Part C
Environmental Interactions

Part C contains eleven chapters; it describes the interaction between the Project and the biophysical environment. It provides an assessment of the potential environmental impacts associated with the Project and describes the mitigation measures, which form part of the Project

6 ECOLOGY

ERM completed a Line Route Selection (LRS) Report (refer *Annex A*) for the Project which identified areas of potential ecological constraints ('hotspots') based on desktop research and preliminary field investigations. Further assessment was undertaken by ERM (2008b) to assess the potential ecological impacts resulting from the Project with particular focus given to those areas previously identified as 'hotspots'. This chapter provides a summary of the key findings of the investigation and the complete report is provided in *Annex H*.

Detailed impact assessment for the Suffolk Park substation (identified by ERM as a potential ecological 'hotspot') was conducted by MWH (2008), with the final report provided as *Annex Q*. The findings and outcomes of this report have been incorporated into this environmental assessment report and referenced as appropriate.

Detailed ecological assessment has not been conducted for the Brunswick Head Feeder Loop and Brunswick Head substation site to date. These have also been identified as potential ecological 'hotspots' and detailed ecological assessment of these areas will be conducted when Country Energy seeks Project Approval for this phase of the Project.

Detailed ecological assessment has not been undertaken for the proposed new 66kV line 8516 between Lismore South substation and the Lismore Switching Station.

6.1 FLORA

The majority of the Project Area consists of cleared agricultural land containing sugarcane and macadamia crops and grazing land consisting of a variety of pasture grasses and herbaceous weeds. Remnants of eucalypt woodland, forest and dry rainforest are scattered throughout the Project Area in a highly fragmented nature. Exotic species such as Camphor Laurel (*Cinnamomum camphora*) are common within these areas. Mangrove communities occur to the north and west of Ballina adjacent to Fishery Creek, Emigrant Creek and North Creek Canal.

6.2 FAUNA

Opportunistic observations during vegetation surveys yielded 10 bird species considered to be common in the area.

Field investigations revealed that potentially suitable fauna habitat exists within the Project Area in the form of:

- fresh/estuarine wetlands;
- modified grasslands;
- swamp sclerophyll forest;
- swamp oak forest;

- mangroves;
- remnant eucalypt woodland;
- remnant moist sclerophyll forest; and
- regrowth / remnant dry rainforest.

Few mature trees were identified that would contain hollows suitable for sheltering and breeding habitat.

Mapping provided by the NSW DECC (Scotts, 2003) indicates the Project Area supports a number of fauna movement corridors (refer *Figure 6.1, Figure 6.2* and *Figure 6.3*).

6.3 IMPACT ASSESSMENT

The majority of the proposed route occurs within existing cleared power line corridors and access will be via existing service roads. Existing corridors are maintained under the *Electricity Supply Act 1995* to prevent damage to infrastructure and to provide a cleared area for routine maintenance of power lines.

Where electricity pole replacement is necessary, a minimal amount of vegetation removal may be required in cases where vegetation has regrown. This maintenance would be conducted in accordance with the provisions of the *Native Vegetation Act 2003* and *Electricity Supply Act 1995* and Country Energy's *CEPG 8008 Vegetation Management Plan*. In areas where deviations from the existing corridor are proposed, ecological impacts will be minimal with the adoption of appropriate mitigation measures (refer *Section 6.4*).

Preliminary ecological assessment of the proposed 66kV line 8516, shows that vegetation in this area is mapped by Lismore City Council (LCC) as predominantly Camphor Laurel interspersed with patches of Dry Rainforest, Wet Sclerophyll Forest and Grassy Woodland. This was confirmed in a preliminary ground truthing inspection of the general area encompassing the proposed new easement. Mapping from LCC also shows that whilst a number of Koalas have been recorded in the Wilson Nature Reserve which occurs to the north of the proposed new 8516 line, vegetation in this area is identified as marginal/unsuitable Koala habitat. Within this area, vegetation clearing as a result of the proposed line will require a maximum 30 metre wide easement. The width of the easement may be reduced during final design and construction if deemed necessary. Further detailed ecological investigation of this area, including an assessment under State Environmental Planning Policy No. 44 – Koala Habitat protection (*SEPP 44*) will be undertaken prior to construction for Project Approval.

Given that the majority of the proposed route will occur within existing electricity easements, the potential impact on native fauna and regional and sub-regional fauna movement corridors identified within the area will be minimal.

6.3.1 State Environmental Planning Policy No. 14 – Coastal Wetlands

As identified under *State Environmental Planning Policy No. 14* (*SEPP 14*), Coastal Wetlands No. 79, 84, 93, 95 and 108 occur within close proximity of the Project Area (refer *Figure 5.1*). Within the *SEPP 14* wetland areas, the existing corridor will be used and no vegetation removal is necessary. Existing transmission poles are located outside the *SEPP 14* areas. Access to these areas will be via existing service points and care will be taken during construction to minimise disturbance, weed invasion and sedimentation via the adoption of mitigation measures (refer *Section 6.4*).

Road upgrades are required to be undertaken along Skinners Shoot Road where it passes through a SEPP 14 Wetland in order to enable access for substation construction equipment. These works will be undertaken within the existing road alignment with only minor trimming of overhanging vegetation required. This will be undertaken to minimize the potential for damage to trees as a result of truck strike. Based on the scope of the proposed works and mitigation measure, the works are not expected to have an adverse impact on the wetland ecosystem.

6.3.2 State Environmental Planning Policy No. 44 – Koala Habitat

The Koala was not recorded during field investigations although a search of the DECC Atlas of NSW Wildlife Database (2008) revealed a number of previous records within the Project Area.

Assessment under *State Environmental Planning Policy No. 44* (*SEPP 44*) revealed the presence of three Koala feed tree species as listed under Schedule 2 of the Policy. These are Swamp Mahogany (*Eucalyptus robusta*), Forest Red Gum (*Eucalyptus tereticornis*) and Tallowwood (*Eucalyptus microcorys*). Given the highly modified nature of the environment, these species constitute less than 15% of the total tree cover within the Project Area. Consequently, the Project Area is not defined as '*potential*' or '*core*' Koala habitat under the provisions of *SEPP 44*.

Although not defined as '*potential*' or '*core*' Koala habitat, the number of previous recorded sightings adjacent to the Project Area suggests that Koalas may traverse the area and browse isolated remnant feed trees as part of their home range.

Any vegetation removal proposed within the Project Area will be minimal and with the adoption of mitigation measures (refer *Section 6.4*) is unlikely to disrupt the life cycle of this species such that a viable population would be placed at risk of extinction.

6.3.3 Threatened Species Conservation Act 1995

A search of the DECC Atlas of NSW Wildlife Database (2008) showed that a number of threatened flora and fauna species have previously been recorded within a 10 kilometre (km) radius of the Project Area. The likelihood of these species utilising or inhabiting the area was assessed by comparing known habitat requirements with habitat present. *Table 6.1* lists those species that were thought to have a moderate to high likelihood of utilising or inhabiting the Project Area.

Table 6.1 Threatened Species Assessed under the Threatened Species Conservation Act 1995

Common Name	Scientific Name	Legal Status under the TSC Act
Arrow-head Vine	*Tinospora tinosporoides*	V
Black Bittern	*Ixobrychus flavicollis*	V
Black-necked Stork	*Ephippiorhynchus asiaticus*	E
Durobby	*Syzygium moorei*	V
Grass Owl	*Tyto capensis*	V
Green-leaved Rose Walnut	*Endiandra muelleri subsp. Bracteata*	E
Grey-headed Flying-fox	*Pteropus poliocephalus*	V
Koala	*Phascolarctos cinereus*	V
Osprey	*Pandion haliaetus*	V
Red Lilly Pilly	*Syzygium hodgkinsoniae*	V
Rusty Plum	*Amorphospermum whitei*	V

V = Vulnerable; E = Endangered

Plant specimens revealed the presence of Arrow-head Vine (*Tinospora tinosporoides*) and possibly Red Lilly Pilly (*Syzygium hodgkinsoniae*) (lack of identifying features made positive identification difficult) within an area to the south of the proposed route in the Skinners Shoot locality). This area will not be affected by the proposal.

As shown in *Figure 6.1*, *Figure 6.2* and *Figure 6.3*, the following two Endangered Ecological Communities (EECs) were identified within the Project Area during field investigations:

- Swamp Sclerophyll Forest on coastal floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions; and
- Swamp Oak Floodplain Forest of the NSW North Coast, Sydney Basin and South East Corner bioregions.

All areas of the route that are in close proximity to these EECs are within the existing corridor and will not require vegetation removal. The adoption of mitigation measures (refer *Section 6.4*) will minimise the potential risk of disturbance and weed invasion to these areas.

Assessments of Significance (7-Part Tests) were conducted in accordance with the *Threatened Species Assessment Guidelines* (DECC, 2007) for species listed in *Table* 6.1 and EECs listed above to determine whether the proposal would have the potential to significantly effect on these species. Assessment showed that the proposal incorporating mitigation measures (refer *Section 6.4*) was unlikely to have a significant effect on those species or EECs under consideration owing largely to the absence of particular habitat features and the minimal level of potential disturbance resulting from the proposal.

6.3.4 Environment Protection and Biodiversity Conservation Act 1999

Habitat assessment of the Project Area showed that one fauna and four flora species listed as Vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999* (*EPBC Act*) have a moderate to high likelihood of occurring within the Project Area (refer *Table 6.2*).

Table 6.2 Threatened Species Assessed under the Environment Protection and Biodiversity Conservation Act 1999

Common Name	Scientific Name
Grey-headed Flying-fox	*Pteropus poliocephalus*
Red Lilly Pilly	*Syzygium hodgkinsoniae*
Durobby	*Syzygium moorei*
Arrow-head Vine	*Tinospora tinosporoides*
Green – leaved Rose Walnut	*Endiandra muelleri*

Assessment in accordance with the *EPBC Act Significant Impact Guidelines* (DEH, 2006) for determining the likely impact of the proposal concludes that threatened species as listed under the *EPBC Act* will not be placed at risk of extinction by the proposal with the adoption of mitigation measures (refer *Section 6.4*).

A search of the Department of Environment, Water, Heritage and the Arts (DEWHA) Database for Matters of National Environmental Significance (MNES) (2008) showed that 11 migratory bird species have been identified as occurring or having the potential to occur within 10km of the Project Area. Given the nature of the proposal and the fact that these species are wide-ranging with generalist habitat requirements it is considered that the proposal is unlikely to have a significant impact on these species.

Having applied the *EPBC Act Significant Impact Guidelines* (DEH, 2006), the project is not likely to have a significant impact on each of the relevant listed vulnerable and migratory species.

6.4 MITIGATION MEASURES

The following mitigation measures will be adopted to further reduce the potential for impact:

- implement erosion and sediment control measures during any clearing in accordance with Country Energy's *CEM 7022 Environmental Operations Manual*;
- responsible management of weeds in accordance with Country Energy's *CEM 7022 Environmental Operations Manual, CEM7022.07 Land Use* and the requirements of the *Noxious Weeds Act 1993*;
- minimise disturbance / removal of existing native vegetation and potential fauna habitat where possible;
- conduct pre-clearance fauna surveys in areas where potential fauna habitat is identified and where removal is required;
- construct protection barriers around areas of vegetation near the existing route to prevent potential damage;
- obtain professional advice from an Arborist in areas where there is potential for root damage to native trees;
- utilization of compensatory plantings for vegetation removed during new substation construction works and clearing of any new easements;
- development of a site specific construction environmental management plan for upgrade works within the Skinners Shoot Road reserve such that adverse impacts upon the SEPP 14 wetland are avoided;
- further detailed ecological impact assessment of the proposed 66kV electricity supply line 8516 including an assessment under *SEPP 44*; and
- stage works to avoid disturbance to threatened fauna that may potentially inhabit the area during their breeding season (e.g. Koala).