BENNELL & ASSOCIATES

Urban planning and environmental architecture

Rick Bennell
BTP, Grd.Dip.Env.Std., M.PIA

Fiona Bennell
B.Sc.(Arch), B.Arch.,
M.Des.Sc., (en.cons.)

38 Ocean View Road,
Arrawarra Headland NSW 2456

M 0431 617 436
T 02 6654 0737
F 02 6654 0737
E rick@bennells.com.au
E fiona@bennells.com.au

ABN 76412429885

Report: **Planning Proposal**

Proposal: Rezoning of the land to R2 Low Density Residential

Property: Lot 1 DP 417132, Mullaway Drive, Mullaway

Owners: Amarjit Singh More, Jagiro Mann and Jagtar Singh Mann

Author: Bennell & Associates

Date: 23 June 2014

Contents

Figures

Appendices

Section 1

Summary

Bennell and Associates has been engaged by Messer's Amarjit Singh More, Jagiro Mann and Jagtar Singh Mann to prepare this Planning Proposal Report in support of the rezoning of the subject land to R2 Low Density Housing to allow the land to be subdivided into 23 allotments and developed for detached dwellings.

The subject land is almost rectangular in shape and supports a single dwelling house, a small dam, cleared grasslands and scattered trees. The land has been used for the grazing of horses for close to 20 years. The real property description of the land is Lot 1, DP417132 and the land has an area of 3.122 hectares. The land is relatively flat and has an extensive frontage to Mullaway Drive of over 400m.

Part of the land was identified as a site for a future sports field and subsequently zoned 6A Open Space (Public Recreation) under Coffs Harbour City Local Environmental Plan 2000. The land has since been zoned part 'RU2 Rural Landscape' and part 'RE1 Public Recreation' under Coffs Harbour LEP 2013. That part of the land zoned for open space purposes was considered in the preparation of the 2010 Open Space Strategy wherein it was found that the land was not of a suitable size or configuration to achieve a sports field without significant incursion into the adjacent National Parks and Wildlife Service (NPWS) holding. The land is not suitable and is no longer required for a sports field and the current zoning for this purpose is inappropriate.

Concept Development Plan

The Coffs Harbour City Council Our Living City (OLC) Settlement Strategy to guide urban development in the LGA for the next 23 years nominated those parts of the subject land outside of the open space zone as an investigation area for residential purposes for release after 2016. The land was nominated for long term release, instead of short or medium term release, because of concerns over the traffic and safety issues associated with the old Pacific Highway (now the Solitary Islands Way). The Pacific Highway now bypasses Mullaway and the Solitary Islands Way is effectively a collector road. Safe ingress and egress is available from the Solitary Islands Way to Mullaway Drive and this impediment to the release of land has been removed. Nevertheless, allowing for rezoning and development lead times, it is expected that the land will be not available for housing development in until 2016.

The Planning Proposal is for the rezoning of the land to 'R2 Low Density Residential' in keeping with the zoning applying to the adjoining land. The proposed rezoning is to allow the development of the land as shown in the concept development plan. Whilst the R2 zone allows a wide range of uses compatible with a low density housing environment, the most likely development of the land, and indeed the owner's intention, is for detached housing development upon the land.

The concept plan envisages the development of the land for 23 Torrens title allotments with each allotment having an area in excess of 1000m2. A fire trail is proposed to be provided and dedicated to Council as public land along the bushland interface. The area to be dedicated will include some bushland areas that extend into the property and beyond the existing fence line. A 30m asset protection zone (bushfire buffer) is available to all allotments. The proposed concept layout has been designed to protect the existing trees on the land; the rezoning does not necessitate the removal of any trees on the land.

The proposal presents an opportunity to provide street trees and to extend the off road cycleway along Mullaway Drive to connect with the existing off road cycleway in Arrawarra Road; this is particularly important for the safety of children accessing Mullaway Primary School.

The subject land is free of prohibiting constraints and adjoins land zoned for residential purposes. The land can be serviced with reticulated water and sewer and has direct, safe access to Mullaway Drive. The proposal represents a logical extension of the residential zone and will provide for additional housing stock in an area with limited supply. The proposal also represents a better outcome from an ecological and land use conflict point of view than the use of the land for a sports field as originally envisaged; adequate sports fields are available in the district to service the local population.

The land adjoins an important bushland reserve and is subject to bushfire hazard. The land is of sufficient area to allow for the provision of adequate fire buffers and a fire trail that can provide for emergency access in the case of a fire and will also provide a demarcation between the bushland and the residential area to help reduce impacts upon the bushland. This report recommends other measures to reduce impacts upon the ecology of the area and to maintain water quality.

The proposal will provide for a contribution of over $500,000.00 to community services and facilities and will provide for a significant boost to the local economy through housing construction and development of the land. The proposal will provide an overall socio- economic benefit to the local community.

The proposal is in keeping with Council's settlement strategy which provides for ecologically sustainable human settlement and provides for a logical extension of the Mullaway Village and is worthy of Council's support.

Section 2

Introduction

Bennell and Associates has been engaged by the owners of the land (Amarjit Singh More, Jagiro Mann and Jagtar Singh Mann) to prepare this Planning Proposal Report in support of the rezoning of the land to R2Low Density Housing. The subject land and the locality are shown in Figures 1 and 2 below.

Figure 1: Locality (source CHCC GIS)

Figure 2: Subject Land (source CHCC GIS)

2.1 Background:

The subject land is almost rectangular in shape and supports a single dwelling house, a small dam, cleared grasslands and forested lands. The existing dwelling house is a single storey brick dwelling with an access driveway to Arrawarra Road and Mullaway Drive. The cleared lands have been used for the grazing of horses for close to 20 years. The real property description of the land is Lot 1, DP417132 and the land has an area of 3.11 hectares; Appendix A includes a Survey Plan by Blair Lanskey Russel Surveyors. The land has an extensive frontage of approximately 408m to Mullaway Drive and a frontage of 81m to Arrawarra Road. The land has an average depth of approximately 75m and has a gradual fall from west (33m Australian Height Datum (AHD)) to east (12m AHD) and a cross fall from the front (i.e. south) of the site to the rear (i.e. north).

The land was zoned 'Rural 1(b) Secondary Agriculture' under Coffs Harbour Local Environmental Plan (LEP) 1988. Following approaches to Coffs Harbour City Council from the local community of Mullaway and Arrawarra and development of Council's Open Space Needs Study, part of the land was identified as a site for a future sports field and subsequently zoned 6A Open Space (Public Recreation) under Coffs Harbour City Local Environmental Plan 2000. The land has since been zoned part 'RU2 Rural Landscape' and part 'RE1 Public Recreation' under Coffs Harbour LEP 2013.

In 2008 Coffs Harbour City Council prepared the Our Living City (OLC) Settlement Strategy to guide urban development in the LGA for the next 23 years; this Strategy is an update of the earlier 1996 Urban Development Strategy. The OLC Settlement Strategy was prepared to meet the obligations for urban release strategies under the North Coast Regional Environmental Plan. The OLC Settlement Strategy nominates areas to be zoned or investigated for urban and rural residential purposes. The OLC Settlement Strategy nominated those parts of the subject land outside of the open space zone as an "investigation area for residential purposes. The land was identified as a 'Long Term' priority to be released after 2016.

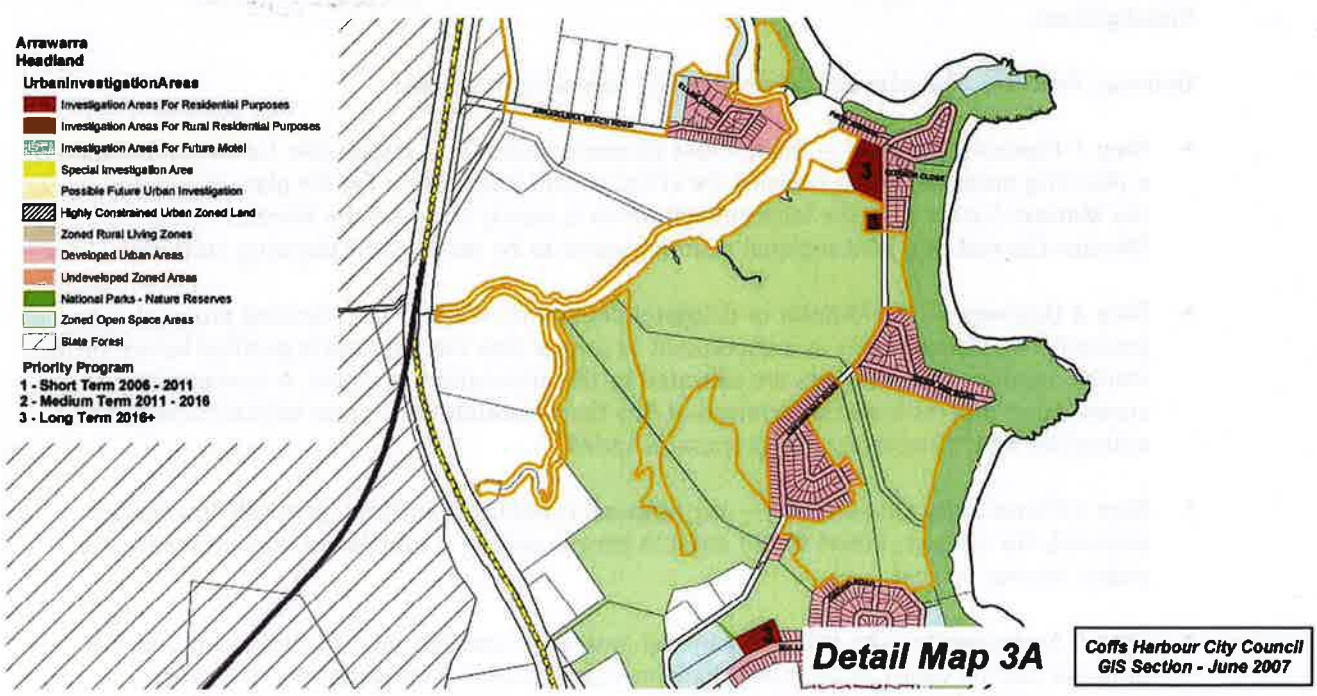


Figure 3: Extract from 2008 OLC Settlement Strategy

The land was nominated for long term rerelease because of concerns over the traffic and safety issues associated with the old Pacific Highway (now the Solitary Islands Way). The Pacific Highway now bypasses Mullaway and the Solitary Islands Way (old Pacific Highway) is effectively a collector road. Safe ingress and egress is available from the Solitary Islands Way to Mullaway Drive and this impediment to the release of land has been removed.

That part of the land zoned for open space purposes was considered in the preparation of the 2010 Open Space Strategy wherein it was found that the land was not of a suitable size or configuration to achieve a sports field without significant incursion into the adjacent National Parks and Wildlife Service (NPWS) holding.

A meeting was held with Council officers on 8 October 2013 to discuss the possible rezoning of the land and it was agreed that the most appropriate way forward is to prepare a Planning Proposal for the rezoning of the land for low density housing. Council noted that neither Council nor the NPWS would be willing to inherit management of any future asset protection zones required as part of the development of the land for housing.

2.2 Planning Proposal Process

A gateway determination is issued by the Minister for Planning (or delegate) and specifies whether a planning proposal is to proceed and, if so, in what circumstances (Environmental Planning and Assessment Act, 1979 (EP&A Act 1979) - Section 56).

The purpose of the gateway determination is to ensure there is sufficient justification early in the process to proceed with a planning proposal. The gateway determination is a checkpoint for planning proposals before significant resources are committed to carrying out technical studies and investigations.

Gateway Process: The gateway process has the following five steps:

- **Step 1 Planning proposal** – the relevant planning authority is responsible for the preparation of a planning proposal, which explains the effect of and justification for the plan. If initiated by the Minister (rather than the local council which is mostly the case) the Minister can appoint the Director-General or a joint regional planning panel to be the relevant planning authority.

- **Step 2 Gateway** – The Minister or delegate) determines whether the planning proposal is to proceed. This Gateway acts as a checkpoint to ensure that the proposal is justified before further studies are done and resources are allocated to the preparation of a plan. A community consultation process is also determined at this time. Consultations occur with relevant public authorities and, if necessary, the proposal is varied.

- **Step 3 Community consultation** – the proposal is publicly exhibited (generally low impact proposals for 14 days, others for 28 days). A person making a submission may also request a public hearing be held.

- **Step 4 Assessment** – The relevant planning authority considers public submissions and the proposal may be varied as necessary. Parliamentary Counsel then prepares a draft local environmental plan – the legal instrument.

- **Step 5 Decision** – With the Minister's (or delegate's) approval the plan becomes law.

2.3 Scope of Report

This report provides for the information with respect to Step 1 and provides an outline of the proposal, a justification of the proposal and deals with the matters that are required to be addressed by Council. The structure of the report is as follows:

The Proposal

- Objectives
- Intended outcomes
- Planning proposal

Local Strategies

- Our Living City Settlement Strategy
- Local Environmental Plan
- Development Control Plans
- Contribution Plans

State and Regional Policies, Ministerial Directions

- Mid North Coast Regional Strategy;
- North Coast Regional Environmental Plan;
- State Environmental Planning Policies;
- NSW Coastal Policy; and
- Ministerial Directions

Environmental Impacts

- Flora and fauna/biodiversity;
- Visual amenity and Urban Design;
- Geotechnics, slope and contaminated land;
- Potential acid sulphate soils;
- Bushfire risk; and
- Archaeology.

Urban Capability Assessment

- Hydrology (i.e. flooding, water quality and groundwater);
- Traffic network and access (e.g. pedestrian and cycleway access, public transport); and
- Water and sewer supply.

Other Issues

- Land use conflicts;
- Consultation; and
- Commonwealth interests.

Section 3

The Proposal

3.1 Objectives

The objectives of this planning proposal are:

- To provide for the development of the land for low density housing in keeping with the land's environmental and servicing capacity;
- To help provide for the future housing needs of the locality;
- To ensure the development of the land can be provided in a cost effective manner and in keeping with Coffs harbour City Council's growth management Strategy; and
- To enable the protection of the land's biodiversity.

3.2 Intended Outcomes

The intended outcomes from the rezoning are:

- The development of the land for low density housing that adds 22 dwellings to the housing supply in the Mullaway and Arrawarra locality;
- A rezoning that removes the cost burden to the community of acquiring land that is no longer needed for open space purposes;
- A development that provides the impetus for an extension to the off road cycle way network;
- A neutral impact in terms of water management, flora and fauna and a beneficial impact in terms of urban design and good strategic planning;
- A new development upon the land that meets the best practice measures in relation to environmental hazards;
- The creation of jobs during subdivision and housing construction and investment from household expenditure after construction and contribution of over $500,000.00 to community services and facilities;
- The development of a low density housing estate that is in keeping with Council's design excellence criteria and that makes a positive contribution to the settlement pattern and urban form of the Arrawarra and Mullaway locality; and
- Protection of the biodiversity values of the land.

3.3 Planning Proposal

The land is currently zoned part 'RU2 Rural Landscape' and part RE1 Public Recreation under Coffs Harbour Local Environmental Plan (LEP) 2013 as shown in Figure 4 below. Refer to land use tables below for the permitted and prohibited uses.

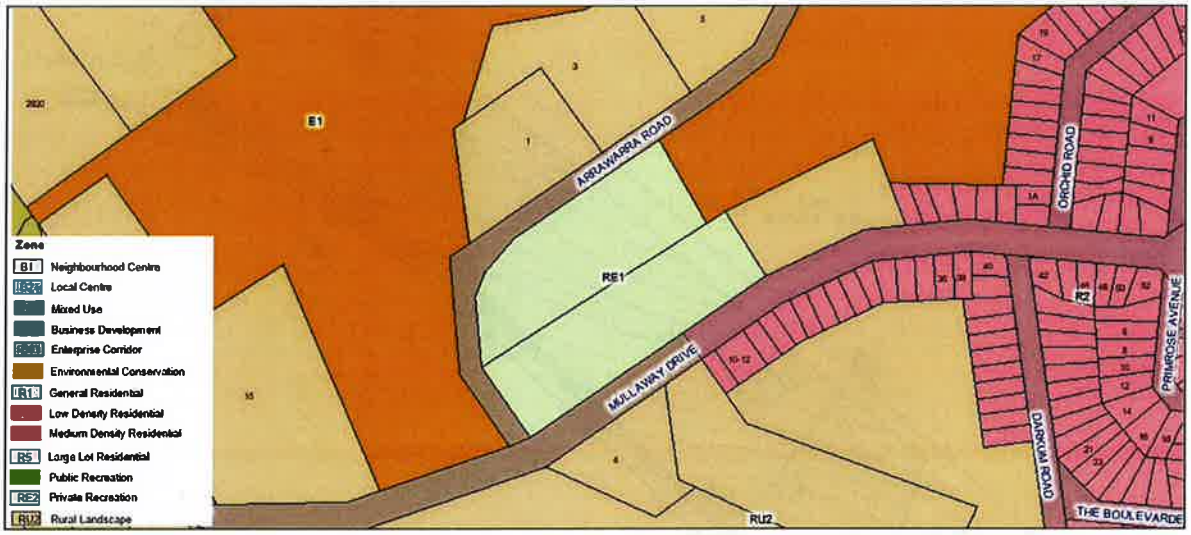


Figure 4: Current Zoning under LEP 2013 (source CHCC GIS)

The Planning Proposal is for the rezoning of the land to 'R2 Low Density Residential' in keeping with the zoning applying to the adjoining land.

Figure 5: Proposed Zoning

Figure 6 below shows the site plan of the existing site proposed to be rezoned..

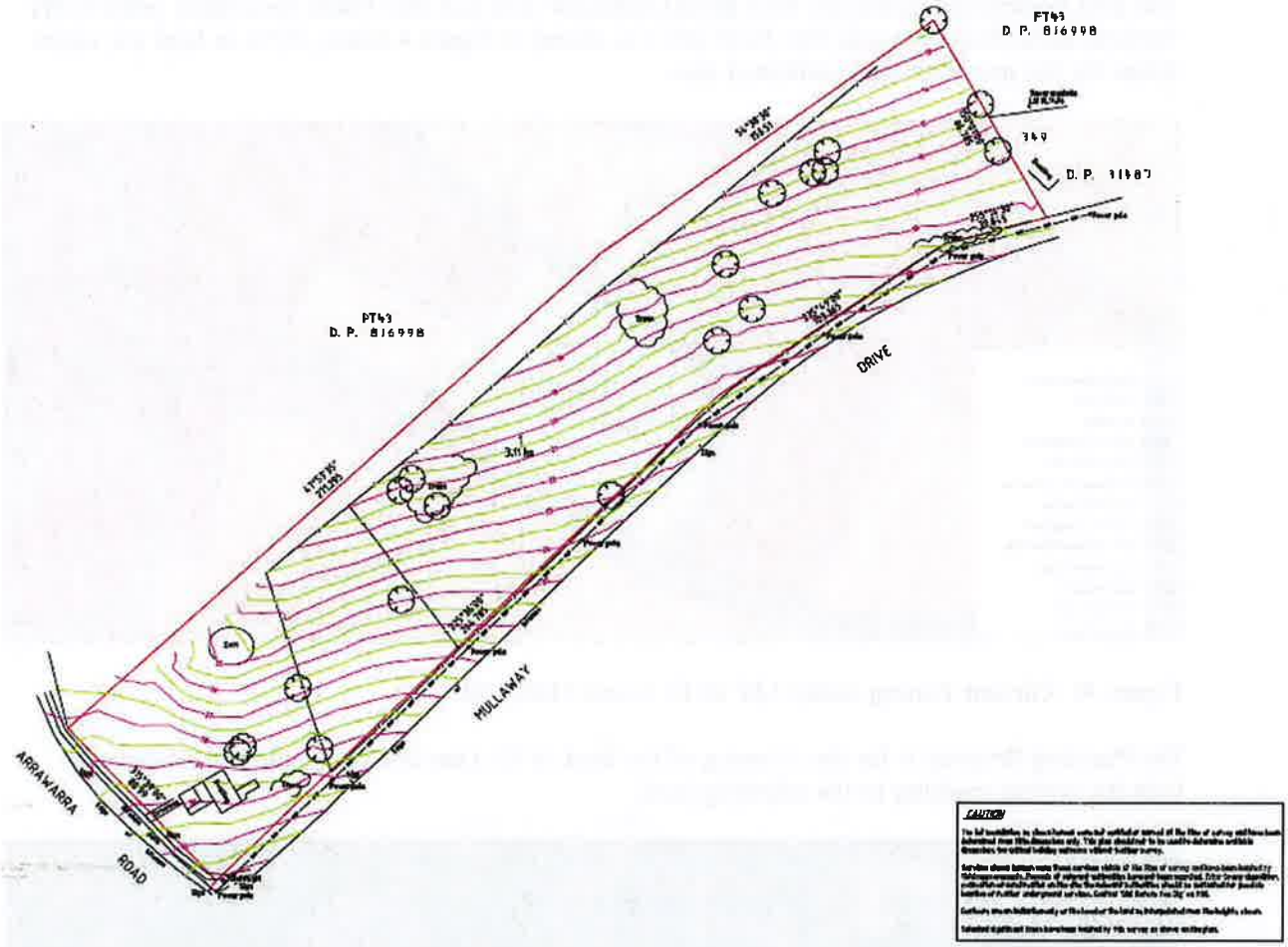


Figure 6: Site Plan

The proposed rezoning is to allow the development of the land as shown in the concept subdivision plan and housing development plan included in Figures 7 and 8; details of these plans are included in Appendix B. The concept plans envisage the development of the land for 20 Torrens title allotments with the asset protection zone accommodated within each allotment. The proposed concept layout has been designed to protect the existing trees on the land; the rezoning does not necessitate the removal of any trees on the land.

The lots are to be in the range of 1000m2 and are likely to be developed for single detached dwelling houses; this is despite the range of uses permitted under the R2 zone, refer to land use table below. Access to the lots will be via Mullaway Drive. A 6m wide fire trail extending along the rear of the properties is also proposed. The concept plan envisages the development of the land for 23 Torrens title allotments. A fire trail is proposed to be provided and dedicated to Council as public land. This will include some bushland areas that extend into the property and beyond the existing fence line. A 30m asset protection zone is available to all allotments. The proposed concept layout has been designed to protect the existing trees on the land; the rezoning does not necessitate the removal of any trees on the land.

The fire trail will provide access for emergency fire fighting vehicles will also provide a buffer and demarcation between the bushland and the residential area to reduce edge conflicts. An opportunity to extend the off road cycleway and to provide street trees along Mullaway Drive is also presented in the proposal.

Figure 7: Subdivision Concept

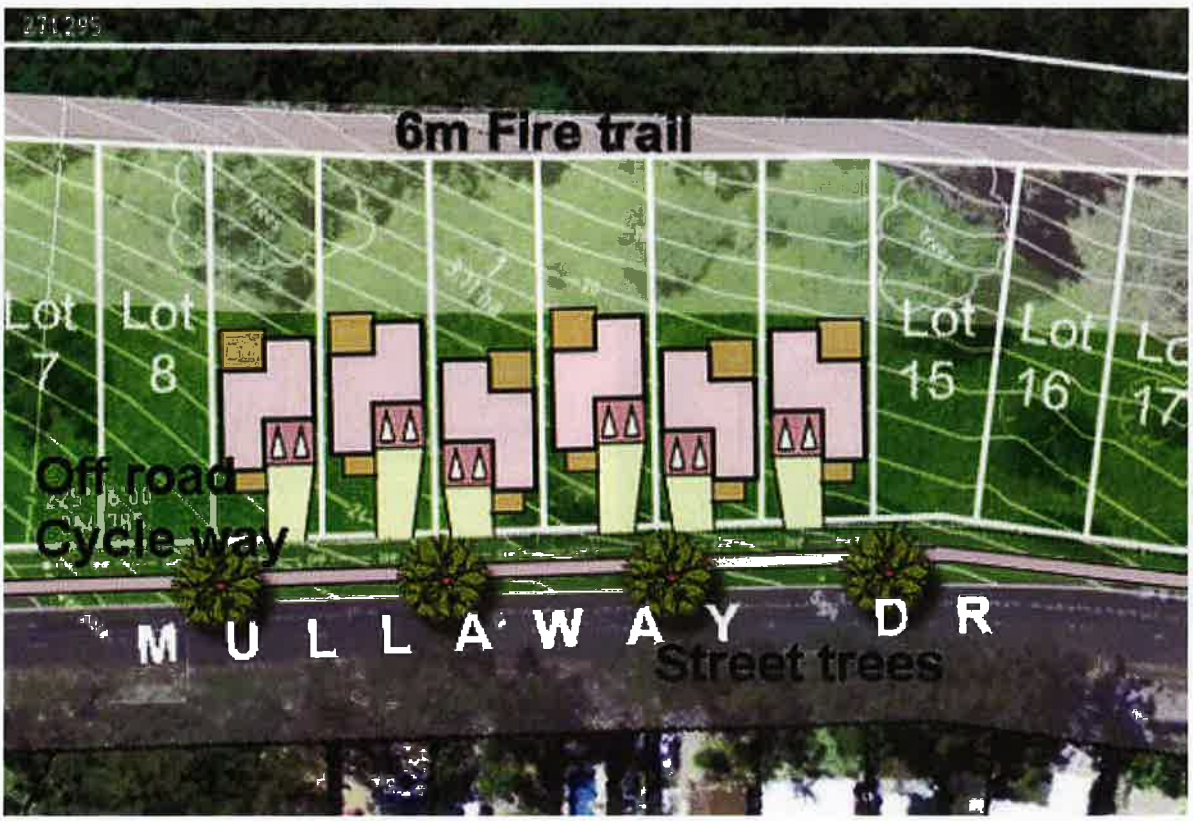


Figure 8: Housing Development Concept

Zone R2 Low Density Residential
1.Objectives of zone
To provide for the housing needs of the community within a low density residential environment. To enable other land uses that provide facilities or services to meet the day to day needs of residents.
2. Permitted without consent
Building identification signs; Home-based child care; Home occupations.
3. Permitted with consent
Attached dwellings; Bed and breakfast accommodation; Boarding houses; Business identification signs; Caravan parks; Child care centres; Community facilities; Dual occupancies; Dwelling houses; Emergency services facilities; Environmental facilities; Environmental protection works; Exhibition homes; Exhibition villages; Flood mitigation works; Group homes; Health consulting rooms; Home businesses; Home industries; Hostels; Kiosks; Neighbourhood shops; Places of public worship; Recreation areas; Recreation facilities (indoor); Recreation facilities (outdoor); Respite day care centres; Roads; Semi-detached dwellings; Seniors housing; Shop top housing; Water storage facilities
4. Prohibited
Any development not specified in item 2 or 3

View of subject land

Existing dwelling on subject land

Section 4

Local Strategic Directions

There are a number of local policy documents that are used to guide rezoning and development decisions within the Coffs Harbour City Local Government Area. The main documents of relevance to this proposal are:

- Our Living City Strategy.
- Coffs Harbour Local Environmental Plan 2013;
- Draft North Coffs Development Control Plan; and
- Coffs Harbour City Contribution Plans.

4.1 Our Living City Strategy

As stated above, the Our Living City Strategy (OLC Strategy) is Council's Growth Management Strategy prepared in 2008to set out a future for the growth and development of the Local Government Area to the year 2031. The goal of the OLC Strategy is to foster healthy urban communities which contribute to delivering the following Vision for the City:

The Healthy City, the Smart City and the Cultural City for our Future.

The OLC strategy projects a population of 99,000 people by 2031 with 94,000 accommodated in existing zoned areas and the balance of 6000 people accommodated in Greenfield sites. The OLC Strategy states that;

The OLC Strategy calculates a demand for 15,499 new dwellings to house the additional population and suggests that 3,726 dwellings will be required in new residential zones by 2031. The OLC Strategy states that the Coffs Harbour Urban area will experience a shortfall in land in the next 3-8 years and has identified the North Coffs Area, which includes the subject land, as part of the residential land supply to meet this demand.

As can be seen by the extract from OLC Strategy map above (Figure 3) the subject land was identified as a 'Long Term' priority to be released after 2016. The rezoning of the subject land will enable the supply of land to be available after 2016 as there is a significant lag time between the resolution to rezone land; preparation of planning documents; gazetting of the rezoning; lodgement and determination of the subdivision application; certification of the subdivision; and eventual sale and development of housing on the identified land. It is expected that this process takes over two years to complete and will in effect provide for housing from 2016 -2018 in accordance with Council's projected timetable.

With the supply of land in Corindi Beach and Safety Beach coming close to exhaustion and limited supply of land in Mullaway and Arrawarra, the upper Northern Beaches District will have severely restricted land stocks in the near future which will lead to increases in land costs. Increases in the cost of land reduces affordability, restricts first home owners from entering the housing market and ultimately skews the population profile so that a younger household cohort is not well represented. It being noted that a more balanced heterogeneous population is likely to make better use of a broader range of commercial and retail services and community services and facilities; this in turn improves economic sustainability.

The Arrawarra Mullaway area is strategically positioned in close proximity to the Woolgoolga Town Centre and is well served by a primary school that will be in need of an increased resident population to maintain pupil numbers in the future.

In terms of environmental sustainability, the OLC Strategy seeks to protect existing habitat areas and protect these areas from adverse impacts; the OLC Strategy is particularly interested in ensuring that the beaches, natural habitat, clean water and open spaces areas are preserved and maintained for enjoyment by existing and future generations.

As stated above, part of the proposal is for the protection of the vegetated parts of the land to help maintain water quality and the flora and fauna values of the land.

The proposal is consistent with this strategy.

4.2 Coffs Harbour Local Environmental Plan

The proposal is for an amendment to the Coffs Harbour Local Environmental Plan (LEP 2013) by way of a change to the 'Land Zoning map' and 'Lot Size map'; these are addressed below.

LEP 2013 has a number of provisions that provide for the orderly development of the land and any future development of the land; the relevant Clauses are 2.3, 2.6, 4.1, 4.3, 5.5, 7.1, 7.4, 7.8, 7.11, 7.13 and these are addressed below:

Clause 2.3 Zone Objectives and Land Use Table: This clause requires the consent authority to have regard to the objectives for development in a zone when determining a development application in respect of land within the zone. As stated above the proposal is for rezoning of the land to the land R2 Low Density Residential. The objectives of this zone are:

> R2 Zone Objectives
>
> *To provide for the housing needs of the community within a low density residential environment.*
>
> *To enable other land uses that provide facilities or services to meet the day to day needs of residents.*

Any future development of the land will be tested against these objectives and will need to meet these objectives. The development of the cleared parts of the land for housing and protection of the existing trees on the land is in keeping with the intent of these broad objectives.

Clause 2.6 Subdivision: Requires consent for the subdivision of the subject land.

Clause 4.1 Minimum Subdivision Lot Size: Under this clause the size of any lot resulting from a subdivision of land to which this clause applies is not to be less than the minimum size shown on the Lot Size Map in relation to that land. The proposal is for an amendment to the lot size map to allow for the subdivision of the land as shown in the concept plan above. In this regard it is proposed to have a minimum lot size of 400m2 applying to the land consistent with the minimum lot size applying to nearby lands. This will then allow for conventional lots in a Torrens title subdivision with lots in the order of 1000m2 in area. As can be seen by Figure 9 below part of the land has a 40ha minimum lot size and part of the land has no minimum lot size.

Figure 9: Lot Size Map extract from LEP 2013

Clause 4.3 Height of Buildings: Under this clause the height of a building on any land is not to exceed the maximum height shown for the land on the Height of Buildings Map. The subject land is currently subject to an 8.5m height limit and this is considered appropriate for the subject land which can tolerate buildings with a two storey height limit. Any future development will be subject to this height limit which will help ensure the scenic qualities can be protected and the 'sense of place' being proposed can be met.

Figure 10: Height Map extract from LEP 2013

Clause 5.5 Development within the Coastal Zone: The table below outlines the matters to be considered under this clause for any development of the land and how these may be responded to; the land is within the coastal zone.

Table: Clause 5.5 Matters	
Matters for Consideration	**Response**
Existing public access along the foreshore is to be retained and opportunities for new public access to the foreshore to be considered...	The proposal will have no impact upon public access to the foreshore.
Suitability of development in terms of type, location and design and its relationship with surrounding areas.	This report demonstrates the suitability of the land for the proposed rezoning and likely development of the land.
Any detrimental impacts upon foreshore amenity, including overshadowing of foreshores or loss of significant views and scenic qualities of the NSW Coast.	The land is set well away from the foreshore. The proposal will change the scenic qualities of this location with a horse paddock replaced with a residential estate. No significant impact in terms of overshadowing, views or scenic qualities are anticipated.
Measures to conserve biodiversity and ecosystems including native coastal vegetation and existing wildlife corridors, rock platforms, water quality of coastal waterbodies, and native fauna and native flora, and their habitats.	The measures to protect the habitat values and water quality are described in this report.
The cumulative impacts of the proposed development and other development on the coastal catchment.	The wider cumulative impacts upon the Coffs Creek catchment are taken into account, the proposal will not add to the overall load of pollutants within the catchment.
The consent authority is to be satisfied that: the proposed development will not impede or diminish, where practicable, the physical, land-based right of access of the public to or along the coastal foreshore,	The proposal will have no impact upon access to the coastal foreshore.
The consent authority is to be satisfied that: if effluent from the development is disposed of by a non-reticulated system, it will not have a negative effect on the water quality of the sea, or any beach, estuary, coastal lake, coastal creek or other similar body of water, or a rock platform,	Reticulated sewer services are available to the development.
The consent authority is to be satisfied that: the proposed development will not discharge untreated stormwater into the sea, or any beach, estuary, coastal lake, coastal creek or other similar body of water, or a rock platform.	No untreated stormwater will be discharged from the site to the sea, or any beach, estuary, coastal lake, coastal creek or other similar body of water, or a rock platform.
The consent authority is to be satisfied that: the proposed development will not: be significantly affected by coastal hazards, or have a significant impact on coastal hazards, or increase the risk of coastal hazards in relation to any other land.	The proposal is expected to have a neutral impact in terms of coastal hazards such as sea level rise and flooding.

Clause 7.1 Acid Sulfate Soils: Under this clause development consent is required for the carrying out of works within 500m of adjacent Class 1, 2, 3 or 4 land that is below 5 metres Australian Height Datum and by which the watertable is likely to be lowered below 1 metre Australian Height Datum on adjacent Class 1, 2, 3 or 4 land. As can be seen by Figure 11 below the subject land is mapped as a low risk (i.e. C lass 5) of potential acid sulphate soils being present. Given the nature of the likely development which will not involve any considerable excavation, it is considered that any development of the land is likely to have neutral impact in terms of acid sulphate soils disturbance. The land is a relatively flat elevated parcel of land that will not require any significant excavations for building pads or services.

Figure 11: Acid Sulfate Soils (source CHCC GIS)

Clause 7.4 Terrestrial biodiversity: The land is identified as "biodiversity"; refer Figure 12 below. This clause applies to land identified as "Biodiversity" on the Terrestrial Biodiversity Map and requires that the following matters be considered before determining a development application.

- *whether the development is likely to have:*
  - *any adverse impact on the condition, ecological value and significance of the fauna and flora on the land, and*
  - *any adverse impact on the importance of the vegetation on the land to the habitat and survival of native fauna, and*
  - *any potential to fragment, disturb or diminish the biodiversity structure, function and composition of the land, and*
  - *any adverse impact on the habitat elements providing connectivity on the land, and*
- *any appropriate measures proposed to avoid, minimise or mitigate the impacts of the development.*
- *Whether the development satisfies the following:*
  - *the development is designed, sited and will be managed to avoid any significant adverse environmental impact, or*
  - *if that impact cannot be reasonably avoided by adopting feasible alternatives—the development is designed, sited and will be managed to minimise that impact, or*
  - *if that impact cannot be minimised—the development will be managed to mitigate that impact.*

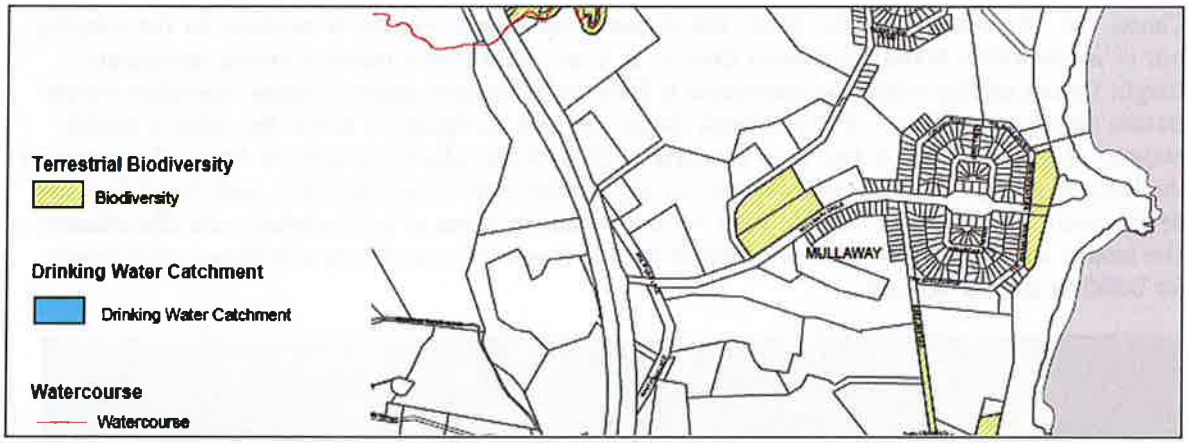


Figure 12: Terrestrial Biodiversity (source CHCC GIS)

An Ecological Assessment by FloraFauna Consulting was carried out to address the potential ecological impacts of the rezoning and ultimate development of the land. This report is included in Appendix C. The main findings and recommendations of the report are outlined below.

During the field survey two main terrestrial plant communities *(Coast and Escarpment Blackbutt Dry Forest; and Lowlands Swamp Box Paperbark – Red Gum Dry Forest)* were recorded within the study area and on the adjoining land to the north. However, the majority of the land within the study area was occupied by a derived grassland community dominated by exotic/weed species.

Potential impacts on biodiversity from the rezoning and subsequent development of the land include removal of vegetation associated with future development of the site, interruption to ecosystem processes, and other impacts associated with increased human activities including changes in animal behaviour and artificial lighting.

It is recommended that the following measures be adopted to mitigate impact:

- where possible Koala feed tree species should be retained;
- a 1:1 tree re-planting strategy should be applied for each tree that is
- removed;
- each replacement tree shall be of the same species as the tree it is replacing; and
- fencing along the bushland interface be excluded to discourage disposal of green waste.

The report noted that the provision of a fire trail adjacent to the interface along the northern boundary of the study area as indicated in the subdivision concept plan appended to this report will help to clearly define the plant community boundary and to discourage the disposing of green waste at the interface by residents.

The report also noted that the proposed rezoning will prevent the land being developed as a sports field as originally envisaged; a sports field would have had a significant impact upon the ecology of the area.

The Assessment concluded that the proposal has the potential to impact on some threatened species and populations, however, the impacts can be mitigated by the measures outlined above.

Clause 7.8 Koala habitat: This clause requires the Coffs Harbour City Koala Plan of Management (KPOM) to be taken into account. The KPOM applies to the whole of the LGA and applies to land mapped as kola habitat and land adjoining land mapped as Primary Koala Habitat. The KPOM maps koala habitat in terms of the level of importance with 'Primary habitat' being the most important resource for koalas and 'Tertiary habitat' being the least important. The subject land supports land mapped as Secondary Koala habitat; this habitat is located generally along the northern boundary of the land and around the existing dwelling house; refer to Figure 13 below.

The KPOM is supplemented by Biodiversity Guideline No5 which sets out criteria for development that may impact upon koala habitat.

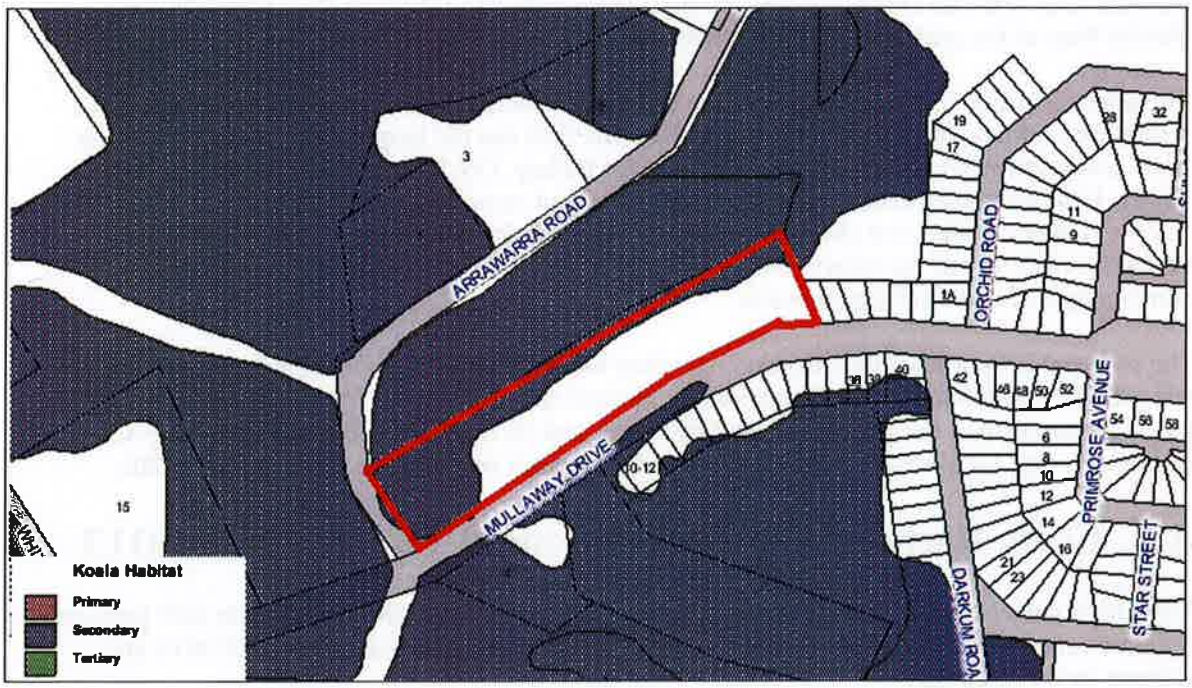


Figure 13: Koala Habitat (source CHCC GIS)

The ecological Assessment by FloraFauna Consulting noted that the majority of the site has been cleared of native vegetation and the remaining trees that were recorded within the study area occurred as either components of small remnant patches or isolated trees; a stand of Forest Red Gum (*Eucalyptus tereticornis*) was recorded in the eastern part of the study area.

The Assessment involved a survey of the entire study area for actual Koala sightings and included a SAT survey and a search for other signs such as scratch markings on trees. This survey found no individuals of the species present or any evidence of Koala activity within the study area. Nevertheless, the Assessment suggested the incorporation of the measures detailed above to mitigate any impacts upon Koala habitat.

Clause 7.11 Essential services: This clause requires that development consent must not be granted unless the consent authority is satisfied that any of the following services that are essential for the proposed development are available or that adequate arrangements have been made to make them available when required:

- the supply of water,
- the supply of electricity,
- the disposal and management of sewage,

- stormwater drainage or on-site conservation,
- suitable road access.

The subject land can be satisfactorily provided with all the listed services to accommodate the likely development of the land if it is rezoned for residential purposes. These matters are addressed in more detail later in the report.

Clause 7.13 Central Business District: Under this clause consent must not be granted to development on any land unless the consent authority has considered whether the development maintains the primacy of the CBD as the principal business, office and retail hub of the Coffs Harbour City. The CBD covers the land in the area identified as "CBD" on the Central Business District Map as the principal business, office and retail hub of the Coffs Harbour City Centre.

The primacy of the CBD is derived from the collective functions of civic services, retail outlets, recreation facilities, and entertainment facilities. The CBD has the largest commercial area in the Local Government Area and it has the Regional Art Gallery, City library, Council Administration Centre, large swimming centre, extensive retail areas and some high density housing. The City Centre has the farmer's market and other festivals and is to be embellished with a new City Park and Performance Centre in the future. The City Centre is also home to the largest conglomeration of community and social service providers.

The proposal is for a residential development that will help add to the available labour market and will provide additional household expenditure to serve the CBD. The proposal will have a neutral to positive impact upon the primacy of the City Centre and its function as the foci for business, community and social services. In this context the proposal supports the primacy of the CBD.

4.3 Coffs Harbour City Development Control Plan 2013

The land is subject to the Coffs Harbour Development Control Plan (DCP) 2013. This DCP includes a series of components that apply to development. The following components of DCP 2013 are relevant to this proposal:

- Component B1 Subdivision Requirements
- Component B2 Residential Development Requirements
- Component B7 Biodiversity Requirements
- Component C1- Design Requirements
- Component C2- Access, Parking and Servicing Requirements
- Component C3- Landscaping Requirements
- Component C6- Minor Earthworks Requirements
- Component C7- Waste Management Requirements
- Component C8 - Integrated (Natural) Water Cycle Management
- Component D1- Erosion and Sediment Control Requirements

Component B1 Subdivision Requirements: The proposal allows for relatively large residential allotments that will have a building envelope outside the bushland areas and all lots can be provided with the required infrastructure services.

Component B2 Residential Development Requirements: The lots will be well over 400m2 and will have sufficient area to meet the density, building setbacks, frontage width, and private open space controls detailed in this component.

Component B7 Biodiversity Requirements: The Assessment by FloraFuana Consultants addresses the biodiversity requirements outlined in this component.

Component C1- Design Requirements: The proposed concept layout meets the subdivision pattern in the locality and the size of the lots (i.e. approximately 1000m2) and orientation of the lots will ensure that all lots can meet the privacy, setbacks, frontage width and energy efficiency requirements of this component.

Component C2- Access, Parking and Servicing Requirements: The site has access to Mullaway Drive which provides good stopping sight distances for the new allotments. Council will require the extension of the kerb and gutter, stormwater drainage system and footpath along Mullaway Drive. The land will be connected to the reticulated water and sewer network. The allotments are of sufficient width to allow for on -site parking as required.

Component C3- Landscaping Requirements: A landscape plan for the street trees will be prepared at the subdivision stage. The potential for an off- road shared pedestrian and cycle link could be considered.

Component C6- Minor Earthworks Requirements: The land is relatively flat and will not require any significant land shaping to provide level building pads.

Component C7- Waste Management Requirements: The subject land is within the Coffs Harbour City Council garbage collection area and sufficient space is available on all parcels of land for the storage of the three 240L mobile bins for general waste, green waste and recyclables.

Component C8 - Integrated (Natural) Water Cycle Management: A treatment train of water quality management measures are available to the development including:

- grass swales;
- soil erosion and sediment control during construction;
- water tanks;
- deep soil zones; and
- detention areas.

Component D1- Erosion and Sediment Control Requirements: An erosion and sediment control plan will be required as part of the subdivision of the land.

4.4 Contribution Plans

The development of the subject land for housing would be subject to a number of Contribution Plans (CPs) prepared under Section 94 of the EP&A Act 1979 including:

- Regional, District and Neighbourhood Facilities Contributions Plan 2008;
- Coffs Harbour Road Network Developer Contributions Plan 2008;
- Surf Rescue Facilities Developer Contributions Plan 2012; and

The proposed rezoning is likely to provide for an additional population of between 50 and 60 people which is not of sufficient size to warrant the provision of any new community facilities or higher order open space and recreation facilities.

It is to be noted that the development of the land is also subject to contributions under Section 64 of the Local Government Act 1993 for water and sewer services. The land is subject to the 'Coffs Harbour Water Supply Development Servicing Plan 2002' and the 'Coffs Harbour Wastewater Development Servicing Plan 2002',

Section 5

State and Regional Policies and Ministerial Directions

The principal State and Regional policies applying to the land are embodied within:

- Mid North Coast Regional Strategy:
- North Coast Regional Environmental Plan;
- State Environmental Planning Policies;
- The NSW Coastal Policy; and
- Ministerial Directions.

5.1 Mid North Coast Regional Strategy:

The Mid North Coast Regional Strategy was introduced in March 2009 and is the principal blueprint for managing growth and development on the Mid North Coast of NSW; the Mid North Coast extends from Hawkes Nest in the south to Yamba in the North. The Strategy envisages a population increase of 94,000 people and a growth rate of 1.1% per annum; the current population of the Mid North Coast is 330,000 people.

The Strategy nominates Coffs Harbour, Port Macquarie and Great Lakes/Taree as the main areas under population growth pressure. An additional 59,600 dwellings will be required to meet the housing demands of this population by 2031 according to the Strategy.

The Strategy requires the Coffs Coast to have a minimum of 19,200 dwellings. Interestingly, the Strategy observes that while 80% of all dwellings are detached dwellings at present, a greater proportion of future housing should be in the form of multi-unit housing; the benefits of accessible and adaptable housing for an ageing population are cited as the main reasons for the necessity in this housing choice shift.

The Strategy outlines a number of planning principles in relation to Settlement and Neighbourhood Planning that are of relevance to any housing development on the subject land. The extracts below outline these principles.

SETTLEMENT PLANNING PRINCIPLES

When preparing local growth management strategies councils will be required to identify the growth areas for their centres, towns and villages using the following settlement planning principles:

- The four major regional centres will be promoted as the focus of settlement, employment and regional services. Major towns will provide major local services, as well as outreach centres for the provision of regional services. Potential opportunities for the growth in retail and commercial capacity of these centres are to be identified.
- Development within all centres, towns and villages will respect and respond to the character of the area.
- Planning for new settlement will respect the environmental, coastal and cultural heritage values of the landscape. Key environmental, cultural and coastal features will be protected, while settlement will be directed towards less valuable areas.
  - > Any growth of coastal towns and villages will protect environmentally fragile areas and preserve the scenic values of the coastal landscape.
  - > Growth of inland towns and villages will be focused in areas where extra population is needed to make existing services more viable and if the risk of environmental degradation is low.
- New settlement areas will be located so as to enable the integration of transport services with the provision of community services and retail activity.
- Settlement areas will be appropriately located and designed to maximise the affordability of housing, as well as to provide the type of housing styles and dwelling mixes that are appropriate to the ageing of the population.
- New settlement areas are only to be identified after infrastructure capacities have been reviewed and environmental suitability assessed.

Greater detail on the application of these settlement planning principles and the preparation of local growth management strategies is provided in the Settlement Planning Guidelines (2007) prepared by the Department of Planning for the Mid and Far North Coast. These guidelines will assist councils in preparing their local growth management strategies and implementing the Regional Strategy at the local level. They include:

- guidance on the preparation of a local growth management strategy, including its content and scope
- settlement planning principles for development
- a framework for a new Mid North Coast housing and land monitor
- application of regional mapping data.

NEIGHBOURHOOD PLANNING PRINCIPLES

- A range of land uses to provide the right mix of houses, jobs, open space, recreational space and green space.
- Easy access (including public transport where viable) to major centres with a full range of shops, recreational facilities and services along with smaller village centres and neighbourhood shops.
- Jobs available locally and regionally, reducing travel times and the demand for transport services.
- Streets and suburbs planned so that residents can walk and cycle to shops for their daily needs.
- A wide range of housing choices to provide for different needs and incomes. Traditional houses on their own block will be available along with smaller lower maintenance homes, units and terraces.
- Conservation lands in and around development sites to help protect biodiversity and provide open space for recreation.

Figure 11: Extract from the Mid North Coast Regional Strategy

The proposal provides for a well planned estate with an appropriate layout that will assist in housing affordability in an area that has reasonable access to transport, employment opportunities and community services. The proposal is in accordance with the Mid North Coast Regional Strategy.

5.2 North Coast Regional Environmental Plan:

The North Coast Regional Environmental Plan (REP) was gazetted on 15 January 1988 and from 1 July 2009 is a deemed State Environmental Planning Policy. The REP aims to:

- *to develop regional policies that protect the natural environment, encourage an efficient and attractive built environment and guide development into a productive yet environmentally sound future,*
- *to consolidate and amend various existing policies applying to the region, make them more appropriate to regional needs and place them in an overall context of regional policy,*
- *to provide a basis for the co-ordination of activities related to growth in the region and encourage optimum economic and social benefit to the local community and visitors to the region, and*
- *to initiate a regional planning process that will serve as a framework for identifying priorities for further investigation to be carried out by the Department and other agencies. regional policies that protect the natural environment, encourage an efficient and attractive built environment and guide development into a productive yet environmentally sound future,*

The REP sets out regional objectives and regional policies to guide the preparation of LEPs and the assessment of development applications. In terms of plan preparation for any residential development on the subject land the relevant clauses are 38, 40, 42, 45, 50,56A, 58 and 65.

Clause 38 Plan preparation—urban land release strategy

Under this Clause council should not prepare a draft local environmental plan which permits development that, in the opinion of the council, constitutes significant urban growth unless it has adopted an urban land release strategy for the whole of its local government area. The clause also states that a draft local environmental plan referred to should be generally consistent with the strategy.

Comment: As can be seen by the extract from OLC Strategy (Council's Urban Release Strategy) map above, the land is identified as an area to be released after 2016. As stated above, there is a significant lag time between the resolution to rezone land; preparation of planning documents; gazetting of the rezoning; lodgement and determination of the subdivision application; certification of the subdivision; and eventual sale and development of housing on the identified land. The proposal will provide for housing from 2016 -2018 in accordance with Council's projected timetable.

The proposal is in keeping with this Clause.

Clause 40 Plan preparation—principles for urban zones

A draft local environmental plan applying to urban areas should adopt the following principles:

(a) zoning should be simple and flexible,

(b) provisions for flexible zone boundaries may apply to any zones except environmental protection zones,

(c) detailed guidelines within the broad zone parameters should be identified in a development control plan, and

(d) the principle of minimising energy use, in particular in the design of buildings and effective transport systems.

Comment: The proposal is for a simple rezoning that will rely largely on the existing provisions in LEP 2013. Coffs Harbour City Council has in place a new Development Control Plan that supplements LEP 2013. As demonstrated above this DCP and LEP 2013 set guidelines for:

- Height limits
- Floor Space Ratio Limits
- Water Sensitive Urban Design;
- Stormwater Management and Flooding;
- Landform Modification;
- Water and Sewer Services;
- Landscaping;
- Acid Sulfate Soils; and
- Energy Efficiency.

Adequate planning and development controls are in place for the control of development of the subject land.

The proposal is in keeping with this Clause.

Clause 42 Plan preparation—principles for housing

This Clause requires a draft local environmental plan to permit dwellings in urban areas should incorporate provisions that: allow the alteration or addition of a dwelling so as to create 2 dwellings in either attached or detached form; allow a wide range of housing types and densities; separate residential development from other incompatible development, including agricultural activity on adjoining land; require that development for residential purposes should not take place until the council is satisfied that the land on which any dwellings are to be erected is adequately serviced with water and sewage disposal facilities; retain existing provisions to enable a dwelling to be erected on an existing allotment; and permit the use of manufactured home estates for permanent occupation.

The Clause also states that a draft local environmental plan that will permit dwellings to be erected in urban areas should not require development consent for a dwelling-house in a residential zone, except where there are special environmental or hazard considerations, or specify a minimum allotment size for residential zones.

Comment: The Draft LEP will be in keeping with current planning practice under the Standard LEP Template of LEP 2013. The draft LEP will allow for dual occupancy development, a range of dwelling types in a low density context and reasonable separation from agricultural activities by Mullaway Drive ; it being noted that the nearest rural lands are located on the opposite side of Mullaway Drive form the subject land. The land will be connected to the reticulated water and sewer network and consent will be required for dwellings as per the current practice.

The proposal is in keeping with the general intent of this clause.

Clause 45 Plan preparation—hazards

Under this clause a draft local environmental plan should not permit development for tourism, rural housing or urban purposes on land subject to the following hazards, namely:

(a) coastal processes,

(b) flooding or poor drainage,

(c) dangers arising from potential or actual acid sulphate soils,

(c1) dangers arising from contaminated land,

(c2) geological or soil instability,

(d) bush fire,

(e) aircraft noise at levels of more than 25 (measured according to the Australian Noise Exposure Forecast),

(f) air or water pollution, or airborne pollution, within 400 metres of sewage treatment works,

(g) disposal of septic effluent,

(h) existing offensive or hazardous industries, and

(i) high tension electrical power lines,

unless the council has made an assessment of the extent of the hazard and included provisions in the plan to minimise adverse impact.

The Clause also states that in the event of a bush fire hazard being identified for land on which dwellings are proposed to be permitted, the council shall not permit development unless it is satisfied that arrangements where appropriate have been made to:

(a) require the creation of a perimeter road or reserve which circumscribes the hazard side of the land intended for that development,

(b) require the creation of a fire radiation zone located on the bushland side of the perimeter road,

Comment: The land is not subject to any coastal processes or any identified geological instability or soil instability. The land is not located near any aircraft noise generation areas, offensive or hazardous industries and is not located near a sewerage treatment works or high voltage power lines. The land is subject to bushfire hazard and a low risk of acid sulfate soil. The investigations have shown that these risks are manageable and will not prevent the land being developed for low density housing as shown in the Draft Concept Plan. The environmental hazards are addressed in detail later in this report.

The proposal is in keeping with Clause 45.

Clause 50 Plan preparation—height controls

Before preparing a draft local environmental plan applying to an urban area, the council should consider the necessity for height controls on buildings and include such controls as it considers appropriate.

Comment: The land will be subject to the 8.5m height limit under LEP 2013.

The proposal is in keeping with this Clause.

Clause 56A Plan preparation—bus services

In the preparation of a draft local environmental plan involving an alteration to the zoning of land which could give rise to the need for bus services or the revision of existing bus services, the council should take into consideration the guidelines in *Technical Bulletin 19—Planning for Bus Services* (published in 1989 by the Department of Planning and the Ministry of Transport at that time) to ensure that the draft plan allows for the provision of an adequate and efficient bus route system.

Comment: The land is located on the local bus route of the Grafton to Coffs Harbour Service. The main bus shelter is located near the Mullaway General Store, approximately 300m from the subject land. This distance is within a reasonable walking distance and the bus services are considered to be reasonable in the context of the northern beaches locality.

The proposal is in keeping with this Clause.

Clause 58 Plan preparation—servicing urban areas

Under this Clause a draft local environmental plan should not permit development for urban purposes unless the council is satisfied that:

(a) the proposed development will make the most economic use of existing services,

(b) where the proposed development is adjacent to an existing urban area and that urban area will be substantially increased, the provision of a reticulated water and sewer system will be provided at reasonable cost to each lot,

(c) the proposed development is located in an area which is consistent with the findings of any urban land release strategy prepared for the local government area or, where no such strategy has been prepared, the proposed development is located in the area to which services can be provided most readily,

(d) consideration has been given to the identification of effluent disposal and discharge points,

(e) domestic water catchment areas and water storage areas are not likely to be polluted as a result of the proposed development, and

(f) consideration has been given to the provision of public transport facilities, pedestrian and cycleways.

Comment: The development of the land represents an economically efficient use of the land with water, sewer and road services readily available to the land.

As stated above, the land is located in a release area and in keeping with the Coffs Harbour City land release strategy as expressed in the OLC Strategy.

The land can be connected to the reticulated sewer network and will have *no effluent discharge points.*

The land is not within a *domestic water catchment area and water storage area.*

The land is located in an existing urbanised area that is serviced by buses and can be accessed by cyclists and pedestrians. An on-road cycleway is located along Mullaway Drive and an off-road pedestrian/cycleway is located along Arrawarra Road. This development provides an opportunity for a safer off- road cycleway to be provided along Mullaway Drive.

The proposal meets the criteria of this Clause.

Clause 65 Plan preparation—provision of community, welfare and child care services

Under this Clause a draft local environmental plan should:

(a) not zone land for residential purposes (including rural residential) unless the council has made an assessment of the need for additional community and welfare services and is satisfied that the plan contains adequate provisions to enable the provision of those services, and

(b) include child care centres as a land use which is permissible with the council's consent in all rural, residential and business zones

Comment: This proposal is expected to accommodate a population of approximately 50-60 people. Mullaway has a Primary School (Mullaway Primary School) and an aged care facility is proposed to be developed on the land almost opposite the school on Mullaway Drive. The area is provided with outreach services from a number of welfare providers, but a trip to Woolgoolga or Coffs Harbour is required for higher order community and welfare services. The site has good accessibility to the regional road network for access to these services.

The site has reasonable access to social support facilities.

5.3 State Environmental Planning Policies

The subject land is located within the coastal zone and is subject to State Environmental Planning Policy (SEPP) No. 71 – Coastal Protection. Under Clause 7 of this SEPP Council is required to take into account the matters listed in Clause 8 of the Policy when preparing a Draft LEP. These are listed below together with a response on how the proposal meets the requirement.

Matters for Consideration	Response
Aims of the Policy which seek to protect and better manage the NSW Coast.	The proposal is for a development in keeping with Council's Settlement Strategy which in turn has been prepared in keeping with coastal management policies.
Existing public access along the foreshore is to be retained.	Proposal will have no impact on public access.
Opportunities for new public access to the foreshore to be considered.	NA
Suitability of development in terms of type, location and design and its relationship with surrounding areas.	Site is suitable for this scale of development and is in keeping with the zoning of the adjoining lands to the east.
Any detrimental impacts upon foreshore amenity, including overshadowing of foreshores or loss of significant views.	The proposal will have no impact upon the foreshore.
Scenic qualities of the NSW Coast.	The subject land provides little contribution to the scenic qualities of the coast at present; it supports vacant grasslands. A well designed housing estate can add to the scenic qualities of the area.

Matters for Consideration	Response
Measures to conserve animals (including fish and marine vegetation) and existing wildlife corridors.	Habitat areas are to be protected and enhanced to provide an improved outcome for native flora and fauna.
The likely impact of coastal hazards and processes.	The land is not subject to any significant coastal hazards or processes.
Measures to reduce potential conflict between land-based and water based coastal activities.	There are no land or water based conflicts to deal with.
Measures to protect Aboriginal culture.	The land is a highly disturbed site that is unlikely to be the source of any Aboriginal cultural values.
Likely impact on the water quality of coastal waterbodies.	The land can be developed to have a positive impact in terms of water quality with the imposition of WSUD measures.
Conservation and preservation of heritage items.	There are no identified heritage items on the land or on the adjoining lands.
Encouragement of compact towns and cities.	The proposal assists in creating a compact urban area; it is a logical extension of the adjoining residential zone.
Cumulative impacts upon the environment and measures to ensure water and energy efficiency.	The proposal is in keeping with the City Settlement Strategy that has considered the wider cumulative impacts. It is an urban release in accordance with Council's settlement strategy. Future dwellings will be subject to BASIX requirements.

The proposal is in keeping with this SEPP.

5.4 NSW Coastal Policy:

The NSW Coastal Policy was released in 1997 and provides a vision for a sustainable future for the NSW Coast. The Policy establishes a number of strategic actions relating to the Natural Environment, Natural Processes and Climate Change, Aesthetic Qualities, Cultural Heritage, Ecologically Sustainable Human Settlement and Public Access and Use.

As stated above, the proposal can be developed to have a positive impact upon the natural environment with the protection of the bushland areas and incorporation of water quality measures. In terms of natural processes and environmental hazards, the proposal can be developed in a manner that will have a neutral to positive impact upon the natural systems. Hazards relating to acid sulfate soils and bushfire impacts can be adequately managed and the existing koala habitat areas on the land can be protected and enhanced through the measures outlined earlier.

The subject land is an elevated site located well away from the coast and above predicted levels for sea level rise. The development of the land in an energy efficient manner is in keeping with Climate Change policies.

The land has potential to provide a well designed housing estate with landscaping and protection of the nature reserve which can deliver benefits to the visual qualities of the locality and Coast generally.

The land does not accommodate a listed heritage item, is not within a heritage conservation area and is unlikely to be the source of any cultural heritage significance.

The proposal is in keeping with Council's settlement strategy which provides for ecologically sustainable human settlement; the proposal provides for a logical extension of the existing urban area.

The land has access to pedestrian and cycleway links that add to the network of non- motorised transport links in the locality.

The proposal is in keeping with the Coastal Policy.

5.5 Ministerial Directions:

Ministerial Directions are directions that apply to a planning proposal to meet the state Government planning policies and strategies. The directions apply to the following policy areas:

1. Employment and Resources;
2. Environment and Heritage;
3. Housing, Infrastructure and Urban Development;
4. Hazard and Risk;
5. Regional Planning;
6. Local Plan Making; and
7. Metropolitan Planning.

The Ministerial Directions under Section 117 of the Environmental Planning and Assessment Act 1979 of relevance to this proposal are addressed below:

Direction 1.5 Rural Lands

Under this Direction a planning proposal a Draft LEP must be consistent with the Rural Planning Principles listed in *State Environmental Planning Policy (Rural Lands) 2008* unless an inconsistency is justified by a strategy that meets the criteria listed in the Direction.

The Rural Subdivision Principles are as follows:

- *the minimisation of rural land fragmentation,*
- *the minimisation of rural land use conflicts, particularly between residential land uses and other rural land uses,*
- *the consideration of the nature of existing agricultural holdings and the existing and planned future supply of rural residential land when considering lot sizes for rural lands,*
- *the consideration of the natural and physical constraints and opportunities of land,*
- *ensuring that planning for dwelling opportunities takes account of those constraints.*

Comment: The land is earmarked for urban purposes and is located in an urbanised setting with lands used for rural purposes located well away from the subject land. The only rural enterprises in the immediate area of the subject land is an alpaca grazing area and poorly maintained coffee plantation on the opposite side of Mullaway Drive near the Old Highway (Solitary Islands Drive), The subject land is well buffered from these lands and will have no impact upon these agricultural enterprises in the locality.

The land can be developed in accordance with its environmental capacity and measures to responsibly manage the limited environmental constraints are addressed in this report.

The proposal is consistent with this Direction.

Direction 2.2 Coastal Protection

This direction requires draft LEP to include provisions that give effect to and are consistent with:

- the *NSW Coastal Policy: A Sustainable Future for the New South Wales Coast 1997*, and
- the *Coastal Design Guidelines 2003*, and
- the manual relating to the management of the coastline for the purposes of section 733 of the *Local Government Act 1993* (the *NSW Coastline Management Manual 1990*).

Comment: The proposal is consistent with these policy documents as it incorporates the following:

- management of environmental hazards;
- protection of existing trees;
- connection with existing urban areas;
- consistency with settlement strategies for the creation of compact towns;
- conservation of habitat links and habitat areas; and
- efficient connection to services, including transport, water and sewer services.

The proposal is consistent with this Direction.

Direction 3.1 Residential Zones

The Direction states that a draft LEP shall include provisions that encourage the provision of housing that will:

- broaden the choice of building types and locations available in the housing market, and
- make more efficient use of existing infrastructure and services, and
- reduce the consumption of land for housing and associated urban development on the urban fringe, and
- be of good design.

The Direction also requires a draft LEP to:

- contain a requirement that residential development is not permitted until land is adequately serviced (or arrangements satisfactory to the council, or other appropriate authority, have been made to service it), and
- not contain provisions which will reduce the permissible residential density of land.

Comment: The proposal provides for the rezoning of the land for low density housing. The zone does allow for a wide range of dwelling types that could be developed on the land. The rezoning will add to housing choice by increasing the stock of low density housing lots in an area with readily available infrastructure services. The area has limited supply of vacant housing lots and the rezoning of this land will assist with the increase in supply and indirectly assist in making the cost of land more affordable in this locality.

The Draft LEP will be in the form of an amendment to Coffs Harbour LEP 2013 which requires servicing and allows for a density of one dwelling per 400m2.

Direction 3.3 Home Occupations

Under this Direction Draft LEPs shall permit home occupations to be carried out in dwelling houses without the need for development consent.

Comment: If the land is zoned R2 and subject to the current provisions under LEP 2013, home occupations will be able to be carried out in dwelling houses without the need for development consent.

Direction 3.4 Integrating Land Use and Transport

The objective of this direction is to ensure that urban structures, building forms, land use locations, development designs, subdivision and street layouts achieve the following planning objectives:

(a) improving access to housing, jobs and services by walking, cycling and public transport, and

(b) increasing the choice of available transport and reducing dependence on cars, and

(c) reducing travel demand including the number of trips generated by development and the distances travelled, especially by car, and

(d) supporting the efficient and viable operation of public transport services, and

(e) providing for the efficient movement of freight.

A planning proposal must locate zones for urban purposes and include provisions that give effect to and are consistent with the aims, objectives and principles of:

(a) *Improving Transport Choice – Guidelines for planning and development* (DUAP 2001), and

(b) *The Right Place for Business and Services – Planning Policy* (DUAP 2001).

Comment: The proposal provides the following measures to integrate land use and transport planning in accordance with the DUAP documents:

- land is located with 500m of main arterial road for transport;
- land is able to be connected to available pedestrian and cycleway networks;
- proposal provides opportunity to make land part of a pedestrian cycle network; and
- land adjoins an existing residential zone.

The proposal is consistent with this Direction.

Direction 4.1 Acid Sulfate Soils: The objective of this direction is to avoid significant adverse environmental impacts from the use of land that has a probability of containing acid sulfate soils.

Comment: The land is in the lowest risk Class (i.e. Class 5) and no impact upon acid sulphate soils are expected from the development of the land for housing. The Class 5 land is generally a buffer to the more sensitive higher class risk lands.

Direction 4.4 Planning for Bushfire Protection: The objectives of this direction are:

(a) to protect life, property and the environment from bush fire hazards, by discouraging the establishment of incompatible land uses in bush fire prone areas, and

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

A planning proposal must:

(a) have regard to Planning for Bushfire Protection 2006,

(b) introduce controls that avoid placing inappropriate developments in hazardous areas, and

(c) ensure that bushfire hazard reduction is not prohibited within the APZ.

A planning proposal must, where development is proposed, comply with the following provisions, as appropriate:

(a) provide an Asset Protection Zone (APZ) incorporating at a minimum:

(i) an Inner Protection Area bounded by a perimeter road or reserve which circumscribes the hazard side of the land intended for development and has a building line consistent with the incorporation of an APZ, within the property, and

(ii) an Outer Protection Area managed for hazard reduction and located on the bushland side of the perimeter road,

(b) for infill development (that is development within an already subdivided area), where an appropriate APZ cannot be achieved, provide for an appropriate performance standard, in consultation with the NSW Rural Fire Service. If the provisions of the planning proposal permit Special Fire Protection Purposes (as defined under section 100B of the Rural Fires Act 1997), the APZ provisions must be complied with,

(c) contain provisions for two-way access roads which links to perimeter roads and/or to fire trail networks,

(d) contain provisions for adequate water supply for fire fighting purposes,

(e) minimise the perimeter of the area of land interfacing the hazard which may be developed,

(f) introduce controls on the placement of combustible materials in the Inner Protection Area.

Comment: These matters are addressed in the bushfire assessment in Appendix D.

Direction 5.1 Implementation of Regional Strategies: The objective of this direction is to give legal effect to the vision, land use strategy, policies, outcomes and actions contained in regional strategies. Planning proposals must be consistent with a regional strategy released by the Minister for Planning.

Comment: As stated above the proposal is consistent with the Mid North Coast Regional Strategy; the proposal provides for a logical extension of an existing residential zone and is in keeping with the objectives of providing housing close to existing urban areas.

The proposal is consistent with this Direction.

Section 6

Environmental Impacts

The key environmental impact issues to consider in relation to this proposal concern:

- Flora, fauna and biodiversity;
- Visual amenity and Urban Design;
- Geotechnical issues/slope and contaminated land;
- Bushfire risk; and
- Archaeology (Indigenous and Post-settlement).

6.1 Flora, Fauna and Biodiversity

The ecological Assessment by FloraFauna Consulting addressed the Flora, Fauna and Biodiversity impacts of the proposed development. The Assessment stated that the majority of the land within the study area is occupied by a derived grassland community dominated by exotic/weed species. As stated earlier, the land has two native plant communities, namely, a Coast and Escarpment Blackbutt Dry Forest community and a Lowlands Swamp Box – Paperbark – Red Gum Dry Forest community. It is noted that remnants of these plant communities extend into the study area where they were recorded at the along the northern boundary and *'as small groups of canopy trees containing an anomalous assemblage of understorey species and as 'isolated 'paddock trees'.*

The Lowlands Swamp Box – Paperbark – Red Gum Dry Forest community was identified as the endangered ecological community – *Subtropical Coastal Floodplain Forest of the NSW North Coast bioregion.*

The observations made during the field survey indicate that the land within the study area *is degraded and heavily infested with exotic/weed species.* The report notes that there are generally no significant impediments to the proposed rezoning.

From the habitat assessment and database/literature review, it was considered that 11 threatened species as listed under the Threatened Species Conservation Act1995 and Environment Protection and Biodiversity Conservation Act 1999 could potentially utilise the limited resources available in the habitat within the study area. The Assessment concluded that the proposal is unlikely to impact significantly on any threatened species and populations.

The rezoning and development of the land can be achieved without the necessity to remove any significant native trees on the site and can assist in the management of weeds on the site. The fire trail outlined in the concept plan has been located away from the areas of bushland on the site and the layout has been designed to allow the retention of all significant native trees on site. With the imposition of the recommendations from the Ecological Assessment, it is anticipated that the proposal will have a neutral to beneficial impact upon the existing biodiversity values on site.

6.2 Visual Amenity and Urban Design

The land is located on Mullaway Drive at the entry to the Mullaway village residential areas. Mullaway Drive at this loaction is a straight road with a gradual slope down towards Mullaway Beach. The road is a two way sesaled road with a pianted cycleway on the road pavement. On the oppposite side of the roadway from the subject land are detached dwelling houses with a mix of single storey and two storey construction. A kayak sales centre (" Skee Kayak Centre"), a child care centre("Pied Piper Preschool") and a diving enterprise ("Dive Quest") are loacted within this residential area. To the east of the subject land are a mix of single storey and two storey detached dwelling houses.

The residential areas have an ecclectic mix of building styles, fencing and landscaping with the only significant unifying feature being a relatively consistent front and side building setbacks; refer to photos below. The settlement pattern in the main part of the village is a unque, formal, generally symmetrical pattern with a crculating decagonal ring road (i.e. The Boulevarde) enclosing decagonal inner circulating avenues (i.e. Rainbow Avenue/Primrose Avenue) that frame two radiating laneways; these laneways and adjoining subdivison pattern reflect a rising or setting sun and are connected by appropraitely named link roads (i.e. "Sun Street" and "Star Street"). Mullaway Drive at the central point has generous road reserves which consist of expansive mown lawn areas. Fingers of residential allotments extend along the entrways (i,e Mullaway Drive, Orchid Road and Darkum Road) to the formal decagonal road network. Figure 13 below shows the existing settlement pattern.

The symmetry of the road network is not obvious at ground level with the variation in topography, mixed treatment of the road verges and variations in housing forms making it difficult to fully interpret the layout . Nevetheless, the the rezoning of the subject land to allow for housing lots would be in keeping with the entryway character established on the oppoiste side of the road from the subject land and would be a logical extension of the housing developemnt adjoining the eastern boundary and extending along Orchid Road. Housing on the subject land would also assits in contributing visually to the sense of enrty to the residential areas.

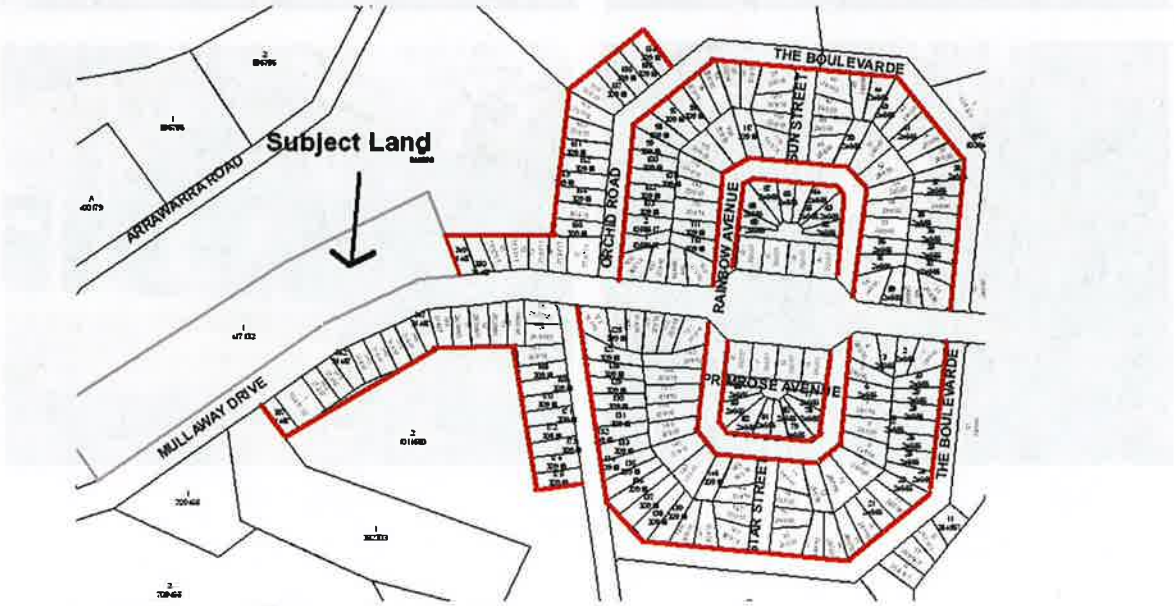


Figure 14: Mullaway village settlement pattern

The land is located within a mixed visual landscape that consists of conventional housing allotmenbts in the order of 700m2, busland areas and a number of larger rural holdings. It is to be noted that an aged persons housing devlopemnt is proposed to be developed on the land to the west of the houses fronting Darkum Road and to the south of those fronting Mullaway Drive. The main intrinsic scenic qulaities of the subject land are the scattered trees and sense of openess. The main extrinsic qualities are associated with the adjoining bushland which provides a green backdrop to the land. The developemnt of the land will alter the sense of openess but will not significantly impinge uponthe green backdrop which is provided by the tall canpoy of the trees which extends up to a height of 20-30m; any resdiential housing developemnt will be restricted to a height limit of 8.5m.

The conceptual development plan shown in Figures 7 and 8 adopts the following design measures:

- Lot layout designed to allow for passive solar access;
- Large lots to allow for housing set within landscaped surrounds;
- Simple linear layout in keeping with settlemnt patternt;
- Fire trail to reduce edge impacts upon bushland;
- Larger lot for existing dwelling to maintain character and ensure driveway access point meets sight distance requireements;
- Retention of existing trees;
- Potential for safer off- road cycleway;
- Street tree planting to enhance entry avenue along Mullaway Drive.

The proposed concept layout is in keeping with the urban design principles from the North Coast Urban Design Guidelines for infill areas.

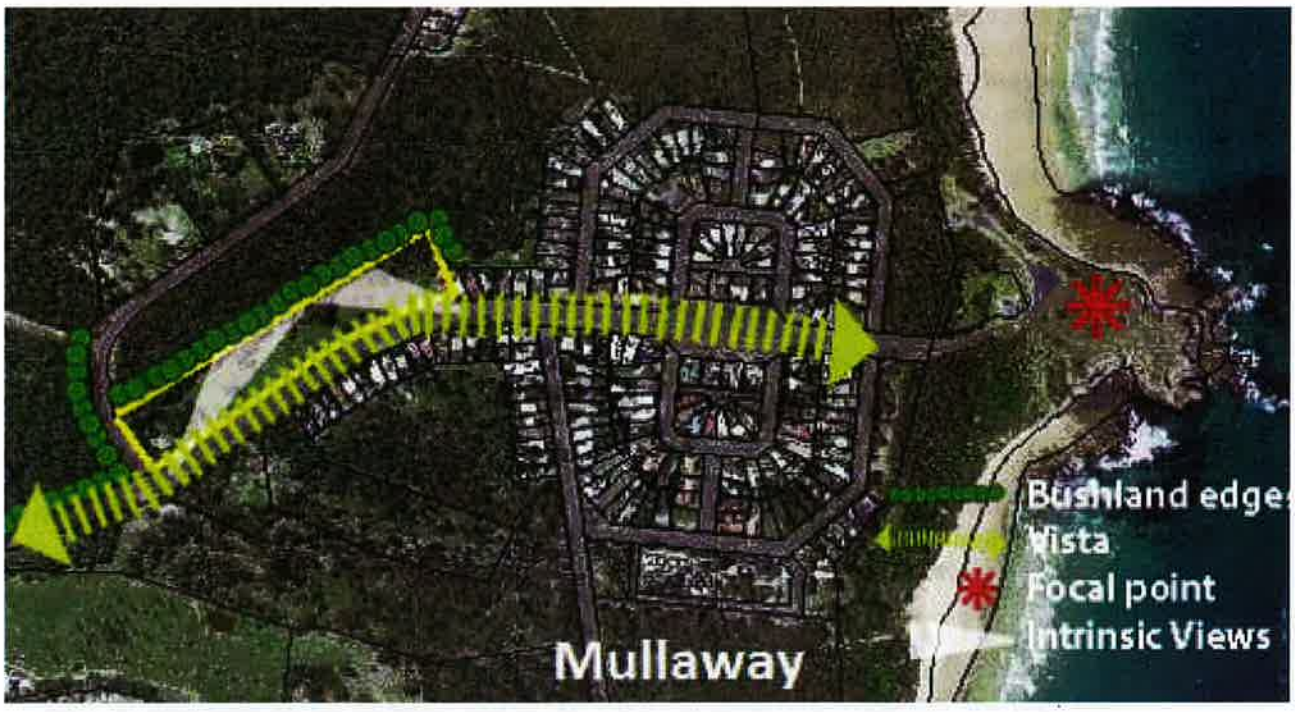


Figure 15: Visual Analysis

The concept proposal outlined in Figure 7 and 8 represents a considered and sensitive design response that optimises and enhances the existing unique visual attributes of the land and its setting within the Mullaway village.

6.3 Geotechnics, Slope and Contaminated Land

The subject land is a relatively flat parcel land in an area that is considered stable; the area is not known for slip, erosion or subsidence. Moroever, the main drainage lines that disperse water in the area fall outside the subject land. No significant impediments are expected in relation to soil stability or provison of footings, foundations or other subsurface structures.

The land has been used for the grazing of horses and prior to this use the land supported native vegetation. There is no evidence of the land being used for any activities that may cause soil contamination and the land is not identified as contaminated land on Council's geographical information system.

In summary, there are no geotechnical, slope or contaminated land constriuants in realtion to the developemnt of the land for housing.

6.4 Bushfire risk

A Bushfire Assessment has been conducted by Florafauna Consulting to assess the risk presented by bushfires and the means to mitigate the risk. A copy of this report is included in Appendix D. The Assessment revealed that the concept development of the land following rezoning can meet with the relevant specifications and requirements of *Planning for Bush Fire Protection 2006* and *Direction 4.4 Planning for Bushfire Protection* subject to Recommendations outlined in the Assessment. The findings and recommendations are as follows:

> *The bushfire assessment demonstrates that bushfire protection of a future residential subdivision development of the land within the subject site can satisfy the requirements of Planning for Bushfire Protection 2006 when assessed in accordance with Section 44 of the Rural Fires Regulation 2013 for the purpose of applying for a Bushfire Safety Authority under Section 100B of the Rural Fires Act 1997.*
>
> *The potential layout of a future residential subdivision that has been used as the basis of this bushfire assessment is shown on the subdivision concept plan prepared by Bennell and Associates appended to this report as Appendix A. This report demonstrates that bushfire risks can satisfactorily be managed for the most likely development of the land for residential purposes as shown in the concept plan. Moreover, subject to the recommendations detailed below, there are no significant impediments to the rezoning of the land from a bushfire hazard perspective.*
>
> *While it is acknowledged that the rezoning of the land for residential purposes will allow a range of other, less likely, but more sensitive uses in terms of bushfire hazard; it is considered that adequate legislation is in place to ensure the bushfire hazards can be addressed for these less likely uses before such developments occur.*

The following recommendations are made in relation to bushfire protection measures for the most likely use for a residential subdivision of the land at Lot 1 DP 417132, Mullaway Drive Mullaway and are based on the relevant provisions of the NSW Rural Fire Service guideline entitled Planning for Bush Fire Protection 2006 and *Australian Standard AS 3959-2009 Construction of buildings in bushfire-prone areas*:

- At the issue of a subdivision certificate and in perpetuity, the land to a minimum distance of 30 metres situated between the northern boundary of the subject site and the northern edge of the (future) building envelopes shall be maintained as an Inner Protection Area (IPA) as prescribed under Section 4.1.3 and Appendix 5 of *Planning for Bush Fire Protection 2006*;
- As outlined under Section A2.2 of *Planning for Bush Fire Protection 2006*, and in relation to the requirements of recommendation 1 above, the IPA should provide a tree canopy cover of less than 15 % which should be located greater than 2 metres from any part of the roofline of a dwelling. Garden beds of flammable shrubs are not to be located under trees and should be no closer than 10 metres from an exposed window or door. Trees should have lower limbs removed up to a height of 2 metres above the ground;
- Water, electricity and gas are to comply with section 4.1.3 of *Planning for Bush Fire Protection 2006*. Any new electricity supply lines are to be installed underground; and
- The proposed fire trail shall comply with Section 4.1.3 (3) of *Planning for Bush Fire Protection 2006*.

6.5 Archaeology

The land is a generally flat cleared land parcel that has been used for many years for the grazing of horses. The land has no particular attributes that would suggest occupation or use in the past by Aboriginal people; the land is not near a major watercourse is unlikely to be part of a significant travel route and has no features, such as, rock shelves, platforms or caves that would have provided a resource for the indigenous community.

As the land is a Greenfield site that will involve activities that will disturb the ground surface, it is important that due diligence is followed with respect to potential impacts upon Aboriginal cultural values. Under the Office of Environment and Heritage guidelines an assessment has been conducted in accordance with the "*Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* ". Given the disturbed and urbanised nature of the site and surrounding area, a reasonable and practicable approach is to follow the "*Generic Due Diligence Process*" under the Code.

This process outlines three steps, namely:

- *Search relevant confirmed site records or other associated landscape feature information on Aboriginal Heritage and Information Management System (AHIMS)? and/or*
- *Search any other sources of information of which a person is already aware? and/or*
- *Search landscape features that are likely to indicate presence of Aboriginal objects?*

The AHIMS search has revealed that there are no objects on the land or within 50m of the subject land; Appendix E includes the results of the search. There are no other sources of information that the author of this report is aware of that would indicate the presence of any Aboriginal heritage item, object or place on or near the land.

For this rezoning proposal the only area where an item or object may be found is within the bushland areas to be zoned for environmental protection purposes and retained as part of a vegetation buffer to the nature reserve; the areas of the land to be developed are disturbed lands supporting grasslands. Nevertheless, the following condition is recommended for any future development application that may result in the disturbance of the land to ensure the protection of Aboriginal cultural heritage in the unlikely event that an item or object is found;

> *The owners, and their employees, earthmoving contractors, subcontractors, machine operators and their representative, whether working in the survey area of elsewhere, should be instructed that in the event of any bone or stone artefacts, or discrete distributions of shell, or any objects of cultural association, being unearthed during earthmoving, work should cease immediately in the area of the find. And contact is to be made with the Department of Environment, Climate Change and Water NSW.*

The imposition of the above condition will ensure any cultural heritage values associated with the site are protected.

Section 7

Urban Capability Assessment

7.1 Hydrology

The subject land is located within a small catchment that feeds a natural drainage line that runs along the northern boundary of the land and extends through the nature reserve before debouching at Mullaway Beach and a formal drainage line that extends along Mullaway Drive and is part of the road drainage network. The development of the land will change the hydrology of the land with an increase in impervious surfaces associated with buildings and driveways and other paved or hard surface areas.

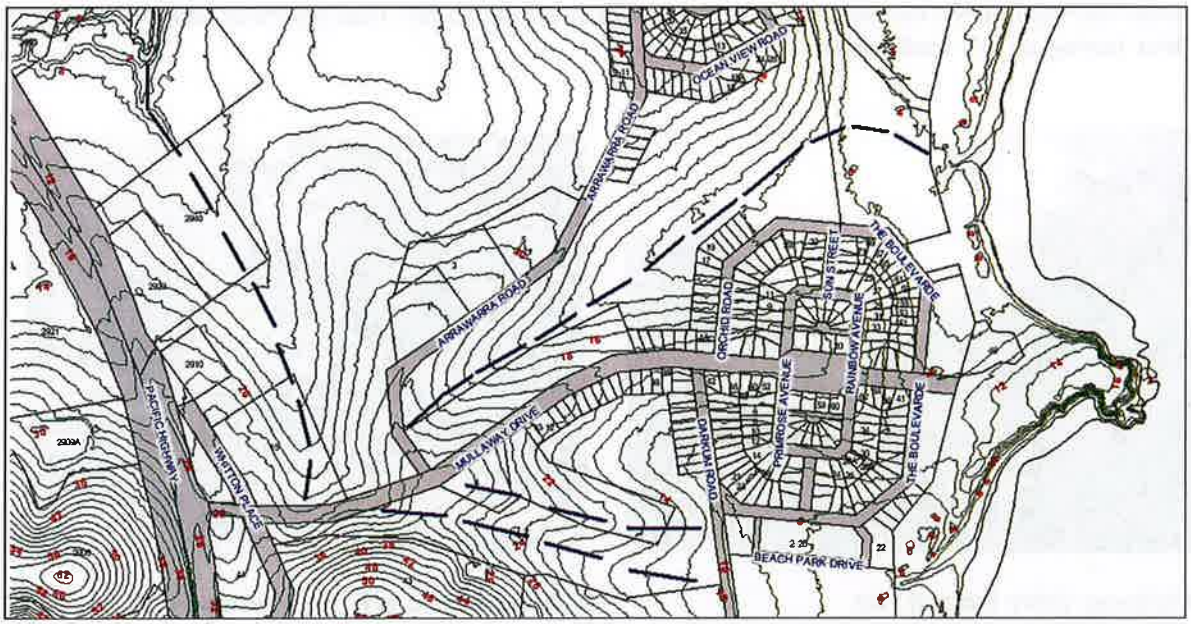


Figure 16: Main Drainage Lines (source CHCC GIS)

The land is an elevated parcel of land and is not mapped as flood prone land. As stated above the land has a gradual fall from west (32m AHD) to east (13.5m AHD) and a cross fall from the front (i.e. south) of the site to the rear (i.e. north). This topography lends itself to a stormwater design solution that captures water at the front and rear of the allotments. A drainage swale could be constructed along the rear of the allotments adjacent to the fire trail to collect stormwater from the development of the land. The drainage at the front of the allotments generally associated with the driveways can be managed by the installation of underground water tanks to collect roof water. Deep soil landscaping can be used to further assist in capturing and treating stormwater runoff to protect the receiving waters of the drainage lines. The proposed approach to water quality management measures include:

- Stormwater treatment measures can be implemented in the housing areas with minimum treatment to meet the water quality objectives listed in Council's Water Sensitive Urban Design (WSUD) Policy.

- Stormwater detention, including first flush measures can be implemented in proposed development areas.

- Because of the many options available, these are best detailed as part of a future development application process.

- A stormwater management strategy can be developed to meet the above objectives.

7.2 Road Network and Access

The subject land has access to both Mullaway Drive and Arrawarra Road. Both of these roads are collector roads that serve the Mullaway and Arrawarra Headland areas respectively. These roads are two way sealed roads with a speed limit of 50km/hr outside of school hours and a 40km/hr speed limit around school opening and closing times (8am - 9.30am and 2.30pm- 4pm) between Arrawarra Road/Mullaway Drive intersection and the Solitary Islands Way (old Pacific Highway). Both roads have designated cycleways with Arrawarra Road having an off- road cycleway and Mullaway Drive having an on- road painted cycleway.

Mullaway Drive looking east

Arrawarra Road off- road cycleway

The existing dwelling house on the land has access to both Mullaway Drive and Arrawarra Road; however, access to the new lots within the subject land is proposed to be restricted to Mullaway Drive. Mullaway Drive is a relatively flat straight road in the location of the subject land and has no significant access constraints. The subject land has a 60m stopping sight distance to vehicles travelling in an easterly direction and over 100m stopping sight distance to vehicles travelling in a westerly direction along Mullaway Drive.

The development of the land for housing will generate approximately 200 daily vehicle trips and 20 weekday peak hour trips. The existing road network can accommodate this additional traffic load without any significant impact upon the level of service of the road network or the general safety of Mullaway Drive. In fact the development of the land provides an opportunity to improve the safety for motorists, pedestrians and cyclists, especially children seeking access to Mullaway Primary School. This improved safety can be achieved by developing an off-road cycleway within the nature strip along the frontage of the land to provide a safer access for pedestrians and cyclists and an opportunity to convert the on- road cycleway back to a road verge to allow for eastbound vehicles to pull over when required. The off-road cycleway can be connected to the existing off road cycleway in Arrawarra Road. The concept plan for the development of the land shows how the off road cycleway can be extended along the subject land.

Mullaway Drive 50km/hr speed limit

Bus shelter in Mullaway Drive

7.3 Water and Sewer Supply

The Mullaway village is connected to the reticulated water and sewer network and this network has capacity for the additional 22 dwellings expected to develop upon the subject land.

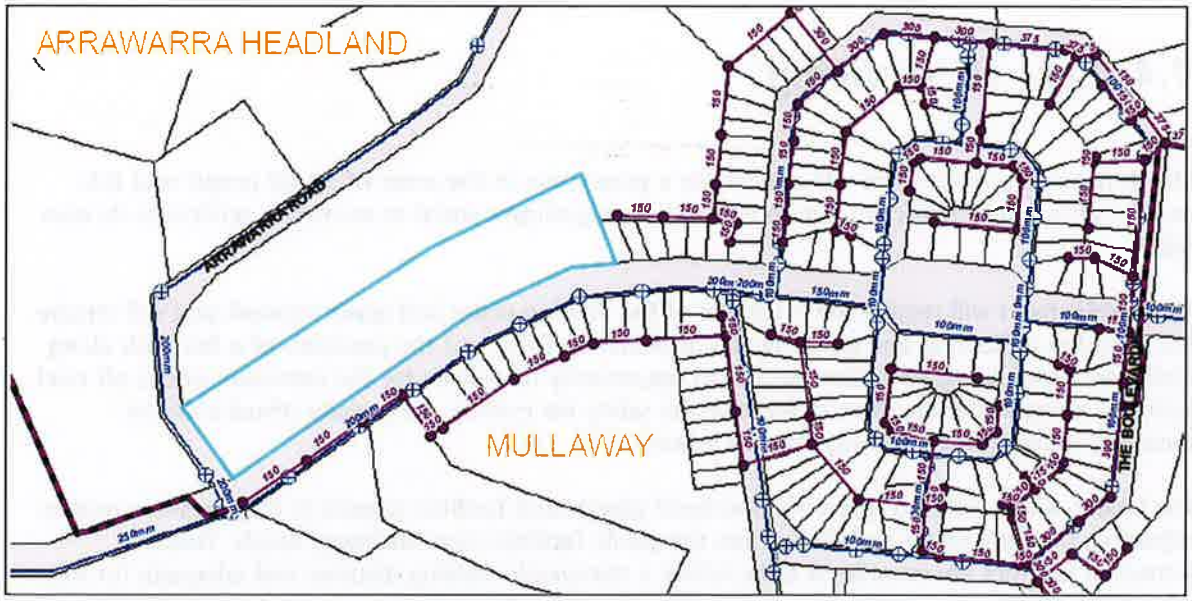


Figure 17: Water and Sewer Services (source CHCC GIS)

A sewer rising main extends from Mullaway Public Primary School and then feeds a 150mm pipeline that extends along Mullaway Drive and another rising main is located along The Boulevarde and connects with a large pumping station located near the Mullaway Beach reserve. The sewer line can be extended to connect with the existing 150mm pipeline that is located at the rear of the properties fronting Mullaway Drive that adjoin the eastern boundary of the site. This will allow for a gravity fall from the subject land which is elevated above these lands.

Water services extend along Arrawarra Road with a 200mm pipeline that extends along the western and northern side of Arrawarra Road and this line then extends along the southern side of Mullaway Drive. The subject land can be serviced with reticulated water by under boring to connect with the pipeline in Arrawarra Road. Given the existing servicing of properties in Mullaway Drive, sufficient water pressure is expected to be available to the subject land.

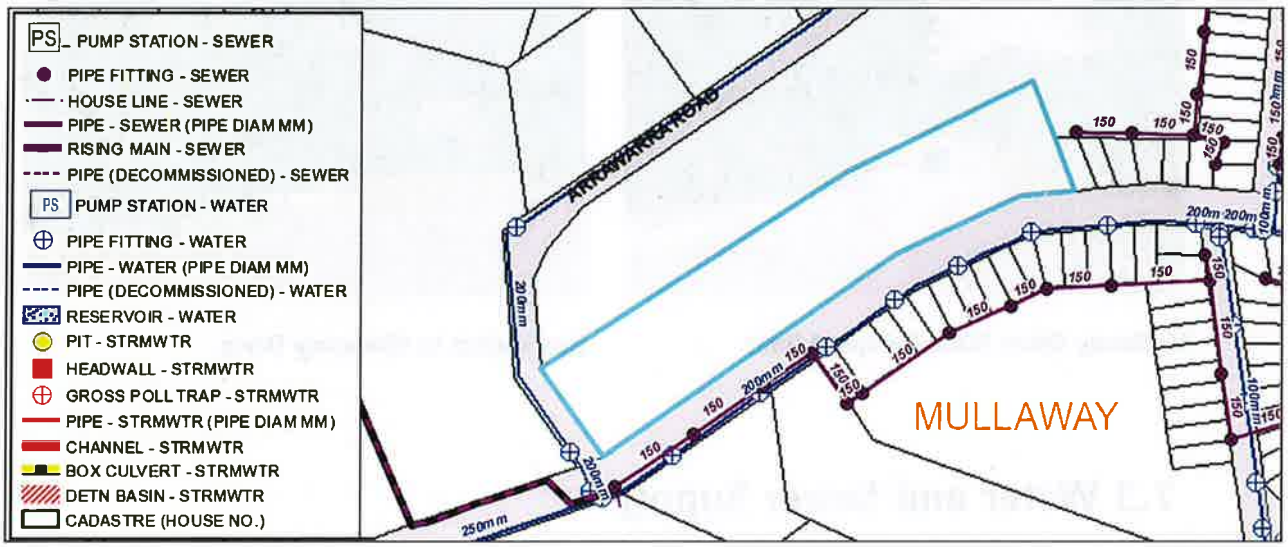


Figure 18: Detail of Water and Sewer Services (source CHCC GIS)

7.4 Cost of Servicing

The development of the land will provide for a population in the order of 50-60 people and this population is not of sufficient size to demand any significant social or recreation services in its own right.

The development will require the extension of the existing water and sewer network and will require the provision of kerbing and guttering along Mullaway Drive and the provision of a footpath along Mullaway Drive. As stated earlier there is an opportunity to provide for the extension of the off road cycleway along Mullaway Drive to improve the safety for cyclists, particularly school children travelling to and from Mullaway Primary School.

The land is within 500m of the neighbourhood playground facilities located in the foreshore reserve adjoining The Boulevarde and 600m from the picnic facilities near Mullaway Beach. Theses recreation facilities are considered to be within a reasonable walking distance and adequate for the size of population expected to be accommodated on the subject land.

Figure 19: Recreation Facilities

The development of the land will be subject to Council's Contribution Plans for community services and facilities prepared under Section 94 of the EP&A Act 1979 including:

- Regional, District & Neighbourhood Facilities Contributions Plan 2008;
- Coffs Harbour Road Network Developer Contributions Plan 2008;
- Surf Rescue Facilities Developer Contributions Plan 2012; and

The development of the land will also be subject to contributions under Section 64 of the Local Government Act 1993 for water and sewer services; the land is subject to the 'Coffs Harbour Water Supply Development Servicing Plan 2002' and the 'Coffs Harbour Wastewater Development Servicing Plan 2002',

The total Section 94 cost to provide for services to the land is $4,952 .39 per lot and $19,056.44 per lot for water and sewer services; this represents a total contribution to Council of $528,194.26 for the development of the land for 20 lots.

Section 8

Other Issues

8.1 Land Use Conflicts

The subject land is located within the village of Mullaway and is bounded by Mullaway Drive to the south, Arrawarra Road to the west and bushland to the north. The eastern boundary adjoins residential lands with frontage to Mullaway Drive and bushland located to the rear of these residential lands.

The land uses generally reflect the zoning of the land with detached dwelling houses occupying land zoned for residential purposes and the bushland areas occupying the land zoned for open space or recreation purposes.

The subject land currently supports grasslands and some scattered trees and is used for the grazing of horses. The potential land use conflicts relate to the potential impacts upon the adjoining residential areas and the impacts upon the adjoining bushland.

The proposal is the rezoning of the land to R2 Low Density Housing in keeping with the adjoining zoning. While the R2 zone allows for a wide range of compatible residential uses, the most likely development of the land is for detached dwellings as outlined in the concept plan. The use of this land for this purpose is not expected to create any significant land uses conflicts or change the amenity currently enjoyed by existing residents. It is to be noted that impacts in terms of privacy and potential overshadowing of the adjoining residential property to the east will be alleviated to a degree by the setback created by the proposed fire trail.

Residential development with an interface to bushland has the potential to impact upon it through weed invasion, disposal of garden refuge, infringements by ancillary activities (i.e. boat and car storage, recreation structures, fences, gardens and the like) and general human activities particularly fire and vehicle use. To mitigate these potential impacts, it is proposed to service the subdivision with a fire trail to provide a clear demarcation between the private and public lands and allow for surveillance of any inappropriate activities.

The proposal is for a low traffic generating low density residential development that is compatible with the surrounding areas and will deliver a far lower level of potential land use conflicts than the original intended use of the site for a sports field.

Figure 20: Adjoining Land Use Mix

8.2 Consultation

The Planning Proposal is required to be advertised to allow for the community to comment on the proposal. Given the past extensive consultation with respect to the 'Our Living City Strategy,' that identified the land as a future investigation area, and the relatively minor scale of this rezoning proposal, the advertising of the proposal is considered to be an adequate means of consultation in this circumstance.

8.3 Commonwealth Interests

The Environment Protection and Biodiversity Conservation (EP&BC) Act 1999 generally seeks to provide for the protection of the environment, especially those aspects of the environment that are matters of national environmental significance. The Ecological Assessment by FloraFauna Consultants included a search of the Department of Sustainability, Environment, Water, Population and Communities web site employing the 'Protected matters Search Tool' with a 10km buffer was undertaken to identify the matters of National Ecological Significance that may occur in, or may relate to the site.

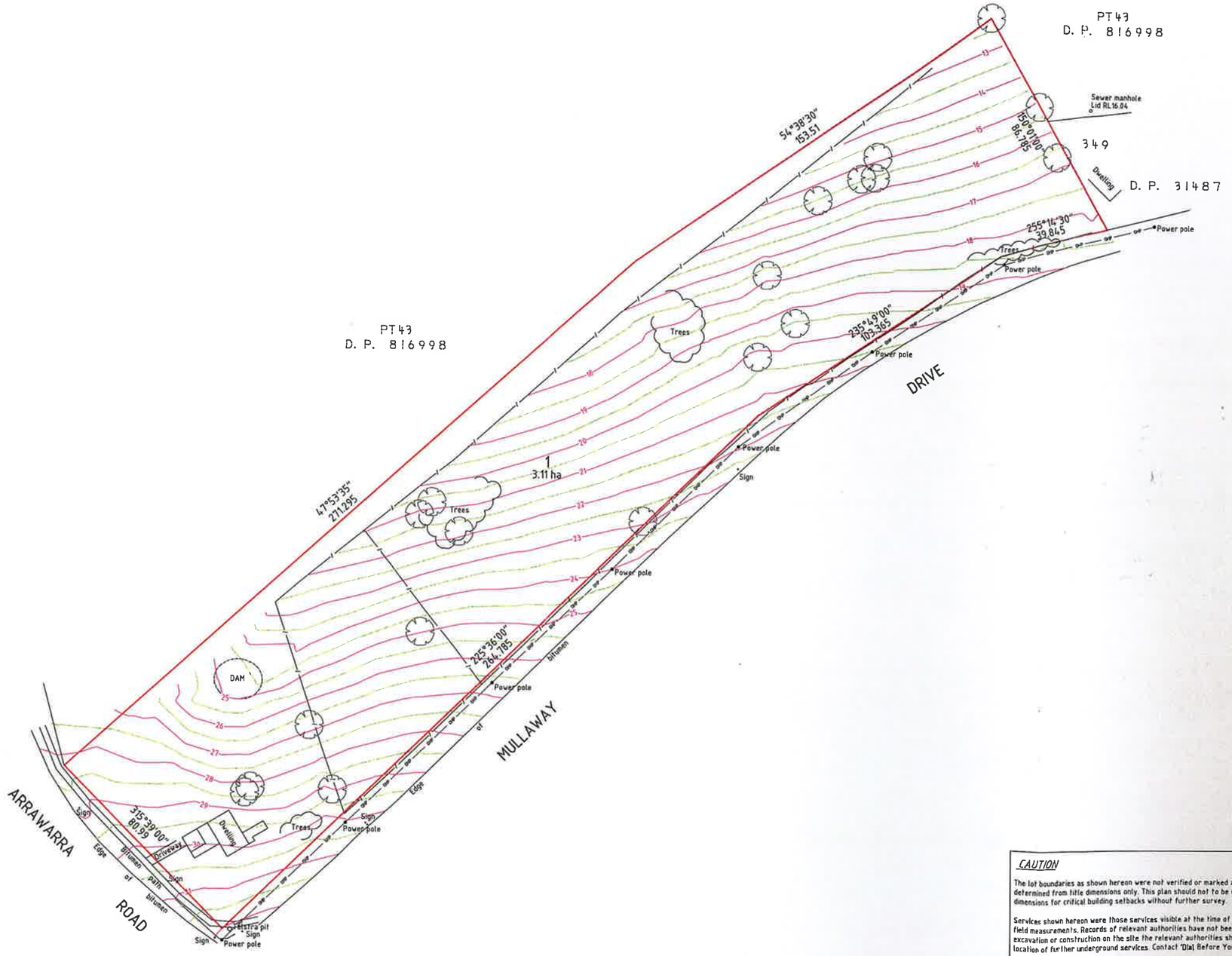
The subject land is a highly disturbed parcel of land that supports no significant native vegetation. Provided soil erosion and sediment control measures, water sensitive urban design measures and the proposed ecological measures are put in place, the proposal should have a neutral to positive impact in terms of biodiversity values. Accordingly, the planning proposal is not expected to impinge upon any Commonwealth interests and is in keeping with the EP&BC Act intent of promoting ecologically sustainable development.

Appendix A

T. | M. | M.

APPROX 2°54'

PLAN BEARINGS



CAUTION

The lot boundaries as shown hereon were not verified or marked at the time of survey and have been determined from title dimensions only. This plan should not to be used to determine available dimensions for critical building setbacks without further survey.

Services shown hereon were those services visible at the time of survey and have been located by field measurements. Records of relevant authorities have not been searched. Prior to any demolition, excavation or construction on the site the relevant authorities should be contacted for possible location of further underground services. Contact 'Dial Before You Dig' on 1100.

Contours are an indication only of the level of the land as interpolated from the heights shown.

Selected significant trees have been located by this survey as shown on the plan.

CONTOUR & DETAIL PLAN
LOT 1 D.P. 417132
MULLAWAY DRIVE
MULLAWAY

REVISION	DESCRIPTION	DATE

BLAIRLANSKEY RUSSELL SURVEYING
REGISTERED SURVEYORS & LAND DEVELOPMENT CONSULTANTS
P.O. BOX 2453 COFFS HARBOUR N.S.W. 2450
Email: bls@blsurvey.com
Phone: (02) 66 525 090

0 8 16 24 32 40
SCALE 1:800 @ A1

DATUM	SURVEYED:	SDR	DESIGNED:	
AHD	JOB No:	8752	DRAWN:	JAL
	DATE:	29-4-2014	CHECKED:	SDR

RECORDS REFERENCE

DATA BASE:	PLANS:
Z:\8752\8752.CDS	Z:\8752\8752.DWG

SHEETS
No: 1
of 1

DATUM ORIGIN
PM75978 at RL18.69

Appendix B


ORCHID ROAD
MULLAWAY DRIVE
DARKUM ROAD
Lot 23
Lot 22
Lot 21
Lot 20
Lot 19
Lot 18
Lot 17
Lot 16
Lot 15
Lot 14
Lot 13
Lot 12
Lot 11
Lot 10
Lot 9
Lot 8
Lot 7
Lot 6
Lot 5
Lot 4
Lot 3
Lot 2
Lot 1
6m Fire Trail
MULLAWAY DRIVE
ABRAWARRA ROAD
ARRAWARRA ROAD
APZ
30m wide

Appendix C

FloraFauna Consulting

Ecological Assessment
EA-2014-1002

Proposed Rezoning

Lot 1 DP 417132
Mullaway Drive Mullaway

March 2014

Prepared for: Ashley More

FPA AUSTRALIA
Certified Business
Bushfire Planning
& Design

FloraFauna Consulting
PO Box 3212 West Kempsey NSW 2440
Ph: (02) 6561 5263. Mob: 0429 727 010
Email: mail@florafauna.com.au
Web: www.florafauna.com.au
ABN: 22 167 601 074

Report Title:	Ecological Assessment
Project:	Proposed Rezoning of Land for Residential Purposes Lot 1 DP 417132 Mullaway Drive Mullaway
Client:	Ashley More
Report No.:	EA-2014-1002
Draft/Final:	Final – 7 May 2014

The preparation of this report has been undertaken in accordance with the project brief provided by the client and has relied upon the information, data and results provided or collected from the sources and under the conditions outlined in the report.

All information contained within this report are prepared for the exclusive use of the client and with respect to the land described herein and are not to be used for any other purpose or by any other person or entity. No reliance should be placed on the information contained in this report for any purposes other than those stated herein.

Prepared By: **Steve Britt**
BSc. (Botany)
Grad. Dip. DBPA
M. Wld. Mgt. (Habitat)

Signed: 

Date: 7 May 2014

Table of Contents

1. Executive Summary

This report describes the ecological assessment undertaken during March 2014 in relation to the proposed rezoning of land situated at the corner of Mullaway Drive and Arrawarra Road Mullaway. The study area has an area of approximately 3.132 ha and is identified as Lot 1 in DP 417132.

Three terrestrial plant communities were recorded within the study area and on the adjoining land to the north during the field survey. The majority of the land within the study area was occupied by a derived grassland community dominated by exotic/weed species. Two native plant communities were recorded on the adjacent land adjoining the northern boundary and included a Coast and Escarpment Blackbutt Dry Forest community and a Lowlands Swamp Box – Paperbark – Red Gum Dry Forest community as described under the Fine Scale (Class 5) Vegetation Mapping. Remnants of these plant communities extended into the study area where they were recorded at the interface along the northern boundary and as small groups of canopy trees containing an anomalous assemblage of understorey species and as isolated 'paddock trees'. The Lowlands Swamp Box – Paperbark – Red Gum Dry Forest community was identified as the endangered ecological community – *Sub-tropical Coastal Floodplain Forest of the NSW North Coast bioregion*.

The objectives of the assessment were to describe the ecological characteristics of the survey area within the study area; identify the impacts of the proposed activity on flora and fauna species, populations, ecological communities and critical habitat; assess the nature, extent, frequency, duration and timing of impacts; assess the extent of threatening processes; assess the significance of the impact on species, ecological communities and populations listed under the *Threatened Species Conservation Act 1995* (TPC Act), *Fisheries Management Act 1994* FM Act) and *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act); and propose environmental management measures to minimise mitigate and if necessary offset impacts.

Observations made during the field survey indicate that the land within the study area is degraded and heavily infested with exotic/weed species. Generally, it appears that there are no significant impediments to the proposed rezoning. In relation to further development of the subject site, it is considered that additional ecological investigation would not be warranted given the extent of the disturbance and modification to the habitats that exists. The mitigation measures proposed under Section 6 are aimed at providing an appropriate biodiversity offset that does not compromise the development potential of the land within the study area.

From the habitat assessment and database/literature review, it was considered that 11 threatened species as listed under the *Threatened Species Conservation Act 1995* and *Environment Protection and Biodiversity Conservation Act 1999* could potentially utilise the limited resources available in the habitat within the study area. The Section 5A Assessments appended to this report as Appendix C concluded that the proposal is unlikely to impact significantly on any threatened species and populations.

2. Introduction

2.1 Background

FloraFauna Consulting has been engaged by Ashley More (the client) to prepare an ecological assessment report to assess the potential impacts in relation to the proposed rezoning of land at Mullaway.

2.2 Study Area

The study area is located at the corner of Arrawarra Road and Mullaway Drive, Mullaway and comprises an allotment of land of approximately 3.153 ha in size that is identified as Lot 1 in DP 417132. The land within the study area is currently zoned RE1 – Public Recreation and RU2 – Rural Landscape under the *Coffs Harbour Local Environmental Plan 2013* (LEP).

There is an existing dwelling located in the south-western corner of the site. The remaining land within the study area has been cleared of native vegetation to form derived grassland dominated by exotic species and appears to have been used for the purpose of keeping horses for a considerable period of time. Within this derived grassland community there are a relatively small number of retained trees that seem to be remnants of the former native plant community.

The study area is situated in a landscape that is impacted by human activities. Currently the surrounding land use practices are variable and include existing rural-residential development, agricultural activities and adjacent residential development associated with the village of Mullaway. More recently there have been significant changes to the landscape associated with the Pacific Highway upgrade.

Immediately adjoining the study area to the north are areas of land containing forest. Further to the north lie Arrawarra Road that heads in a generally north-eastern direction and a small number of developed rural-residential allotments surrounded by extensive areas of land containing native forest. To the east the study area adjoins existing residential development, which is the current western extent of the village of Mullaway on the northern side of Mullaway Drive. Immediately adjoining the southern boundary of the study area is the road corridor of Mullaway Drive. To the south of the eastern part of the study area and adjoining the southern side of Mullaway Drive are a number of developed residential allotments. To the southwest of these allotments and opposite the western part of the study area are two developed rural allotment of land, in which native vegetation has been retained. Further southward much of the land has been cleared for agricultural purposes. The western boundary of the study area adjoins Arrawarra Road. Beyond the road corridor further westward the land contains a mix of forested areas, cleared land and rural-residential development.

The relative position of the subject site and the general nature of the surrounding landscape are shown in Figure 2.1.

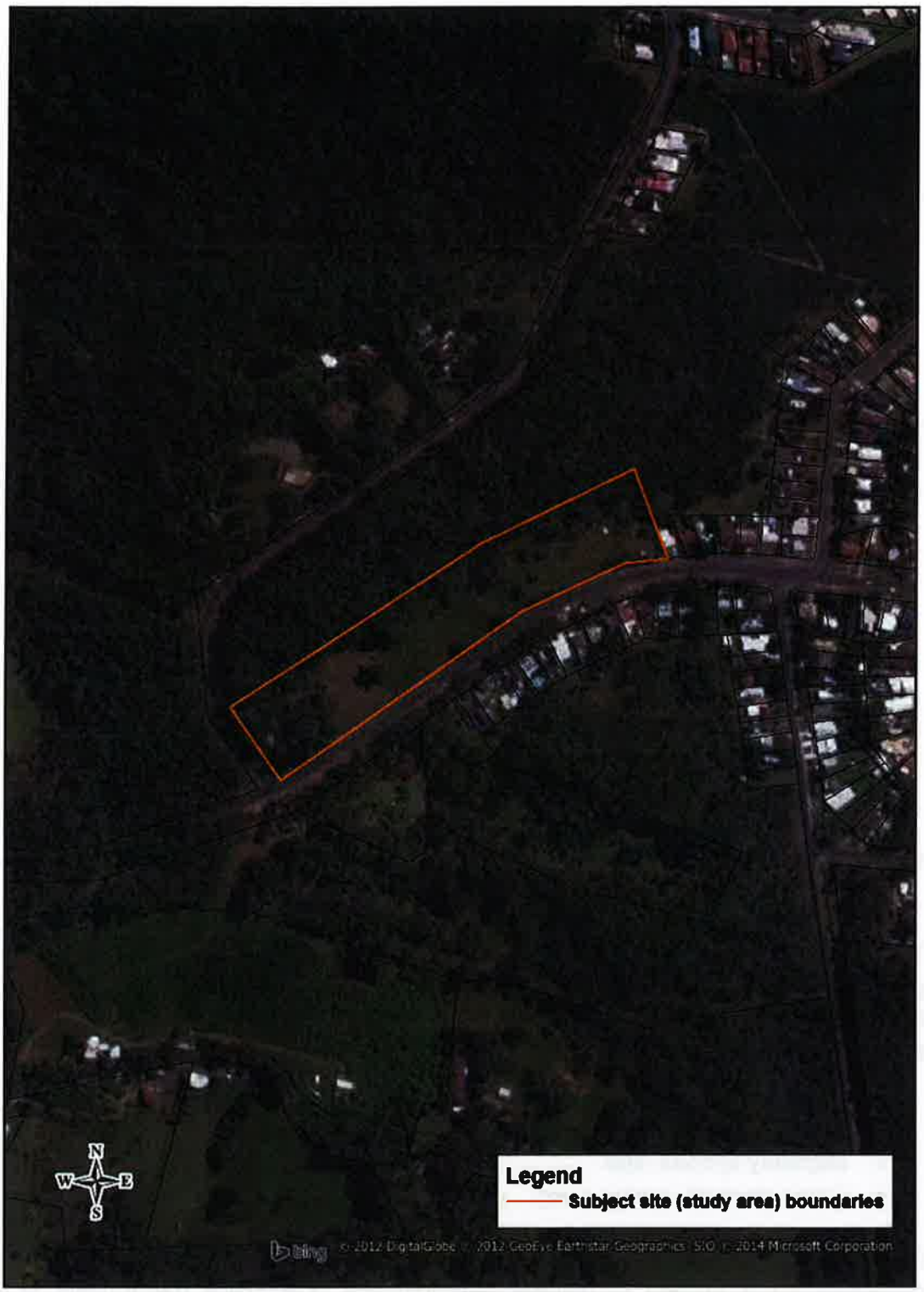


Figure 2.1: Aerial image of the study area and surrounding landscape

2.3 Proposed Development

The proposed development involves a rezoning of the land within the study area for residential purposes. Once the land within the study area has been rezoned it is intended that approval will be sought for a low density residential subdivision comprising 23 allotments incorporating an asset protection zone and perimeter fire trail adjacent to the northern boundary. The subdivision concept plan showing the proposed subdivision layout is appended to end of this report as Appendix D.

2.4 Legislative Context

In NSW the *Environmental Planning and Assessment Act 1979* (EP&A Act) provides the framework for the assessment of development activities. Clause 5A of the Act requires that the significance of the impact of a proposal on threatened species, populations and endangered ecological communities is assessed by preparing a seven-part test in accordance with Clause 5A(2) of the Act.

Other State legislation relevant to the ecological assessment includes the following:

- *Threatened Species Conservation Act 1995* (TSC Act);
- *National Parks and Wildlife Act 1974* NPW Act);
- *Noxious Weeds Act 1993* (NW Act);
- *Fisheries Management Act 1994* (FM Act);
- *State Environmental Planning Policy No. 14 – Coastal Wetlands* (SEPP 14);
- *State Environmental Planning Policy No. 26 – Littoral Rainforests* (SEPP 26);
- *State Environmental Planning Policy No.44 – Koala Habitat* (SEPP 44).

Commonwealth legislation relevant to the ecological assessment is:

- *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The EPBC Act protects nationally and internationally important flora, fauna, ecological communities and heritage places, which are defined in the Act as matters of national environmental significance. Matters of national environmental significance relevant to biodiversity are:

- Wetlands of international importance;
- Nationally threatened species and ecological communities;
- Migratory species; and
- Commonwealth marine areas.

Significance of impacts is determined in accordance with the *Significance impact guidelines 1.1 – matters of national environmental significance* (Department of Environment, Water, Heritage and the Arts, 2006). Where a proposal is likely to have a significant impact on a matter of national environmental significance, the proposal is referred to the Federal Environment Minister. The referral process involves a decision on whether or not the proposal is a 'controlled action'. When a proposal is declared a controlled action, approval from the Minister is required.

2.5 Objectives of the Report

The objectives of the ecological assessment are to:

- Describe the ecological characteristics of the study area including identifying protected and threatened flora and fauna species, populations and ecological communities and their habitats;
- Identify the direct and indirect impacts of the proposed activity on flora and fauna species, populations, ecological communities and critical habitat;
- Assess the nature, extent, frequency, duration and timing of impacts;
- Assess the extent to which the proposed activity contributes to processes threatening the survival of biota on the site;
- Assess the significance of the impact of the proposed activities on species, ecological communities and populations listed under the TSC Act, FM Act and EPBC Act; and
- Propose management measures to minimise or mitigate and if necessary offset impacts.

3. Survey Methodology

3.1 Licencing

All work in relation to this ecological assessment was undertaken with appropriate licences and authorisations including:

- A Scientific Licence for the purpose of ecological survey and consulting issued subject to the provisions of Section 132C of the NPW Act and regulations; and
- An Animal Research Authority issued by the Department of Industries and Investment (formerly the Department of Primary Industries) Director-General's Animal Care and Ethics Committee for the purpose of biodiversity survey and habitat assessment.

3.2 Nomenclature

The names of plants used in this document follow the *Flora of New South Wales* (Harden, 2000) with updates from the PlantNet website (Royal Botanic Gardens Sydney, 2012).

The description of plant communities used in this document follow the Fine Scale (Class 5) Vegetation Mapping – Coffs Harbour Local Government Area – Vegetation Community Profiles (NSW Office of Environment and Heritage). In addition, a description based on the NSW Plant Community Type (PCT) classification from the NSW Vegetation Information System (VIS) classification database (NSW Office of Environment and Heritage) has also been provided as this is the classification system more widely used in NSW. For clarity observations recorded during the field survey have also been provided.

The names of vertebrate animals used in this document follow the Census of Australian Vertebrates (CAVS) database maintained by the Department of the Environment and Heritage (2004).

3.3 Literature Review

The following literature was reviewed in relation to this ecological assessment:

- *Coffs Harbour Local Environmental Plan 2013* (LEP);
- Coffs Harbour City Council online land zoning map;
- Coffs Harbour City Council online mapping tool; and
- Fine Scale Vegetation Mapping for the Coffs Harbour Local Government Area.

3.4 Database Searches

Database searches as summarised in Table 3.1 were undertaken on 4 March 2014 and 16 April 2014.

Database	Source
Atlas of NSW Wildlife (10 km x 10 km search area)	NSW Government Office of Environment and Heritage
PlantNet: ROTAP/Threatened Species Spatial Search (10 km radius)	Sydney Royal Botanic Gardens
EPBC Act Protected Matters Search Tool (10 km buffer)	Department of the Environment

Table 3.1: Database Searches

3.4.1 Atlas of NSW Wildlife

The Atlas of NSW wildlife database was searched to verify the number and location of threatened species records within a 10 x 10 km (default) search area around the study area. This information was used to determine:

- The number of records of threatened species
- The proximity of any threatened species records to the study area; and
- If a population of a threatened species such as the Koala is indicated.

3.4.2 EPBC Act Protected Matters Search Tool

The Protected Matters Search Tool (PMST) was utilised to generate a report that provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act around the study area employing a 10 km buffer.

a. Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the nominated area within the 10 km buffer.

b. Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the EPBC Act that may relate to the nominated area within the 10 km buffer. 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 and the heritage values of a place on the Register of the National Estate.

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.

3.5 Field Survey

An investigation of the study area was undertaken on 5 March 2014 for the purpose of conducting an assessment of the flora and fauna, a survey of trees within the canopy of the plant community and habitat assessment as detailed below.

3.5.1 Flora Assessment

An assessment of the flora was conducted during the field investigation using a modified random meander method after Cropper (1993) and the following tasks were undertaken:

- Identification of the plant communities, species and populations present;
- Targeted survey of threatened species identified in the database search
- Spatial distribution of the vegetation in the survey area;
- Assess the condition of the vegetation; and
- Determine the conservation significance of the vegetation;

3.5.2 Tree Survey

Trees were surveyed to quantify the species composition of the canopy within the plant communities. The purpose of quantifying the species within the canopy was to assist with:

- Determining the plant communities present within the study area;
- Collection of information for the habitat assessment such as presence of tree hollows; and
- Determining the approximate percentage of Koala feed tree species present as part of the Koala habitat assessment.

For the purposes of this ecological assessment a tree is defined as a perennial plant having a trunk diameter at breast height (DBH) of not less than 100 mm where DBH is the measurement of the trunk at 1.3 m above ground level.

3.5.3 Fauna Assessment

The fauna assessment conducted was restricted to a visual daytime survey. Trapping or other survey techniques such as spotlighting and the like for fauna species was not conducted, nor was a comprehensive species list gathered. During the fauna survey the following information was collected:

- An inventory of bird species present within the site and adjacent land using the "standardised search" method after Watson (2007); and
- Other species of fauna recorded opportunistically during the field survey.

3.5.4 Habitat Assessment

The habitat assessment focused on the potential for species to occur within the survey area based on the type, suitability and condition of the habitat, and the habitat features present. Although recording threatened species during field survey can confirm their presence in an area, the lack of threatened species records does not necessarily indicate that threatened species are absent. Threatened species tend to be rare and in many cases are cryptic by nature, consequently they are often difficult to detect. Suitable habitat is, therefore, a useful indicator and an important matter for consideration when determining the potential for the presence of threatened species. During the field survey the following information was collected:

- Habitat type;
- Habitat features including locating and mapping all hollow-bearing trees within the study area;
- Threatened species and populations likely to be present based on the type of habitat and the habitat features present; and
- Habitat connectivity; and conservation significance (individuals, species, populations and communities).

3.6 Koala Habitat Assessment and Koala Survey

3.6.1 Coffs Harbour Koala Plan of Management

Under the provisions of Clause 11 of SEPP 44 a plan of management may be prepared for either:

a) The whole of a local government area, or
b) A part of such a local government area (including an area of land that is the subject of a development application).

The *Coffs Harbour Koala Plan of Management* is a comprehensive Koala plan of management (CKPoM) covering the whole of the Coffs Harbour City Local Government Area.

The Koala habitat mapping provided in the CKPoM indicates that part of the land within the study area and land adjoining the study area contains secondary Koala habitat as indicated in Figure 3.1.

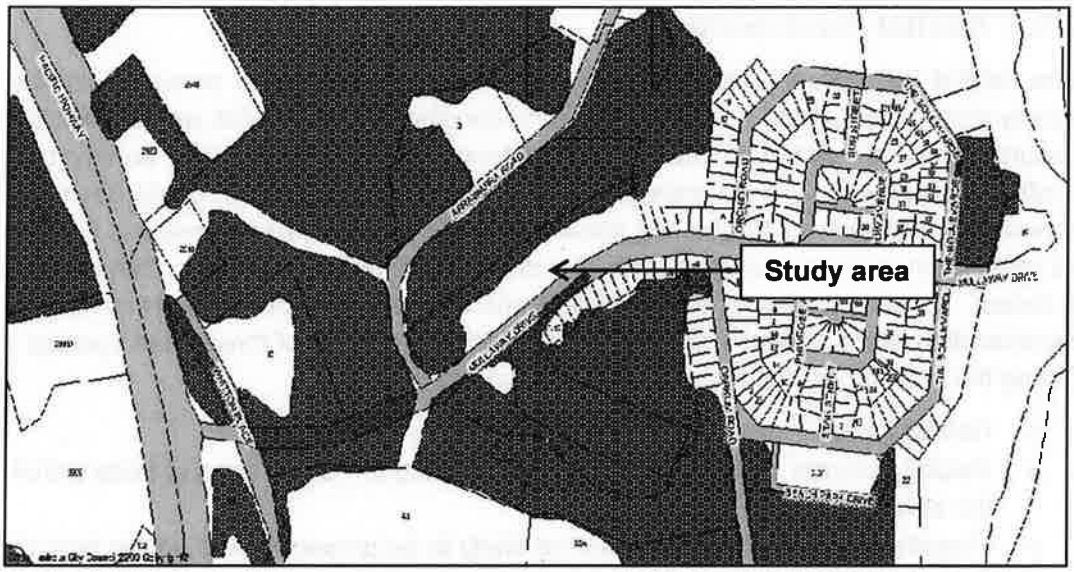


Figure 3.1: Extract of the Koala habitat map (Source: Coffs Harbour City Council)

Key: Mapped secondary Koala habitat

As part of the study area is mapped as secondary Koala habitat for the purposes of the CKPoM, the objective and management actions applicable to secondary Koala habitat as listed under clause 3.4 of Part A of the CKPoM must be considered.

The objective for mapped secondary Koala habitat is:

To minimise further loss, fragmentation or isolation of existing secondary koala habitat and the creation of barrier to koala movement and, where appropriate, to encourage restoration of koala habitat

The management actions applicable to mapped secondary Koala habitat are described under Section 5.2 of the report. The measures to address the management actions are provided in Section 6.2 of this report.

The Atlas of NSW wildlife database was searched to verify the number and location of Koala records within a 10 km x 10 km (default) search area around the study area. This information was used to determine if a population of the species is indicated and to gauge the potential utilisation of the habitat within the study area by the species.

3.6.2 EPBC Act

Koala (*Phascolarctos cinereus*) populations in Queensland (QLD), New South Wales (NSW) and the Australian Capital Territory (ACT) have been listed as vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). This listing came into legal effect on 2 May 2012. The Department of the Environment has prepared *Draft EPBC Act referral guidelines for the vulnerable koala (combined populations of Queensland, New South Wales and the Australian Capital Territory)* (the Guidelines), which are designed to assist proponents in deciding whether a proposed action is likely to have a significant impact on the Koala. The Guidelines advise that for the most up-to-date report of whether the Koala may occur in the project area, always use the Department's Protected Matters Search Tool (PMST).

For the purposes of determining significant impacts under the EPBC Act, the distribution of the Koala has been split into two contexts (the inland and the coastal). These contexts exhibit different climatic and ecological attributes and therefore each have different considerations with regard to habitat critical to the survival of the Koala and the significance of impacts on the species. To separate the coastal and inland geographic contexts the Guidelines uses the 800 mm per annum rainfall isohyet.

As the study area receives more than 800 mm of rainfall per annum it falls within the coastal context. The attributes of the coastal context applicable to the study area are provided in Table 3.2 below:

Attribute	Applicable to Coastal Geographic Context
Potential Habitat	• Large, connected areas of native vegetation, including in forests and woodlands where logging has altered tree species composition; • Small, isolated patches of native vegetation in rural or urban areas; • Narrow areas of native vegetation along riparian areas and linear infrastructure; and • Isolated food and/or shelter trees on farm lands and in suburban streetscapes and parks.
Primary threats	• Loss, fragmentation and degradation of habitat including dispersal habitats; and • Mortality due to vehicle strikes, dog attacks and disease.
Interim recovery objective	• Protect and conserve large, connected areas of koala habitat, particularly large, connected areas that support koalas that are: ➢ Genetically diverse/distinct; or ➢ Free of disease or have a very low incidence of disease; or ➢ Breeding (i.e. presence of back young or juveniles).

Table 3.2: Koala attributes – coastal context (Source: *Draft EPBC Act referral guidelines for the vulnerable koala (combined populations of Queensland, New South Wales and the Australian Capital Territory)*

If the PMST indicates that the Koala or its habitat is known to or may occur within an area, a habitat assessment is necessary to ascertain whether habitat critical to the survival of the species occurs in the area.

i. Koala Habitat Assessment

Habitat critical to the survival of the Koala is considered to be habitat that is important for the long-term survival and recovery of the species. The Guidelines contain a Koala habitat assessment tool to assist in determining the sensitivity, value and quality of the impact area and whether it contains habitat critical to the survival of the

species. The Koala habitat assessment tool categorises five primary Koala habitat attributes including:

- Koala occurrence;
- Vegetation composition;
- Habitat connectivity;
- Existing threats and
- Recovery value.

Each habitat attribute is scored between zero and two and the scores are added together to give a total out of 10, providing an indication of the overall value of habitat in the impact area. An impact area that scores five or more under the habitat assessment tool for the Koala is deemed to contain habitat critical to the species survival.

An extract of the Koala habitat assessment tool relevant to the study area (coastal) is provided in Table 3.3 below:

Attribute	Score	Coastal Criteria
Koala occurrence	2 (High)	Evidence of one or more koalas within the last 2 years.
	1 (Medium)	Evidence of one or more koalas within 5 km of the edge of the impact area within the last 5 years.
	0 (Low)	None of the above.
Vegetation composition	2 (High)	Has forest or woodland with 2 or more known koala food tree species in the canopy.
	1 (Medium)	Has forest or woodland with only 1 species of known koala food tree present in the canopy.
	0 (Low)	None of the above.
Habitat connectivity	2 (High)	Area is part of a contiguous landscape ≥ 500 ha.
	1 (Medium)	Area is part of a contiguous landscape < 500 ha, but ≥ 300 ha.
	0 (Low)	None of the above.
Key existing threats	2 (High)	Little or no evidence of koala mortality from vehicle strike or dog attack at present in areas that score 1 or 2 for koala occurrence.
	1 (Medium)	Evidence of infrequent or irregular koala mortality from vehicle strike or dog attack at present in areas that score 1 or 2 for koala occurrence.
	0 (Low)	Evidence of frequent or regular koala mortality from vehicle strike or dog attack in the study area at present, or Areas which score 0 for koala occurrence and have a significant dog or vehicle threat present.
Recovery value	2 (High)	Habitat is likely to be important for achieving the interim recovery objectives for the relevant context (see Table 3.3).
	1 (Medium)	Uncertainty exists as to whether the habitat is important for achieving the interim recovery objectives for the relevant context (see Table 3.3).
	0 (Low)	Habitat is unlikely to be important for achieving the interim recovery objectives for the relevant context (see Table 3.3).

Table 3.3: Extract of the Koala habitat assessment tool relevant to the study area

The study (impact) area was assessed in accordance with the Koala habitat assessment tool – coastal criteria as detailed in Table 3.3.

ii. Desktop Survey

As per the Guidelines, a desktop survey was undertaken that included a search of Koala records in the Atlas of NSW Wildlife database and the EPBC Act Protected Matters Search Tool. To assist with the assessment of habitat quality, habitat size, habitat connectivity and Koala occurrence the Port Macquarie-Hastings Council Koala habitat mapping was reviewed and aerial imagery of the study (impact) area was examined. Information regarding the intensity of existing threats to the Koala in the area was also gathered. No other sources of additional information were considered for the purposes of this assessment.

iii. Field (On-ground) Survey

As per the Guidelines a Koala 'on-ground' survey was undertaken. As the study area was relatively small and contained limited potential habitat it was possible to undertake a search of the entire habitat within the study area during the field survey.

For the purposes of the EPBC Act, the Koala survey of the study area involved a diurnal search for direct Koala sightings. This was supported by indirect survey methods including a Spot Assessment Technique (SAT) survey (Phillips and Callaghan, 2011), which involved a search for scats, and a search for other indicators such as scratch markings on trees.

3.7 Significance Assessments

Significance assessments were carried out for threatened species, populations and ecological communities listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and the *Threatened Species Conservation Act 1995* (TSC Act).

In the case of the EPBC Act, the significance assessments were undertaken in accordance with the *Significance Impact Guidelines 1.1 – Matters of National Environmental* (Department of Environment, Water, Heritage and the Arts, 2009). In the case of the TSC Act, the significance assessments were undertaken in accordance with the *Threatened Species Assessment Guidelines – The Assessment of Significance* (Department of Environment and Climate Change, 2007).

The conclusions drawn in this report are based upon information obtained from the review of literature and database searches, and from the ecological assessment undertaken of the study area at the time of the field investigation. These results are not exhaustive but rather are indicative of the environmental conditions, including the presence or otherwise of threatened species, populations and ecological communities. It should also be recognised that environmental conditions are dynamic and will change over the course of time.

Habitat assessments were completed for all threatened species and populations identified in the database searches (Table 3.1) to determine whether or not suitable

habitat exists within the subject site. This is a conservative approach that is more likely to include cryptic species as well those that are otherwise difficult to detect.

4. Results

4.1 Fine Scale (Class 5) Vegetation Mapping Profiles

The Fine Scale (Class 5) Vegetation Mapping indicates that two plant communities are present on part of the land within study area and on land adjacent to the northern boundary as indicated in the extract of the Fine Scale (Class 5) Vegetation Mapping at Figure 4.1 below.

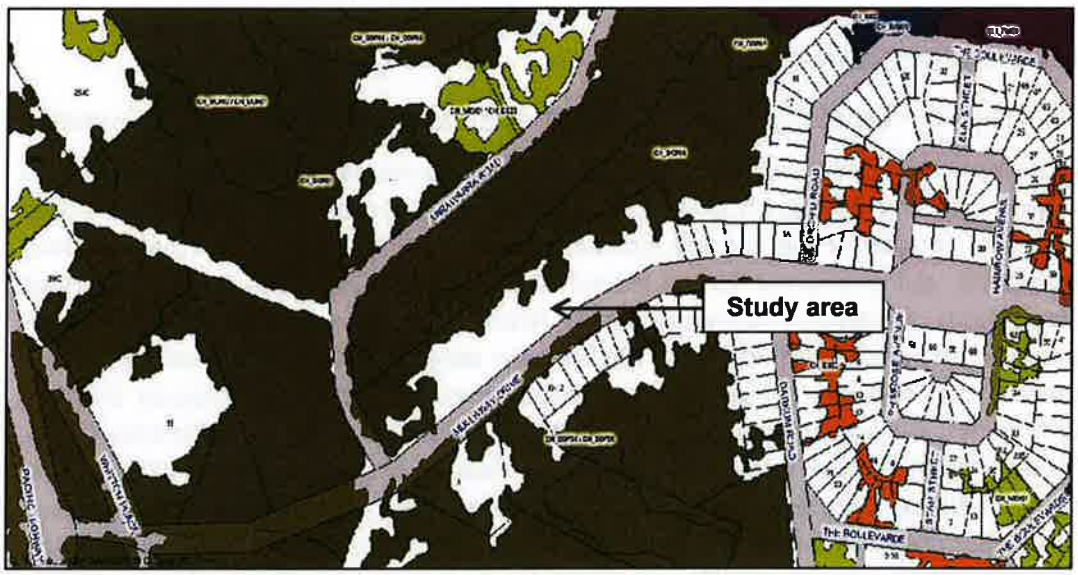


Figure 4.1: Extract of the Fine Scale (Class 5) Vegetation Mapping (Coffs Harbour City Council)

Key: **CH_DOF01: Coast and Escarpment Blackbutt Dry Forest**
CH_DOF06: Lowlands Swamp Box – Paperbark – Red Gum Dry Forest

The Fine Scale (Class 5) Vegetation Mapping descriptions of these plant communities are provided below.

4.1.1 Plant Community 1

CH_DOF01 – Coast and Escarpment Blackbutt Dry Forest

This plant community is identified as CH_DOF01: Coast and Escarpment Blackbutt Dry Forest. It is described as a tall open forest community characterised by an open canopy of *Eucalyptus pilularis* (Blackbutt). Other species that may be co-dominant include *Eucalyptus resinifera* subsp. *hemilampra* (Red Mahogany), *Eucalyptus signata* (Scribbly Gum), *Syncarpia glomulifera* (Turpentine), *Corymbia intermedia* (Pink Bloodwood) and *Eucalyptus microcorys* (Tallowwood). The understorey is typically grassy and/or ferny and can vary from a heathy to a dry shrubby species composition. Also, there may be a range of associated canopy species present such as *Angophora costata* (Smooth-barked Apple), *Eucalyptus saligna* (Blue Gum) and *Eucalyptus propinqua* (Small-fruited Grey Gum). An open middle small tree layer is present that may include *Allocasuarina littoralis* (Black She-oak), *Allocasuarina torulosa* (Forest Oak), Acacia irrorata (Green Wattle) and juveniles of the canopy species. Sometimes a sparse to dense second mid layer of shrubs is present, which

may include *Dodonaea triquetra* (Large-leaf Hop Bush), *Leucopogon lanceolatus* (Beard Heath), *Notelaea longifolia* (Mock Olive), *Elaeocarpus reticulatus* (Blueberry Ash), *Persoonia stradbrokensis* (Geebung) and *Polyscias sambucifolia* (Elderberry Ash). The dense ground layer is comprised of species such as *Themeda australis* (Kangaroo Grass), *Lomandra longifolia* (Spiny-headed Mat-rush), *Pteridium esculentum* (Common Bracken), *Calochlaena dubia* Rainbow Fern), *Blechnum cartilagineum* (Gristle Fern), *Imperata cylindrica* (Blady Grass) and *Dianella caerulea* (Blue Flax-lily). Variants of this community sometimes exhibit canopy dominance of species such as *Eucalyptus saligna* (Sydney Blue Gum), *Eucalyptus signata* (Scribbly Gum) and *Angophora costata* (Smooth-barked Apple).

4.1.2 Plant Community 2

CH_DOF06 – Lowlands Swamp Box Paperbark – Red Gum Dry Forest

This plant community is identified as CH_DOF06: Lowlands Swamp Box – Paperbark – Red Gum Dry Forest. It is described as an open forest community with various dominant species in the canopy including *Lophostemon suaveolens* (Swamp Box), *Melaleuca quinquenervia* Broad-leaved Paperbark), *Corymbia intermedia* (Pink Bloodwood), *Eucalyptus resinifera* subsp. *hemilampra* (Red Mahogany), *Eucalyptus tereticomis* (Forest Red Gum) and *Callistemon salignus* (Willow Bottlebrush). Other species that may be present in the canopy include *Eucalyptus robusta* (Swamp Mahogany), *Eucalyptus pilularis* (Blackbutt), and *Eucalyptus signata* (Scribbly Gum). There is often a lower tree strata present containing species such as *Allocasuarina littoralis* (Black Sheoak) and *Glochidion ferdinandi* var. *ferdinandi* (Cheese Tree). The mid-strata is generally dominated by *Dodonaea triquetra* (Large-leaf Hop Bush), *Leucopogon lanceolatus* (Beard Heath), *Notelaea longifolia* (Mock Olive), *Elaeocarpus reticulatus* (Blueberry Ash), *Persoonia stradbrokensis* (Geebung) and *Polyscias sambucifolia* (Elderberry Ash). The dense ground layer is typically comprised of species such as *Themeda australis* (Kangaroo Grass), *Lomandra longifolia* (Spiny-headed Mat-rush), *Pteridium esculentum* (Bracken Fern), *Calochlaena dubia* (Rainbow Fern), *Blechnum cartilagineum* (Gristle Fern), *Imperata cylindrica* (Blady Grass) and *Dianella caerulea* (Blue Flax-lily).

4.2 NSW Vegetation Information System Classification

Based on the aforementioned Fine Scale (Class 5) Vegetation Mapping descriptions and the data collected during the flora assessment of the study area the equivalent NSW Plant Community Type (PCT) classification from the NSW Vegetation Information System (VIS) classification database is as follows:

4.2.1 Plant Community 1

Blackbutt – Pink Bloodwood shrubby open forest of the coastal lowlands of the NSW North Coast Bioregion

Plant Community ID: 686

Biometric Vegetation Type ID: NR117

Vegetation Type:

i. **Common Community Name:** Blackbutt – Pink Bloodwood shrubby open forest of the coastal lowlands of the NSW North Coast Bioregion;

ii. **Scientific Community Name:** *Eucalyptus pilularis, Corymbia intermedia, Eucalyptus resinifera* subsp. *resinifera / Breynia oblongfolia, Callistemon saligna, Glochidion ferdinandi, Melaleuca linariifolia / Entolasia marginata, Eustrephus latifolius, Lomandra longifolia, Oplismenus imbecillus*;

iii. **Dominant Canopy Species:** *Eucalyptus pilularis* (Blackbutt), *Corymbia intermedia* (Pink Bloodwood), *Eucalyptus resinifera* subsp. *resinifera* (Red Mahogany);

iv. **Mid Strata Species:** *Glochidion ferdinandi* (Cheese Tree), *Melaleuca linariifolia* (Flax-leaved Paperbark), *Rubus hillii* (Molucca Bramble), *Breynia oblongfolia* (Coffee Bush), *Callistemon saligna* (Willow Bottlebrush).*Viola hederacea* (Ivy-leaved Violet);

v. **Ground Strata Species:** *Eustrephus latifolius* (Wombat Berry), *Lomandra longifolia* (Spiny-headed Mat-rush), *Oplismenus imbecillus*, *Pratia purpurascens* (White Root), *Pseuderanthemum variabile* (Pastel Flower), *Pteridium esculatum* (Bracken), *Vernonea cinerea*, *Imperata cylindrical* var. *major* (Blady Grass), *Entolasia marginata* Bordered Panic).

Vegetation Formation (CMA): Wet Sclerophyll forests (Shrubby sub-formations)

Vegetation Class: North Coast Wet Sclerophyll Forests

Landscape Position: in low lying areas on the coast from Kendall north to Coffs Harbour (in relation to Northern Rivers)

4.2.2 Plant Community 2

Forest Red Gum – Swamp Box of the Clarence Valley lowlands of the North Coast

Plant Community ID: 837
Biometric Vegetation Type ID: NR161

Vegetation Type:

i. **Common Community Name:** Forest Red Gum – Swamp Box of the Clarence Valley lowlands of the NSW North Coast Bioregion;

ii. **Scientific Community Name:** *Eucalyptus tereticornis, Lophostemon suaveolens, Corymbia intermedia, Eucalyptus siderophloia/Alphitonia excelsa/Cymbopogon refractus, Entolasia stricta, Lomandra longifolia, Pratia purpurascens*;

iii. **Dominant Canopy Species:** *Eucalyptus tereticornis* (Forest Red Gum), *Lophostemon suaveolens* (Swamp Turpentine), *Corymbia intermedia* (Pink Bloodwood); *Eucalyptus siderophloia* (Grey Ironbark);

iv. **Mid Strata Species:** *Alphitonia excelsa* (Red Ash);

v. **Ground Strata Species:** *Lomandra longifolia* (Spiny-headed Mat-rush), *Pratia purpurascens* (Whiteroot), *Themeda australis* (Kangaroo Grass), *Cymbopogon refractus* (Barbed-wire Grass), *Entolasia stricta* (Wiry Panic.

Vegetation Formation (CMA): Grassy Woodlands

Vegetation Class: Coastal Valley Grassy Woodlands

Landscape Position: On high and low quartz sediments in the Clarence lowlands

Conservation Status: Endangered Ecological Community (EEC) – *Sub-tropical Coastal Floodplain Forest of the NSW North Coast bioregion*

4.3 Flora Assessment – Field Survey

The plant communities identified under the Fine Scale (Class 5) Vegetation Mapping in Section 4.1 more or less correlate with the two plant communities recorded on the adjacent land and the remnants of these plant communities recorded within the study area during the field survey.

4.3.1 Derived Plant Community

It was noted during the field survey that the majority of the land within the study area is occupied by a derived grassland community that is dominated by exotic/weed species. The more common species recorded within the derived grassland during the field survey included *Imperata cylindrica* (Blady Grass), *Paspalum urvillei* (Vasey Grass), *Sporobolus africanus* (Parramatta Grass), *Ageratum houstonianum* (Billygoat Weed), *Conyza bonariensis* (Flax-leaf Fleabane), *Bidens pilosa* (Cobbler's Pegs), *Cyperus eragrostis* (Umbrella Sedge) and *Gomphocarpus fruticosus* (Narrow-leaf

Cotton Bush). The full list of flora species recorded during the field survey is provided under Appendix A of this report.

An image of the derived grassland community is shown in Figure 4.2 below.

Figure 4.2: View of the derived grassland within the study area

4.3.2 Fine Scale Mapping Plant Community Field Observations

(a) Coast and Escarpment Blackbutt Dry Forest

Observations made during the plant community assessment indicated that the Coast and Escarpment Blackbutt Dry Forest community occurred on the land adjoining the northern boundary at the western (Arrawarra Road) end of the study area. Remnants of this plant community were recorded within the study area and comprised several retained trees from the canopy situated at the western end of the study area in the vicinity of the existing dwelling. Away from the immediate vicinity of the existing dwelling, the remnants of this plant community consisted of a small number of isolated 'paddock' trees with some components of the understorey and groundcover recorded along the interface at the northern boundary and also infrequently in other parts of the study area. The principle species in the canopy of the Coast and Escarpment Blackbutt Dry Forest on the land immediately adjacent to the study area included *Eucalyptus pilularis* (Blackbutt), *Corymbia intermedia* (Pink Bloodwood) *Eucalyptus resinifera* subsp. *hemilampra* (Red Mahogany) and *Eucalyptus microcorys* (Tallowwood). Other species recorded in the canopy included *Eucalyptus saligna* (Sydney Blue Gum) and *Angophora costata* (Smooth-barked Apple).

The principal understorey species recorded at the interface between the study area and the land adjacent to the northern boundary during the field survey was *Allocasuarina torulosa* (Forest Oak), *Pittosporum undulatum* (Sweet Pittosporum), *Acacia binervata* (Two-veined Hickory), *Acacia floribunda* (White Sally) and *Breynia*

oblongfolia (Coffee Bush). There were also some exotic/weed species recorded in the understorey at the interface including *Lantana camara* (Lantana), *Schefflera actinophylla* (Umbrella Tree), *Senna pendula* var. *glabrata* (Easter Cassia) and *Solanum mauritianum* (Wild Tobacco).

The more common species in the groundcover recorded at the interface included *Imperata cylindrica* (Blady Grass), *Centella asiatica* (Indian Pennywort), *Lomandra longifolia* (Spiny-headed Mat-rush), *Glycine microphylla* (Small-leaf Glycine), and *Entolasia marginata* (Bordered Panic). Other relatively common species recorded in the groundcover included, *Oplismenus imbecillis*, *Panicum simile* (Two-colour Panic) *and Pratia purpurascens* (Whiteroot). Several exotic/weed species were also recorded in the groundcover at the interface. The more common of these included *Andropogon virginicus* (Whisky Grass) and *Asparagus aethiopicus* (Asparagus Fern).

During the field survey no threatened species or populations of flora were recorded within this community. Coast and Escarpment Blackbutt Dry Forest (Blackbutt – Pink Bloodwood shrubby open forest) is not listed as an endangered ecological community for the purposes of the *Threatened Species Conservation Act 1995* (TSC Act) or the *Environmental Protection Biodiversity Conservation Act 1999* (EPBC Act).

A view of the Coast and Escarpment Blackbutt Dry Forest community recorded on the adjacent land adjoining the northern boundary of the study area is shown Figure 4.3 below.

Figure 4.3: View of the Coast and Escarpment Blackbutt Dry Forest community recorded on the adjacent land adjoining the northern boundary of the study area

A view of the Coast and Escarpment Blackbutt Dry Forest community recorded at the interface along the northern boundary of the study area is shown Figure 4.4 below.

Figure 4.4: View of the Coast and Escarpment Blackbutt Dry Forest community recorded at the interface along the northern boundary of the study area

(b) Lowlands Swamp Box Paperbark – Red Gum Dry Forest

Observations made during the plant community assessment indicated that the Lowlands Swamp Box – Paperbark – Red Gum Dry Forest occupied the land adjoining the northern boundary in the eastern section of the study area. It also occurred within the eastern part of the study area as small remnant patches containing just a few trees or as isolated trees. The principal species of the canopy at the interface and the remnants were *Melaleuca quinquenervia* (Broad-leaved Paperbark), *Eucalyptus resinifera* subsp. *hemilampra* (Red Mahogany), *Lophostemon suaveolens* (Swamp Box) and *Eucalyptus tereticornis* (Forest Red Gum). Less abundant species recorded in the canopy included *Corymbia intermedia* (Pink Bloodwood), *Eucalyptus pilularis* (Blackbutt) and *Eucalyptus microcorys* (Tallowwood).

The more common species recorded in the understorey of the Lowlands Swamp Box – Paperbark – Red Gum Dry Forest at the interface included *Glochidion ferdinandi* (Cheese Tree), *Pittosporum undulatum* (Sweet Pittosporum), *Cordyline stricta* (Narrow-leaved Palm-lily), and *Elaeocarpus reticulatus* (Blueberry Ash). Vines recorded within the Lowlands Swamp Box – Paperbark – Red Gum Dry Forest included *Parsonsia straminea* (Common Silkpod), *Marsdenia rostrata* (Milk Vine) and *Stephania japonica* (Snake Vine). Another species; *Livistona australis* (Cabbage Palm), which is commonly associated with Paperbark swamp forest was recorded as juveniles but adult individuals were not recorded in the canopy. Other species generally not associated with Lowlands Swamp Box – Paperbark – Red Gum Dry Forest were also recorded in the understorey at the interface including *Elaeodendron australe* var. *australe* (Red Olive Plum), *Cupaniopsis anacardioides* (Tuckeroo), *Euroschinus falcatus* (Ribbonwood) and *Morinda jasminoides* (Sweet Morinda). Some of the more common exotic/weed species recorded in the understorey of the Lowlands Swamp Box – Paperbark – Red Gum Dry Forest at the interface included

Lantana camara (Lantana), *Senna pendula* var. *glabrata* (Easter Cassia) and *Ochna serrulata* (Micky Mouse Plant).

The more common species recorded in the groundcover of the Lowlands Swamp Box – Paperbark – Red Gum Dry Forest at the interface included *Entolasia stricta* (Wiry Panic), *Lomandra longifolia* (Spiny-headed Mat-rush), *Oplismenus imbecillus*, *Pratia purpurascens* (White Root), *Eustrephus latifolius* (Wombat Berry), *Alpinia caerulea (Native Ginger)*, *Lepidosperma laterale* (Variable Sword-sedge) and *Centella asiatica* (Indian Pennywort). Several exotic/weed species were also recorded in the groundcover including *Asparagus aethiopicus* (Asparagus Fern), *Passiflora suberosa* (Corky Passion Flower) and *Paspalum mandiocanum* (Broad-leaf Paspalum).

The remnant patches of Lowlands Swamp Box – Paperbark – Red Gum Dry Forest within the study area (comprising small groups of trees) contained a varied and generally atypical assemblage of species within the understorey and groundcover. There was a relatively large assemblage of exotic/weed species recorded as well as a significant assemblage of native species generally associated with rainforest communities. The exotic/weed species recorded within the remnant patches included *Lantana camara* (Lantana), *Asparagus aethiopicus* (Asparagus Fern), *Passiflora suberosa* (Corky Passion Flower), *Paspalum mandiocanum* (Broad-leaf Paspalum), *Senna pendula* var. *glabrata* (Easter Cassia), *Ligustrum* lucidum (Broad-leaved Privet), *Ageratum houstonianum* (Billygoat Weed) and *Ochna serrulata* (Micky Mouse Plant). Native species recorded within the understorey included *Cupaniopsis anacardioides* (Tuckeroo), *Cupaniopsis newmanii* (Long-leaved Tuckeroo), *Ficus* macrophylla (Moreton Bay Fig), *Ficus coronata* (Creek Sandpaper Fig), Jagera *pseudorhus* var. *pseudorhus* (Foambark Tree), *Pittosporum undulatum* (Sweet Pittosporum) and *Stephania japonica* var. *discolor* (Snake Vine).

The likely reason for this assemblage of species in the understorey of the remnant patches of Lowlands Swamp Box – Paperbark – Red Gum Dry Forest within the study area is that birds that have consumed fruit of exotic/weed and rainforest species have deposited seeds while roosting in the remnant trees.

The Lowlands Swamp Box – Paperbark – Red Gum Dry Forest (Forest Red Gum – Swamp Box of the Clarence Valley lowlands of the NSW North Coast Bioregion) was identified as the Endangered Ecological Community (EEC) – *Sub-tropical Coastal Floodplain Forest of the NSW North Coast bioregion*.

A view of the Lowlands Swamp Box – Paperbark – Red Gum Dry Forest community recorded on the adjacent land adjoining the northern boundary of the study area is shown Figure 4.5 below.

Figure 4.5: View of the Lowlands Swamp Box – Paperbark – Red Gum Dry Forest community recorded on the adjacent land adjoining the northern boundary of the study area

A view of the Lowlands Swamp Box – Paperbark – Red Gum Dry Forest community remnants recorded within the study area (foreground) and at the interface along the northern boundary of the study area (background) is shown Figure 4.6 below.

Figure 4.6: View of the Lowlands Swamp Box – Paperbark – Red Gum Dry Forest community remnants within the study area and at the interface along the northern boundary

Note: Refer to Appendix A for the complete list of flora recorded within the study area during the field survey.

4.3.3 Threatened Flora Species Targeted Survey

Based on the plant communities recorded within the study area and the data gathered from the data base searches of the Atlas of NSW Wildlife, the PlantNet ROTAP/Threatened Species Spatial Search and the EPBC Act Protected Matters Search Tool it was considered that suitable habitat could potentially occur at the interface with the Lowlands Swamp Box – Paperbark – Red Gum Dry Forest for one threatened species of Orchid; *Phaius australis* (Lesser Swamp-orchid) listed nationally under the EPBC Act and within NSW under the TSC Act.

Information obtained from the Department of Environment's species profile and threats database indicates that *Phaius australis* (Lesser Swamp-orchid) should be surveyed during the warmer months when it is flowering as the species can only be distinguished from other swamp orchids by characteristics of its flowers, which are present during spring.

This study was conducted in March and outside the flowering time for *Phaius australis (Lesser Swamp-orchid)*. However, it was possible to target Swamp-orchid species generally at the interface with the Lowlands Swamp Box – Paperbark – Red Gum Dry Forest, which could inform as to whether or not further surveys targeting *Phaius australis* would be warranted. Following the targeted search of Swamp-orchid species it was concluded that the species were unlikely to be present within the study area.

Given that the only potentially suitable habitat for the Orchid species within the study area is at the interface with the Lowlands Swamp Box – Paperbark – Red Gum Dry Forest there is little likelihood that the species would be impacted by the proposed subdivision as this plant community has been identified as an endangered ecological community and will be excluded from any actions associated with the proposed development.

4.3.4 Tree Survey

During the flora assessment trees within the study area were surveyed. As previously discussed, the plant communities within the study area have been significantly modified and are present as the edge of the plant communities on the adjacent land to the north and as small isolated remnants. The growth stage of the remnant trees within the study area ranged from the early-mature to the late-mature growth stages. All trees within the study area were assessed for visible hollows; however no hollow-bearing trees were recorded.

The tree survey also assessed the species composition of the canopy within the study area. Species composition data was not quantified in detail other than to confirm the identification of species composition and their relative abundance. The results of this aspect of the tree survey indicate that in the western part of the study area the principal retained species of the canopy included *Eucalyptus microcorys* (Tallowwood), *Eucalyptus pilularis* (Blackbutt), *Eucalyptus resinifera* subsp.

hemilampra (Red Mahogany), *Angophora costata* (Smooth-barked Apple) and *Eucalyptus saligna* (Blue Gum).

In the eastern part of the study area the principal retained species of the canopy included *Melaleuca quinquenervia* (Broad-leaved Paperbark), *Eucalyptus tereticornis* (Forest Red Gum) and *Casuarina glauca* (Swamp Oak).

4.4 Habitat

The principal components of the habitat within the study area comprised the interface with the plant communities on the land adjacent to the northern boundary and the remnant patches. As previously discussed in Section 4.3 the majority of the study area has been cleared of native vegetation to form a derived grassland community dominated by exotic/weed species that generally lacks habitat features.

4.5 Fauna

Based upon information gathered during the field survey in relation to the plant communities, the past disturbance and modification that have occurred and the lack of habitat features observed as previously discussed, it was determined that the land within the study area provides limited potential habitat for a relatively small number of species.

During the field survey a number of fauna species were recorded. These were all common species and included two species of reptile, 10 avian species and one species of mammal. The species of fauna recorded within the study area during the field survey are appended to this report under Appendix B. No threatened species or populations of fauna were recorded within the survey area during the field survey.

There are a number of Atlas of NSW Wildlife records of threatened species in the vicinity of the study area. These species have been included for consideration under the Assessment of Significance (7 Part Test) appended to this report as Appendix C.

4.6 Protected Matters

Under the provisions of the EPBC Act approval is required for any action that may have a significant impact on matters of National Environmental Significance (NES) or on Commonwealth land. A search of the Department of Sustainability, Environment, Water, Population and Communities web site employing the Protected matters Search Tool with a 10km buffer was undertaken to identify the matters of NES that may occur in, or may relate to the site.

4.6.1 Matters of NES (within 10km radius of the site)

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Significance:	None
Great Barrier Marine Parks	None
Commonwealth Marine Areas:	1

Threatened Ecological Communities:	2
Threatened Species:	54
Migratory Species:	60

The threatened ecological communities returned in the Protected Matters Search Tool were the critically endangered:

- *Littoral Rainforest and Coastal Vine Thickets of Eastern Australia*; and
- *Lowland Rainforest of Subtropical Australia.*

Neither of these plant communities was observed within the study area during the field survey.

The threatened species returned in the Protected Matters Search Tool have been considered under the Assessment of Significance appended to this report as Appendix C.

None of the 60 migratory species returned in the Protected Matters Search Tool are considered likely to have potential to utilise the habitat within the study area.

None of these species is listed as a threatened species. The Cattle Egret was introduced into Australia in the 1930s but the large numbers across northern Australia suggests that the species may have self-introduced from Asia.

4.6.2 Other Matters Protected by the EPBC Act

Commonwealth Lands:	2
Commonwealth Heritage Places:	None
Listed Marine Species:	76
Whales and other Cetaceans:	14
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Commonwealth Reserves Marine:	None
Places on the RNE (Indigenous sites):	3
State and Territory Reserves:	4
Regional Forest Agreements:	1
Invasive Species:	41
Nationally Important Wetlands:	None
Key Ecological Features (Narine):	None

The Protected Matters report lists 15 weed species under Invasive Species, which includes some of the 20 weeds 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. With respect to invasive animal species returned in the Protected Matters Search, four species of bird and seven species of mammal are considered to have potential to occur within or utilise the land within the study area. The weeds and other invasive species that are known or are considered to have potential to occur within the survey area are listed in Table 4.1.

Scientific Name	Common Name
Plantae (Weeds)	
Anredera cordifolia	Madeira Vine
Asparagus aethiopicus	Asparagus Fern *
Dolichandra unguis-cati	Cat's-claw Creeper
Genista sp. X Genista monspessulana	Broom
Lantana camara	Lantana*
Opuntia spp.	Prickly Pears
Rubus fruticosus aggregate	Blackberry
Sagittaria platyphylla	Delta Arrowhead
Senecio madagascariensis	Fireweed*
Amphibia	
Bufo marinus	Cane Toad
Aves	
Acridotheres tristis	Indian Myna
Passer domesticus	House Sparrow
Streptopelia chinensis	Spotted Turtle-dove
Sturnus vulgaris	Common Starling
Mammalia	
Canis lupus familiaris	Domestic Dog
Felis catus	Domestic Cat
Lepus capensis	Brown Hare
Mus muclus	House Mouse
Oryctolagus cuniculus	European Rabbit
Rattus rattus	Black Rat
Vulpes vulpes	Red Fox

Table 4.1: Invasive species known or likely to occur within the survey area
*** Indicates species recorded within the survey area during the field survey**

Three Weeds of National Significance (WoNS); *Asparagus aethiopicus* (Asparagus Fern), *Lantana camara* (Lantana) and *Senecio madagascariensis* (Fireweed) were recorded within the study area during the field survey.

4.7 Koala Habitat Assessment and Koala Survey

4.7.1 CKPoM

The parts of the study area mapped as secondary Koala habitat under the CKPoM included the western portion in the vicinity of the existing dwelling and at the interface adjacent to the northern boundary of the allotment where remnants of the original native plant communities remain. These areas were modified or disturbed to varying extents. In the western part of the study area the remnant forest comprised a portion of the canopy, little understorey and a groundcover that was managed in conjunction with the residential use of that part of the site. At the interface the understorey and groundcover were present but a significant component comprised exotic/weed species.

The western part of the study area in the vicinity of the existing dwelling contained a significant number of retained trees from the canopy of the adjacent Coast and Escarpment Blackbutt Dry Forest community. The species recorded in this part of the study area included *Eucalyptus microcorys* (Tallowwood), *Eucalyptus pilularis* (Blackbutt), *Eucalyptus resinifera* subsp. *hemilampra* (Red Mahogany), *Angophora costata* (Smooth-barked Apple) and *Eucalyptus saligna* (Blue Gum).

At the interface in the western part of the study area canopy trees from the adjacent Coast and Escarpment Blackbutt Dry Forest community were recorded, including *Eucalyptus pilularis* (Blackbutt), *Eucalyptus resinifera* subsp. *hemilampra* (Red Mahogany), *Eucalyptus microcorys* (Tallowwood) and *Corymbia intermedia* (Pink Bloodwood). At the interface in the eastern part of the study area canopy trees from the adjacent Lowlands Swamp Box – Paperbark – Red Gum Dry Forest community were recorded, including *Melaleuca quinquenervia* (Broad-leaved Paperbark), *Eucalyptus tereticornis* (Forest Red Gum), *Eucalyptus resinifera* subsp. *hemilampra* (Red Mahogany), *Corymbia intermedia* (Pink Bloodwood) and *Lophostemon suaveolens* (Swamp Box).

As previously discussed in Section 4.3 the majority of the study area has been cleared of native vegetation to form a derived grassland community dominated by exotic/weed species. Therefore, it is appropriate that these parts of the site are not mapped as Koala habitat for the purposes of the CKPoM.

Two of the species recorded within the study area are listed under clause 3.4 – Secondary Koala Habitat of the CKPoM. These included *Eucalyptus microcorys* (Tallowwood) and *Eucalyptus tereticornis* (Forest Red Gum). However, several of these trees were located in those parts of the study area that are not mapped as Koala habitat. For example a small stand of *Eucalyptus tereticornis* (Forest Red Gum) comprising approximately 8 individuals was recorded in the derived grassland at the eastern end of the study area. It appears that some of these trees may lie outside the mapped secondary Koala habitat. There were also some isolated individuals of *Eucalyptus microcorys* (Tallowwood) recorded within the study area that were located outside of the mapped Koala habitat.

A view of the stand of *Eucalyptus tereticornis* (Forest Red Gum) recorded in the eastern part of the study area is shown at Figure 4.8 below.

Figure 4.7: View of *Eucalyptus tereticornis* (Forest Red Gum) recorded as a small widely-spaced group in the eastern part of the study area

In relation to the management actions described under clause 3.4 of the CKPoM, there are a number of matters that should be considered, which are addressed in Section 5.2 and Section 6.2 of this report.

During the site investigation a search of the entire habitat within the study area was undertaken. This included searching the site for actual Koala sightings as well as conducting a SAT survey and searching for other indicators such as scratch markings on trees. This survey found no evidence of the Koala being present or utilising the habitat within the study area. On this basis it appears unlikely that the habitat within the study area is currently being utilised by the species.

4.7.2 EPBC Act

i. Koala Habitat Assessment

The Koala habitat assessment was undertaken using the Koala habitat assessment tool in accordance with the Guidelines as detailed in Table 4.2.below.

Attribute	Coastal Criteria	Score
Koala occurrence	Atlas of NSW Wildlife Koala records within 5 km	1
Vegetation composition	2 species of Koala food trees recorded: *Eucalyptus microcorys* and *Eucalyptus tereticornis* – CKPoM and the Recovery Plan for the Koala (primary food tree species)	2
Habitat connectivity	Study area is not part of a contiguous landscape ≥ 500 ha or a contiguous landscape < 500 ha, but ≥ 300 ha.	0
Key existing threats	Little or no evidence of koala mortality from vehicle strike or dog attack at present in areas that score 1 or 2 for koala occurrence.	2
Recovery value	Habitat is unlikely to be important for achieving the interim recovery objectives for the coastal context (see Table 3.2)	0
Total		5

Table 4.2: Koala habitat assessment (coastal criteria)

Based on the Koala habitat assessment tool score the habitat within the study area is considered to contain habitat critical to the species survival.

ii. Desktop Survey

The Atlas of NSW Wildlife database search returned 12 records of the Koala within a 10 km x 10 km search area around the study area. This suggests a history of a population of the species in the area but not necessarily a population that is presently on, or utilising the habitat and resources within the study area. It was noted that there were no Atlas records of the Koala within the immediate vicinity of the study area. The nearest records were two records located to the south within 1 km of the study area. There were also two records located further to the south. All the other Atlas records were situated to the south and west; however the Pacific Highway forms a barrier to the movement of the Koala from these areas to the vicinity of the study area. The locations of the Koala records within the search area from the Atlas of NSW Wildlife (OEH, 2013) are shown in Figure 4.8.

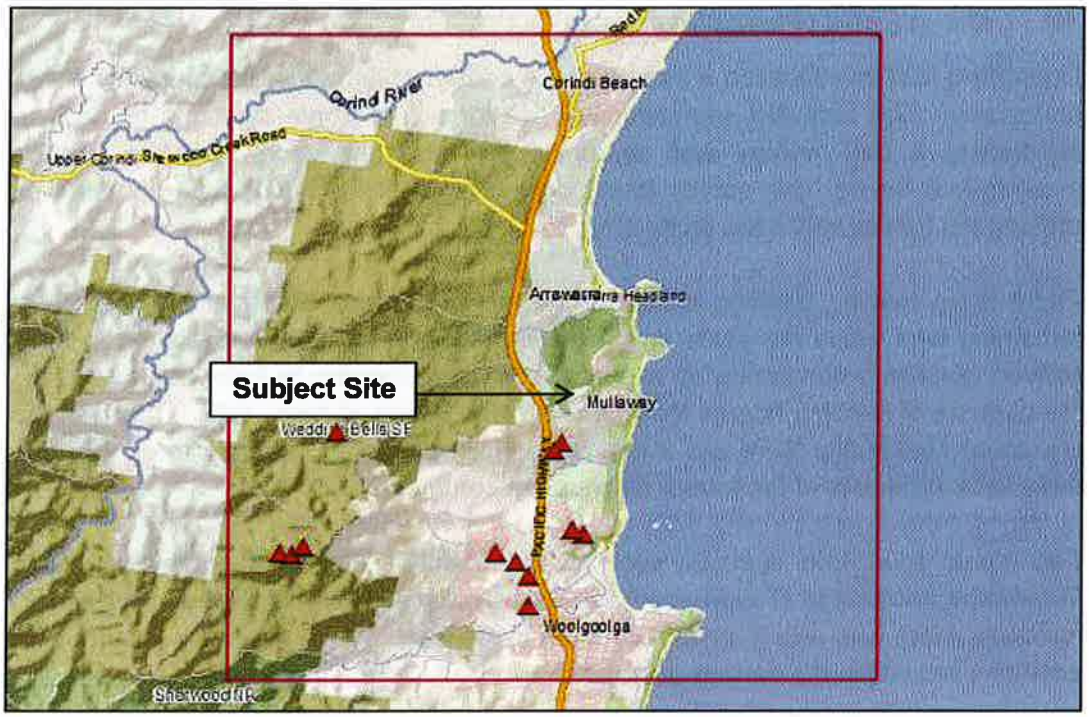


Figure 4.7: Locations of Koala sightings (red markers) in proximity to the study area. (Source: Atlas of NSW Wildlife – NSW Office of Environment and Heritage)

The EPBC Act Protected Matters Search Tool indicates that the *Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory)* or the species habitat is known to occur in the area of the study area.

The Coffs Harbour Council Koala mapping indicates that part of the study area is mapped as secondary Koala habitat for the purposes of the CKPoM as indicated in Figure 3.1. Therefore, the objective and management actions applicable to secondary Koala habitat as listed under clause 3.4 of Part A of the CKPoM must be considered.

Aerial imagery including the Coffs Harbour On-line Mapping Tool utilising ADS40 imagery supplied by the NSW Department of Finance and Services, 2012 GeoEye Earthstar Geographics (Bing) imagery in MapInfo Professional version 12.0, Spatial Information Exchange SIX Maps and Google Earth indicates that the study area is located at the south-eastern margin of an expanse of forest of less than 100 ha in size that is bounded by Arrawarra Road in the north and west, the village of Mullaway to the east and Mullaway Drive to the south. Outside these perimeters the landscape is an amalgam of cleared land for either agricultural or residential purposes and areas of native forest. As a result the habitat within the vicinity of the study area is relatively small and contains barriers that are likely to impede Koala movements.

In such landscapes containing residential development and agricultural activities, domestic dogs are a significant potential threat to the Koala. During the field survey it was noted that several domestic dogs were present in the immediate vicinity of the study area. In addition, the aforementioned barrier formed by the Pacific Highway in particular but also other roads such as Mullaway Drive and Arrawarra Road represent a significant threat to the Koala as well.

iii. On-ground (Field) Survey

During the field investigation a search of the entire habitat within the study area was undertaken. This included searching the site for actual Koala sightings as well as conducting a SAT survey and searching for other indicators such as scratch markings on trees. This survey found no evidence of the Koala being present or utilising the habitat within the study area.

There is an existing dwelling located in the south-western corner of the site. The remaining land within the study area has been cleared of native vegetation to form derived grassland dominated by exotic species and appears to have been used for the purpose of keeping horses for a considerable period of time. Within this derived grassland community there are a relatively small number of retained trees that are likely to be remnants of the former native plant community.

Two Koala food tree species were recorded during the field survey including *Eucalyptus microcorys* (Tallowwood) and *Eucalyptus tereticornis* (Forest Red Gum). However, there was only a small number of these trees, which generally occurred as isolated trees within the derived grassland.

Given the aforementioned limitations of the habitat within the study area in relation to the area of contiguous habitat, barriers to Koala movements from areas where the population appears to be concentrated, lack of connectivity, the presence of domestic dogs in the immediate vicinity of the study area and limited food resources it appears unlikely that the study area would contain habitat critical to the species survival.

5. Potential Impacts on Biodiversity

The proposal involves the rezoning of the land within the study area from the current zoning of RE1 – Public Recreation and RU2 – Rural Landscape to residential. Initially this is unlikely to have any direct impact on biodiversity. However, it is acknowledged that once rezoned for residential purposes it is likely that any subsequent development within the study area such as subdivision of the land, provision of infrastructure and construction of buildings could potentially impact on biodiversity. Therefore, consideration of the potential impacts on biodiversity that may occur from future development as result of the proposed rezoning is warranted.

The principle impact on biodiversity associated with the proposed rezoning stems from the likely subdivision of what is effectively an allotment of vacant land into several smaller parcels of land each of which would have some form of development entitlement. Essentially, this would result in loss of habitat, albeit one that is highly disturbed, to facilitate the provision of infrastructure and construction of buildings. In the longer term there would also be an ongoing increased human presence that would also potentially impact on biodiversity in various ways such as interruption of ecosystem processes, introduction of environmental weeds and exotic animals, and increased artificial lighting. However, most of these impacts already occur and would continue to occur irrespective of whether the proposed rezoning and any subsequent development proceed or not.

As detailed in Section 4 of this report, the habitat associated with the plant communities across the majority of the study area has been previously modified in the past. Generally, there has been a significant reduction of the canopy and the understorey has been removed except at the interface between the study area and the land adjacent to the northern boundary. Essentially, the study area contains a single derived grassland community in which some remnants of natural plant communities persist as small patches and isolated trees. These modifications appear to have been in place for a considerable period of time.

Several specific potential impacts have been identified in relation to the proposed rezoning and future subdivision of the land within the study area.

5.1 Vegetation Removal

No vegetation will be removed from within the study area in relation to the proposed land rezoning. Given the extent to which the land within the study area has been cleared of vegetation in the past it is unlikely that further vegetation removal will be necessary in order to facilitate any future residential development of the land.

5.2 CKPoM Management Actions

Clause 3.4 of the CKPoM states that the consent authority shall not grant consent to the carrying out of development on areas identified as Secondary Koala Habitat which will remove the following tree species: *Eucalyptus microcorys* (Tallowwood), *Eucalyptus robusta* (Swamp Mahogany), *Eucalyptus grandis* (Flooded Gum) (except

when part of a forest plantation), *Eucalyptus tereticornis* (Forest Red Gum), or *Eucalyptus propinqua* (Small-fruited Grey Gum), unless the development will not significantly destroy, damage or compromise the values of the land as Koala habitat. The following matters shall be considered by the consent authority:

- That there will be minimal net loss of Secondary Koala Habitat;
- The level of significance to Koalas of the trees proposed to be removed;
- The number of trees proposed to be removed in relationship to the extent and quality of adjacent or nearby Primary and/or Secondary Koala Habitat;
- The threats to koalas which may result from the development;
- All other options for protecting Koala trees as listed above; and
- The impacts to existing or potential koala movement corridors; Whether the land is accredited under the *Timber Plantation (Harvest Guarantee) Act 1995*

Two of the above tree species were recorded within the study area. In the eastern part of the study area approximately eight individuals of *Eucalyptus tereticornis* (Forest Red Gum) were recorded. While these trees were located in close proximity to each other they were sufficiently separated to permit management of the area around them including ongoing suppression of any regeneration of the understorey. The other species was *Eucalyptus microcorys* (Tallowwood), which was recorded as a small number of isolated individuals scattered across the site.

Consent to the carrying out of development in areas identified as Secondary Koala Habitat shall not be granted by the consent authority unless it is satisfied that:

- The proposal will not result in significant barriers to Koala movement;
- Boundary fencing does not prevent the free movement of Koalas;
- Lighting and Koala exclusion fencing is provided where appropriate on roadways adjacent to Koala habitat;
- Tree species listed above under Secondary Koala Habitat are retained, where possible;
- New local roads are designed to reduce traffic speed to 40 KPH in potential koala black spots;
- Preferred Koala trees are used in landscaping where suitable;
- Threats to Koalas by dogs have been minimised i.e. banning of dogs or confining of dogs to Koala proof yards; and
- Fire protection zones, including fuel reduced zones and radiation zones, are provided generally outside of Secondary Koala Habitat.

5.3 Interruption to Ecosystem Processes

Ecosystems require a suite of processes in order to function. These processes include climatic processes, primary processes (production of biomass), hydrological processes, nutrient cycling, interspecific and intraspecific interactions, movement of organisms and natural disturbance regimes such as fire and flooding (Gleeson et al, 2012). Ecosystem processes are complex and therefore are difficult to quantify. Most development in natural environments has the potential to interrupt ecosystem processes.

Given the extent of disturbance that exists within the study area it is unlikely that the rezoning proposal and any subsequent development will contribute significantly to further interruption of ecosystem processes.

5.4 Weed Invasion

Weed invasion has a negative impact on biodiversity. It is generally accepted that weeds are a significant threat to biodiversity as well as being an economic problem. Depending on the species, weeds can increase shading, compete with native plants for nutrients, smother native plants or chemically suppress their germination or growth through allelopathy. Invasion of native plant communities by exotic perennial grasses and invasion, establishment and spread of Lantana (*Lantana camara*) are listed in NSW as Key Threatening Processes (KTPs).

During the field survey it was noted that invasion of the habitats within the study area by exotic/weed species is significant with a large assemblage of exotic/weed species recorded and the larger proportion of the study area being dominated by exotic/weed species. Three weeds of National Significance including *Asparagus aethiopicus* (Asparagus Fern), *Lantana camara* (Lantana) and *Senecio madagascariensis* (Fireweed) were widespread across the study area.

5.5 Other Impacts Associated with Human Activities

5.5.1 Changes in Animal Behaviour

Behavioural changes in native animals can occur as a result of the physical presence of a development or due to interaction with people at a development. There are various types of behavioural changes possible such as changes in the choice of foraging and reproductive behaviour. In some cases animals may be drawn to a development by an improved food supply associated with the presence of humans. For example, species such as the Eastern Grey Kangaroo, Brushtail Possum, Magpie, Butcherbird, Kookaburra and Noisy Miner often live in close proximity to humans because of the improved foraging opportunities. Other more secretive or shy species such as the large forest Owls and the Bush Rat are more likely to avoid areas in the vicinity of a development. In other cases modification of the habitat in the vicinity of a development such as removal of the understory to create a parkland-like setting favours particular species that can result in the absence of other species. For example, a parkland cleared site is favoured habitat of the Noisy Miner, an aggressive, cooperative breeder that will exclude many other avian species from an area. It was noted that the Noisy Miner was the most common bird recorded with the study area during the field survey.

5.5.2 Artificial Lighting

Artificial lighting can cause disruption of foraging behaviour, increased potential for collision with structures, and disruption of reproduction and movement. The effects of artificial lighting on most Australian fauna are not fully understood, nor has it been sufficiently studied.

6. Managing Potential Impacts

The proposed subdivision development is likely to have some impact on biodiversity as discussed previously in Section 5. However, there are a number of measures that can be undertaken to manage, minimise and mitigate the potential impacts.

The recommended mitigation measures are described below. Prior to initiating the mitigation measures a Vegetation Management Plan (VMP) should be prepared to define and document the actions required to implement the management of the proposed environmental lot containing the Paperbark swamp forest EEC and retained habitat corridors which should detail the measures to be adopted for the restoration, protection and conservation of these areas of land in the longer-term.

The following objectives for site management have been identified:

- To protect the retained native vegetation and habitat;
- Encourage regeneration of the retained vegetation
- Control invasive weeds;
- To minimise the impact of the proposed development on biodiversity; and
- To perform monitoring and maintenance activities to ensure that implementation of the mitigation measures are adequate and a satisfactory restoration outcome is achieved.

6.1 Vegetation

In relation to the proposed rezoning of the land and to facilitate the construction of infrastructure and buildings associated with future subdivision and residential development of the land within the study area it is unlikely that removal of trees will be necessary. However, if it becomes necessary for any tree(s) to be removed it is recommended that the following measures be adopted:

- Where possible Koala feed tree species should be retained;
- A 1:1 tree re-planting strategy should be applied for each tree that is removed; and
- Each replacement tree shall be of the same species as the tree it is replacing;

6.2 CKPoM Management Actions

Several of the Koala food trees (Forest Red Gum and Tallowwood) recorded within the study area were situated outside the mapped secondary Koala habitat. However, it is not intended to remove any tree from within the study area for the purposes of the proposed rezoning of the land and it is also unlikely that they would need to be removed in order to facilitate any future residential development of the land.

With respect to other management actions detailed under Section 5.2 of this report the following information is provided:

- As the study area comprises land that has been cleared previously and adjoins an existing road network it is unlikely to form part of a habitat corridor that contributes to Koala movement;

- The adjacent land adjoining the northern boundary of the study area provides a vegetated habitat corridor through which Koala movements would be facilitated;
- Boundary fencing is not proposed as part of the rezoning of the land but may be incorporated in a future residential development and is considered unlikely to form a barrier to Koala movements;
- It is intended to retain tree species listed under Secondary Koala Habitat of the CKPoM;
- There are no new local roads proposed as part of the rezoning or any future residential subdivision development;
- Preferred Koala trees should be used in landscaping associated with any future development of the site;
- Dogs are already present in the area, but threats associated with any future development of the land could be minimised through appropriate conditions of the development consent; and
- Asset protection zones associated with any future residential development of the land within the study area are likely to be partly located in areas within the site that are mapped as Secondary Koala Habitat; however the majority of the land in these areas is generally cleared of native vegetation.

6.3 Weed Management

As discussed in Section 5 weed invasion has the potential to impact on the local environment. In addition, as detailed in Section 5.4 some invasive or environmental weeds are identified as Key Threatening Processes (KTPs). With respect to the study area the major area where weeds are most likely to be of ecological concern are at the interface between the areas of cleared land within the study area and the native plant communities adjacent to the northern boundary.

The proposed rezoning of the land alone is unlikely to contribute to further invasion by exotic/weed species but any future residential development of the land has the potential for significant colonisation of the adjacent native plant communities by exotic/weed species. The provision of a fire trail adjacent to the interface along the northern boundary of the study area as indicated in the subdivision concept plan appended to this report as Appendix D will help to clearly define the plant community boundary and to discourage the disposing of green waste at the interface by residents.

There is evidence to suggest that fencing at the interface between residential developments and natural plant communities tends to encourage the disposal of green waste in these areas. Therefore, it is recommended that fencing along the interface in any future residential development of the site should be either excluded or constructed of a transparent material.

7. Conclusion

This report has been prepared to assess the ecological impact of the proposed rezoning of land situated at the corner of Mullaway Drive and Arrawarra Road Mullaway identified as Lot 1 in DP 417132.

During the field survey three terrestrial plant communities were recorded within the study area and on the adjoining land to the north. The majority of the land within the study area was occupied by a derived grassland community dominated by exotic/weed species. Two native plant communities were recorded on the adjacent land adjoining the northern boundary and included a Coast and Escarpment Blackbutt Dry Forest community and a Lowlands Swamp Box – Paperbark – Red Gum Dry Forest community as described under the Fine Scale (Class 5) Vegetation Mapping. Remnants of these plant communities extended into the study area where they were recorded at the interface along the northern boundary, as small groups of canopy trees containing an anomalous assemblage of understorey species and as isolated 'paddock trees'. The Lowlands Swamp Box – Paperbark – Red Gum Dry Forest community was identified as the endangered ecological community – *Sub-tropical Coastal Floodplain Forest of the NSW North Coast bioregion*.

The potential impacts on biodiversity, which may occur as a consequence of the land within the study area being rezoned, are described in Section 5 of this report. These include removal of vegetation associated with future development of the site, secondary Koala habitat, interruption to ecosystem processes, and other impacts associated with increased human activities including changes in animal behaviour and artificial lighting. The proposed measures to mitigate the potential impacts are detailed in Section 6 of the report.

As previously discussed, the land within the study area is degraded and heavily infested with exotic/weed species. Generally, it appears that there are no significant impediments to the proposed rezoning. In relation to the future development of the land within the study area for residential purposes, it is considered that additional ecological investigation would not be warranted given the extent of the disturbance and modification to the habitats that exists. The mitigation measures proposed under Section 6 are aimed at providing an appropriate biodiversity offset that does not compromise the development potential of the land within the study area.

It is noted that the proposed future low density residential subdivision development comprises 23 allotments, and incorporates asset protection zones and a perimeter fire trail for bushfire protection. It is considered that this is likely to have a significantly reduced potential impact on biodiversity than the previously intended use of the land as part of a sports field development, which would have required extensive clearing of the adjoining land to the north. In addition to the removal of more than 1 ha of native forest the potential ecological impacts associated with such a development include a larger interface and associated edge effect, greater interruption to ecological processes, intrusion into mapped secondary Koala habitat and disturbance of the endangered ecological community situated on the land to the north of the eastern part of the study area.

From the habitat assessment and database/literature review, it was considered that 11 threatened species as listed under the *Threatened Species Conservation Act 1995* and *Environment Protection and Biodiversity Conservation Act 1999* could potentially utilise the habitat within the survey area.

The Section 5A Assessment appended to this report as Appendix C. concluded that the proposal has the potential to impact on some threatened species and populations. Generally however, the impacts can be mitigated by the measures outlined in Section 6 of this report.

8. References

Auld, B. A., Medd, R. W., 1992, *Weeds: An Illustrated Botanical Guide to the Weeds of Australia*, Reed International Books Australia, Port Melbourne, Australia

Bibby, C. J., Burgess, N. D., Hill, D. A., 1992, *Bird Census Techniques*, Academic Press, New York

Boland, D. J., Brooker, M. I. H., Chippendale, G. M., Hall, N., Hyland, B. P. M., Johnston, R. D., Kleinig, D. A., Turner, J. D., 1992, *Forest Trees of Australia*, CSIRO Publishing, Collingwood, Victoria, Australia

Cogger, H. G., 1986, *Reptiles and Amphibians of Australia*, Reed Books Pty Ltd, Sydney, Australia

Costermans, L., 2008, *Native Trees and Shrubs of South-Eastern Australia*, New Holland Publishers, Australia

Cropper, S. C., 1993, *Management of Endangered Plants*, CSIRO Publishing, Collingwood, Victoria, Australia

Department of Environment and Climate Change, 2008, *Recovery Plan for the Koala (Phascolarctos cinereus)*

Department of Environment, 2014, Census of Australian Vertebrates, from; www.environment.gov.au/biodiversity/abrs/onlineresources/fauna/afd/home

Department of Environment, 2014, EPBC Act Protected Matters report, retrieved 14.03.2014, from; http://www.environment.gov.au/epbc/pmst/index.html

Department of Environment, 2013, *Draft EPBC Act referral guidelines for the vulnerable koala (combined populations of Queensland, New South Wales and the Australian Capital Territory)*

Gleeson, J., and Gleeson, D., 2012, *Reducing the Impacts of Development on Wildlife*, CSIRO Publishing, Collingwood Victoria, Australia

Floyd, A. G., 2008, *Rainforest Trees of Mainland South-eastern Australia*, Terania Rainforest Publishing, Australia

Greig, D., 1999, *Field Guide to Australian Wildflowers*, New Holland Publishers, Chatswood, Australia

Harden, G. J., McDonald, W. J. F., Williams, J. B., 2007, *Rainforest Climbing Plants: A Field Guide to Their Identification*, Gwen Harden Publishing, Nambucca Heads, Australia

Harden, G. J., McDonald, W. J. F., Williams, J. B., 2006, *Rainforest Trees and Shrub: A Field Guide to their Identification*, Gwen Harden Publishing, Nambucca Heads, Australia

Harden, G. J., Ed,˙2000 (revised), *Flora of New South Wales*, University Press, Sydney, Australia

Klaphake, V., 2004, *Key to the Commoner Species of Sedges and Rushes of Sydney and the Blue Mountains*, Byabarra, NSW, Australia

Keith, D., 2004, *Ocean Shores to Desert Dunes: The Native Vegetation of New South Wales and the ACT*, Department of Environment and Conservation, Hurstville, NSW Australia

Lamp, C. A., Forbes, S. J., Cade, J. W., 2001, *Grasses of Temperate Australia A Field Guide*, Bloomings Books, Melbourne, Australia

Lunney, D., Matthews, A., Moon, C., Ferrier, S., 2000, Incorporating habitat mapping into practical koala conservation on private land, *Conservation Biology* 14(3), pp. 669-680

Mackowski, C. M., 1984, The ontogeny of hollows in Blackbutt, *Eucalyptus pilularis* and its relevance to the management of forests for possums, gliders and timber, in *Possums and Gliders*, Eds. Smith, A. P., Hume, I. D., pp. 517-525, Surrey, Beatty and Sons, Sydney

Mallet, K., Orchard, A. E., Eds., 2002, *Flora of Australia Volume 43 Poaceae 1 Introduction and Atlas*, CSIRO Publishing, Collingwood, Australia

Mallet, K., Ed. 2005, *Flora of Australia Volume 44B Poaceae 3*, CSIRO Publishing, Collingwood, Australia

Menkhorst, P., Knight, F., 2004, *A Field Guide to the Mammals of Australia*, Oxford University Press, Melbourne, Australia

National Parks and Wildlife Service, 2003, *The Bioregions of New South Wales Their biodiversity, conservation and history*, National Parks and Wildlife Service (NSW), Hurstville

NSW Office of the Environment and Heritage, 2014, Atlas of NSW Wildlife, retrieved 14.03.2014 from; http://www.bionet.nsw.gov.au

NSW Rural Fire Service, 2006, *Planning for Bushfire Protection 2006*, NSW Rural Fire Service and Department of Planning, Sydney, Australia

Office of Environment and Heritage, 2014, Threatened Species Search Site, retrieved 14.03.2014, from; www. environment.nsw.gov.au/threatened species/

Phillips, S., and Callaghan, J., 2011, The Spot Assessment Technique: a tool for determining localised levels of habitat use by koalas *(Phascolarctos cinereus)*, *Australian Zoologist 35*, pp. 774–780.

Richardson, F. J., Richardson, R. G., Shepherd, R. C. H., 2007, *Weeds of the South-East: An Identification Guide for Australia*, Second Edition, R. G. and F. J. Richardson, Victoria, Australia

Robinson, M., 1998, *A Field Guide to Frogs of Australia*, New Holland Publishers, Australia

Rose, H., Rose, C., 2012, *Grasses of coastal NSW*, NSW Department of Primary Industries, Sydney

Royal Botanic Gardens, 2014, PlantNet – FloraOnline Spatial Search, retrieved 14.03.2014, from; plantnet.rbgsyd.nsw.gov.au/search/spatial.htm, Sydney, NSW, Australia

Schodde, R., Tideman, S. C., 1993, *Complete Book of Australian Birds*, Readers Digest Australia Ltd, Surrey Hills, NSW, Australia

Scott, D., 2003, *Key Habitats and Corridors for Forest Fauna; A landscape Framework for conservation in north-east New South Wales, Occasional Paper No. 32*, NSW National Parks and Wildlife Service, Hurstville

Slater, P., Slater, P., Slater, R., 2003, *The Slater Field Guide to Australian Birds*, New Holland Publishers, Australia

Smith, A. P., Andrews, S., 1997, *Koala Habitat, Abundance and Distribution in the Pine Creek Study Area, A report to State Forests NSW*, Austeco, *Environmental* Consultants, Armidale

Strahan, R., Ed, 1998, *The Mammals of Australia*, New Holland Publishers, Sydney, Australia

Swan, G., Shea, G., Sadlier, R., 2004, *A Field Guide to Reptiles of New South Wales*

Triggs, B., 1996, *Tracks, Scats and Other Signs- A Field Guide to Australian Mammals*, Oxford University Press, Melbourne, Australia

Watson, D. M., 2003, The 'standardised search': An improved way to conduct bird Surveys, *Austral Ecology 28*, pp. 515-525

White, N. A., 1999, Ecology of the koala (*Phascolarctos cinereus*) in rural south-east Queensland, Australia, *Wildlife Research* 26, pp. 731-744

Wilson, A., Ed., 2009, *Flora of Australia Volume 44A Poaceae 2*, CSIRO Publishing, Collingwood, Australia Wilson, S. K., Swan, G., 2005, *A Complete Guide to Reptiles of Australia*, Reed New Holland, Sydney, Australia

Woodgate, P. W., Ritman, K., Coram, J., Brady, A., Rule, A., Banks, J., 1994, A Study of Old-growth Forests of East Gippsland, Conservation and Natural Resources Department, Melbourne

Wormington, K., Lamb, D., 1999, Tree hollow development in wet and dry Sclerophyll eucalypt forest in south-east Qld, Australia, *Australian Forestry 62*, pp. 336-345

9. Appendix A: Flora Species List

The species of flora recorded within the study area during the field survey are detailed in Table A.1 below.

Family	Species	Common Name
Anacardiaceae	*Euroschinus falcatus*	Ribbonwood
Apiaceae	*Centella asiatica*	Indian Pennywort
Apocynaceae	*Gomphocarpus fruticosus**	Narrow-leaved Cotton Bush
	Marsdenia fraseri	Narrow-leaved Milk Vine
	Parsonsia straminea	Common Silkpod
Araliaceae	*Polyscias sambucifolia*	Elderberry Panax
	*Schefflera actinophylla**	Umbrella Tree*
Arecaceae	*Archontophoenix cunninghamiana*	Bangalow Palm
Asparagaceae	*Asparagus aethiopicus**	Asparagus Fern*
Asteliaceae	*Cordyline stricta*	Narrow-leaved Palm Lily
Asteraceae	*Ageratina houstonianum**	Blue Billygoat Weed*
	Ambrosia artemisiifolia	Annual Ragweed
	*Baccharis halimifolia**	Groundsel Bush*
	*Bidens pilosa**	Cobblers Pegs*
	*Cirsium vulgare**	Spear Thistle*
	*Hypochaeris radicata**	Catsear
	*Pseudognaphalium luteoalbum**	Jersey Cudweed*
	*Senecio madagascariensis**	Fireweed*
	*Taraxacum officinale**	Dandelion*
Blechnaceae	*Blechnum cartilagineum*	Gristle Fern
Casuarinaceae	*Allocasuarina torulosa*	Forest Oak
	Casuarina glauca	Swamp Oak
Celastraceae	*Elaeodendron australe* var. australe	
Cyperaceae	*Cyperus brevifolius**	Mullumbimby Couch*
	Carex inversa	Knob Sedge
Dennstaedtiaceae	*Pteridium esculentum*	Bracken
Dilleniaceae	*Hibbertia aspera*	Rough Guinea Flower
	Hibbertia scandens	Climbing Guinea Flower
Elaeocarpaceae	*Elaeocarpus obovatus*	Hard Quandong
Fabaceae Caesalpinioideae	*Senna pendula var. glabrata**	Easter Cassia*
Fabaceae Faboideae	*Desmodium gunnii*	Slender Tick-trefoil
	Glycine clandestina	Twining glycine
	Podolobium scandens	Netted Shaggy Pea
Fabaceae Mimosoideae	*Acacia elongata*	Swamp Wattle

Family	Species	Common Name
Geraniaceae	*Geranium homeanum*	
Lobeliaceae	*Pratia purpurascens*	Whiteroot
Lomandraceae	*Lomandra longifolia*	Spiny-headed Mat-rush
Luzuriagaceae	*Eustrephus latifolius*	Wombat Berry
	Geitonoplesium cymosum	Scrambling Lily
Menispermaceae	*Stephania japonica* var. *discolor*	Snake Vine
Moraceae	*Ficus coronata*	Creek Sandpaper Fig
	Ficus macrophylla	Moreton Bay Fig
	*Morus alba**	White Mulberry*
Myrtaceae	*Angophora costata*	Smooth-barked Apple
	Corymbia intermedia	Pink Bloodwood
	Eucalyptus microcorys	Tallowwood
	Eucalyptus pilularis	Blackbutt
	Eucalyptus resinifera subsp. *hemilampra*	Red Mahogany
	*Eucalyptus torelliana**	Cadagi*
	Lophostemon suaveolens	Swamp Turpentine
	Melaleuca quinquenervia	Broad-leaved Paperbark
Ochnaceae	*Ochna serrulata**	Micky Mouse Plant
Oleaceae	*Ligustrum lucidum**	Broad-leaf Privet*
	Notelaea longifolia f. intermedia	Large Mock-olive
Passifloraceae	*Passiflora suberosa**	Corky Passion Flower*
Phormiaceae	*Dianella caerulea var. assera*	Blue Flax Lily
Phyllanthaceae	*Breynia oblongifolia*	Coffee Bush
	Glochidion ferdinandi var. ferdinandi	Cheese Tree
Pittosporaceae	*Pittosporum undulatum*	Sweet Pittosporum
	Pittosporum revolutum	Rough Fruit Pittosporum
Plantaginaceae	*Plantago lanceolata**	Lamb's Tongues*
Poaceae	*Andropogon virginicus**	Whisky Grass*
	Aristida vagans	Threeawn Speargrass
	*Chloris gayana**	Rhodes Grass*
	Cymbopogon refractus	Barbed Wire Grass
	Cynodon dactylon	Common Couch
	Digitaria ramularis	Reflexed Finger Grass
	*Echinochloa crusgalli **	Barnyard grass*
	Echinopogon caespitosus	Tufted Hedgehog Grass
	Entolasia marginata	Bordered Panic
	Entolasia stricta	Wiry Panic
	Eragrostis brownii	Brown's Lovegrass
	*Eragrostis curvula**	African Lovegrass*

Family	Species	Common Name
	Imperata cylindrica	Blady Grass
	Microlaena stipoides var. *stipoides*	Weeping grass
	Oplismenus imbecillis	
	Panicum simile	Two-colour Panic
	Paspalidium distans	Spreading Punk Grass
	Paspalum dilatatum *	Common Paspalum*
	Paspalum mandiocanum *	Broadleaf Paspalum*
	*Paspalum urvillei**	Vasey Grass*
	*Setaria pumila**	Pale Pigeon Grass*
	*Setaria sphacelata**	Setaria*
	*Sporobolus africanus**	Parramatta Grass*
	Themeda australis	Kangaroo Grass
Rhamnaceae	*Alphitonia excelsa*	Red Ash
Rosaceae	*Rubus parvifolius*	Native Raspberry
Rubiaceae	*Morinda jasminoides*	Sweet Morinda
Sapindaceae	*Cupaniopsis anacardioides*	Tuckeroo
	Cupaniopsis newmanii	Long-leaved Tuckeroo
	Jagera pseudorhus var. *discolor*	Foambark Tree
Smilacaceae	*Smilax australis*	Lawyer Vine
Solanaceae	*Solanum mauritianum**	Wild Tobacco*
	Solanum prinophyllum	Forest Nightshade
Verbenaceae	*Lantana camara**	Lantana*
	*Verbena bonariensis**	Purpletop*
Zingiberaceae	*Alpinia caerulea*	Native Ginger

Table A.1: Flora species recorded within the survey area

* Indicates an introduced species

10. Appendix B: Fauna Species List

The species of fauna recorded within the survey area during the field survey are detailed in Table B.1 below.

Family	Scientific Name	Common Name
Reptilia		
Scincidae	*Lampropholis delicate*	Garden Skink
Varanidae	*Varanus varius*	Lace Monitor
Aves		
Alcedinidae	*Dacelo novaeguneae*	Laughing Kookaburra
Anatidae	*Chenonetta jubata*	Australian Wood Duck
Artamidae	*Cracticus nigrogularis*	Pied Butcherbird
	Cracticus tibicen	Australian Magpie
	Strepera graculina	Pied Currawong
Cacatuidae	*Calyptorhynchus funereus*	Yell-tailed Black-cockatoo
Meliphagidae	*Entomyzon cyanotis*	Blue-faced Honeyeater
	Meliphaga lewinii	Lewin's Honeyeater
	Manorina melanocephala	Noisy Miner
Pardalotidae	*Pardalotus striatus*	Striated Pardalote
Mammalia		
Macropodidae	*Macropus giganteus*	Eastern Grey Kangaroo
	Wallabia bicolor	Swamp Wallaby
Peramelidae	*Isoodon/Perameles sp.*	Unidentified Bandicoot
Pseudocheiridae	*Pseudocheirus peregrinus*	Common Ringtail Possum
Tachyglossidae	*Tachyglossus aculeatus*	Echidna

Table D.1: Fauna species recorded during the field survey

11. Appendix C: Assessments of Significance

The BioNet Atlas of NSW Wildlife database search returned three threatened species of flora and 56 threatened species of fauna recorded in a 10 km x 10 km search area around the study area.

The EPBC Act Protected Matters Report indicated that a total of 65 threatened species or species habitat may occur in the area with a 10 km buffer. However, the vast majority of these threatened species were disregarded immediately on the basis that they are aquatic or marine species whose habitat is not present within the study area or adjacent land.

The following Assessment of Significance (Seven-Part Test) relies on the ecological assessment provided in Section 4 and 5 of this report. Based on the plant community and habitat assessment, it is considered that the land within the study area constitutes potential habitat for two threatened species of flora, four threatened species of bird and 11 threatened species of mammal recorded in the BioNet Atlas of NSW Wildlife database and/or listed on the EPBC Act Protected Matters Report as detailed in Table C.1.

Family	Scientific Name	Common Name	NSW	Nat
PLANTAE				
Orchidaceae	*Phaius australis*	Lesser Swamp-orchid		E
AVES				
Accipitridae	*Lophoictinia isura*	Square-tailed Kite	V	
MAMMALIA				
Emballonuridae	*Saccolaimus flaviventris*	Yellow-bellied Sheathtail-bat	V	
Pteropodidae	*Pteropus polioephalus*	Grey-headed Flying-fox	V	
Vespertilionidae	*Chalinolobus dwyeri*	Large-eared Pied Bat		V
	Chalinolobus nigrogriseus	Hoary Wattled Bat	V	
	Kerivoula papuensis	Golden-tipped Bat	V	
	Miniopterus australis	Little Bentwing-bat	V	
	M. schreibersii oceanensis	Eastern Bentwing-bat	V	
	Myotis macropus	Southern Myotis	V	
	Scoteanax rueppellii	Greater Broad-nosed Bat	V	

Table C.1: Subject species for Section 5A Assessment (see key below for listings)

Key to Threatened Species Listings – Table E.1

Abbreviation	Meaning
NSW	TSC Act listing
Nat	EPBC Act Listing
V	Vulnerable
E	Endangered

Assessment of Significance

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

Plantae

Lesser Swamp Orchid (*Phaius australis*)

The Lesser Swamp Orchid has flower stems up to 2 m tall and large broad leaves with a pleated appearance, both arising from a fleshy bulb near ground level. The large, showy flowers, with up to 20 per stem, have four petals which are white on the outside and brown with white or yellow veins on the inside. The central tongue of the flower is pink and yellow with lobes slightly curved inwards.

The species occurs in Queensland and north-east NSW as far south as Coffs Harbour. Historically, it extended farther south, to Port Macquarie. The preferred habitat is swampy grassland or swampy forest including rainforest, eucalypt or paperbark forest, mostly in coastal areas. The species can only be distinguished from other swamp orchids by characteristics of its flowers. Therefore, surveys for the species can only be undertaken during spring when the Lesser Swamp Orchid is flowering. The Lesser Swamp Orchid is listed as endangered in NSW under the *Threatened Species Conservation Act 1995*.

The areas of Lowlands Swamp Box – Paperbark – Red Gum Dry Forest within the study area at the interface and within the small remnants may be suitable for this species. As this habitat has been identified as an EEC and is to be retained it is considered that the action proposed is unlikely to have an adverse effect on the life cycle of this species such that a viable population of the species is likely to be placed at risk of extinction. Note: A targeted survey conducted during the field survey failed to detect the species.

Aves

Square-tailed Kite (*Lophoictinia isura*)

The Square-tailed Kite is a medium sized long-winged raptor with a square tail and upturned wings when in flight. Adults have a white face with thick black streaks on the crown and finer streaks elsewhere. The saddle, rump and central upper tail-coverts are blackish with grey-brown barring. The underparts are predominately grey-brown with black tips on the grey tail and wings. There is an obscure bullseye on the wings and when sitting the legs are barely visible. The species is usually silent; however it may utter a hoarse or plaintiff yelp and a weak twitter near its nest. The species is found in a variety of habitats including open forest, and shows a particular preference for timbered watercourses. The species is a specialist hunter of passerine birds, especially honeyeaters and appears to occupy large hunting ranges of more than 100km^2. Nesting occurs between July and October, with birds constructing a large stick nest lined with eucalypt leaves generally located on a large horizontal branch of a eucalypt 12-26m above the ground.

The Square-tailed Kite is listed as vulnerable in NSW under the *Threatened Species Conservation Act 1995*. There are 17 records of the species listed under the Atlas of NSW Wildlife within a 10 km x 10 km search area around the study area.

There is limited foraging habitat available but the Square-tailed Kite is unlikely to utilise the habitat for nesting or roosting. Therefore, the action proposed is unlikely to have an adverse effect on the life cycle of this species such that a viable population of the species is likely to be placed at risk of extinction.

Mammalia

Yellow-bellied Sheathtail-bat (*Saccolaimus flaviventris*)

The Yellow-bellied Sheathtail-bat is a very distinctive, large insectivorous bat up to 87 mm long. It has long, narrow wings, a glossy jet-black back, and a white to yellow belly extending to the shoulders and just behind the ear. Characteristically, it has a flattened head and a sharply-pointed muzzle. The tail is covered with an extremely elastic sheath that allows variation in the tail-membrane area. Males have a prominent throat pouch, while females have a patch of bare skin in the same place.

The species is widely distributed across northern and eastern Australia. In the most southerly part of its range most of Victoria, south-western NSW and South Australia) it is a rare visitor in late summer and autumn. It roosts singly or in groups up to six, in tree hollows and buildings. In treeless areas the species is known to utilise mammal burrows. The species forages in most habitats for insects flying high and fast over the forest canopy.

The Yellow-bellied Sheathtail-bat is listed as vulnerable in NSW under the *Threatened Species Conservation Act 1995*. There was one record of the species listed under the Atlas of NSW Wildlife within a 10 km x 10 km search area around the study area.

There is limited foraging habitat available to the Yellow-bellied Sheathtail-bat within the study area but the species is unlikely to utilise the habitat for nesting or shelter. Therefore, the action proposed is unlikely to have an adverse effect on the life cycle of this species such that a viable population of the species is likely to be placed at risk of extinction.

Grey-headed Flying-fox (*Pteropus poliocephalus*)

The Grey-headed Flying-fox is the largest Australian bat species and is found within 200km of the eastern coast of Australia from Bundaberg in Queensland to Melbourne, Victoria. The species occurs in subtropical and temperate rainforest, tall sclerophyll forest and woodland and individuals travel up to 50km to feed on the nectar and pollen of native trees, particularly eucalypts, Melaleuca spp. and Banksia spp. and the fruits of rainforest trees and vines.

The Grey-headed Flying-fox is listed as endangered in NSW under the *Threatened Species Conservation Act 1995* and as vulnerable nationally under the *Environment Protection and Biodiversity Conservation Act 1999*. There are 496 records of the

species listed under the Atlas of NSW Wildlife within a 10 km x 10 km search area around the survey area.

The Grey-headed Flying Fox could potentially utilise the habitat within the study area for foraging purposes, however, there is no indication of the species utilising the habitat for other purposes such as for breeding or for roosting. Consequently, it is unlikely that the species would utilise the habitat within the study area for roosting or breeding. Therefore, it is considered that the action proposed is unlikely to have an adverse effect on the life cycle of this species such that a viable population of the species is likely to be placed at risk of extinction.

Large-eared Pied Bat (*Chalinolobus dwyeri*)

The Large-eared Pied Bat is known from scattered locations from near Rockhampton in central Queensland to Bungonia in southern NSW. It is found in a range of habitats, including dry sclerophyll forest and woodland to the east and west of the Great Dividing Range. Isolated records from subalpine woodland above 1500 metres and at the edge of rainforest and moist eucalypt forest, suggest it may tolerate a greater range of habitats than has so far been recorded. The species daytime roosts include caves, mine tunnels and the abandoned, bottle-shaped mud nests of Fairy Martins. The combination of a relatively short, broad wing and low weight per unit area of wing is indicative of manoeuvrable flight, suggesting it probably forages for small flying insects below the forest canopy.

The Large-eared Pied Bat is listed as vulnerable in NSW under the *Threatened Species Conservation Act 1995* and nationally under the *Environment Protection and Biodiversity Conservation Act 1999*.

The Large-eared Pied Bat forages across a wide range of habitats but requires caves, mine tunnels and the abandoned, bottle-shaped mud nests of Fairy Martins for roosting. As these types of habitat features are not present in the study area it is unlikely that the species could utilise the habitat for nesting or roosting. Therefore, the action proposed is unlikely to have an adverse effect on the life cycle of this species such that a viable population of the species is likely to be placed at risk of extinction.

Hoary Wattled Bat (*Chalinolobus nigrogriseus*)

The Hoary Wattled Bat is a small sooty-coloured bat with a light silvery-white frosting or hoary appearance that is visible at close range. Also, there are small lobes of skin or wattles between the ears and mouth. This species is typically observed flying about at dusk, leaving its roost site before other bat species have emerged.

The Hoary Wattled Bat is widely distributed across northern Australia but is absent from the arid centre. In northeast NSW it reaches the lower Clarence and Richmond River areas, extending from near Murwillumbah in the north, south to between Grafton and Coffs Harbour. In NSW the Hoary Wattled Bat occurs in dry open eucalypt forests, favouring forests dominated by Spotted Gum as well as box and ironbark species, and heathy coastal forests where Red Bloodwood and Scribbly Gum are common. Because it flies fast below the canopy level, forests with naturally

sparse understorey layers may provide the best habitat. The species is known to roost in rock crevices but in the absence of these it is likely to roost in tree hollows or similar sites. The Hoary Wattled Bat is listed as vulnerable in NSW under the *Threatened Species Conservation Act 1995*.

There is limited foraging habitat available to the Hoary Wattled Bat within the study area but the species is unlikely to utilise the habitat for nesting or roosting. Therefore, the action proposed is unlikely to have an adverse effect on the life cycle of this species such that a viable population of the species is likely to be placed at risk of extinction.

Golden-tipped Bat (*Kerivoula papuensis*)

The Golden-tipped Bat has dark brown, curly fur with bright golden tips that extends along the wings, legs and tail. It has a short, pointed, over-hanging muzzle and pointy, funnel-shaped ears. Adults weigh about 6 grams and have a wingspan of about 25 cm.

The Golden-tipped Bat is distributed along the east coast of Australia in scattered locations from Cape York Peninsula in Queensland to south of Eden in southern NSW and also occurs in New Guinea. The species is found in rainforest and adjacent wet and dry sclerophyll forest up to 1000m. It is also recorded in tall open forest, *Casuarina*-dominated riparian forest and coastal *Melaleuca* forests. It roosts mainly in abandoned hanging Yellow-throated Scrubwren and Brown Gerygone nests, as well as in tree hollows, dense foliage and epiphytes; located in rainforest gullies on small first- and second-order streams. The species will fly up to two km from roosts to forage in rainforest and sclerophyll forest on mid and upper-slopes, where it feeds on small web-building spiders. The Golden-tipped Bat is listed as vulnerable in NSW under the *Threatened Species Conservation Act 1995*.

There is some limited foraging habitat available to this species within the study area but the species is unlikely to utilise the habitat for nesting or roosting. Therefore, the action proposed is unlikely to have an adverse effect on the life cycle of this species such that a viable population of the species is likely to be placed at risk of extinction.

Little Bentwing-bat (*Miniopterus australis*)

The Little Bentwing-bat occurs along the east coast of Australia from north-eastern Queensland to the central coast of New South Wales. The species mainly forages for insects between the canopy and understorey of well-timbered habitats including wet and dry sclerophyll forest, woodland, rainforest and coastal swamp forest. The Little Bentwing-bat is regarded as a cave-obligate species that roosts by day in caves, tunnels and mine shafts. Maternity colonies are formed during summer in roost sites with high humidity, which are often shared with the Eastern Bentwing-bat. The Little Bentwing-bat is listed as vulnerable in NSW under the *Threatened Species Conservation Act 1995*.

The Little Bentwing-bat forages across a wide range of habitats but requires caves, tunnels and mine shafts for roosting. As these types of habitat features are not present in the study area it is unlikely that the species could utilise the habitat for

nesting or roosting. Therefore, the action proposed is unlikely to have an adverse effect on the life cycle of this species such that a viable population of the species is likely to be placed at risk of extinction.

Eastern Bentwing-bat (*Miniopterus schreibersii)*

The Eastern Bentwing-bat occurs in eastern Australia from north Queensland to south-eastern South Australia. In New South Wales, the species is found along the coast and western slopes including high elevations of the Great Dividing Range. The Eastern Bentwing-bat forages for insects mainly above the tree canopy in a range of timbered habitats including rainforest, coastal swamp forest, heathland, woodland and sclerophyll forest. The species is regarded as a cave-obligate, roosting in caves, tunnels, mine shafts and closed stormwater drains. The Eastern Bentwing-bat is listed as vulnerable in NSW under the *Threatened Species Conservation Act 1995.*

The Eastern Bentwing-bat forages across a wide range of habitats but requires caves, tunnels and mine shafts for roosting. As these types of habitat features are not present in the study area it is unlikely that the species could utilise the habitat for nesting or roosting. Therefore, the action proposed is unlikely to have an adverse effect on the life cycle of this species such that a viable population of the species is likely to be placed at risk of extinction.

Southern Myotis (*Myotis macropus*)

The Southern Myotis has disproportionately large feet with widely-spaced toes, which are distinctly hairy and with long, curved claws. The species has dark-grey to reddish-brown fur above and is paler below. It weighs up to 15 g and has a wingspan of approximately 28 cm.

The Southern Myotis is found along the coastal strip from the northwest of Australia, across northern Australia and south to western Victoria. The species is rarely found more than 100 km inland, except along major rivers. It is always found close to water, from small creeks to large lakes and mangrove-lined estuaries. The species utilises a range of roost sites including caves, mineshafts, culverts, dense foliage and tree hollows in which it roosts in groups of 10-15 individuals. It forages low over water taking flying insects as well as aquatic insects and small fish, which it captures by raking the claws across the water surface.

The Southern Myotis is listed as vulnerable in NSW under the *Threatened Species Conservation Act 1995.* There are 7 records of the species listed under the Atlas of NSW Wildlife within a 10 km x 10 km search area around the study area.

Suitable habitat features for roosting and breeding purposes are not available within the study area for this species. Furthermore, as the species requires a body of water for foraging it is unlikely that the species would utilise the habitat within the study area for foraging purposes. Therefore, the action proposed is unlikely to have an adverse effect on the life cycle of this species such that a viable population of the species is likely to be placed at risk of extinction.

Greater Broad-nosed Bat (*Scoteanax rueppellii*)

The Greater Broad-nosed Bat is a large robust bat with a broad head and short, squarish muzzle. The ears are widely spaced, short and have a rounded apex with a concave rear edge immediately below the apex. The upper parts vary from mid-brown to dark cinnamon-brown and the underparts are tawny-olive in colour.

The species occurs in a range of habitats including cleared grazing land, heathland, coastal swamp forest, woodland, rainforest as well as wet sclerophyll forest and dry sclerophyll forest. The species usually roosts in tree hollows and forages after sunset, flying slowly along watercourses at an altitude of 3m to 6m.

The Greater Broad-nosed Bat is listed as vulnerable in NSW under the *Threatened Species Conservation Act 1995*. There are 9 records of the species listed under the Atlas of NSW Wildlife within a 10 km x 10 km search area around the study area.

This species utilises a wide range of habitats for foraging and roosting. There is limited foraging habitat but no potential nesting or roosting habitat available to this species within the study area. Therefore, the action proposed is unlikely to have an adverse effect on the life cycle of this species such that a viable population of the species is likely to be placed at risk of extinction.

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

The Koala (Combined populations of Queensland, New South Wales and the Australian Capital Territory)

This population has been listed as vulnerable under the EPBC Act as it has undergone a substantial decline over three generations due to a combination of a number of factors including loss and fragmentation of habitat, vehicle strike, disease and predation by dogs.

The majority of the habitat within the study area is not mapped as Koala habitat for the purposes of the Coffs Harbour CKPoM. With respect to the Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) listed nationally under the EPBC Act, the habitat within the study area was considered to contain habitat critical to the species survival based on the Koala habitat assessment tool score of 5. However, the results obtained from the desktop and 'on-ground' (field) survey indicated that the habitat within the study area is not habitat critical to the species survival.

On this basis the action proposed is unlikely to have an adverse effect on the life cycle of this species (that constitutes an endangered population) such that a viable population of the species is likely to be placed at risk of extinction

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

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

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

The endangered ecological community – *Sub-tropical Coastal Floodplain Forest of the NSW North Coast bioregion* and was recorded at the interface and as small remnants in the eastern parts of the study area. As the EEC located at the interface and remnants are to be excluded from any future development and are to be retained:

- It is unlikely that the proposed action will have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction; and
- It is unlikely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.

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

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

The habitat within the study area has been significantly disturbed in the past with the majority of the canopy removed; almost all of the understory removed and the groundcover that is dominated by exotic/weed species managed by an ongoing slashing regime. Therefore, in view of the existing modification and disturbance of the habitat and the intent to retain the native plant communities at the interface along the northern boundary, the habitat to be removed or modified as a result of the proposed action is not considered to be significant with respect to a threatened species, population or ecological community.

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

It is considered that the proposed action is unlikely to fragment habitat areas or isolate habitat areas from other areas of habitat.

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

The habitat within the study area has been significantly disturbed in the past and does not contain any significant habitat features. It is also intended to retain the native plant communities at the interface along the northern boundary. Therefore, the habitat within the study area proposed to be removed and/or modified is not considered to be significant to the long-term survival of the aforementioned threatened species.

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

Critical habitat was not recorded within the subject site. Therefore, the action proposed is unlikely to have an adverse effect on critical habitat (either directly or indirectly).

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

There is no recovery plan or threat abatement plan relevant to the proposed action or the study area.

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

Key threatening processes (KTPs) are listed in Schedule 3 of the TSC Act. Those considered to be applicable to future development of the subject site once it has been rezoned are:

Clearing of Native Vegetation

The reduction of native vegetation within the study area associated with the proposed development of the land could be viewed as contributing to the overall incremental decline of native vegetation within the region. However, the plant communities within the subject site have previously been significantly modified. It is intended to retain the remaining native plant communities at the interface and remnant trees. Therefore, it is considered that the proposed action does not contribute significantly to this KTP.

Anthropogenic Climate Change

The use of machinery and power tools during any future earthworks or construction activities will contribute to anthropogenic climate change through release of stored carbon from vegetation and greenhouse gas emissions associated with use of fossil fuels. However, the overall impact of the action is considered negligible in the context of other human activities in the region.

Invasion of native plant communities by exotic perennial grasses

The study area is already heavily infested with invasive weeds. The proposed action is unlikely to contribute significantly further to this KTP.

Invasion, Establishment and Spread of Lantana (Lantana camara)

The field survey revealed that Lantana is established within the study area. However, the proposed action in itself is unlikely to significantly contribute to this KTP.

12. Appendix D: Subdivision Concept Plan

Appendix D

FloraFauna Consulting

Bushfire Assessment

In relation to

Proposed Rezoning

Lot 1 DP 417132
Mullaway Drive
Mullaway

May 2014

Prepared for Ashley More

BA-2014-1002-100B

FPA AUSTRALIA
Certified Business
Bushfire Planning & Design

FloraFauna Consulting
PO Box 3212 West Kempsey NSW 2440
Ph: (02) 6566 9075Mob: 0429 727 010
mail@florafauna.com.au
www.florafauna.com.au
ABN: 22 167 601 074

Report Title:	Bushfire Assessment Report
Project:	Bushfire Assessment – Proposed Rezoning
Client:	Ashley More
Report No.:	BA-2014-1002-100B
Draft/Final:	Final – 13 May 2014

The preparation of this report has been undertaken in accordance with the project brief provided by the client and has relied upon the information, data and results provided or collected from the sources and under the conditions outlined in the report.

All information contained within this report are prepared for the exclusive use of the client and with respect to the land described herein and are not to be used for any other purpose or by any other person or entity. No reliance should be placed on the information contained in this report for any purposes other than those stated herein.

Prepared By:	**Steve Britt** BSc. (Botany) Grad. Dip. DBPA M. Wld. Mgt. (Habitat)
Signed:	
Date:	13 May 2014

Contents

1. Executive Summary – Certificate

The assessment relates to a proposed rezoning of land identified as Lot 1 DP 417132, Mullaway Drive Mullaway for residential purposes. This is to certify that the proposed development conforms to the relevant specifications and requirements of *Planning for Bush Fire Protection 2006*, subject to recommendations 1-5 of this assessment. The details relevant to the assessment are:

Real Property Description	1//417132
Property Address	Mullaway Drive Mullaway
Date of Assessment	27 November 2013
FDI	80 (North Coast)
Zoning	RU2 Rural Landscape RE1 Public Recreation
Local EPI	Coffs Harbour City Local Environmental Plan 2013
Proposed Development	Rezoning for residential purposes
Existing Dwelling	Yes
Assessment based on plans by	Bennell and Associates
Plan Title	Subdivision Concept Plan
Plan date/issue	Concept plan undated
Any amendments to plan?	No
What is the highest assessed BAL as per AS 3959-2009?	BAL-29
Can this development comply with the acceptable solution provisions of PBP?	Yes
Assessment by	Steve Britt BPD-PA-09334 Certified Practitioner Bushfire Planning and Design, FPAA

The preparation of this report has been undertaken in accordance with the project brief provided by the client and has relied upon the information, data and results provided or collected from the sources and under the conditions outlined in the report.

All information contained within this report are prepared for the exclusive use of the client and with respect to the land described herein and are not to be used for any other purpose or by any other person or entity. No reliance should be placed on the information contained in this report for any purposes other than those stated herein.

2. Introduction

FloraFauna Consulting has been engaged by Bennell and Associates on behalf of Ashley More to prepare a bushfire assessment report in relation to a proposed rezoning of land at Mullaway Drive Mullaway.

The subject site comprises land identified as Lot 1 in DP 417132, Mullaway Drive Mullaway, which is currently zoned RE1 – Public Recreation and RU2 – Rural Landscape under the *Coffs Harbour City Local Environmental Plan 2013* (LEP). The proposed development involves rezoning of the land within the subject site for residential purposes.

The land is mapped as bushfire prone land. The bushfire prone land map for the area indicates that the subject site contains category 1 vegetation (shown orange) along the edge of the northern boundary and across the western end of the site. The bushfire prone land map indicates that the remainder of the subject site is situated within the 100 m bushfire-prone vegetation buffer to bushfire-prone category 1 vegetation (shown red). An extract of the bushfire prone land map is provided below (Figure 2.1).

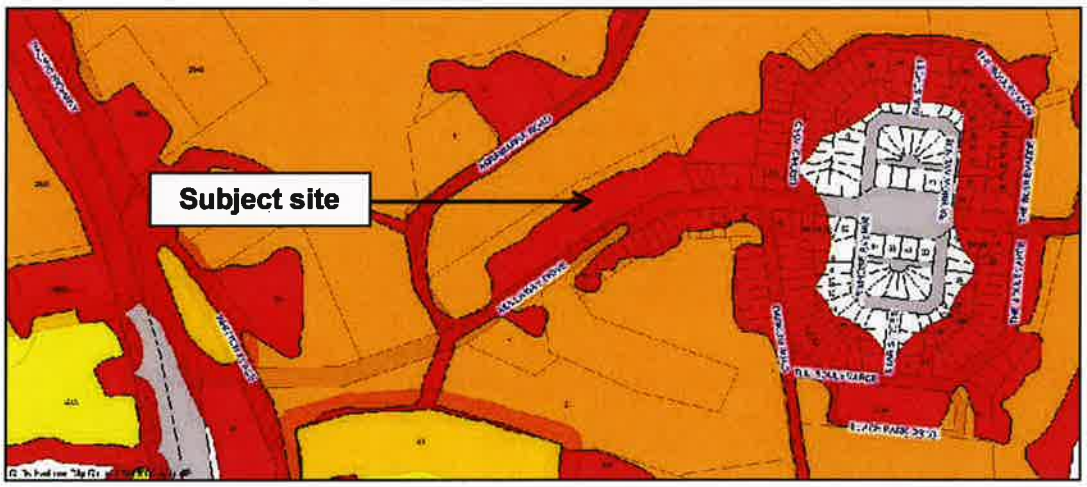


Figure 2.1 – Extract of Bushfire Prone Lands Map (Source: Coffs Harbour City Council)

- Category 1 Vegetation - Category 2 Vegetation - Buffer

Section 100B of the *Rural Fires Act 1997* (RF Act) provides that a person must obtain a Bushfire Safety Authority before developing land where the development involves a subdivision of bush fire prone land that could lawfully be used for residential or rural residential purposes, or development of bush fire prone land for a special fire protection purpose.

As a Bushfire Safety Authority must be obtained before consent can be granted for subdivision of bush fire prone land, such development constitutes integrated development for the purposes of Section 91 of the *Environmental Planning and*

Assessment Act 1979 (EP&A Act). Clause 44 of the *Rural Fires Regulation 2013* contains the matters that must be included in an application for a Bushfire Safety Authority.

This is a preliminary bushfire assessment to determine if a residential subdivision of the land within the subject site can satisfy the requirements of *Planning for Bushfire Protection 2006* when assessed in accordance with Section 44 of the *Rural Fires Regulation 2013*.

The prospective layout of a future residential subdivision that has been used as the basis of this bushfire assessment is shown on the subdivision concept plan prepared by Bennell and Associates appended to this report as Appendix A. The assessment considers if the bushfire risks can be satisfactorily managed for the most likely development of the land for residential purposes as shown in the concept plan. Moreover, the assessment will consider if there are any significant impediments to the rezoning and potential residential subdivision development of the land from a bushfire hazard perspective.

3. Rural Fires Regulation Assessment

Clause 44 of the *Rural Fires Regulation 2013* contains the matters that must be included in an application for a Bushfire Safety Authority. This assessment addresses the relevant points for consideration as listed in the Regulation.

A. Site Description

The subject site is located at the corner of Arrawarra Road and Mullaway Drive, Mullaway and comprises an allotment of land of approximately 3.153 ha in size that is identified as Lot 1 in DP 417132. The land within the subject site is currently zoned RE1 – Public Recreation and RU2 – Rural Landscape under the *Coffs Harbour Local Environmental Plan 2013* (LEP).

There is an existing dwelling located in the south-western corner of the site. The remaining land within the subject site has been cleared of native vegetation to form derived grassland in which a small number of trees have been retained. The native forest vegetation on the land adjoining land to the north extends a short distance onto the land within the subject site along the northern boundary interface.

Currently the surrounding land use practices are variable and include existing rural-residential development, agricultural activities and adjacent residential development associated with the village of Mullaway. More recently there have been significant changes to the landscape associated with the Pacific Highway upgrade.

Immediately adjoining the subject site to the north are areas of land containing forest. Further to the north lie Arrawarra Road that heads in a generally north-eastern direction and a small number of developed rural-residential allotments surrounded by extensive areas of land containing native forest. To the east the subject site adjoins existing residential development, which is the current western extent of the village of Mullaway on the northern side of Mullaway Drive. Immediately adjoining the southern boundary of the subject site is Mullaway Drive. To the south of the eastern part of the subject site and adjoining the southern side of Mullaway Drive are a number of developed residential allotments. To the southwest of these allotments and opposite the western part of the subject site are two developed rural allotment of land, in which native vegetation has been retained. Further southward much of the land has been cleared for agricultural purposes. The western boundary of the subject site adjoins Arrawarra Road. Beyond the road corridor further westward the land contains a mix of forested areas, cleared land and rural-residential development.

The relative position of the subject site and the general nature of the surrounding landscape are shown in Figure 3.1.

Figure 3.1: Aerial photo of the subject site and surrounding land

The following images show the general condition of the land within the vicinity of the subject site.

Figure 3.2: View looking northward across the subject site towards the adjacent land containing unmanaged forest

Figure 3.3: View looking northeast across the subject site from the western part of the subject site

Figure 3.4: View of the eastern part of the subject site showing some of the Remnant trees that have been retained within the subject site

Figure 3.5: View looking southwest from the eastern part of the subject site showing some of the small number of isolated retained trees

Figure 3.6: View looking southwest along Mullaway Drive adjacent to the front boundary of the subject site

Figure 3.7: View of the western part of the subject site from the front boundary showing the existing dwelling

Figure 3.8: View of the managed yard area in the vicinity of the existing dwelling located in the south-western corner of the subject site

Figure 3.9: View of Arrawarra Road adjacent to southwestern boundary of the subject site adjacent

B. Classification of Vegetation

Vegetation within the Coffs Harbour local government area has been mapped under the Coffs Harbour Fine Scale Vegetation Mapping. The areas of mapped vegetation proximate to the subject site are shown in Figure 3.10 below.

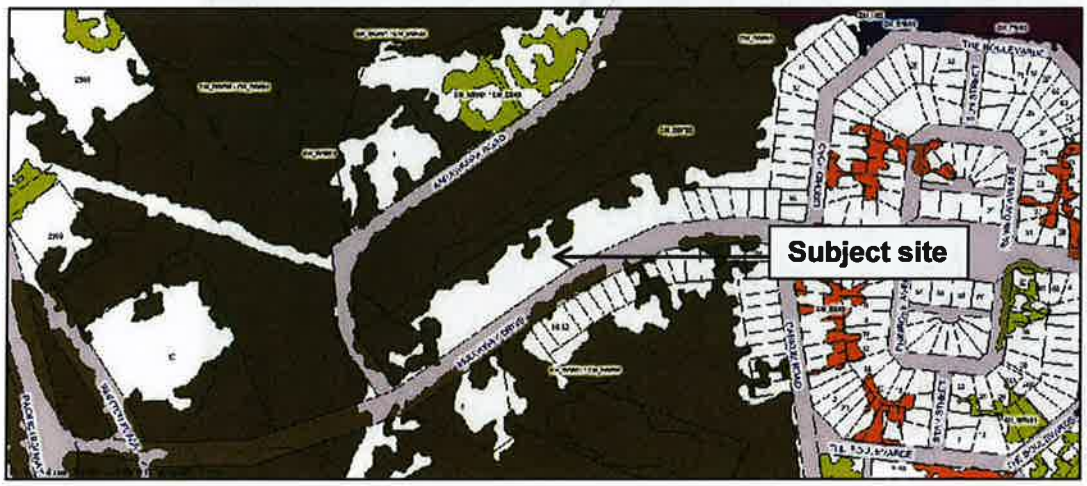


Figure 3.10: Fine Scale Vegetation Mapping extract (Coffs Harbour City Council)

Key: **CH_DOF01: Coast and Escarpment Blackbutt Dry Forest**
CH_DOF06: Lowlands Swamp Box – Paperbark – Red Gum Dry Forest

In relation to the areas of land containing unmanaged vegetation situated within 140 m of the subject site the Fine Scale Vegetation Mapping indicates two plant communities. The first of these is listed as CH_DOF01: Coast and Escarpment Blackbutt Dry Forest, which was situated on land adjacent to the northern boundary in the western part of the subject site, on the land to the south of Mullaway Drive and on the land to the west of Arrawarra Road as indicated in Figure 3.10. An image of this plant community is provided at Figure 3.11 below.

Figure 3.11: Coast and Escarpment Blackbutt Dry Forest

The second plant community indicated by the Fine Scale Vegetation Mapping is listed as CH_DOF06: Lowlands Swamp Box – Paperbark – Red Gum Dry Forest, which was situated on land adjacent to the northern boundary in the eastern part of the subject site as indicated in Figure 3.10. An image of this plant community is provided at Figure 3.12 below.

Figure 3.12: Lowlands Swamp Box – Paperbark – Red Gum Dry Forest

For the purpose of bushfire assessment the classification of the vegetation was determined in accordance with the methodology set out in Addendum Appendix 3 of

PBP. The vegetation within 140 m of the site was identified based on Keith (2004) and classified under Table A2.1 in Appendix 2 of PBP. The Coast and Escarpment Blackbutt Dry Forest was classified as Dry Sclerophyll Forest and the Lowlands Swamp Box – Paperbark – Red Gum Dry Forest was classified as Forested Wetland. This was then converted to Specht classifications by applying Table A3.5.1 in line with AS 3959-2009 and the *Building Code of Australia 2010* (BCA 2010) giving a classification of forest for both plant communities.

C. Assessment of Effective Slope

For the purposes of PBP and AS 3959-2009 the effective slope of land is the slope of the land under the classified vegetation as this is the slope that directly influences bushfire behaviour including the rate of spread, the severity of the fire and the level of radiant heat.

The effective slope was determined by review of the Coffs Harbour City Council Online Mapping Tool (Coastal 2 m contours) and validated by field survey utilising a Suunto Tandem 360PC/360R clinometer. With respect to the vegetation on the land adjacent to the northern boundary of the subject site the effective slope was assessed as upslope/flat. In relation to the unmanaged vegetation situated on the land to the south of Mullaway Drive and west of Arrawarra Road the effective slope was assessed as >5° to 10°.

An extract of the Coastal 2 m contours mapping is provided at Figure 3.13 below.

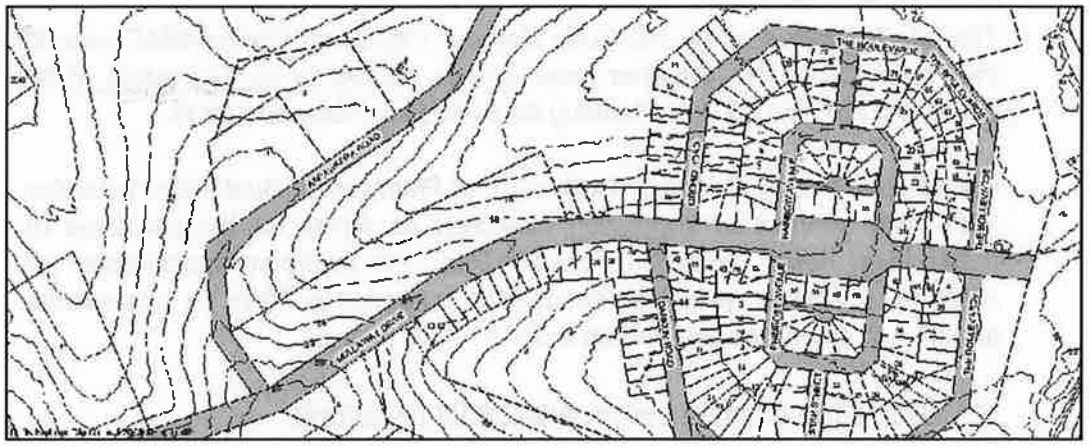


Figure 3.13: Extract of the Coastal 2 m contours mapping (Coffs Harbour City Council)

D. Significant Environmental Features

The majority of the proposed development footprint within the subject site has been cleared of native vegetation for a considerable period of time. Therefore, a residential subdivision development would result in no clearing of native vegetation. During the field survey no other significant environmental features were identified within the subject site.

E. Threatened Species

The subject site is unlikely to provide potential habitat for species of threatened flora and fauna. It is anticipated that the impact of the proposed development and any that may arise from bushfire protection measures will be considered by Council through the development assessment process. However, given that residential subdivision development will be confined to areas of land within the subject that have been cleared of native vegetation for a considerable period of time it is unlikely that there will be a significant impact on any threatened species, populations or endangered ecological communities.

F. Indigenous Sites

For the purposes of determining the details and location of any Aboriginal object or Aboriginal place that may be situated on the subject site a search of the Aboriginal Heritage Information Management System (AHIMS) on the NSW Office of Environment and Heritage (OEH) website was undertaken on 16 April 2014. The basic search indicated that no Aboriginal sites are recorded in or near the subject site and that no Aboriginal places have been declared in or near the subject site. The AHIMS basic search report is appended to this report as Appendix B.

G. Bushfire Assessment

i. The extent to which the development is to provide for setbacks including Asset Protection Zones:

The site is located within the Coffs Harbour City Local Government Area, in the North Coast Fire Weather Area, and is subject to an FDI rating of 80 according to Table A2.3 of *Planning for Bush Fire Protection 2006*.

Based upon the provisions of Table A2.5 of *Planning for Bush Fire Protection 2006*, with respect to vegetation classified as forest for the purposes of determining Asset Protection Zones (APZs), the minimum specification for APZs applicable to residential subdivision purposes is 20 m for upslope/flat and 0° – 5° slope classes, and 30 m for 5° – 10° slope.

ii. The siting and adequacy of water supplies for firefighting:

Reticulated mains water supply is available to the subject site. Fire hydrant spacing, sizing and pressures that comply with *AS 2419.1 – 2005 Fire hydrant installations – System design, installation and commissioning* can be provided.

iii. The capacity of public roads to handle increased volumes of traffic in the event of a bushfire emergency:

The construction of new roads within the subject site would not be required to facilitate residential subdivision development of the land. The existing road network and in particular, Mullaway Drive satisfies the acceptable solutions of

PBP for public road access for road widths and design and therefore have the capacity to handle increased volumes of traffic in the event of a bushfire emergency.

iv. Whether or not public roads in the vicinity have two-way access:

The proposed development access road, Mullaway Drive and Arrawarra Road are bitumen-sealed two-wheel drive all weather roads. The roadways provide two-way access, meaning that they comprise at least two (2) traffic lane widths to allow traffic to pass in opposite directions.

v. The adequacy of arrangements for access to and egress from the development site for the purposes of an emergency response:

Generally, access and egress to the subject site satisfy the acceptable solutions of PBP and therefore, also meet the performance criteria for public road access with respect to an emergency response, which states that *public road widths and design that allow safe access for firefighters while residents are evacuating an area.*

vi. The adequacy of any bushfire maintenance plans and fire emergency procedures for the development site:

There is no bushfire maintenance plan currently in place for the subject site and, in the context of the most likely development of the site (residential subdivision) it is considered that such a maintenance plan will not be necessary.

vii. The construction requirements to be used for building elements in the development:

The maximum Bushfire Attack Level (BAL) that a class 1 or 2 residential building as defined under the *Building Code of Australia 2012* (BCA) can be subjected to is BAL-29. The minimum separation distances between the proposed buildings and the vegetation are prescribed in Table 2.4.3 of AS 3959-2009. Where a greater separation distance between a residential building and a bushfire hazard can be achieved a lower BAL may be applied.

The relevant BAL with respect to the proposed development based on the minimum separation distance between the areas of unmanaged vegetation (bushfire hazard) and any residential building is summarised in Table 3.1.

Hazard	Direction	Effective Slope	BAL-29	BAL-19	BAL12.5
			Minimum Separation Distance (m)		
Forest	North	Upslope/flat	21	31	42
Forest	South	>5° – 10°	33	46	61
Forest	West	>5° – 10°	33	46	61

Table 3.1: Summary of relevant BAL based on minimum separation distances

viii. The adequacy of sprinkler systems and other fire protection measures to be incorporated into the development:

It is not proposed to install a sprinkler system to the proposed buildings on the subject site for the purposes of bushfire protection.

H. Compliance: Planning for Bushfire Protection

The details provided in Section G of this assessment outline the relationship between a proposed future residential subdivision development and the specifications set out in Chapter 4 (performance-based controls) of *Planning for Bush Fire Protection 2006*. The following tables assess the proposed residential subdivision against the relevant performance criteria.

I. Asset Protection Zones

In relation to the provision of Asset Protection Zones, a proposed future residential subdivision development can comply with the relevant provisions of Section 4.1.3 of *Planning for Bush Fire Protection 2006* as detailed in Table 3.2.

Performance Criteria	Relationship of Proposed Subdivision to Performance Criteria	Meets performance criteria?
Radiant heat levels at any point on a proposed building will not exceed 29kW/m^2.	• APZs are achievable in accordance with Appendix 2 of *Planning for Bush Fire Protection 2006* or with Table 2.4.3 of AS 3959-2009.	**Yes**
APZs are managed and maintained to prevent the spread of a fire towards the building.	• APZs to the proposed buildings can satisfy *Standards for Asset Protection Zones* (RFS, 2005).	**Yes**
APZ maintenance is practical, soil stability is not compromised and potential for crown fires is negated.	• Any future APZ is able to be located on lands with a slope of <18°.	**Yes**

Table 3.2: Asset Protection Zones

II. Access (1) – Public Access

In relation to the provision of access, a proposed future residential subdivision development can comply with the relevant provisions of Section 4.1.3 of *Planning for Bush Fire Protection* 2006 as detailed in Table 3.3.

Performance Criteria	Relationship of Proposed Subdivision to Performance Criteria	Meets performance criteria?
Firefighters are provided with safe all weather access to structures (thus allowing more efficient use of firefighting resources).	• All roads to be used to access the proposed development are two-wheel drive, all weather roads.	**Yes**
Public road widths and design that allow safe access for firefighters while residents are evacuating an area.	• All roads used to access the proposed development provide two-way access meaning that they comprise at least two (2) traffic lane widths which allows traffic to pass in opposite directions.	**Yes**
The capacity of road surfaces and bridges is sufficient to carry fully loaded firefighting vehicles.	• The capacity of the existing road surfaces and bridges are capable of carrying a load of 15 tonnes	**Yes**
Roads that are clearly sign-posted (with easily distinguishable names) and buildings/properties that are clearly numbered.	• Coffs Harbour is provided with standard addressing which is easily identifiable.	**Yes**
Parking does not obstruct the minimum paved width.	• The roads will be provided with roll top kerbing, allowing vehicles to park without obstructing the paved width. All allotments will be provided with off-street parking.	**Yes**

Table 3.3: Access (1) – Public Access

III. Access (2) – Property Access

In relation to the provision of property access, a proposed future residential development can comply with the relevant provisions of Section 4.1.3 of *Planning for Bush Fire Protection* 2006 as detailed in Table 3.4.

Performance Criteria	Relationship of Proposed Subdivision to Performance Criteria	Meets performance criteria?
Access to properties is provided in recognition of the risk to fire fighters and / or evacuating occupants.	• Property access greater than 200m from a public road is not required	**Yes**
The capacity of road surfaces and bridges is sufficient to carry fully loaded firefighting vehicles. *All weather access is provided.*	• The proposed property access road network will be capable of providing all weather access to fully laden firefighting vehicles.	**Yes**
Road widths and design enable safe access for vehicles.	• The proposed property access roads will allow vehicles to pass each other.	**Yes**

Table 3.4: Access (2) – Property Access

IV. Water Supply, Electricity and Gas

Reticulated water is available to the subject site. Table 3.5 below assesses a proposed future residential subdivision development against the relevant performance criteria for water supply, electricity and gas.

Performance Criteria	Relationship of Proposed Subdivision to Performance Criteria	Meets performance criteria?
Water Supply *Water supplies are easily accessible and located at regular intervals.*	• Reticulated water is available to the proposed development. • Fire hydrants can be provided in accordance with AS 2419.1-2005.	**Yes**
Electricity Services *Location of electricity services limits the possibility of ignition of surrounding bushland or the fabric of buildings.*	• Electricity provision is able to be provided away from native vegetation and is also able to be provided underground.	**Yes**
Gas services *Location of gas services will not lead to ignition of surrounding bushland or the fabric of buildings.*	• Reticulated gas can be installed in accordance with AS 1596.	**Yes**

Table 3.5: Water Supply, Electricity and Gas

4. Conclusions and Recommendations

The proposed development involves rezoning of land for residential purposes on land identified as Lot 1 DP 417132, Mullaway Drive Mullaway. The bushfire assessment demonstrates that bushfire protection of a future residential subdivision development of the land within the subject site can satisfy the requirements of *Planning for Bushfire Protection 2006* when assessed in accordance with Section 44 of the *Rural Fires Regulation 2013* for the purpose of applying for a Bushfire Safety Authority under Section 100B of the *Rural Fires Act 1997*.

The potential layout of a future residential subdivision that has been used as the basis of this bushfire assessment is shown on the subdivision concept plan prepared by Bennell and Associates appended to this report as Appendix A. This report demonstrates that bushfire risks can satisfactorily be managed for the most likely development of the land for residential purposes as shown in the concept plan. Moreover, subject to the recommendations detailed below, there are no significant impediments to the rezoning of the land from a bushfire hazard perspective.

While it is acknowledged that the rezoning of the land for residential purposes will allow a range of other, less likely, but more sensitive uses in terms of bushfire protection; it is considered that adequate legislation is in place to ensure the bushfire risk can be addressed for these less likely uses before such developments occur.

The following recommendations are made in relation to bushfire protection measures for the most likely use for a residential subdivision of the land at Lot 1 DP 417132, Mullaway Drive Mullaway and are based on the relevant provisions of the NSW Rural Fire Service guideline entitled *Planning for Bush Fire Protection 2006* and *Australian Standard AS 3959-2009 Construction of buildings in bushfire-prone areas*:

1. At the issue of a subdivision certificate and in perpetuity, the land to a minimum distance of 30 metres situated between the northern boundary of the subject site and the northern edge of the (future) building envelopes shall be maintained as an Inner Protection Area (IPA) as prescribed under Section 4.1.3 and Appendix 5 of *Planning for Bush Fire Protection 2006*;
2. As outlined under Section A2.2 of *Planning for Bush Fire Protection 2006*, and in relation to the requirements of recommendation 1 above, the IPA should provide a tree canopy cover of less than 15 % which should be located greater than 2 metres from any part of the roofline of a dwelling. Garden beds of flammable shrubs are not to be located under trees and should be no closer than 10 metres from an exposed window or door. Trees should have lower limbs removed up to a height of 2 metres above the ground;
3. Water, electricity and gas are to comply with section 4.1.3 of *Planning for Bush Fire Protection 2006*. Any new electricity supply lines are to be installed underground; and
4. The proposed fire trail shall comply with Section 4.1.3 (3) of *Planning for Bush Fire Protection 2006*.

NOTE AND DISCLAIMER:

1. *This assessment relates to a residential subdivision on the subject land and only the plans referenced in this Assessment have been considered.*
2. *This Assessment has been based on bushfire protection guidelines as outlined in the document entitled Planning for Bush Fire Protection 2006 (PBP).*
3. *As noted by PBP and notwithstanding the precautions recommended, it should always be borne in mind that bushfires burn under a range of conditions and an element of risk always remains.*
4. *This assessment does not imply or infer any approval for the removal of vegetation for asset protection or other purposes. It is the responsibility of the client/land owner to obtain any and all necessary approvals in this regard.*

Steve Britt 13 May 2014

Graduate Diploma in Design for Bushfire Prone Areas
BPAD-Level 3 Accredited Practitioner, FPA Australia

5. References

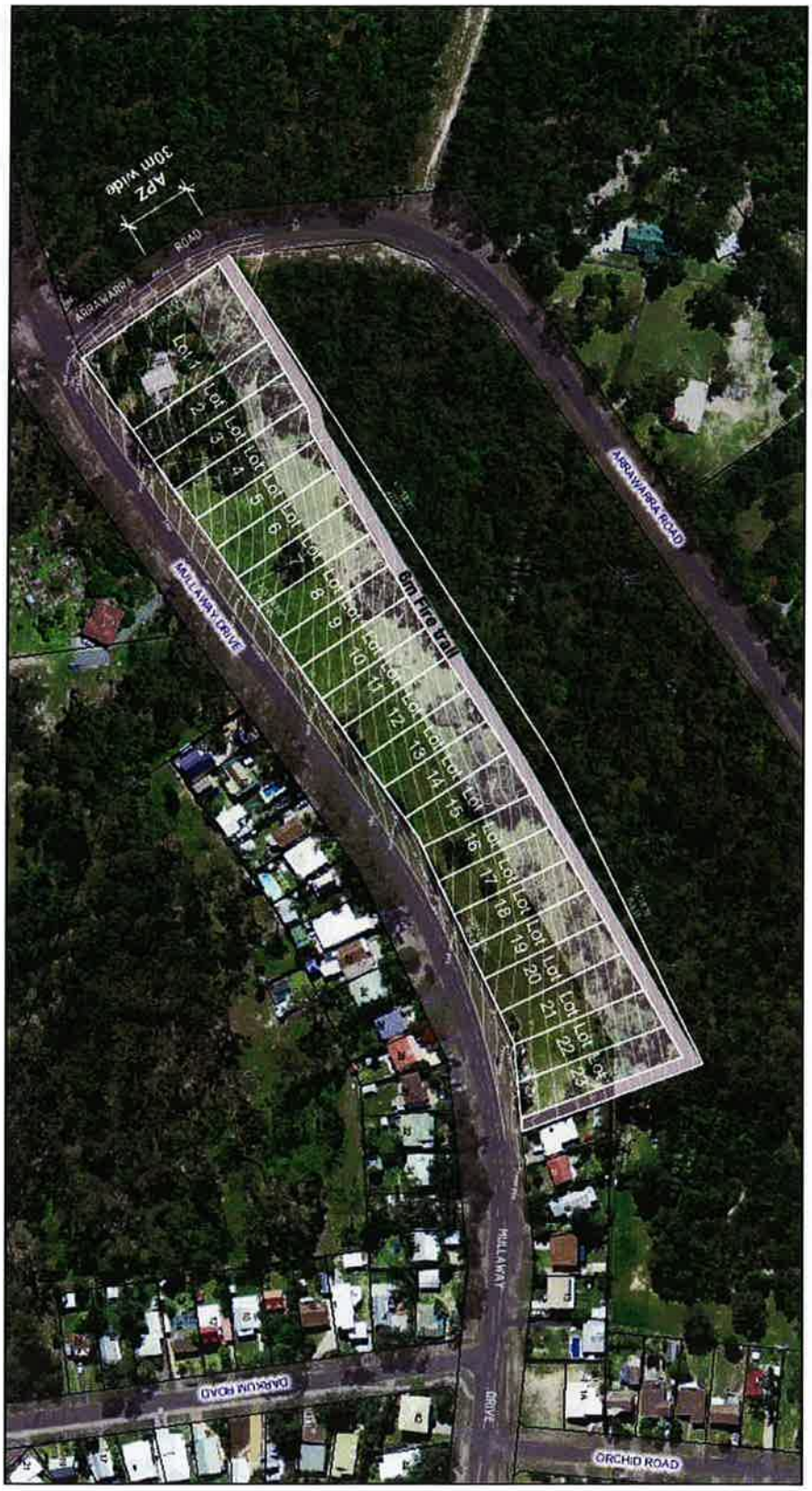
Keith, D., 2004, *Ocean Shores to Desert Dunes: The Native Vegetation of New South Wales and the ACT*, Department of Environment and Conservation, Hurstville, NSW Australia

NSW Rural Fire Service, 2005, *Standards for Asset Protection Zones*, NSW Rural Fire Service, Sydney

NSW Rural Fire Service, 2006, *Planning for Bushfire Protection 2006*, NSW Rural Fire Service, Sydney

Standards Australia, 2009, *AS3959-2009 Construction of buildings in bushfire-prone Areas*, Standards Australia, Sydney

6. Appendix A: Proposed Layout Plan



Source: Bennell and Associate

7. Appendix B: AHIMS Search Report

Office of Environment & Heritage

NSW GOVERNMENT

AHIMS Web Services (AWS)
Search Result

Your Ref Number :
Client Serv

Steve Britt
PO Box 3212
West Kempsey New South Wales 2440
Attention: Steve Britt
Email: steve@florafauna.com.au

Date:

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lot : 1, DP:DP417132 with a Buffer of 50 meters, conducted by Steve Britt on 16 April 2014.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.

A search of the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

0	Aboriginal sites are recorded in or near the above location.
0	Aboriginal places have been declared in or near the above location. *

Source: Aboriginal Heritage Information Management System (AHIMS) Web Service

Appendix E

Office of Environment & Heritage

AHIMS Web Services (AWS)
Search Result

Your Ref Number :

Client Service ID : 127064

Richard Bennell

38 Ocean View Road
Arrawarra headland New South Wales 2456

Attention: Richard Bennell

Email: rick@bennells.com.au

Date: 03 March 2014

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lot : 1, DP:DP417132 with a Buffer of 50 meters, conducted by Richard Bennell on 03 March 2014.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.

A search of the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

0	Aboriginal sites are recorded in or near the above location.
0	Aboriginal places have been declared in or near the above location. *

If your search shows Aboriginal sites or places what should you do?

- You must do an extensive search if AHIMS has shown that there are Aboriginal sites or places recorded in the search area.
- If you are checking AHIMS as a part of your due diligence, refer to the next steps of the Due Diligence Code of practice.
- You can get further information about Aboriginal places by looking at the gazettal notice that declared it. Aboriginal places gazetted after 2001 are available on the NSW Government Gazette (http://www.nsw.gov.au/gazette) website. Gazettal notices published prior to 2001 can be obtained from Office of Environment and Heritage's Aboriginal Heritage Information Unit upon request

Important information about your AHIMS search

- The information derived from the AHIMS search is only to be used for the purpose for which it was requested. It is not be made available to the public.
- AHIMS records information about Aboriginal sites that have been provided to Office of Environment and Heritage and Aboriginal places that have been declared by the Minister;
- Information recorded on AHIMS may vary in its accuracy and may not be up to date .Location details are recorded as grid references and it is important to note that there may be errors or omissions in these recordings,
- Some parts of New South Wales have not been investigated in detail and there may be fewer records of Aboriginal sites in those areas. These areas may contain Aboriginal sites which are not recorded on AHIMS.
- Aboriginal objects are protected under the National Parks and Wildlife Act 1974 even if they are not recorded as a site on AHIMS.
- This search can form part of your due diligence and remains valid for 12 months.

PO BOX 1967 Hurstville NSW 2220
43 Bridge Street HURSTVILLE NSW 2220
Tel: (02)9585 6345 (02)9585 6471 Fax: (02)9585 6094

ABN 30 841 387 271
Email: ahims@environment.nsw.gov.au
Web: www.environment.nsw.gov.au