In addition to the one-way fauna exclusion fencing there are projects within the area surrounding the the Proposed Protection Zone and ecological corridor that are further hindering access to the ecological corridor from the conservation areas.

Yawalpah Road is planned as a four lane road. The northern two lanes as well as the earthworks for the future (southern) two lanes are constructed across the ecological corridor. Roadworks are under way to the east of the ecological corridor to extend the northern two lanes of Yawalpah road to the intersection with Kerkin road, replacing the old existing two lane road.

There are a series of hydraulic culverts within the ecological corridor and crossing underneath Yawalpah Road. Council road design drawings show that the culverts are 1.8m in diameter. The culverts extend under the Yawalpah Road embankment and are approximately 40m long.

The length of piping and absence of fauna furniture and permanent inundation would preclude movements through them by koalas from the conservation areas to the ecological corridor.

The culvert outlets are located north of the Yawalpah road reserve boundary and thus north of the one-way fauna exclusion fence. The culverts are partially submerged and aquatic plants are growing at both the inlet and outlet of the culverts, indicating that the culverts are permanently submerged (refer to Figure 12). Koalas cannot cross through the culverts and move from the north to the south.

Koalas can however cross the road reserve from the south (e.g. from urban development in the south), cross the fence on the northern boundary and move towards the koala conservation area in the north.

Figure 12: Partially submerged culverts under Yawalpah Road, north outlet

The constraints listed above and the Proposed Protection Zone condition it is evident that both the the Proposed Protection Zone and ecological corridor south of Yawalpah Road cannot support a viable koala population.

As per the information provided in the referral and in line with the Department's assessment above, the physical attributes of the corridor (including the vegetation within the corridor) makes it a suitable method for the dispersal of koalas from the Coomera Woods Development site to the conservation area.

The one-way fauna exclusion fences across that cross the ecological corridor effectively allow koalas to enter the koala conservation area, through a drop down method. However, the 60cm strip of sheet metal along the top of the fencing on the conservation area side stops koalas from climbing over the fence and into the urban footprint.

		The combined effect is that while the ecological corridor does provide for koalas that may be present to disperse to the koala conservation area, it does not provide connectivity between the Coomera Woods site and the koala conservation area located beyond the urban footprint. The Proposed Protection Zone is thus not part of a contiguous landscape greater than 300 Ha. The habitat connectivity score should therefore be =0 No habitat connectivity values will be retained in the short or long term surrounding the Proposed Protection Zone, resulting in an attribute score of 0.
Key Existing Threats	0	Detailed information is available about the existing threats to Koalas in the East Coomera area as extensive monitoring and research was completed during 2012 and 2013 as a lead in to implementing the Council's translocation strategy. Vehicle strikes, dog attacks and disease are three existing threats to the Coomera koala population. The following data has been provided from Council's Reports and Plans (East Coomera Koala Conservation Plan 2014-2018) surrounding this strategy and reports on threats at a time when East Coomera was substantially less developed. Vehicle Strike: Between 2012 and 2013, Wildcare Australia recorded six (6) Koala fatalities from vehicle strike within East Coomera. In the same period, CGC recorded a further two (2) Koala fatalities taking the total deaths from vehicle strike to 8 for the period. The majority of these strikes occurred along Foxwell Road to the south of the project site. Additionally, thirteen (13) Koala vehicle strikes were recorded along the Pacific Motorway as it traverses the Coomera area. Substantial development expansion and vehicle usage on existing and new roads has occurred since this period. Additionally, it is noted that the project area includes two new large scale "trunk" road corridors partially funded by the Council and State Government. Dog Attack: There are approximately 60,000 registered dogs within the Gold Coast area with the majority of these residing in urban settings and occurring through the entire East Coomera area. In 2012, fifteen (15) Koalas were rescued or recovered from the East Coomera Area by Wildcare Australia. Many of these were due to threats of or actual suspected attacks by dogs. Substantial evidence of both frequent and regular Koala mortality from vehicle strike and dog attack is known within the immediate proximity of the project site. These threats, along with the removal of habitat, are in essence why the CGC commenced this strategy of physically capturing and relocating the Koalas from the East Coomera area. Disease: Chlamydia is a common bacterial infection in koalas which causes symptoms such as cystitis, conjunctivitis leading to blindness, respiratory infections, reduced fertility rates and if left untreated can lead to death. Unfortunately, most wild koala populations are infected, and inhibits conservation activities. Chlamydia is a serious threat to koalas within the Gold Coast with a mortality rate of 78 per cent of those admitted to the Currumbin Wildlife Hospital. Wildcare Australia koala rescues for 2011 and 2012 found that 26 per cent of examined koalas from East Coomera tested positive for Chlamydia. The Coomera Woods site is almost completely surrounded by vehicle and dog attack threats, either through already constructed residential areas and roads or through approved and under construction areas, the majority of which also retain EPBC approvals. A large portion of the East Coomera koala population is also at risk from chlamydia. Due to the existence of key threats, the attribute has scored 0.
Recovery Value	0	The relevant interim recovery objective states: 1. Protect and conserve large, connected areas of koala habitat, particularly large, connected areas that support koalas that are: (i) Of sufficient size to be genetically robust / operate as a viable sub-population; or (ii) Free of disease or have a very low incidence of disease; or (iii) Breeding (i.e. presence of back young or juveniles). 2. Maintain corridors and connective habitat that allow movement of koalas between large areas of habitat. Reviewing the above, it is considered that the majority of habitat provided within the proposed works area of the proposed Protection Zone is unlikely to be important in achieving the Interim Recovery Objectives. *Large and connected* The proposed Protection Zone encompasses approximately 1.5ha. While it forms part of the Coomera Woods Development site, which encompass approximately 147 hectares), as has been demonstrated above, the site is not connected to the Council's Koala Conservation Area. The proposed Protection Zone is not large and connected, and is not part of a large connected area of koala habitat.

Does the site support a viable sub-population?

Because the Proposed Protection Zone (and the Coomera Woods Development Site) is functionally disconnected from the larger conservation area to the north, whether the Proposed Protection Zone is able to support a viable sub-population must be considered on the basis that the Proposed Protection Zone and sub-population within Coomera Woods is separated from the sub-popualtion in the conservation area.

The Proposed Protection Zone its self is not of sufficient size to support a viable koala sub-population. As discussed within EPBC 2017/8134 the Coomera Woods Development Site sub-population is not viable, given the size and condition of the habitat and being disconnected from the conservation area sub-population.

Furthermore, Biolink 2017 estimates that a minimum viable population (MVP) would require 170 individuals and approximately 1500 hectares of suitable habitat (Biolink 2007b). The sub-population within Coomera Woods, nor within the urban koala area, meet the MVP requirements. Comprehensive surveys of Coomera Woods found only five koalas and none recorded within the Proposed Protection Zone.

The Koala Referral Guidelines state:

"*In most cases, the value of these three attributes [i.e. habitat connectivity, existing threats and recovery value] in urban areas is likely to be zero as the existing effects of habitat loss, fragmentation, vehicle strike, dog attack and other threats have and area likely to continue to degrade these areas over the medium to long-term*." (p. 25)

The Biolink 2017 also includes the following statement:

"*It is very clear that the urban sub-populaiton in the emerging Coomera Town Centre section of the urban area is at significant risk and is unlikely to be viable over the long-term*." (p. 49)

The Proposed Protection Zone does not support a viable sub-population, and is not of sufficient size to support a genetically robust sub-population. Extensive surveys over the Coomera Woods Development Site recorded only five koalas, none of which were observed within the Proposed Protection Zone. This is a likely result of the extensive and continual anthropogenic disturbances from adjacent land uses and degraded habitat within the Proposed Protection Zone. The Proposed Protection Zone does not meet the interim recovery objectives in this regard.

Disease

Additionally, a consideration within the interim recovery objective refers to koalas that are '*free of disease or have a very low incidence of disease*'. The following extracts from *East Coomera Koala Translocation Program* are noted in relation to the health of koalas in the Coomera area:

"*Of the Koalas examined for the project, around 40% had some clinical signs of illness or disease ranging from conjunctivitis, cystitis, reproductive tract disease, gingivitis, gastrointestinal candidiasis, poor body condition, bacterial infection, toxaemia/septicaemia anaemia and bone marrow disease."*

The report goes on to state;

"the health assessment have raised serious concerns regarding overall health of the local koala population, particularly in relation to chlamydial infection", with 21% of Koala examined testing positive for Chlamydia.

In the Biolink 2017 report (p20) it is recorded that 14.3% of adult males and 26.1% of adult females observed (by detection through binoculars) showed obvious signs of disease *(i.e.* cystitis and/or conjunctivitis).

The report further provide that:
"Disease poses an ongoing threat to koalas in urban landscapes where resident koalas are likely to face added nutritional and social stress associated with limited available habitat and safe dispersal opportunities, and in some cases elevated koala densities."

The koala sub-population within the urban koala area are not disease free and neither does it have a low incidence of disease.

The interim recovery objective is not met in this regard.

Breeding

Extensive surveys over the Coomera Woods site recorded only five koalas, none of which were observed within the Proposed Protection Zone. It is considered that the Proposed Protection Zone does not support a viable sub-population and does not facilitate breeding within the urban footprint.

The urban koala sub-population has dramatically decreased over the past decade indicating a negative breeding rate.

Biolink 2017 estimates that the overall koala population for the entire East Coomera area, which includes both the urban and rural koala sub-populations, is relatively the same as the results from over a decade ago, namely:

- 2006-07 population estimate: 510 (±129)
- 2017 population estimate: 499 (±74)

It is to be expected that the koala population within the conservation area would be breeding.

		However, in order to assess whether the koalas within the urban footprint are breeding, it is necessary to review the corresponding koala population estimates. The following figures are relevant: • The Biolink 2007 report (p.7) estimated that 70% of the East Coomera population (356 koalas) resided within the UKA; and • 180 koalas were translocated from the UKA (Biolink 2017, p.5) From the abovementioned numbers, it is evident that, (ignoring all natural reproduction of the remaining koalas during this decade) the current population should be 356 – 180 = 176 koalas. However, Biolink 2017 (p.57) state that only up to approximately 80 koalas are currently still likely to reside in the UKA. If these Biolink figures are correct, there has been a very considerable negative koala population growth within the koala populations located within the urban footprint. The koala population estimates in the Biolink 2017 report do not point to successful breeding amongst the fragmented urban koala population within the urban footprint. On the contrary, the latest population estimates support the scientific position that the population within the urban footprint will continue to decline over time. The Proposed Protection Zone does not meet the recovery objectives in relation to breeding. *Maintain corridors and connective habitat that allow movement of koalas between large areas of habitat* As has been demonstrated above, the site is not large and connected, and is not part of a large connected area of koala habitat. The interim recovery objective is not met in this regard. As the Proposed Protection Zone does not meet the interim recovery objectives, the attribute has been scored 0.
Total Score	**3**	

The proposed action results in the removal of suitable tree species for use by the koala and no koalas have been recorded within/using the Proposed Protection Zone. As a collective the habitat is disturbed, fragmented and retains no functioning connectivity to areas of known critical habitat. As detailed in the Koala Habitat Assessment Tool vegetated portions of the Proposed Protection Zone retain a score of 3 out of 10 which registers below the threshold to be determined critical habitat. This low score was based on the lack of functional connectivity, viability of the small population, the abundance of risks to koalas and reduced recovery value for the species.

The Proposed Protection Zone does not contain any habitat critical to the survival of the koala and therefore cannot adversely affect such areas. It is considered unlikely that the proposed action will adversely affect habitat critical to the koala, in the removal of approximately 1.5ha of degraded/primarily sparse vegetation.

- **Disrupt the breeding cycle of an important population of each species**

The Proposed Protection Zone does not support an important population of koalas. Site surveys identified a small population of 5 individuals within the Coomera Woods Development Site, which includes the Proposed Protection Zone. This population is not viable and reduced connectivity to the rural koala population is limited reducing potential breeding between these populations and unsustainable over the long term. The proposed action is unlikely to disrupt the breeding cycle of an important population.

- **Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline**

The quality of habitat on-site has been largely diminished by the approved actions of clearing and residential development which have occurred around the Proposed Protection Zone. The Proposed Protection Zone does not contain any habitat critical to the survival of the koala and therefore cannot adversely affect such areas. It is considered unlikely that the proposed action will adversely affect habitat critical to the koala, in the removal of approximately 1.5ha of degraded/primarily sparse vegetation.

- **Resulting invasive species that are harmful to the vulnerable species becoming established in the vulnerable species' habitat**

Threats and invasive species are common within the Proposed Protection Zone and surrounding areas. The proposed action will not significantly increase the presence of invasive species within the Proposed Protection Zone, as they already occur in abundance immediately adjoining the project area on all orientations. Additionally, the Proposed Protection Zone has been confirmed as not supporting critical habitat for a vulnerable species.

- **Introduce disease that may cause each species to decline**

The proposed action is unlikely to introduce disease into the area. As part of the East Coomera Koala Conservation Project Council completed detailed monitoring of koala health. 21% of Koalas examined tested positive for Chlamydia. It is therefore considered likely that this disease is prevalent within the East Coomera Locality and within the small population within the Proposed Protection Zone.

- **Interfere substantially with the recovery of each species**

The koala was observed during survey. This species is well known from the locality and considered wide ranging. The Proposed Protection Zone is not considered to contain critical habitat. The removal of approximately 1.5ha of modified/disturbed vegetation is unlikely to interfere substantially with the recovery of this species. The proposed action is not considered to compromise the recovery of the discussed specie as detailed within existing recovery plans (federal and/or state) for the discussed species.

Conclusion

The proposed action is unlikely to result in a significant effect on this species as:

- No koalas have been recorded within/using the Proposed Protection Zone within surveys for the Coomera Woods Development site or recent site investigations.
- The Proposed Protection Zone does not support an important population.
- The habitat within the proposed works area is not considered critical to the survival of this species.
- Suitable habitat is not considered limited to the Proposed Protection Zone.
- The proposed action is unlikely to lead to a long-term decrease in the population size or interfere substantially with the recovery of this species

Despite the assessment, it is considered unlikely for the proposed action to result in a significant impact on the koala as demonstrated above or require referral to the Department of Environment and Energy (refer to figures below). The Proposed Protection Zone does not contain critical habitat, as determined above within Table 8. Following the flow chart for *Assessing adverse effects on habitat critical to the survival of the koala* (Figure13) the proposed action should then be assessed against Section 9 of the Koala Referral Guidelines. The proposed action, as determined above, is unlikely to interfere substantially with the recovery of this species given the proposed action is unlikely to increase or excerabate key threats which are already present and significant within the Proposed Protection Zone. In the event that the Proposed Protection Zone did contain critical habitat for the survival of the koala, the area is less than 2ha and is therefore unlikely to have a significant impact on the koala and would not require referral to the Department.

Figure 1: Summary of the EPBC Act referral guidelines for the koala.

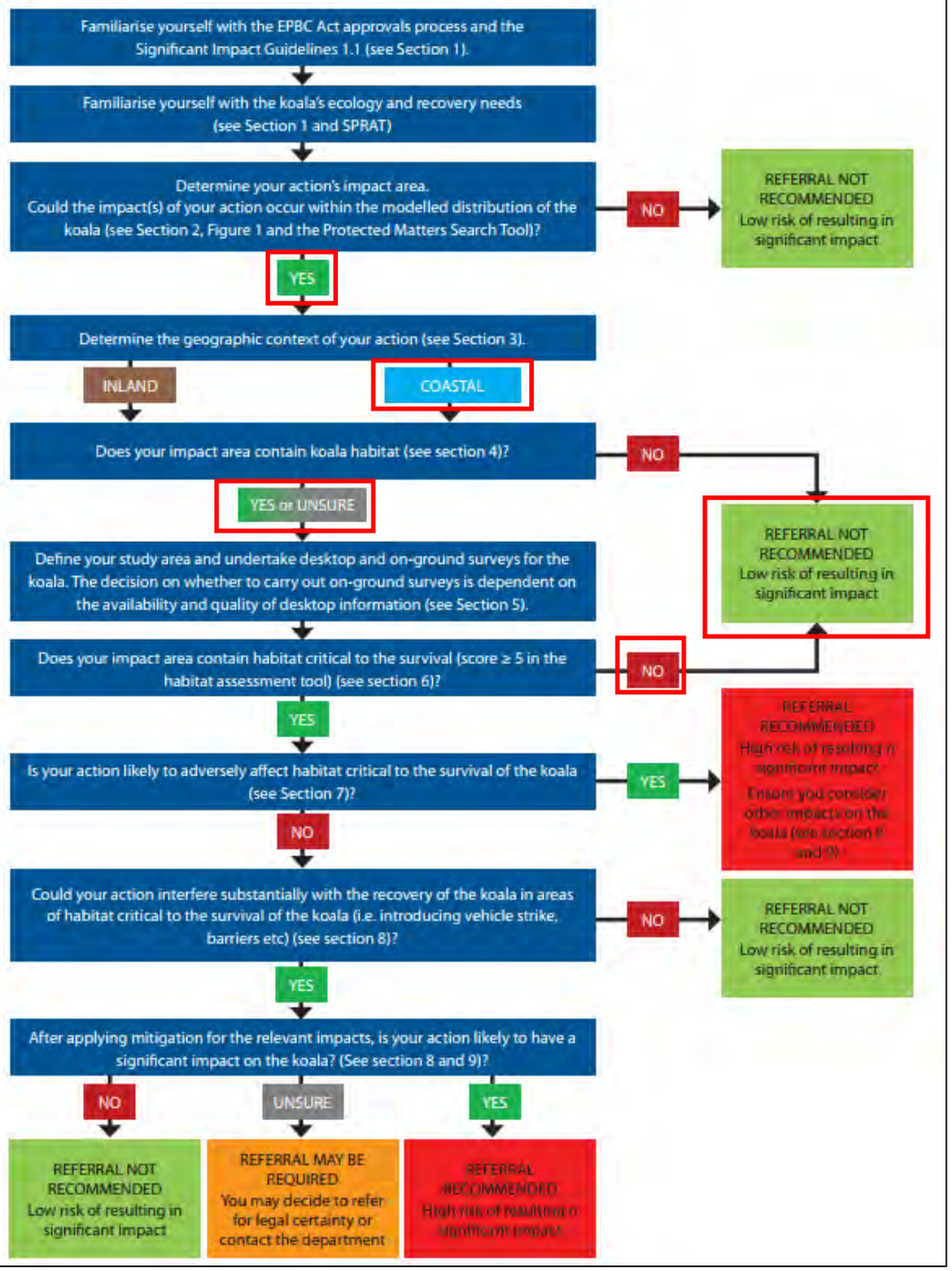

Figure 14: Koala Critical Habitat Assessment Process

Figure 2: Assessing adverse effects on habitat critical to the survival of the koala

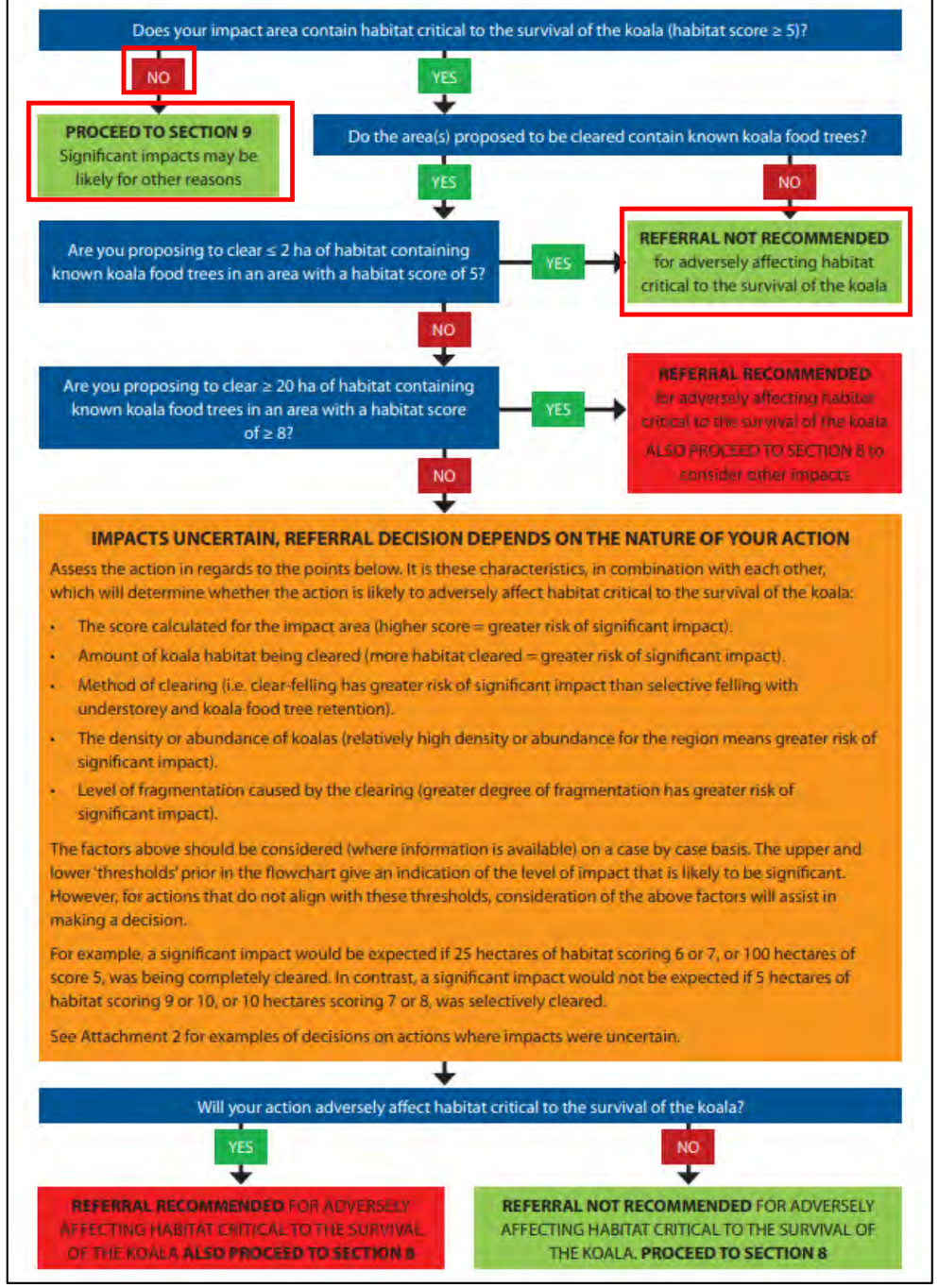

Figure 13: Assessing adverse affects on habitat critical to the survival of the

Greater Glider (*Petauroides volans*)

The species has not been recorded within the Proposed Protection Zone or Coomera Woods Development site during various detailed ecological assessments. The habitat features and requirements for this species are considered largely absent from the Proposed Protection Zone and that of the surrounding areas. Scat analysis for the area and surrounding properties were conducted during surveys of each property.

In addition to the ecological assessments performed within the Coomera Woods Development site, Planit Consulting also performed detailed ecological surveys on numerous surrounding properties which have included surveying for nocturnal anarboreal mammals. The Greater Glider was not identified during any of the detailed surveys of the surrounding sites. The surrounding areas surveyed are shown within the figure below.

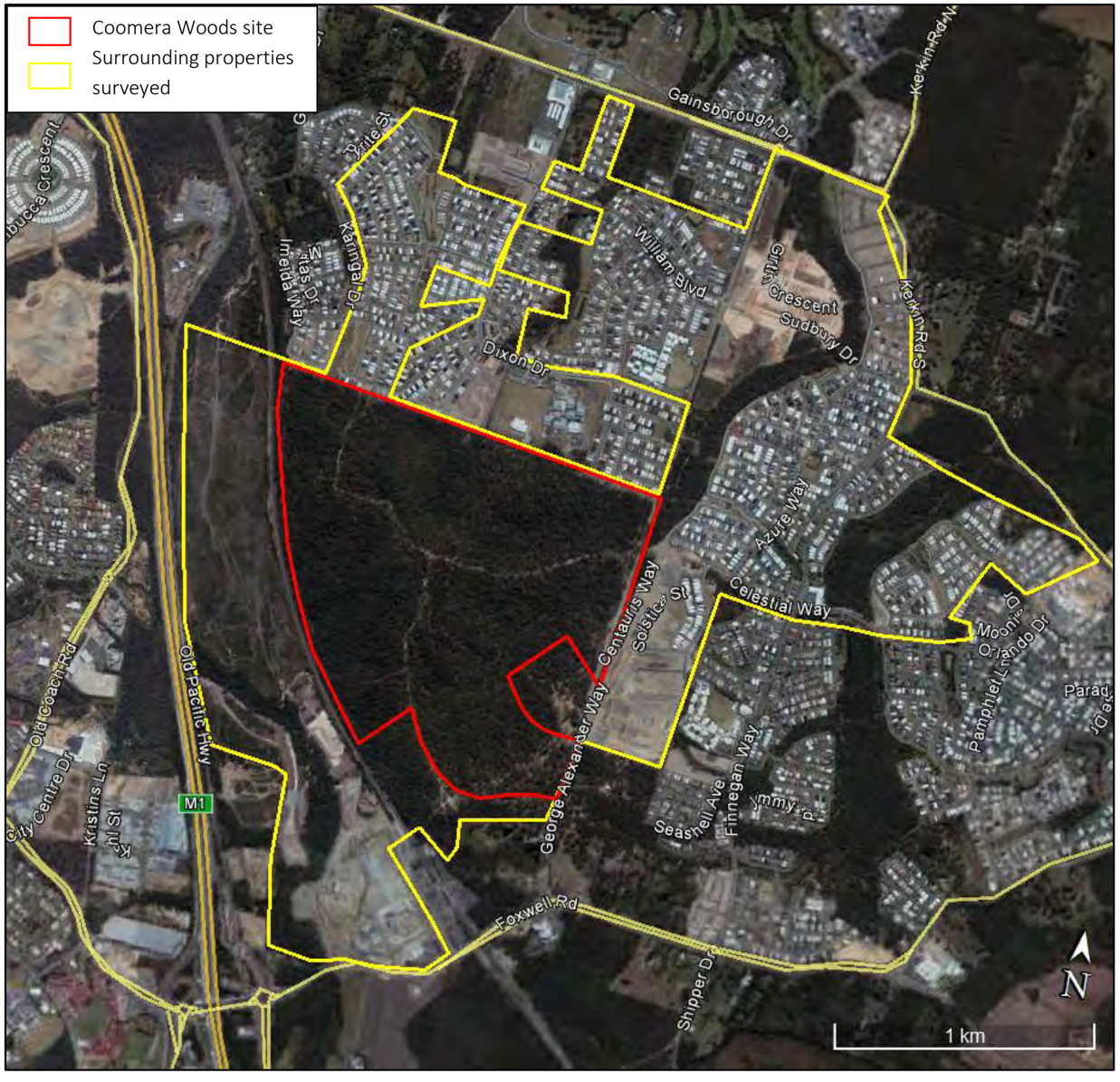

Figure 15: Surrounding Properties Surveyed.

The Table below outlines the properties and survey period/season.

Table 9: Ecological Surveys of surrounding properties

Development/Property	Survey Date/s
Bloom Estate (formally Big Sky)	Stage 10: 14 & 15 October 2009 Stages 4 & 9: 24 & 27 May 2010 Stages 5-8: 11 & 12 March 2010
The Meadows Estate	June – November 2003
Karingal Drive Precinct	January 2007
Gainsborough Park Woodlands	April – May 2004
Coomera Centre Commercial Park (Lot 1/SP209027)	Initial Surveys: November 2003 – May 2004 Additional surveys: February – March 2008
Polaris Residential Estate (Lot 2/SP165374)	Initial Surveys: November 2003 – May 2004 Reviewed Ecological Assessment & VMP: July 2015
Coomera Town Centre	November 2003 – May 2004

The total area surveyed including the Coomera Woods site equates to approximately 550ha. This surveying over a significant time period and potential habitat area failed to record the Great Glider. The initial surveys undertaken in the locality were performed prior to any urban development. The surveys were performed across a range of seasons and weather conditions. The surveys performed within the surrounding properties have also been detailed within the table below.

It is noted that the *Survey Guidelines for Australia's Threatened Mammals Guidelines* under the EPBC Act does not directly list survey techniques for the Greater Glider as the Great Glider listing came into effect after the publication of this document.

However, based on the requirements for other arboreal mammals and in particular glider species, it is considered that spotlighting is the most commonly used method to detect such species. A number of the surveys conducted within the Coomera Woods site and surrounding areas incorporated this technique and specific searches for arboreal mammals. The diurnal searches for signs of foraging and investigation of hollowbearing trees is another survey technique recommended to determine presence and habitat suitability for Glider species, which are commonly used techniques within the surveys detailed below.

All surveying completed by Planit Consutling over the 15 year period has been performed by suitably qualified ecologists with the appropriate licences and permits.

Detailed arboreal mammal surveys conducted on and adjacent to the Proposed Protection Zone and Coomera Woods Master Planned Development site, covering an area of approximately 550ha found that;

- Tree hollow density was low and below mean habitat tree range (5.9 +/- 0.4 habitat trees/ha) for Coastal Dry sclerophyll Forests (Ross, 1999).
  - Within Coomera Woods development site there exists a general scattering of hollow bearing trees (HBT) which are stocked at a recorded rate of ~0.16-17 HBT/ha.
- Tree hollow density (0.16-0.17 HBT/ha) is well below that required for the Greater Glider.
  - Hollow-bearing trees appear to be the most important factor in habitat selection in southern Queensland. Although greater gliders have a relatively small home range they are reported to be absent from forests with fewer than six habitat trees per hectare (ARCS 1999).
  - Several studies have identified that a density of four hollow-bearing trees/ha is sufficient to sustain the diversity of arboreal mammal populations in South East Queensland (Wormington et al. 2002, Maloney et al. 2002). However, some species, such as the greater glider, have been known to utilise many more tree hollows to survive (Council, 'Guideline for the provision of nest boxes').
- Greater Glider was not observed within the Proposed Protection Zone or adajcent properties through detailed ecological surveying.
- Greater Glider was not recorded through scat analysis.

Based on informaiton provided within the table above and the extensive surveying effort it is unlikely that the species is present within the Coomera Woods site and therefore unlikley that the proposed action is to have a significant impact on the Greater Glider. The Assessment of Significance provided within below is therefore considered appropriate and consistent with the information provided above.

As discussed above, this species has not been recorded within the Proposed Protection Zone or Coomera Woods Development Site during extensive and details ecological surveys over the past 15 years. Much of the surrounding properties have also been surveyed by Planit. These surveys have also resulted in no records of the Greater Glider. It is therefore considered that this species does not occur within the Proposed Protection Zone and the proposed action is unlikely to significantly impact this species.

Based upon the locality, distribution and available habitat it is unlikely that the proposed action will:

- **Lead to a long-term decrease in the size of an important population of each species**

An 'important population' is a population that is necessary for a species' long-term survival and recovery. This may include populations identified as such in recovery plans, and/or that are:

4. *key source populations either for breeding or dispersal*

5. *populations that are necessary for maintaining genetic diversity, and/or*
6. *populations that are near the limit of the species range.*

The Proposed Protection Zone is not currently occupied by an important population. This species has not been recorded within the Proposed Protection Zone or surrounding properties over an extensive period of surveying. The potential habitat within the Proposed Protection Zone is not considered sufficient to maintain a population of this species. It is therefore considered that this species does not occur within the area and the proposed action is unlikely to lead to a long-term decrease in the size of an important population.

- **Reduce the area of occupancy of an important population**

The Proposed Protection Zone is not currently occupied by an important population. This species has not been recorded within the Proposed Protection Zone or surrounding properties over an extensive period of surveying. The potential habitat within the Proposed Protection Zone is not considered sufficient to maintain a population of this species. It is therefore considered that this species does not occur within the Proposed Protection Zone and the proposed action is unlikely to reduce the area of occupancy of an important population.

- **Fragment an existing important population into two or more populations**

The Proposed Protection Zone is not currently occupied by an important population. This species has not been recorded within the Proposed Protection Zone or surrounding properties over an extensive period of surveying.

The potential habitat within the Proposed Protection Zone is not considered sufficient to maintain a population of this species. The Proposed Protection Zone is largely disturbed/modified as a result of historic land uses. The Proposed Protection Zone is considered isolated from large intact habitats as a result of adjacent land uses.

It is therefore considered that this species does not occur within the Proposed Protection Zone and the proposed action is unlikely to fragment an existing important population into two or more populations.

- **Adversely affect habitat critical to the survival of a species**

Habitat critical to the survival of a species refers to areas that are necessary:

- *For activities such as foraging, breeding, roosting, or dispersal*
- *For the long-term maintenance of the species (including the maintenance of species essential to the survival of the species)*
- *To maintain genetic diversity and long-term evolutionary development, or*
- *For the reintroduction of populations or recovery of the species.*

Critical habitat may be habitat identified in a recovery plan for the species or listed as Critical Habitat on the Register maintained by the minister under the EPBC Act. The Proposed Protection Zone is not listed as habitat critical to the survival of a threatened fauna species within the Critical Habitat Register.

It is considered that the project site does not contain habitat critical to the survival of this species as defined within the NES Guidelines and the species profiles/studies reviewed relevant to the species.

The Proposed Protection Zone is not currently occupied by an important population. This species has not been recorded within the Proposed Protection Zone or surrounding properties over an extensive period of surveying.

The potential habitat within the Proposed Protection Zone is not considered sufficient to maintain a population of this species. The Proposed Protection Zone is largely disturbed/modified as a result of historic land uses. The Proposed Protection Zone is considered isolated from large intact habitats as a result of adjacent land uses.

It is therefore considered that this species does not occur within the Proposed Protection Zone and the proposed action is unlikely to adversely affect habitat critical to the survival of this species.

- **Disrupt the breeding cycle of an important population of each species**

The Proposed Protection Zone is not currently occupied by an important population. This species has not been recorded within the Proposed Protection Zone or surrounding properties over an extensive period of surveying.

The potential habitat within the Proposed Protection Zone is not considered sufficient to maintain a population of this species. The Proposed Protection Zone is largely disturbed/modified as a result of historic land uses. The Proposed Protection Zone is considered isolated from large intact habitats as a result of adjacent land uses.

It is therefore considered that this species does not occur within the Proposed Protection Zone and the proposed action is unlikely to disrupt the breeding cycle of an important population of this species.

- **Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline**

The Proposed Protection Zone is not currently occupied by an important population. This species has not been recorded within the Proposed Protection Zone or surrounding properties over an extensive period of surveying.

The potential habitat within the Proposed Protection Zone is not considered sufficient to maintain a population of this species. The Proposed Protection Zone is largely disturbed/modified as a result of historic land uses. The Proposed Protection Zone is considered isolated from large intact habitats as a result of adjacent land uses.

It is therefore considered that this species does not occur within the Proposed Protection Zone and the proposed action is unlikely to modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.

- **Resulting invasive species that are harmful to the vulnerable species becoming established in the vulnerable species' habitat**

Invasive flora species are common within the Proposed Protection Zone and a vegetation management plan has been prepared to reduce propagule spread to areas external the Proposed Protection Zone and offsite habitats.

It is considered unlikely that the proposed action will significantly increase occurrence of invasive species that are harmful to the vulnerable species and becoming established within the species' habitat.

- **Introduce disease that may cause each species to decline**

As far as the intended use of the Proposed Protection Zone as an urban development there is limited possibility of disease introduction. Potential vectors of disease (i.e. introduced fauna species) are considered unlikely to increase via the project and implementation of wash-down procedures for plant and equipment to minimize the chance of transporting weed propagules into the Proposed Protection Zone is recommended within the vegetation management plan. Protocols should also be developed to ensure such plant disease are not introduced into new locations where they may impact upon the areas external the Proposed Protection Zone.

The construction and operation of the proposed action is unlikely to introduce disease that may cause either of the discussed species to decline.

- **Interfere substantially with the recovery of each species**

The Proposed Protection Zone is not currently occupied by an important population. This species has not been recorded within the Proposed Protection Zone or surrounding properties over an extensive period of surveying.

The potential habitat within the Proposed Protection Zone is not considered sufficient to maintain a population of this species. The Proposed Protection Zone is largely disturbed/modified as a result of historic land uses. The Proposed Protection Zone is considered isolated from large intact habitats as a result of adjacent land uses.

It is therefore considered that this species does not occur within the Proposed Protection Zone and the proposed action is unlikely to modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.

Conclusion
The proposed action is unlikely to result in a significant effect on this species as:

- This species has not been recorded within the Proposed Protection Zone during an extensive 15 year period of detailed ecological studies.
- This species was not recorded in adjacent properties during detailed ecological surveys.
- The Proposed Protection Zone is not considered to be occupied by an important population of this species.
- The habitat is not considered critical to the survival of this species and lacks large hollows to maintain a population of this species.

Vulnerable Species Conclusion

The proposed action is considered unlikely to have a significant impact on scheduled MNES threatened species as discussed above. The 1.5ha Proposed Protection Zone contains a mixture of remnant vegetation and non-remnant which provides limited potential habitat to MNES threatened species. The Proposed Protection Zone is located within areas of low ecological value which minimises disturbance and potential impacts to native vegetation and fauna. The proposed action will remove approximately 1.5 hectares of primarily modified/sparse vegetation. The removal of this vegetation has been assessed and determined unlikely to have a significanct impact on MNES threatened species.

3.4 Migratory Species

The Protected Matters Search identified thirty-six (36) migratory bird species that have been reported occurring within 2km of the Proposed Protection Zone.

Table 10: Migratory Species

Species	EPBC Status	Habitat Description	Likelihood of occurrence and potential impacts
Migratory Marine Birds			
Fork-tailed Swift (*Apus pacificus*)	Migratory	The Fork-tailed Swift occurs over inland plains but sometimes above foothills or in coastal areas. They often sighted over cliffs and beaches and also over islands and sometimes well out to sea. They also occur over settled areas, including towns, urban areas and cities. They favour dry or open habitats, including riparian woodland and teatree swamps, low scrub, heathland or saltmarsh. They are also found at treeless grassland and sandplains covered with spinifex, open farmland and inland and coastal sand-dunes. They may occur above rainforests, wet sclerophyll forest or open forest or plantations of pines (Higgins 1999). This migratory bird species forages aerially, up to hundreds of metres above ground, but also less than 1 m above open areas or over water (Cameron 1952). They sometimes feed aerially among tree-tops in open forest (Higgins 1999). The Forktailed Swift leaves its breeding grounds in Siberia from August–September and usually arrives in Australia around October; some arrive early in September, however, this is rare (Higgins 1999). The Fork-tailed Swift does not breed in Australia. In their breeding range, they nest on mountain cliffs or island rock caves, inside narrow crevices or in cracks on vertical cliff faces. They are also known to nest in houses and occasionally in holes in trees (Chantler & Driessens, 1995; De Schauensee 1984; Grimmett et al. 1999). They breed from April to July, usually in small colonies, producing two or three eggs per brood (Chantler & Driessens 1995; Grimmett et al. 1999; Robson 2000).	This migratory species was not observed within the Proposed Protection Zone. It is considered that the preferred habitat for this species is largely absent from the proposed works area. The proposed action is considered unlikely to significantly impact this Matter of National Environmental Significance.
Migratory Terrestrial Species			
Oriental Cuckoo (C*uculus optatus)*	Migratory	'Important habitat: Non-breeding habitat only: monsoonal rainforest, vine thickets, wet sclerophyll forest or open *Casuarina*, *Acacia* or *Eucalyptus* woodlands. Frequently at edges or ecotones between habitat types. Riparian forest is favoured habitat in the Kimberley region.' (DoE 2015 Referral Guidelines)	This migratory species was not observed within the Proposed Protection Zone. It is considered that the preferred habitat for this species is largely absent from the proposed works area. The proposed action is considered unlikely to significantly impact this Matter of National Environmental Significance.
White-throated Needletail (*Hirundapus caudacustus)*	Migratory	The White-throated Needletail is almost exclusively aerial, from heights of less than 1 m up to more than 1000 m above the ground (Coventry 1989; Tarburton 1993; Watson 1955). Most records of this large swift have been taken above wooded areas, including open forest and rainforest. They may also fly between trees or in clearings, below the canopy (Higgins 1999). They also commonly occur over heathland (Cooper 1971; Learmonth 1951; McFarland 1988), but less often over treeless areas, such as grassland or swamps (Cooper 1971; Gosper 1981; Learmonth 1951). When flying above farmland, they are more often recorded above partly cleared pasture, plantations or remnant vegetation at the edge of paddocks (Emison and Porter 1978; Friend 1982; Tarburton 1993). In coastal areas, they are sometimes seen flying over sandy beaches or mudflats (Cooper 1971; Crompton 1936; Davis 1965), and often around coastal cliffs and other areas with prominent updraughts, such as ridges and sand-dunes (Cooper 1971; Dawson et al. 1991; Loyn 1980; Mitchell et al. 1996; Schulz and Kristensen 1994). They are sometimes recorded above islands well out to sea (Brandis et al. 1992; Cooper 1971; Warham 1957). In Australia, White-throated Needletails almost always forage aerially, at heights up to 'cloud level', above a wide variety of habitats ranging from heavily treed forests to open habitats, such as farmland, heathland or mudflats (Learmonth 1951; McDonald 1938; Tarburton 1993; Templeton 1991). They often forage in areas of updraughts, such as ridges, cliffs or sanddunes (Legge 1927; Loyn 1985; Mitchell et al. 1996), or in the smoke of bushfires (McCulloch 1966), or in whirlwinds (Le Souëf and Campbell 1902). They also often forage along the edges of low pressure systems, which both lift their food sources and assist with their flight, and it is said that they follow these systems across Australia (Boehm 1939). The White-throated Needletail breeds in Asia (Chantler 1999; Dement'ev and Gladkov 1951) and spends the non-breeding season in Australasia, mainly in Australia, and occasionally in New Guinea and New Zealand (Barrett et al. 2003; Blakers et al. 1984; Brooker et al. 1979; Higgins 1999; Sedgwick 1978)' [in DSEWPC, 2013]	This migratory species was not observed within the Proposed Protection Zone. It is considered that the preferred habitat for this species is largely absent from the proposed works area. The proposed action is considered unlikely to significantly impact this Matter of National Environmental Significance.
Black-faced Monarch (*Monarcha melanopsis)*	Migratory	The Black-faced Monarch is a widespread migratory bird species that occurs within Rainforest, riparian forest, wet sclerophyll forest, occasionally in dry sclerophyll forest. It is a common summer migrant found in eucalypt forest, rainforest and coastal scrub (Gold Coast City Council 2006).	This migratory species was not observed within the Proposed Protection Zone. It is considered that the preferred habitat for this species is largely absent from the proposed works area. The proposed action is considered unlikely to significantly impact this Matter of National Environmental Significance.
Spectacled Monarch (*Monarcha trivirgatus)*	Migratory	The Spectacled Monarch is a common summer migrant found in rainforest and damper eucalypt forests. It is typically found well below canopy as it favours thick undergrowth. It is moderately common within rainforest, riparian forest, and well vegetated gullies (Gold Coast City Council 2006). Breeding occurs between October and February within a deeply cupshaped nest placed within the upright for of a tree or vine tangle 1-7m above the ground (Readers Digest, 2002).	This migratory species was not observed within the Proposed Protection Zone. It is considered that the preferred habitat for this species is largely absent from the proposed works area. The proposed action is considered unlikely to significantly impact this Matter of National Environmental Significance.
Satin Flycatcher (*Myiagra*	Migratory	The Satin Flycatcher is widespread in eastern Australia and vagrant to New Zealand (Blakers et al. 1984). It inhabits heavily vegetated gullies in eucalypt-dominated forests and taller woodlands, and on	This migratory species was not observed

Species	EPBC Status	Habitat Description	Likelihood of occurrence and potential impacts
canoleuca)		migration, occur in coastal forests, woodlands, mangroves and drier woodlands and open forests (Blakers et al. 1984; Emison et al. 1987). Satin Flycatchers are mainly recorded in eucalypt forests, especially wet sclerophyll forest, often dominated by eucalypts such as Brown Barrel, Eucalypt fastigata, Mountain Gum, E. dalrympleana, Mountain Grey Gum, Narrow-leaved Peppermint, Messmate or Manna Gum, or occasionally Mountain Ash, E. regnans. Such forests usually have a tall shrubby understorey of tall acacias, for example Blackwood, Acacia melanoxylon. In higher altitude Black Sallee, E. stellulata, woodlands, they are often associated with tea-trees and tree-ferns (Emison et al. 1987; Loyn 1985; Mac Nally 1997). They sometimes also occur in dry sclerophyll forests and woodlands, usually dominated by eucalypts such as Blakely's Red Gum, E. blakelyi, Mugga Ironbark, E. sideroxylon, Yellow Box, White Box, E. albens, Manna Gum or stringybarks, including Red Stringybark, E. macrorhyncha and Broad-leaved Stringybark, usually with open understorey (Ford and Bell 1981; Traill et al. 1996). Satin Flycatchers prefer to nest in a fork of outer branches of trees, such as paperbarks, eucalypts, and banksias (BA NRS 2002). Satin Flycatchers are migratory, moving north in autumn to spend winter in northern Australia and New Guinea. They return south in spring to spend summer in south-eastern Australia (Blakers et al. 1984). On the south-eastern mainland of Australia and Tasmania, they appear to be almost entirely deserted in winter, with reporting rates of 7.8% and 13.6%, respectively, in summer, and 0.3% in both in winter (Blakers et al. 1984; Emison et al. 1987).	within the Proposed Protection Zone. It is considered that the preferred habitat for this species is largely absent from the proposed works area. The proposed action is considered unlikely to significantly impact this Matter of National Environmental Significance.
Rufous Fantail *(Rhipidura rufifrons)*	Migratory	The Rufus Fantail occurs throughout coastal northern and eastern Australia and adjacent ranges from the Kimberleys to southwestern Victoria. This bird species favours denser undergrowth of rainforest, wet sclerophyll forests, mangroves and swamp woodlands (Readers Digest, 2002). The fantail has a complex migratory route, along the eastern and northern coastlines of Australia and into the Torres Strait Islands and southern Papua New Guinea. However, only those populations south of the 25th parallel appear to be completely migratory. Breeding populations further north may be entirely sedentary or locally nomadic, such as from higher altitudes to the coast during winter. Migrants generally travel alone within dense understorey (JWA, 2005) The Rufous Fantail builds a small compact cup nest, of fine grasses bound with spider webs, that is suspended from a tree fork about 5 m from the ground. The bottom of the nest is drawn out into a long stem. Both sexes share nest-building, incubation and feeding of the young (Readers Digest, 2002).	This migratory species was not observed within the Proposed Protection Zone. It is considered that the preferred habitat for this species is largely absent from the proposed works area. The proposed action is considered unlikely to significantly impact this Matter of National Environmental Significance.
Migratory Wetland Species			
Common Sandpiper (*Actitis hypoleucos)*	Migratory	Found along all coastlines of Australia and in many areas inland, the Common Sandpiper is widespread in small numbers. The population when in Australia is concentrated in northern and western Australia (Blakers et al. 1984; Higgins & Davies 1996). The species 60cuminat a wide range of coastal wetlands and some inland wetlands, with varying levels of salinity, and is mostly found around muddy margins or rocky shores and rarely on mudflats. The Common Sandpiper has been recorded in estuaries and deltas of streams, as well as on banks farther upstream; around lakes, pools, billabongs, reservoirs, dams and claypans, and occasionally piers and jetties. The muddy margins utilised by the species are often narrow, and may be steep. The species is often associated with mangroves, and sometimes found in areas of mud littered with rocks or snags (Geering et al. 2007; Higgins & Davies 1996). Generally the species forages in shallow water and on bare soft mud at the edges of wetlands; often where obstacles project from substrate, e.g. rocks or mangrove roots. Birds sometimes venture into grassy areas adjoining wetlands (Higgins & Davies 1996). Roost sites are typically on rocks or in roots or branches of vegetation, especially mangroves. The species is known to perch on posts, jetties, moored boats and other artificial structures, and to sometimes rest on mud or 'loaf' on rocks (Higgins & Davies 1996).' (DEE 2017 online @ http://www.environment.gov.au/cgi- bin/sprat/public/publicspecies.pl?taxon_id=59309)	This migratory species was not observed within the Proposed Protection Zone. It is considered that the preferred habitat for this species is largely absent from the proposed works area. The proposed action is considered unlikely to significantly impact this Matter of National Environmental Significance.
Sharp-tailed Sandpiper (*Calidris acuminata)*	Migratory	'The Sharp-tailed Sandpiper spends the non-breeding season in Australia with small numbers occurring regularly in New Zealand. Most of the population migrates to Australia, mostly to the south-east and are widespread in both inland and coastal locations and in both freshwater and saline habitats. Many inland records are of birds on passage (Cramp 1985; Higgins & Davies 1996). In Australasia, the Sharp-tailed Sandpiper prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation. This includes lagoons, swamps, lakes and pools near the coast, and dams, waterholes, soaks, bore drains and bore swamps, saltpans and hypersaline saltlakes inland. They also occur in saltworks and sewage farms. They use flooded paddocks, sedgelands and other ephemeral wetlands, but leave when they dry. They use intertidal mudflats in sheltered bays, inlets, estuaries or seashores, and also swamps and creeks lined with mangroves. They tend to occupy coastal mudflats mainly after ephemeral terrestrial wetlands have dried out, moving back during the wet season. They may be attracted to mats of algae and water weed either floating or washed up around terrestrial wetlands, and coastal areas with much beachcast seaweed. Sometimes they occur on rocky shores and rarely on exposed reefs (Higgins & Davies 1996). They forage at the edge of the water of wetlands or intertidal mudflats, either on bare wet mud or sand, or in shallow water. They also forage among inundated vegetation of saltmarsh, grass or sedges. They forage in sewage ponds, and often in hypersaline environments. After rain, they may forage in paddocks of short grass, well away from water. They may forage on coastal mudflats at low tide, and move to freshwater wetlands near the coast to feed at high tide. Occasionally they forage on wet or dry mats of algae and among rotting beachcast seagrass or seaweed, and sometimes they are recorded foraging around the edges of stony wetlands or among rocks in water, and rarely on exposed reef (Higgins & Davies 1996). Roosting occurs at the edges of wetlands, on wet open mud or sand, in shallow water, or in short sparse vegetation, such as grass or saltmarsh. Occasionally, they roost on sandy beaches, stony shores or on rocks in water (Higgins & Davies 1996). They have also been recorded roosting in mangroves (Minton & Whitelaw 2000).' (DEE 2017 online @ http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=874)	This migratory species was not observed within the Proposed Protection Zone. It is considered that the preferred habitat for this species is largely absent from the proposed works area. The proposed action is considered unlikely to significantly impact this Matter of National Environmental Significance.
Red Knot (*Calidris canutus*)	Endangered	Addressed in threatened species above as *C. canutus.*	Addressed within threatened species above.
Curlew Sandpiper (*Calidris ferruginea)*	Critically Endangered	Addressed in threatened specie above as *C. ferruginea.*	Addressed within threatened species above.
Pectoral Sandpiper (*Calidris melanotos)*	Migratory	'In Australasia, the Pectoral Sandpiper prefers shallow fresh to saline wetlands. The species is found at coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands. The species is usually found in coastal or near coastal habitat but occasionally found further inland. It prefers wetlands that have open fringing mudflats and low, emergent or fringing vegetation, such as grass	This migratory species was not observed within the Proposed Protection Zone. It is considered that the preferred habitat

Species	EPBC Status	Habitat Description	Likelihood of occurrence and potential impacts
		or samphire. The species has also been recorded in swamp overgrown with lignum. They forage in shallow water or soft mud at the edge of wetlands (Higgins & Davies 1996). In New South Wales (NSW), the Pectoral Sandpiper is widespread, but scattered. Records exist east of the Great Divide, from Casino and Ballina, south to Ulladulla.	for this species is largely absent from the proposed works area. The proposed action is considered unlikely to significantly impact this Matter of National Environmental Significance.
Latham's Snipe *(Gallinago hardwickii)*	Migratory	'In Australia, Latham's Snipe occurs in permanent and ephemeral wetlands up to 2000 m above sea-level (Chapman 1969; Naarding 1981). They usually inhabit open, freshwater wetlands with low, dense vegetation (e.g. swamps, flooded grasslands or heathlands, around bogs and other water bodies) (Frith et. Al. 1977; Naarding 1983; Weston 2006, pers. Comm.). However, they can also occur in habitats with saline or brackish water, in modified or artificial habitats, and in habitats located close to humans or human activity (Frith et al. 1977; Naarding 1983). Latham's Snipe occurs in temperate and tropical regions of Australia (Driscoll 1993). Its altitudinal range extends from sea-level (i.e. the coast) or possibly below. For example, there are records from near Lake Eyre (Higgins & Davies 1996) to approximately 2000 m above sea-level (Chapman 1969; Driscoll 1993). In Australia, Latham's Snipe occurs in a wide variety of permanent and ephemeral wetlands (Naarding 1981). They usually occur in open, freshwater wetlands that have some form of shelter (usually low and dense vegetation) nearby (Frith et al. 1977; Naarding 1983; Weston 2006, pers. Comm.). They generally occupy flooded meadows, seasonal or semi-permanent swamps, or open waters (Frith et al. 1977; Naarding 1983), but various other freshwater habitats can be used including bogs, waterholes, billabongs, lagoons, lakes, creek or river margins, river pools and floodplains (Frith et al. 1977; Naarding 1981, 1983). The structure and composition of the vegetation that occurs around these wetlands is not important in determining the suitability of habitat (Naarding 1983). As such, snipe may be found in a variety of vegetation types or communities including tussock grasslands with rushes, reeds and sedges, coastal and alpine heathlands, lignum or tea-tree scrub, button-]grass plains, alpine herbfields and open forest (Chapman 1969; Frith 1970; Frith et al. 1977; Naarding 1983; Wall 1990). Latham's Snipe sometimes occur in habitats that have saline or brackish water, such as saltmarsh, mangrove creeks, around bays and beaches, and at tidal rivers (Frith et al. 1977; Naarding 1983; Patterson 1991). These habitats are most commonly used when the birds are on migration (Frith et al. 1977). They are regularly recorded in or around modified or artificial habitats including pasture, ploughed paddocks, irrigation channels and drainage ditches, ricefields, orchards, saltworks, and sewage and dairy farms (Fielding 1979; Frith et al. 1977; Lane & Jessop 1985; Naarding 1982, 1983). They can also occur in various sites close to humans or human activity (e.g. near roads, railways, airfields, commercial or industrial complexes) (Frith et al. 1977; Naarding 1983). The foraging habitats of Latham's Snipe are characterized by areas of mud (either exposed or beneath a very shallow covering of water) and some form of cover (e.g. low, dense vegetation) (Frith et al. 1977; Todd 2000). The snipe roost on the ground near (or sometimes in) their foraging areas, usually in sites that provide some degree of shelter, e.g. beside or under clumps of vegetation, among dense tea-tree, in forests, in drainage ditches or plough marks, among boulders, or in shallow water if cover is unavailable (Frith et al. 1977; Naarding 1982, 1983)' [DoE, 2014 online @http://www.environment.gov.au/cgibin/sprat/public/publicspecies.pl?taxon_id=863]	This migratory species was not observed within the Proposed Protection Zone. It is considered that the preferred habitat for this species is largely absent from the proposed works area. The proposed action is considered unlikely to significantly impact this Matter of National Environmental Significance.
Bar-tailed Godwit (*Limosa lapponica)*	Migratory	The Bar-tailed Godwit has been recorded in the coastal areas of all Australian states. It is widespread in the Torres Strait and along the east and south-east coasts of Queensland, NSW and Victoria, including the offshore islands. It is found south from Cooktown to Port Phillip Bay, but is less common west of the Bellarine Peninsula. There are a few inland records from NSW and Victoria. The species is occasionally recorded at King Island and the Furneaux Group, with scattered records on the north and east coasts of Tasmania. The Bar-tailed Godwit is most abundant in south-east Tasmania between Orford and Southport Lagoon. There are a few records from the west coast of Tasmania and inland at Oatlands. In South Australia it is rarely recorded in the south-east and mostly recorded around coasts from Lake Alexandrina to Denial Bay. In Western Australia it is widespread around the coast, from Eyre to Derby, with a few scattered records elsewhere in the Kimberley Division. Populations have also been recorded in the Top End, from Darwin and Melville Island, east to the Alligator River and Croker Island. It is also found in the Gulf of Carpentaria, around Gove Peninsula, Groote Eylandt, Numbulwar and the Sir Edward Pellew Group. Populations have also been sighted in Alice Springs. It is widespread along some parts of the New Zealand coast and is also a regular migrant to Christmas Island, Norfolk Island, Lord Howe Island, Kermadec Island and Chatham Island. Populations have been recorded on Macquarie Island, Snares Island, Auckland Island and Campbell Island (Marchant & Higgins 1993). The Bar-tailed Godwit is found mainly in coastal habitats such as large intertidal sandflats, banks, mudflats, estuaries, inlets, harbours, coastal lagoons and bays. It is found often around beds of seagrass and, sometimes, in nearby saltmarsh. It has been sighted in coastal sewage farms and saltworks, saltlakes and brackish wetlands near coasts, sandy ocean beaches, rock platforms, and coral reef-flats. It is rarely found on inland wetlands or in areas of short grass, such as farmland, paddocks and airstrips, although it is commonly recorded in paddocks at some locations overseas (Marchant & Higgins 1993). The Bar-tailed Godwit usually forages near the edge of water or in shallow water, mainly in tidal estuaries and harbours. They appear not to forage at high tide and prefer exposed sandy substrates on intertidal flats, banks and beaches. The also prefer soft mud; often with beds of eelgrass Zostera or other seagrasses. Occasionally they have been known to forage among mangroves, or on coral reefs or rock platforms among rubble, crevices and holes. They rarely forage in grassy or vegetated areas. On Heron Island they have been seen feeding on insect larvae among the roots of Casuarina (Marchant & Higgins 1993). The Bar-tailed Godwit usually roosts on sandy beaches, sandbars, spits and also in near-coastal saltmarsh. In New Zealand, a few have been recorded roosting in wet grasslands and farmlands. They have been observed roosting at high tide on a claypan 2 km inland of Roebuck Bay, Western Australia (Collins et al. 2001). In some conditions, waders may choose roost sites where a damp substrate lowers the local temperature. In Moreton Bay, inspection of major roosts on opposite sides of the bay during northward migration revealed a marked difference in the proportion of birds in breeding plumage; also, a significantly higher number of moulting males (perhaps breeding adults) were found on islands, as opposed to mainland sites (Thompson 1990b).' (DEE 2017 online @ http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=844)	This migratory species was not observed within the Proposed Protection Zone. It is considered that the preferred habitat for this species is largely absent from the proposed works area. The proposed action is considered unlikely to significantly impact this Matter of National Environmental Significance.
Eastern Curlew (*Numenius madagascariensis*)	Critically Endangered	Addressed in threatened species above as *N. madagascariensis*.	Addressed within threatened species above.
Osprey (*Pandion haliaetus*)	Migratory	The breeding range of the Eastern Osprey extends around the northern coast of Australia (including many offshore islands) from Albany in Western Australia to Lake Macquarie in NSW; with a second isolated breeding population on the coast of South Australia, extending from Head of Bight east to Cape Spencer and Kangaroo Island (Abbott 1982; Barrett et al. 2003; Bischoff 2001; Blakers et al. 1984; Clancy 1991; Condon 1969; Dennis 2007a; Johnstone & Storr 1998; Marchant & Higgins 1993). The total range (breeding plus non-breeding) around the northern coast is more widespread, extending from Esperance in Western Australia to NSW, where records become scarcer towards the south, and into Victoria and Tasmania, where the species is a rare vagrant (Barrett et al. 2003; Blakers et al. 1984; Johnstone & Storr 1998; Marchant & Higgins 1993; Morris et al. 1981). The distribution of the species around the northern coast (south-western Western Australia to south-eastern NSW) appears continuous except for a possible gap at Eighty Mile Beach (Barrett et al. 2003; Blakers et al. 1984). Eastern Ospreys occur in littoral and coastal habitats and terrestrial wetlands of tropical and temperate Australia and offshore islands. They are mostly found in coastal areas but occasionally travel inland along major rivers, particularly in northern Australia (Johnstone & Storr 1998; Marchant & Higgins 1993; Olsen 1995). They require extensive areas of open fresh, brackish or saline water for foraging	This migratory species was not observed within the Proposed Protection Zone. The nearby estuarine/riparian habitats are considered to provide potential habitat for the Osprey.

Species	EPBC Status	Habitat Description	Likelihood of occurrence and potential impacts
		(Marchant & Higgins 1993). They frequent a variety of wetland habitats including inshore waters, reefs, bays, coastal cliffs, beaches, estuaries, mangrove swamps, broad rivers, reservoirs and large lakes and waterholes (Czechura 1985; Domm 1977; Fleming 1987; Gosper 1983; Gosper & Holmes 2002; Johnstone & Storr 1998; Olsen 1995; Roberts & Ingram 1976). They exhibit a preference for coastal cliffs and elevated islands in some parts of their range (Boekel 1976; Domm 1977), but may also occur on low sandy, muddy or rocky shores and over coral cays (Marchant & Higgins 1993). They may occur over atypical habitats such as heath, woodland or forest when travelling to and from foraging sites (Czechura 1985; Hembrow 1988; Pruett-Jones & O'Donnell 2004; Roberts & Ingram 1976).	This species is considered an unlikely occurrence within the Proposed Protection Zone. The proposed action is considered unlikely to significantly impact this Matter of National Environmental Significance.
Common Greenshank *(Tringa nebularia*)	Migratory	'The Common Greenshank does not breed in Australia, however, the species occurs in all types of wetlands and has the widest distribution of any shorebird in Australia (Higgins & Davies 1996). The species has been recorded in most coastal regions. It is widespread west of the Great Dividing Range, especially between the Lachlan and Murray Rivers and the Darling River drainage basin, including the Macquarie Marshes, and north-west regions (Higgins & Davies 1996). The Common Greenshank is found in a wide variety of inland wetlands and sheltered coastal habitats of varying salinity. It occurs in sheltered coastal habitats, typically with large mudflats and saltmarsh, mangroves or seagrass. Habitats include embayments, harbours, river estuaries, deltas and lagoons and are recorded less often in round tidal pools, rock-flats and rock platforms. The species uses both permanent and ephemeral terrestrial wetlands, including swamps, lakes, dams, rivers, creeks, billabongs, waterholes and inundated floodplains, claypans and saltflats. It will also use artificial wetlands, including sewage farms and saltworks dams, inundated rice crops and bores. The edges of the wetlands used are generally of mud or clay, occasionally of sand, and may be bare or with emergent or fringing vegetation, including short sedges and saltmarsh, mangroves, thickets of rushes, and dead or live trees. It was once recorded with Black-winged Stilts (Himantopus himantopus) in pasture, but are generally not found in dry grassland (Higgins & Davies 1996). The species is known to forage at edges of wetlands, in soft mud on mudflats, in channels, or in shallows around the edges of water often among pneumatophores of mangroves or other sparse, emergent or fringing vegetation, such as sedges or saltmarsh. It will occasionally feed on exposed seagrass beds (Higgins & Davies 1996). The Common Greenshank roosts and loafs round wetlands, in shallow pools and puddles, or slightly elevated on rocks, sandbanks or small muddy islets. Occasionally the species will perch and roost on stakes (Higgins & Davies 1996). The species is known to have roosted on an inland claypan near Roebuck Bay, Western Australia; this site may be an important roost site for this species at least during the non-breeding season (Collins et al. 2001).' (DEE 2017 online @ http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=832)	This migratory species was not observed within the Proposed Protection Zone. It is considered that the preferred habitat for this species is largely absent from the proposed works area. The proposed action is considered unlikely to significantly impact this Matter of National Environmental Significance.

3.4.1 Migratory Species Summary

No migratory species listed under the *Environment protection and Biodiversity Conservation Act 1999* were observed within the study area. No species are considered to be a potential occurrence within the Proposed Protection Zone. The removal of approximately 1.5 hectares of primarily modified/disturbed vegetation is unlikely to result in the loss of significant area of habitat for the Osprey. The area proposed for removal is considered insignificant in the context of the available similar habitats within the locality. Additionally, more suitable habitat associated with Oaky Creek and Coomera River. The proposed action within site is considered unlikely to have a significant impact upon migratory species

4 Potential Site Impacts

This section of the report reviews the proposed action and likely resultant impact to flora, fauna and habitat value. The proposed action involves the establishment of a fire break/APZ to reduce the bushfire risk to adjacent residential dwellings and Pimpama Secondary School.

A number of unsafe trees along the northern boundary of the Coomera Woods Development Site have been identified as hazards and have caused damage to neighbouring dwellings through limb fall. Polaris Coomera Pty Ltd have received numerous complaints from adjacent residents over the damage the trees are causing and the potential safety risk the trees pose.

A detailed investigation of the boundary identified thirty-seven (37) trees that have caused or may cause damage to neighbouring structures/dwellings. The identified trees are contained within the Proposed Protection Zone.

4.1 Significance of Impacts to Threatened Species, Communities and/or Ecologically Significant Areas

DEC (2005 & 2008) outline assessments relating to the significance of impacts of actions to threatened species, communities and populations. DEC (2005) notes that evaluation of impacts should involve not only the magnitude and extent of impacts, but also the significance of the impacts as related to the conservation importance of the habitat, individuals and populations likely to be affected. Impacts are considered more significant if:

- Areas of high conservation value are affected.
- Individual animals and/or plants and/or subpopulations that are likely to be affected by a proposal play an important role in maintaining the long-term viability of the species, population or ecological community.
- Habitat features that are likely to be affected by a proposal play an important role in maintaining the long-term viability of the species, population or ecological community.
- The impacts are likely to be long-term in duration.
- The impacts are likely to be permanent and irreversible.

As vegetation clearing will be restricted to areas of modified vegetation and 'least concern' habitats, the impact to threatened species and communities will be minimal and largely limited to local scale direct (incremental vegetation removal within the locality) and indirect impacts (i.e. edge effects within the broader area, inappropriate or no management of weeds and domestic animals etc). It is noted that no 'of concern' and/or 'endangered' remnant regional ecosystems will be removed and no 'endangered' or 'vulnerable' flora or fauna species are likely to be significantly impacted upon by the proposal.

4.2 Clearing of Vegetation Communities

Clearing of vegetation will be the major direct impact associated with the intended development. As discussed in this report it is considered that these works will not have a significant environmental impact in the context of the City of Gold Coast's City Plan and is consistent with the previously approved development over the Coomera Woods Development site. A proposed vegetation clearing plan has been prepared for the development (refer to Figure 16).

Table 11: Clearing of Native Vegetation

Vegetation Community	Approx extent to be removed (ha)
Community 1: Forest Red Gum/Ironbark/Bloodwood Association Broad gullies and Drainage Lines	0.255
Community 2: Spotted Gum/Ironbark Association Ridglines and Balance Areas	0.427
Community 3: Tallowwood/White Mahogany/Grey Gum Association Mid-Slope Areas	0.873
Total	**1.555**

LEGEND

LOT 44 ON SP207822 BOUNDARY

PROPOSED PROTECTION ZONE
10 MERTES WIDE FROM THE PROPERTY BOUNDARY
TOTAL AREA : APPROX 15,000M2

COMMUNITY 1:
FOREST RED GUM/IRONBARK/BLOODWOOD ASSOCIATION
BROAD GULLIES AND DRAINAGE LINES
AFFECTED AREA: APPROX. 2550M2

COMMUNITY 2:
SPOTTED GUM/IRONBARK ASSOCIATION
RIDGELINES AND BALANCE AREAS
TOTAL AREA : APPROX 4270 M2

COMMUNITY 3:
TALLOWWOOD/WHITE MAHOGANY/GREY GUM ASSOCIATION
MID-SLOPE AREAS
TOTAL AREA APPROX 8730M2

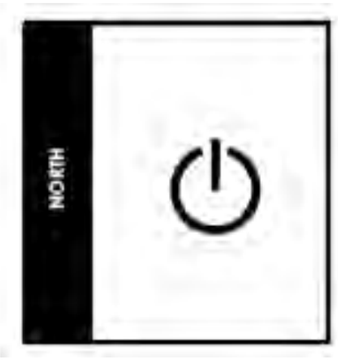

Figure 16: Proposed Clearing Plan

A number of unsafe trees along the northern boundary have been identified as hazards and have caused damage to neighbouring dwellings through limb fall. Polaris Coomera Pty Ltd have received numerous complaints from adjacent residents over the damage the trees are causing and the potential safety risk the trees pose.

A detailed investigation of the boundary identified thirty-seven (37) trees that have caused or may cause damage to neighbouring structures/dwellings. The identified trees are contained within the Proposed Protection Zone. The detailed information regarding the trees (i.e. ID, species, notes, latitude & longitude) are provided within Attachment 5.

4.3 Impacts to Fauna Habitat

The proposal will have an impact upon fauna habitat through the removal of remnant and non-remnant habitat areas. Typically clearing of vegetation impacts upon fauna habitat elements including loss of feeding resources, removal of dead timber (fallen and standing), removal of ground strata, debris and leaf-litter. Such elements are necessary (depending upon species) for shelter, refuge from predators, feeding, temperature regulation and breeding. Typical additional impacts associated with vegetation clearing on fauna and associated habitat include:

- Overall loss of standing biomass and reduction in flora species abundance/diversity
- Mortality as a result of activities (removal/disturbance of nests, hollows, burrows and general habitat)
- Loss of habitat complexity from the clearance zones including loss of potential foraging and nesting/roosting resources
- Increased potential from 'edge effects' to retained remnants (on or offsite)
- Disturbance of species behaviour (i.e. some species are less tolerant to human presence or a higher level of human activity and may abandon currently utilized habitats)
- Reduction of potential fauna movement linkages throughout the overall landscape
- Alteration to the fauna assemblage (some species tolerant to modified habitats (i.e. rats, minors, crows etc) may dominant the newly created niches and displace species from adjacent vegetated remnants)

In this instance it is considered that only a minor loss of foraging resources and refuge habitat will occur in comparison to what's available within the locality.

It is noted that areas considered to represent high ecological values will not be impacted by the proposed action.

The proposed action is within an urban landscaoe and zoned for residential use which has been previously approved for urban development. It is noted that such is consistent with the planning intent for Coomera Woods Development Site and Proposed Protection Zone.

4.4 Habitat Fragementation, Barrier Effects and Edge Effects

Habitat fragmentation is considered to be the division of a single area of habitat into two or more smaller habitats separated by a new habitat type in the area between the remaining fragments (PB, 2007). Often the dividing habitat is anthropogenic (i.e. crop, roadway, residential development etc.) which limits continued interaction and movement of individuals between the new patches to varying degrees (i.e. birds may be still able to move between patches). Additionally, the dividing habitat tends to favour a different assemblage of animals typically described as generalist and/or aggressive (i.e. crows, noisy minors, black rat). This is particularly relevant to urban development where domestic and feral species (cats, foxes, dogs) are favoured by the new habitat to the exclusion of native species.

The resultant habitat fragments or patches are also impacted as a result of a reduction in patch size, reduction in the 'interior' area and creation or expansion of the habitat 'edge.' Edge areas also typically favour aggressive and generalist species particularly in relation to exotic flora. Dominance of exotic flora or weeds can threaten the integrity of the 'interior' habitat thus expanding the edge further. Weed dominance also typically simplifies the structural and floristic diversity to the exclusion of numerous 'niches' and the fauna that occupy such spaces.

Many wildlife studies have shown how the relative abundance of fauna species changes with habitat fragment size (e.g. Ambuel and Temple 1983; Lynch and Whigham 1984; Robinson *et al.* 1997) with some species showing a greater abundance in smaller remnants, while others decrease or even disappear from remnants due to habitat fragmentation (Berry, 2001).

"Species can be grouped according to their response to edges. 'Edge' species are those that increase in abundance at habitat edges. Typically, these are habitat generalist or open-country species, and often they are species also found in greater numbers in small habitat remnants. In contrast, 'interior' species decrease in abundance or are absent from habitat edges; these are typically specialists, have large home ranges, inhabit large forest areas, and are rare or absent from small habitat remnants (Ambuel and Temple 1983; Ford *et al.* 1995; Canady 1997; Luck *et al.* 1999). For example, Catterall *et al.* (1991) found that in forest–suburb boundaries in Brisbane, forest-interior birds were typically smaller and insectivorous, while forest-edge species were usually larger and fed on open ground" (Berry, 2001: 240).

Some of the above and more commonly discussed impacts are summarized below:

> Barrier effects "result when severed habitat connections restrict the movement of species (Yahner 1988). Barrier effects can result from relatively small-scale anthropogenic disjunction of habitat and may preclude dispersal or migration and disrupt population processes (e.g. Mansergh and Scotts 1989). The distance over which such effects operate may vary among species. For example, many bird species may be able to readily cross discontinuities in suitable habitat by using small remnants as stepping stones (e.g. Date *et al.* 1991). In contrast, forest-dependent mammals may be reluctant to cross relatively small areas of open habitat (e.g. Burnett 1992)" (Goldingah & Whelan, 1997:24-25)
>
> Genetic isolation may occur when individuals from a previously connected population can no longer interbreed due to the creation of fragments and barrier effects. Such isolation can result in problems associated with inbreeding (and associated loss of genetic diversity and risk of disease, mutation, population crash), divergence and genetic drift.
>
> "Edge effects may occur when a new boundary is established within an existing habitat, producing a change in the remaining habitat (Harris 1984). Abiotic and biotic factors may be responsible for an edge effect (Murcia 1995). Abiotic factors include changes in microclimate such as altered temperature regimes, increased light levels and greater wind speeds (e.g. Scougall *et al.* 1993). Changes in the nutrient status of the soil surrounding an edge may occur when remnant habitat occurs adjacent to agricultural land. Biotic factors include changes in the abundance of animals and plants. These may occur in response to the abiotic factors or because particular species are favoured by the close association of two different habitat types. Edges may promote access by predators to existing habitat, particularly those that favour boundaries between open and remnant habitat (Harris 1988). This may increase the

vulnerability of species and lead to a decline in their abundance near the edge (Yahner 1988; Marini *et al.* 1995)" (Goldingah & Whelan, 1997:24)

As discussed, it is considered that currently the proposed action is not located within a significant terrestrial fauna corridor or area of significant habitat given the similar available habitat throughout the locality. The proposed action is not situated within a core area of extensive native remnant bushland.

4.5 Predation or Alterations to Behavioural Ecology by Domestic Animals

Mortality of fauna (especially koalas) as a result of dog attacks is considered to be a key conservation concern for fauna management with some studies reporting that dog attacks account for between 5% and 40% of total recorded mortalities (McAlpine et al, 2007). Within the 'koala coast' of SEQLD an average of 300 koalas each year die as a result of dog attacks (EPA, 2006). Studies into dispersal patterns of koalas undertaken by Dique et al (2003) indicates that in addition to mortality the presence of dogs within or proximate to habitats is likely to disrupt behaviour and associated dispersal options which can lead to those impacts discussed in 6.5 above. The risk of predation can strongly alter the behaviour and activity of potential prey (Lima and Dill 1990). In assessing predation hazards, many species use remote cues of risk because of the dangers of direct encounters with predators, including avoidance of open areas (e.g. Banks et al. 1999) or changing the time that they forage (in Banks et al, 2003; 406).

Cats also have direct impacts on native fauna through predation. 'They can kill vertebrates weighing as much as 3kg (Dickman 1996), but preferentially kill mammals weighing less than 220g and birds less than 200g. They also kill and eat reptiles, amphibians and invertebrates (Dickman 1996). Cats can also have indirect effects on native fauna by carrying and transmitting infectious diseases (DEH 2004). They are thought to have contributed to the extinction of many small to medium-sized mammals and ground-nesting birds in the arid zone, and to have seriously affected populations of bilby, mala and numbat (DEH 2004)'(DEWHA, 2008).

The proposed action is unlikely to significantly increase the risk of domestic fauna impact upon native fauna species as such risks are well established within the locality. As the Proposed Protection Zone is not considered to represent significant habitat for threatened species the impact of the is unlikely to increase.

4.6 Mortality Associated with Roadways/Vehicle Strike

Roads and traffic are widely accepted as having impacts upon terrestrial wildlife. "Roads cut across landscape features and divide wildlife habitats. Consequently, they are one of the main obstacles to the movement of land vertebrates (Yanes *et al.* 1995). The implications of movement barriers to wildlife populations are considerable. Barriers tend to create metapopulations (subpopulations) where a road divides a large continuous population into smaller, partially isolated local populations (Forman and Alexander 1998). Small populations fluctuate in size more widely and have a higher probability of extinction than do large populations (van der Zande *et al.* 1980). In addition, disruption of population dispersal (Mansergh and Scotts 1989) and recolonisation (Mader 1984; Andrews 1990) may result from the barrier-effect of roads.

Roads also result in vehicle collisions with wildlife (road-kill) and can represent a significant source of mortality for declining populations of some wildlife species (Harris and Gallagher 1989; Saunders 1990; Sheridan 1991; Scott *et al.* 1999).

It is widely accepted that terrestrial fauna (in particular koala) mortality associated with vehicle strike

on roadways intersecting or proximate to habitat represents a serious through to the ongoing viability of populations (Dique et al, 2003; NPWS, 2003; McAlpine et al, 2007; EPA, 2006). Vehicle strikes are heightened where arterial and other roads bisect bushland, remnant bushland or urban habitat areas, resulting in high mortality of resident koalas, or limited success of dispersing animals that must cross roads to reach suitable habitat and mates (Dique *et al*. 2003 in EPA, 2007). NPWS (2003) note that habitat bisecting roadways are particularly likely to lead to increased vehicle strike where traffic volume is high, speeds exceed 60km/hr, where visibility of road edges is reduced and/or where lighting is absent.

Larger species or species with restricted distributions, or those regularly in contact with roads (e.g. migration paths or home ranges), are those most affected by road-kill (Bennett 1991; Forman and Alexander 1998) [in Taylor and Goldingay, 2003]". Morality rates can also be particularly high for species which are slow moving (i.e. arboreal mammals), those which become distracted by vehicle lights (i.e. kangaroos) and those which require many individual movements to cross the roadway (i.e. small reptiles and amphibians).

In this instance, it is considered that this impact is unlikely to increase as a result of the porposed action. Whilst additional vehicle movements will occur within the Proposed Protection Zone for the proposed action the vehicles will use existing fire trails and adjacent roadways within developed areas to access to works area, avoiding significant fauna habitat.

4.7 Establishment of Weeds

Weed invasion occurs when unwanted or exotic plants become established in native bushland via natural dispersal vectors such as wind, water, insects, birds and other animals, however, humans are by far the most effective and efficient vector of plants (Coutts-Smith and Downey, 2006; Randall, 2007 in TSSC, 2010). Humans may facilitate the direct introduction weeds by inappropriate garden dumping, via vehicles, imported agricultural products and stock rotation/movement. The potential impacts of weed invasion in Australia are well documented and summarized in TSSC (2010) including:

Genetic effects

Environmental weeds cause a decline in the number of genetically distinct sub-populations that make up a native species. It is reasonable to conclude that an associated reduction in the genetic diversity of the affected species is likely to result. The invasion of weeds may also affect the genetic diversity of native species through cross breeding or hybridisation, whereby foreign genes are introduced into local plant populations

Introduction of diseases

The introduction of weeds often results in the introduction of pathogens (fungi, nematodes, bacteria and viruses) that are associated with these plants in their natural range (ILDA, 2009).

Competition for resources

Competition between species is inevitable when more than one species occupy the same niche and have similar requirements for a limited resource (Cadotte, 2007). Weeds are known to compete with native plants for limited resources such as moisture, nutrients, sunlight, pollinators and space (Csurches and Edwards, 1998; Blood, 2001; Brunskill, 2002).

Prevention of recruitment

Growth of weeds can be sufficiently vigorous to reduce or prevent the establishment of native plant species (Csurches and Edwards, 1998).

Alteration of ecosystem processes

Invasive weeds are also capable of altering various ecosystem processes such as geomorphological processes, hydrological cycles, nutrient dynamics and disturbance regimes (Csurches and Edwards, 1998). Alterations to ecosystem processes can potentially influence many if not all species within a community (Vranjic et al., 2000).

Changes to abundance of indigenous fauna
Weeds that become invasive can both directly and indirectly change the abundance of indigenous fauna. Fauna such as the Richmond Birdwing Butterfly and *Petrogale persephone* (Proserpine Rock Wallaby) are directly impacted by escaped garden plants, Dutchman's Pipe (*Aristolochia elegans*) and Pink Periwinkle (*Catharanthus roseus*), respectively, both of which are attractive as a food source and yet toxic to them when consumed (Watts and Vidler, 2006). Indirectly, weeds impact indigenous fauna by altering the availability of suitable habitat, including food and shelter, and by creating habitats that harbour other pest species that can, in turn, have a detrimental effect.

During site inspection weeds were commonly noted, mostly herbaceous ground covers and non-native grasses. To reduce the potential impact of recorded weeds on vegetation external the Proposed Protection Zone the following is recommended:

- Removal of all weeds within the Proposed Protection Zone.

5 Mitigation Measures

5.1 Avoidance

The proposed action has been carefully considered with the consultation of planning and bushfire consultants to minimize potential impacts (i.e. native vegetation loss) and ensure the bushfire APZ is established such that loss of significant habitat trees or foraging for MNES species are minimal. The proposed action is located within areas considered to represent low ecological values, previously disturbed for bushfire management and/or impacted by the adjacent land uses and so vegetation within the Proposed Protection Zone is sparse.

5.2 Mitigation Measures

The following measures are proposed to mitigate potential impacts associated with proposed action:

5.2.1 Impact of Vegetation and Habitat Clearing

Disturbance to areas of native and exotic vegetation as described in this report will be unavoidable to deliver the required fire break in accordance with the appropriate BAL. To ensure that clearing impacts do not occur outside of the Proposed Protection Zone it will be necessary to clearly identify and mark the boundaries of the clearing zone onsite prior to commencement. Such boundaries are to be protected via high visibility fencing and signage identifying that no activities (including temporary storage, stockpiling, vehicle movement etc.) are permitted beyond such points.

Within the Proposed Protection Zone, identification of areas to be cleared are to be pre-assessed by an experienced ecologist and wildlife spotter/catcher. This pre-assessment shall allow for an inventory of trees bearing birds nests and/or hollows (suitable for arboreal mammal or bat nesting) to be undertaken prior to felling works. A wildlife spotter catcher is to be utilised during all phases of clearing of the Proposed Protection Zone to ensure safe dispersal and relocation of native fauna.

Salvageable habitat components such as hollow stems or ground logs shall also be stockpiled and randomly dispersed throughout the retained bushland external to the proposed Protection Zone.

5.2.2 Domestic Animal Management

To mitigate the potential impact of domestic animals on resident fauna the following measures are proposed:

- No cats or dogs are permitted to be kept within the proposed Protection Zone.

5.2.3 Terrestrial Fauna Dispersal Barriers, Barrier Effects

As discussed in the previous sections the following measures are proposed to reduce the potential impact of proposed action on continued terrestrial fauna dispersal within the locality:

- Limiting clearing to the proposed Protection Zone.
- Prohibiting the keeping of cats and dogs (other than guide dogs) from the proposed Protection Zone.

5.2.4 Weed Management

A vegetation management plan has been prepared to minimise the potential impact of weeds within the Proposed Protection Zone as a result of the proposed action (refer to Attachment 6).

5.2.5 Fauna Management

Within the Proposed Protection Zone, identification of areas to be cleared are to be pre-assessed by an experienced ecologist and wildlife spotter/catcher. This pre-assessment shall allow for an inventory of trees bearing birds nests and/or hollows (suitable for arboreal mammal or bat nesting) to be undertaken prior to felling works. A wildlife spotter catcher is to be utilised during all phases of clearing of the Proposed Protection Zone to ensure safe dispersal and relocation of native fauna.

Salvageable habitat components such as hollow stems or ground logs shall also be stockpiled and randomly dispersed throughout the retained bushland external to the Proposed Protection Zone.

6 Conclusions

This document presents and summarises the results of ecological field survey undertaken by Planit Consulting in 2017 and 2018 over Lot 44 on SP207822. These surveys were carried out to address State and Federal protected environmental matters. Focused searches were conducted for EPBC issues in relation to potential Matters of National Environmental Significance.

The following provides a summary of the MNES Assessment:

- The proposed action location is within an urban area and zoned for residential purposes. The Proposed Protection Zone is zone:
    - Conservation; and
    - Medium density residential.

- No EPBC Act listed Threatened Ecological Communities (TECs) considered to have potential to occur were recorded within the Proposed Protection Zone.

- No EPBC Act listed threatened flora species considered to have potential to occur were recorded within the Proposed Protection Zone.

- Of the EPBC Act listed threatened fauna species identified with the Protected Matters Search, only three (3) were considered as potential occurrences.

    - The Grey-headed flying fox has not been identified within the proposed Protection Zone, though considered as a potential occurrence given the vegetation within the proposed Protection Zone and surrounding environment. It was determined that the species is unlikely to be significantly impacted by the proposed action given the potential habitat within the locality and the current condition of the Proposed Protection Zone.
    - The koala is known to occur within the Coomera Woods Development site through contemporary surveying over the area has failed to record this species within the proposed Protection Zone. However, it is considered the the Proposed Protection Zone provides poor habitat for the koala given the presence of extensive edge effects. The small population within the Coomera Woods Development Site is not considered an important population and the habitat not defined as critical habitat in accordance with the Significant Impact Guidelines.
    - The Greater Glider has not been recorded within the Proposed Protection Zone or surrounding properties which have been surveyed by Planit. It was determined that this species is unlikely to occur within the Proposed Protection Zone or surrounding locality given the limited potential habitat and HBT availability. It is therefore unlikely that this speices will be significantly impacted by the proposed action.

- Of the EPBC Act listed migratory species considered to have potential to occur within the Proposed Protection Zone, none were recorded within the Proposed Protection Zone. It was determined that it is unlikely the proposed action will have a significant impact on the four listed migratory species.

- An assessment of significance against the NES Guidelines was performed for each of the vulnerable species recorded or considered likely to occur within the Proposed Protection Zone. Each assessment came to the same conclusion that the proposed action is considered unlikely to have a significant impact on each species.

7 List of Attachments

Attachment 1 – Proposed Protection Zone Plans & Aerial Images
Attachment 2 – Ecological Technical Note (SHG 2017)
Attachment 3 – Koala Assessment Report (SHG 2016)
Attachment 4 – Koala Evaluation and Assessment Report Chapter 1 & 2 (Planit 2017)
Attachment 5 – Detailed assessment of Northern Boundary
Attachment 6 – Vegetation Management Plan
Attachment 7 – Protected Matters Search