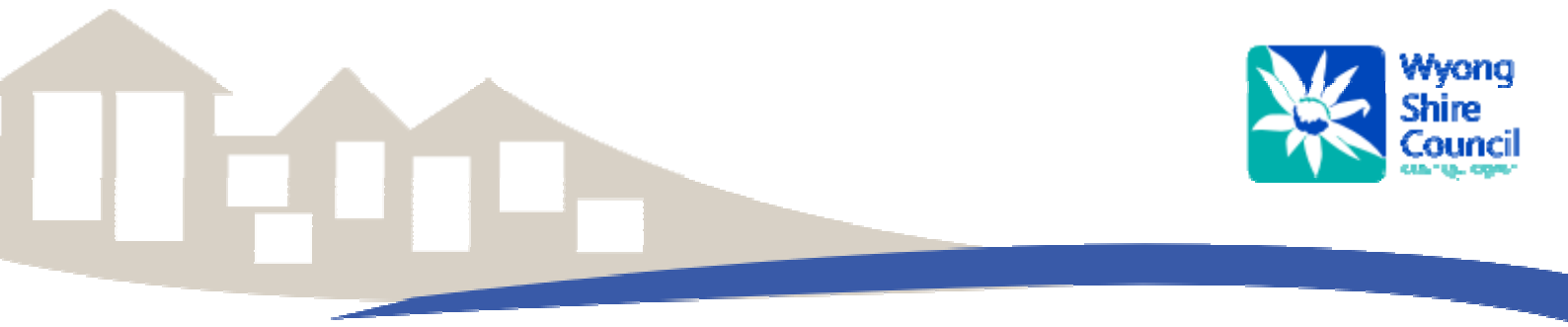


Wyong Shire Council

## **ORDINARY MEETING**

## **ENCLOSURES**

**Wednesday, 9 November, 2011**



**WYONG SHIRE COUNCIL**  
ENCLOSURES TO THE  
**ORDINARY MEETING**  
TO BE HELD IN THE COUNCIL CHAMBER,  
WYONG CIVIC CENTRE, HELY STREET, WYONG  
ON WEDNESDAY, 9 NOVEMBER 2011 ,  
COMMENCING AT 5:00:00 PM

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## Biodiversity Certification Assessment Report for the Warnervale Town Centre (WTC)

**FINAL**

Prepared for  
Wyong Shire Council (WSC)

21 October 2011



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 Biocertification Assessment of Warnervale Town Centre
 

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**DOCUMENT TRACKING**

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## Abbreviations

ABBREVIATION	DESCRIPTION
ARA	Adjacent Remnant Area
BCAA	Biodiversity Certification Assessment Area
BCAM	Biodiversity Certification Assessment Methodology
DECCW	Department of Environment, Climate Change and Water (now OEH)
EEC	Endangered Ecological Community
ELA	Eco Logical Australia
OEH	Office of Environment and Heritage (formerly DECCW)
RFEF	River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions
SSF	Swamp Sclerophyll Forest (Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregion)
TSPD	Threatened Species Profile Database
WEZ	Wyang Employment Zone
WSC	Wyang Shire Council
WTC	Warnervale Town Centre

# 1 Introduction

## 1.1 PROJECT BACKGROUND

The NSW Office of Environment and Heritage (OEH- formerly the Department of Environment, Climate Change and Water) has recently finalised the methodology to be applied to Biodiversity Certification (Biocertification) applications throughout NSW, known as the Biodiversity Certification Assessment Methodology (DECCW 2011). Eco Logical Australia (ELA) were commissioned by Wyong Shire Council (WSC) to apply the Biodiversity Certification Assessment Methodology (BCAM) to assess the Warnervale Town Centre (WTC) proposed rezoning.

This assessment of the WTC Biodiversity Certification Assessment Area (BCAA) has been completed using field and desktop assessment methods, utilising existing information in previous flora and fauna assessment reports, databases and vegetation mapping products where possible. Additional site survey, limited predominantly to biometric vegetation transects/plots and opportunistic threatened species observations, has been undertaken by ELA for this project.

## 1.2 BIODIVERSITY CERTIFICATION ASSESSMENT AREA

The Warnervale Town Centre BCAA is located on the NSW Central Coast, in the Wyong Local Government Area (Figure 1). The site is located east of Tuggerah Lake, approximately 12 kilometres from the coast. The WTC is 113.4 hectares in size. It is bounded by Sparks Road in the south, Hakone Road in the north and Hiawatha Road in the east. The site is dissected by the main northern railway.

## 1.3 CONDITIONS OF BIOCERTIFICATION

The information provided in this report outlines the credits required, and generated, on the Warnervale Town Centre Biodiversity Certification Assessment Area, which Wyong Council wishes to Biodiversity Certify under the new Part 7AA of the *Threatened Species Conservation Act 1995*. Biodiversity Certification will only be conferred on land where the Minister makes a determination that the application improves or maintains biodiversity values.

Should Biodiversity Certification be conferred on the WTC BCAA, Section 126I of the *Threatened Species Conservation Act 1995* states that projects carried out on biodiversity certified lands do not require an assessment of the impact of the project on biodiversity values (State Significant Developments under the Planning Act), or are considered not likely to significantly affect any threatened species, population or ecological community, or its habitat (Part 4 and 5 of the Planning Act). Therefore, should either of the sites be biodiversity certified, additional flora and fauna survey, assessment and seven part tests will not be required where development is consistent with the Biodiversity Certification Order (to be drafted).

Biocertification Assessment of Warnervale Town Centre

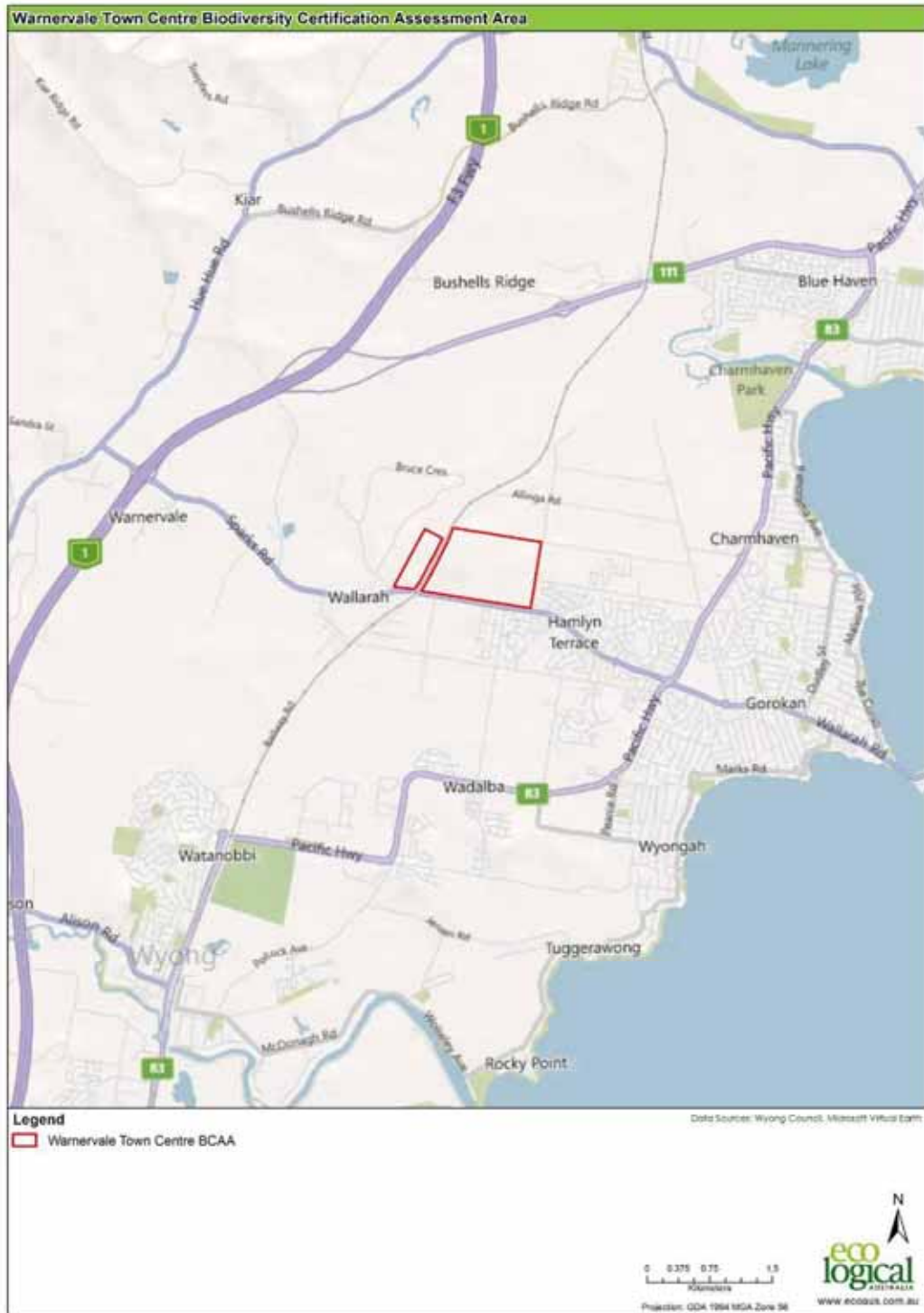


Figure 1: Warnervale Town Centre Biodiversity Certification Assessment Area

## 2 Methods

### 2.1 FIELD ASSESSMENT

The WTC BCAA has a long history of previous ecological assessments including studies by Bell and Murray (2004) and ELA (2005, 2008, 2010). A comprehensive flora and fauna study was undertaken for the study site (Bell and Murray 2004), and included a range of survey techniques including plot and transect based flora surveys, targeted threatened species survey, vegetation mapping, diurnal and nocturnal fauna surveys, trapping and spotlighting.

Bell and Murray (2004) conducted 14 visits to the broader WTC study area (11 of which occur within the Biodiversity Certification Assessment Area) to complete flora surveys, including general reconnaissance, targeted terrestrial orchid surveys, other cryptic species survey and plot based surveys. Surveys included reconnaissance, targeted survey and random meander techniques, with plot data collected undertaken within 0.04ha quadrats (Figure 2). General reconnaissance was conducted on the site in August 2003, whilst targeted flora surveys were conducted between September 2003 and February 2004.

Bell and Murray (2004) also conducted a significant assessment of threatened fauna, with surveys undertaken by targeting the following fauna groups; birds, mammals, reptiles and amphibians. Survey sites were established to sample each fauna habitat type. Three survey sites within the current WTC site were surveyed, along with two other sites that are located outside the current BCAA (Figure 2). Fauna surveys were conducted in October and November 2003.

In addition to the general fauna survey sites Bell and Murray (2004) also conducted targeted fauna surveys for a number of threatened fauna species considered likely to occur within the study area. Surveys completed include (Bell and Murray (2004)):

- *Bird surveys, including diurnal 20 minute census recording all bird species observed or heard at each survey site, opportunistic sampling whilst undertaking other activities and nocturnal census involving quiet listening for calls of nocturnal birds followed by playback of prerecorded calls of threatened owls;*
- *Surveys for the presence of mammals including trapping for small terrestrial and arboreal mammals, spotlighting for terrestrial and arboreal mammals, examination of scratch marks on tree trunks, searches for characteristic diggings, burrows and other indirect evidence including collection of scats and analysis of hair samples collected in hair tubes;*
- *Trapping undertaken at each of the fauna survey sites with Elliott Type A traps (8 x 10 x 33 centimetre) baited with a mixture of peanut butter, rolled oats and honey. At each site, 25 small traps were set for three consecutive nights. In addition, five cage (cat size) traps were also set for three nights;*
- *Arboreal trapping for possums and gliders was undertaken with Elliott Type B (15 x 16 x 45 cm) folding aluminium traps mounted on platforms attached to the tree trunk. Spotlight searches were undertaken by foot at each survey site for 30 - 40 minutes with a 55 watt spotlight, followed by quiet listening in darkness to detect any animal movements or vocalisations. Arboreal mammal trapping and spotlight surveys were conducted during the October and November 2003 surveys.*
- *SEPP 44 (Koala Habitat) Assessment;*

## Biocertification Assessment of Warnervale Town Centre

- *Surveying for the presence of large terrestrial mammals included spotlight searches undertaken by foot at each survey site for 30 - 40 minutes with a 55 watt spotlight, followed by quiet listening in darkness to detect any animal movements or vocalisations. Searches were also conducted of all adjoining bushland areas. Searches for indirect evidence to suggest the presence of a species, including collection of scats, examination of burrows, diggings and hair tube samples;*
- *Surveys for megachiropteran (flying foxes) and microchiropteran (insectivorous) bat species consisted of harp trapping undertaken at suitable sites for two nights to determine the presence of sub-canopy species, detection of echolocation calls via Anabat II detectors onto audio cassettes and digital memory cards for subsequent computer analysis and spotlighting for flying foxes and large microchiropteran bats.*
- *Diurnal investigations for reptiles involved searching beneath ground litter, such as sheets or iron, fallen timber, leaf litter, decorticated bark on tree trunks and on the ground, tuft of vegetation and stones. Searches incorporated both opportunistic searches as well as intensive searches within an area for approximately 30 to 60 minutes. Nocturnal spotlight searches for reptiles were undertaken on foot in conjunction with arboreal mammals.*
- *Surveys were undertaken of water bodies (i.e. dams) and drainage lines of the area to identify frog species, which may include those species not recorded during other surveys. Nocturnal searches involved walking along drainage lines and through swamp habitat involving standard techniques such as spotlighting around water bodies and along creek lines, identification of individuals present by audible call, eliciting of responses to play-back of calls and searches in likely microhabitats.*

A summary of the survey effort is provided in Table 1.

**Table 1: Fauna survey effort (adapted from Bell and Murray 2004)**

Fauna Group	Survey Sites	Technique	Survey Effort	Total Survey Effort
Small Mammals	3 sites	Elliott A	25 traps / night for 3 nights	225 trap nights
Larger Mammals	3 sites	Cage Trap	2 traps / site for 3 nights	18 trap nights
Arboreal Mammals	3 sites	Elliott B arboreal	10 traps / site for 3 nights	90 trap nights
		Spotlight Searches	30 mins per search (Oct, Nov)	6.0 hours
Bats All	4 sites	Harp Trap	2 trap nights per site	8 harp trap nights
	4 sites	Anabat Recording	2 all night recordings per site x 2 sample periods	16 nights
Reptiles	3 sites	Diurnal searches	1 hr searches per site	3 hours
Amphibians	5 sites	Nocturnal searches	30min searches of specific habitats (dams, creek lines)	2.5 hours

Although targeted survey had previously been completed within the assessment area, the BCAM also requires a minimum number of Biometric vegetation transects/pots be completed to satisfy the methodology. The assessment of WTC BCAA required a minimum of 9 transects/plots (based on the number and area of vegetation zones), however 11 were completed for the assessment area. The location of the transects/plots are provided in Figure 2.

## Biocertification Assessment of Warnervale Town Centre

As comprehensive studies have previously been undertaken across the study site, no additional targeted threatened species surveys were conducted as part of this biocertification assessment. Opportunistic observations were made as transects/plots were completed, however, and these opportunistic observations were included in the overall results of this assessment.

A range of threatened species and endangered ecological communities were identified within the WTC BCAA from the previous studies and from ELAs work on site for this assessment. The threatened species and endangered ecological identified are provided in Table 2.

**Table 2: Threatened species and ecological communities**

Threatened Species	Status		Recorded in the Study Area	Credit Type	Population size (Flora)
	TSC Act	EPBC Act			
<b>Flora</b>					
<i>Rutidosia heterogama</i>	V	V	Yes	Species	~1000 plants
<b>Fauna</b>					
Powerful Owl	V	-	Yes	Ecosystem	
Masked Owl	V	-	Yes	Ecosystem	
Squirrel Glider	V	-	Yes	Ecosystem	
Wallum Froglet	V	-	Yes	Species	
<b>Endangered Ecological Communities</b>					
Swamp Sclerophyll Forest on Coastal Floodplains NSW North Coast, Sydney Basin and South-East Corner bioregions	EEC	-	Yes	N/A	



Biocertification Assessment of Warnervale Town Centre



Figure 2: Survey Effort

## 2.2 BIOMETRIC VEGETATION TYPE AND CONDITION MAPPING

Within the WTC BCAA defined for this project, Bell and Murray (2004) recorded 5 unique vegetation communities. The vegetation mapping prepared by Bell and Murray (2004) formed the base for the Biocertification Assessment of the WTC.

The vegetation communities identified at the WTC study site were converted to Biometric vegetation types through comparison between the vegetation descriptions provided in Bell and Murray (2004) and the Biometric Vegetation Types Database. The equivalent Biometric vegetation types for each vegetation community in the surrounding areas are outlined in Table 3 and described in detail in section 2.6.

**Table 3: Biometric Vegetation Type Conversions**

Bell and Murray Map Unit	Bell and Murray (2007) Vegetation Community	Biometric Vegetation Type	Comments
14	Freshwater Wetlands	N/A	Old dam/water areas considered cleared for the assessment.
20	Alluvial Floodplain Shrub Swamp Forest	Swamp Mahogany swamp forest on coastal lowlands of the North Coast and northern Sydney Basin	The Biometric Vegetation Type appears to be a good fit for this vegetation community
27	Narrabeen Coastal Blackbutt Shrubby Forest	Blackbutt - Turpentine open forest of the foothills of the North Coast	The Biometric Vegetation Type appears to be a good fit for this vegetation community
28	Narrabeen Buttonderry Footslopes Forest	Smooth-barked Apple - Red Bloodwood open forest on coastal plains on the Central Coast, Sydney Basin	The Biometric Vegetation Type appears to be a good fit for this vegetation community
30	Narrabeen Dooralong Spotted Gum Ironbark Forest	Spotted Gum - Grey Ironbark open forest on the foothills of the Central Coast, Sydney Basin	This Biometric Vegetation Type appears to be an appropriate fit for this vegetation community.

Following the conversion of communities to Biometric types, the existing vegetation mapping (Bell and Murray 2004) was tagged with the corresponding Biometric vegetation types as outlined in Table 3. The vegetation mapping within the WTC study sites was subsequently updated using a 'heads-up' on-screen digitising approach to capture vegetation which had not previously been mapped. Additional vegetation added to the mapping layer included areas of moderately dense paddock trees, dense regrowth which may not have been present during the original mapping and some minor areas which have been added to the assessment area due to boundary changes. Areas which had been cleared since the original mapping were also removed (including general tidying-up of the vegetation community boundaries).

The condition assessment involved the categorisation of vegetation based on a two-stage process. Vegetation which had been identified to community level by Bell and Murray (2004) was automatically assigned a condition of 'good', while those areas identified as variously disturbed (i.e. coded Xs or Xr) were assigned a condition of 'moderate'. All other areas were visually assessed and assigned either a condition of 'good', 'moderate' or 'poor'. Generally areas assigned a condition of 'good' had all structural layers present, areas assigned 'moderate' consisted of dense regrowth (particularly *Melaleuca* spp.) and areas assigned 'poor' consisted primarily of scattered remnant canopy trees over a highly disturbed groundlayer.



Minor changes and alterations were made to Biometric vegetation type boundaries where two condition states were present within one vegetation polygon; and a number of polygons automatically assigned a condition of 'moderate' were upgraded to 'good' based on visual assessment of the aerial photography.

Due to the use of previously completed mapping as the basis of the vegetation and condition map for the site, and the conversion of this previous mapping into Biometric vegetation types, some site scale inconsistencies in the vegetation mapping were identified at a small number of the sites visited and traversed. In these cases the vegetation mapping was updated, however for this project the previously validated vegetation mapping was not systematically amended or updated as vegetation transects/plots were considered the priority for the assessment. Should additional time be spent on site conducting vegetation mapping, additional site scale inconsistencies may be identified.

### 2.3 ENDANGERED ECOLOGICAL COMMUNITY MAPPING

Endangered Ecological Communities (EECs) within the WTC BCAA were mapped based on Bell and Murray (2004) who identified one small area of Swamp Sclerophyll Forest (SSF) adjoining Sparks Road. No attempt was made to validate the EEC mapping of Bell and Murray (2004), however it is considered to be largely accurate.

Since the original Bell and Murray (2004) study, there has been conjecture regarding the presence of Lower Hunter Spotted Gum Ironbark Forest EEC within the WTC study site. A detailed and quantitative analysis of this issue has been prepared (Appendix 1). This analysis has concluded that no Lower Hunter Spotted Gum Ironbark Forest EEC occurs within the WTC study site.

### 2.4 THREATENED SPECIES OBSERVATIONS

As comprehensive studies have previously been undertaken across the study site, no additional targeted threatened species surveys were included as part of this Biocertification Assessment. Opportunistic observations were made, however, and the results of the previous assessments also considered.

From the opportunistic observations made, and the previous work completed within the WTC BCAA (Bell and Murray 2004), two threatened species (requiring species credits) were identified as present within the WTC BCAA (Figure 3). The flora species *Rutidosia heterogama* occurs solely in the conservation lands, and previous surveys from Bell and Murray (2004) and ELA (2005, 2008) were used to confirm its presence and extent.

Wallum froglet was also identified in three locations across the site, and the habitat mapped (Figure 3). The observations made by ELA during this study were consistent with those areas also identified by Bell and Murray (2004).

Details on the calculation of credits for each of these species are contained in Section 3.8. The species predicted on site by the Biobanking Credit Calculator v 1.2, and those requiring survey, are provided in Appendix 2.

The results provided in Appendix 2 for species requiring survey identify two species which have not received targeted survey within the appropriate specified months. Although survey did not occur at the correct time, one species (Wallum froglet) was identified on site during both ELA opportunistic observations and Bell and Murray (2004). Therefore the survey effort for this species is considered to have met the requirements of the methodology.

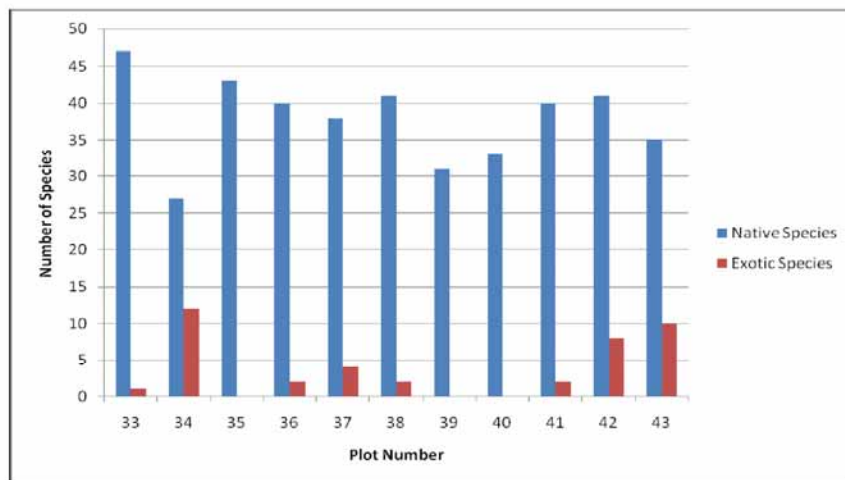
## Biocertification Assessment of Warnervale Town Centre

The other species that did not receive targeted survey at the appropriate time of year is the *Diuris praecox*. The survey period for *Diuris praecox* is identified as July and August, and targeted survey was completed by Bell and Murray between September 2003 and January 2004 (Bell and Murray 2004). Bell and Murray did complete site reconnaissance in August 2003, and although not a targeted survey the site was traversed in some detail.

The nearest NSW Wildlife Atlas record for *Diuris praecox* is 11km north-east of the WTC BCAA. This, coupled with the fact that the site was traversed in the appropriate survey period, and targeted survey occurred only a matter of weeks after the identified survey period, indicates that the species is unlikely to be present within the WTC BCAA.

## 2.5 SPECIES RICHNESS

A total of 166 flora species (143 native, 22 exotic and one non-local native) from 46 plant families were recorded at the WTC study site during the Biocertification assessment (Appendix 3). Species richness by Biometric vegetation transect/plot is outlined in Graph 1.



Graph 1 Flora species richness

## 2.6 VEGETATION TYPE DESCRIPTIONS

Vegetation descriptions for Blackbutt - Turpentine open forest of the foothills of the North Coast, Smooth-barked Apple - Red Bloodwood open forest on coastal plains on the Central Coast, Sydney Basin and Spotted Gum - Grey Ironbark open forest on the foothills of the Central Coast, Sydney Basin are provided below. A description for Swamp Mahogany swamp forest on coastal lowlands of the North Coast and northern Sydney Basin has not been provided due to its extremely small size (0.1 ha) and the fact that it is not impacted by the development (retained lands).


Biocertification Assessment of Warnervale Town Centre




Figure 3: Threatened Species Observations and Habitat




## Biocertification Assessment of Warnervale Town Centre

<b>Biometric Vegetation Type</b>	<b>BLACKBUTT – TURPENTINE OPEN FOREST OF THE FOOTHILLS OF THE NORTH COAST</b>
<b>Site</b>	WTC
<b>Location</b>	On the upper sandstone slopes and ridgetop in the centre of the WTC study site.
<b>Description</b>	This vegetation type was open forest in structure (Specht and Specht 2002) with trees generally 20 to 25m in height with projected foliage cover in the order of 30%. The majority of this vegetation type had been recently burnt (<2yrs) with a number of fire trails dissecting the vegetation. Many of the larger trees had lopped branches along the trackside.
	
<b>Canopy</b>	This vegetation type had a canopy dominated by <i>Eucalyptus pilularis</i> with <i>Angophora costata</i> occurring as a co-dominant species.
<b>Midstorey</b>	Characterised by <i>Allocasuarina littoralis</i> .
<b>Groundcovers</b>	The groundcover of this vegetation type was characterised by a number of native species including <i>Entolasia stricta</i> , <i>Pteridium esculentum</i> , <i>Themeda australis</i> and <i>Xanthorrhoea</i> spp.
<b>Threatened Species</b>	None observed.
<b>Weeds</b>	<i>Bidens pilosa</i> , <i>Lantana camara</i> , <i>Ligustrum sinense</i> and <i>Senecio madagascariensis</i> .

## Biocertification Assessment of Warnervale Town Centre

<b>Biometric Vegetation Type</b>	<b>SMOOTH-BARKED APPLE - RED BLOODWOOD OPEN FOREST ON COASTAL PLAINS ON THE CENTRAL COAST, SYDNEY BASIN</b>
<b>Location</b>	Slightly elevated and sloping sections of the WEZ study site and the majority of the WTC study site.
<b>Description</b>	This vegetation type varied from woodland to open forest in structure (Specht and Specht 2002) with trees generally from 15 to 25m in height with projected foliage cover in the order of 20-40%. While there has been disturbance and clearing across this vegetation type, large intact areas still remain at both study sites.
	
<b>Canopy</b>	This vegetation type has a canopy co-dominated by <i>Angophora costata</i> , <i>Eucalyptus capitellata</i> and <i>Corymbia gummifera</i> , although a range of other species were frequently recorded including <i>C. maculata</i> , <i>E. globoidea</i> and <i>E. umbra</i>
<b>Midstorey</b>	The midstorey of this vegetation type generally consists of commonly recorded species such as <i>Melaleuca nodosa</i> , <i>Banksia spinulosa</i> var. <i>collina</i> , <i>Allocasuarina littoralis</i> and <i>Leptospermum trinervium</i> .
<b>Groundcovers</b>	The groundcover of this vegetation type was dominated by sedges and grasses, including species such as <i>Imperata cylindrica</i> , <i>Entolasia stricta</i> , <i>Xanthorrhoea media</i> , <i>Gahnia radula</i> , <i>Cyathochaeta diandra</i> and <i>Lepyrodia scariosa</i> .
<b>Threatened Species</b>	Wallum froglet.
<b>Weeds</b>	More disturbed areas were dominated by weeds such as <i>Andropogon virginicus</i> but the more intact areas were relatively weed free.

## Biocertification Assessment of Warnervale Town Centre

<b>Biometric Vegetation Type</b>	<b>SPOTTED GUM - GREY IRONBARK OPEN FOREST ON THE FOOTHILLS OF THE CENTRAL COAST, SYDNEY BASIN</b>
<b>Location</b>	More elevated sections in the west of the WEZ and WTC study sites.
<b>Description</b>	This vegetation type was generally open forest in structure (Specht and Specht 2002) with trees to 25m in height with projected foliage cover in the order of 20-40%.
	
<b>Canopy</b>	This vegetation type was highly variable and consisted of a range of canopy species; however <i>Corymbia maculata</i> was recorded in all patches in association with a range of ironbarks. Co-dominant species included <i>Angophora costata</i> , <i>E. capitellata</i> , <i>E. crebra</i> , <i>E. fibrosa</i> , <i>E. globoidea</i> , <i>E. paniculata</i> and <i>E. siderophloia</i> .
<b>Midstorey</b>	The midstorey of this vegetation type varied from open to dense and was marked by the shrub <i>Melaleuca nodosa</i> . Other commonly recorded midstorey species included <i>Exocarpos cupressiformis</i> , <i>Melaleuca linariifolia</i> , <i>Allocasuarina torulosa</i> and <i>Allocasuarina littoralis</i> . Smaller shrubs included <i>Daviesia ulicifolia</i> and <i>Pultenaea villosa</i> .
<b>Groundcovers</b>	Commonly recorded groundcover species included <i>Dianella caerulea</i> var. <i>producta</i> , <i>Entolasia stricta</i> , <i>Gahnia clarkei</i> , <i>Gahnia radula</i> , <i>Imperata cylindrica</i> , <i>Lepidosperma laterale</i> and <i>Themeda australis</i> .
<b>Threatened Species</b>	Rutidosia heterogama, Wallum froglet.
<b>Weeds</b>	Some areas of this community have been extensively invaded by <i>Lantana camara</i> at the WTC study site.