N

TUGUN

BILINGA

COBAKI
BROADWATER

Legend

- *Archidendron hendersonii*
- *Cryptocarya foetida*
- *Lepiderema pulchella*
- *Macadamia tetraphylla*
- *Syzygium moorei*
- Subject Site

0 500m

1 : 20 000

SOURCE: Tugun Bypass Species Impact Statement (Dec 2004) Figure 4.5

SCALE: 1 : 20 000 @ A3

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Cobaki Lakes, Cobaki, NSW
Shire of Tweed

FIGURE 24

PREPARED: BW
DATE: 30 June 2010
FILE: 97038_EA_Bypass Flora.cdr

TITLE
LOCATION OF THREATENED FLORA ADJACENT TO SUBJECT SITE

TABLE 5
POTENTIAL LOSS OF THREATENED FLORA HABITAT
FROM THE PROPOSED DEVELOPMENT

Species	Existing habitat (ha)	Area to be Removed (ha)	Area to be Removed (%)
White yiel yiel	10.99	0.11	1.0%
Scented acronychia	10.99	0.11	1.0%
Fine-leaved tuckeroo	10.99	0.11	1.0%
Spiny gardenia	10.99	0.11	1.0%
Marblewood	10.99	0.11	1.0%
Brush cassia	10.99	0.11	1.0%
Coolamon	10.99	0.11	1.0%
Green-leaved rose walnut	10.99	0.11	1.0%
White lace flower	10.99	0.11	1.0%
Stinking cryptocarya	10.99	0.11	1.0%
Pink nodding orchid	3.80	3.80	100%
Rough-shelled bush-nut	10.99	0.11	1.0%
Swamp orchid	3.80	3.80	100%

4.2.6.3 Impacts on Threatened Flora

A plan showing the locations of Threatened flora on the Subject site in relation to the proposed development is shown in **FIGURES 25, 25a, 25b & 25c** and a summary of impacts for each species is provided below:

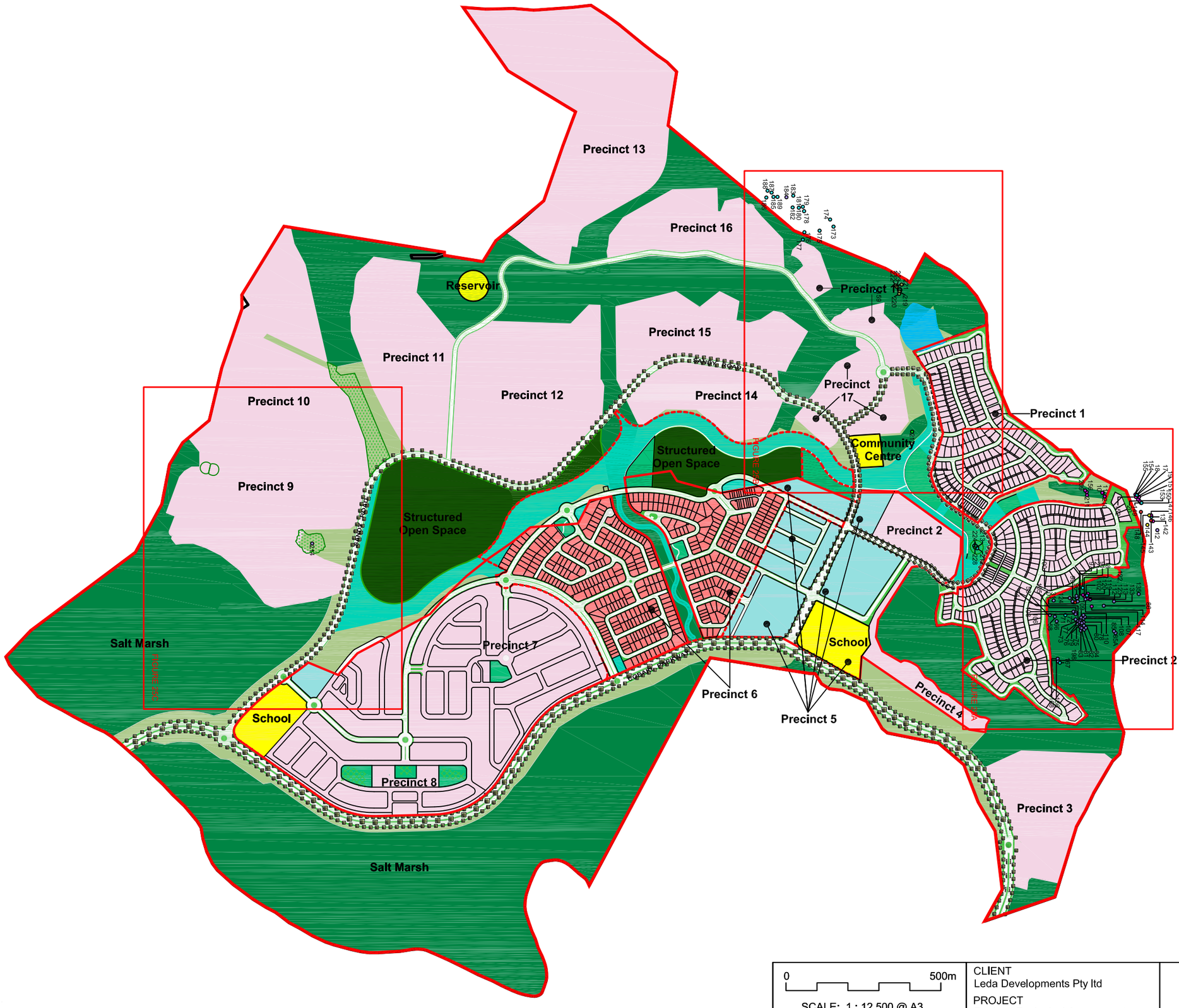
White yiel yiel

The NPWS database (June 2010) contains twenty-four (24) records of this species within 10kms of the Subject site. Twenty-eight (28) records occur within the Tweed LGA. One (1) stem of White yiel yiel have been recorded on the Subject site (**FIGURES 23 & 23a**) within the rainforest communities associated with Mt. Woodgee in the northern portion of the Subject site. Two (2) additional stems of this species have been recorded within the border reserve to the north of the Subject site. This species has also been recorded in adjacent habitat to the east of the Subject site (EcoPro 2004) (**FIGURE 24**).

The single stem of White yiel yiel occurs outside of the proposed development footprint and will not be affected by the proposed development (**FIGURE 25a**).

The proposed development will result in the removal or modification of a total of 0.11 hectares (1%) of rainforest communities that are considered to represent potential habitat for this species, all of which will occur from areas of the site with existing development approvals.

The removal of a small area of potential habitat from the Subject site is not considered to represent a significant impact in relation to the local distribution of habitat for this



LEGEND

- Marblewood (*Acacia bakeri*)
- Fine-leaved tuckeroo (*Lepiderema pulchella*)
- Spiny gardenia (*Randia moorei*)
- Yiel yiel (*Grevillea hilliana*)
- Coolamon (*Syzygium moorei*)
- Brush cassia (*Cassia brewsteri* var. *marksiana*)
- Scented acronychia (*Acronychia littoralis*)
- Green-leaved rose walnut (*Endiandra muelleri* subsp. *bracteata*)
- Precinct 6 Proposed Residential Area (extent of application shown below)
- Precincts 1, 2, 4 and 6 to 8 Zone Boundary
- Extent of Precinct 6 Application
- Future Residential Development
- Future Retail / Commercial / Mixed Use
- Future Community Facilities / Education / Utilities Development
- Existing Water Body
- Stormwater Treatment and Delivery Areas
- Cultural Protected Area
- Covenant Protected Area
- Environmental Protection Area
- Open Space
- Casual Park
- Structured Open Space
- 2.5m Shared User Path/Maintenance Access
- Site Outline

SOURCE:
Flora - James Warren & Associates Pty Ltd
June/July 2004, July 2006, July/Sept 2007 & Feb 2008
Layout - Design Forum Architects
(Ref: DA 01.01 E Master Plan.dwg)

0 500m

SCALE: 1 : 12 500 @ A3

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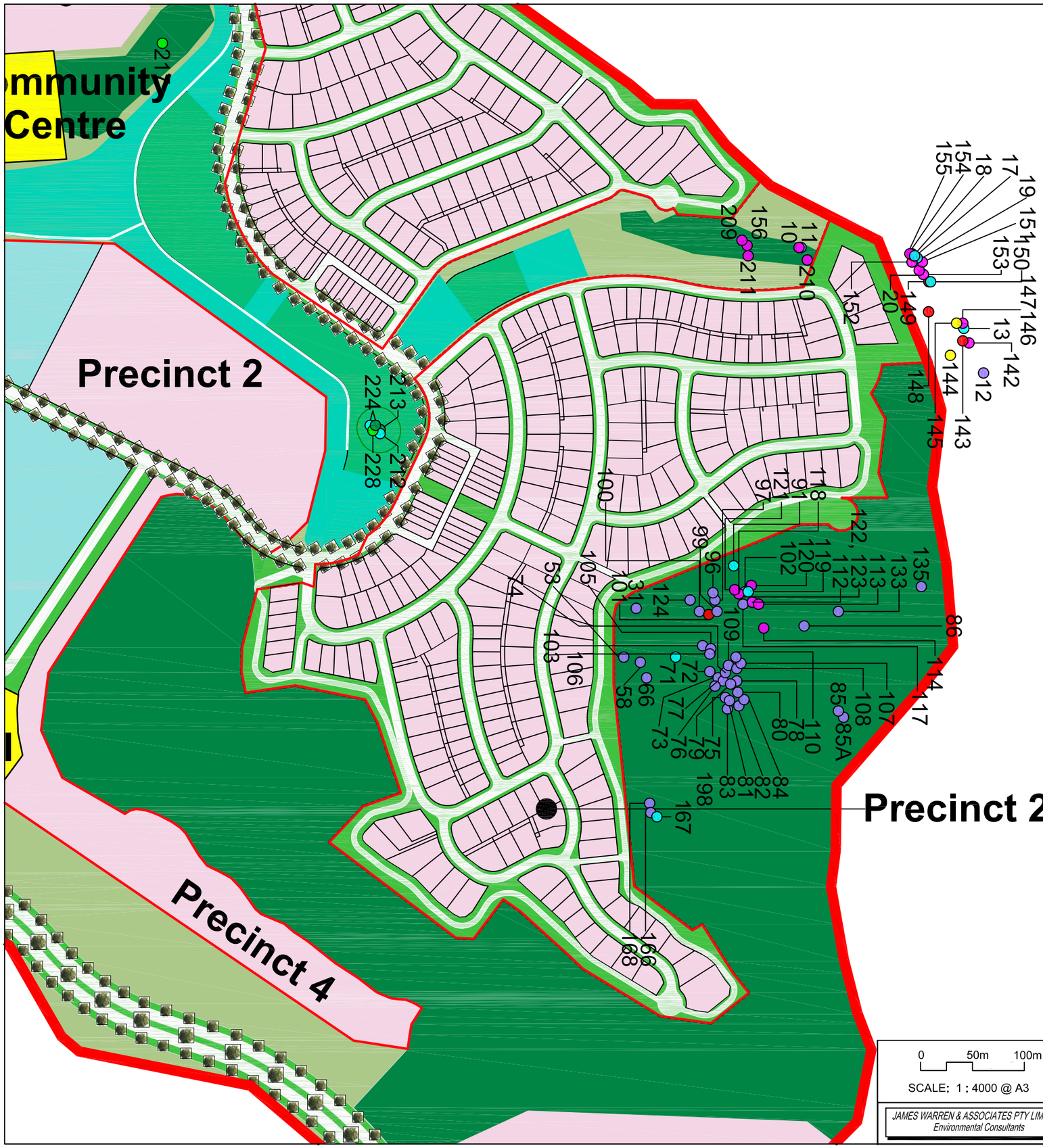
Tweed Shire Council

FIGURE 25

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

TITLE
IMPACT ON THREATENED FLORA



N

LEGEND

- Marblewood (*Acacia bakeri*)
- Fine-leaved tuckeroo (*Lepiderema pulchella*)
- Spiny gardenia (*Randia moorei*)
- Yiel yiel (*Grevillea hilliana*)
- Coolamon (*Syzygium moorei*)
- Brush cassia (*Cassia brewsteri* var. *marksiana*)
- Scented acronychia (*Acronychia littoralis*)
- Green-leaved rose walnut (*Endiandra muelleri* subsp. *bracteata*)
- Precinct 6 Proposed Residential Area (extent of application shown below)
- Precincts 1, 2, 4 and 6 to 8 Zone Boundary
- Extent of Precinct 6 Application
- Future Residential Development
- Future Retail / Commercial / Mixed Use
- Future Community Facilities / Education / Utilities Development
- Existing Water Body
- Stormwater Treatment and Delivery Areas
- Cultural Protected Area
- Covenant Protected Area
- Environmental Protection Area
- Open Space
- Casual Park
- Structured Open Space
- 2.5m Shared User Path/Maintenance Access
- Site Outline

SOURCE:
Flora - James Warren & Associates Pty Ltd
June/July 2004, July 2006, July/Sept 2007 & Feb 2008
Layout - Design Forum Architects
(Ref: DA 01.01 E Master Plan.dwg)

0 50m 100m

SCALE: 1 : 4000 @ A3

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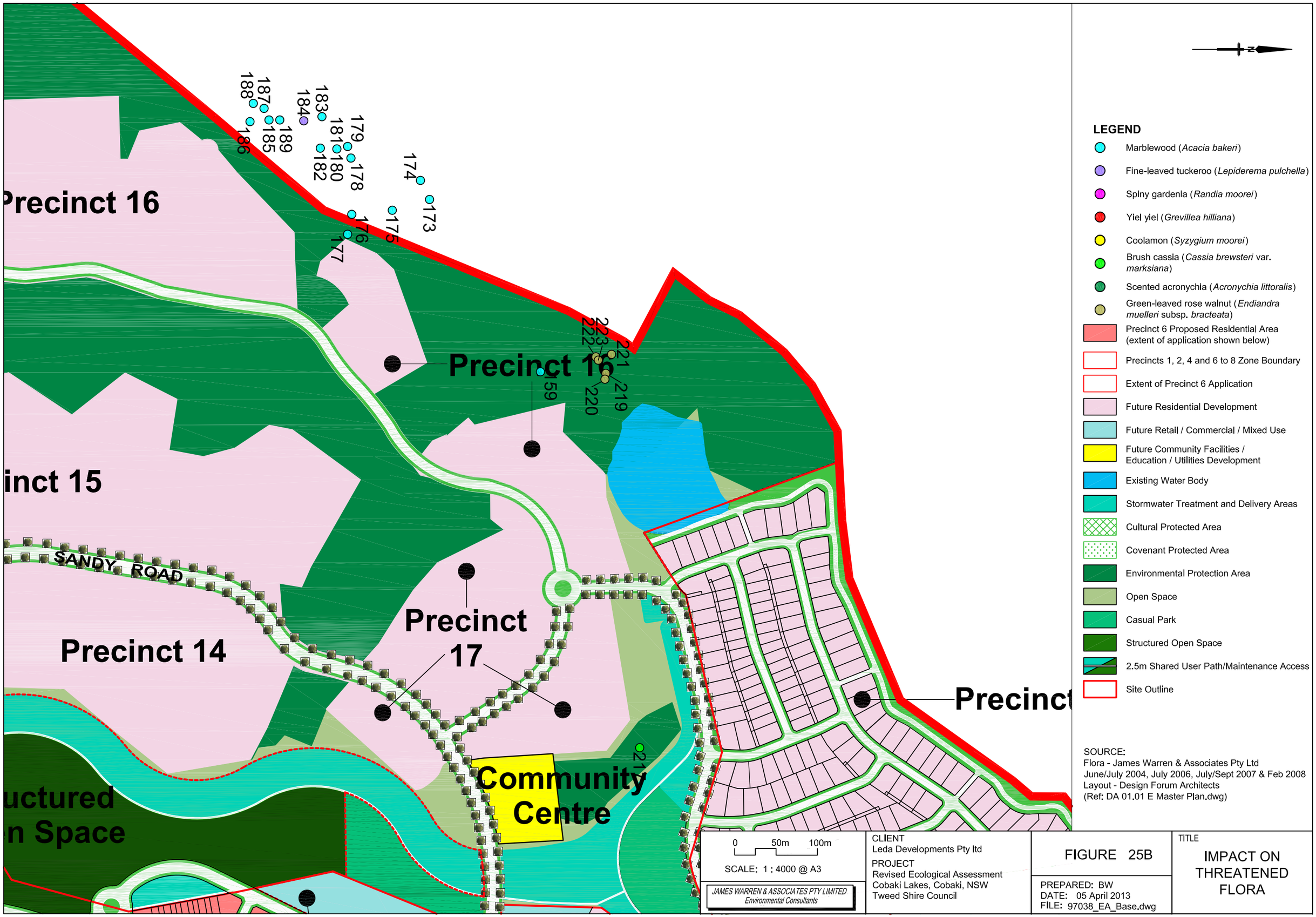
Cobaki Lakes, Cobaki, NSW
Tweed Shire Council

FIGURE 25A

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

TITLE
IMPACT ON THREATENED FLORA


Precinct 16
Precinct 15
Precinct 14
Precinct 17
Precinct 1
Precinct
Community Centre
SANDY ROAD
uctured
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N
LEGEND
Marblewood (Acacia bakeri)
Fine-leaved tuckeroo (Lepiderema pulchella)
Spiny gardenia (Randia moorei)
Yiel yiel (Grevillea hilliana)
Coolamon (Syzygium moorei)
Brush cassia (Cassia brewsteri var. marksiana)
Scented acronychia (Acronychia littoralis)
Green-leaved rose walnut (Endiandra muelleri subsp. bracteata)
Precinct 6 Proposed Residential Area (extent of application shown below)
Precincts 1, 2, 4 and 6 to 8 Zone Boundary
Extent of Precinct 6 Application
Future Residential Development
Future Retail / Commercial / Mixed Use
Future Community Facilities / Education / Utilities Development
Existing Water Body
Stormwater Treatment and Delivery Areas
Cultural Protected Area
Covenant Protected Area
Environmental Protection Area
Open Space
Casual Park
Structured Open Space
2.5m Shared User Path/Maintenance Access
Site Outline
SOURCE:
Flora - James Warren & Associates Pty Ltd
June/July 2004, July 2006, July/Sept 2007 & Feb 2008
Layout - Design Forum Architects
(Ref: DA 01.01 E Master Plan.dwg)
0
50m
100m
SCALE: 1 : 4000 @ A3
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Revised Ecological Assessment
Cobaki Lakes, Cobaki, NSW
Tweed Shire Council
FIGURE 25B
PREPARED: BW
DATE: 05 April 2013
FILE: 97038_EA_Base.dwg
TITLE
IMPACT ON THREATENED FLORA

Precinct 10

Precinct 9

Salt Marsh

Structur
Open Spa

ANDY ROAD

214

N

LEGEND

- Marblewood (*Acacia bakeri*)
- Fine-leaved tuckeroo (*Lepiderema pulchella*)
- Spiny gardenia (*Randia moorei*)
- Yiel yiel (*Grevillea hilliana*)
- Coolamon (*Syzygium moorei*)
- Brush cassia (*Cassia brewsteri* var. *marksiana*)
- Scented acronychia (*Acronychia littoralis*)
- Green-leaved rose walnut (*Endiandra muelleri* subsp. *bracteata*)
- Precinct 6 Proposed Residential Area (extent of application shown below)
- Precincts 1, 2, 4 and 6 to 8 Zone Boundary
- Extent of Precinct 6 Application
- Future Residential Development
- Future Retail / Commercial / Mixed Use
- Future Community Facilities / Education / Utilities Development
- Existing Water Body
- Stormwater Treatment and Delivery Areas
- Cultural Protected Area
- Covenant Protected Area
- Environmental Protection Area
- Open Space
- Casual Park
- Structured Open Space
- 2.5m Shared User Path/Maintenance Access
- Site Outline

SOURCE:
Flora - James Warren & Associates Pty Ltd
June/July 2004, July 2006, July/Sept 2007 & Feb 2008
Layout - Design Forum Architects
(Ref: DA 01.01 E Master Plan.dwg)

0 50m 100m

SCALE: 1 : 4000 @ A3

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Tweed Shire Council

FIGURE 25C

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

TITLE
IMPACT ON THREATENED FLORA

species. It is considered that the proposed development is highly unlikely to result in the local extinction of this species.

Scented acronychia

The NPWS database (June 2010) contains nine (9) records of this species within 10kms of the Subject site. Thirty-two (32) records occur within the Tweed LGA. A total of one (1) stem of Scented acronychia has been recorded from within a small isolated clump of vegetation in the central northern portion of the Subject site **FIGURES 23 & 23a**).

The Concept Plan has been amened to include this small patch of vegetation, including the single stem of Scented acronychia, within an area of Public Open Space (**FIGURE 25a**). Furthermore, it is proposed to protect this patch of vegetation under an Environmental Covenant.

The proposed development will result in the removal or modification of a total of 0.11 hectares (1%) of rainforest communities that are considered to represent potential habitat for this species, all of which will occur from areas of the site with existing development approvals.

The potential removal of a small area of potential habitat from the Subject site is not considered to represent a significant impact in relation to the local distribution of habitat for this species. It is considered that the proposed development is highly unlikely to result in the local extinction of this species.

Fine-leaved tuckeroo

The NPWS database (June 2010) contains one hundred and four (104) records of this species within 10kms of the Subject site. One hundred and fifty-five (155) records occur within the Tweed LGA. A total of thirty-six (36) stems of Fine-leaved tuckeroo have been recorded on the Subject site (**FIGURES 23, 23a, 23b & 23c**), the majority of which occur within the rainforest communities associated with Mt. Woodgee in the northern portion of the Subject site. One (1) stem occurs within a small isolated patch of rainforest in the central southern portion of the Subject site (i.e. Community 2b). This species has also been recorded in adjacent habitat to the east of the Subject site (EcoPro 2004) (**FIGURE 24**).

All stems of Fine-leaved tuckeroo occur outside of the proposed development footprint and will not be affected by the proposed development (**FIGURE 25a, 25b & 25c**). The small isolated patch of rainforest in the central southern portion of the Subject site (i.e. Community 2b) will be retained and protected by an Environmental covenant.

The proposed development will result in the removal or modification of a total of 0.11 hectares (1%) of rainforest communities that are considered to represent potential habitat for this species, all of which occurs in areas of the site which have existing development approvals. This species is particularly common within the locality with several hundred having been recorded by JWA at Terranora and Bilambil.

The removal of a small area of potential habitat, from the Subject site is not considered to represent a significant impact in relation to the local distribution of habitat for this species. It is considered that the proposed development is highly unlikely to result in the local extinction of this species.

Spiny gardenia

The NPWS database (June 2010) contains forty-two (42) records of this species within 10kms of the Subject site. Eighty-three (83) records occur within the Tweed LGA. A total of twelve (12) stems of Spiny gardenia have been recorded on the Subject site (**FIGURES 23 & 23a**) the majority of which occur within the rainforest communities associated with Mt. Woodgee and in a small riparian community (near Mt. Woodgee) in the northern portion of the Subject site. Six (6) additional stems of this species have been recorded within the border reserve to the north of the Subject site.

All Spiny gardenia stems occur outside of the proposed development footprint and will not be affected by the proposed development (**FIGURE 25a**).

The proposed development will result in the removal or modification of a total of 0.11 hectares (1%) of rainforest communities that are considered to represent potential habitat for this species, all of which occurs in areas of the site which have existing development approvals.

The removal of a small area of potential habitat from the Subject site is not considered to represent a significant impact in relation to the local distribution of habitat for this species. It is considered that the proposed development is highly unlikely to result in the local extinction of this species.

Marblewood

The NPWS database (June 2010) contains thirty (30) records of this species within 10kms of the Subject site. One hundred and nineteen (119) records occur within the Tweed LGA. A total of eight (8) stems of Marblewood have been recorded on the Subject site (**FIGURES 23, 23a & 23b**) from within the rainforest communities associated with Mt. Woodgee in the northern portion of the Subject site, and within small isolated patches of vegetation in the central northern portion of the site. A number of specimens are also located within the steep-sided gullies near the dam on the western boundary of the Subject site. Fourteen (14) additional stems of this species have been recorded adjacent to the western boundary and three (3) additional stems within the border reserve to the north.

All stems of Marblewood occur outside of the proposed development footprint and will not be affected by the proposed development (**FIGURES 25a & 25b**).

The proposed development will result in the removal or modification of a total of 0.11 hectares (1%) of rainforest communities that provide potential habitat for this species, all of which occurs in areas of the site which have existing development approvals.

The removal of a small area of potential habitat from the Subject site is not considered to represent a significant impact in relation to the local distribution of habitat for this species. It is considered that the proposed development is highly unlikely to result in the local extinction of this species.

Brush cassia

The NPWS database (June 2010) contains twenty-six (26) records of this species within 10kms of the Subject site. One hundred and nine (109) records occur within the Tweed LGA. A total of two (2) stems of Brush cassia have been recorded on the Subject site

(**FIGURES 23, 23a & 23b**) from within small isolated patches of vegetation and riparian areas in the central northern portion of the site.

The Concept Plan has been amended to include these isolated patches of vegetation containing the Brush cassia within areas either designated as Environmental Protection Area or to be retained under Environmental covenant (**FIGURES 25a & 25b**).

The proposed development will result in the removal or modification of a total of 0.11 hectares (1%) of potential habitat for this species, all of which occurs in areas of the site which have existing development approvals.

The removal of a small area of potential habitat from the Subject site is not considered to represent a significant impact in relation to the local distribution of habitat for this species. It is considered that the proposed development is highly unlikely to result in the local extinction of this species.

Coolamon

The NPWS database (June 2010) contains forty-five (45) records of this species within 10kms of the Subject site. One hundred and ninety-five (195) records occur within the Tweed LGA. No specimens of Coolamon have been recorded on the Subject site, however, two (2) Coolamons have been recorded within the border reserve to the north of the Subject site (**FIGURES 23 & 23a**).

The proposed development is considered unlikely to impact on the Coolamons which occur adjacent to the Subject site (**FIGURE 25a**).

The proposed development will result in the removal or modification of a total of 0.11 hectares (1%) of rainforest communities considered to represent potential habitat for this species, all of which occurs in areas of the site which have existing development approvals.

The removal of a small area of potential habitat from the Subject site is not considered to represent a significant impact in relation to the local distribution of habitat for this species.

Green-leaved rose walnut

The NPWS database (June 2010) contains six (6) records of this species within 10kms of the Subject site. Thirty-nine (39) records occur within the Tweed LGA. A total of five (5) stems of Green-leaved rose walnut have been recorded on the Subject site (**FIGURES 23 & 23b**) from within the steep-sided gullies near the dam on the western boundary of the Subject site. This species has also been recorded in adjacent habitat to the east of the Subject site (EcoPro 2004) (**FIGURE 24**).

None of the Green-leaved rose walnuts occur within the proposed development footprint (**FIGURE 25b**).
The proposed development will result in the removal or modification of a total of 0.11 hectares (1%) of rainforest communities considered to represent potential habitat for this species, all of which occurs in areas of the site which have existing development approvals.

The removal of a small area of potential habitat from the Subject site is not considered to represent a significant impact in relation to the local distribution of habitat for this species. It is considered that the proposed development is highly unlikely to result in the local extinction of this species.

White lace flower

The NPWS database (June 2010) contains sixteen (16) records of this species within 10kms of the Subject site. Twenty-seven (27) records occur within the Tweed LGA. This species has been recorded from rainforest communities adjacent to the Subject site (EcoPro 2004) (**FIGURE 24**). However, extensive searches on the Subject site (JWA 2000 – 2007) have failed to record this species.

Suitable habitat for the White lace flower is considered to be comprised of undisturbed riverine and lowland subtropical rainforest communities on and adjacent to the Subject site. The proposed development will result in the removal or modification a total of 0.11 hectares (1%) of potential habitat for this species, all of which occurs in areas of the site which have existing development approvals.

The removal of a small area of potential habitat from the Subject site is not considered to represent a significant impact in relation to the local distribution of habitat for this species. It is considered that the proposed development is highly unlikely to result in the local extinction of this species.

Stinking cryptocarya

The NPWS database (June 2010) contains forty-three (43) records of this species within 10kms of the Subject site. Seventy-two (72) records occur within the Tweed LGA. This species has been recorded from rainforest communities adjacent to the Subject site (EcoPro 2004) (**FIGURE 24**). However, extensive searches on the Subject site (JWA 2000 – 2007) have failed to record this species.

Suitable habitat for this species is considered to be comprised of undisturbed riverine and lowland subtropical rainforest communities on and adjacent to the Subject site. The proposed development will result in the removal or modification a total of 0.11 hectares (1%) of potential habitat for this species, all of which occurs in areas of the site which have existing development approvals.

The removal of a small area of potential habitat from the Subject site is not considered to represent a significant impact in relation to the local distribution of habitat for this species. It is considered that the proposed development is highly unlikely to result in the local extinction of this species.

Pink nodding orchid

The NPWS database (June 2010) contains seven (7) records of this species within 10kms of the Subject site. Seventeen (17) records occur within the Tweed LGA. This species has been recorded from Swamp forest adjacent to the Subject site (EcoPro 2004) (**FIGURE 24**). However, extensive searches on the Subject site (JWA 2000 – 2007) have failed to record this species.

Suitable habitat for this species is considered to be comprised of undisturbed dry eucalypt forest and coastal swamp forest at lower altitudes on and adjacent to the Subject site. The proposed development will result in the removal or modification a total of 3.8 hectares of potential habitat for this species, all of which occurs in areas of the site which have existing development approvals.

The removal of a small area of potential habitat from the Subject site is not considered to represent a significant impact in relation to the local distribution of habitat for this species. It is considered that the proposed development is highly unlikely to result in the local extinction of this species.

Rough-shelled bush-nut

The NPWS database (June 2010) contains seventy-seven (77) records of this species within 10kms of the Subject site. One hundred and seventy (170) records occur within the Tweed LGA. This species has been recorded from rainforest communities adjacent to the Subject site (EcoPro 2004) (**FIGURE 24**). However, extensive searches on the Subject site (JWA 2000 – 2007) have failed to record this species.

Suitable habitat for this species is considered to be comprised of undisturbed subtropical rainforest communities on and adjacent to the Subject site. The proposed development will result in the removal or modification a total of 0.11 hectares (1%) of potential habitat for this species, all of which occurs in areas of the site which have existing development approvals.

The removal of a small area of potential habitat from the Subject site is not considered to represent a significant impact in relation to the local distribution of habitat for this species. It is considered that the proposed development is highly unlikely to result in the local extinction of this species.

Swamp orchid

The NPWS database (June 2010) contains two (2) records of this species within 10kms of the Subject site. Four (4) records occur within the Tweed LGA. This species has been recorded from Swamp forest adjacent to the Subject site (EcoPro 2004) (**FIGURE 24**). However, extensive searches on the Subject site (JWA 2000 – 2007) have failed to record this species.

Suitable habitat for the Swamp orchid is considered to be comprised of undisturbed swamp sclerophyll forest communities on and adjacent to the Subject site. The proposed development will result in the removal or modification a total of 3.8 hectares of potential habitat for this species, all of which occurs in areas of the site which have existing development approvals.

The removal of a small area of potential habitat from the Subject site is not considered to represent a significant impact in relation to the local distribution of habitat for this species. It is considered that the proposed development is highly unlikely to result in the local extinction of this species.

4.2.6.4 Amelioration for Threatened flora

The major amelioration strategy for Threatened flora species on the Subject site is the retention and long-term protection of suitable habitat within Environmental Protection Areas.

All of the Threatened plants recorded on and adjacent to the Subject site, with the exception of the Swamp orchid and the Pink nodding orchid, are typical of lowland rainforest. Approximately 10.88 hectares (99%) of lowland rainforest communities occurring on the Subject site will be retained, and an additional 13.30 hectares of land is proposed to be rehabilitated as lowland rainforest in accordance with the Revised Site Regeneration and Revegetation Plan (JWA 2013a). This will ensure a net gain of 13.19ha of suitable habitat for the majority of Threatened flora species on the Subject site. Furthermore, 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. Rehabilitation of lowland rainforest communities is discussed further in Section 4.2.6.6.

The Swamp orchid and the Pink nodding orchid have been recorded adjacent to the Subject site and are typical of swamp sclerophyll forest communities. The entire area of existing Swamp sclerophyll forest on coastal floodplain will be lost from the Subject site. 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 common agricultural weeds in the groundcover layer.

In total, 6.77 hectares of Swamp sclerophyll forest will be regenerated/revegetated on the Subject site in accordance with the Revised Site Regeneration and Revegetation Plan (JWA 2013a) to offset the loss of 3.8 hectares. This will ensure a net gain of 2.97ha of suitable habitat for these Threatened flora species. Furthermore, 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. Rehabilitation of Swamp sclerophyll forest communities is discussed further in Section 4.2.6.6.

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. The rationale and methodology of Threatened plant propagation will be detailed within individual regeneration and revegetation plans to be completed for each of the rehabilitation precincts (in accordance with the Revised Site Regeneration and Revegetation Plan – JWA 2013a) at the Operational Works stage.

As a minimum, every retained Threatened plant on the Subject site will be provided with a 5m vegetated buffer.

4.2.6.5 Impacts on Endangered Ecological Communities

Six (6) Endangered Ecological Communities (EEC's) have been recorded on the Subject site, including:

- Swamp sclerophyll forest on coastal floodplain - which occurs as an isolated clump of scattered Swamp mahogany in the central eastern of the Subject site;

- Lowland rainforest on floodplain - occurring at various locations generally in association with drainage lines and depressions;
- Lowland rainforest - occurring on Mt. Woodgee and on lower slopes in the northern portion of the Subject site;
- Freshwater wetlands - occurring in the central and eastern portions of the site;
- Swamp oak floodplain forest – occurring in association with drainage lines in the south-east of the site; and
- Coastal saltmarsh in the NSW North Coast bioregion - occurring in the south-east of the site.

The locations of these EEC's are shown in **FIGURE 26.** The potential impacts of the proposed development on EEC's recorded on the site are discussed briefly below. A plan showing the locations of EEC's in relation to the proposed development is shown in **FIGURE 27**. A summary of the impacts on EEC's is provided in **TABLE 6.**

TABLE 6
POTENTIAL LOSS OF EEC'S FROM THE PROPOSED DEVELOPMENT

Existing EEC	TOTAL AREA (ha)	Area to be Removed (ha)	Area to be Removed (%)
Swamp Sclerophyll Forest on Coastal Floodplain	3.80	3.80	100%
Lowland Rainforest on Floodplain	1.75	0.01	0.57%
Lowland Rainforest	9.24	0.10	1.08%
Freshwater Wetland	35.39	24.12	68.15%
Swamp oak floodplain forest	4.52	0.73	16.15%
Saltmarsh	54.63	9.69	17.73%

Swamp sclerophyll forest on coastal floodplain

This EEC occurs in the central eastern potion of the Subject site and is comprised of approximately 3.80 hectares of Mid-high open woodland (*Eucalyptus robusta*) (**FIGURE 26**).

The entire area of existing Swamp sclerophyll forest on coastal floodplain will be lost from the Subject site (**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 common agricultural weeds in the groundcover layer. The Mid-high open woodland (*E. robusta*) community on the Subject site is therefore generally comprised of scattered trees within a slashed/grazed grassland environment.

The removal of this vegetation community will occur from an area of the site, which has an existing development approval. The removal of this small area of degraded Swamp sclerophyll forest on coastal floodplain from the Subject site is not considered to represent a significant impact in relation to the local distribution of this community. Offsets to ensure no net loss are discussed in Section 4.2.6.6.

N

LEGEND

- Lowland Rainforest
- Lowland Rainforest on Floodplain
- Swamp Sclerophyll Forest on Floodplain
- Swamp Oak Floodplain Forest
- Freshwater Wetland (Degraded)
- Saltmarsh
- Site Outline

SOURCE:
EEC's - James Warren & Associates Pty Ltd
Aerial - Michel Group Services (Ref: 6400-197.dwg)
- photo taken March 2010

0 500m

SCALE: 1 : 12 500 @ A3

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

FIGURE 26

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

TITLE
ENDANGERED ECOLOGICAL COMMUNITIES

N

LEGEND

- Lowland Rainforest
- Lowland Rainforest on Floodplain
- Swamp Sclerophyll Forest on Floodplain
- Swamp Oak Floodplain Forest
- Freshwater Wetland (Degraded)
- Saltmarsh
- Proposed Development Areas
- Site Outline

SOURCE:
EEC's - James Warren & Associates Pty Ltd
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

0 500m

SCALE: 1 : 12 500 @ A3

JAMES WARREN & ASSOCIATES PTY LIMITED
Environmental Consultants

CLIENT
Leda Developments Pty ltd

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

FIGURE 27

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

TITLE
IMPACT ON ENDANGERED ECOLOGICAL COMMUNITIES

Lowland rainforest on floodplain

This EEC occurs as several isolated patches of forest in the southern and northern portions of the Subject site generally in association with drainage lines and depressions (i.e. riparian forest) (**FIGURE 26**). Lowland rainforest on floodplain covers a total area of approximately 1.75 hectares on the Subject site.

In total, 0.01 hectares of Lowland rainforest on floodplain (0.57%) will be lost from the Subject site (**FIGURE 27**), all of which occurs within portions of the site with existing development approvals.

The conservation significance of these communities has been compromised by historical clearing activities which have resulted in the fragmentation of rainforest communities. The removal of this small area of degraded Lowland rainforest on floodplain from the Subject site is not considered to represent a significant impact in relation to the local distribution of this community. Offsets to ensure no net loss are discussed in Section 4.2.6.6.

Lowland rainforest

This EEC occurs on Mt. Woodgee and associated slopes in the northern portion of the Subject site (**FIGURE 26**) and covers a total area of approximately 9.24 hectares. Vegetation on Mt. Woodgee (i.e. Community 2a) is relatively intact and is considered to represent one of the most ecologically significant vegetation communities on the Subject site, particularly in terms of habitat value for Threatened flora species.

Approximately 0.1 hectares of this EEC (1.1%) will be lost from the Subject site (**FIGURE 27**), all of which occurs within portions of the site with existing development approvals. The removal of this small area of Lowland rainforest from the Subject site is not considered to represent a significant impact in relation to the local distribution of this community. Offsets to ensure no net loss are discussed in Section 4.2.6.6.

Freshwater wetlands

This EEC is comprised of areas of Rushland/Sedgeland/Grassland (i.e. Community 12) on the Subject site covering a total area of approximately 35.39 hectares (**FIGURE 26**). The large area of Freshwater wetland in the central portion of the site has been heavily degraded by past and existing land use including drain construction and maintenance, grazing and slashing. Scattered patches of this EEC also occur in the eastern portions of the site, which are generally dominated by Saltmarsh communities. It is likely that the freshwater communities in this portion of the site are occurring as a result of historical changes to the tidal inundation in this portion of the site.

In total, 24.12 hectares of Freshwater wetland (68.15%) will be lost from the Subject site as a direct result of the proposed development (**FIGURE 27**). Furthermore, it is proposed to restore the natural tidal regime in the eastern portion of the Subject site with the intention of returning the entire area to its original Saltmarsh status.

The removal of areas of highly degraded Freshwater wetland from the Subject site is not considered to represent a significant impact in relation to the local distribution of this community. Offsets to ensure no net loss are discussed in Section 4.2.6.6.

Swamp oak floodplain forest

This EEC occurs in the south-eastern portion of the Subject site in association with drainage lines and covers an area of approximately 4.52 hectares (**FIGURE 26**). This community occurs in an area that is currently subject to tidal inundation via the main constructed drain in this portion of the site (i.e. Dunn's drain) and also through a breach in the constructed levy bank adjacent to the creek. This community occurs as linear stands of trees along the edges of constructed drains. Additionally, this area is currently actively grazed by cattle under existing use rights (i.e. routine agricultural activities) which has resulted in the prevalence of introduced grasses and common agricultural weeds in some areas.

In total, 0.73 hectares of Swamp oak floodplain (16.15%) will be lost from the Subject site (**FIGURE 27**). The removal of this small area of Swamp oak floodplain forest from the Subject site is not considered to represent a significant impact in relation to the local distribution of this community. Offsets to ensure no net loss are discussed in Section 4.2.6.6.

Coastal saltmarsh in the NSW North Coast bioregion

This EEC occurs in the south-eastern potion of the Subject site adjacent to Cobaki Creek and covers an area of approximately 54.63 hectares (**FIGURE 26**). This area is currently subject to tidal inundation via the main constructed drain in this portion of the site (i.e. Dunn's drain) and also through a breach in the constructed levy bank adjacent to the creek. This area is currently actively grazed by cattle, and slashed in some areas, under existing use rights (i.e. routine agricultural activities). This has resulted in the prevalence of introduced grasses and common agricultural weeds in some areas.

In total, 9.69 hectares of Coastal saltmarsh (17.73%) will be lost from the Subject site (**FIGURE 27**). The removal of this small area of degraded Coastal saltmarsh from the Subject site is not considered to represent a significant impact in relation to the local distribution of this community. Offsets to ensure no net loss are discussed in Section 4.2.6.6.

4.2.6.6 Amelioration for Endangered Ecological Communities

The major amelioration strategy for EEC's on the Subject site is the retention and long-term protection of these vegetation communities where possible within Environmental Protection Areas.

The Revised Site Regeneration and Revegetation Plan (JWA 2013a) outlines the various measures to ensure that the retained EEC's are adequately managed. Furthermore, revegetation/regeneration will be completed in accordance with this plan to offset any loss of EEC's (**FIGURE 28**). A summary of proposed EEC offsets is provided in **TABLE 7.**

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: