11. Ecology

11.1 Introduction

When planning infrastructure such as the South East Busway extension from Rochedale to Springwood, consideration must also be given to possible ecological impacts (e.g. impacts on native flora and fauna) within and adjacent to the project area.

This chapter outlines the ecological values of the South East Busway extension from Rochedale to Springwood and surrounding areas. Potential impacts on these values are also identified along with mitigation measures for ameliorating these.

11.2 Methodology

A desktop assessment was undertaken to identify ecological values within and adjacent to the South East Busway extension corridor. This assessment involved the following:

- reviewing data from ecological investigations previously conducted within and adjacent to the busway extension corridor
- searches of various databases for records of flora and fauna from along and adjacent to the busway corridor
- reviewing existing mapping of essential habitat, wetlands and remnant vegetation.

A desktop assessment of ecological values was deemed sufficient for the conceptual design stage of the busway extension. In subsequent stages, further studies may be needed to more accurately assess ecological impacts associated with this project.

11.2.1 Previous investigations

Pacific Motorway Transit Project

The Pacific Motorway Transit Project Environmental Approval Report (Connell Wagner 2007) includes a recent assessment of habitat values within the project area and adjoining lands based on desktop and field investigations (i.e. database searches, review of existing vegetation/habitat mapping, and 'on ground' surveys).

Though part of a broader-scale ecological assessment, this report provides useful information for assessing ecological values within the project area including information on the structure and floristic composition of vegetation as well as known and likely occurrences of flora and fauna within and adjacent to the corridor for busway extension. In addition to this the report identifies potential ecological impacts associated with the busway extension. Mitigation strategies for ameliorating or minimising these impacts are also discussed in some detail.

11.2.2 Additional investigations

While providing useful information on ecological values within a broader context, the Pacific Motorway Transit Project Environmental Approval Report does not fully or adequately address ecological values specific to the busway extension. Additional investigations regarding the ecological values specific to the project area and adjoining lands are therefore necessary.

Additional investigations undertaken as part of the current ecological assessment included:

- searches of Queensland Herbarium Records Database (HERBRECS), Queensland Herbarium Core Vegetation Mapping Database (CORVEG), Wildlife Online, Queensland Museum, Birds Australia, and Department of Environment, Water, the Arts and Heritage databases for flora and fauna known or potentially occurring within the corridor and/or surrounding area[1]
- review of aerial photos, geographic information system data and existing maps of vegetation and important habitat areas (including Department of Environment and Resource Management mapping of remnant vegetation as well as mapping of essential habitat and wildlife corridors, and Logan City Council mapping of Vegetation Management Areas and remnant bushland)
- consultation with Logan City Council
- an assessment of the likelihood of occurrence of species of conservation significance known or potentially occurring within or adjacent the busway extension corridor
- a review of other relevant literature (e.g. published material addressing the habitat needs of native flora and fauna).

The corridor for the South East Busway extension from Rochedale to Springwood was also traversed by car and, where possible, foot to identify any other ecological values not identified during the desktop investigations.

Not all of the ecological impacts identified within the Pacific Motorway Transit Project Environmental Approval Report are likely to apply to the proposed extension. The relevance of these impacts (and associated mitigation measures) to the current proposal therefore also needs to be reassessed.

11.3 Preliminary analysis

11.3.1 Existing situation

General description of habitat

The corridor for the South East Busway extension from Rochedale to Springwood lies within a heavily urbanised area. With little in the way of remnant bushland, habitat for native flora and fauna along this corridor is limited mainly to backyards, roadside vegetation and areas of parkland.

No vegetation communities of conservation significance were identified within or adjacent to the corridor for the busway extension, though vegetation of conservation significance (mapped remnant vegetation) does occur to the west (see Figure 11-1).

The busway extension does not bisect any areas mapped as wetland, though it does cross a small section of unmapped open creek alongside the Pacific Motorway. This section of open creek carries run-off from urban areas westwards to several large pipes crossing under the motorway.

While heavily modified, land within and adjoining the busway corridor may provide suitable habitat for a number of native plant or animal species. This includes a number of species of conservation significance.

[1] Database searches were undertaken for the following grid area: latitude 27° 35' to 27° 37' and longitude 153° 06' to 153° 08'

Occurrence of species of conservation significance

Database searches and a review of existing reports identified several rare and threatened species listed under the *Environment Protection and Biodiversity Conservation Act 1999* and/or *Nature Conservation Act 1992* (Queensland) as potentially occurring within the extension corridor (see Tables F-1 and F-2 in Appendix F). Several migratory species listed in the Environment Protection and Biodiversity Conservation Act were also identified as potentially occurring within or adjacent to the busway corridor (see Table F-3 in Appendix F).

For most of these species, the likelihood of occurrence within the project area is considered low due to:

- the absence of confirmed records within the local area
- an absence of suitable habitat within or immediately adjacent to the busway corridor
- lack of connectivity with other nearby areas of known or potentially suitable habitat
- barrier effects limiting effective dispersal from nearby areas of suitable habitat
- known or potential threatening processes occurring within the project area and surrounding lands.

Of the listed threatened species identified in Tables F-1 and F-2 (see Appendix F), the koala (*Phascolarctos cinereus*) and grey-headed flying fox (*Pteropus poliocephalus*) are the only species likely to occur within the corridor or adjacent land. Habitat for the koala within the project area has not been subject to detailed investigation but is likely to include isolated feed and shelter trees (predominantly large eucalypt and paperbark trees) in backyards, areas of parkland and roadside reserves. Habitat for the grey-headed flying fox is most likely limited to feed trees. This includes a wide range of native and exotic species, including flowering eucalypts, fruit trees and fruiting figs and palms.

Of the migratory species, five were identified as likely to occur within the corridor (see Appendix F, Table F-3). Habitat for these species along the busway extension corridor is generally limited to that used for foraging and roosting (e.g. regrowth vegetation, vegetated backyards, and remnant trees). This habitat is unlikely to be important for the persistence of migratory species within the local area.

A number of locally significant bird species (species considered rare in the Logan City Council area) are also considered likely to occur within or alongside the busway extension corridor. These include the little lorikeet, Australian hobby, Pacific baza and several of the listed species discussed previously. Habitat suitable for these species is likely to be restricted to vegetated backyards and isolated feed trees in park areas along the busway extension corridor. Similar habitat for these species occurs on lands adjoining the corridor, with higher quality habitat in areas of remnant bushland and low-density housing to the east and west of the project area.

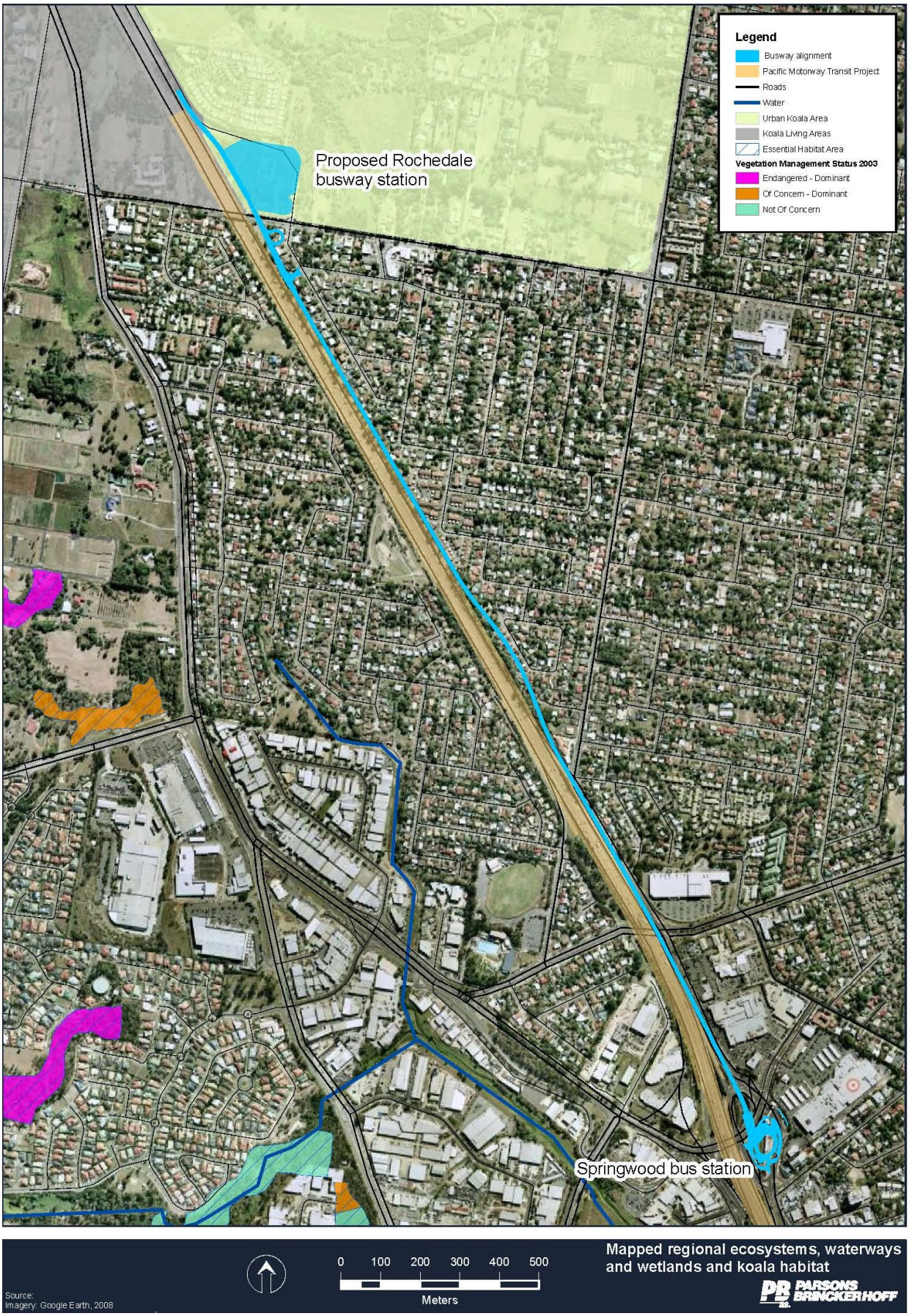

Figure 11-1: Mapped regional ecosystems, waterways and wetlands and koala habitat

Other (non-threatened) flora and fauna

Native flora and fauna living along the busway corridor must contend with numerous threats including:

- weed invasion
- predation by domestic and feral animals
- barrier and edge effects associated with habitat fragmentation
- noise and light pollution
- vehicular traffic.

For this reason, the majority of flora and fauna species known or likely to occur within the corridor and adjacent lands are common native and introduced species considered resilient to anthropogenic disturbances (e.g. noisy miner *Manorina melanocephala* and Torresian crow *Corvus orru*).

Important habitat for common native fauna along the proposed extension is likely to include large hollow-bearing trees and trees supporting termitaria which provide habitat for hollow-dependent species (e.g. brush-tailed possum *Trichosurus vulpecula* and kookaburra *Dacelo gigas*). These trees may also provide shelter for michrochiropteran bats which, in addition to tree hollows, may utilise exfoliating bark and pipe and box culverts for roosting. Isolated trees (in particular large eucalypts) may also provide roosting and/or foraging opportunities for various fauna (in particular lorikeets, crows and flying foxes).

The loss of these resources is unlikely to impact significantly on the occurrence of most common species within the local area, but may (in the short term at least) limit the availability of habitat for these species within and immediately adjacent the busway extension corridor.

Habitat for aquatic fauna along the extension corridor is limited to a short stretch of open creek subtended by pipe culverts and dominated by weeds. Though badly degraded, this area may still provide habitat for resilient native species such as the brown striped marsh frog (*Limnodynastes peronii*) and water rat (*Hydromys chrysogaster*). Rank vegetation associated with this section of creek may also provide cover for northern brown bandicoots (*Isoodon macrourus*), another resilient species known to persist in urban areas (as indicated by the presence of conical diggings during a brief site inspection).

The open section of creek connects east of the Pacific Motorway with more extensive creek habitat to the west via a series of gated pipes running under the Pacific Motorway. The significance of these western drainages in terms of aquatic fauna has not been assessed. However, given their highly modified nature it is unlikely these drainages would provide important habitat for aquatic species other than a handful of resilient common native and introduced species. These areas may however provide foraging opportunities (albeit limited) for a handful of migratory species listed under the Environment Protection and Biodiversity Conservation Act such as cattle egrets *Ardea ibis* and the great egret *Ardea alba*.

Other ecological values

The busway extension lies within the catchment area for Moreton Bay — a RAMSAR site listed as a wetland of international significance under the Environment Protection and Biodiversity Conservation Act. Any impacts on water quality downstream of the busway extension are likely to be minor and easily mitigated. It is therefore unlikely that construction of the busway extension will affect wader habitat within Moreton Bay.

11.3.2 Managing issues and opportunities

Issues

Loss and disturbance of habitat for flora and fauna may occur due to activities related to busway construction and operation, including:

- clearing of vegetation along the busway extension corridor
- increased light and noise pollution
- possible introduction of pest species including weeds and red imported fire ants
- reduced water quality may also occur along watercourses to the west of the busway extension corridor.

If these issues are not managed appropriately, mortality of fauna may result.

Opportunities

In the longer term, opportunities may exist to enhance the value of habitat for fauna along the busway extension corridor, through the planting of food trees and provision of artificial shelter.

Mitigation measures

Mitigation measures can be employed to address most or all of the aforementioned issues. The mitigation strategies required to do this vary according to the type and scale of the impact under consideration. Mitigation strategies currently available to address the above impacts include the following:

- using spotter catchers to reduce mortality of animals during clearing operations
- landscaping and replanting of disturbed habitat with locally native plants (where appropriate)
- using fauna exclusion and protection measures such as fauna exclusion fencing and koala refuge poles
- providing unidirectional fauna hatches along busway/motorway fencing to allow fauna straying onto the busway to escape safely
- providing compensatory habitat for native fauna where habitat loss is unavoidable (e.g. deployment of nesting boxes and bat shelters in green space areas adjoining the project area to compensate for the loss of roosting/shelter sites during construction)
- developing and implementing a plan to reduce the risk associated with exotic pest species not currently known to occur within the project area or surrounding lands, in particular the red imported fire ant
- implementing controls to ensure contaminated run-off from the development site does not affect water quality downstream (i.e. along drainages west of the Pacific Motorway)
- restricting development activity to daylight hours, where possible.

11.4 Future investigations

To ensure ecological values within the project area are properly identified and protected, habitat values within the project corridor and adjacent lands should be investigated in more detail closer to delivery of the project. Of particular importance in this regard is the identification of significant habitat trees, especially those likely to be utilised by species of conservation significance (i.e. grey-headed flying fox, koala and locally significant bird species).

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