BDAR for a proposed subdivision of Lots 155 and 188, DP 755537, 24 Coronation Road, Congarinni North, New South Wales

by
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Executive Summary

Context

It is proposed to subdivide this property into 276 lots as part of a Torrens Title Subdivision (henceforth known as the subdivision project). The subdivision project will be located at Lots 155 and 188, DP 755537, 24 Coronation Road, Congarinni North, New South Wales, within the Local Government Area (LGA) of the Nambucca Shire Council.

The subdivision project site (henceforth known as the subject site) is approximately 144 acres (about 58 hectares) in size on land currently vacant, although much of it has been cleared and most of the other neighbouring bushland areas to the north and west are slightly disturbed from semi-clearing (at least at some edges), logging, bushfires etc. These other bushland areas involve rainforest, swamp woodland, swamp oak forest and mangrove communities (see later). At least two of these are endangered PTCs (Swamp Woodland and Swamp Oak Forest).

The proposed development would occupy approximately 13.5 hectares with around little or no areas requiring vegetation removal. Most of the proposed developmental area is exotic pasture grasslands with dispersed trees of Camphor Laurel, *Cinnamomum camphora* (Lauraceae). A few native *Eucalyptus* (Myrtaceae) and *Ficus* (Moraceae) trees are dispersed within and just outside the proposed developmental area. There are also some area of low lying sedgelands with *Juncus* sp. (Juncaceae) which are also weed infested.

Aims of this BDAR report

T.J. Hawkeswood Scientific Consulting was commissioned to assess the ecological values and impacts associated with the subdivision project. The primary objective of this report is to utilise the Biodiversity Assessment Methodology (BAM) (OEH, 2017) to describe and assess the ecological values within the subject site, and to determine how the subdivision project is likely to have an impact on threatened biodiversity listed under the NSW Biodiversity Conservation Act 2016 (BC Act) and Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).

Survey overview

An ecological survey in accordance with the BAM methodology was undertaken for the subdivision project, including:

a. Site reconnaissance in order to map the occurrence of native vegetation (if any) within the proposed development area and to determine habitat for any threatened biodiversity (23-28 July 2020).

b. Biodiversity Assessments were undertaken from between 23-28 July 2020 including BAM plot/ transect collection and threatened plant survey. Night surveys were undertaken during 24-27 July 2020, using night spotting equipment and an Anabat detector (see Table 1).

Native vegetation Assessment

As there were no native ecological communities detected, historically the best fit PCT nearby in adjacent higher areas is Sub-tropical Rainforest, hence the :

1522 - Lilly Pilly - Sandpaper Fig - Prickly-leaved Tea Tree warm temperate rainforest of the Central Coast and lower Hunter Valley. This is not listed as a TEC (Threatened Ecological Community).

Threatened flora species

Targeted threatened flora surveys were completed over several days (i.e. 23-28 July 2020, Table 1). No threatened flora were recorded during the field surveys. No threatened flora are likely to be impacted by the subdivision project.

Threatened fauna species

Habitat condition within the subject site has been influenced by previous historic clearing of vegetation and cattle/horse grazing, as well as selective logging for firewood etc. The developmental area has been grazed for decades.

Fauna habitat within the developmental mostly consists of a few scattered trees (Figs. 1-4). The developmental area is virtually devoid of native trees and mostly contains scattered Camphor laurels. *Cinnamomum camphora* (Lauraceae) which make up most of the tree species and tree biodiversity of the developmental area. Most of the site is weeds and introduced pasture grasses.

No threatened fauna species were detected during targeted surveys within the developmental area.

Impacts

The impacts of the subdivision project on ecological values are summarised as follows: Clearing of of mostly introduced grassland will be about 13.5 hectares. The whole property is 57.3 hectares, most of which will not be impacted.

Avoid, minimise and mitigate impacts

Measures to reduce the impact of the subdivision project on local flora and fauna include:

A. Inclusion of endemic tree and shrub species in landscaping, introduction of a vegetation and weed management plan to enhance the remaining depauperate bushland/grassland by adding further plant species and individuals and removing and control of weeds.

B. Rainwater harvesting to reduce the volume of stormwater leaving the site, thereby reducing impacts to nearby riparian vegetation.

C. Some trees to be logged such as camphor laurels, can be widely scattered as logs or mulch in bushland areas to enhance ground zone habitat values etc. for reptiles and other ground frequenting creatures.

Credit calculations

Vegetation identified within the subject site (developmental area) generates a requirement of 0 ecosystem credits for the removal of 13.5 hectares of grassland which once used to contain **1522** - Lilly Pilly - Sandpaper Fig - Prickly-leaved Tea Tree warm temperate rainforest of the Central Coast and lower Hunter Valley..

No species credits are required for the subdivision project (see Appendix 4, BAM reports).

Biodiversity Development Assessment Report

1. Biodiversity Assessment

1.1. Introduction

T.J. Hawkeswood Consulting was commissioned to assess the ecological values and impacts associated with the subdivision project. The primary objective of this report is to use the Biodiversity Assessment Methodology (BAM) (OEH 2017) to describe and assess the ecological values within the Site and surrounds, and determine how the Subdivision Project is likely to have an impact on threatened biodiversity listed under the NSW Biodiversity Conservation Act 2016 (BC Act) and Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).

1.2. The subdivision project

1.2.1. General description of the subdivision project site

The subdivision project site is located at 24 Coronation Road, Congarinni North, New South Wales, NSW, within the Nambucca Shire Local Government Area. The whole site is approximately 57.3 hectares in size on land which is presently vacant land surrounded in the north and west by native plant communities and in the south by cleared agricultural land. The plant communities surrounding the developmental area are Warm temperate Rain Forest, Swamp Mahogany Forest, Swamp Oak Forest, Sedgelands and Mangrove.

Approximately 13.5 hectares of pasture grassland will be disturbed for this development. The vast majority of the property will be retained as native vegetated land in the north and west.

1.2.2. Construction and operational footprint

The proposed development will entail 276 residential lots, each with one building platform (see Fig. 11).

1.3. State approval and assessment process

1.3.1. Application of the BAM

The BAM is a new framework for assessment of biodiversity impacts and determination of offsetting requirements under the NSW Biodiversity Offsets Scheme (BOS). Implementation of the BAM is required when certain thresholds are triggered, as prescribed in the Biodiversity Conservation Regulation 2017 (BC Reg), namely:

The area of vegetation to be cleared exceeds the clearing threshold associated with the minimum lot size applicable to the property.

The land to be cleared does not occur in the shaded area of the Biodiversity Values Map (see Fig. 8).

The development is not likely to significantly affect any threatened species or ecological communities, however, this subdivision project triggers the BAM because it exceeds the clearing

thresholds specified in the BC Regulations: the subject property is more than 1.0 hectare and less than 50 hectares, with an associated clearing threshold of 0.5 hectares. Given the subdivision project would result in the removal of 13.5 hectares of grassland vegetation, a BDAR is therefore required. This report constitutes the BDAR for the subdivision project.

Biodiversity Development Assessment Report

1.4. Commonwealth approval and assessment process

Matters of National Environmental Significance (MNES) are protected under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act). The BAM requires proponents to identify and assess the impacts on all nationally listed threatened species and threatened ecological communities that may be present on or near the Site. Therefore, the BAM has partially been used to perform assessment of impacts under the EPBC Act.

1.5. Assessment objectives and format

The primary objective of this assessment is to use the guidelines and methodology provided in the BAM to determine the impact the subdivision project would have on biodiversity, avoid and mitigate these impacts and then calculate the subdivision project's biodiversity offset requirement.

This BDAR has two broad stages consistent with the BAM methodology: Stage 1 – Biodiversity Assessment

a. assessment of landscape features
b. assessment of native vegetation
c. assessment of threatened species and populations.

Stage 2 – Impact Assessment
a. avoid and minimise impacts on biodiversity values b. consider impact and offset thresholds
c. determine and calculate offset requirements.

1.6. Assessment resources and assessor qualifications

This BDAR has been prepared by the following accredited assessor: Dr T.J. Hawkeswood - BAM Assessor Number: 18160.

1.7. Landscape assessment

1.7.1 Methods

As detailed in Section 4 of the BAM (OEH 2017), a landscape assessment for the proposal is required, which was conducted within the BAM Calculator. Landscape value is an assessment of a number of factors including: Native vegetation cover; Rivers, streams and estuaries; Areas of geological significance; Habitat connectivity etc.

For each factor the current state of the landscape is assessed then compared with the state of the landscape if the proposal were to proceed.

1.7.2. Landscape features and scoring

IBRA bioregion/subregion: The site is located in the Coffs Coast and Escarpment subregion of the New South Wales North Coast Interim Biogeographic Regionalisation for Australia (IBRA) bioregion.

Mitchell Landscapes: The Mitchell Landscape within the site is: Mmb Manning - Macleay Barriers and Beaches NNC Coastal Barriers Landscapes, Version 2).

Rivers, streams and estuaries and Strahler stream order: There are no streams within the subject site except for ephemeral drainage lines. There is a river system in the northern swamplands which has been overgrown by vegetation. This system is not clearly observed on the ground but shows up in the aerial photography (see Fig. 1).

Wetlands within and adjacent to the proposed development: Swamp wetlands occur within or adjacent to the subject site but not within the developmental area (Figs. 1-3, 9,10).

Cleared areas: Only the developmental area is cleared for grazing land (see Figs. 1-3, 9,10).

Connectivity features: The subject site is connected via vegetation to areas to the west and north (Figs. 4,5).

Woody vegetation cover

Development area (% native vegetation cover): less than 0.1 % Woody vegetation cover.

Non-development area (% native vegetation cover): 100% woody vegetation cover.

Non-woody vegetation cover

For non-woody vegetation, experience of the study area was drawn upon in addition to aerial photography interpretation to estimate cover of native grassland vegetation. The development area contains about 0.01 % of non-woody native vegetation cover because most of the species are exotic weeds.

Total native vegetation cover

Combining the estimated woody and non-woody vegetation cover resulted in only 0.11% of the subject site supporting native vegetation.

Geological significance and soils: There are no karst, caves, crevices or other areas of geological significance within the subject site. There are no high hazard soil areas or acid sulphate soils.

1.7.3. Site context

The subject property is located within a rural landscape setting surrounded by similar sized lots with varied use of intensive agriculture and lifestyle living.

Nearby native vegetation connectivity is of reasonable value in a few directions, although is broken for short distances due to roads, localised clearing, water courses and electricity easements.

Beyond the 1,500m buffer, particularly to the south and west, rural development further breaks the native vegetation connectivity.

North of the property is various swamplands such as the Swamp Oak Forest and the Swamp Mahogany Forests which are endangered ecological communities. To the west is also a section of **1522** - Lilly Pilly - Sandpaper Fig - Prickly-leaved Tea Tree warm temperate rainforest of the Central Coast and lower Hunter Valley. This is not listed as a TEC (Threatened Ecological Community).

1.8. Native vegetation and flora assessment

1.8.1. Methods–data review

A review of spatial records of threatened flora within a 10 km radius of the study area was undertaken using data obtained from the NSW Bionet Atlas (Table 6). Records were obtained prior to field survey. Results were considered during field survey and likelihood of occurrence analysis.

A Protected Matters Search (EPBC Act)(Table 7) was carried out for a 10 km area around the subject site (Appendix H). Results were considered during field survey and likelihood of occurrence analysis.

Records of candidate species were also utilised from the BAM Calculator (Table 5).

1.8.2. Methods-field survey

Ecological values were appraised via survey of the vegetation present at the subject site, as well as any potential threatened species habitat.

An ecological survey in accordance with the BAM was undertaken for the subdivision project, and consisted of:

Fauna field surveys consisted of the following:

Site walk overs as well as more detailed traverses on 23-28 July 2020 to examine native vegetation and determine habitat for threatened biodiversity.

Biodiversity Assessment on the 23-28 July 2020, which included BAM plot/transects collection, and threatened flora survey.

Results were used within the BAM Calculator to generate credit requirements. The BAM plot requirements were determined using the BAM (OEH 2017). Three plots were undertaken although only one plot is required under BAM.

Walking meanders were carried out at habitat observation points and around plot locations. Given the cleared nature of the developmental area, random meanders were able to undertaken that thoroughly covered the entire area.

1.8.3. Plant community delineation

Plant lists have been provided in Table 3.

Under the BAM a ‘bestfit’ PCT must be attributed to vegetation as supported by the following abstract from OEH (2018):

"Where the vegetation is a mix of local and non-local planted species the assessor should consider the best matching PCT based on the local species present ".

The best fit PCT from field observations on the vegetation within the nearest adjacent vegetation type on the same slope/elevation was determined as **1522 -** Lilly Pilly - Sandpaper Fig - Prickly-leaved Tea Tree warm temperate rainforest of the Central Coast and lower Hunter Valley. This is not listed as a TEC (Threatened Ecological Community).

1.8.4. Site values

Flora

Floristic data recorded from the two floristic plots (Plot BAM1 and Plot BAM2) are included as (Appendix 2) within the survey field sheets. 27 plant species were recorded in the two BAM plots comprising 10 native species and 17 exotic species (Appendix 2).

The vegetation integrity score was determined by entering plot data into the BAM Calculator. The data provides quantitative measures of composition, structure and function for each vegetation zone. The BAM Calculator compares the values recorded with the benchmark for the vegetation class to provide the vegetation integrity score. This score represents the overall condition of the vegetation compared against the benchmark (out of 100).

The score from these inputs, coupled with data in the following section of this report, is used to determine the number of ecosystem credits that are required for development.

Patch size for the vegetation zone was given the highest score in the BAM (>100 hectares), as the native vegetation at the site is directly connected to native vegetation of neighbouring properties (Fig. 5). The vegetation integrity scores (VIS) from the BAM calculator is as follows:

1.8.5 Vegetation integrity score

522 - Lilly Pilly - Sandpaper Fig - Prickly-leaved Tea Tree warm temperate rainforest of the Central Coast and lower Hunter Valley.

See BAM reports (Appendix 4).

1.8.6. High threat weeds

During the field surveys two species of high threat weeds were recorded, as listed the High Threat Weeds list associated with the BAM Calculator. The high threat weed species are sporadically distributed throughout the BAM Plot 1 (*Lantana camara*) and commonly distributed BAM Plot 2 (*Senecio madagascariensis*) area.

1.8.7. Threatened flora

No threatened flora were detected during the field surveys. It is highly unlikely that any threatened flora would remain undetected during the field survey given that the subject site has been extensively cleared/semi-cleared in most areas during previous times and ground zone flora has been stripped by cow and goat grazing in more recent times. It should be noted that overall, native species richness and cover was exceedingly low (Appendix 2, BAM plot data). This can be attributed to the highly modified condition of the site and past extensive, widespread clearing.

Threatened flora with the potential to occur, as generated by the BAM Calculator, are presented in Table 5. All are assumed to be absent from the site based on non-detection of the species during targeted searches.

1.9. Fauna assessment

1.9.1. Methods–data review NSW Bionet Atlas Database

A review of spatial records of threatened fauna within a 20 km radius of the subject site was undertaken using data obtained from the NSW Bionet Atlas (Table 6). Records were obtained prior to field survey. Results were considered during field survey and likelihood of occurrence analysis. None of these species are likely to occur within he development area due to lack of habitat, disturbance by domestic animals and lack of food resources.

EPBC Act Protected Matters Search

A Protected Matters Search (EPBC Act)(Table 7) was carried out for the entire Nambucca Shire Council area. Results were considered during field survey and likelihood of occurrence analysis. All species considered relevant from Bionet review and the Protected Matters Search were included in Appendix A and some more relevant species included in the 5-part Tests of Significance for each species in Appendix I.

1.9.2. Methods-field survey

Fauna field surveys consisted of the following:

Site walk overs during 23-28 July 2020 to examine native vegetation and determine habitat for threatened biodiversity (see also Table 1).

Fauna habitat survey during 23-28 July 2020 within the site (see also Table 1).

Night amphibian/bat survey using night spotting gear and Anabat detector during 24-27 July 2020 (see also Table 1).

1.9.3. Assessment of threatened species

Threatened species predicted or potentially occurring within the IBRA subregion were reviewed. (Tables 5-7). This list was significantly refined and reduced in size post field survey for the development envelope within the BAM Calculator on the basis of the vegetation type, condition and habitat features present as well as the results of field survey (see Table 5). No ecosystem credit species were included in the BAM Calculator because there is very limited or no habitat present within the 4.5 hectare development area for all of the predicted species. A number of species are defined as candidate species only on the basis of breeding habitat and thus, these species are not considered further if breeding habitat does not occur at the site.

1.9.4. Fauna habitats

Habitat condition within the site has been influenced by previous historic clearing of vegetation, bushfires etc.

Fauna habitat within the site consists of a very sparsely vegetated grassland which acts as pasture for cattle and horses (see Figs. 1-3). The developmental area generally lacks a range of habitat features (large hollow logs, hollow-bearing trees, mature trees, diverse vegetation and structure).

1.9.5. Fauna recorded from field surveys

Fauna field surveys using the methods described in Section 1.9.2. were undertaken. Notable opportunistic sightings whilst travelling through the subject site were also recorded. A total of 20 fauna species were recorded during field surveys from the site, comprising 12 species of birds, no reptiles, two frogs and six mammals (all mammals are introduced species).

1.9.6. Threatened fauna

No threatened fauna were detected during targeted survey within the development area.

Given the highly modified condition of the native vegetation within the development, lack of detection during the field survey, and lack of preferred habitat for threatened fauna, it is most unlikely that any threatened fauna would rely upon the habitat within the subject site on a regular basis. Threatened fauna such as bats would most likely occur in the pristine areas of native vegetation in the north and the west.

2. Impact Assessment

The Impact Assessment forms Stage 2 of the BDAR as detailed in the BAM.

2.1. Avoid and minimise impacts

In accordance with the BAM, proponents must demonstrate the measures employed to avoid, mitigate and offset impacts of a subdivision project on biodiversity values. This section of the report outlines the avoidance, management and mitigation measures that the owner of the property has incorporated into the subdivision project design or will employ during construction, operation or completion of the subdivision project in order to reduce impacts on biodiversity values. It is intended to provide an extensive Vegetation Management Plan (VMP) in order to provide for some regeneration of certain areas as well as providing nesting boxes etc. in suitable areas which will offset impacts of the proposal.

2.1.1. Avoidance measures (pre−construction)

The proposed design of the subdivision project allows for avoidance of native vegetation clearing outside. the development area.

2.1.2. Mitigation measures (construction and post construction)

The following management and mitigation measures will be further developed and implemented during the construction and operation phases of the Subdivision Project:

Implementation of standard erosion and sediment controls for the duration of construction works. Regular maintenance of erosion and sediment controls during construction.

Ensuring that the development does not impose on the drip lines of the trees on the neighbouring properties or in the adjacent native vegetation.

Weed control (a detailed Vegetation Management Plan may be required after approval).

Landscape planting focusing on naturally occurring endemic tree and shrub species to compensate for loss of foraging habitat due to the removal of some native trees.

Ensuring vehicles remain on designated roads (and tracks) whenever possible, through use of signposting.

Rainwater harvesting to reduce the volume of stormwater leaving the site, thereby reducing impacts to neighbouring vegetation.

Management and removal of all waste from the site.

2.2. Impact Summary

Avoid and Minimise

There is no karst, caves, crevices, cliffs or other geological features of significance within the development footprint. There are no rocks, human made structures or non- native vegetation within the development footprint which is considered as significant habitat for any threatened species.

There will be no impact to connectivity of habitat areas as the very small amount of native vegetation disturbance (scattered small weed infested sedgelands and a few scattered native trees) which will be required for this development proposal will be a further extension of already cleared and disturbed open paddock areas.

There will be no impact to connectivity of habitat areas therefore there will be no impact to the movement of threatened species that maintains their life cycle.

There is no water bodies or significant hydrological processes which sustain threatened species or threatened ecological communities within the development footprint. There is no risk to water bodies or hydrological processes down hill of the development footprint which is likely to impact on any threatened species or threatened ecological community.

This is not a wind turbine development.

There is no additional risk to threatened species or animals which are a part of a threatened ecological community from vehicle strikes from this proposed development.

Hydrological regime is proposed to be altered slightly for stormwater drainage. The availability of water in areas which currently have surface water flows will be reduced following construction of the subdivision hard surfaces. The impacts on flora in these locations is expected to be minor as there are only a few native trees and small shrubs to be removed.

The building envelope should be clearly defines to prevent builders and associated trades people from entering areas unnecessarily. Erosion control measures, if needed, should be erected before construction begins.

Trades people should enter via designated roads and driveways only. Trades people should be trained and made aware to reduce impacts where possible and to report any incidents which may contribute to environmental damage to the site supervisor immediately. Construction should follow engineering plans as approved by council. Work should be undertaken within daylight hours to prevent impacts on any resident nocturnal species.

Noise and light

Landscaping should be designed to reduce the surface water flow from wastewater outlets. This will prevent water with high nutrient levels from entering into the drainage line.

Before, during and after construction of the subdivision and associated dwellings, noise and light impacts should be considered and minimised where possible. Residents should avoid erecting high-powered floodlights which radiate into the surrounding bushland areas, disturbing resident fauna. Education brochure should be distributed to all new residents advising how to minimise indirect impacts to any resident fauna species.

Trades people should ensure they remove all rubbish an associated waste to prevent pollutants entering into the remaining vegetation areas.

2.2.3. Summary of impacts

The removal of a few native trees and small shrubs from this location is not expected to have any adverse effects on any threatened ecological community or critical habitat for any species. There was no threatened flora species identified within the development footprint.

Avoid and minimise

The subdivision will not displace resident fauna throughout the entire development footprint area.. There will be no displacement of threatened species or removal of any critical habitat for any species.

There are no hollow trees or trees with suitable habitat hollows.

Landscaping of lots should be undertaken with consideration of the native vegetation and natural environment surrounding the lot. No restricted flora species should be planted within the lots. Landscaping with exotic species should remain a minimum of at least 10m from the native vegetation line.

Possibility of invasive flora species entering into the remaining native vegetation and causing biodiversity loss.

Residents should practice responsible pet ownership, particularly with cats and dogs. Cats should be kept inside or within outdoor car runs. Rabbits should be kept within suitable enclosures. Fox activity may increase due to the keeping of poultry.

A Waste Water Management Plan has been developed to ensure waste water from new dwellings is managed and dispersed within the development footprint. There should be very little change to hydrological flows. Some diversion of surface water flow may occur due to placement of infrastructure and landscaping however this is expected to be minimal.

The construction of dwellings within the subdivision is going to increase local noise levels slightly. Following this, a slight increase in local noise levels will be expected from noise associated with occupied dwellings occurs.

There is a possibility of exotic fauna species preying upon resident fauna within the surrounding nearby native vegetation.

There is a slight risk of increases nutrient load reaching remaining native vegetation.

There s a possibility of minor changes to surface water flow.

There is a slight possibility of increase to local noise levels.

2.2.4. Serious and irreversible impacts

The approach of Serious and Irreversible Impacts (SAII) in relation to the Biodiversity Offset Scheme is to ensure there is no contributing factors within a development proposal which will contribute to the extinction of a threatened species, threatened ecological community, threatened populations or critical habitat.

The four principles of determining SAII are as follows:

- 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;

- will further reduce the population size of the species that is currently observed, estimated, inferred or reasonably suspected to have a very small population size, or will further degrade or disrupt an ecological community that is already observed, inferred or reasonably suspected to be severely degraded or disturbed;

- impact on the habitat of a species or ecological community that is currently observed, estimated, inferred or reasonably suspected to have a very limited geographic distribution;

- impact on a species or ecological community that is unlikely to respond to measures to improve habitat and vegetation integrity and is therefore irreplaceable.
  There were no threatened species identified within the assessed areas of the subject property and the disturbance to 13.5 ha of exotic grassland vegetation will not impact upon any threatened ecological community located within the subject property. There were no threatened populations identified within the subject property and no critical habitat for any species.

The development will not cause any plant, ecological community or animal species to be impacted such that their survival and existence is threatened. No habitat of any endangered species or ecological community will be removed or impacted in any way by the development.

2.3. Biodiversity Credit Report

2.3.1. Quantifying offset requirements

The BAM identifies the BAM Calculator as the appropriate tool for quantifying the offsets required in both ecosystem credit and species credit terms. A calculation of the nature and extent of biodiversity credits required due to ecological impacts associated with the subdivision project has been undertaken using the BAM Calculator.

2.3.2 Summary of ecosystem credits required

The results of the BAM calculator in terms of vegetation integrity scoring for vegetation zones and associated ecosystem credit requirements are shown in Appendix 4. The final report generated by the BAM Calculator is provided in Appendix 3.

PCT Best Fit

1522 - Lilly Pilly - Sandpaper Fig - Prickly-leaved Tea Tree warm temperate rainforest of the Central Coast and lower Hunter Valley (from historical information and nearby extant native vegetation

Required credits (see also Appendix 4).

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2.3.3. Summary of species credits required

No species credits are required for the Subdivision Project.

The subject property has a history of disturbance from the use as a livestock grazing property and timber removal. There is virtually no native vegetation within the study area apart from a few scattered trees and shrubs/forbs and a few Juncus ponds which are mostly weed infested. The remaining property outside of the study area contains significant natural resources in the various plant communities represented. The *Biodiversity Conservation Act 2016* aims to ensure a no net loss of biodiversity value within NSW using the Biodiversity Offset method. Therefore an improved biodiversity outcome for the local and regional landscape would be achieved from the approval of this property for a subdivision following the Biodiversity Assessment Method and current legislation.

The proposed development of the subdivision will not significantly impact upon any important Threatened Ecological Community as listed on the schedule of the *NSW BC Act*. No other potential habitat for any threatened fauna or flora species or populations will be directly affected.

2.4. Recommendations

The following environmental management measures are regarded as part of the proposal:

- installation of sediment and erosion control devices prior to clearing or earthmoving works;

- removal of any high threat weed species as listed in the *Biosecurity Act 2015* as determined by the NSW Department of Primary Industries for Nambucca local government area;

- landscaping of the residential lots should not use any exotic or non-indigenous species that are known to be invasive in areas of native bushland;

- development of a stormwater management plan for use during all stages of the construction to reduce the impacts of changed water quality and quantity.

3.0. SEPP Koala Habitat Protection

From December 2020, the original SEPP 44 Koala Habitat Protection SEPP 44 (22 March 1995) is in force in NSW, not the SEPP 2019 one. No koalas were detected within the developmental footprint and no koala habitat was noted apart from one old *Eucalyptus microcorys* tree. This tree was closely inspected during the surveys and there was no evidence of any koala living in or utilising this tree. No koala scats were detected. The tree was isolated amongst grassland. The scientific conclusion is that the developmental area is not core koala habitat. Therefore no further provisions of SEPP 44 (1995) are to be addressed.

4.0. SEPP (Coastal Management) 2018

STATE ENVIRONMENTAL PLANNING POLICY (COASTAL MANAGEMENT) 2018 - REG 11

Development on land in proximity to coastal wetlands or littoral rainforest
11 Development on land in proximity to coastal wetlands or littoral rainforest

Note : The *Coastal Wetlands and Littoral Rainforests Area Map* identifies certain land that is inside the coastal wetlands and littoral rainforests area as "proximity area for coastal wetlands" or "proximity area for littoral rainforest" or both.
(1) Development consent must not be granted to development on land identified as "proximity area for coastal wetlands" or "proximity area for littoral rainforest" on the *Coastal Wetlands and Littoral Rainforests Area Map* unless the consent authority is satisfied that the proposed development will not significantly impact on--
(a) the biophysical, hydrological or ecological integrity of the adjacent coastal wetland or littoral rainforest, or
(b) the quantity and quality of surface and ground water flows to and from the adjacent coastal wetland or littoral rainforest.
(2) This clause does not apply to land that is identified as "coastal wetlands" or "littoral rainforest" on the *Coastal Wetlands and Littoral Rainforests Area Map* .

This development will not significantly impact on the biophysical, hydrological or ecological integrity of the adjacent coastal wetlands to the north of the development. None of these areas will be removed or impacted during development. There will be hydrological controls that will ensure that the quantity and quality of surface and ground water flows to and from the adjacent coastal wetland will not be affected or impacted.

Appendix 1. Tables.

Table 1. Survey Effort (23-28 July 2020)

Date	Activities
23 July 2020	Flora/fauna day meander/ night survey (2 hrs) with torches
24 July 2020	Flora/fauna meander. BAM quadrats, night surbvey, Anabat, torches (7 hrs)
25 July 2020	Flora/fauna meander, investigation of nearby rainforest, night survey, Anabat, torches (8 hrs)
26 July 2020	Flora/fauna meander, night survey, Anabat, torches (6 hrs)
27 July 2020	Flora/fauna meander, night survey, Anabat, torches (6 hrs)
28 July 2020	Flora/fauna meander, edge of swamp investiation (3 hrs)

Table 2. Macksville developmental area fauna list

Amphibians

Crinia signifera (Myobatrachidae)(Common Eastern Toadlet) -many heard calling from ponds in the more shallow areas.

Limnodynastes peronii (Myobatrachidae)(Tock Frog) - several heard calling from large pond near entrance of property.

Reptiles

No reptiles were detected during the survey times.

Birds

Bubulcus ibis (Ardeideae)(Cattle Egret) common where cattle were mingling.

Gymnorhina tibicen (Magpie) - several seen near roadside.

Hirundo neoxena (Welcome Swallow)- many observed hilltopping.

Falco cenchroides (Falcionidae)(Nankeen Kestrel)- at least one observed hilltopping on the site.

Sphecotheres vieilloti (Oriolodae)(Australian Fig Bird) - common on the site in and around Cinnamomum camphora, the berries on which they feed.

Gymnorhina tibicen (Coirvidae)(Magoie()

Dacelo novaeguinenae (Alcedinidae)(J|Kookaburra)

Playcercus eximius (Platycercidae)(Eastern Rosella)

Stagonopleura guttata (Estrilidae)(Diamond Firetail)

Rhipidura fuliginosa (Rhipiduridae)(Grey Fantail)

Cacatua roseocapilla (Cacatuidae)(Galah)

Columba leucomela (Columbidae)(White Headed Pigeon)

Mammals

Bos taurus (Boidae)(Cow)- at least 20 on site.

Equis calabus (Equiidae)(Horse) - at least one on the site.

Canis familiaris (Canidae)(Domestic Dog)- several resident on site.

Felis catus (Felidae))(Domestic Cat)- at least 2 on the site.

Mus musculus (Muridae)(Field Mouse)- nest found at base of fig tree.

Vulpes vulpes (Canidae)(Introduced Fox(- detected by droppings at various places.

Table 3. Macksville developmental area plant list

Cinnamomum camphora (Lauraceae) Exists as stands of young trees along boundary fences and as old trees over 100 years old and scattered.
Lantana camara (Verbenaceae)
Hibbertia scandens (Dilleniaceae)
Zieria smithii (Rutaceae)
Gomphocarpus fruiticosus (Apocynaceae)
Rubus fruiticosus (Rosaceae)
Lycium ferocissimum (Solanaceae)
Acacia producta (Fabaceae)
Senecio madagascariensis (Asteraceae)
Syzygium sp. (Myrtacea)(but not *S. paniculatum*)
Sida rhombifolia (Malvaceae)_
Asplenium astralasicum (Aspleniaceae)
Ficus watkinsiana (Moraceae)
Paspalum mandiocanum (Poaceae)
Trophis scandens (Moraceae)
Bidens pilosa (Asteraceae)
Solanum nigrum (Solanaceae)
Allocasuariuna littoralis (casuarinaceae)
Corymbia intermedia (Myrtaceae)
Cyperus sp. (Cyperaceae)
Kennedia rubicunda (Fabaceae)
Hardenbergia violacea (Fabaceae)
Parsonsia straminea (Apocynaceae)
Notolaea longifolia (Oleaceae)
Imperata cylindrica (Poaceae)
Pratia purpurascens (Lobeliaceae)
Andropogon virginicus (Poaceae)
Pennisetum clandestinum (Poaceae)
Oxalis corniculatus (Oxalidaceae)
Geranium sp. (Geraniasceae)
Alphitonia excelsa (Rhamnaceae)
Solanum mauritianum (Solanaceae)
Eucalyptus microcorys (Myrtaceae)
Hypochoeris radicata (Asteraceae)
Paspalum urvillei (Poaceae)
Cirsium vulgare (Asteraceae)
Ligustrum sinense (Oleaceae)
Gahnia sieberiana (Cyperaceae)
Juncus acutus (Juncaceae)
Pittosporum undulatum (Pittosporaceae)
Passiflora sp. (Passifloraceae)
Ochna serrulata (Ochnaceae)
Eucalyptus pilularis (Myrtaceae)
Phytolacca octandra (Phytolaccaceae)
Acacia parramattensis (Fabaceae)
Melaleuca linearis (Myrtaceae)
Setaria sp. (Poaceae)
Cerastium glomeratum (Carypophyllaceae)
Mangifera indica (Sapindaceae)
* = introduced species

Table 4. Predicted Threatened Species (from BAM Calculator)

Dasyurus maculatus
Spotted-tailed Quoll
Scientific name: *Dasyurus maculatus*
Conservation status in NSW: Vulnerable
Commonwealth status: Endangered
Profile last updated: 24 Sep 2020
The Spotted-tailed Quoll is about the size of a domestic cat, from which it differs most obviously in its shorter legs and pointed face. The average weight of an adult male is about 3500 grams and an adult female about 2000 grams. It has rich-rust to dark-brown fur above, with irregular white spots on the back and tail, and a pale belly. The spotted tail distinguishes it from all other Australian mammals, including other quoll species. However, the spots may be indistinct on juvenile animals.
The range of the Spotted-tailed Quoll has contracted considerably since European settlement. It is now found in eastern NSW, eastern Victoria, south-east and north-eastern Queensland, and Tasmania. Only in Tasmania is it still considered relatively common.Recorded across a range of habitat types, including rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline.Quolls use hollow-bearing trees, fallen logs, other animal burrows, small caves and rock outcrops as den sites.Mostly nocturnal, although will hunt during the day; spend most of the time on the ground, although also an excellent climber and will hunt possums and gliders in tree hollows and prey on roosting birds.Use communal 'latrine sites', often on flat rocks among boulder fields, rocky cliff-faces or along rocky stream beds or banks. Such sites may be visited by multiple individuals and can be recognised by the accumulation of the sometimes characteristic 'twisty-shaped' faeces deposited by animals.A generalist predator with a preference for medium-sized (500g-5kg) mammals. Consumes a variety of prey, including gliders, possums, small wallabies, rats, birds, bandicoots, rabbits, reptiles and insects. Also eats carrion and takes domestic fowl.Females occupy home ranges of 200-500 hectares, while males occupy very large home ranges from 500 to over 4000 hectares. Are known to traverse their home ranges along densely vegetated creeklines. Average litter size is five; both sexes mature at about one year of age. Life expectancy in the wild is about 3-4 years.

Ptilinopus superbus
Superb Fruit-Dove
Scientific name: *Ptilinopus superbus*
Conservation status in NSW: Vulnerable
Commonwealth status: Not listed
Profile last updated: 12 Feb 2018
The Superb Fruit-dove is a small pigeon, approximately 24 cm in length. The male is brightly coloured, with golden-green upperparts, a brilliant orange-vermilion neck, and a rich purple crown. The tail is short and tipped with white. The throat and breast are grey with a lilac tinge, and a broad black band on the lower breast separates the grey breast from the creamy-white belly and green flanks. The female is light green on the back, has a small purple spot on the crown, and no dark breast band. The call is a distinctive cooing, rising in pitch and volume to a loud and clear 'whoop, whoop'. Also gives a low 'oom' in a steady sequence.
The Superb Fruit-dove occurs principally from north-eastern in Queensland to north-eastern NSW. It is much less common further south, where it is largely confined to pockets of suitable habitat as far south as Moruya. There are records of vagrants as far south as eastern Victoria and Tasmania.Inhabits rainforest and similar closed forests where it forages high in the canopy, eating the fruits of many tree species such as figs and palms. It may also forage in eucalypt or acacia woodland where there are fruit-bearing trees.Part of the population is migratory or nomadic. There are records of single birds flying into lighted windows and lighthouses, indicating that birds travel at night. At least some of the population, particularly young birds, moves south through Sydney, especially in autumn.Breeding takes place from September to January. The nest is a structure of fine interlocked forked twigs, giving a stronger structure than its flimsy appearance would suggest, and is usually 5-30 metres up in rainforest and rainforest edge tree and shrub species.The male incubates the single egg by day, the female incubates at night.

Table 5. Candidate threatened Species (Credit Species)(from BAM Calculator)

Cynanchum elegans
White-flowered Wax Plant

Scientific name: *Cynanchum elegans*
Conservation status in NSW: Endangered
Commonwealth status: Endangered
Profile last updated: 26 May 2020

A climber or twiner with a highly variable form. Mature stems have a fissured corky bark and can grow to 10 metres long and 3.5 cm thick. The leaves are paired (or rarely in threes), ovate to broadly ovate in shape, 1.5 to 10.5 cm long, and 1.5 to 7.5 cm wide. The flowers are white, tubular, and up to 4 mm long and 12 mm wide. The fruit is a dry pointed pod to 8 cm long, which contains up to 45 seeds with long silky hairs attached to one end.
Distribution
Restricted to eastern NSW where it is distributed from Brunswick Heads on the north coast to Gerroa in the Illawarra region. The species has been recorded as far west as Merriwa in the upper Hunter River valley.
Habitat and ecologyThe White-flowered Wax Plant usually occurs on the edge of dry rainforest vegetation. Other associated vegetation types include littoral rainforest; Coastal Tea-tree *Leptospermum laevigatum* – Coastal Banksia *Banksia integrifolia* subsp. *integrifolia* coastal scrub; Forest Red Gum *Eucalyptus tereticornis* aligned open forest and woodland; Spotted Gum *Corymbia maculata* aligned open forest and woodland; and Bracelet Honeymyrtle *Melaleuca armillaris* scrub to open scrub.Flowering occurs between August and May, with a peak in November. Flower abundance on individual plants varies from sparse to prolific.The fruit can take up to six months to mature.Seed production is variable and unreliable. Seeds are wind dispersed. It is considered to be unlikely that a soil seed bank for this species exists.Plants are capable of suckering from rootstock in response to occasional slashing or grazing. The fire response of the species is unknown although it has been know to reshoot following fire. Annual burning at one site has been shown to result in population decline.

Litoria brevipalmata
Green-thighed Frog

Scientific name: *Litoria brevipalmata*
Conservation status in NSW: Vulnerable
Commonwealth status: Not listed
Profile last updated: 21 Jan 2019
Green-thighed Frogs are named for the bright green or blue-green colour on the groin and back of the thighs. They are small frogs (to 40 mm in length), rich brown to chocolate brown on the back, sometimes with smaller black flecks. A broad black stripe runs from the snout to the flank, ending as a series of blotches. The call is a continuous series of 'quack' or 'wok' sounds.
Isolated localities along the coast and ranges from just north of Wollongong to south-east Queensland.Green-thighed Frogs occur in a range of habitats from rainforest and moist eucalypt forest to dry eucalypt forest and heath, typically in areas where surface water gathers after rain. It prefers wetter forests in the south of its range, but extends into drier forests in northern NSW and southern Queensland.Breeding occurs following heavy rainfall from spring to autumn, with larger temporary pools and flooded areas preferred. Frogs may aggregate around breeding sites and eggs are laid in loose clumps among waterplants, including water weeds. The larvae are free swimming.The frogs are thought to forage in leaf-litter.

Mixophyes iteratus
Giant Barred Frog

Scientific name: *Mixophyes iteratus*
Conservation status in NSW: Endangered
Commonwealth status: Endangered
Gazetted date: 13 Aug 1999
Profile last updated: 01 Dec 2017
Giant Barred Frogs are very large (up to 115mm long) and powerfully built. They are blotched light and dark brown above and are well-camouflaged in leaf litter. Limbs have dark crossbars and the hind sides of the thighs are black with yellow spots. The pupil is vertical and the iris is golden. The call is a deep guttural 'ork'. The Giant Barred Frog can be most easily distinguished from other barred frog species by the call and the distinctive eye colour.
The Giant Barred Frog is distributed along the coast and ranges from Eumundi in south-east Queensland to Warrimoo in the Blue Mountains. Declines appear to have occurred at the margins of the species' range, with no recent records south of the Hawkesbury River and disappearances from a number of streams in QLD. Northern NSW, particularly the Coffs Harbour-Dorrigo area, is a stronghold.Giant Barred Frogs are found along freshwater streams with permanent or semi-permanent water, generally (but not always) at lower elevation.Moist riparian habitats such as rainforest or wet sclerophyll forest are favoured for the deep leaf litter that they provide for shelter and foraging, as well as open perching sites on the forest floor. However, Giant Barred Frogs will also sometimes occur in other riparian habitats, such as those in drier forest or degraded riparian remnants, and even occasionally around dams.Breeding takes place from late spring to summer. Once eggs are laid and fertilised in the water, the female kicks them out of the water where they stick onto a suitable bank (e.g. overhanging or steeply sloped). Hatchlings drop or wriggle into the water. Tadpoles grow to about 11cm and it may take up to 14 months between egg laying and the completion of metamorphosis.Although generally found within about 20m of the stream, outside the breeding season, the Giant Barred Frog may disperse away from the stream (e.g. 50m or further). It is a generalist feeder, with large insects, snails, spiders and frogs included in its diet.

Rhodamnia rubescens
Scrub Turpentine
Scientific name: *Rhodamnia rubescens*
Conservation status in NSW: Critically Endangered
Commonwealth status: Not listed
Gazetted date: 01 Feb 2019
Profile last updated: 27 Mar 2019

Shrub or small tree to 25 m high with reddish/brown, fissured bark. Young stems densely covered in fine hairs. Leaves 5–10 cm long, 2–5 cm wide, upper surface green and sparsely hairy, lower surface paler and sparsely to densely hairy. Leaves strongly 3-veined from base with moderately dense, translucent oil dots. Petiole 4–9 mm long. Inflorescences 1–3 per axil, usually 3-flowered with petals 4–6 mm diam. and white. Fruit globose, 5–8 mm diam., red turning black.

Occurs in coastal districts north from Batemans Bay in New South Wales, approximately 280 km south of Sydney, to areas inland of Bundaberg in Queensland. Populations of *R. rubescens* typically occur in coastal regions and occasionally extend inland onto escarpments up to 600 m a.s.l. in areas with rainfall of 1,000-1,600 mm.Found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest usually on volcanic and sedimentary soils.This species is characterised as highly to extremely susceptible to infection by Myrtle Rust. Myrtle Rust affects all plant parts.

Rhodomyrtus psidioides
Native Guava
Scientific name: *Rhodomyrtus psidioides*
Conservation status in NSW: Critically Endangered
Commonwealth status: Not listed
Gazetted date: 01 Feb 2019
Profile last updated: 27 Mar 2019

A shrub or small tree to 12 m high with brown scaly bark. Young branchlets and inflorescences covered with pale hairs. Leaves 5–25 cm long, 2.5–6.5 cm wide with upper surface hairless and glossy, and paler lower surface. Leaves have conspicuous lateral veins and numerous oil glands. Petiole 15–20 mm long. Flowers clustered and on a long stalk (10–25 mm long). Petals 7–10 mm long, white or pink. Berry 15–25 mm long, 10–15 mm wide, yellow and fleshy.

Occurs from Broken Bay, approximately 90 km north of Sydney, New South Wales, to Maryborough in Queensland. Populations are typically restricted to coastal and sub-coastal areas of low elevation however the species does occur up to c. 120 km inland in the Hunter and Clarence River catchments and along the Border Ranges in NSW.Pioneer species found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest often near creeks and drainage lines. This species is characterised being extremely susceptible to infection by Myrtle Rust. Myrtle Rust affects all plant parts.

Table 6. List of endangered plant and animal species known from the Nambucca LGA according to BIONET resources.

Amphibia	
Pouched Frog, Assa darlingtonii	V
Wallum Froglet, Crinia tinnula	V
Stuttering Frog, Mixophyes balbus	E
Giant Barred Frog, Mixophyes iteratus	E
Sphagnum Frog, Philoria sphagnicollis	V
Green and Golden Bell Frog, Litoria aurea	E
Green thighed Frog, Litoria brevipalmata	V
Reptilia	
White crowned Snake, Cacophis harrietae	V
Pale headed Snake, Hoplocephalus bitorquatus	V
Broad headed Snake, Hoplocephalus bungaroides	V
Stephens banded Snake, Hoplocephalus stephensii	V
Aves	
Blue billed Duck, Oxyura australis	V
Freckled Duck, Stictonetta naevosa	V
Woompoo Fruit Dove, Ptilinopus magnificus	V
Rose Fruit Dove, Ptilinopus regina	V
Superb Fruit Dove, Ptilinopus superbus	V
Black necked Stork, Epippiorhynchus asiaticus	E
Australasian Bittern, Botarus poiciloptilus	E
Black Bittern Ixobrychis flaviciollis	V
Spotted Harrier, Circus assimils	V
Red Goshawk, Erythrotriorchis radiatus	E
White bellied Sea Eagle, Haliaeetus leucogaster	V
Little Eagle, Hieraaetus morphnoides	V
Square tailed Kite, Loiphoictina isura	V
Eastern Osprey, Pandion cristatus	V
Comb crested Jacana, Irediparra gallinacea	V
Black- tailed Godwit, Limosa formosa	V
Glossy black Cockatoo, Calyptorrhinchus lathami	V
Little Lorikeet, Glossopsitta pusila	V
Eastern Ground Parrot, Pezoporus wallicus	V
Barking Owl, Ninox conivens	V
Powerful Owl, Ninox strenua	V
Masked Owl, Tyto novaehollandiae	V
Sooty Owl, Tyto tenebricosa	V
Rufous Scrub bird, Atrichornis rufescens	V
Brown Tree Creeper, Climateris picumnus victorea	V
Speckled Warbler, Chthonicola sagittata	V

Regent Honeyeater, Anthochaera phrygia	E
Mangrove Honeyeater, Lichenostomus fasciogularis	V
Grey Crowned Babbler, Pomatostomus temporalis	V
Varied Sitella, Daphoenositta chrysoptera	V
Barred Cuckoo-Shrike, Coracina lineata	V
Olive Whistler, Pachycephala olivaceas	V
Dusky Wood Swallow, Artamus cyanopterus	V
White eared Monarch, Cartyerornis leucotis	V
Hooded Robin, Melanodryas cucullata	V
Scarlet Robin, Petroica boodang	V
Flame Robin, Petroica phoenicea	V
Diamond Firetail, Stagonopleura guttata	V

Mammalia

Spotted Tailed Quoll, Dasyurus maculatus	V
Brush-tailed Phascogale, Phascogale tapoatafa	V
Common Planigale, Planigale maculata	V
Koala, Phascolarctos cinereus	V
Eastern Pygmy Possum, Carcartellus nanus	V
Yellow bellied Glider, Petaurus australis	V
Squirrel Glider, Petaurus norfolcensis	V
Rufous Bettong, Aepyrmnus rufescens	V
Long Nosed Potoroo, Potorus tridactylus	V
Parma Wallaby, Macropus parma	V
Brush tailed Rock Wallaby, Petrogale penicillata	V
Red legged Pademelon, Thyogale stigmatica	V
Grey headed Flying Fox, Pteropus poliocephalus	V
Common Blossom Bat, Synconyrteris australis	V
Yellow bellied Sheath tailed Bat, Saccolaemis flaviventris	V
Eastern Free Tailed Bat, Mioconomus norfolcensis	V
Large eared Pied Bat, Chalinolobus dwyeri	V
Eastern False Pipistrelle, Falsistrellus tasmaniensis	V
Southern Myotis, Myotis macropus	V
Eastern Long eared Bat, Nyctophilus bifax	V
Golden tipped Bat, Phoniscus papiuensis	V
Greater Broad nosed Bat, Scoeanax rueppellii	V
Eastern Cave Bat, Vespadelus troughtoni	V

Insecta

Black Grass Dart Butterfly, Ocybadistes knightorum	V
Southern Pink Underwing Moth, Phyllodes imperialis	V
Laced Fritillary, Argynnis hyperbius	V
Giant Dragonfly, Petalura gigantea	E

Plantae

White Flowered Wax Plant, Cynanchum elegans	E
Slender Marsdenia, Marsdenia longiloba	E
Milky Silkpod, Parsonsia dorrigoensis	V
Cryptic Forest Twiner, Tylophora woollsii	E
Stinky Lily, Tyuphonium brownii	E
Silver Sword Lily, Neoastelia spectabilis	V
Coast Groundsel, Senecio spathulatus	E
Square stemmed Spike Rush, Eleocharis tetaquetra	E
Lesser Creeping Fern, Arthropteris palkisotii	E
Guinea Flower, Hibbertia hexandra	E
Dracophyllum, Dracophyllum macrantheum	V
Sand Spurge, Chamaesyce psammogeton	E
Rainforest Cassia, Senna acclinis	E
Glycine, Glycine clandestina (broad leaf)	E
Coast Headland Pea, Pultenaea maritima	V
Silverbush, Sophora tomentosa	E
North Brother Wattle, Acacia courtii	V
Velvet Sea Berry, Haloragis exalata	V
Maundia, Maundia triglochinoides	V
Noahs False Chickweed, Lindermia alsinoides	E
Slender Screw Ferbn, Lindsaea incisa	E
Tinospora Vine, Tinospora smilacina	E
Arrow Head Vine, Tinospora linosporoides	V
Rough Barked Apple, Angophora robur	V
Bottle Brush, Callistemon linearifolius	V
Bottle Brush, Callistemon pungens	V
Craven Grey Box, Eucalyptus largeana	E
Woodland Babingtonia, Kardomia silvestris	E
Biconvex Paperbark, Melaleuca biconvexa	V
Groves Paperbark, Melaleuca groeveana	V
Scrub Turpentine, Rhodamnia rubescens	E
Native Guava, Rhodomyrtus psidioides	E
Magenta Lilly Pilly, Syzygium paniculatum	E
Tongue Orchid, Cryptostylis hunteriana	V

Key: V = Vulnerable, E = Endangered.

Table 7. EPBC Protected Matters report

Australian Government
Department of the Environment and Energy

EPBC Act Protected Matters Report

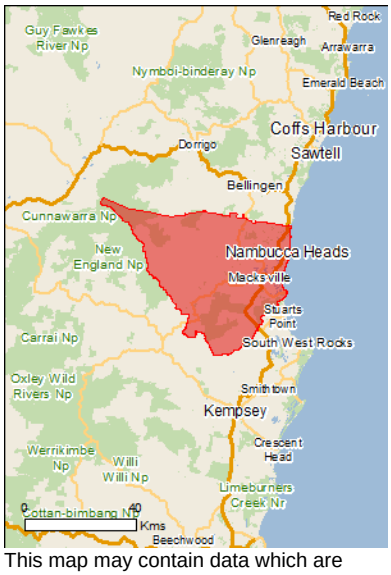
This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

LGA NAMBUCCA SHIRE COUNCIL, NSW

Report created: 03/09/20 11:21:26



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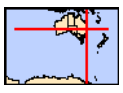

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance - see http://environment.gov.au/protection/environment-assessments

World Heritage Properties:	1
National Heritage Places:	1
Wetlands of International Significance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Threatened Ecological Communities:	5
Threatened Species:	90
Migratory Species:	63

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at http://www.environment.gov.au/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species. Information on EPBC Act permit requirements and application forms can be found at http://www.environment.gov.au/epbc/permits-and-application-forms

Commonwealth Lands:	7
Commonwealth Heritage Places:	1
Listed Marine Species:	84
Whales and Other Cetaceans:	12
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

State and Territory Reserves:	18
Regional Forest Agreements:	1
Invasive Species:	37
Nationally Important Wetlands:	1

Matters of National Environmental Significance

World Heritage Properties		[Resource Information
ame	State	Status
ondwana Rainforests of Australia	NSW	Declared property

ational Heritage Properties		[Resource Information
ame	State	Status
atural		
ondwana Rainforests of Australia	NSW	Listed place

hreatened Ecological Communities		[Resource Information

or threatened ecological communities where the distribution is well known, maps are derived from recovery ans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological mmunity distributions are less well known, existing vegetation maps and point location data are used to oduce indicative distribution maps.

ame	Status	Type of Presence
oastal Swamp Oak (Casuarina glauca) Forest of New outh Wales and South East Queensland ecological mmunity	Endangered	Community likely to occur within area
ttoral Rainforest and Coastal Vine Thickets of astern Australia	Critically Endangered	Community likely to occur within area
owland Rainforest of Subtropical Australia	Critically Endangered	Community likely to occur within area
ew England Peppermint (Eucalyptus nova-anglica) rassy Woodlands	Critically Endangered	Community may occur within area
ubtropical and Temperate Coastal Saltmarsh	Vulnerable	Community likely to occur within area

hreatened Species		[Resource Information
ame	Status	Type of Presence
RDS		
thochaera phrygia egent Honeyeater [82338]	Critically Endangered	Species or species habitat known to occur within area
richornis rufescens ufous Scrub-bird [655]	Endangered	Species or species habitat known to occur within area
otaurus poiciloptilus ustralasian Bittern [1001]	Endangered	Species or species habitat likely to occur within area
alidris canutus ed Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
alidris ferruginea urlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
omedea antipodensis ntipodean Albatross [64458]	Vulnerable	Foraging, feeding or relate behaviour likely to occur

Name	Status	Type of Presence
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Erythrotriorchis radiatus Red Goshawk [942]	Vulnerable	Species or species habitat likely to occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area
Fregetta grallaria grallaria White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Species or species habitat likely to occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area
Limosa lapponica baueri Bar-tailed Godwit (baueri), Western Alaskan Bar-tailed Godwit [86380]	Vulnerable	Species or species habitat likely to occur within area
Limosa lapponica menzbieri Northern Siberian Bar-tailed Godwit, Bar-tailed Godwit (menzbieri) [86432]	Critically Endangered	Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat likely to occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area
Pterodroma neglecta neglecta Kermadec Petrel (western) [64450]	Vulnerable	Foraging, feeding or related behaviour may occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Species or species

Name	Status	Type of Presence
		habitat may occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Species or species habitat may occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Species or species habitat may occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thinornis cucullatus cucullatus Hooded Plover (eastern), Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat may occur within area
Turnix melanogaster Black-breasted Button-quail [923]	Vulnerable	Species or species habitat may occur within area
FISH		
Epinephelus daemelii Black Rockcod, Black Cod, Saddled Rockcod [68449]	Vulnerable	Species or species habitat likely to occur within area
FROGS		
Litoria aurea Green and Golden Bell Frog [1870]	Vulnerable	Species or species habitat known to occur within area
Mixophyes balbus Stuttering Frog, Southern Barred Frog (in Victoria) [1942]	Vulnerable	Species or species habitat known to occur within area
Mixophyes iteratus Giant Barred Frog, Southern Barred Frog [1944]	Endangered	Species or species habitat known to occur within area
INSECTS		
Argynnis hyperbius inconstans Australian Fritillary [88056]	Critically Endangered	Species or species habitat may occur within area
Phyllodes imperialis smithersi Pink Underwing Moth [86084]	Endangered	Species or species habitat may occur within area
MAMMALS		
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area

Name	Status	Type of Presence
Chalinolobus dwyeri		
Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat likely to occur within area
Dasyurus maculatus maculatus (SE mainland population)		
Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat known to occur within area
Eubalaena australis		
Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area
Megaptera novaeangliae		
Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
Petauroides volans		
Greater Glider [254]	Vulnerable	Species or species habitat known to occur within area
Petrogale penicillata		
Brush-tailed Rock-wallaby [225]	Vulnerable	Species or species habitat known to occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)		
Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat known to occur within area
Potorous tridactylus tridactylus		
Long-nosed Potoroo (SE Mainland) [66645]	Vulnerable	Species or species habitat known to occur within area
Pseudomys novaehollandiae		
New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat likely to occur within area
Pseudomys oralis		
Hastings River Mouse, Koontoo [98]	Endangered	Species or species habitat likely to occur within area
Pteropus poliocephalus		
Grey-headed Flying-fox [186]	Vulnerable	Roosting known to occur within area
PLANTS		
Acronychia littoralis		
Scented Acronychia [8582]	Endangered	Species or species habitat known to occur within area
Arthraxon hispidus		
Hairy-joint Grass [9338]	Vulnerable	Species or species habitat likely to occur within area
Asperula asthenes		
Trailing Woodruff [14004]	Vulnerable	Species or species habitat may occur within area
Callistemon pungens		
[55581]	Vulnerable	Species or species habitat known to occur within area
Cryptostylis hunteriana		
Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat likely to occur within area
Cynanchum elegans		
White-flowered Wax Plant [12533]	Endangered	Species or species habitat likely to occur within area
Dichanthium setosum		
bluegrass [14159]	Vulnerable	Species or species habitat may occur within area
Diuris eborensis		
[88275]	Endangered	Species or species

Name	Status	Type of Presence
		habitat likely to occur within area
Diuris pedunculata Small Snake Orchid, Two-leaved Golden Moths, Golden Moths, Cowslip Orchid, Snake Orchid [18325]	Endangered	Species or species habitat likely to occur within area
Diuris venosa Veined Doubletail, Goat Orchid, Veined Donkey-orchid [6425]	Vulnerable	Species or species habitat may occur within area
Euphrasia arguta [4325]	Critically Endangered	Species or species habitat may occur within area
Gaultheria viridicarpa J.B.Williams subsp. viridicarpa ms. Green Waxberry [67411]	Vulnerable	Species or species habitat known to occur within area
Gingidia rupicola Mountain Angelica, Broad-leafed Carrot [86880]	Endangered	Species or species habitat likely to occur within area
Haloragis exalata subsp. velutina Tall Velvet Sea-berry [16839]	Vulnerable	Species or species habitat likely to occur within area
Hicksbeachia pinnatifolia Monkey Nut, Bopple Nut, Red Bopple, Red Bopple Nut, Red Nut, Beef Nut, Red Apple Nut, Red Boppel Nut, Ivory Silky Oak [21189]	Vulnerable	Species or species habitat known to occur within area
Macadamia integrifolia Macadamia Nut, Queensland Nut Tree, Smooth-shelled Macadamia, Bush Nut, Nut Oak [7326]	Vulnerable	Species or species habitat may occur within area
Marsdenia longiloba Clear Milkvine [2794]	Vulnerable	Species or species habitat likely to occur within area
Neoastelia spectabilis [6404]	Vulnerable	Species or species habitat likely to occur within area
Parsonsia dorrigoensis Milky Silkpod [64684]	Endangered	Species or species habitat likely to occur within area
Persicaria elatior Knotweed, Tall Knotweed [5831]	Vulnerable	Species or species habitat likely to occur within area
Phaius australis Lesser Swamp-orchid [5872]	Endangered	Species or species habitat may occur within area
Plectranthus nitidus Nightcap Plectranthus, Silver Plectranthus [55742]	Endangered	Species or species habitat may occur within area
Rhizanthella slateri Eastern Underground Orchid [11768]	Endangered	Species or species habitat may occur within area
Tasmannia glaucifolia Fragrant Pepperbush [21975]	Vulnerable	Species or species habitat known to occur within area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat known to occur within area
Tylophora woollsii [20503]	Endangered	Species or species habitat likely to occur within area

Name	Status	Type of Presence
REPTILES		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area
Coeranoscincus reticulatus Three-toed Snake-tooth Skink [59628]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding likely to occur within area
SHARKS		
Carcharias taurus (east coast population) Grey Nurse Shark (east coast population) [68751]	Critically Endangered	Species or species habitat likely to occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area

Migratory Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Migratory Marine Birds		
Anous stolidus Common Noddy [825]		Species or species habitat likely to occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area
Ardenna grisea Sooty Shearwater [82651]		Species or species habitat likely to occur within area
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat may occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Name	Threatened	Type of Presence
Diomedea sanfordi		
Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Fregata ariel		
Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area
Fregata minor		
Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat likely to occur within area
Macronectes giganteus		
Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli		
Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Phoebetria fusca		
Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area
Sternula albifrons		
Little Tern [82849]		Breeding known to occur within area
Thalassarche bulleri		
Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area
Thalassarche cauta		
Shy Albatross [89224]	Endangered	Species or species habitat may occur within area
Thalassarche eremita		
Chatham Albatross [64457]	Endangered	Species or species habitat may occur within area
Thalassarche impavida		
Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris		
Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche salvini		
Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi		
White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Migratory Marine Species		
Balaena glacialis australis		
Southern Right Whale [75529]	Endangered*	Species or species habitat likely to occur within area
Balaenoptera edeni		
Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera musculus		
Blue Whale [36]	Endangered	Species or species habitat may occur within area
Carcharodon carcharias		
White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area
Caretta caretta		
Loggerhead Turtle [1763]	Endangered	Species or species

Name	Threatened	Type of Presence
Diomedea sanfordi		
Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Fregata ariel		
Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area
Fregata minor		
Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat likely to occur within area
Macronectes giganteus		
Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli		
Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Phoebetria fusca		
Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area
Sternula albifrons		
Little Tern [82849]		Breeding known to occur within area
Thalassarche bulleri		
Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area
Thalassarche cauta		
Shy Albatross [89224]	Endangered	Species or species habitat may occur within area
Thalassarche eremita		
Chatham Albatross [64457]	Endangered	Species or species habitat may occur within area
Thalassarche impavida		
Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris		
Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche salvini		
Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi		
White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Migratory Marine Species		
Balaena glacialis australis		
Southern Right Whale [75529]	Endangered*	Species or species habitat likely to occur within area
Balaenoptera edeni		
Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera musculus		
Blue Whale [36]	Endangered	Species or species habitat may occur within area
Carcharodon carcharias		
White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area
Caretta caretta		
Loggerhead Turtle [1763]	Endangered	Species or species

Name	Threatened	Type of Presence
		habitat known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat may occur within area
Manta alfredi Reef Manta Ray, Coastal Manta Ray, Inshore Manta Ray, Prince Alfred's Ray, Resident Manta Ray [84994]		Species or species habitat may occur within area
Manta birostris Giant Manta Ray, Chevron Manta Ray, Pacific Manta Ray, Pelagic Manta Ray, Oceanic Manta Ray [84995]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding likely to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
Sousa chinensis Indo-Pacific Humpback Dolphin [50]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat known to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Monarcha trivirgatus Spectacled Monarch [610]		Species or species habitat known to occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area

Name	Threatened	Type of Presence
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Foraging, feeding or related behaviour known to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Calidris ruficollis Red-necked Stint [860]		Foraging, feeding or related behaviour known to occur within area
Charadrius bicinctus Double-banded Plover [895]		Foraging, feeding or related behaviour known to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Foraging, feeding or related behaviour known to occur within area
Gallinago megala Swinhoe's Snipe [864]		Foraging, feeding or related behaviour likely to occur within area
Gallinago stenura Pin-tailed Snipe [841]		Foraging, feeding or related behaviour likely to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Foraging, feeding or related behaviour likely to occur within area
Numenius phaeopus Whimbrel [849]		Foraging, feeding or related behaviour known to occur within area
Pandion haliaetus Osprey [952]		Breeding known to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Foraging, feeding or related behaviour known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Foraging, feeding or related behaviour known to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Name
Commonwealth Land - Australian & Overseas Telecommunications Corporation
Commonwealth Land - Australian Postal Commission
Commonwealth Land - Australian Postal Corporation
Commonwealth Land - Australian Telecommunications Commission
Commonwealth Land - Australian Telecommunications Corporation
Commonwealth Land - Defence Service Homes Corporation
Commonwealth Land - Telstra Corporation Limited

Commonwealth Heritage Places [Resource Information]

Name	State	Status
Historic		
Macksville Post Office	NSW	Listed place

Listed Marine Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos		
Common Sandpiper [59309]		Species or species habitat may occur within area
Anous stolidus		
Common Noddy [825]		Species or species habitat likely to occur within area
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba		
Great Egret, White Egret [59541]		Breeding known to occur within area
Ardea ibis		
Cattle Egret [59542]		Breeding likely to occur within area
Calidris acuminata		
Sharp-tailed Sandpiper [874]		Foraging, feeding or related behaviour known to occur within area
Calidris canutus		
Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos		
Pectoral Sandpiper [858]		Species or species habitat may occur within area
Calidris ruficollis		
Red-necked Stint [860]		Foraging, feeding or related behaviour known to occur within area
Calonectris leucomelas		
Streaked Shearwater [1077]		Species or species habitat may occur within area
Charadrius bicinctus		
Double-banded Plover [895]		Foraging, feeding or related behaviour known to occur within area

Name	Threatened	Type of Presence
Charadrius ruficapillus Red-capped Plover [881]		Foraging, feeding or related behaviour known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea gibsoni Gibson's Albatross [64466]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat likely to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Foraging, feeding or related behaviour known to occur within area
Gallinago megala Swinhoe's Snipe [864]		Foraging, feeding or related behaviour likely to occur within area
Gallinago stenura Pin-tailed Snipe [841]		Foraging, feeding or related behaviour likely to occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]		Foraging, feeding or related behaviour known to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species

Name	Threatened	Type of Presence
		habitat may occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Monarcha trivirgatus Spectacled Monarch [610]		Species or species habitat known to occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Foraging, feeding or related behaviour likely to occur within area
Numenius phaeopus Whimbrel [849]		Foraging, feeding or related behaviour known to occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat likely to occur within area
Pandion haliaetus Osprey [952]		Breeding known to occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Foraging, feeding or related behaviour known to occur within area
Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [1043]		Foraging, feeding or related behaviour likely to occur within area
Puffinus griseus Sooty Shearwater [1024]		Species or species habitat likely to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat likely to occur within area
Sterna albifrons Little Tern [813]		Breeding known to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Species or species habitat may occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Species or species

Name	Threatened	Type of Presence
		habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche sp. nov. Pacific Albatross [66511]	Vulnerable*	Species or species habitat may occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thinornis rubricollis rubricollis Hooded Plover (eastern) [66726]	Vulnerable*	Species or species habitat may occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Foraging, feeding or related behaviour known to occur within area
Fish		
Acentronura tentaculata Shortpouch Pygmy Pipehorse [66187]		Species or species habitat may occur within area
Festucalex cinctus Girdled Pipefish [66214]		Species or species habitat may occur within area
Filicampus tigris Tiger Pipefish [66217]		Species or species habitat may occur within area
Heraldia nocturna Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area
Hippichthys heptagonus Madura Pipefish, Reticulated Freshwater Pipefish [66229]		Species or species habitat may occur within area
Hippichthys penicillus Beady Pipefish, Steep-nosed Pipefish [66231]		Species or species habitat may occur within area
Hippocampus whitei White's Seahorse, Crowned Seahorse, Sydney Seahorse [66240]		Species or species habitat likely to occur within area
Histiogamphelus briggsii Crested Pipefish, Briggs' Crested Pipefish, Briggs' Pipefish [66242]		Species or species habitat may occur within area
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within

Name	Threatened	Type of Presence
		area
Solegnathus dunckeri Duncker's Pipehorse [66271]		Species or species habitat may occur within area
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area
Solenostomus cyanopterus Robust Ghostpipefish, Blue-finned Ghost Pipefish, [66183]		Species or species habitat may occur within area
Solenostomus paradoxus Ornate Ghostpipefish, Harlequin Ghost Pipefish, Ornate Ghost Pipefish [66184]		Species or species habitat may occur within area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area
Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area
Trachyrhamphus bicoarctatus Bentstick Pipefish, Bend Stick Pipefish, Short-tailed Pipefish [66280]		Species or species habitat may occur within area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
Reptiles		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area
Hydrophis elegans Elegant Seasnake [1104]		Species or species habitat may occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding likely to occur within area
Pelamis platurus Yellow-bellied Seasnake [1091]		Species or species habitat may occur within area

Whales and other Cetaceans		[Resource Information]
Name	Status	Type of Presence
Mammals		
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area

Name	Status	Type of Presence
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area
Delphinus delphis Common Dophin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area
Sousa chinensis Indo-Pacific Humpback Dolphin [50]		Species or species habitat likely to occur within area
Stenella attenuata Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area

Extra Information

State and Territory Reserves	[Resource Information]
Name	State
Bollanolla	NSW
Bowraville	NSW
Dunggir	NSW
Forestry Management Areas in Urunga (FMZ1)	NSW
Gaagal Wanggaan (South Beach)	NSW
Ganay	NSW
Gumbaynggirr	NSW
Gumbaynggirr	NSW
Gumma	NSW
Jagun	NSW
Juugawaarri	NSW
LNE Special Management Zone No1	NSW
New England	NSW
Ngambaa	NSW
Nunguu Mirral	NSW
UNE_LNE_OldGrowth	NSW
Valla	NSW
Yarriabini	NSW

Regional Forest Agreements	[Resource Information]
Note that all areas with completed RFAs have been included.	
Name	State

Name	State
North East NSW RFA	New South Wales

Invasive Species [Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit,

Name	Status	Type of Presence
Birds		
Acridotheres tristis Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Carduelis carduelis European Goldfinch [403]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Lonchura punctulata Nutmeg Mannikin [399]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Pycnonotus jocosus Red-whiskered Bulbul [631]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Frogs		
Rhinella marina Cane Toad [83218]		Species or species habitat known to occur within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Feral deer Feral deer species in Australia [85733]		Species or species habitat likely to occur within area
Lepus capensis Brown Hare [127]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species

Name	Status	Type of Presence
		habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus norvegicus Brown Rat, Norway Rat [83]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Anredera cordifolia Madeira Vine, Jalap, Lamb's-tail, Mignonette Vine, Anredera, Gulf Madeiravine, Heartleaf Madeiravine, Potato Vine [2643]		Species or species habitat likely to occur within area
Asparagus aethiopicus Asparagus Fern, Ground Asparagus, Basket Fern, Sprengi's Fern, Bushy Asparagus, Emerald Asparagus [62425]		Species or species habitat likely to occur within area
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		Species or species habitat likely to occur within area
Chrysanthemoides monilifera subsp. rotundata Bitou Bush [16332]		Species or species habitat likely to occur within area
Cytisus scoparius Broom, English Broom, Scotch Broom, Common Broom, Scottish Broom, Spanish Broom [5934]		Species or species habitat likely to occur within area
Eichhornia crassipes Water Hyacinth, Water Orchid, Nile Lily [13466]		Species or species habitat likely to occur within area
Genista sp. X Genista monspessulana Broom [67538]		Species or species habitat may occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Nassella neesiana Chilean Needle grass [67699]		Species or species habitat likely to occur within area
Nassella trichotoma Serrated Tussock, Yass River Tussock, Yass Tussock, Nassella Tussock (NZ) [18884]		Species or species habitat likely to occur within area
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within area
Rubus fruticosus aggregate Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and		Species or species

Name	Status	Type of Presence
Sterile Pussy Willow [68497]		habitat likely to occur within area
Salvinia molesta Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area
Senecio madagascariensis Fireweed, Madagascar Ragwort, Madagascar Groundsel [2624]		Species or species habitat likely to occur within area
Ulex europaeus Gorse, Furze [7693]		Species or species habitat likely to occur within area

Nationally Important Wetlands	[Resource Information]
Name	State
100 Acre Swamp	NSW

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining oigations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Appendix 2. BAM Quadrat data

BAM 1 data sheet 1 of 2

BAM Site – Field Survey Form | Site Sheet no: 1 of

		Survey Name	Zone ID	Recorders		
Date	25/7/2020	MACKSVILLE		TJ HAWKESWOOD		
Zone	Datum	Plot ID	BAM1	Plot dimensions		Photo #
Easting	Northing	IBRA region		Midline bearing from 0 m		Magnetic
Vegetation Class						Confidence: H M L
Plant Community Type	GRASSLAND (PADDOCK)			EEC: NO		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	0
	Shrubs	32
	Grasses etc.	0
	Forbs	50
	Ferns	0
	Other	0
Sum of Cover of native vascular plants by growth form group	Trees	0
	Shrubs	25.1
	Grasses etc.	0
	Forbs	5.0
	Ferns	0
	Other	0
High Threat Weed cover		5.0

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm	0	0
50 – 79 cm	0	0
30 – 49 cm	0	0
20 – 29 cm	0	0
10 – 19 cm	0	0
5 – 9 cm	0	0
< 5 cm	0	n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)	NO LOGS	

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)	50 40 50 60 50	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0
Average of the 5 subplots	50.0	0.0	0.0	0.0

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)	3	0	
Cultivation (inc. pasture)	3	0	
Soil erosion			
Firewood / CWD removal	3	0	
Grazing (identify native/stock)	3	0	
Fire damage			
Storm damage			
Weediness	3	0	
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

BAM 1 data sheet 2 of 2

400 m² plot: Sheet _ of _	Survey Name	Plot Identifier	Recorders
Date 25/7/2020	MACKSVILLE	BAM 1	T J HAWKESWOOD

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
T	1	CINNAMOMUM CAMPHORA		10	4		
S	2	ALSTONIA EXCELSA		0.1	1		
S	3	CINNAMOMUM CAMPHORA		10	21		
S	4	LANTANA CAMARA	HTE	5.0	4		
S	5	HIBBERTIA SCANDENS		3	2		
S	6	ZIERIA SMITHII		2	4		
S	7	GOMPHOCARPUS FRUTICOSUS		2	6		
S	8	RUBUS FRUTICOSUS		10	22		
S	9	LYCIUM FEROCISSIMUM		2	1		
S	10	ACACIA PRODUCTA		5	4		
S	11	SYZYGIUM SP.		6	9		
S	12	SIDA RHOMBIFOLIA		0.5	1		
S	13	SOLANUM MAURITIANUM		3	7		
S	14	FICUS SP.		4	6		
S	15	HARDENBERGIA VIOLACEA		1.0	2		
S	16	PARSONSIA STRAMINEA		3	4		
S	17	KENNEDIA RUBICUNDA		1	1		
F	18	HYPOCHAERIS RADICATA		25	600		
F	19	PRATIA PURPURASCENS		5	50		
F	20	OXALIS SP.		5	50		
F	21	RANUNCULUS SP.		2	10		
F	22	CYPERUS SP.		0.1	2		
~~F~~	~~23~~	~~OXALIS SP.~~		~~5~~	~~50~~		
G	24	ANDROPOGON VIRGINICUS		25	100		
G	25	PENNISETUM CLANDESTINUM		50	500		
	26						
	27						
	28						
	29						
	30						
	31						
	32						
	33						
	34						
	35						
	36						
	37						
	38						
	39						
	40						

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 2 data sheet 1 of 2

BAM Site – Field Survey Form | Site Sheet no: 1 of

		Survey Name	Zone ID	Recorders			
Date	25/7/2022	MACKSVILLE		T.J.HAWKESWOOD			
Zone	Datum	Plot ID	BAM2	Plot dimensions		Photo #	
Easting	Northing	IBRA region		Midline bearing from 0 m		Magnetic	
Vegetation Class						Confidence: H M L	
Plant Community Type	GRASSLAND			EEC: NO		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	0
	Shrubs	0
	Grasses etc.	0
	Forbs	0
	Ferns	0
	Other	0
Sum of Cover of native vascular plants by growth form group	Trees	0
	Shrubs	0
	Grasses etc.	0
	Forbs	0
	Ferns	0
	Other	0
High Threat Weed cover		50

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm	0	0
50 – 79 cm	0	0
30 – 49 cm	0	0
20 – 29 cm	0	0
10 – 19 cm	0	0
5 – 9 cm	0	0
< 5 cm	0	n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)	0	Tally space

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)	60 60 60 10 10	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0
Average of the 5 subplots	40.0	0.0	0.0	0.0

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)	3	0	
Cultivation (inc. pasture)	3	0	
Soil erosion			
Firewood / CWD removal	3	0	
Grazing (identify native/stock)	3	0	
Fire damage			
Storm damage			
Weediness	3	0	
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

BAM 2 data sheet 2 of 2

400 m² plot: Sheet _ of _	Survey Name	Plot Identifier	Recorders
Date 25/11/2020	MACKSVILLE	BAM 2	T.J. HAWKESWOOD

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
S	1 CINNAMOMUM CAMPHORA	[redacted]	0.5	1		—
F	2 SENECIO MADAGASCARIENSIS		50	200		—
F	3 CYPERUS SP.		10	25		
F	4 HYPOCALYMMA ANGUSTIFOLIUM		1	4		
F	5 PASPALUM VULCANUM		0.1	1		
F	6 ASTER SUBULATUS		0.1	1		
G	7 PASPALUM DILATATUM		0.1	1		
G	8 PASPALUM SP.		80	500		
G	9 PENNISETUM CLANDESTINUM		0.1	1		
	10					
	11					
	12					
	13					
	14					
	15					
	16					
	17					
	18					
	19					
	20					
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	35					
	36					
	37					
	38					
	39					
	40					

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, ...

Species	Common Name	BAM	Quadrat Number 1	2
Acacia floribunda	Wattle	*	-	
Alphitonia excelsa	Red Ash	*	-	
*Andropogon virginicus	Whisky Grass	*	-	
*Aster subulatus	Daisy	-	*	
*Cinnamomum camphora	Camphor Laurel	*	-	
*Cirsium vulgare	Thistle	*	*	
*Cyperus sp.	Sedge	-	*	
Ficus sp.	Fig	*	-	
*Gomphocarpus fruticosus	Milk Weed	*	-	
Hibbertia scandens	Guinea Flower	*	-	
Hardenbergia violacea	Native Sarsparilla	*	-	
*Hypochoeris radicata	Boneseed	*	-	
Kennedia rubicunda	Kennedia	*	-	
*Lantana camnara	Lantana	*	-	
*Lycium ferocissimum	Thornbush	*	-	
*Oxalis sp.	Oxalis	*	-	
Parsonsia straminea	Parsoonsia	*	-	
*Paspalum urvillei	Paspalum Grass	-	*	
*Paspalum sp.	Paspalum	-	*	
*Pennisetum clandestinum	Buffalo Grass	*	*	
Pratia purpurascens	Pratia	*	-	
*Ranunculus sp,	Ranunculus	*	-	
*Rubus fruticosus	Blackberry	*	-	
*Senecio madagascariensis	Fireweed	-	*	
*Solanum mauritianum	Solanum	*	-	
Syzygium sp.	Lilly Pilly	*	-	
Zieria smithii	Zieria	*	-	

Appendix 3. Plans and Photographs

Fig. 1. Aerial view of the subject property of 24 Coronation Road, Congarinni North, New South Wales.

Fig. 2. Landscape context of 24 Coronation Road, Congarinni North. NSW.

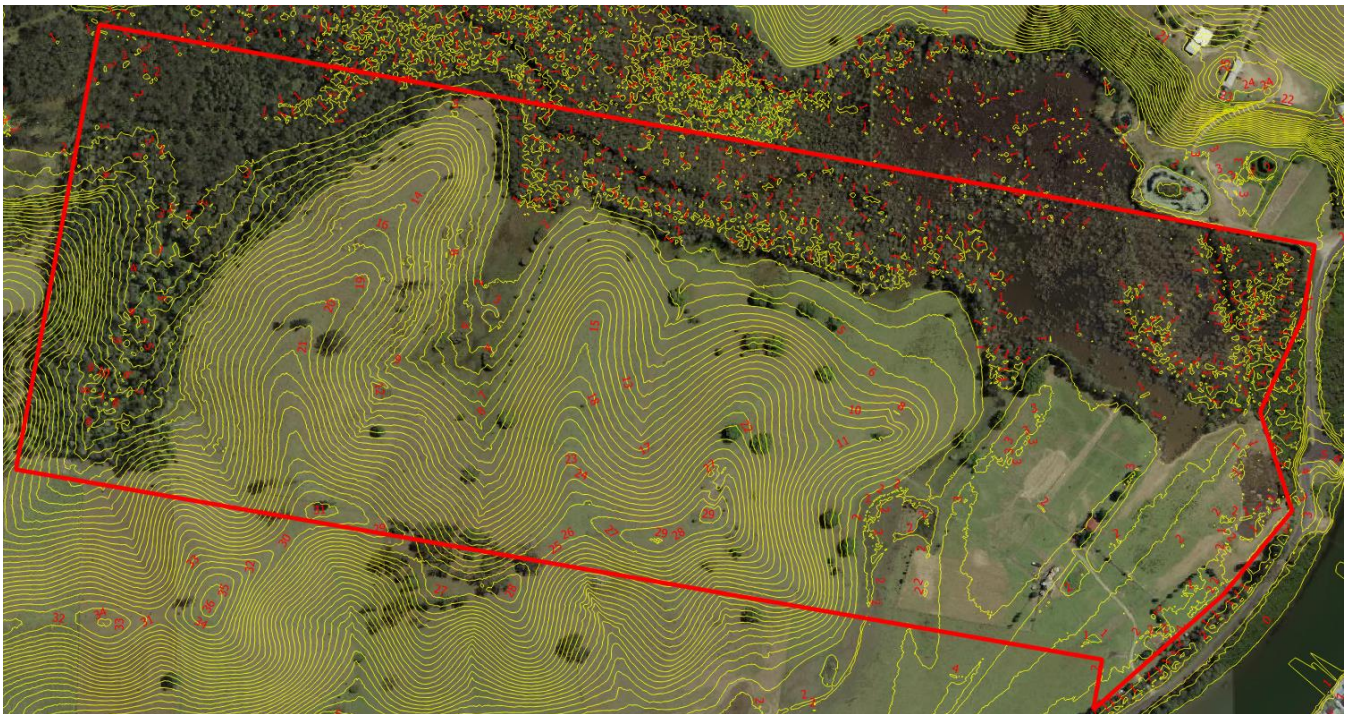

Fig. 3. One metre contours of 24 Coronation Road, Congarinni North. NSW. (Google Maps).

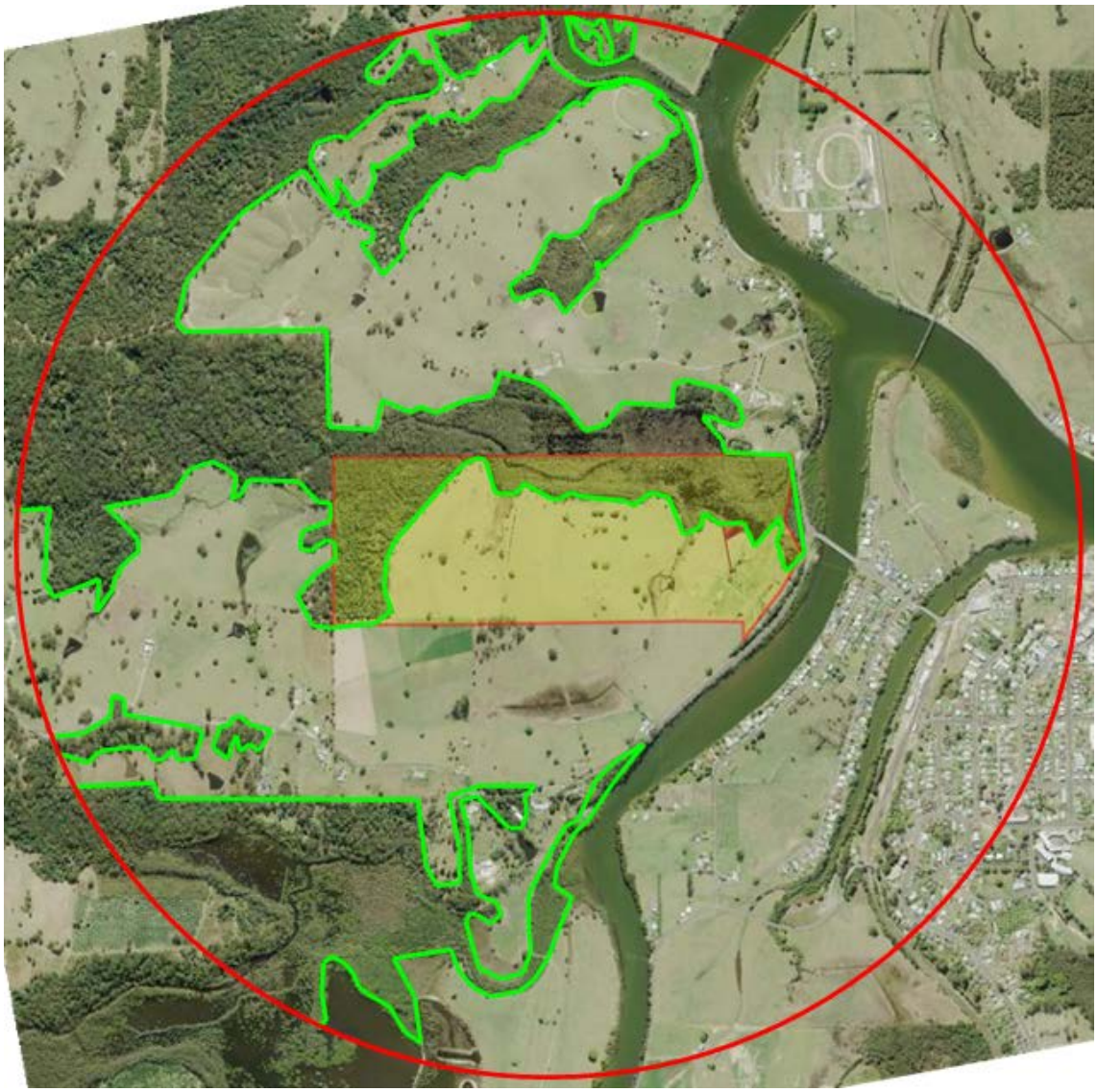

Fig. 4. Connectivity of native vegetation within 1,500m surrounding the proposed development footprint

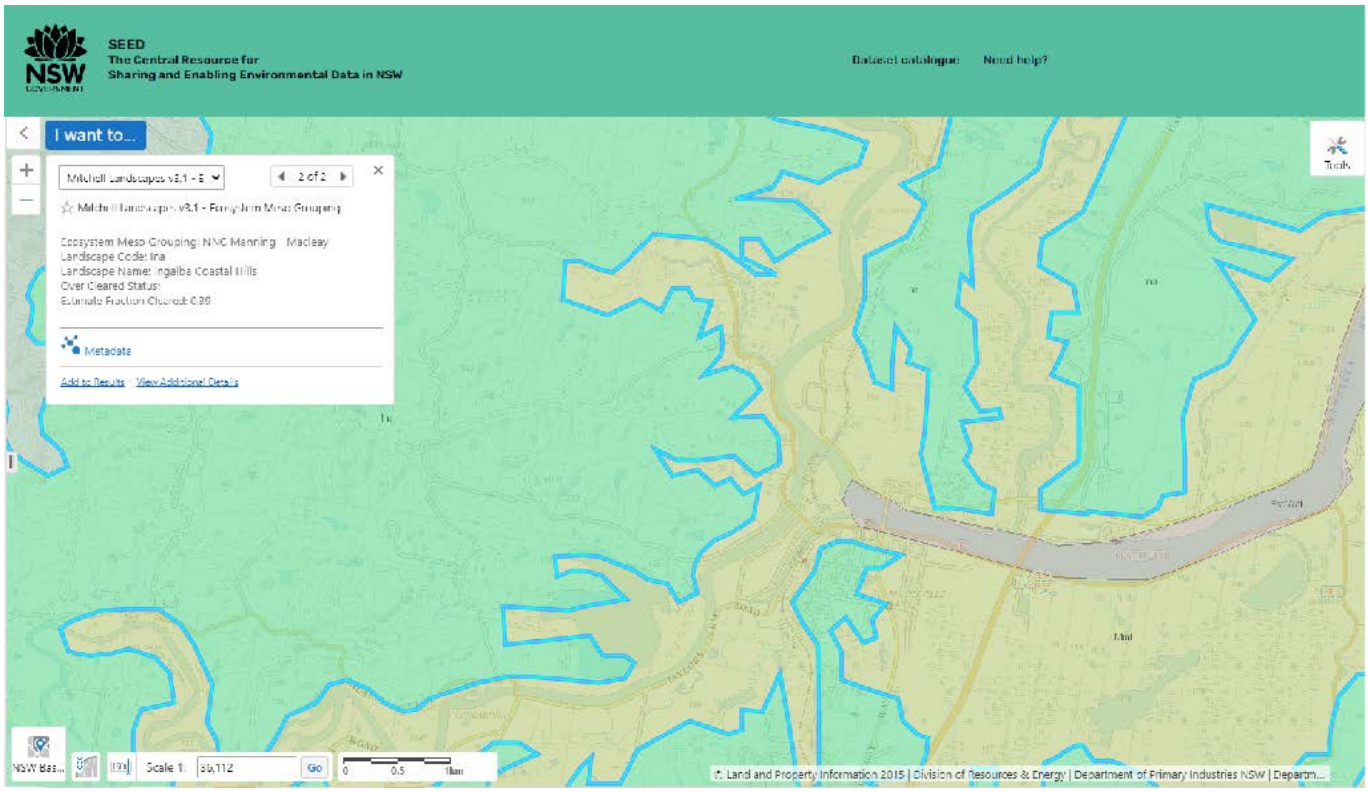

Fig. 5. SEED Mitchell Landscape for the site. .

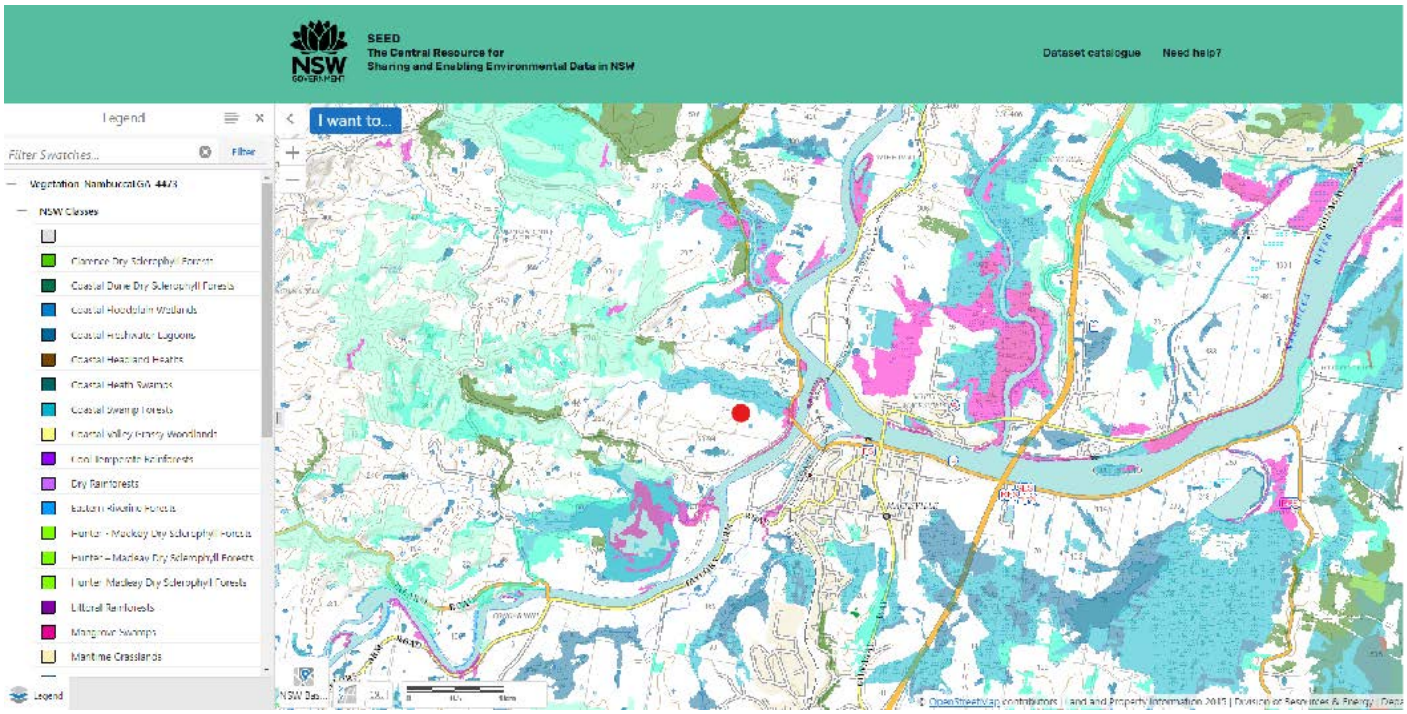

Fig. 6. SEED Nambucca Vegetation.

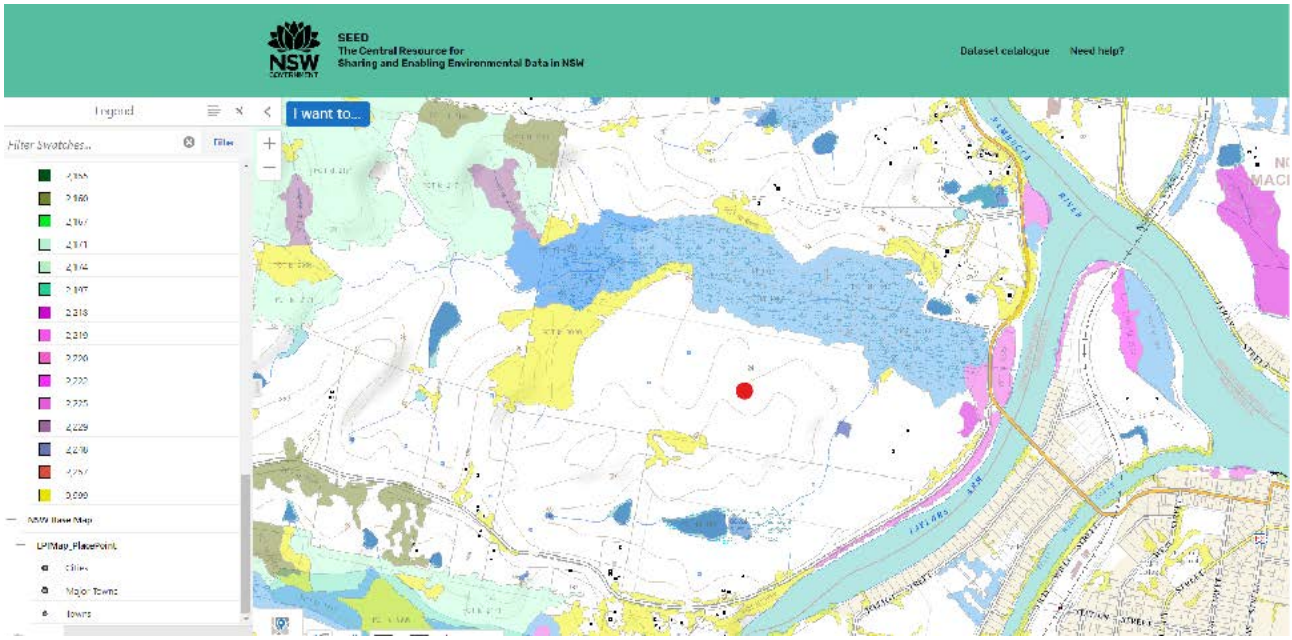

Fig. 7. SEED Macksville Vegetation surrounding 24 Coronation Drive, Congarinni North, NSW.

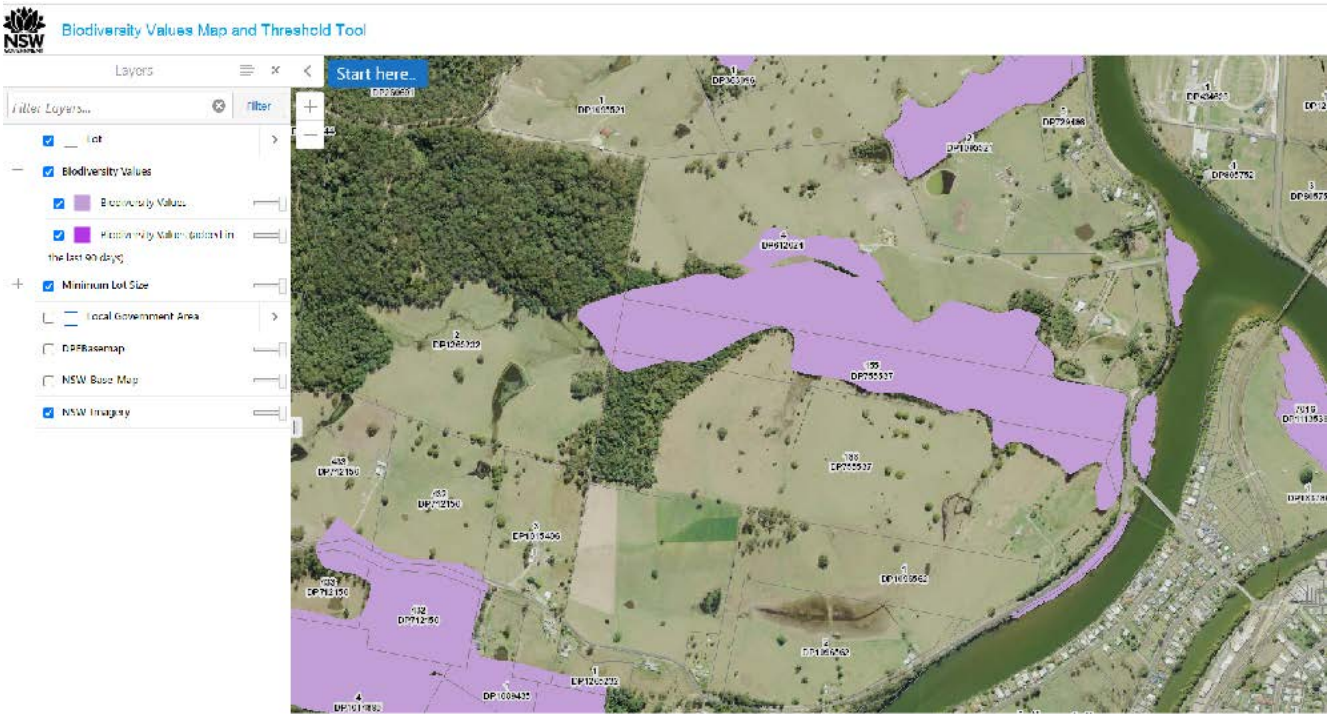

Fig. 8. Biodiversity Values Map, 24 Coronation Drive, Congarinni North, NSW.

Fig. 9. Location of walking and meandering transects throughout proposed development footprint.

Fig. 10. Location of quadrats (1 and 2) (rectangles) and anabat positions (A1, A2 and A3) throughout the survey.

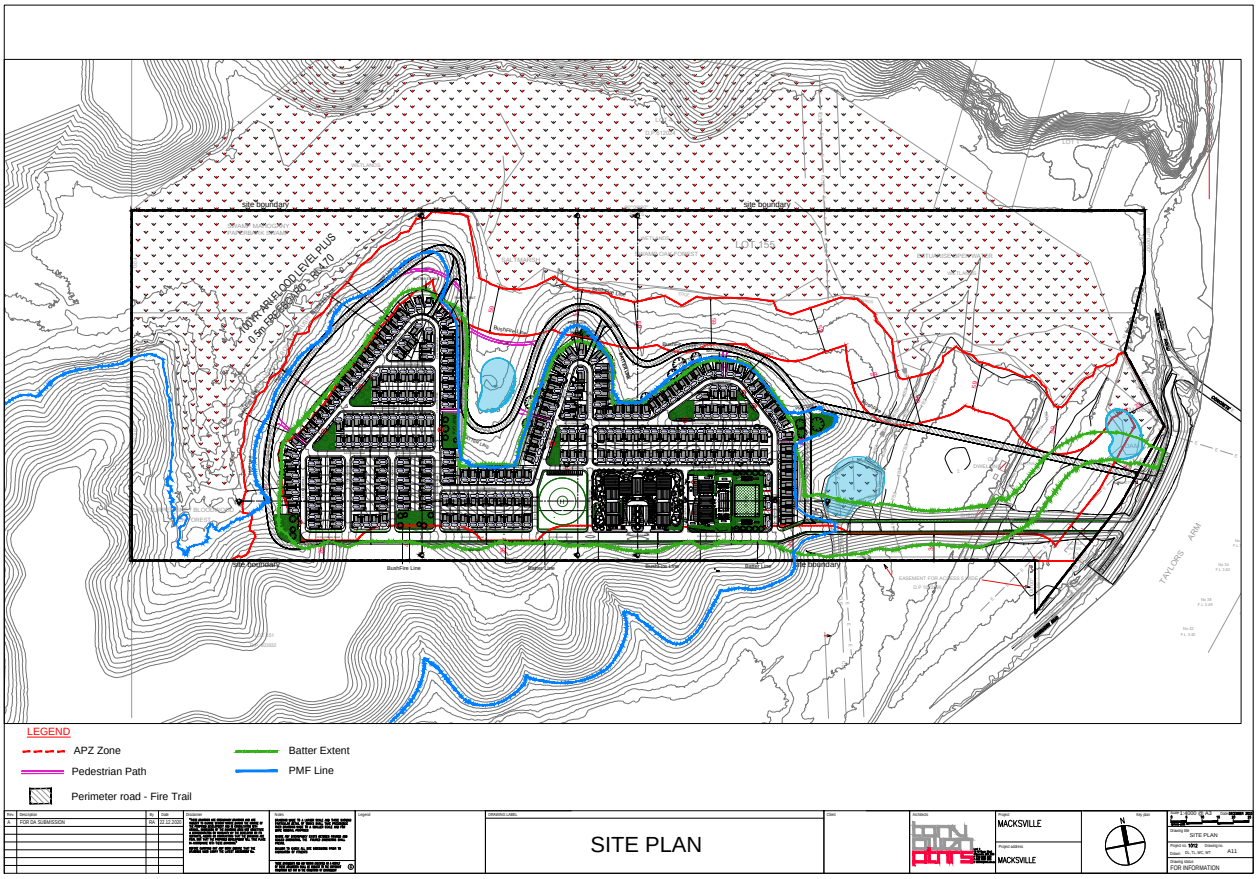

Fig. 11. Masterplan indicating 276 lots.

Appendix 4. BAM Summary Reports

BAM Credit Summary Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00023260/BAAS18160/20/00023277	Macksville North Congarinni	07/12/2020
Assessor Name	Report Created	BAM Data version *
Trevor John Hawkeswood	08/12/2020	34
Assessor Number	BAM Case Status	Date Finalised
BAAS18160	Open	To be finalised
Assessment Revision	Assessment Type	BOS entry trigger
0	Part 4 Developments (General)	BOS Threshold: Area clearing threshold

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Ecosystem credits for plant communities types (PCT), ecological communities & threatened species habitat

Zone	Vegetation zone name	TEC name	Current Vegetation integrity score	Change in Vegetation integrity (loss / gain)	Area (ha)	BC Act Listing status	EPBC Act listing status	Species sensitivity to gain class (for BRW)	Biodiversity risk weighting	Potential SAII	Ecosystem credits
Lilly Pilly - Sandpaper Fig - Prickly-leaved Tea Tree warm temperate rainforest of the Central Coast and lower Hunter Valley											
1	1522_Class name1	Not a TEC	15.3	15.3	50			Low Sensitivity to Potential Gain	1.00		0
										Subtotal	**0**
										Total	**0**

Biodiversity payment summary report

Assessment Id	Payment data version	Assessment Revision	Report created
00023260/BAAS18160/20/00023277		0	08/12/2020

Assessor Name	Assessor Number	Proposal Name	BAM Case Status
Trevor John Hawkeswood	BAAS18160	Macksville North Congarinni	Open

Assessment Type	Date Finalised	BOS entry trigger
Part 4 Developments (General)	To be finalised	BOS Threshold: Area clearing threshold

PCT list

Price calculated	PCT common name	Credits
Yes	**1522 -** Lilly Pilly - Sandpaper Fig - Prickly-leaved Tea Tree warm temperate rainforest of the Central Coast and lower Hunter Valley	0

Species list

Price calculated	Species	Credits

Ecosystem credits for plant communities types (PCT), ecological communities & threatened species habitat

BAM Biodiversity Credit Report (Variations)

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00023260/BAAS18160/20/00023277	Macksville North Congarinni	07/12/2020
Assessor Name	Assessor Number	BAM Data version *
Trevor John Hawkeswood	BAAS18160	34
Proponent Name(s)	Report Created	BAM Case Status
	08/12/2020	Open
Assessment Revision	Assessment Type	Date Finalised
0	Part 4 Developments (General)	To be finalised
BOS entry trigger	* 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.	
BOS Threshold: Area clearing threshold		

Potential Serious and Irreversible Impacts

Name of threatened ecological community	Listing status	Name of Plant Community Type/ID
Nil		

Species
Nil

Additional Information for Approval

PCTs With Customized Benchmarks

PCT
No Changes

Predicted Threatened Species Not On Site

BAM Calculator

App last updated: 22/10/2020 11:00 (Version: 1.3.0.00)
BAM data last updated *: 7/12/2020 (Version: 34) * Disclaimer ()

OPEN | SAVE | SAVE AS NEW VERSION | CANCEL | DELETE | FINALISE | PRINT - | LOGOUT

00023260/BAAS18160/20/00023277 / Revision: 0

1. Assessment details () | 2. Site context () | 3. Vegetation () | 4. Habitat suitability: Predicted () | 5. Habitat suitability: Candidate () | 6. Habitat survey () | 7. Credits () | 8. Credit classes () | 9. Price ()

All fields marked with an asterisk (*) are mandatory

Plant community types (PCT) & ecological communities

Formation *	Class *	Plant community type *	PCT % cleared	Associated TEC *	BC Act listing status	EPBC Act listing status	Action	Delete
Rainforests	Northern Warm Temperate Rainforests	**1522** - Lilly Pilly - Sandpaper Fig - Prickly-leaved Tea Tree warm temperate rainforest of the Central Coast and lower Hunter Valley	19	Not a TEC			ADD VEG ZONE Modify default benchmarks	

ADD ANOTHER PCT | SEARCH PCT OUTSIDE IBRA

IMPORT SITE | Vegetation zones (Current vegetation integrity score)

#	Import	PCT code	Condition class *	Vegetation zone name	Patch Size*	Area (ha)*	Location *	Composition condition score	Structure condition score	Function condition score	Current vegetation integrity score	Management zones	Delete
1		1522	Classname1	1522_Classname1	0	50		29.5	8.8	13.8	15.3		

Vegetation zones (Future vegetation integrity score)

#	PCT code	Condition class	Vegetation zone name	Patch Size	Management zone	Area (ha)	Composition condition score	Structure condition score	Function condition score	Vegetation integrity (VI) score	Change in VI score	Total VI loss
1	1522	Classname1	1522_Classname1	0		50	0	0	0	0	-15.3	-15.3

CLEAR | NEXT

BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id 00023260/BAAS18160/20/00023277	Proposal Name Macksville North Congarinni	BAM data last updated * 07/12/2020
Assessor Name Trevor John Hawkeswood	Assessor Number BAAS18160	BAM Data version * 34
Proponent Names	Report Created 08/12/2020	BAM Case Status Open
Assessment Revision 0	Assessment Type Part 4 Developments (General)	Date Finalised To be finalised
BOS entry trigger BOS Threshold: Area clearing threshold	* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.	

Potential Serious and Irreversible Impacts

Name of threatened ecological community	Listing status	Name of Plant Community Type/ID
Nil		

Species
Nil

Additional Information for Approval

BAM Candidate Species Report

Proposal Details

Assessment Id 00023260/BAAS18160/20/00023277	Proposal Name Macksville North Congarinni	BAM data last updated * 07/12/2020
Assessor Name Trevor John Hawkeswood	Report Created 08/12/2020	BAM Data version * 34
Assessor Number BAAS18160	Assessment Type Part 4 Developments (General)	BAM Case Status Open
Assessment Revision 0	Date Finalised To be finalised	BOS entry trigger BOS Threshold: Area clearing threshold

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

List of Species Requiring Survey

Name	Presence	Survey Months

Threatened species assessed as not on site

Refer to BAR for detailed justification

Common name	Scientific name	Justification in the BAM-C
Giant Barred Frog	Mixophyes iteratus	Refer to BAR
Green-thighed Frog	Litoria brevipalmata	Refer to BAR
Native Guava	Rhodomyrtus psidioides	Refer to BAR
Scrub Turpentine	Rhodamnia rubescens	Refer to BAR
White-flowered Wax Plant	Cynanchum elegans	Refer to BAR

BAM Predicted Species Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00023260/BAAS18160/20/00023277	Macksville North Congarinni	07/12/2020
Assessor Name	Report Created	BAM Data version *
Trevor John Hawkeswood	08/12/2020	34
Assessor Number	Assessment Type	BAM Case Status
BAAS18160	Part 4 Developments (General)	Open
Assessment Revision	BOS entry trigger	Date Finalised
0	BOS Threshold: Area clearing threshold	To be finalised

* 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.

Threatened species reliably predicted to utilise the site. No surveys are required for these species. Ecosystem credits apply to these species.

Common Name	Scientific Name	Vegetation Types(s)

Threatened species assessed as not within the vegetation zone(s) for the PCT(s)

Common Name	Scientific Name	Plant Community Type(s)
Spotted-tailed Quoll	Dasyurus maculatus	1522-Lilly Pilly - Sandpaper Fig - Prickly-leaved Tea Tree warm temperate rainforest of the Central Coast and lower Hunter Valley
Superb Fruit-Dove	Ptilinopus superbus	1522-Lilly Pilly - Sandpaper Fig - Prickly-leaved Tea Tree warm temperate rainforest of the Central Coast and lower Hunter Valley

Threatened species assessed as not within the vegetation zone(s) for the PCT(s)

Refer to BAR for detailed justification

Common Name	Scientific Name	Justification in the BAM-C
Spotted-tailed Quoll	Dasyurus maculatus	Refer to BAR
Superb Fruit-Dove	Ptilinopus superbus	Refer to BAR