9.1 Introduction

This assessment considers the flora and flora impacts of the proposed Biomass Power Plant Project with regard to Commonwealth and NSW planning and environmental legislation, including the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), *Environmental Planning and Assessment Act 1979* (EP&A Act), *Threatened Species Conservation Act 1995* (TSC Act), *Native Vegetation Act 2003* (NV Act), State Environmental Planning Policy (SEPP) 44 and the *Noxious Weeds Act 1993*. The full Terrestrial Ecology Assessment is presented in **Appendix D**.

The assessment was conducted generally in accordance with *Threatened Biodiversity and Assessment; Guidelines for Developments and Activities Working Draft* (DEC 2004) and the *Guidelines for Threatened Species Assessment* (DEC /DPI July 2005).

A bush fire risk assessment has also been undertaken and is discussed in **Chapter 13**.

9.2 Methodology

9.2.1 Literature Review

Threatened species, populations and ecological communities listed under the TSC Act and the EPBC Act with the potential to occur in the area based on the habitats present were identified. Current aerial photographs of the Site were studied and historical aerial photographs were also assessed to determine the approximate age of existing vegetation.

9.2.2 Field Survey

A field survey was undertaken on 22nd and 23rd June 2009 and photographs were taken using a GPS camera. The site visit concentrated on the areas of anticipated impact, however much of the site perimeter and existing work areas were also visited.

Preliminary vegetation studies were conducted during the initial site walkover, with areas of interest (e.g. with mature vegetation or extensive weed infestations etc) noted. Opportunistic sightings of fauna were also noted.

An assessment of the quality of habitats present for both TSC and EPBC Act listed species within the Site was conducted. Significant habitat features, such as significant amounts of fallen timber, including fallen hollow logs, standing hollow bearing trees, stags, or stands of flora species likely to provide foraging or nesting habitat for threatened fauna species, were noted. The habitat assessment covered the full list of species 'known or predicted' to occur within the Catchment Management Authority (CMA) sub-region to ensure that as many species as possible were covered.

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9.3 Existing Environment

9.3.1 Results of Assessment - Flora

The literature review identified the following:

- 22 threatened flora listed under the EPBC Act and / or the TSC Act have been previously recorded, or are predicted to occur, within 10 km of the site. 11 species are listed as Vulnerable and 11 as Endangered under the TSC Act; ten species are listed as Vulnerable and one is listed as Endangered under the EPBC Act. One critically endangered ecological community (EEC) (Littoral Rainforest and Coastal Vine Thickets of Eastern Australia), is listed as a "community likely to occur within area". The location of previous flora records is shown on **Figure 9-1**.
- The DECC 'Find by Geographic Region' threatened species, populations and ecological communities online search tool also indicated that an additional six EECs are known or predicted to occur within the South East Coastal Plains CMA subregion.
- No marine or aquatic flora species were identified as likely to occur within the Southern Rivers CMA area.

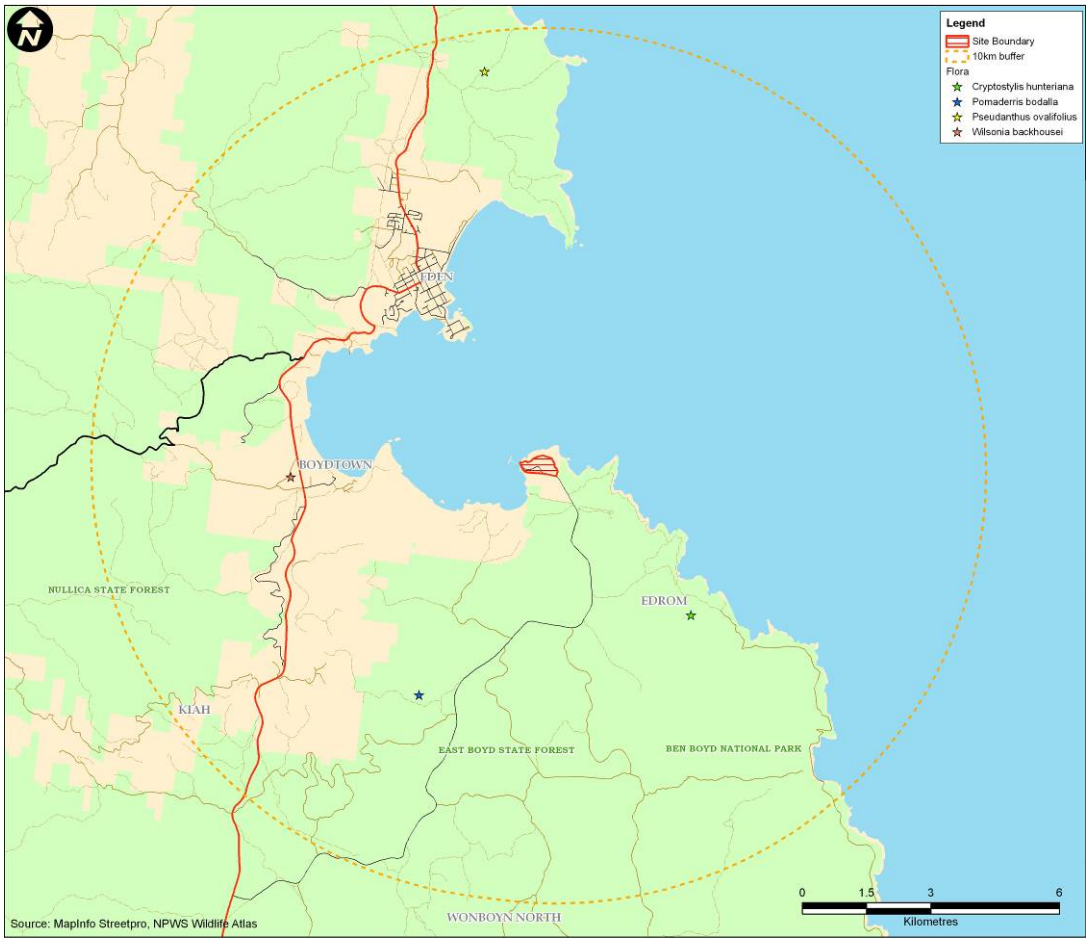

Figure 9-1 NPWS Atlas Threatened Flora Records

Aerial photographs from the mid 1970s indicate that the Site has previously been cleared of all vegetation, with photographs showing the Site devoid of vegetation in 1976. This means that all vegetation present is regrowth or landscape plantings, no older than approximately 30 years. Although the standard definition of regrowth suggests that any vegetation that has grown since 1990 is regrowth (DECC 2008), historical disturbance and clearing must be taken into account when assessing existing on-site vegetation.

Field Survey

Vegetation in proximity to the proposed Power Plant includes some small areas of vegetation, generally very patchy and highly disturbed regrowth, typically alongside roadways and fence lines. There are no large continuous patches of vegetation, however there are extensive vegetated areas outside of the Site boundary. Some of the areas of vegetation within the Site, and specifically, within the area of anticipated impact, appear to have been planted with native (but not necessarily endemic) vegetation for landscaping and screening purposes. Most of the areas of vegetation within the Site are highly fragmented, with numerous tracks, walkways and roads throughout.

The Site has been operational for many years, resulting in the cumulative impacts of continued and long-term disturbance in the form of access tracks, fire control and protection activities, landscaping, and artificial noise, dust and light impacts.

Many of the vegetated areas of the Site comprise a range of Eucalypt and exotic pine species in the canopy, which is generally patchy and disturbed, with various *Acacia* species in the midstorey. Much of the Site lacks any understorey vegetation, however some areas do have a disturbed understorey primarily of exotic grass (typically mowed lawns) and annual species such as Fleabane *Conyza bonariensis* and Cobblers Pegs *Bidens pilosa*.

The Forest Ecosystem Classification and Mapping for the Eden CRA Region (Keith and Bedward 1998) was used as a guide to vegetation communities that could be expected to occur within the Site. However, given the level of previous disturbance and the fragmented and degraded nature of vegetation, it was determined that none of the vegetation communities described within the Eden CRA Region appropriately described the vegetation within the Site. **Plate 9-1** and **Plate 9-2** show the vegetation likely to be impacted by the proposed development. Only vegetation within the fence line would require removal.

Threatened Flora Species

No threatened species were identified within the Site during the field survey. The desktop review indicates that up to 22 threatened flora species have the potential to occur within the area.

The results of the habitat assessment (**Appendix D**) indicate that while there are several records of threatened flora within 10 km of the Site, it is highly unlikely that these species occur within the area of anticipated impact, due to the continued disturbance to, and general low condition of, the vegetation within this area. The majority of records of threatened species around the Site are within the extensive National Park and State Forest to the east and south.

As such, no further assessment has been undertaken for any threatened flora species.

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Plate 9-1 Vegetation adjacent to the internal site road

Plate 9-2 Vegetation adjacent to existing burner

Threatened Populations

The results of the literature review indicate that no endangered flora populations listed under Schedule 1 (Part 2) of the TSC Act have previously been recorded within the vicinity of the Site.

Weeds

The field investigation noted that much of the area of impact lacks any understorey vegetation, however some areas do have a disturbed understorey primarily comprised of exotic grass (typically mowed lawns) and annual species such as Fleabane *Conyza bonariensis* and Cobblers Pegs *Bidens pilosa*. The field investigation did not observe any noxious weeds. Noting that a full flora survey was not conducted, mitigation measures have been recommended for weed management during the construction and operational phase of the proposed development. These include the application of clean mulch around replanted native species and the potential use of weed matting as appropriate.

9.3.2 Results of Assessment - Threatened Ecological Communities

Seven threatened ecological communities (TECs) were predicted to occur within the vicinity of the Site based on the desktop review. The habitat assessment and field survey determined that these communities did not exist within the Site. High levels of disturbance and previous clearing have resulted in an area now characterised by highly disturbed vegetation, much of which has been planted, pruned, thinned and modified for safety, access, aesthetic and landscaping purposes.

Due to the potential for bushfires within the area, strict hazard reduction procedures are also followed, reducing the potential for the survival of any residual native seed bank.

As such, no further assessment has been undertaken for any TEC's.

9.3.3 Results of Assessment - Fauna

The literature review identified the following:

- The results of the online DECCW Atlas of NSW Wildlife database search show 22 records of threatened fauna species within 10 km of the Site since 1980.
- The Commonwealth EPBC Online Protected Matters Database search tool indicated that 39 threatened fauna species or their habitat may occur within 10 km of the site, including marine species. Up to 31 listed migratory bird species (including migratory terrestrial, wetland and marine species) or their habitat may also occur within the area.
- 47 threatened fauna species are known or predicted to occur within the South East Coastal Plains CMA subregion.

The location of previous fauna records is shown on **Figure 9-2**.

Field Survey

Several common fauna species were noted during the field survey, namely Eastern Grey Kangaroos *Macropus giganteus*, Rabbits *Oryctolagus cuniculus*, one species of Martin *Petrochelidon* sp., and one species of Cormorant *Phalacrocorax* sp. Rabbits were not seen but were identified from the presence of scats. Eastern Grey Kangaroos were not observed inside of the Site fence, however several scats were observed, and the species was seen outside of the Site boundary. Martins were observed via overfly, and the cormorants were observed sitting on the jetty.

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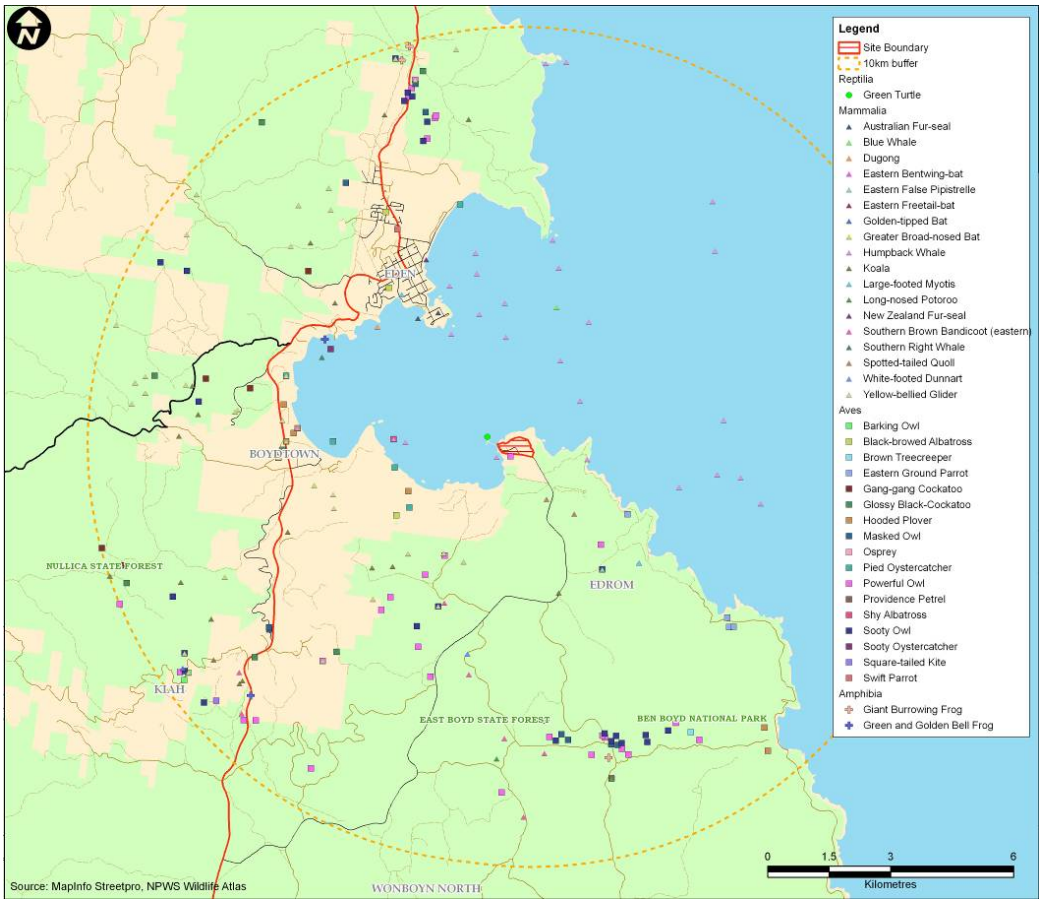

Figure 9-2 NPWS Atlas Threatened Fauna Records

Threatened Fauna Species

No threatened fauna species were observed during the field visit. Results of the habitat assessment suggest that there is potential habitat for up to seven threatened fauna species to occur in the area. An assessment of significance (in the form of a 7-part test) has been carried out for these species, to determine what, if any, impacts the proposed action may result in.

Threatened Populations

No endangered populations, as listed under Schedule 1 (Part 2) of the TSC Act, of any fauna species are noted as occurring within the vicinity of the Site.

Habitat Resources

Habitat resources of relevance to the Site are discussed in detail in Section 3.3.2 of the Terrestrial Ecology Assessment (**Appendix D**). Habitat resources were present in very low numbers due to the history of Site disturbance and activities carried out as part of the current operations.

Threatening Processes

A 'key threatening process' (KTP) is defined under the TSC Act as 'a process that threatens, or may have the capability to threaten the survival or evolutionary development of species, populations or ecological communities'. Evidence of the following KTPs were recorded during the field survey:

- clearing of native vegetation.
- Competition and grazing by the feral European rabbit (*Oryctolagus cuniculus*).

Use of the Site has resulted in past clearing of native vegetation and rabbit scats were observed within the Site boundary.

While the proposed action would involve the removal of a small amount of vegetation it is highly unlikely that this would result in an increase to the KTP of clearing native vegetation. While rabbit scats was observed within the Site, it is unlikely that this would result in any increased grazing pressures, with the majority of the area likely to be impacted by the proposed works being unsuitable as a habitat resource for the majority of common and threatened fauna species.

Critical Habitat

The NSW National Parks and Wildlife Service is responsible for the identification of critical habitat within NSW. Critical habitat is an area of land that is crucial to the survival of a particular threatened species, population or ecological community.

There are no areas of recommended or declared critical habitat that are relevant to the Site or the surrounding locality.

9.3.4 Existing Disturbance

The Site is a working site and experiences high levels of disturbance, with site roads, lighting, noise and dust generated from plant and machinery. In addition the presence of a security fence effectively isolates the site from the surrounding bushland. The Site also has high levels of vehicle usage.

The Site is exposed to regular bushfire maintenance activities that include controlled burns and much of the landform within the Site has been modified. The area of disturbance is an elevated portion of sandstone that has been built up with waste wood chips and fines from the processing plant.

9.4 Assessment of Potential Impacts

9.4.1 Threatened Flora

No threatened species were identified within the Site during the field survey.

A habitat assessment was carried out for each of the 22 threatened flora species identified as having the potential to occur in the area. The results of the habitat assessment concluded that, despite there being records of these species within 10 km of the Site, it would be highly unlikely that they would occur within the area of impact. The area has been subject to continued disturbance. The site was cleared in the late 1970s and the site inspection highlighted the general low condition of the landscape vegetation and regrowth which exists there. As such, no threatened flora species listed under the TSC Act or EPBC Act are considered likely to occur within the area of impact.

9.4.2 Threatened Fauna

Five fauna species listed as vulnerable and two species listed as endangered under the TSC Act potentially occur within the study area, based on habitats present and / or previous sightings: Sanderling *Calidris alba*; Lesser Sand-plover *Charadrius mongolus*; Sooty Oystercatcher *Haematopus fuliginosus*; Pied Oystercatcher *Haematopus longirostris*; Black Bittern *Lxobrychus flavicollis*; Little Tern *Sterna albifrons*; and Hooded Plover *Thinornis rubricollis*.

Assessments pursuant to s.5A of the EP&A Act (the so-called '7-part test') for these species were undertaken and are included in **Appendix D**. The 7-Part Tests concluded that the proposed development will not have a significant impact on any threatened fauna.

There are no listed threatened populations that are relevant to the Site, nor are any of the endangered ecological communities predicted to occur within the area of impact.

Factors considered in determining the significance of potential impacts upon transient, seasonal or migratory fauna species included the small amount of very low quality habitat to be impacted, the existing level of degradation within the Site, the high levels of human-induced disturbance (plant, vehicles etc), and the regional context of the Site. Based on these factors, the proposed works are not 'likely' to impose a 'significant effect' on any threatened species listed under the TSC or EPBC Act.

9.4.3 Threatening Processes

The KTP relevant to the proposal is 'clearing of native vegetation'. The proposal will involve the clearing of 0.09 ha of vegetation (**Figure 9-3**). The vegetation within the area of anticipated impact is highly degraded and modified, hence the proposed action would not result in an increase to this KTP.

9.4.4 Construction Impacts

Flora

The proposed works will require clearing of 0.09 ha of vegetation, comprised of highly degraded and modified native and exotic species, of no particular discernable vegetation community (**Figure 9-3**).

No threatened or endangered flora species, populations or communities listed under the TSC Act or EPBC Act are likely to be impacted by the proposed works.

Fauna

The site contains a number of habitat features including feed trees (flowering eucalypts) and fallen timber. Habitat value of vegetation outside the Site boundary is much higher than within the area of impact and the loss of such habitat is unlikely to have a significant impact on local populations of native fauna.

Clearing of vegetation will not result in habitat fragmentation or loss of habitat corridors because the development will not bisect / isolate any substantial areas of native vegetation. The development will not have an impact on the movement of native fauna within the region due to existing habitat fragmentation and the presence of a boundary security fence.

The proposal is unlikely to result in any disturbance (temporary or permanent) to any woodland birds that utilise the site given the existing levels of disturbance and modification within the area of impact and the minimal habitat available. If present these species are mobile, widespread and common.

Figure 9-3 Areas of Potential Vegetation Clearance

A low diversity of native reptiles is likely to occupy the area of anticipated impact. Given the high levels of noise and disturbance and general lack of suitable habitat within the area, it is assumed that most species would not utilise the area in question. As such, the proposal is highly unlikely to have any impact on native reptile species. Native amphibian species will not be impacted due to a lack of any suitable habitat within the area of impact.

Eastern Grey Kangaroos use habitat resources within the Site. The proposed works are unlikely to impact this species as limited suitable habitat exists within the area of impact. Larger, more connected remnants of woodland occur elsewhere within and external to the Site which provide more suitable habitat for the species.

It is highly unlikely that microbats use the area of impact given the lack of habitat resources, high levels of disturbance and small area of vegetation present. These species are much more likely to utilise the high quality bushland outside of the site boundary for roosting and foraging activities. As such, the proposed action will not have an impact upon microbats.

9.4.5 Threatened Species

The proposal is unlikely to have direct impacts on any threatened flora species. No threatened species were located during the field survey and no potential habitat was observed. Suitable potential habitat for threatened flora occurs outside of the Site boundary and this will not be impacted by the proposal action. No endangered ecological communities will be impacted.

9.4.6 Indirect and Operational Impacts

The Terrestrial Ecology Assessment (**Appendix D)** considers a number of potential indirect and operational impacts of the proposed Power Plant. Sediment, dust, run-off, artificial lighting, roads and site access, and potential impacts of hydrology, edge effects and habitat fragmentation are discussed, with mitigation measures proposed to minimise the anticipated impacts.

9.4.7 Long Term Impacts

Long term impacts of the proposed works include the permanent loss of low-quality habitat including some fallen timber, immature feed trees (eucalypts), recruitment trees that may develop hollows over time and vegetation that is not structurally diverse. The long term impacts identified are unlikely to be detrimental to any species.

The findings of the assessment conclude that the proposed works will not result in a significant impact on any threatened species, population or community within the site itself or within the wider locality.

No offset or compensatory habitat is considered necessary due to the minimal amount of clearing of low quality degraded vegetation.

9.5 Mitigation Measures

Mitigation measures to be included in a CEMP and OEMP are listed below in **Table 9-1**.

Table 9-1 Mitigation Measures

Mitigation Measure	Project Stage		
	Pre construction	Construction	Operations
Areas identified for clearing should be clearly marked prior to construction using highly visible flagging tape or spray paint to prevent unnecessary clearing.	✓		
Maintain low vehicle speeds to reduce fauna fatalities.		✓	✓
Limit vehicular and personnel entry into retained vegetation through exclusion fencing, locating access roads and paths to avoid habitat and use of signage.		✓	
Employ down-lights and motion sensor lighting to reduce light spill and the associated secondary impact on nocturnal fauna potentially using adjoining vegetation.			✓
Implement sediment and erosion control measures to manage disturbance to the site.		✓	
Implement weed control measures.		✓	✓
Replant cleared areas with indigenous native vegetation and spread layers of clean mulch to limit the potential for colonisation by weeds.		✓	✓