1023.0	17.6	65		SSE	22	1021.9
15	Su	10.6	24.5	0			NNE	37	17:56	18.4	63		NNW	9	1023.1	20.0	70		NE	20	1018.4
16	Mo	12.9	26.7	0			S	70	16:51	22.1	48		NNW	4	1015.8	22.0	52		NE	11	1012.1
17	Tu	9.5	17.6	9.8			SSE	81	15:16	10.2	100		SW	15	1020.6	15.0	100		S	59	1017.1
18	We	10.1	20.2	39.4			SSE	76	00:11	17.2	94		SSE	35	1023.2	19.4	82		SE	22	1022.7
19	Th	15.0	21.9	9.6			NNE	37	22:48	17.4	99		S	6	1027.0	19.8	84		ENE	19	1024.7
20	Fr	16.3	23.5	0.4			NE	56	18:29	19.8	86		NE	28	1027.0	20.6	79		NE	35	1022.6
21	Sa	17.2	21.4	0			NNE	50	01:37	18.0	85		NNE	28	1022.3	19.6	88		NNE	33	1018.1
22	Su	17.3	22.3	0.2			S	35	12:24	18.6	94		ENE	2	1021.1	20.6	70		SE	15	1019.8
23	Mo	13.9	22.1	0			S	41	18:02	18.3	53		W	7	1023.5	20.5	28		SW	20	1019.7
24	Tu	10.2	19.6	0			N	26	20:42	16.8	52		SSW	7	1027.3	18.0	55		ENE	19	1023.7
25	We	11.2	21.1	0			SSE	28	15:19	16.9	50		SSW	15	1027.9	19.3	55		SE	22	1025.1
26	Th	14.7	23.6	0			NE	33	18:28	20.6	67		ENE	15	1026.7	18.8	74		ENE	22	1022.3
27	Fr	14.6	23.4	0			ENE	26	13:53	19.7	71		WNW	6	1019.5	19.9	78		E	19	1014.1
28	Sa	14.4	18.5	0			S	56	13:58	17.7	70		S	28	1015.9	17.4	59		S	46	1015.0
29	Su	11.5	22.3	0			SE	28	22:27	18.4	66		S	4	1019.1	19.3	62		ENE	20	1016.0
30	Mo	15.2	18.5	1.2			S	50	14:50	15.4	89		NW	9	1023.8	15.4	85		SSE	41	1024.2
Statistics for September 2019																					
Mean		12.7	21.4							17.2	69			13	1020.6	18.8	65			22	1017.6
Lowest		9.5	15.6							10.2	46		ENE	2	1007.7	13.5	24		WNW	6	998.2
Highest		17.3	28.3	39.4			SSE	81		22.1	100		SSE	35	1031.3	25.6	100		S	59	1027.9
Total				81.8																	

Observations were drawn from Norah Head AWS (station 061366)

IDCJDW2099.201909 Prepared at 12:00 UTC on 8 Jun 2020
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Norah Head, New South Wales
October 2019 Daily Weather Observations

Australian Government
Bureau of Meteorology

Date	Day	Temps		Rain	Evap	Sun	Max wind gust			9am						3pm					
		Min	Max				Dirn	Spd	Time	Temp	RH	Cld	Dirn	Spd	MSLP	Temp	RH	Cld	Dirn	Spd	MSLP
		°C	°C	mm	mm	hours		km/h	local	°C	%	eighths		km/h	hPa	°C	%	eighths		km/h	hPa
1	Tu	13.4	22.5	10.8			NNE	44	21:50	16.6	87		NW	2	1031.5	20.5	59		NE	22	1028.6
2	We	12.7	23.9	0			NE	35	15:59	20.2	72		NNE	7	1029.3	21.0	74		NE	28	1024.7
3	Th	13.2	26.7	0			NNE	28	16:28	20.3	74		SSW	9	1024.9	21.9	75		NE	17	1020.8
4	Fr	16.0	33.3	0			SSW	61	15:15	26.4	36		NW	4	1018.7	20.9	84		SSW	37	1015.1
5	Sa	16.0	20.4	6.2			SSE	31	09:07	16.1	98		S	24	1023.8	17.7	79		S	15	1021.8
6	Su	15.4	22.1	6.0			NNE	50	18:36	17.0	85		N	22	1019.3	20.5	82		NNE	39	1012.2
7	Mo	16.9	22.3	0			SSW	28	07:09	18.8	92		SSW	19	1011.8	21.0	84		S	19	1009.8
8	Tu	17.2	24.8	0.2			SSW	63	15:17	18.6	89		WSW	4	1010.9	18.3	77		S	41	1008.1
9	We	11.8	17.8	3.2			S	56	17:38	14.6	82		SW	19	1021.7	16.7	65		S	41	1021.1
10	Th	12.5	18.3	0			S	50	13:14	16.0	72		SSW	20	1022.8	17.5	75		S	31	1020.6
11	Fr	12.7	20.5	1.2			SSE	35	21:01	15.9	74			Calm	1019.7	17.5	66		SE	24	1016.5
12	Sa	12.1	18.7	34.2			SSE	44	15:08	15.8	72		SE	30	1018.0	16.7	66		SE	33	1016.8
13	Su	13.0	20.2	0.2			SSW	31	07:53	14.8	87		SSW	22	1021.1	17.9	69		SE	17	1019.2
14	Mo	12.6	23.7	0.2			NNE	35	19:06	17.3	76		N	7	1017.9	22.2	65		NE	26	1014.0
15	Tu	15.5	25.9	0			NE	46	17:58	19.1	82			Calm	1013.4	25.0	70		NE	15	1010.3
16	We	15.6	22.7	0.2			SSW	35	06:45	18.1	100		SSW	22	1012.7	20.1	83		SSE	13	1009.0
17	Th	17.7	27.7	0.8			N	54	00:15	20.9	77		W	6	1005.9	23.8	77		ENE	17	1004.5
18	Fr	12.2	21.7	0			NNE	39	18:47	17.4	40		WNW	6	1017.6	20.0	49		E	26	1015.2
19	Sa	12.9	29.6	0			S	61	21:33	20.5	48		NNW	4	1015.8	29.0	17		W	13	1010.4
20	Su	13.2	21.8	0			SSW	48	01:04	17.2	48		SSW	15	1022.1	19.4	50		ESE	17	1020.7
21	Mo	13.6	21.9	0			E	24	14:33	19.1	70		S	4	1026.9	20.9	61		E	19	1024.6
22	Tu	14.3	25.3	0			NE	33	17:10	19.3	71		ENE	2	1026.1	23.7	61		NE	22	1022.5
23	We	17.9	25.8	0			NE	44	17:58	22.0	76		NNE	15	1024.1	23.7	70		NE	31	1018.9
24	Th	17.1	25.4	0.2			SSW	24	05:43	19.1	91		SSW	15	1018.9	23.5	76		SE	13	1016.0
25	Fr	17.3	34.3	0.2			NE	76	17:05	25.3	55		NNW	7	1013.3	25.8	49		NE	28	1008.0
26	Sa	20.2	32.7	0			WNW	70	13:39	26.9	31		NNW	30	1004.2	31.4	24		WNW	28	1001.4
27	Su	14.9	23.3	0			NE	30	18:50	19.1	92		SW	7	1015.8	20.1	39		E	20	1014.1
28	Mo	15.0	24.2	0			SE	43	16:04	19.3	73		SSW	11	1020.8	21.4	69		SE	20	1021.3
29	Tu	15.6	26.6	0			NE	48	17:09	19.4	76		N	2	1023.8	23.8	67		NE	31	1019.5
30	We	15.5	23.5	0			NNE	24	22:16	18.6	84			Calm	1018.5	22.2	76		ENE	9	1016.1
31	Th	17.0	26.5	0.2			NE	43	19:57	21.2	89		NE	4	1017.5	24.4	70		NE	28	1015.3
Statistics for October 2019																					
Mean		14.9	24.3							19.1	71			10	1019.0	21.6	65			23	1016.0
Lowest		11.8	17.8							14.6	31		Calm		1004.2	16.7	17		ENE	9	1001.4
Highest		20.2	34.3	34.2			NE	76		26.9	100		#	30	1031.5	31.4	84		S	41	1028.6
Total				63.8																	

Observations were drawn from Norah Head AWS (station 061366)

IDCJDW2099.201910 Prepared at 13:00 UTC on 8 Jun 2020
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Norah Head, New South Wales
November 2019 Daily Weather Observations

Australian Government
Bureau of Meteorology

Date	Day	Temps		Rain	Evap	Sun	Max wind gust			9am					3pm					
		Min	Max				Dirn	Spd	Time	Temp	RH	Cld	Dirn	Spd	MSLP	Temp	RH	Cld	Dirn	Spd	MSLP
		°C	°C	mm	mm	hours		km/h	local	°C	%	eighths		km/h	hPa	°C	%	eighths		km/h	hPa
1	Fr	17.1	26.0	0.4			NE	61	17:22	20.0	80		NNE	6	1018.0	22.7	73		NE	39	1014.1
2	Sa	17.4	23.3	0.2			NE	57	17:15	19.7	82		NNE	30	1017.2	21.8	75		NE	43	1013.6
3	Su	16.9	24.5	0			NNE	46	15:05	20.8	80		NE	22	1013.9	21.0	78		NNE	31	1009.0
4	Mo	16.1	23.3	17.0			SSW	31	01:29	20.1	75		SSW	7	1014.4	21.0	78		ESE	11	1013.3
5	Tu	15.0	19.0	2.6			S	61	13:33	17.0	56		SW	31	1013.8	16.9	71		S	50	1014.3
6	We	11.7	25.7	1.6			NNE	48	17:27	18.9	63		NW	9	1014.5	22.1	59		ENE	22	1008.1
7	Th	15.9	31.4	0			WNW	41	11:21	23.3	50		NNE	7	1005.4	21.6	69		S	22	1002.7
8	Fr	15.8	31.2	0			WSW	52	19:31	24.3	45		NNW	9	1003.2	30.4	22		WNW	13	997.7
9	Sa	13.3	19.5	0.2			SSW	57	23:21	16.1	33		SW	17	1011.8	18.5	49		SSE	28	1009.8
10	Su	13.1	23.6	0			SSE	43	12:23	18.7	38		WSW	15	1012.6	21.3	54		SSE	31	1010.9
11	Mo	14.8	25.7	0			NNE	46	16:03	20.0	72		N	13	1016.9	24.0	64		ENE	26	1013.1
12	Tu	15.6	36.2	0			SSW	72	22:11	24.4	47		N	24	1008.7	34.9	13		NW	15	1001.1
13	We	15.0	22.6	0			S	63	23:13	19.1	35		W	13	1013.4	20.2	42		SE	22	1012.1
14	Th	13.9	25.7	0			NNE	35	18:40	21.3	36		S	7	1016.0	21.6	49		ENE	17	1012.5
15	Fr	14.5	29.3	0			S	44	22:57	24.7	34		WNW	9	1010.9	22.6	61		ESE	13	1006.2
16	Sa	17.9	24.4	0			SSW	54	23:47	22.0	66		SSE	17	1016.0	22.3	64		SE	19	1014.5
17	Su	18.6	23.1	0			SSE	50	14:19	19.6	87		SSW	22	1014.1	20.2	77		SSE	43	1014.9
18	Mo	16.4	26.7	0			NE	41	15:45	20.9	65		N	9	1019.6	24.0	63		NE	31	1013.9
19	Tu	16.1	31.5	0			SSW	59	21:41	26.7	35		WNW	4	1012.6	24.2	56		NE	24	1008.7
20	We	18.5	24.7	0			S	50	23:01	19.7	77		S	30	1017.3	23.8	60		SSE	24	1016.1
21	Th	17.3	28.3	0			NE	52	17:15	22.3	85		N	6	1016.6	25.9	72		NE	30	1011.2
22	Fr	19.9	21.7	0			SSW	54	08:52	21.5	88		SSW	26	1011.8	20.2	88		S	28	1012.8
23	Sa	19.2	25.0	0			S	43	22:49	19.9	88		SSW	17	1015.5	23.0	72		SE	17	1013.0
24	Su	17.9	23.1	0.6			S	52	01:28	19.2	86		S	24	1018.8	22.8	71		S	24	1016.1
25	Mo	18.9	27.9	0			NNE	57	18:48	21.5	81			Calm	1012.7	27.0	62		NE	31	1007.7
26	Tu	19.1	34.5	2.0			N	67	11:33	23.5	80		NNE	28	1004.6	23.3	76		W	9	1000.5
27	We	14.0	23.2	2.4			NNE	41	21:28	18.4	41		SSW	15	1016.4	20.9	50		E	15	1015.2
28	Th	15.6	27.2	0			NE	54	20:41	20.8	66		NNE	6	1016.9	25.7	64		ENE	26	1014.5
29	Fr	19.4	27.2	0			NE	37	23:01	21.4	81		NW	2	1014.9	25.7	70		ENE	19	1010.9
30	Sa	20.4	22.0	0			S	57	11:37	20.6	93		S	24	1008.1	19.8	85		SSW	22	1007.5
Statistics for November 2019																					
	Mean	16.5	25.9							20.9	64			14	1013.6	23.0	62			24	1010.5
	Lowest	11.7	19.0							16.1	33			Calm	1003.2	16.9	13		W	9	997.7
	Highest	20.4	36.2	17.0			SSW	72		26.7	93		SW	31	1019.6	34.9	88		S	50	1016.1
	Total			27.0																	

Observations were drawn from Norah Head AWS (station 061359)

IDCJDW2059.201911 Prepared at 16:00 UTC on 7 Jun 2020
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Norah Head, New South Wales
January 2020 Daily Weather Observations

Australian Government
Bureau of Meteorology

Date	Day	Temps		Rain	Evap	Sun	Max wind gust			9am					3pm					
		Min	Max				Dirn	Spd	Time	Temp	RH	Cld	Dirn	Spd	MSLP	Temp	RH	Cld	Dirn	Spd	MSLP
		°C	°C	mm	mm	hours		km/h	local	°C	%	eighths		km/h	hPa	°C	%	eighths		km/h	hPa
1	We	19.3	26.3	0			SW	48	23:51	20.8	75		SSW	11	1014.7	24.1	70		SE	17	1013.1
2	Th	19.1	23.2	0			S	37	01:28	20.9	84		SSW	15	1019.2	22.6	76		SSW	19	1017.0
3	Fr	20.7	27.5	0			NE	37	17:53	22.1	96		SSW	9	1017.4	25.8	79		E	17	1013.3
4	Sa	20.2	29.5	0			SSW	67	22:55	24.7	82		NNE	11	1011.2	26.5	69		NE	30	1006.0
5	Su	21.0	23.7	0			SSW	81	23:39	21.5	83		SSW	26	1017.9	23.1	77		SSW	33	1017.3
6	Mo	20.2	24.0	0			SE	44	23:33	22.0	81		SE	13	1020.2	21.7	85		ESE	20	1017.8
7	Tu	21.1	26.4	4.6			NNE	41	17:57	23.1	94		N	4	1016.6	25.1	88		ENE	17	1012.3
8	We	21.5	24.0	0			S	44	11:26	22.1	90		SSW	31	1015.4	23.6	84		SSW	33	1013.6
9	Th	21.1	23.6	0			SSW	39	02:24	21.5	94		SSW	22	1017.4	22.5	87		S	26	1016.5
10	Fr	21.2	30.6	0.2			NE	48	16:03	23.3	91		N	2	1014.1	28.6	67		NE	30	1007.5
11	Sa	20.0	22.2	0.2			SSW	76	03:09	20.1	95		S	37	1011.0	20.8	75		SSW	26	1012.6
12	Su	19.0	26.6	0.8			SSE	46	15:53	22.1	65		SSE	24	1017.8	24.0	60		SSE	13	1017.8
13	Mo	20.1	26.7	0			SE	28	01:08	23.3	61		SSE	7	1019.6	25.2	64		ESE	13	1017.5
14	Tu	20.2	28.2	0			E	20	15:49	23.9	82		S	9	1017.8	26.0	70		E	17	1015.8
15	We	20.4	27.3	0			NE	37	21:12	22.4	90		SSW	7	1014.8	25.9	72		E	13	1011.3
16	Th	21.6	27.4	0			NNE	30	14:48	23.5	99			Calm	1008.4	24.6	85		NE	17	1005.8
17	Fr	21.7	25.5	0			SSW	48	12:55	23.6	86		SSE	26	1007.4	21.1	100		SSW	31	1008.0
18	Sa	20.2	22.3	25.0			SSW	48	12:48	21.0	100		SW	17	1008.6	20.9	92		SSW	30	1008.3
19	Su	19.5	25.6	1.0			S	39	12:56	21.6	91		SSW	17	1008.2	23.7	86		S	28	1005.6
20	Mo	20.6	30.8	0.4			SSW	74	19:28	25.4	83		NE	9	1004.1	23.9	100		NNE	28	998.9
21	Tu	20.4	31.2	3.8			SSE	37	13:15	27.0	57		NNW	6	1007.3	28.6	57		SE	24	1005.7
22	We	21.0	30.6	0			NNE	44	21:12	25.0	81		S	6	1011.5	28.2	76		ENE	24	1007.6
23	Th	21.5	40.7	0			N	69	11:46	39.5	51		N	41	1004.1	37.9	25		N	39	999.2
24	Fr	24.1	27.4	0			SSW	37	10:46	26.0	79		SSW	11	1008.8	26.3	75		SSW	19	1010.0
25	Sa	23.5	26.8	0			SE	24	04:28	24.4	89		E	7	1014.6	24.9	98		SSW	4	1012.6
26	Su	23.5	32.4	0			N	61	17:26	25.5	91		NNE	6	1012.8	26.8	84		NE	26	1009.5
27	Mo	23.0	29.1	0			SSW	44	03:26	23.9	89		SSW	20	1014.1	28.5	77		S	15	1012.3
28	Tu	22.5	31.4	0			W	41	16:41	25.4	86		NNE	4	1012.8	29.9	72		NE	17	1009.6
29	We	23.6	28.1	0			SSW	43	10:06	24.1	88		SSW	22	1015.5	26.9	76		S	19	1015.3
30	Th	21.9	30.6	0			NE	28	16:55	25.2	77		SSW	6	1018.0	27.4	71		E	17	1015.1
31	Fr	23.4	33.6	0			NE	57	17:27	27.1	86		NE	11	1015.9	30.9	64		NE	35	1012.1
Statistics for January 2020																					
	Mean	21.2	27.8							23.6	83			14	1013.5	25.7	76			22	1011.2
	Lowest	19.0	22.2							20.1	51			Calm	1004.1	20.8	25		SSW	4	998.9
	Highest	24.1	40.7	25.0			SSW	81		39.5	100		N	41	1020.2	37.9	100		N	39	1017.8
	Total			36.0																	

Observations were drawn from Norah Head AWS (station 061359)

IDCJDW2059.202001 Prepared at 13:00 UTC on 5 Jun 2020
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Norah Head, New South Wales
February 2020 Daily Weather Observations

Australian Government
Bureau of Meteorology

Date	Day	Temps		Rain	Evap	Sun	Max wind gust			9am						3pm					
		Min	Max				Dirn	Spd	Time	Temp	RH	Cld	Dirn	Spd	MSLP	Temp	RH	Cld	Dirn	Spd	MSLP
		°C	°C	mm	mm	hours		km/h	local	°C	%	eighths		km/h	hPa	°C	%	eighths		km/h	hPa
1	Sa	23.8	31.2	0.2			NE	43	18:10	26.3	83		NNE	26	1011.7	28.9	70		NE	24	1007.6
2	Su	23.0	27.8	0			S	63	18:11	24.3	86		SSW	19	1008.9	25.5	91		SSE	20	1004.2
3	Mo	22.8	27.1	17.6			S	74	19:28	23.9	100		SSE	2	1005.9	26.8	81		SSE	22	1003.5
4	Tu	19.5	24.9	0			S	67	02:06	20.5	63		S	31	1019.6	23.4	56		SSE	22	1020.3
5	We	18.4	26.8	0			NE	31	17:32	22.2	72		SSE	2	1020.8	25.1	64		E	20	1018.2
6	Th	20.4	23.9	1.2			ENE	59	22:35	21.4	100		SE	20	1021.3	23.4	84		NE	20	1020.5
7	Fr	19.4	21.9	94.8			ESE	69	18:00	20.3	100		E	31	1019.6	20.8	100		E	31	1017.4
8	Sa	19.4	23.6	81.4			E	57	19:39	21.2	100		ENE	26	1017.9	22.2	88		E	33	1016.2
9	Su	20.4	22.3	45.8			SE	89	07:23	21.0	100		SE	65	1010.1	21.3	100		ENE	41	1006.6
10	Mo	20.2	26.2	72.0			ESE	33	23:01	22.0	100		N	6	1009.8	24.2	93		SE	17	1007.7
11	Tu	19.8	28.5	1.0			NE	41	15:35	23.1	100		N	7	1009.3	25.2	81		ENE	26	1007.5
12	We	20.7	24.9	0			SE	24	15:59	22.6	100		SSE	4	1009.2	24.0	97		SE	4	1008.8
13	Th	21.9	27.0	0.4			SSE	24	19:00	23.5	100		SSW	11	1011.0	24.5	94		SE	9	1010.0
14	Fr	21.8	25.2	2.2			S	39	10:35	23.6	85		SSW	22	1009.3	24.4	75		S	24	1006.5
15	Sa	18.4	27.9				SSE	20	11:57	22.8	79		NNE	2	1005.9	24.2	71		SSE	15	1006.4
16	Su	20.4	25.3	2.6			S	31	14:17	22.9	89		SSW	19	1014.0	24.5	80		S	28	1013.8
17	Mo	21.4	24.7	0.6			S	30	11:05	22.1	97		SSW	11	1014.6	22.5	100		S	11	1012.5
18	Tu	20.5	30.6	11.2			SW	65	22:28	24.3	90		N	7	1010.1	28.9	74		NE	30	1005.7
19	We	20.9	28.6	22.2			S	41	18:03	23.9	54		W	9	1003.0	28.1	53		S	13	1002.5
20	Th	18.3	24.3	0			S	39	10:29	22.1	63		SW	9	1010.2	23.4	63		S	28	1010.9
21	Fr	20.8	26.8	0			SE	28	22:41	22.6	70		ENE	4	1018.4	23.9	65		E	13	1015.7
22	Sa	19.0	23.0	13.2			SE	43	01:39	20.7	90		S	26	1023.1	21.1	91		SSW	17	1022.9
23	Su	19.1	27.1	3.0			ENE	41	01:38	22.8	75		NNE	24	1024.2	23.5	68		NE	17	1023.0
24	Mo	20.3	29.6	0			NNE	30	22:33	22.7	79		NW	2	1021.3	27.5	62		NE	13	1019.4
25	Tu	21.1	30.1	0			NE	48	18:46	24.6	77		NNE	19	1016.9	28.5	68		NE	28	1013.5
26	We	21.3	33.9	0			SSW	74	20:08	25.6	80		N	7	1007.8	28.1	59		WSW	9	1004.0
27	Th	20.3	27.2	1.2			S	54	23:10	21.3	76		S	19	1011.3	24.9	67		ENE	6	1008.9
28	Fr	18.9	23.4	0			SSE	44	18:27	21.7	66		SSW	19	1010.3	22.9	72		SSW	30	1011.8
29	Sa	18.6	27.3	0.2			NE	26	18:11	21.1	81		SSW	7	1017.3	25.5	65		ENE	17	1014.9
Statistics for February 2020																					
	Mean	20.4	26.6							22.7	84			15	1013.4	24.7	76			20	1011.8
	Lowest	18.3	21.9							20.3	54		#	2	1003.0	20.8	53		SE	4	1002.5
	Highest	23.8	33.9	94.8			SE	89		26.3	100		SE	65	1024.2	28.9	100		ENE	41	1023.0
	Total			370.8																	

Observations were drawn from Norah Head AWS (station 061366)

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Norah Head, New South Wales
March 2020 Daily Weather Observations

Australian Government
Bureau of Meteorology

Date	Day	Temps		Rain	Evap	Sun	Max wind gust			9am						3pm					
		Min	Max				Dirn	Spd	Time	Temp	RH	Cld	Dirn	Spd	MSLP	Temp	RH	Cld	Dirn	Spd	MSLP
		°C	°C	mm	mm	hours		km/h	local	°C	%	eighths		km/h	hPa	°C	%	eighths		km/h	hPa
1	Su	20.2	29.7	0			NE	48	17:52	23.7	85			Calm	1014.5	28.3	70		NE	24	1010.8
2	Mo	21.2	36.4	0			S	69	17:01	26.0	75		NNW	4	1009.5	30.3	57		E	17	1007.8
3	Tu	20.8	22.6	0.2			SSW	46	23:22	21.6	81		SSW	20	1018.6	21.6	84		SSW	22	1018.7
4	We	19.8	26.4	26.8			NE	46	08:43	21.2	100		NE	37	1018.7	25.7	78		NE	26	1016.1
5	Th	21.2	24.6	1.4			NNE	57	14:04	22.0	100		NNE	15	1012.0	21.8	100		NNE	37	1007.6
6	Fr	20.4	29.0	22.8			S	50	20:37	24.0	100		NNW	9	1007.1	23.7	86		S	22	1008.0
7	Sa	19.7	23.1	1.0			S	61	21:59	21.3	92		S	15	1018.5	21.7	81		S	30	1018.8
8	Su	17.8	21.9	1.4			SSE	43	00:49	19.6	91		SSW	19	1020.7	21.5	77		SSW	17	1018.8
9	Mo	18.6	24.3	0.2			SSE	37	21:14	19.7	89		S	28	1020.9	23.5	66		SSE	22	1020.0
10	Tu	17.3	23.4	0			SE	37	00:37	18.7	83		SSW	13	1021.3	22.9	69		S	24	1020.0
11	We	16.4	24.8	0			SSE	33	09:05	20.6	80		SW	6	1022.8	22.6	67		S	11	1022.8
12	Th	17.7	26.6	0			E	24	18:45	22.2	65		ENE	15	1025.0	24.5	60		ENE	13	1023.4
13	Fr	16.5	25.3	0			NNE	33	20:49	20.3	74		SSW	6	1020.8	24.2	64		E	13	1016.4
14	Sa	17.0	20.3	0			S	80	06:17	20.3	88		S	67	1013.9	15.7	99		SSW	39	1016.7
15	Su	14.1	21.1	14.0			S	63	00:18	18.2	72		S	44	1020.5	19.0	81		S	28	1021.1
16	Mo	16.6	23.1	8.0			S	61	15:06	20.0	81		SSE	28	1023.6	21.7	73		SSE	30	1023.8
17	Tu	15.4	22.8	7.0			SSE	43	23:01	17.6	95		WSW	9	1027.0	21.8	79		S	22	1025.8
18	We	16.1	25.6	0			NNE	43	18:34	19.9	75		W	2	1027.0	25.2	66		ENE	20	1023.0
19	Th	16.5	28.7	0			NE	26	16:49	21.0	77		N	4	1022.0	28.2	63		ENE	13	1020.0
20	Fr	18.9	33.6	0			SSW	43	21:49	24.5	64		NW	7	1016.1	32.7	37		NNW	11	1011.7
21	Sa	20.2	26.8	0			SSW	39	23:02	23.5	73		SSE	17	1019.6	25.3	70		SSE	17	1019.1
22	Su	19.3	27.7	0			S	54	21:22	22.2	87		NW	4	1018.5	25.1	77		SE	13	1016.1
23	Mo	17.7	24.6	1.6			S	50	01:54	19.8	78		S	20	1024.6	21.3	69		SSE	22	1023.9
24	Tu	17.9	25.1	0.2			NE	43	18:09	20.1	90		ESE	9	1024.2	24.3	69		ENE	19	1021.3
25	We	17.4	24.1	0.2			NNE	43	23:24	21.2	79		N	11	1019.0	19.7	87		W	9	1019.2
26	Th	18.1	21.2	20.0			SSE	63	04:05	18.6	88		S	48	1023.9	20.1	88		SSW	28	1024.0
27	Fr	17.5	23.9	3.2			SE	37	02:03	20.4	70		SE	22	1026.3	21.7	68		SSW	7	1025.3
28	Sa	16.1	23.4	0			NNE	46	17:43	18.9	81		SW	7	1025.1	19.2	93		SSE	17	1023.0
29	Su	18.2	26.8	30.8			NNE	57	03:50	21.4	90		NNE	33	1020.3	24.0	82		NE	22	1017.6
30	Mo	18.5	24.0	1.8			N	28	10:54	18.8	100		N	6	1014.9	22.0	81		NW	6	1012.8
31	Tu	18.4	26.5	0.6			SSE	26	15:19	20.9	83		WNW	7	1016.4	24.9	74		SSE	20	1015.2
Statistics for March 2020																					
	Mean	18.1	25.4							21.0	83			17	1019.8	23.4	74			20	1018.3
	Lowest	14.1	20.3							17.6	64			Calm	1007.1	15.7	37		NW	6	1007.6
	Highest	21.2	36.4	30.8			S	80		26.0	100		S	67	1027.0	32.7	100		SSW	39	1025.8
	Total			141.2																	

Observations were drawn from Norah Head AWS (station 061366)

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APPENDIX 4

PROJECT TEAM CURRICULA VITAE

PHILLIP CONACHER

Qualifications

- Masters Degree of Natural Resources (University of New England)
- Bachelor of Science (1st Class Honours) (UNE)
- Diploma of Urban and Regional Planning (UNE)
- Graduate Certificate of Applied Science - Ornithology (CSU)
- Certificate of Air Photograph Interpretation (Bathurst School of Civil Engineering)

Professional Affiliations

- Environmental Institute of Australia
- Ecological Consultants Association of Australia
- Soil Science Society of Australia

Fields of Expertise

- Biodiversity Planning and Advice
- Environmental Impact Assessment
- Flora and Fauna Surveys and Habitat Assessment
- Extractive Industry Management
- Site Rehabilitation Planning
- Soil Conservation - Urban, Rural
- Bushfire Hazard Assessment

Employment History

2014- Current	Project Director at ***Conacher Consulting Pty Ltd***
2008-2013	Director at ***Conacher Environmental Group***
1998-2007	Director at ***Conacher Travers Pty Ltd***
1991	Established ***Integrated Site Planning and Management***, an Environmental and Land Management Consultancy Business.
1990-91	***Travers Morgan Pty Ltd***. (Planning and Management Consultants). Held position of Senior Consultant and Manager of the Gosford Office.
1980-90	***Soil Conservation Service of New South Wales***. Held various positions including: • Officer In Charge - Sydney District 1984-1985 • Secondment to DMR Freeway Construction 1986-1988 • Officer In Charge - Central Coast District 1989-1990 • Catchment Management Projects - Sydney 1989
1979-80	Technical Officer (Scientific) – ***National Herbarium of NSW***

Project Experience

1) Ecological Assessment

- Biodiversity Conservation Assessment and Management Strategy - Valla Urban Growth Area
- Ecological Site Assessment Report for residential development - Riverside Teagardens
- Ecological Site Assessment Report for residential development - Parkside Terrigal
- Species Impact Statement for Northlakes Residential Estate - Wallsend (Masked Owl / Squirrel Glider)
- Species Impact Statement for Pambulong Forest - Wallsend (Masked Owl / Squirrel Glider)
- Species Impact Statement for Landcom Estate Teralba (Squirrel Glider / Powerful Owl)
- Species Impact Statement for Retirement Village - Salamander Bay (Squirrel Glider / Bats)
- Species Impact Statement for Tourist Resort - Mulbring (Comb Crested Jacana)
- Wadalba Residential Release Area - 6 Separate SIS Reports (Squirrel Glider / Masked Owl)
- Species Impact Statement for Industrial Development for Belrose (Duffy's Forest / Southern Brown Bandicoot)
- Species Impact Statement for Prestons Industrial Estate (Cumberland Plain Woodland / Cumberland Plain Snail)
- Species Impact Statement for Residential Estate Landcom Campbelltown (Koala / Cumberland Plain Snail)
- Ku-ring-gai Biodiversity Survey – Ku-ring-gai Municipal Council
- Gosford Biodiversity Surveys– Gosford City Council

2) Bushfire Assessment

- Bushfire Assessment for 105 Lot Residential Subdivision – Johns Road Wadalba
- Bushfire Assessment for 89 Lot Residential Subdivision – Pacific Highway Wadalba
- Bushfire Assessment for 48 Lot Residential Subdivision – Hamlyn Road Hamlyn Terrace
- Bushfire Assessment for 109 Lot Residential Subdivision – Central Coast Highway Forresters Beach
- Bushfire Assessment for Rezoning for 46 Lot Residential Subdivision - Bakali Road Forresters Beach
- Bushfire Assessments for 55 Public schools throughout NSW for Bovis Lend Lease
- Bushfire Assessment for 97 Lot Residential Subdivision - UrbanGrowth Myall Road, Hillsborough
- Land and Environment Court Expert Witness for Bushfire Matters – 7 Lot Rural Residential Subdivision Bensville

3) Site Rehabilitation Plans/ Landscape Plans

I have completed site rehabilitation, revegetation and landscape management plans for the following extractive industries.

• Kincumber Quarry	Kerta Rd, Kincumber
• Springfield Quarry	Clarence Rd, Springfield
• Nells Road Quarry	Nells Rd, West Gosford
• Narellan Sand Quarry	Springs Rd, Narellan
• Dripstone Roadside Quarry	Mumbil Rd, Dripstone
• Suntop Roadside Quarry	Guerie Rd, Suntop
• Stuart Town Diggings	Burrendong Dam, Stuart Town
• Mangrove Mountain Quarry	Wiseman's Ferry Rd, Mangrove Mountain
• Martin's Creek Quarry	Station Street, Martin's Creek
• Point Clare Sandstone Quarry	Manooka, Pont Clare

4) Environmental Audits and Supervision

- Mangrove to Mardi Link project – WSC contracted Environmental Officer
- Woy Woy Commuter Carpark – NSW Government Transport Construction Authority contracted Environmental Representative
- Ardglen Basalt Quarry, New England Highway, Ardglen (Major Project No.06/0264) – Audit team member.

5) Environmental Management Plans – Extractive Industries

I have completed Environmental Management Plans incorporating monitoring, compliance with consent conditions, ongoing works and site rehabilitation for the following quarries:

- Somersby Quarry Ongoing Annual Reporting — Kangoo Rd, Somersby
- Piles Creek Quarry Ongoing Annual Reporting — Old Pacific Highway, Somersby
- Kangoo Road Quarry Ongoing Annual Reporting — Somersby
- Debenham Road Quarry Ongoing Annual Reporting — Kariong
- Mount White Quarry Ongoing Annual Reporting — Ashbrookes Rd, Mount White
- Calga Quarry Ongoing Annual Reporting — Peats Ridge Rd, Calga
- Kurrajong Quarry Ongoing Annual Reporting — Bull's Ridge Rd, East Kurrajong
- Cattai Quarry Ongoing Annual Reporting — Wiseman's Ferry Rd, Cattai
- Luddenham Quarry Ongoing Annual Reporting — Adams Rd, Luddenham (P91/02045)
- Mangrove Mtn Quarry Ongoing Annual Reporting — Wiseman's Ferry Rd, Mangrove Mtn

6) Pollution Incident Response Management Plans

I have prepared the necessary documentation and reporting for the Pollution Incident Response Management Plans to address Part 5.7A of the *Protection of the Environment Operations Act* (1997) for the following licenced premises.

- Cattai Quarry — Wiseman's Ferry Rd, Cattai
- Kurrajong Quarry — Bull's Ridge Rd, East Kurrajong
- Narallen Sand Quarry — Springs Rd, Narrallen

7) Large Scale Site Rehabilitation Works

I was involved in the following large scale landform reshaping and revegetation projects in either a supervisory, planning or management role:

- Botany Bay (Southern Foreshore) Sand Drift and Revegetation Project
  Captain Cooks Landing Place / Kamay Botany Bay National Park
- Kurnell Dune Rehabilitation Project
  Captain Cooks Landing Place / Kamay Botany Bay National Park
- Cape Bailey Lighthouse Dune Stabilization
- Cronulla Beach Dune Stabilization
- Soldiers Beach Dune Reshaping and Revegetation
- Wamberal Dune Blowout Revegetation
- Lakes Beach Dune Reshaping and Revegetation
- ANZAC Rifle Range Revegetation
- Wahroonga to Berowra F3 Revegetation and Erosion Control
- Trees by the Sea – Coastal Parks Landscaping and Vegetation Plantings
- Warnervale Town Centre Construction (Site Clearing, Earthworks, Revegetation)

JACOB MANNERS

SENIOR ECOLOGIST / PROJECT MANAGER

Jacob Manners has over ten years of experience in the biodiversity assessment and management industry as a private consultant. He has provided advice and prepared assessments and management reports for a variety of projects including major sandstone and hard rock quarries, local government infrastructure works, industrial estates and facilities, residential subdivisions and dwellings, estuarine seagrass studies and road upgrade projects. the following selected project experience is provided.

- Biodiversity Development Assessment Report 2019 – Industrial Development West Gosford
- Biodiversity Development Assessment Report 2019 – Industrial Development Annangrove Road Rouse Hill
- Biodiversity Development Assessment Report 2019– Hallidays Point NSW
- Species Impact Statement – 60 Lot Residential Subdivision Warnervale Road Warnervale
- Flora and Fauna Addendum Assessment 2019 – Industrial Development Somersby
- Flora and Fauna Assessment Report 2019 – Residential Dwelling Great North Road Murrays Run
- Flora and Fauna Assessment Report 2009 – Australian Post Facility, Sunnybank Road Lisarow
- Flora and Fauna Assessment Report 2018 – Aged Care Facility Woy Woy
- Flora and Fauna Assessment Report & Vegetation Management Plan Seniors Living Facility St Ives
- Flora and Fauna Assessment Report 2018 – Residential Flat Building - Gosford
- Biodiversity Offset Assessment Options Report – Blackhill NSW
- Biodiversity Offset and Habitat Rehabilitation Plan – Sand Quarry Development Somersby
- Biodiversity Management Plan –6 Lot Rural-residential subdivision, Wisemans Ferry Rd Somersby
- Vegetation Management Plan –18 Lot Residential Subdivision at Anderson Road Glenning Valley
- Riparian Corridor Vegetation Management Plan –79 Lot Subdivision at Macpherson Street Warriewood
- Flora and Fauna Management Plan for a 9 Lot Subdivision at Reeves Street Somersby
- Conservation Area Management Plan – 200 Lot Residential Subdivision at Sandy Beach
- Flora and Fauna Assessment Report - Road Upgrade Chain Valley Bay, for Central Coast Council
- Flora and Fauna Assessment - Shared Pathway at Charmhaven for Central Coast Council
- Flora and Fauna Assessment - Road and Drainage Upgrade – Buff Point, for Wyong Shire
- Flora and Fauna Assessment - Kanangra Drive Upgrade, Crangan Bay for Wyong Shire Council
- Flora Offset Monitoring Reports 2011-2014 - Warnervale Business Park Offset for Wyong Shire Council
- Biodiversity Assessment Report – Sparks Road & Warnervale Town Centre Intersection Upgrade.

Jacob has a strong passion for the natural environment and holds a Masters Degree in Wildlife Management. He is an accredited BAM Assessor under the *Biodiversity Conservation Act* (2016) and has skills in advanced plant identification and fauna survey. A full list of his qualifications is provided below.

- Master of Wildlife Management – Macquarie University
- Bachelor of Science - University of Newcastle
- OEH Accredited Biodiversity Assessment Method Assessor
- Advanced Plant Identification Skills for Research & Environmental Assessment, UNSW
- Nocturnal Bird and Mammal: Species Identification & Survey Skills workshop.
- Frog, Bat and Reptile: Species Identification and Survey Skills Workshop, NSW DPI
- Shorebird identification Workshop - Birds Australia
- Woodland Birds Identification & Ecology Workshop. DPI Forests NSW
- Commercial Photography Certificate III - TAFE Ultimo Campus
- OHS General Induction for Construction Work in NSW - Workcover NSW
- Open Water Dive Certificate (PADI)
- NPWS Registered Flora and Fauna Surveyor

ASHLEY MULLAHEY

Research Assistant and GIS Technician

Ashley has over four years of experience as a Research Assistant and GIS Technician at Conacher Consulting since 2015. His key areas of expertise are GIS mapping and analysis, fauna surveys including experience in trapping and remote camera deployment and identification, amphibian surveys, microbat call identification, threatened flora searches and reporting assistance. Ashely has completed a number of university levels courses of relevance to ecological consulting including chemistry, environmental science, biology, GIS, ecology, marine science and statistics.

Selected Project Experience

GIS Mapping

- BAL and APZ mapping for 105 Lot Residential Subdivision – Johns Road Wadalba
- BAL and APZ mapping for 109 Lot Residential Subdivision – Central Coast Highway Forresters Beach
- BAL and APZ mapping for Rezoning & 46 Lot Residential Subdivision - Bakali Road Forresters Beach
- Flora and Fauna Mapping Martins Creek Quarry SSD
- Bushfire and Flora and Fauna Mapping – Multi Lot Rural Residential Development Somersby
- Soil & Water Management Plan - Somersby

Fauna Survey Experience

- Field Survey Assistant for Species Impact Statement– Warnervale Road Warnervale NSW
- Red-crowned Toadlet Survey – Arcadia NSW
- Red-crowned Toadlet Survey Mangrove Mountain NSW
- Wallum Froglet Survey – Chain Valley Bay NSW
- Remote Camera Trapping for Heath Monitor– Oxford Falls NSW
- Remote Camera Survey – Lake Munmorah NSW
- Remote Camera Survey – Tacoma NSW
- Elliot Trapping –Empire Bay NSW
- Elliot Trapping – Green Point NSW
- Hair Tube & Nest Box Survey – Somersby NSW
- Large Forest Owl Nest Tree Survey Assistant– Hillsborough
- Large Forest Owl Nest Tree Survey Assistant– Wyong
- Remote camera survey – Wyong

Flora Survey Experience

- *Rutidosis heterogama* Monitoring Survey Assistant –Chelmsford Road Charmhaven
- *Tetratheca juncea* Survey Assistant – Wyee Road Morisset
- *Tetratheca glandulosa* Survey Assistant – Bell Road Mangrove Mountain
- *Pimelea spicata* Survey Assistant – Lodges Road Narellan
- *Prostanthera junonis* Survey Assistant– Grants Road Somersby
- *Melaleuca biconvexa Survey Assistant* – Springfield Road, Springfield
- *Melaleuca biconvexa Survey Assistant* – Oyster Shell Road Lower Mangrove
- Threatened Orchid Survey Assistant – Martins Creek
- Threatened Orchid Survey Assistant – Pacific Highway Lake Munmorah
- Threatened Orchid Survey Assistant – Sparks Road Halloran
- Threatened Orchid Survey Assistant – Empire Bay Drive Bensville
- Threatened Orchid Survey Assistant – Warnervale Road, Warnervale

Bryan Furchert

Botanist

Bryan Furchert is a Project Manager and Botanist at Cumberland Ecology, based in Sydney. He has a Bachelor of Biodiversity and Conservation.

Bryan has been with Cumberland Ecology since 2013, and prior to his current role has six years' experience in bushland restoration as a Team Leader.

Bryan has extensive experience undertaking botanical surveys of vegetation communities throughout the Sydney Basin Bioregion and the Brigalow Belt South Bioregion in New South Wales, and within the Northern Brigalow Belt Bioregion in Queensland. He has undertaken vegetation mapping and detailed collection of floristic data across project sites ranging from small urban properties to large areas of land for mining sites and biodiversity offset properties.

Bryan also has experience in Geospatial Information Systems (MapInfo), threatened flora species and community monitoring.

Recent consultancy work has included:

- Vegetation Management Plans;
- Flora and fauna impact assessment;
- Species Impact Statements; and
- Monitoring studies.

Fields of Competence

- NSW *Biosecurity Act 2015*;
- Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*;
- NSW *Biodiversity Conservation Act 2016*;
- Weeds of National Significance (WoNS) – identification and control; and
- Botanical surveys.

Key Industry Sectors

- Urban development;
- Industrial and logistics;
- Infrastructure; and
- Extraction.

Education

Bachelor of Biodiversity and Conservation, Macquarie University, 2012.

Diploma of Conservation and Land Management, Belmont TAFE, 2009.

Completed professional development courses have included:

- Biodiversity Offsets Scheme training;
- Recognising Water Weeds (DPI), and
- Aboriginal Site Awareness (The Aboriginal Heritage Office).

Key Projects

Botanical Surveys

Bryan regularly undertakes botanical surveying for site and Biodiversity Assessment Methodology assessments, targeted threatened species searches, and identification and mapping of Critically Endangered and Endangered Ecological Communities.

State Significant Projects and Development Applications

Bryan has undertaken vegetation mapping and botanical surveys for large state significant extraction projects and prepared Vegetation Management Plans, Ecological Constraints Analyses, Ecological Impact Assessments, Flora and Fauna Assessments and Species Impact Statements for Development Applications.

He has worked extensively on the Epping to Thornleigh Third Track upgrade over three years, with works including botanical surveys, vegetation mapping, and preparation of Flora and Fauna Assessments and 7 Part Tests for threatened species and ecological communities for ancillary works related to the project.

Long-term Monitoring

Bryan has also undertaken flora monitoring and reporting for long term restoration projects for urban bushland remnants, and large biodiversity offset areas.

EMS Form Environmental Assessment – Level 2

Warnervale Aircraft Landing Area Northern Obstacle Limitation Surface Vegetation Management Works 2020

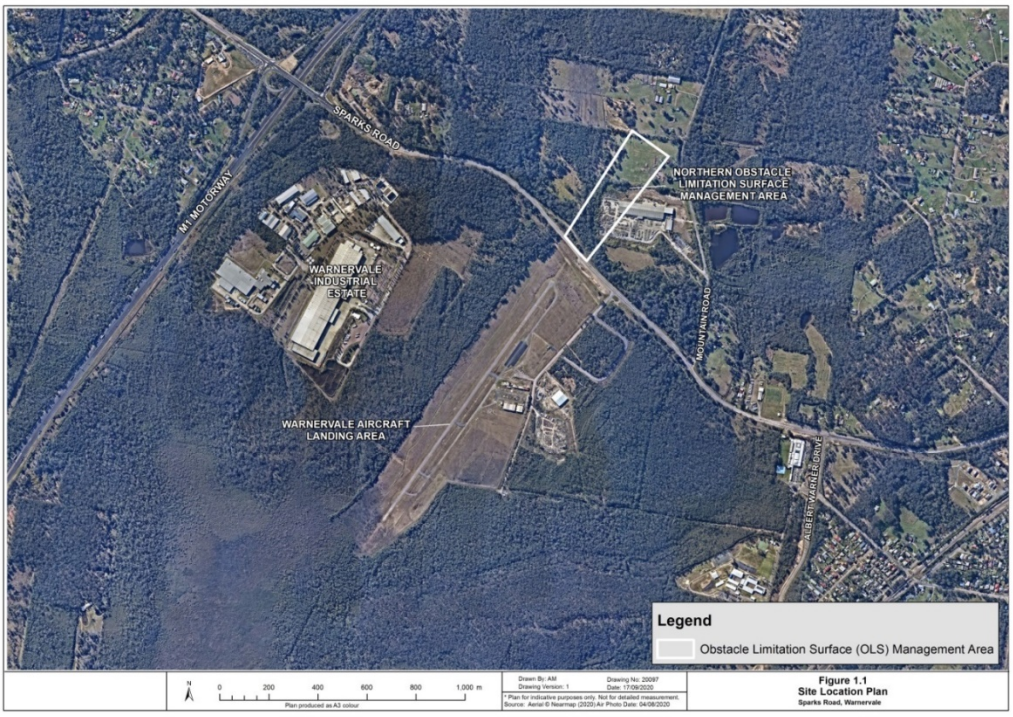
This form is an Environmental Impact Assessment or Review of Environmental Factors under Part 5 of the EP&A Act 1979 and S228 of the EP&A Reg (2000). This form is to be completed by a competent Assessing Officer in accordance Council's Environmental Assessment Procedure. Contact Council's Environmental Reporting Section if advice is required.

Section A: Work Activity

Does the work activity meet the relevant conditions to be permissible without consent? Yes

The proposed works can be assessed as development permitted without consent under Part 5 of the *Environmental Planning and Assessment Act 1979* and the *Wyong Local Environment Plan 2013*. As such, the area threshold and biodiversity values map triggers for the biodiversity offset scheme do not apply under the Biodiversity Conservation Act 2016. Impacts to threatened species, communities and their habitats have been assessed in the attached Threatened Biodiversity Assessment report which has concluded that the works are not likely to significantly affect the environment.

Section B: Nature and Scope

Project title	Warnervale Aircraft Landing Area Northern Obstacle Limitation Surface Management Works
Location address	Road reserve of Sparks Road, Lot 1 DP 796730, Lot 96 DP 867429, Lot 74 DP 755245 and Lot 69 DP 755245, Halloran, NSW.
Location map	
Site zoning	E2 Environmental Conservation, SP2 Infrastructure and IN1 General Industrial

Brief description of the work activity	The proposed works are for the management of existing vegetation within the northern obstacle limitation surface (OLS) at the Warnervale Aircraft Landing Area. The area of the northern OLS is approximately 8.2 hectares and approximately 1.55 hectares of vegetation will require management. The proposed works involve vegetation removal to manage vegetation to a height of 3m below the Night Time Obstacle Limitation Surface, which has a minimum gradient of 3.33% gradient from the northern end of the runway. The works will be completed by qualified arborists (AQF 3 minimum). Vegetation management works are to be completed in accordance with industry standard arboricultural practices. This environmental assessment covers the initial vegetation works and ongoing maintenance as required.
Description of the existing environment	The surrounding land uses are environmental conservation, rural residential and industrial. There is native vegetation within the proposed works area. A detailed vegetation description is provided in the Threatened Biodiversity Assessment provided as Appendix A.
Reasons for undertaking the work activity	Vegetation within the area of the northern OLS is a risk to aircraft. This requires management of tree height to protect human life and property.

Section C: Environmental Impacts and Control Measures

Environmental Impacts Select if applicable or not applicable to the work activity.	Details of Impacts Include a brief description of the environmental impact including cause, severity, extent and duration.	Impacts Without Controls Insignificant, minor, potentially significant or significant.	Control Measures Include a brief description of the control measures that will be implemented to avoid, minimise or offset the environmental impact.	Impacts With Controls Positive, insignificant, minor, potentially significant or significant.
Air Quality				
Odours	Gases and fumes from vehicles and machinery (eg chainsaws, site tractors etc)	Minor: Odours generated. Limited to duration of works.	• Maintenance of vehicles, plant and machinery.	Minor: Odours generated. Limited to duration of works.
Dust	Dust from vehicular movements, plant, equipment and materials. Dust from exposed soils.	Minor: Dust generated. Limited to duration of works.	• Air quality and dust management measures are to be implemented including dust suppression and revegetation of disturbed areas. • A CEMP or other suitable management plan will be prepared if deemed required by Council and the Contractor	Minor: Dust generated. Limited to duration of works and will be controlled by dust suppression measures.
Water				
Stormwater	Pollution of stormwater with sediment or chemicals (oils or fuels)	Minor: Stormwater will potentially contain sediment but will not leave the site.	• Erosion and sediment control plan to be implemented and prepared. • No fuels, oils or chemical are to be stored on-site. • A CEMP or other suitable management plan will be	Minor: Stormwater will potentially contain sediment or pollutants, but will not leave the site and implementation of the control plan will prevent any significant impact.

			prepared if deemed required by Council and the Contractor	
Groundwater	No excavation is proposed. Groundwater will not be intercepted			
Water Bodies	Decrease in stream shading / Buttonderry Creek, pollution of Buttonderry Creek, disturbances to stabilising vegetation.	Potentially Significant: Works will potentially cause substantial change to a water body.	• Erosion and sediment controls, revegetation of disturbed area, store plant, equipment and chemicals away from water bodies. • Retain vegetation cover along riparian areas	Minor: Works will be carried out adjacent to a water body, but any effects will be minimal or temporary.

Soil

Soil Erosion and Disturbance	The works will result in some disturbance to vegetation which may result in soil erosion and off-site sedimentation.	Potentially Significant: The works will potentially cause soil erosion or land degradation.	• Minimise vegetation and soil disturbance and remediate any disturbed areas.	Minor: Soils will be disturbed during works, but any potential impact will be effectively mitigated by implementation of erosion and sediment controls.
Acid Sulfate Soils	No shallow acid soils identified. No soil excavation required.	Insignificant	• No excavation permitted	Insignificant
Land Contamination Not Applicable				

Biodiversity

Native Fauna (Animals)	The works will result in native fauna habitat disturbance. Refer to the Threatened Biodiversity Assessment Report provided as Appendix A.	Potentially Significant: Fauna might potentially be harmed if inappropriate clearing undertaken	• Works will occur during appropriate seasonal conditions. • Works will be supervised by a qualified and experienced project ecologist.	Minor: Fauna habitat may be disturbed, but controls will effectively mitigate any potential impact.

			• No known hollow bearing trees will be affected.	
Native Vegetation	The extent of vegetation obstructing the OLS varies depending on daytime and night time operating levels as well as any displaced thresholds from the airport runway, as these all affect the angle of take-off and landing. As a precaution, the extent of vegetation management has been assessed at a 'worst case scenario' of night time and 3m below the OLS. The actual extent of vegetation height reduction may be lesser than what is described in the Threatened Biodiversity Assessment Report and will likely target specific tall trees within the works area	Potentially Significant: Areas of native vegetation will be pruned or cleared.	• Establishment of exclusion zones and application of appropriate arboricultural best practices.	Minor
Aquatic Ecology	Proposal will impact riparian vegetation and may alter the aquatic ecology of Buttonderry Creek within the vicinity of the works due to a decrease in stream shading.	Potentially Significant	• Erosion and sediment controls, minimisation of understorey vegetation removal, exclusion zones, pathogen and weed controls.	Minor and sufficiently mitigated by control measures.
Threatened Species & Ecological Communities	The works area includes known habitat for the following threatened species: • *Melaleuca biconvexa* • Southern Myotis • Squirrel Glider • Little Lorikeet • Grey-headed Flying-fox • River-flat Eucalypt Forest on Coastal Floodplains • Swamp Sclerophyll Forest on Coastal Floodplains.	Other: Potential impact on threatened species or EECs	• Preparation of a site specific tree management plan for reduction of tree heights to desired levels. • Preparation of site management protocols for machinery access, works area delineation, tree/mulch stockpile sites and site biosecurity matters. • Exclusion from riparian area • Tree trimming during appropriate seasonal conditions • No known hollow bearing trees will be affected.	Minor and sufficiently mitigated by control measures.

			• Use of Arboricultural best practices • Supervision of works by a qualified and experienced project ecologist • Reporting of works as ongoing/undertaken to Council at monthly / quarterly intervals.	
Weeds and Pests	The works have potential to introduce and spread weeds.	Minor: Weeds or pests may be disturbed	• Implementation of a weed management protocol during works.	Minor
Conservation Areas **Not Applicable**				
Wildlife Corridors	The site is mapped as core habitat on Council's Wildlife Corridors internal mapping however not a corridor linkage.	The works are not expected to sever any connectivity value of the vegetation as much vegetation will be retained, particularly in the understorey.	• Understorey vegetation is to be retained	Minor

Waste & Energy

Waste & Stockpiles	Vegetation waste / mulch stockpile may be required for the works.	Insignificant: Incidental waste & stockpiles.	• All stockpiles are to be located within existing cleared areas or offsite. • Mulch generated by the works is to be removed from the site and lawfully re-used or disposed of.	Insignificant
Emissions & Radiation	Potential for emissions from work machinery, vehicles and plant.	Minor	• Use and correctly maintain low emission plant & equipment.	Insignificant

Socio-economic

Aboriginal Heritage	No item or place of Aboriginal heritage significance is mapped near the works area. **AHIMS Search Date:** 18/09/2020 **AHIMS Search ID:**536634	Minor	• Works are to cease if any unexpected finds occur - contact Council's Environmental Reporting team for advice before proceeding	Insignificant
Local & State Heritage Not Applicable				
Community Disturbance	Potential for public interest and community opposition.	Insignificant: Potential minor amenity effect during works or for short term periods.	• Council has had previous discussions with adjoining landowners regarding trimming on their land and will continue to consult with them prior to works.	Insignificant: The community is unlikely to be disturbed and any noise during works will be short term.
Economic	The management of vegetation to a height of 3m below the OLS compared to total vegetation removal has been identified as providing a satisfactory economic outcome while balancing environmental impacts.	Minor: Ongoing operation and maintenance costs.	• Budget has been allocated.	Minor: Ongoing operation and maintenance costs.
Visual	Potential visual impacts associated with vegetation removal.	Minor: Potential reduction in visual amenity associated with tree height reduction.	• Remove trees which die back following works.	Minor

Miscellaneous

Environmental Hazards	Flooding	Damage to machinery and habitats	• The proposed works are not to be undertaken during flood events and equipment storage and stockpiles are to be located above of the 1:100 year flood line	Insignificant

Noise & Vibration	Noise from vehicles and equipment.	Minor: Noise and/or vibration will be generated during works and may impact nearby receivers.	• Adhere to standard operating hours, maintain plant and equipment, utilise appropriate PPE.	Insignificant given controls and relatively short duration of works.
Hazardous Chemicals & Dangerous Goods	Chemical / fuel spills which result in land contamination or water pollution.	Insignificant: HC&DG may be used during works.	• No storage of fuel or chemicals on-site. Spill clean-up kits to be present and utilised on site.	Minor
Cumulative Impacts	Regular vegetation clearing and trimming works associated with the ongoing management of the OLS.	Minor	N/A	Minor

Additional Impacts
Not Applicable

Section D: Additional Information

Date of site inspection (and attendees)	16/09/2020 Phillip Conacher
Who is the relevant land owner/asset manager?	Lot 96 DP 867428 is owned by Central Coast Council. There are several separate private land owners for the other allotments.
Concurrences, approvals, licences and/or permits	None applicable
Consultation	Consultation with adjoining land owners is underway seeking permission to access private land. Permission is also being sought to trim the vegetation that affects the OLS initially but also for ongoing maintenance as required.
Replacement Planting	Replacement planting not deemed suitable due to aviation hazard and the works will only management of trees, not understorey shrubs or ground cover vegetation.
Project Handover	A copy of this environmental assessment and the Threatened Biodiversity Assessment will be provided to the arborist contractor to comply with. Council will induct the contractor prior to works and it is proposed that an ecologist will supervise works as appropriate

Section E: Authorisation

The completed form is to be sent to an Authorising Officer via email, TRIM or ECM for review and approval. A peer review may be undertaken by any other competent Assessing Officer if deemed necessary. The approved version is to be stored in TRIM or ECM (Subject 17.227) with a precis that includes the following: 'EMS Environmental Assessment – Level 2 – Project Title – Location'.

I have assessed the activity in accordance with Council's Environmental Assessment Procedure. The activity amounts to minor work that meets the Environmental Assessment criteria and has been assessed as being not likely to significantly affect the environment. I will ensure that the environmental control measures committed to in this assessment are effectively communicated to the implementation/construction team.

Assessing Officer Name	Position	Consultancy	Date
Phillip Conacher	Project Director	Conacher Consulting	28/09/2020

I have reviewed the Environmental Assessment for the activity and concur with the Environmental Assessment that the activity is for minor works and is not likely to significantly affect the environment. The activity is approved to proceed in accordance with the control measures committed to within this Environmental Assessment.

Peer Reviewing Officer Name	Position	Service Unit	Date
Mairin Ireland	Env Mgmt Coordinator	Environmental Reporting	29/09/2020

I have reviewed the Environmental Assessment, which has examined and taken into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the activity. I concur with the Environmental Assessment that the activity is for minor works and is not likely to significantly affect the environment. The accompanying Threatened Biodiversity Assessment report further demonstrates that the activity is not likely to significantly affect threatened species or ecological communities, or their habitats. I also note that the activity is not likely to have a significant impact on any matter of national environmental significance. The activity is approved to proceed in accordance with the control measures committed to within this Environmental Assessment.

Authorising Officer Name	Position	Service Unit	Date
David Langford	Acting Unit Manager	Business Enterprise	29/09/2020