

LEGEND

1. RURAL

- 1(a) (a) Rural
- 1(b1) (b1) Agricultural Protection
- 1(b2) (b2) Agricultural Protection
- 1(c) (c) Rural Living

2. RESIDENTIAL

- 2(a) (a) Low Density Residential
- 2(b) (b) Medium Density Residential
- 2(c) (c) Urban Expansion
- 2(d) (d) Village
- 2(e) (e) Residential Tourist
- 2(f) (f) Tourism

5. SPECIAL USES

- 5(a) (a) Special Uses

6. OPEN SPACE

- 6(a) (a) Open Space
- 6(b) (b) Recreation

7. ENVIRONMENTAL PROTECTION

- 7(a) (a) Environmental Protection (Wetlands & Littoral Rainforests)
- 7(d) (d) Environmental Protection (Scenic/Escarpment)
- 7(f) (f) Environmental Protection (Coastal Lands)
- 7(l) (l) Environmental Protection (Habitat)

- S14 SEPP14 - Coastal Wetlands

- Clause 52 (Cobaki Lakes)

- Clause 52 (Cobaki Lakes)

- (R) Restriction On Use (DP1051024)

- Restriction on Use Area

- 20m APZ

- 20 - 40m APZ

- Site Outline

SOURCE:
APZ's - Michel Group Services (6400-172.dwg)
Zoning - Michel Group Services (Ref: 969030.dwg)
Aerial - Michel Group Services (Ref: 6400-197.dwg)
- photo taken March 2010

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JAMES WARREN & ASSOCIATES PTY LIMITED
Environmental Consultants

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PROJECT
Revised Ecological Assessment
Cobaki Lakes, Cobaki, NSW
Tweed Shire Council

FIGURE 34
PREPARED: BW
DATE: 30 June 2010
FILE: 97038_EA_Base.dwg

TITLE
ASSET
PROTECTION
ZONES
(APZ'S)

4.3.2.6 Environmental restoration and enhancement works

A Revised Site Regeneration and Revegetation Plan (JWA 2013a) has been completed to accompany this Ecological Assessment. The Plan outlines the restoration works, which are to be completed in the areas of vegetation that will be retained and rehabilitated, including buffer areas (**FIGURE 22**).

The basic principles of the Revised Site Regeneration and Revegetation Plan include:

- Weed control will occur within the Environmental protection areas, open space and any ecological buffers;
- All weed control will be completed using the recommended methods, including poisoning of Camphor laurel, cut and paint of woody weeds and selective spot spraying of any weedy annuals and grasses;
- All herbicide applications will be completed by suitably qualified persons;
- Weed control will be undertaken on a progressive basis over a three (3) - five (5) year period;
- Embellishment plantings are to be used to consolidate each of the Environmental Protection Areas (EPA's). Planting efforts will be divided into moderate planting zones and high density planting zones;
- All revegetation areas will be fenced to exclude cattle and reduce native fauna grazing;
- All revegetation will include the planting of native species that are representative of the species composition of the community concerned;
- All of the rehabilitation work is to be completed by qualified bush regenerators;
- A detailed maintenance program for each area will be included which outlines the maintenance to be completed over the next three (3) - five (5) years; and
- A detailed monitoring program will be completed by a qualified ecologist. Reports on the progress of the rehabilitation are to be issued to Tweed Shire Council on a quarterly basis.

4.4 Assess proposed native vegetation clearing with consideration of potential impacts

4.4.1 Introduction

This section details the extent of native vegetation clearing as a result of the proposed development. The possible direct and indirect impacts of the proposal are outlined, along with proposed offset strategies to ensure that there is no net loss of native vegetation values. The potential impacts on significant vegetation (i.e. remnant bushland, Threatened flora species, EEC's, etc.) has been discussed in previous sections of this report.

The majority of vegetation to be removed will be in accordance with existing DA's and construction certificates.

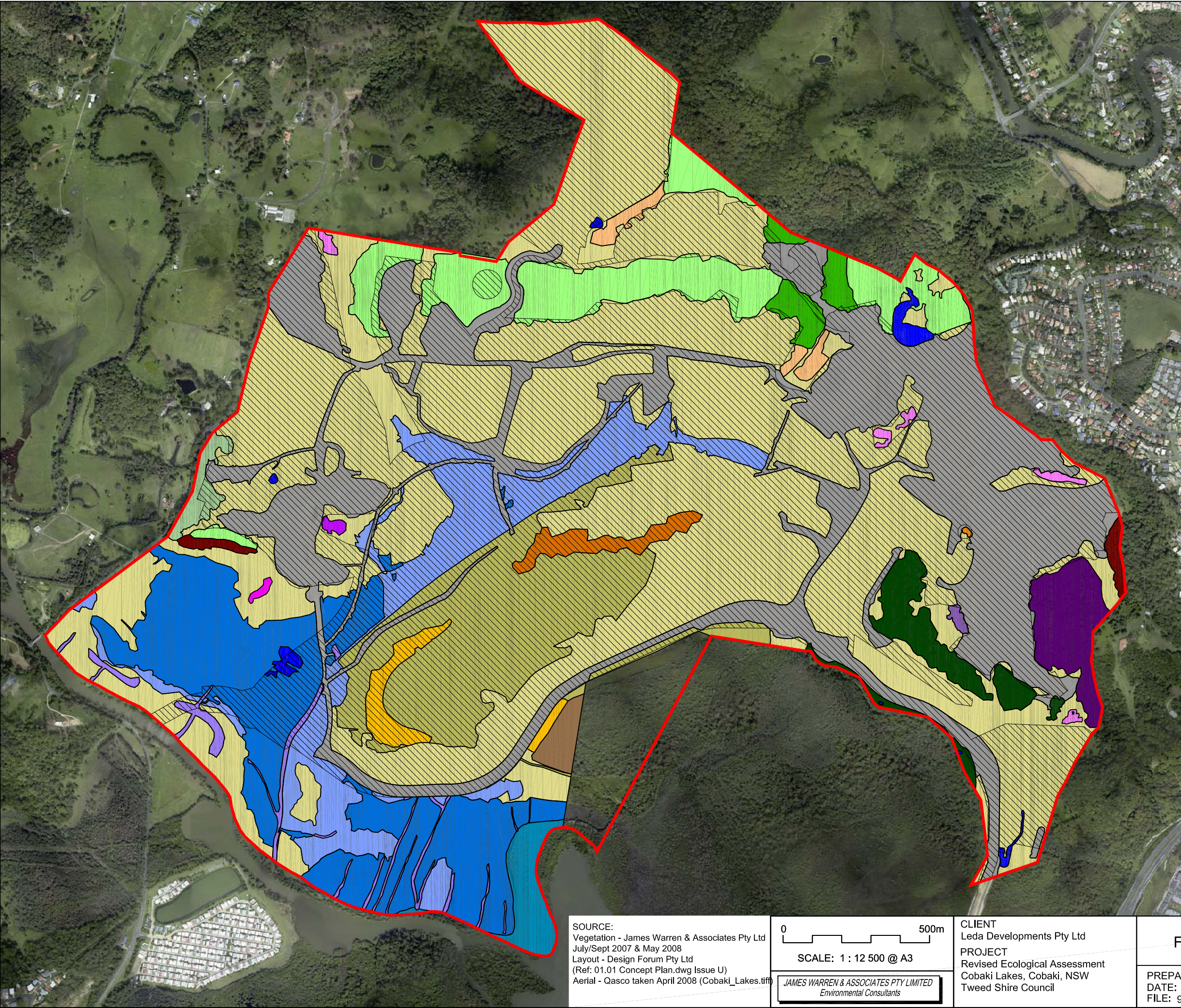
4.4.2 Potential Impacts on Native Vegetation

The proposed development concept will result in the loss of vegetation for the construction of a town centre, residential dwellings, educational buildings, a business park, access roads, driveways and associated infrastructure. Vegetation to be removed from the Subject site occurs within existing 2(c) zoned land (i.e. Urban Expansion), land proposed to be rezoned as 2(c), or land that may otherwise be cleared in accordance with existing use rights. The impact of the proposed development on vegetation communities on the site is shown in **FIGURE 35**.

A summary of vegetation that may be removed and their respective areas is shown in **TABLE 9**. It should be noted that portions of the Subject site that have been cleared in accordance with existing development and earthworks approvals (covering 131.33 hectares) have not been included in the following table and calculations.

TABLE 9
POTENTIAL VEGETATION LOSS AS A RESULT OF THE PROPOSED DEVELOPMENT

Community	TOTAL AREA (ha)	Area to be Removed (ha)	Area to be Removed (%)
1a	31.84	3.65	11.46%
1b	4.84	0.75	15.50%
1c	9.35	0.19	2.03%
1d	2.58	0.77	29.84%
2a	8.86	0.07	0.79%
2b	0.34	0.01	2.94%
2c	0.39	0.02	5.13%
2d	1.41	0.00	0.00%
3	1.88	0.01	0.53%
4	2.44	0.00	0.00%
5	0.07	0.01	14.29%
6	3.80	3.80	100.00%
7	4.19	3.60	85.92%
8	0.27	0.00	0.00%
9	2.67	0.13	4.87%
10	252.66	204.01	80.74%



LEGEND

Community 1 - Dry sclerophyll communities

Community 1a - Very tall open/closed sclerophyll forest (*Eucalyptus pilularis* +/- *E. microcorys* +/- *E. propinqua* +/- *Corymbia intermedia*)

Community 1b - Tall open/closed sclerophyll forest (*E. propinqua*)

Community 1c - Tall open sclerophyll woodland (*E. pilularis*)

Community 1d - Tall open sclerophyll forest (*E. pilularis* +/- *E. siderophloia* +/- *E. tereticornis*)

Community 2 - Rainforest communities

Community 2a - Tall closed forest (*Lophostemon confertus* +/- *Araucaria cunninghamii*)

Community 2b - Tall open forest (*Archontophoenix cunninghamiana*)

Community 2c - Very tall closed forest (*A. cunninghamii*)

Community 2d - Mid-high open/closed forest (Riparian species +/- Mixed species)

Community 3 - Tall/very tall open/closed forest (*L. confertus* +/- Mixed rainforest species)

Community 4 - Low closed forest (Heathland)

Community 5 - Mid-high open woodland (Mixed rainforest species)

Community 6 - Mid-high open woodland (*E. robusta*)

Community 7 - Mid-high open woodland (*E. racemosa*)

Community 8 - Mid-high open woodland (*E. siderophloia*)

Community 9 - Low closed forest (Revegetation areas +/- Mixed *Eucalyptus* species)

Community 10 - Low closed grassland with scattered trees (Pastoral grassess +/- Mixed species)

Community 11 - Low closed grassland (*Sporobolus virginicus*, *Triglochin striata* +/- *Casuarina glauca*)

Community 12 - Rushland/sedgeland/ grassland (Mixed aquatic species)

Community 13 - Low to mid-high open mangrove forest (*Avicennia marina* var *australasica* / *Aegiceras corniculatum* +/- *Casuarina glauca*)

Community 14 - Dams & drainage lines (Mixed aquatic species)

Community 15 - Low open forest/woodland (*Casuarina glauca* +/- Mixed species)

Community 16 - Slashed grassland/ heathland/sedgeland (Mixed Species)

Unvegetated land

Proposed Development Areas

Site Outline

SOURCE:
Vegetation - James Warren & Associates Pty Ltd
July/Sept 2007 & May 2008
Impact Area - Design Forum Architects
(Ref: DA 01.01 E Master Plan.dwg)
Aerial - Michel Group Services (Ref: 6400-197.dwg)
- photo taken March 2010

SOURCE:
Vegetation - James Warren & Associates Pty Ltd
July/Sept 2007 & May 2008
Layout - Design Forum Pty Ltd
(Ref: 01.01 Concept Plan.dwg Issue U)
Aerial - Qasco taken April 2008 (Cobaki_Lakes.tif)

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JAMES WARREN & ASSOCIATES PTY LIMITED
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Revised Ecological Assessment
Cobaki Lakes, Cobaki, NSW
Tweed Shire Council

FIGURE 35

PREPARED: BW
DATE: 05 April 2013
FILE: 97038_EA_Base.dwg

TITLE
IMPACT ON
VEGETATION
COMMUNITIES

Community	TOTAL AREA (ha)	Area to be Removed (ha)	Area to be Removed (%)
11	54.63	9.69	17.74%
12	35.39	24.12	68.15%
13	5.66	0.00	0.00%
14	2.33	0.80	34.33%
15	4.52	0.73	16.15%
16	43.73	42.35	96.84%
TOTAL	473.86	294.71	62.19%

In total, 294.71 hectares of vegetation occurs within the proposed development footprint the majority of which is comprised of grassland communities. Of this vegetation, the majority occurs in areas of the site with existing development approvals. As previously mentioned, existing use rights over the Subject site would allow for the continued maintenance of drainage lines, fence lines and firebreaks as well as pasture improvement activities throughout the Subject site.

It should be noted that the maximum area of vegetation to be lost has been calculated based on the concept plan. There may be opportunities to retain areas of native vegetation within the proposed development footprint and this will be the subject of a detailed assessment at the Development Application stage.

Additional impacts on vegetation communities include:

- Clearance of areas of the Subject site represents a loss of habitat available for dispersal for plants and will reduce visits by pollination and dispersal vectors;
- Disturbance to the Subject site creates opportunities for weeds to colonise. Weeds may be introduced to the Study site in construction materials or by vehicles. Occupation of the Subject site creates opportunities for weeds to become established. Landscape species may escape to retained areas of vegetation;
- The removal of vegetation from the Subject site represents the loss of organic material from the site;
- Residents may create walking tracks through bushland areas. This may result in direct loss of vegetation, change in vegetation structure and increased opportunities for weeds and disturbance-adapted animal species; and
- Occupation of the site may increase the risk of fire release into the surrounding bushland.

4.4.3 Impacts on Threatened flora

The potential impacts on Threatened flora species on the Subject site have been discussed in Section 4.2.6.3. Seven (7) part tests have also been completed in accordance with the *Threatened Species Conservation Amendment Act 2002* (JWA 2012c).

With the adoption of the proposed amelioration measures, it is considered that the proposed development is highly unlikely to result in the local extinction of any Threatened flora species recorded on or adjacent to the Subject site.

4.4.4 Proposed Offset strategy to ensure that there is no net loss of native vegetation values.

The proposed development will result in the loss of native vegetation as discussed within Section 4.4.2. The majority of vegetation communities occurring within the Environmental protection areas will be retained (**FIGURE 9**). Additionally, numerous areas of the site will be revegetated or regenerated (**FIGURE 22**) in accordance with the Revised Site Regeneration and Revegetation Plan (JWA 2013a). The Plan outlines the restoration works, which are to be completed in the areas of vegetation that will be retained and rehabilitated.

The basic principles of the Revised Site Regeneration and Revegetation Plan include:

- Weed control will primarily consist of minor weed control within the Environmental protection areas, open space and any ecological buffers, the SEPP 14 wetland;
- All weed control will be completed using the recommended methods, including poisoning of Camphor laurel, cut and paint of woody weeds and selective spot spraying of any weedy annuals and grasses;
- All herbicide use will be completed by a qualified Bush regenerator;
- Weed control will be undertaken on a progressive basis over a three (3) - five (5) year period;
- Embellishments planting are to be used to consolidate each of the Environmental protection areas (EPA's). Planting efforts will be divided into moderate planting zones and high density planting zones;
- All revegetation areas will be fenced to exclude cattle and reduce native fauna grazing;
- All revegetation will include the planting of native species that are representative of the species composition of the community concerned;
- All of the rehabilitation work is to be completed by qualified bush regenerators;
- A detailed maintenance program for each area will be included, which outlines the maintenance to be completed over the next three (3) - five (5) years;
- A detailed monitoring program will be completed by a qualified ecologist. Reports on the progress of the rehabilitation are to be issued to Tweed Shire Council on a quarterly basis.

As previously discussed, approximately 296.27 hectares of vegetation occurs within the proposed development envelope, the majority of which is comprised of Low closed grassland.

In terms of remnant vegetation, 13.80 hectares occurs within the proposed development envelope (17.12% of the total area of remnant bushland). The Revised Site Regeneration and Revegetation Plan (JWA 2013a) will ensure that rehabilitation works to be completed will adequately offset any vegetation loss, through rehabilitation

works and the provision of detailed monitoring and maintenance programs and specific performance objectives.

The proposed offset strategy on the Subject site focuses on the revegetation/regeneration of EEC's and their associated habitat values. Proposed EEC offsets are shown in **FIGURE 28**. A summary of proposed EEC offsets is provided in Section 4.2.6.5.

Where impacts are likely on EEC's, a combination of offset measures have been proposed as follows:

1. Offset areas will be established and maintained on the Subject site in accordance with the following plans:
 - a. Revised Site Regeneration and Rehabilitation Plan (JWA 2013a); and
 - b. Revised Saltmarsh Rehabilitation Plan (JWA 2013b).
2. In instances where appropriate offset areas are not available on the Subject site, Leda Manorstead Pty Ltd is currently in negotiations with OEH with a view to securing appropriate off-site offsets.

4.5 Consideration of the provision, management and ongoing maintenance of general public open space

4.5.1 Introduction

This section will discuss the location of proposed Environmental Protection Areas within the open space network on the Subject site and also address the management and maintenance of these Environmental Protection Areas. The management intent of the remaining active and passive open space areas is detailed within the Landscape Concept Plan (Place 2008).

4.5.2 Description of Environmental Protection Areas

The concept plan for the proposed development of the Cobaki Lakes site includes approximately 199.86ha of Environmental Protection Areas (**FIGURE 9**). The Environmental Protection Areas have been designated primarily for conservation of ecologically significant areas and retention/revegetation of habitat linkages from the vegetated ridgelines adjacent to and within the western portion of the Subject site through the central Open Space area to the adjoining Environmental Reserve to the east of the site.

The key ecological values of the Environmental Protection Areas will be retained through the following measures:

- No development except for tracks for pedestrian access or for essential environmental management purposes;
- Pedestrian access is to be limited to designated tracks; and
- Vehicular access, apart from for essential environmental management purposes, will be precluded.

4.5.3 Management of Environmental Protection Areas

The Site Revegetation and Rehabilitation plan (JWA 2012) provides details on the specific uses and management for the Environmental Protection Areas, including the following:

- A description of the existing features;
- An outline of the rehabilitation or revegetation to be completed, including a detailed description of which species are to be planted; and
- A detailed maintenance and monitoring program, including performance indicators, deadlines for completion, reporting and reviewing and any corrective action that may be required.

4.5.4 Maintenance

The maintenance of the Environmental Protection Areas is described in detail in the Site Revegetation and Rehabilitation plan and the Flora and Fauna Monitoring Program (SMEC 2012). The SRR will detail a 5 year maintenance program and it is intended that maintenance would become public responsibility after this time period.

4.6 Provide an assessment against SEPP 14 - Coastal Wetlands

4.6.1 Introduction

In response to the state-wide degradation of coastal wetlands, the Department of Planning enacted SEPP - 14 Coastal Wetlands in 1985. The policy aims to “ensure that the coastal wetlands are preserved and protected in the environmental and economic interests of the State”.

This section provides an assessment of the potential impacts and the planned amelioration measures to reduce impacts associated with the proposed development.

4.6.2 Impacts on SEPP 14 Wetland No.1

4.6.2.1 Background

SEPP 14 - Coastal Wetland No.1 occurs adjacent to the Subject site as shown in **FIGURE 3**. This wetland area is protected by State Environmental Planning Policy No. 14 - Coastal wetlands. The portion of the wetland that occurs on the Subject site occurs almost entirely within the area dedicated to council (under Section 88b of the Conveyancing Act 1919) and the approved alignment of the Cobaki Parkway (i.e. a major arterial road to be constructed through the Subject site).

It is therefore considered that the proposed residential development of the Subject site is unlikely to have any significant direct impacts on the ecology of the wetland area. However, there is potential for the wetland area to be affected indirectly by changes in water quality, alteration of the local hydrological regime, sedimentation or a combination of these factors.

Stormwater runoff from the Subject site has the potential to impact on the hydrological regime of the adjacent area of wetland. Amelioration measures are discussed in detail within the Stormwater Management Plan.

4.6.2.2 General Impacts

The proposed development has the potential to result in impacts on the SEPP 14 wetland related to:

- Alterations of hydrology within SEPP 14 wetlands;
- Change to the hydrological regime may alter the current distribution of vegetation communities;
- Increased sediment loads from construction activities;
- Impacts on water quality and hydrology as a result of stormwater runoff from the proposed development;
- Increased visitation, with potential for trampling of intertidal vegetation, dumping of rubbish or refuse in creek habitats (particularly discarded fishing line, bait bags, etc.), disturbance of fauna; and
- Disturbance to the Subject site creates opportunities for weeds to colonise. Weeds may be introduced to the Study site in construction materials or by vehicles. Occupation of the Subject site creates opportunities for weeds to become established.

4.6.2.3 Erosion

The Subject site shows some evidence of soil erosion. A number of factors contribute to the level of erosion evident on the site. These factors include:

- The nature of the alluvial soil structure;
- The high rainfall and climatic conditions of the Subject site; and
- Land management practices.

Earthworks will increase the potential for soil erosion.

4.6.2.4 Stormwater Impacts

Due to the steep slope in parts of the Subject site and the periods of high rainfall, stormwater runoff may potentially impact on the Subject site and study area in a number of ways.

Impacts may include:

- Increased soil erosion;
- Increased soil dispersal;
- Alteration of habitat microclimate conditions for flora and fauna; and
- Alteration of water quality of aquatic habitats downstream from the Subject site.

4.6.3 *Amelioration measures*

The entire development footprint occurs to the west of the approved alignment of the Cobaki Parkway (i.e. a major arterial road to be constructed through the Subject site). Areas of retained vegetation will assist in sedimentation deposition and nutrient uptake for any stormwater runoff from the development area. These vegetated areas also provide habitat and movement opportunities for fauna in the Study area (including Threatened fauna).

A Stormwater Management Plan has been prepared for the Subject site, which incorporates current best-practise measures to ensure that untreated stormwater does not flow directly into the SEPP 14 wetland. Stormwater management will involve the creation and use of suitable planted buffer zones where necessary, in accordance with the Revised Site Regeneration and Revegetation Plan (JWA 2013a).

4.7 Address the requirements of Councils DCP 25 - Biting Midge and Mosquito Control

4.7.1 *Introduction*

This section addresses the requirements of Tweed Shire Council's DCP 25 - Biting Midge and Mosquito Control. A Development Control Plan (DCP 25) relating to biting insects problems in the Tweed Shire was adopted by Tweed Shire Council in 1993. The DCP outlines the nuisance of biting insects, suggests ways to avoid biting insect problems, and includes maps of biting insect breeding areas. DCP 25 can be used in the planning

stages of development, alleviating the nuisance and health risks associated with biting insects for residents and visitors.

4.7.2 Literature review

A Mosquito Management Report was compiled by Anthony E. Wright in 2001. The report addressed a number of strategies for the effective prevention of the vast majority of mosquito breeding at Cobaki Lakes, which may have the potential to “significantly constrain or prevent the successful development of the Cobaki Lakes site”. This report will be utilised in the assessment of mosquito nuisance at the Cobaki Lakes development site due to the localised nature of the report.

4.7.3 Mosquito control

The existing site at Cobaki Lakes frequently breeds large populations of mosquitoes, in particular the saltmarsh mosquito *Aedes vigilax* (Wright 2001). This species, and several others, create both an intolerable level of nuisance and health risks from mosquito borne viruses including Ross River (RR) and Barmah Forest (BF). Wright (2001) suggests three (3) options for the effective prevention of the vast majority of mosquito breeding at Cobaki Lakes, including:

- “Cobaki Lakes Wetland Habitat Restoration” (Tweed Shire);
- Solid fill, laser levelling and freshwater lagoon; and
- Liquid fill and freshwater lagoon.

A Biting Midge and Mosquito Control Plan for the Cobaki Lakes site has been prepared by Mosquito Consulting Services Pty Ltd (McGinn 2008). This plan has been developed in consultation with JWA and Gilbert & Sutherland. Furthermore, the Stormwater Management Plan provides for the diffuse discharge of treated stormwater to both the freshwater and saltwater habitats through the construction of under-drained swales with level-spreader devices. By controlling, repairing and improving the surface water management within the rehabilitated areas, it is anticipated that the mosquito and biting midge problem will be reduced.

This Biting Midge and Mosquito Control Plan (McGinn 2008), in association with the Stormwater Management Plan, is considered to adequately address the requirements of Tweed Shire Council DCP 25.

4.8 Consideration of impacts on matters of National Environmental Significance (EPBC Act 1999)

4.8.1 Introduction

The *Environment Protection & Biodiversity Conservation Act 1999 (EPBC Act 1999)* was passed by Commonwealth Parliament in June 1999 and came into force on 16 July, 2000. A person must not, without an approval under the Act, take an action that has or will have, or is likely to have, a significant impact on a matter of National Environmental Significance (NES). A Commonwealth Assessment will be required for proposed activities on the Subject site if they affect a matter of NES.

A detailed assessment of the Environment Protection & Biodiversity Conservation (EPBC) Act (1999) was included within the original Ecological Assessment report (JWA 2008). A summary of this assessment is provided below.

4.8.2 Summary

Flora

Six (6) Commonwealth Threatened flora species have been recorded on and/or adjacent to the Subject site:

- Coolamon
- Spiny gardenia
- Scented acronychia
- Stinking cryptocarya
- Rough-shelled bush-nut
- Swamp orchid

Potential impacts on these species and amelioration measures to retain/enhance habitat on the Subject site have been discussed in section 4.2.

Fauna

One (1) Commonwealth Threatened fauna species, the Grey-headed flying-fox, was recorded on the Subject site. The Long-nosed potoroo and the Wallum sedge frog were recorded on land adjacent to the Subject site, in the SEPP 14 wetlands to the east and in Crown land to the south-east, respectively. Mitchell's rainforest snail is considered a possible occurrence at the site.

It is considered that the Subject site does not support an important population of any species listed in the *EPBC Act (1999)* and a significant impact on these species will not be incurred.

Listed Migratory Species

It is considered that although two (2) listed migratory species, the Osprey and Black-tailed godwit, are known or likely to occur occasionally in the study area, no area of important habitat occurs in the study area for listed migratory species.

4.8.3 Requirement for Commonwealth Assessment

The proposal has been referred to the Commonwealth Department of the Environment, Water, Heritage and the Arts (DEWHA) for assessment.

5 SUMMARY OF IMPACTS, MITIGATION & OFFSETS

The environmental zoning process on the Subject site over 15 years has ensured that areas of ecological significance have been included in environmental protection zones. These areas have, therefore, been avoided in the development planning process. Ecologically significant plants or areas occurring within residentially zoned land will either be avoided or replaced in non-developed portions of the site. The emphasis will be to avoid the loss of these plants or EEC's in the Development Application phase.

As previously discussed, the proposed offset strategy on the Subject site focuses on the revegetation/regeneration of EEC's and their associated habitat values. Where impacts are likely on EEC's, a combination of offset measures have been proposed as follows:

1. Offset areas will be established and maintained on the Subject site in accordance with the following plans:
 - a. Revised Site Regeneration and Rehabilitation Plan (JWA 2013a); and
 - b. Revised Saltmarsh Rehabilitation Plan (JWA 2013b).
2. In instances where appropriate offset areas are not available on the Subject site, Leda Manorstead Pty Ltd is currently involved in negotiations with OEH with a view to securing appropriate off-site offsets.

A summary of impacts on wildlife corridors, remnant bushland, Koala habitat in accordance with SEPP 44 and Tweed Shire Council, and any threatened species and their habitats is provided in **TABLE 12** below. Also addressed are the mitigation and offset measures proposed to ensure minimal impacts on ecologically significant areas and species.

TABLE 12
SUMMARY OF IMPACTS, MITIGATION AND OFFSETS

	Potential impacts	Amelioration measures	Proposed mitigation/offset	Net loss/gain
Wildlife corridors				
	<ul style="list-style-type: none"> A reduction in the overall effectiveness of the site as a corridor due to habitat loss and fragmentation. Edge effects may impact on retained corridor habitat. 	<ul style="list-style-type: none"> The proposed development utilises existing cleared areas. A network of existing vegetated corridors will be retained on the site. Additionally, smaller interlinking corridors will be provided on the Subject site through regeneration and revegetation works. Rehabilitation works on the Subject site will include buffers to retained vegetation corridors as well as weed maintenance along edges. 	<ul style="list-style-type: none"> A Revised Site Regeneration and Revegetation Plan (JWA 2013a) has been prepared for the Subject site to provide vegetated links across the site and ensure that the remaining wildlife corridors will be embellished utilising revegetation and natural regeneration principles. A total of 61.82ha of revegetation/ regeneration works are proposed. 	<ul style="list-style-type: none"> A net gain of approximately 9.03ha of vegetation providing suitable corridor habitat will occur as a result of the proposed development.
Remnant bushland				
	<ul style="list-style-type: none"> 13.80 hectares (17.12%) of remnant bushland will be lost. Edge effects may impact on retained remnant bushland. 	<ul style="list-style-type: none"> A total of 71.35 hectares (83.75%) of remnant bushland will be retained on the Subject site. Weed control will be completed on the interface of remnant bushland by a qualified Bush regenerator; Weed control will be undertaken on a progressive basis over a three (3) - five (5) year period. Embellishment plantings are to be used to consolidate each of the areas of remnant vegetation. All areas of remnant vegetation will be fenced to exclude 	<ul style="list-style-type: none"> The Revised Site Regeneration and Revegetation Plan (JWA 2013a) includes 61.82ha of revegetation/ regeneration works to offset the loss of 13.80ha of remnant bushland and outlines the various measures to ensure that the retained remnant vegetation is adequately managed. 	<ul style="list-style-type: none"> Revegetation on the Subject site will result in a long-term net gain of remnant bushland.

	Potential impacts	Amelioration measures	Proposed mitigation/offset	Net loss/gain
		<p>pedestrian traffic and cattle grazing.</p> <ul style="list-style-type: none"> Formal pathways are to be provided through areas of remnant vegetation to prevent the creation of numerous informal tracks. A monitoring and maintenance program for areas of remnant vegetation is included in the Revised Site Regeneration and Revegetation Plan (JWA 2013a). 		
Koala habitat				
	<ul style="list-style-type: none"> 11.89 hectares (28.04%) of suitable Koala habitat may potentially be lost. All potential Koala habitat to be removed occurs within portions of the site with existing development approval. No conclusive evidence of Koala activity has been recorded from the Subject site. 	<ul style="list-style-type: none"> A total of 32.80 hectares (77.34%) of suitable Koala habitat is proposed to be retained within Environmental Protection Areas & Open Space areas. 	<ul style="list-style-type: none"> Proposed revegetation and regeneration works on the Subject site (FIGURE 22) will increase the area of available Koala habitat in the long-term and provide vegetated linkages through the landscape. Approximately 61.82ha of revegetation/ regeneration works will be completed to offset the loss of 11.89ha of suitable Koala habitat. 	<ul style="list-style-type: none"> Revegetation on the Subject site, including planted Koala food tree species, will result in a long-term net gain of vegetation suitable as Koala forage and/or corridor habitat.
Threatened flora				
<ul style="list-style-type: none"> White yiel yiel (<i>Grevillea hilliana</i>) Scented acronychia 	<ul style="list-style-type: none"> No stems of White yiel yiel occur within the proposed development footprint (FIGURE 25a). One (1) stem of Scented acronychia has been 	<ul style="list-style-type: none"> Approximately 10.88 hectares (99%) of suitable habitat for these species will be retained. Rehabilitation of retained lowland rainforest communities will be completed. 	<ul style="list-style-type: none"> Rehabilitation of approximately 13.30ha of lowland rainforest in accordance with the Revised Site Regeneration and Revegetation Plan (JWA 2013a) to offset the 	<ul style="list-style-type: none"> The local populations of these species will be bolstered through propagation and replanting of this species. Revegetation on the Subject

	Potential impacts	Amelioration measures	Proposed mitigation/offset	Net loss/gain
<p>(<i>Acronychia littoralis</i>)</p> <ul style="list-style-type: none"> Fine-leaved tuckeroo (<i>Lepiderema pulchella</i>) Spiny gardenia (<i>Randia moorei</i>) Marblewood (<i>Acacia bakeri</i>) Brush cassia (<i>Cassia brewsteri</i> var. <i>marksiana</i>) 	<p>recorded from within a small isolated clump of vegetation in the central northern portion of the Subject site (FIGURE 25a). This clump of vegetation will be retained and protected under Environmental Covenant.</p> <ul style="list-style-type: none"> No stems of Fine-leaved tuckeroo occur within the proposed development footprint (FIGURE 25a, 25b & 25c). No stems of Spiny gardenia occur within the proposed development footprint (FIGURE 25a). No stems of Marblewood occur within the proposed development footprint (FIGURE 25a & 25b). One (1) stem of the Brush cassia occurs within an area designated as Environmental Protection and one (1) stem within 	<ul style="list-style-type: none"> Retained patches of rainforest will be buffered from the proposed development and embellished to increase the overall extent of isolated patches and reduce existing anthropogenic impacts. It is also recommended that propagation of Threatened flora species be undertaken as part of the rehabilitation works on the Subject site in an attempt to bolster local populations. As a minimum, every retained Threatened plant on the Subject site will be provided with a 5m vegetated buffer. Weed control will be completed on the interface of retained rainforest habitats by a qualified Bush regenerator. Weed control will be undertaken on a progressive basis over a three (3) - five (5) year period. All areas of retained rainforest habitat will be fenced to exclude pedestrian traffic and cattle grazing. 	<p>loss of 0.11 ha and will ensure protection for retained Threatened flora species and their habitats.</p>	<p>site will result in a long-term net gain of approximately 13.19ha of suitable habitat for these species.</p>

	Potential impacts	Amelioration measures	Proposed mitigation/offset	Net loss/gain
<ul style="list-style-type: none"> Coolamon (<i>Syzygium moorei</i>) Green-leaved rose walnut (<i>Endiandra muelleri</i> subsp. <i>bracteata</i>) White lace flower (<i>Archidendron hendersonii</i>) Stinking cryptocarya (<i>Cryptocarya foetida</i>) Rough-shelled bush-nut (<i>Macadamia tetraphylla</i>) 	<p>an area to be retained and protected by Environmental Covenant (FIGURE 25a & 25b).</p> <ul style="list-style-type: none"> The proposed development is considered unlikely to impact on the Coolamons which occur adjacent to the Subject site (FIGURE 25a). None of the five (5) stems of Green-leaved rose-walnut recorded on the site occur within the proposed development footprint (FIGURE 25b). This species has not been recorded from the Subject site. This species has not been recorded from the Subject site. This species has not been recorded from the Subject site. 	<ul style="list-style-type: none"> Formal pathways are to be provided throughout the development to prevent the creation of numerous informal tracks. A monitoring and maintenance program for areas of remnant vegetation is included in the Revised Site Regeneration and Revegetation Plan (JWA 2013a). 		

	Potential impacts	Amelioration measures	Proposed mitigation/offset	Net loss/gain
	<ul style="list-style-type: none"> The proposed development will remove 0.11 hectares (1%) of potential habitat for these species, all of which will occur from areas of the site with existing development approvals. 			
<ul style="list-style-type: none"> Pink nodding orchid (<i>Geodorum densiflorum</i>) Swamp orchid (<i>Phaius australis</i>) 	<ul style="list-style-type: none"> This species has not been recorded from the Subject site. This species has not been recorded from the Subject site. The proposed development will result in the removal or modification a total of 3.8 hectares of potential habitat for these species, all of which occurs in areas of the site, which have existing development approvals. Edge effects may impact on retained habitat. 	<ul style="list-style-type: none"> Rehabilitation of Swamp sclerophyll forest communities will be completed. It is also recommended that propagation of Threatened flora species be undertaken as part of the rehabilitation works on the Subject site in an attempt to bolster local populations. As a minimum, every retained Threatened plant on the Subject site will be provided with a 5m vegetated buffer. Weed control will be completed on the interface of retained habitats by a qualified Bush regenerator. Weed control will be undertaken on a progressive basis over a three (3) - five (5) year period. All areas of retained habitat will 	<ul style="list-style-type: none"> In total, 6.77 hectares of Swamp sclerophyll forest will be regenerated/revegetated on the Subject site to offset the loss of 3.8 hectares. These areas will ensure protection for retained Threatened flora species and also provide additional habitat for Threatened flora species occurring on and adjacent to the Subject site. 	<ul style="list-style-type: none"> The local populations of these species will be bolstered through propagation and replanting of this species. Revegetation/regeneration works on the Subject site will result in a long-term net gain of approximately 2.97ha of suitable habitat for these species.

	Potential impacts	Amelioration measures	Proposed mitigation/offset	Net loss/gain
		<p>be fenced to exclude pedestrian traffic and cattle grazing.</p> <ul style="list-style-type: none"> Formal pathways are to be provided throughout the development to prevent the creation of numerous informal tracks. A monitoring and maintenance program for areas of remnant vegetation is included in the Revised Site Regeneration and Revegetation Plan (JWA 2013a). 		
Endangered Ecological Communities				
<ul style="list-style-type: none"> Swamp sclerophyll forest on coastal floodplain 	<ul style="list-style-type: none"> The entire area (3.8ha) of existing Swamp sclerophyll forest on coastal floodplain will be lost (FIGURE 27). The conservation significance of this community has been severely compromised by past land-use activities including cattle grazing and periodic slashing which has resulted in the removal of the midstorey and the prevalence of introduced grasses and 	<ul style="list-style-type: none"> Amelioration for the removal of the degraded Swamp sclerophyll forest on coastal floodplain will be provided through revegetation works on the Subject site. A Revised Site Regeneration and Revegetation Plan (JWA 2013a) has been prepared for the Subject site and includes measures to offset the loss of this EEC from the Subject site. The Revised Site Regeneration and Revegetation Plan includes specific performance criteria as well as detailed maintenance and 	<ul style="list-style-type: none"> In total, 6.77 hectares of Swamp sclerophyll forest will be regenerated/ revegetated on the Subject site (FIGURE 28) to offset the loss of 3.8 hectares. 	<ul style="list-style-type: none"> Revegetation and landscaping works on the Subject site will result in a long-term net gain of approximately 2.97ha of Swamp sclerophyll forest on coastal floodplain.

	Potential impacts	Amelioration measures	Proposed mitigation/offset	Net loss/gain
	<p>common agricultural weeds in the groundcover layer.</p> <ul style="list-style-type: none"> Edge effects may impact on retained EEC's. 	<p>monitoring programs and it is therefore considered that the compensatory Swamp sclerophyll forest on coastal floodplain will be more likely to persist in the long-term compared to the existing communities.</p> <ul style="list-style-type: none"> Weed control will be completed on the interface of EEC's by a qualified Bush regenerator. Weed control will be undertaken on a progressive basis over a three (3) - five (5) year period. Embellishment plantings are to be used to consolidate each of the areas of EEC. All areas of EEC will be fenced to exclude pedestrian traffic and cattle grazing. A monitoring and maintenance program for areas of remnant vegetation is included in the Revised Site Regeneration and Revegetation Plan (JWA 2013a). 		
<ul style="list-style-type: none"> Lowland rainforest on floodplain 	<ul style="list-style-type: none"> In total, 0.01 hectares (0.57%) of Lowland rainforest on floodplain will be lost (FIGURE 27), all of which occurs 	<ul style="list-style-type: none"> Amelioration for the removal of a small area of Lowland rainforest on floodplain will be provided through revegetation works on the Subject site. 	<ul style="list-style-type: none"> In total, 9.59 hectares of Lowland rainforest on floodplain will be regenerated/ revegetated on the Subject site 	<ul style="list-style-type: none"> Revegetation works on the Subject site will result in a long-term net gain of approximately 9.58ha of Lowland rainforest on

	Potential impacts	Amelioration measures	Proposed mitigation/offset	Net loss/gain
	<p>within portions of the site with existing development approvals.</p> <ul style="list-style-type: none"> Edge effects may impact on retained EEC's. 	<ul style="list-style-type: none"> The Revised Site Regeneration and Revegetation Plan (JWA 2013a) includes measures to offset the loss of a small area of this EEC from the Subject site. Furthermore, retained patches of this EEC will be buffered from the proposed development and embellished to increase the overall extent of isolated patches and reduce existing anthropogenic impacts. As a minimum, retained Lowland rainforest on floodplain on the Subject site will be provided with a 10m vegetated buffer. The Revised Site Regeneration and Revegetation Plan (JWA 2013a) includes specific performance criteria as well as a detailed maintenance and monitoring program to ensure the persistence of this EEC in the long-term. Weed control will be completed on the interface of EEC's by a qualified Bush regenerator. Weed control will be undertaken on a progressive basis over a three 	<p>(FIGURE 28) to offset the loss of 0.01 hectares.</p>	<p>floodplain.</p>

	Potential impacts	Amelioration measures	Proposed mitigation/offset	Net loss/gain
		<p>(3) - five (5) year period.</p> <ul style="list-style-type: none"> Embellishment plantings are to be used to consolidate each of the areas of EEC. All areas of EEC will be fenced to exclude pedestrian traffic and cattle grazing. A monitoring and maintenance program for areas of retained and rehabilitated vegetation is included in the Revised Site Regeneration and Revegetation Plan (JWA 2013a). 		
<ul style="list-style-type: none"> Lowland rainforest 	<ul style="list-style-type: none"> Approximately 0.10 hectares (1.08%) of Lowland rainforest will be lost (FIGURE 27), all of which occurs within portions of the site with existing development approvals. Edge effects may impact on retained EEC's. 	<ul style="list-style-type: none"> Amelioration for the removal of a small area of Lowland rainforest will be provided through revegetation works on the Subject site. The Revised Site Regeneration and Revegetation Plan (JWA 2013a) includes measures to offset the loss of a small area of this EEC from the Subject site. Furthermore, retained patches of this EEC will be buffered from the proposed development and embellished to increase the overall extent of isolated patches and reduce existing anthropogenic impacts. 	<ul style="list-style-type: none"> In total, 3.71 hectares of Lowland rainforest will be regenerated and/or revegetated on the Subject site (FIGURE 28) to offset the loss of 0.10 hectares. 	<ul style="list-style-type: none"> Revegetation works on the Subject site will result in a long-term net gain of approximately 3.61ha of Lowland rainforest.

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	Potential impacts	Amelioration measures	Proposed mitigation/offset	Net loss/gain
		<ul style="list-style-type: none"> As a minimum, retained Lowland rainforest on the Subject site will be provided with a 10m vegetated buffer. The Revised Site Regeneration and Revegetation Plan (JWA 2013a) includes specific performance criteria as well as a detailed maintenance and monitoring program to ensure the persistence of this EEC in the long-term. Weed control will be completed on the interface of EEC's by a qualified Bush regenerator. Weed control will be undertaken on a progressive basis over a three (3) - five (5) year period. Embellishment plantings are to be used to consolidate each of the areas of EEC. All areas of EEC will be fenced to exclude pedestrian traffic and cattle grazing. A monitoring and maintenance program is included in the Revised Site Regeneration and Revegetation Plan (JWA 2013a). 		
• Freshwater	• In total 24.12 hectares	• A Revised Site Regeneration and	• Offsets for the removal of	• The proposed development

	Potential impacts	Amelioration measures	Proposed mitigation/offset	Net loss/gain
wetlands	(68.15%) of highly degraded Freshwater wetland will be lost from the Subject site (FIGURE 27).	<p>Rehabilitation Plan (JWA 2013a) has been prepared for the Subject site and includes measures to provide more intact wetland communities on the Subject site.</p> <ul style="list-style-type: none"> The Revised Site Regeneration and Rehabilitation Plan (JWA 2013a) includes specific performance criteria as well as a detailed maintenance and monitoring program and it is therefore considered that the rehabilitated Freshwater wetlands will be more likely to persist in the long-term compared to the existing community. Weed control will be completed on the interface of EEC's by a qualified Bush regenerator. Weed control will be undertaken on a progressive basis over a three (3) - five (5) year period. All areas of EEC will be fenced to exclude pedestrian traffic and cattle grazing. A monitoring and maintenance program for areas of remnant vegetation is included in the Revised Site Regeneration and Rehabilitation Plan (JWA 2013a). 	<p>highly degraded Freshwater wetland vegetation from the Subject site will include the following:</p> <ol style="list-style-type: none"> 1. Recreation of approximately 2ha of high quality wetland habitats (FIGURE 28). These compensatory Freshwater wetlands will be offline from the stormwater treatment train and will also be specifically designed to provide core (breeding) habitat for the Wallum froglet; and 2. Leda Manorstead Pty Ltd is currently negotiating with OEH regarding appropriate off-site offsets. 	<p>will result in a net loss of approximately 22.12 ha of Freshwater wetlands.</p> <ul style="list-style-type: none"> As previously mentioned Leda Manorstead Pty Ltd is currently in negotiations with OEH with a view to securing appropriate off-site offsets.

	Potential impacts	Amelioration measures	Proposed mitigation/offset	Net loss/gain
<ul style="list-style-type: none"> Swamp oak floodplain forest 	<ul style="list-style-type: none"> In total 0.73 hectares (16.15%) of Swamp oak floodplain will be lost (FIGURE 27). Edge effects may impact on retained EEC's. 	<ul style="list-style-type: none"> The removal of approximately 0.73 hectares of the Swamp oak floodplain forest community from the Subject site will be ameliorated by regenerating and revegetating compensatory Swamp oak communities on the Subject site. Areas within and adjacent to the existing Saltmarsh communities on the Subject site are currently comprised of a mixture of exotic grasses and will be restored to Saltmarsh and Swamp oak communities in accordance with the Revised Saltmarsh Restoration Plan (JWA 2013b). Removal of cattle from the area and subsequent relinquishment of existing use rights is considered an integral component of the rehabilitation process. Weed control will be completed on the interface of EEC's by a qualified Bush regenerator. Weed control will be undertaken on a progressive basis over a three (3) - five (5) year period. Embellishment plantings are to be 	<ul style="list-style-type: none"> In total, apporximately 5.88 hectares of Swamp oak floodplain forest will be revegetated on the Subject site, in combination with Saltmarsh revegetation (FIGURE 28), to offset the loss of 0.73 hectares. 	<ul style="list-style-type: none"> Revegetation works on the Subject site will result in a long-term net gain of approximately 5.15ha of Swamp oak floodplain forest.

	Potential impacts	Amelioration measures	Proposed mitigation/offset	Net loss/gain
		<p>used to consolidate each of the areas of EEC.</p> <ul style="list-style-type: none"> All areas of EEC will be fenced to exclude pedestrian traffic and cattle grazing. A monitoring and maintenance program for areas of Swamp oak floodplain forest is included in the Revised Saltmarsh Rehabilitation Plan (JWA 2013b). 		
<ul style="list-style-type: none"> Coastal saltmarsh 	<ul style="list-style-type: none"> In total 9.69 hectares (17.73%) of Coastal saltmarsh will be lost (FIGURE 27). Edge effects may impact on retained EEC's. 	<ul style="list-style-type: none"> The removal of approximately 9.69 hectares of degraded Saltmarsh communities from the Subject site will be ameliorated by regenerating and revegetating compensatory Saltmarsh communities on the Subject site. Large areas adjacent to the existing Saltmarsh communities are currently comprised of a mixture of exotic grasses and will be restored to Saltmarsh communities in accordance with the Revised Saltmarsh Restoration Plan (JWA 2013b). Removal of cattle from the area and subsequent relinquishment of existing use rights is considered an integral component of the rehabilitation process. 	<ul style="list-style-type: none"> In total, approximately 20 hectares of Coastal saltmarsh will be revegetated on the Subject site, in conjunction with 64.28ha of natural regeneration (FIGURE 28), to offset the loss of 9.69 hectares. 	<ul style="list-style-type: none"> Revegetation works on the Subject site will result in a long-term net gain of approximately 34.59ha of Coastal saltmarsh.

	Potential impacts	Amelioration measures	Proposed mitigation/offset	Net loss/gain
		<ul style="list-style-type: none"> • Weed control will be completed on the interface of EEC's by a qualified Bush regenerator. • Weed control will be undertaken on a progressive basis over a three (3) - five (5) year period. • All areas of EEC will be fenced to exclude pedestrian traffic and cattle grazing. • A monitoring and maintenance program is included in the Revised Saltmarsh Rehabilitation Plan (JWA 2013b). 		
Threatened fauna				
<ul style="list-style-type: none"> • Wallum froglet (<i>Crinia tinnula</i>) 	<ul style="list-style-type: none"> • The proposed development may result in direct mortality to individuals of this species during construction. • The proposed development will not remove or modify any areas of core habitat. • Approximately 66.47 hectares (84.01%) of potential forage habitat will be removed. The majority of forage habitat will be removed from areas with existing 	<ul style="list-style-type: none"> • Approximately 2ha of additional Freshwater wetlands, 6.77ha of Swamp sclerophyll forest will be regenerated/revegetated on the Subject site (FIGURE 28) in accordance with the Revised Site Regeneration and Revegetation Plan (JWA 2013a) and SMEC (2012). These areas are likely to provide suitable forage habitat for this species and partly offset the loss of degraded forage habitat. • A detailed Stormwater Management Plan has been prepared for the Subject site utilising current best-practice 	<ul style="list-style-type: none"> • No core habitat will be removed. • Offsets for the removal of highly degraded Freshwater wetland vegetation from the Subject site will include the following: <ol style="list-style-type: none"> 1. Recreation of approximately 2.00ha of high quality wetland habitats (FIGURE 28). These compensatory Freshwater wetlands will be offline from the stormwater 	<ul style="list-style-type: none"> • Revegetation works on the Subject site will result in a net gain of approximately 2ha of core habitat for the Wallum froglet. • The proposed development will result in a net loss of approximately 57.17ha of highly degraded forage habitat. • As previously mentioned Leda Manorstead Pty Ltd is currently in negotiations with OEHL with a view to securing appropriate off-

	Potential impacts	Amelioration measures	Proposed mitigation/offset	Net loss/gain
	<p>development approvals.</p> <ul style="list-style-type: none"> Alteration of water quality in drainage lines due to soil runoff from the construction site. Alteration of hydrology of the drainage lines due to construction. Contamination or reduction of water quality in drainage lines due to runoff from chemicals or debris (fertilisers, etc). Introduction of weed species into core habitat areas. Increased competition from disturbance-adapted native, domestic and introduced fauna (such as Cane toads, Noisy miners, foxes, dogs, cats, rats, etc.). 	<p>management techniques which will ensure no adverse impacts on the hydrology of the current core habitat (adjacent to the site) and the proposed rehabilitated freshwater wetlands.</p> <ul style="list-style-type: none"> Weed control will be completed on the interface of compensatory habitat areas by a qualified Bush regenerator. Weed control will be undertaken on a progressive basis over a three (3) - five (5) year period. A monitoring and maintenance program for areas of compensatory habitat will be included within a Wallum Froglet Compensatory Habitat Plan to be completed at the development application stage. 	<p>treatment train and will also be specifically designed to provide core (breeding) habitat for the Wallum froglet; and</p> <p>2. Leda Manorstead Pty Ltd is currently negotiating with OEH regarding appropriate off-site offsets.</p> <ul style="list-style-type: none"> Furthermore, 6.77ha Swamp sclerophyll forest will be regenerated and/or revegetated on the Subject site (FIGURE 28) in accordance with the Revised Site Regeneration and Revegetation Plan (JWA 2013a). 	<p>site offsets.</p>
<ul style="list-style-type: none"> Black-necked stork (<i>Xenorhynchus asiaticus</i>) 	<ul style="list-style-type: none"> Approximately 78.76 hectares (56.02%) of potential forage habitat will be removed from the Subject site. The majority of forage 	<ul style="list-style-type: none"> Approximately 2 hectares of additional Freshwater wetland habitat will be created on the Subject site. Furthermore, 6.77 hectares of 	<ul style="list-style-type: none"> In total, 8.77 hectares of vegetation likely to provide suitable forage habitat will be regenerated and/or revegetated on the Subject site (FIGURE 28) to partly 	<ul style="list-style-type: none"> The proposed development will result in a net loss of approximately 35.40ha of highly degraded forage habitat. As previously mentioned

	Potential impacts	Amelioration measures	Proposed mitigation/offset	Net loss/gain
	<p>habitat will be removed from areas with existing development approvals.</p> <ul style="list-style-type: none"> Given the high mobility of this species, the loss of potential foraging habitat is not considered significant in relation to the regional distribution of habitat for this species. 	<p>Swamp sclerophyll forest will be regenerated/revegetated on the Subject site (FIGURE 28) in accordance with the Revised Site Regeneration and Revegetation Plan (JWA 2013a).</p> <ul style="list-style-type: none"> These areas are likely to provide suitable forage habitat for this species and offset any loss of forage habitat in the long-term. Additionally, 54.63 hectares of vegetation within the south-eastern portion of the Subject site will be retained and rehabilitated in accordance with the Revised Saltmarsh Rehabilitation Plan (JWA 2013b). This area currently provides suitable forage habitat for the Black-necked stork and will continue to do so in the long term. 	<p>offset the loss of 78.76 hectares.</p> <ul style="list-style-type: none"> There will be a net gain of 34.59ha within the Saltmarsh community in the eastern portion of the Subject site, which currently provides suitable habitat for this species. Additionally, Leda Manorstead Pty Ltd is currently in negotiations with OEH with a view to securing appropriate off-site offsets for the loss of degraded Freshwater wetland habitats. 	<p>Leda Manorstead Pty Ltd is currently in negotiations with OEH with a view to securing appropriate off-site offsets.</p>
<ul style="list-style-type: none"> Powerful owl (<i>Ninox strenua</i>) 	<ul style="list-style-type: none"> The primary threat to this species and its habitat is the loss and modification of forest and old growth elements, especially trees supporting large nest hollows and areas supporting high densities of prey populations (Debus and Chafer 1994). This species may 	<ul style="list-style-type: none"> The proposed retention of large areas of intact forest is likely to result in the continued foraging of this species on the Subject site. Furthermore, approximately 61.82ha of revegetation/regeneration works will be completed in accordance with the Revised Site Regeneration and Revegetation Plan (JWA 2013a) to offset the loss of 13.09ha of forage 	<ul style="list-style-type: none"> In total, 61.82 hectares of vegetation likely to provide suitable forage habitat for the Powerful owl in the long-term will be regenerated/revegetated on the Subject site (FIGURE 28) to offset the loss of 13.09 hectares. 	<ul style="list-style-type: none"> Revegetation works on the Subject site will result in a long-term net gain of approximately 48.73ha of suitable forage habitat for the Powerful owl.

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	Potential impacts	Amelioration measures	Proposed mitigation/offset	Net loss/gain
	<p>potentially forage over the majority of the Subject site, however, it is estimated that the development will result in the loss of approximately 13.09 hectares (18.47%) of better quality habitat.</p> <ul style="list-style-type: none"> The majority of forage habitat will be removed from areas with existing development approvals. Given the high mobility of this species, the loss of potential foraging habitat is not considered significant in relation to the regional distribution of habitat for this species. Loss of vegetation from the Subject site will approximate to only 2-3% of the estimated home range of a Powerful owl. 	<p>habitat.</p> <ul style="list-style-type: none"> These areas are all likely to provide suitable forage habitat for the Powerful owl in the long-term. Retention of old growth trees will also provide continued nesting opportunities for this species. Additionally, the installation of nest boxes of a suitable size for owls within retained vegetation (in accordance with the Revised Fauna Management Plan - JWA 2013) will improve the habitat values of the site for this species and encourage the use of site habitats for nesting purposes. 		
<ul style="list-style-type: none"> Masked owl - (<i>Tyto novaehollandiae</i>) 	<ul style="list-style-type: none"> This species may potentially forage over the majority of the Subject site, however, it is estimated that approximately 13.09 	<ul style="list-style-type: none"> The proposed retention of large areas of intact forest is likely to result in the continued foraging of this species on the Subject site. 	<ul style="list-style-type: none"> In total, 61.82 hectares of vegetation likely to provide suitable forage habitat for the Masked owl in the long-term will be regenerated and/or revegetated on the 	<ul style="list-style-type: none"> Revegetation works on the Subject site will result in a long-term net gain of approximately 48.73ha of suitable forage habitat for the Masked owl.

	Potential impacts	Amelioration measures	Proposed mitigation/offset	Net loss/gain
	<p>hectares (18.74%) of better quality forage habitat for the Masked owl will be removed.</p> <ul style="list-style-type: none"> The majority of forage habitat will be removed from areas with existing development approvals. This species may also be susceptible to road-strike, as birds often forage along roadsides or use roads to move between foraging sites (Debus and Rose 1994). Loss of Sclerophyll forest may reduce the availability of arboreal and terrestrial mammalian prey for this species, however, loss of vegetation from the Subject site will approximate to only 2%-3% of the estimated home range of a Masked owl. Given the high mobility of this species, the loss of potential foraging habitat is not considered significant in relation to 	<ul style="list-style-type: none"> Furthermore, approximately 61.82ha of revegetation/regeneration works will be completed in accordance with the Revised Site Regeneration and Revegetation Plan (JWA 2013a) to offset the loss of 13.09ha of forage habitat. These areas are all likely to provide suitable forage habitat for the Masked owl in the long-term. Retention of old growth trees will also provide nesting opportunities for this species. Additionally, the installation of nest boxes of a suitable size for owls within retained vegetation (in accordance with the Revised Fauna Management Plan - JWA 2013) will improve the habitat values of the site for this species and encourage the use of site habitats for nesting purposes. 	<p>Subject site (FIGURE 28) to offset the loss of 13.09 hectares.</p>	

	Potential impacts	Amelioration measures	Proposed mitigation/offset	Net loss/gain
	the regional distribution of habitat.			
<ul style="list-style-type: none"> Osprey (<i>Pandion haliaetus</i>) 	<ul style="list-style-type: none"> It is expected that impacts of the proposed development will be restricted to human disturbance near any nest site. No active nest sites have been recorded on the Subject site in recent times. 	<ul style="list-style-type: none"> The developer is therefore committed to erecting at least two (2) artificial nesting platforms on the site (FIGURE 32). It is well known that these platforms are highly successful. 	<ul style="list-style-type: none"> No forage habitat will be removed from the Subject site. 	N/A
<ul style="list-style-type: none"> Koala (<i>Phascolarctos cinereus</i>) 	<ul style="list-style-type: none"> 11.89 hectares (28.04%) of suitable Koala habitat may potentially be lost. All potential Koala habitat to be removed occurs within portions of the site with existing development approval. No conclusive evidence of Koala activity has been recorded from the Subject site. 	<ul style="list-style-type: none"> A total of 32.80 hectares (77.34%) of suitable Koala habitat is proposed to be retained within Environmental Protection Areas & Open Space areas. 	<ul style="list-style-type: none"> Proposed revegetation and regeneration works on the Subject site (FIGURE 22) will increase the area of available Koala habitat in the long-term and provide vegetated linkages through the landscape. 61.82ha of revegetation/regeneration works will be completed to offset the loss of 11.89ha of suitable Koala habitat. 	<ul style="list-style-type: none"> Revegetation on the Subject site, including planted Koala food tree species, will result in a long-term net gain of vegetation suitable as Koala forage and/or corridor habitat.
<ul style="list-style-type: none"> Grey-headed flying-fox (<i>Pteropus poliocephalus</i>) 	<ul style="list-style-type: none"> Approximately 12.96ha (17.94%) of potential forage habitat will be removed from the Subject site. The majority of forage habitat will be removed 	<ul style="list-style-type: none"> The Grey-headed flying-fox is considered likely to continue foraging within retained areas of vegetation on the site. Furthermore, 6.77ha of Swamp sclerophyll forest, 9.59ha of 	<ul style="list-style-type: none"> In total, 32.66 hectares of vegetation likely to provide suitable forage habitat for the Grey-headed flying-fox will be regenerated/revegetated on the Subject site (FIGURE 28) to offset 	<ul style="list-style-type: none"> Revegetation works on the Subject site will result in a long-term net gain of approximately 19.70ha of suitable forage and/or corridor habitat for the Grey-headed flying-fox.

	Potential impacts	Amelioration measures	Proposed mitigation/offset	Net loss/gain
	<p>from areas with existing development approvals.</p> <ul style="list-style-type: none"> Suitable roosting habitat for this species may occur in the rainforest community located on Mt. Woodgee which will be retained. Given the high mobility of this species, the loss of 12.96ha is not considered significant in relation to the regional distribution of potential foraging habitat for this species. 	<p>Lowland rainforest on floodplain, 3.71ha of Lowland rainforest and 12.06ha of Mixed sclerophyll forest will be regenerated/revegetated on the Subject site (FIGURE 28) in accordance with the Revised Site Regeneration and Revegetation Plan (JWA 2013a).</p> <ul style="list-style-type: none"> These areas are likely to provide suitable forage habitat for this species and offset the loss of 12.96ha. 	<p>the loss of 12.96 hectares.</p>	
<ul style="list-style-type: none"> Little bent-wing bat (<i>Miniopterus australis</i>) & Common bent-wing bat (<i>Miniopterus schreibersii</i>) 	<ul style="list-style-type: none"> Approximately 12.96ha (17.94%) of potential forage habitat will be removed from the Subject site. The majority of forage habitat will be removed from areas with existing development approvals. Given the high mobility of these species, the loss of potential foraging habitat is not considered significant in relation to the regional distribution 	<ul style="list-style-type: none"> Approximately 61.82ha of revegetation/regeneration works will be completed in accordance with the Revised Site Regeneration and Revegetation Plan (JWA 2013a) to offset any loss of remnant bushland and to provide vegetated links across the site. These areas are likely to provide suitable forage habitat for these species in the long-term and offset the loss of 12.96ha. 	<ul style="list-style-type: none"> In total, 61.82 hectares of vegetation likely to provide suitable forage habitat for these species will be regenerated/revegetated on the Subject site (FIGURE 28) to offset the loss of 12.96 hectares. 	<ul style="list-style-type: none"> Revegetation works on the Subject site will result in a long-term net gain of approximately 48.86ha of suitable forage habitat for these species.

	Potential impacts	Amelioration measures	Proposed mitigation/offset	Net loss/gain
	<p>of habitat for this species.</p> <ul style="list-style-type: none"> No roost habitat will be affected by the proposed development and it is considered that this species will continue to forage over the retained vegetation on the Subject site. 			
<ul style="list-style-type: none"> Eastern free-tail bat (<i>Mormopterus norfolkensis</i>), Yellow-bellied sheath-tail bat (<i>Saccolaimus flaviventris</i>) & Greater broad-nosed bat (<i>Scoteanax rueppellii</i>) 	<ul style="list-style-type: none"> Approximately 12.96ha (17.94%) of potential forage habitat will be removed from the Subject site. The majority of forage habitat will be removed from areas with existing development approvals. Given the high mobility of these species, the loss of potential foraging habitat is not considered significant in relation to the regional distribution of habitat for this species. There will be a minor loss of potential roost sites (i.e. hollow-bearing 	<ul style="list-style-type: none"> It is considered that these species will continue to utilise retained vegetation for foraging and retained habitat trees for roosting. Furthermore, approximately 61.82ha of revegetation/regeneration works will be completed in accordance with the Revised Site Regeneration and Revegetation Plan (JWA 2013a) to offset any loss of remnant bushland and to provide vegetated links across the site. These areas are all likely to provide suitable forage habitat for these species in the long-term. The installation of bat boxes within retained vegetation (in accordance with the Revised Fauna Management Plan - JWA 2013) will 	<ul style="list-style-type: none"> In total, 61.82 hectares of vegetation likely to provide suitable forage habitat for these species will be regenerated/revegetated on the Subject site (FIGURE 28) to offset the loss of 12.96 hectares. 	<ul style="list-style-type: none"> Revegetation works on the Subject site will result in a long-term net gain of approximately 48.86ha of suitable forage habitat for these species. Installation of bat boxes within retained vegetation (in accordance with the Revised Fauna Management Plan - JWA 2013) will increase roosting opportunities for these species and offset the loss of any hollow-bearing trees.

	Potential impacts	Amelioration measures	Proposed mitigation/offset	Net loss/gain
	trees) for these species.	increase roosting opportunities for these species.		
<ul style="list-style-type: none"> Wallum sedge frog (<i>Litoria olongburensis</i>) 	<ul style="list-style-type: none"> This species has not been recorded from the Subject site, however, potential habitat occurs. The proposed development will not remove or modify any area considered to provide core habitat for the Wallum sedge frog. Approximately 24.12 hectares (68.15%) of potential forage habitat will be removed from the Subject site. Alteration of water quality in drainage lines due to soil runoff from the construction site. Alteration of hydrology of the drainage lines due to construction. Contamination or reduction of water quality in drainage lines 	<ul style="list-style-type: none"> Approximately 2ha of additional Freshwater wetlands and 6.77ha of Swamp sclerophyll forest will be regenerated/revegetated on the Subject site (FIGURE 28) in accordance with the Revised Site Regeneration and Revegetation Plan (JWA 2013a) and SMEC (2012). These areas are likely to provide suitable forage habitat for this species and partly offset the loss of degraded forage habitat. A detailed Stormwater Management Plan has been prepared for the Subject site utilising current best-practice management techniques, which will ensure no adverse impacts on the hydrology of the current adjacent core habitat and the proposed rehabilitated freshwater wetlands. A monitoring and maintenance program for areas of compensatory habitat is included in the Revised Site Regeneration and Revegetation Plan (JWA 2013a). 	<ul style="list-style-type: none"> No core habitat will be removed. Offsets for the removal of highly degraded Freshwater wetland vegetation from the Subject site will include the following: <ol style="list-style-type: none"> Recreation of approximately 2ha of high quality wetland habitats (FIGURE 28). These compensatory Freshwater wetlands will be offline from the stormwater treatment train and will also be specifically designed to provide core (breeding) habitat for the Wallum froglet; and Leda Manorstead Pty Ltd is currently negotiating with OEH regarding appropriate off-site offsets. 	<ul style="list-style-type: none"> Revegetation works on the Subject site will result in a net gain of approximately 2ha of core habitat suitable for the Wallum sedge frog. The proposed development will result in a net loss of approximately 15.35ha of highly degraded forage habitat. As previously mentioned Leda Manorstead Pty Ltd is currently in negotiations with OEH with a view to securing appropriate off-site offsets.

	Potential impacts	Amelioration measures	Proposed mitigation/offset	Net loss/gain
	<p>due to runoff from chemicals or debris (fertilisers, etc).</p> <ul style="list-style-type: none"> • Introduction of weed species into core habitat areas adjacent to the Subject site. • Increased competition from disturbance-adapted native, domestic and introduced fauna (such as Cane toads, Noisy miners, foxes, dogs, cats, rats, etc.). 		<ul style="list-style-type: none"> • Furthermore, 6.77ha Swamp sclerophyll forest will be regenerated and/or revegetated on the Subject site (FIGURE 28) in accordance with the Revised Site Regeneration and Revegetation Plan (JWA 2013a). 	
<ul style="list-style-type: none"> • Bush hen (<i>Amaurornis moluccana</i>) 	<ul style="list-style-type: none"> • This species has not been recorded from the Subject site, however, potential habitat occurs. • The proposed development will result in the removal or modification a total of 0.02 hectares (1.42%) of potential habitat for this species, all of which occurs within portions of the site with existing development approvals. • Due to their crepuscular and nocturnal nature, 	<ul style="list-style-type: none"> • Rehabilitation works in accordance with the Revised Site Regeneration and Revegetation Plan (JWA 2013a) will result in the regeneration/revegetation of 6.77 hectares of Swamp sclerophyll forest, 9.59hectares of Lowland rainforest on floodplain, 3.71 hectares of Lowland rainforest and 2hectares of Freshwater wetland. • Traffic movement controls on local roads and awareness signage are to be incorporated into detailed site design. • Landowners should control cats. All pet animals should reside 	<ul style="list-style-type: none"> • In total, 22.07 hectares of vegetation that may provide suitable forage habitat for this species in the long-term will be regenerated/revegetated on the Subject site (FIGURE 28) to offset the loss of 0.02 hectares. 	<ul style="list-style-type: none"> • Revegetation/regeneration works on the Subject site will result in a long-term net gain of approximately 22.05ha of potential forage habitat for the Bush hen.

	Potential impacts	Amelioration measures	Proposed mitigation/offset	Net loss/gain
	<p>this species is most likely to be active around dusk or during the night. This may place any birds at risk of disturbance by street lighting and night-time traffic.</p> <ul style="list-style-type: none"> Other impacts may include predation by domestic cats. 	<p>within fenced enclosures and be on a leash when outside of the enclosure.</p> <ul style="list-style-type: none"> Street lights adjacent to retained habitat areas should be capped. Vegetated buffers and/or dense planted screens will also reduce the impacts of lighting. 		
<ul style="list-style-type: none"> Glossy black-cockatoo (<i>Calyptrorhynchus lathami</i>) 	<ul style="list-style-type: none"> This species has not been recorded from the Subject site, however, potential habitat occurs. The proposed development will result in the removal or modification of a total of 5.42 hectares (11.15%) of potential habitat for this species. The majority of forage habitat will be removed from areas with existing development approvals. Given the high mobility of this species, the loss of potential foraging habitat is not considered significant in relation to 	<ul style="list-style-type: none"> The proposed development will retain large areas of intact forest that will provide continued foraging resources for this species on the Subject site. Rehabilitation works in accordance with the Revised Site Regeneration and Revegetation Plan (JWA 2013a) will result in 61.82ha of revegetation/regeneration works to offset any loss of vegetation and to provide vegetated links across the site. These works will utilise <i>Allocasuarina</i> species where possible to provide suitable forage resources for this species. Additionally, the installation of nest boxes of a suitable size for cockatoos within retained vegetation (in accordance with Revised Fauna Management Plan - JWA 2013) will improve the habitat 	<ul style="list-style-type: none"> In total, 61.82ha of vegetation that may provide suitable forage habitat for this species in the long-term will be regenerated/ revegetated on the Subject site (FIGURE 28) to offset the loss of 5.42 hectares. 	<ul style="list-style-type: none"> Revegetation works on the Subject site will result in a long-term net gain of 56.40ha of suitable forage habitat for the Glossy black-cockatoo.

	Potential impacts	Amelioration measures	Proposed mitigation/offset	Net loss/gain
	the regional distribution of habitat for this species.	values of the site for this species and encourage the use of site habitats for nesting purposes.		
<ul style="list-style-type: none"> Brolga (<i>Grus rubicunda</i>) 	<ul style="list-style-type: none"> This species has not been recorded from the Subject site, however, potential habitat occurs. Approximately 78.76 ha (56.02%) of potential forage habitat will be removed from the Subject site. The majority of forage habitat will be removed from areas with existing development approvals. Given the high mobility of this species, the loss of potential foraging habitat is not considered significant in relation to the regional distribution of habitat for this species. 	<ul style="list-style-type: none"> Approximately 2 hectares of Freshwater wetland habitat will be created on the Subject site. Furthermore, 6.77 hectares of Swamp sclerophyll forest will be regenerated/revegetated on the Subject site (FIGURE 28) in accordance with the Revised Site Regeneration and Revegetation Plan (JWA 2013a). These areas are likely to provide suitable forage habitat for this species and offset any loss of forage habitat in the long-term. Additionally, 54.63 hectares of vegetation within the south-eastern portion of the Subject site will be retained and rehabilitated in accordance with the Revised Saltmarsh Rehabilitation Plan (JWA 2013b). This area currently provides potential forage habitat for the Brolga and will continue to do so in the long term. 	<ul style="list-style-type: none"> In total, 8.77 hectares of vegetation likely to provide suitable forage habitat will be regenerated and/or revegetated on the Subject site (FIGURE 28) to partly offset the loss of 78.76 hectares. There will be a net gain of 34.59ha within the Saltmarsh community in the eastern portion of the Subject site, which currently provides potential habitat for this species. Additionally, Leda Manorstead Pty Ltd is currently in negotiations with OEHL with a view to securing appropriate off-site offsets for the loss of degraded Freshwater wetland habitats. 	<ul style="list-style-type: none"> The proposed development will result in a net loss of approximately 35.40ha of highly degraded forage habitat. As previously mentioned Leda Manorstead Pty Ltd is currently in negotiations with OEHL with a view to securing appropriate off-site offsets.
<ul style="list-style-type: none"> Black bittern (<i>Ixobrychus flavicollis</i>) 	<ul style="list-style-type: none"> This species has not been recorded from the Subject site, however, potential habitat occurs. 	<ul style="list-style-type: none"> Approximately 2 hectares of Freshwater wetland habitat will be created on the Subject site. 	<ul style="list-style-type: none"> The proposed development will not result in disturbance to or the removal of potential 	<ul style="list-style-type: none"> Revegetation works on the Subject site will result in a long-term net gain of potential forage habitat for

	Potential impacts	Amelioration measures	Proposed mitigation/offset	Net loss/gain
	<ul style="list-style-type: none"> The proposed development will not result in disturbance to or the removal of potential habitat for this species. The majority of forage habitat will be removed from areas with existing development approvals. Overall, impacts on this species are considered to be relatively low. 	<ul style="list-style-type: none"> Furthermore, 6.77 hectares of Swamp sclerophyll forest will be regenerated/revegetated on the Subject site (FIGURE 28) in accordance with the Revised Site Regeneration and Revegetation Plan (JWA 2013a). These areas may provide suitable habitat for this species. 	<ul style="list-style-type: none"> habitat for this species. In total, 8.77ha of vegetation that may provide suitable forage habitat for this species in the long-term will be regenerated/ revegetated on the Subject site (FIGURE 28). 	<ul style="list-style-type: none"> the Black bittern.
<ul style="list-style-type: none"> Mangrove honeyeater (<i>Lichenostomus fasciogularis</i>) 	<ul style="list-style-type: none"> This species has not been recorded from the Subject site, however, potential habitat occurs. The proposed development will not result in disturbance to or the removal of potential habitat for this species. Overall, impacts on this species are considered to be relatively low. 	<ul style="list-style-type: none"> Rehabilitation works in accordance with the Revised Site Regeneration and Revegetation Plan (JWA 2013a) will result in the regeneration/revegetation of 6.77 hectares of Swamp sclerophyll forest. Furthermore, 54.63 hectares of vegetation within the south-eastern portion of the Subject site will be retained and rehabilitated in accordance with the Revised Saltmarsh Rehabilitation Plan (JWA 2013b). This area currently provides stands of mangrove vegetation suitable as forage habitat for the Mangrove honeyeater and will continue to do 	<ul style="list-style-type: none"> The proposed development will not result in disturbance to or the removal of potential habitat for this species. In total, 6.77ha of vegetation that may provide suitable forage habitat for this species in the long-term will be regenerated/ revegetated on the Subject site (FIGURE 28). 	<ul style="list-style-type: none"> Revegetation works on the Subject site will result in a long-term net gain of potential forage habitat for the Mangrove honeyeater.

	Potential impacts	Amelioration measures	Proposed mitigation/offset	Net loss/gain
		so in the long term.		
<ul style="list-style-type: none"> White-eared monarch (<i>Monarcha leucotis</i>) 	<ul style="list-style-type: none"> This species has not been recorded from the Subject site, however, potential habitat occurs. Approximately 0.11 hectares (1%) of potential forage habitat will be removed from the Subject site all of which will be removed from areas of the site with existing development approvals. Given the high mobility of this species, the loss of potential foraging habitat is not considered significant in relation to the regional distribution of habitat for this species. 	<ul style="list-style-type: none"> Rehabilitation works in accordance with the Revised Site Regeneration and Revegetation Plan (JWA 2013a) will result in the regeneration/revegetation of 9.59 hectares of Lowland rainforest on floodplain and 3.71 hectares of Lowland rainforest. 	<ul style="list-style-type: none"> In total, 13.30ha of vegetation that may provide suitable forage habitat for this species in the long-term will be regenerated/ revegetated on the Subject site (FIGURE 28) to offset the loss of 0.11 hectares. 	<ul style="list-style-type: none"> Revegetation works on the Subject site will result in a long-term net gain of approximately 13.19ha of potential forage habitat for the White-eared monarch.
<ul style="list-style-type: none"> Wompoo fruit-dove (<i>Ptilinopus magnificus</i>), Rose-crowned fruit-dove (<i>Ptilinopus regina</i>) & Superb fruit-dove (<i>Ptilinopus superbus</i>) 	<ul style="list-style-type: none"> These species have not been recorded from the Subject site, however, potential habitat occurs. Approximately 0.11 hectares (1%) of potential forage habitat will be removed from the Subject site all of which 	<ul style="list-style-type: none"> Rehabilitation works in accordance with the Revised Site Regeneration and Revegetation Plan (JWA 2013a) will result in the regeneration/revegetation of 9.59 hectares of Lowland rainforest on floodplain and 3.71 hectares of Lowland rainforest. These areas may provide suitable 	<ul style="list-style-type: none"> In total, 13.30ha of vegetation that may provide suitable forage habitat for this species in the long-term will be regenerated/ revegetated on the Subject site (FIGURE 28) to offset the loss of 0.11 hectares. 	<ul style="list-style-type: none"> Revegetation works on the Subject site will result in a long-term net gain of approximately 13.19ha of potential forage habitat for the fruit-doves.

	Potential impacts	Amelioration measures	Proposed mitigation/offset	Net loss/gain
	<p>will be removed from areas of the site with existing development approvals.</p> <ul style="list-style-type: none"> Given the high mobility of these species, the loss of potential foraging habitat is not considered significant in relation to the regional distribution of suitable habitat. 	<p>habitat for the fruit-doves and offset the loss of 0.11ha of potential habitat.</p>		
<ul style="list-style-type: none"> Collared kingfisher (<i>Todiramphus chloris</i>) 	<ul style="list-style-type: none"> This species has not been recorded from the Subject site, however, potential habitat occurs. The proposed development will not result in disturbance to or the removal of potential habitat for this species. Overall, impacts on this species are considered to be relatively low. 	<ul style="list-style-type: none"> Approximately 54.63 hectares of vegetation within the south-eastern portion of the Subject site will be retained and rehabilitated in accordance with the Revised Saltmarsh Rehabilitation Plan (JWA 2013b). This area currently provides stands of mangrove vegetation suitable as forage habitat for the Collared kingfisher and will continue to do so in the long term. 	<ul style="list-style-type: none"> No forage habitat will be removed from the Subject site. 	N/A
<ul style="list-style-type: none"> Eastern grass owl (<i>Tyto longimembris</i>) 	<ul style="list-style-type: none"> This species has not been recorded from the Subject site, however, potential habitat occurs. The proposed development will not 	<ul style="list-style-type: none"> Rehabilitation works in accordance with the Revised Site Regeneration and Revegetation Plan (JWA 2013a) will result in the regeneration/ revegetation of 6.77 hectares of Swamp sclerophyll forest (FIGURE 28). These areas 	<ul style="list-style-type: none"> No nesting/roost habitat will be removed from the Subject site. 	<ul style="list-style-type: none"> Revegetation works on the Subject site will result in a long-term net gain of approximately 6.77ha of potential habitat for this species.

	Potential impacts	Amelioration measures	Proposed mitigation/offset	Net loss/gain
	<p>result in disturbance to or the removal of potential nesting/roost habitat for this species.</p> <ul style="list-style-type: none"> Given the high mobility of this species, the loss of potential foraging habitat on the Subject site is not considered significant in relation to the regional distribution of potential foraging habitat for this species. Increased vehicular traffic on the Subject site may result in the increased risk of vehicular strike. 	<p>may also provide suitable habitat for this species.</p> <ul style="list-style-type: none"> Traffic movement controls on local roads and awareness signage are to be incorporated into detailed site design. 		
<ul style="list-style-type: none"> Large-footed myotis (<i>Myotis adversus</i>) 	<ul style="list-style-type: none"> This species has not been recorded from the Subject site, however, potential habitat occurs. Approximately 0.8ha (34.33%) of potential forage habitat will be removed from the Subject site. Overall, impacts on this species are considered to be relatively low. 	<ul style="list-style-type: none"> The retention of large areas of intact forest communities, including a number of old growth trees, will continue to provide potential roost sites. Additionally, the installation of bat boxes within retained vegetation (in accordance with the Revised Fauna Management Plan - JWA 2013) will improve the habitat values of the site for this species and encourage the use of site habitats for roosting purposes. 	<ul style="list-style-type: none"> Revegetation areas and the construction of drainage channels on the Subject site (FIGURE 28) will offset the loss of 0.8 hectares of forage habitat for this species. 	<ul style="list-style-type: none"> The construction of water bodies, revegetation areas and the installation of bat boxes will result in a long-term net gain of foraging and roosting habitat for this species.

	Potential impacts	Amelioration measures	Proposed mitigation/offset	Net loss/gain
<ul style="list-style-type: none"> Eastern long-eared bat (<i>Nyctophilus bifax</i>) 	<ul style="list-style-type: none"> This species has not been recorded from the Subject site, however, potential habitat occurs. Approximately 0.11 hectares (1%) of potential forage habitat will be removed from the Subject site, all of which will be removed from areas of the site with existing development approvals. Given the high mobility of this species, the loss of a small area of potential foraging habitat is not considered significant in relation to the regional distribution of habitat for this species. 	<ul style="list-style-type: none"> The retention of large areas of intact forest communities, including a number of old growth trees, will continue to provide potential roost sites. Rehabilitation works in accordance with the Revised Site Regeneration and Revegetation Plan (JWA 2013a) and will result in the regeneration/revegetation of 6.77 hectares of Swamp sclerophyll forest, 9.59 hectares of Lowland rainforest onfloodplain, 3.71 hectares of Lowland rainforest and 12.06ha of Mixed sclerophyll forest. These areas may provide additional suitable habitat for this species and offset any loss of 0.11ha of potential habitat. The installation of bat boxes within retained vegetation (in accordance with the Revised Fauna Management Plan - JWA 2013) may also improve the habitat values of the site for this species and encourage the use of site habitats for roosting purposes. 	<ul style="list-style-type: none"> In total, 32.13ha of vegetation that may provide suitable forage habitat for this species in the long-term will be regenerated/revegetated on the Subject site (FIGURE 28) to offset the loss of 0.11 hectares. 	<ul style="list-style-type: none"> Revegetation works on the Subject site will result in a long-term net gain of approximately 32.02ha of potential forage habitat for the Eastern long-eared bat.
<ul style="list-style-type: none"> Squirrel glider (<i>Petaurus norfolkensis</i>) 	<ul style="list-style-type: none"> This species has not been recorded from the Subject site, however, 	<ul style="list-style-type: none"> Approximately 61.82ha of revegetation/regeneration will be completed in accordance with 	<ul style="list-style-type: none"> In total, 61.82ha of vegetation that may provide suitable forage 	<ul style="list-style-type: none"> Revegetation works on the Subject site will result in a long-term net gain of

	Potential impacts	Amelioration measures	Proposed mitigation/offset	Net loss/gain
	<p>potential habitat occurs.</p> <ul style="list-style-type: none"> In total 9.55ha (18.08%) of potential habitat (i.e. remnant bushland with hollow-bearing trees) will be lost from the Subject site. The majority of habitat to be removed occurs within portions of the site with existing development approval. The loss of potential habitat on the Subject site is not considered significant in relation to the regional distribution of habitat for this species. 	<p>Revised Site Regeneration and Revegetation Plan (JWA 2013a) to offset any loss of remnant bushland and to provide vegetated links across the site.</p> <ul style="list-style-type: none"> The retention of large areas of intact forest communities, including a number of old growth trees, will continue to provide potential roost sites. Additionally, the installation of nest boxes within retained vegetation (in accordance with the Revised Fauna Management Plan - JWA 2013) will improve the habitat values of the site for this species and encourage the use of site habitats for denning purposes. 	<p>habitat for this species in the long-term will be regenerated/revegetated on the Subject site (FIGURE 28) to offset the loss of 9.55 hectares.</p>	<p>approximately 52.27ha of potential forage habitat for the Squirrel glider.</p>
<ul style="list-style-type: none"> Common planigale (<i>Planigale maculata</i>) 	<ul style="list-style-type: none"> This species has not been recorded from the Subject site, however, potential habitat occurs. In total 13.09 hectares (17.47%) of potential habitat will be lost from the Subject site. The majority of habitat to be removed occurs 	<ul style="list-style-type: none"> Approximately 61.82ha of revegetation/regeneration will be completed in accordance with the Revised Site Regeneration and Revegetation Plan (JWA 2013a) to offset any loss of vegetation and to provide vegetated links across the site. The retention of large areas of intact forest communities, including a number of old growth 	<ul style="list-style-type: none"> In total, 61.82ha of vegetation that may provide suitable forage habitat for this species in the long-term will be regenerated/revegetated on the Subject site (FIGURE 28) to offset the loss of 13.09 hectares. 	<ul style="list-style-type: none"> Revegetation works on the Subject site will result in a long-term net gain of approximately 48.73ha of potential forage habitat for the Common planigale.

	Potential impacts	Amelioration measures	Proposed mitigation/offset	Net loss/gain
	<p>from portions of the site with existing development approval.</p> <ul style="list-style-type: none"> The loss of potential habitat is not considered significant in relation to the regional distribution of habitat for this species. This species would be particularly susceptible to predation by cats and dogs. 	<p>trees, will continue to provide potential habitat for this species.</p> <ul style="list-style-type: none"> Additionally, the installation of nest boxes within retained vegetation (in accordance with the Revised Fauna Management Plan - JWA 2013) will improve the habitat values of the site for this species and encourage the use of site habitats for denning purposes. Landowners should control cats. All pet animals should reside within fenced enclosures and be on a leash when outside of the enclosure. 		
<ul style="list-style-type: none"> Long-nosed potoroo (<i>Potorous tridactylus</i>) 	<ul style="list-style-type: none"> This species has not been recorded from the Subject site, however, potential habitat occurs. The proposed development will not result in disturbance to or the removal of potential habitat for this species. This species has historically been recorded from the north and south of the existing site access road, 	<ul style="list-style-type: none"> Approximately 61.82ha of revegetation/regeneration will be completed in accordance with the Revised Site Regeneration and Revegetation Plan (JWA 2013a) to offset any loss of vegetation and to provide vegetated links across the site. A Potoroo Management Plan has been prepared for this population (Warren <i>et al.</i> 1994). It is a recommendation of this report that the construction of the main access road into the Cobaki Lakes development incorporates a number of underpasses/culverts to encourage movements of potoroos 	<ul style="list-style-type: none"> No known habitat will be removed from the Subject site. 	<ul style="list-style-type: none"> Revegetation works on the Subject site may potentially result in a long-term net gain of up to 61.82ha of forage habitat for the Long-nosed potoroo.

	Potential impacts	Amelioration measures	Proposed mitigation/offset	Net loss/gain
	<p>essentially two small sub-populations. Without mitigation, road kills may significantly affect these populations.</p> <ul style="list-style-type: none"> Predation by domestic cats and dogs is also a potential impact of the development. 	<p>between the two identified sub-populations.</p> <ul style="list-style-type: none"> Predator control fencing along the interface of the development site and potoroo habitat is also recommended. With the adoption of these amelioration measures, it is unlikely that the proposed development will result in the extinction of this Endangered Population. 		
<ul style="list-style-type: none"> Common blossom bat (<i>Syconycteris australis</i>) 	<ul style="list-style-type: none"> This species has not been recorded from the Subject site, however, potential habitat occurs. The proposed development will result in the removal or modification of a total of 3.80 hectares of Swamp sclerophyll forest on floodplain. Given the high mobility of this species, the loss of potential foraging habitat is not considered significant in relation to the regional distribution of habitat for this 	<ul style="list-style-type: none"> Rehabilitation works in accordance with the Revised Site Regeneration and Revegetation Plan (JWA 2013a) will result in the regeneration/revegetation of 6.77 hectares of Swamp sclerophyll forest. These areas may provide additional suitable forage habitat for this species and offset the loss of 3.80ha of potential habitat. 	<ul style="list-style-type: none"> In total, 6.77 ha of vegetation with the potential to provide suitable forage habitat for the Common blossom bat will be regenerated/revegetated on the Subject site (FIGURE 28) to offset the loss of 3.80 hectares. 	<ul style="list-style-type: none"> Revegetation works on the Subject site will result in a long-term net gain of approximately 2.97ha of suitable forage and/or corridor habitat for the Common blossom bat.

Revised Ecological Assessment - Cobaki Lakes

	Potential impacts	Amelioration measures	Proposed mitigation/offset	Net loss/gain
	species.			

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