saunders havill group

Coomera Woods

EPBC Act Referral Submission

Polaris Coomera Pty. Ltd.
Planning and Development

49 & 51 George Alexander Way, Coomera
Polaris Coomera Pty Ltd
7390
November 2015

surveying town planning urban design environmental management landscape architecture

Referral of proposed action

Project title:	Coomera Woods Master Planned Development

1 Summary of proposed action

NOTE: You must also attach a map/plan(s) and associated geographic information system (GIS) vector (shapefile) dataset showing the location and approximate boundaries of the area in which the project is to occur. Maps in A4 size are preferred. You must also attach a map(s)/plan(s) showing the location and boundaries of the project area in respect to any features identified in 3.1 & 3.2, as well as the extent of any freehold, leasehold or other tenure identified in 3.3(i).

1.1 **Short description**

Use 2 or 3 sentences to uniquely identify the proposed action and its location.

The proposed action involves the development of 'Coomera Woods'; a master planned residential community located within Gold Coast's northern growth corridor and future Coomera Town Centre. Main uses include detached and attached dwellings, medium and high density residential, open space areas and conservation corridors. The development will be generally in accordance with the Coomera Town Centre Structure Plan and proposed Coomera Woods Locality Plan.

1.2 **Latitude and longitude**

Latitude and longitude details are used to accurately map the boundary of the proposed action. If these coordinates are inaccurate or insufficient it may delay the processing of your referral.

DATUM: GDA94		
Coordinate ID	**Longitude (east)**	**Latitude (south)**
1	153°19'23''	27°50'17''
2	153°19'22''	27°50'22''
3	153°19'22''	27°50'22''
4	153°19'18''	27°50'43''
5	153°19'18''	27°50'44''
6	153°19'18''	27°50'48''
7	153°19'17''	27°50'48''
8	153°19'15''	27°50'55''
9	153°19'15''	27°50'55''
10	153°19'13''	27°50'55''
11	153°19'10''	27°50'55''
12	153°19'7''	27°50'56''
13	153°19'5''	27°50'57''
14	153°19'3''	27°50'57''
15	153°19'1''	27°50'56''
16	153°18'60''	27°50'56''
17	153°18'58''	27°50'55''
18	153°18'56''	27°50'53''
19	153°18'55''	27°50'51''
20	153°18'54''	27°50'50''
21	153°18'53''	27°50'47''
22	153°18'49''	27°50'51''
23	153°18'47''	27°50'53''
24	153°18'43''	27°50'49''
25	153°18'40''	27°50'45''
26	153°18'37''	27°50'40''
27	153°18'32''	27°50'29''
28	153°18'31''	27°50'26''
29	153°18'30''	27°50'22''
30	153°18'28''	27°50'13''
31	153°18'28''	27°50'11''
32	153°18'27''	27°50'8''
33	153°18'54''	27°50'12''

1.3 **Locality and property description**

Provide a brief physical description of the property on which the proposed action will take place and the project location (eg. proximity to major towns, or for off-shore projects, shortest distance to mainland).

Contextually, the site is located within Coomera, situated in South East Queensland approximately 30 kilometres north of the Gold Coast. Coomera is a popular tourist destination, home to theme parks including Dreamworld and White Water World and has experienced notable expansion of urban development over recent years, particularly within Coomera west.

The site is bound by the Gold Coast Railway Line to west, residential development and Pimpama State Secondary School to the north, Big Sky Residential Development to the east, and the proposed Coomera Activity Centre and Transport Hub associated with the existing Coomera Train Station and Bus Interchange, to the south. Major arterials including the Pacific Motorway approximately 350 metres to the west and Foxwell Road approximately 400 metres to the south, segregate the application area. The referral area makes up 147.331 hectares and is dominated by disturbed woodland. Refer to **Figure 1** for site context and **Figure 2** for site aerial.

1.4	**Size of the development footprint or work area (hectares)**	147.331 hectares (gross site area) 137.181 hectares (net site area)
1.5	**Street address of the site**	49 & 51 George Alexander Way Coomera QLD 4209

1.6 **Lot description**

Describe the lot numbers and title description, if known.

Lot 1 on SP165374 (Freehold)
Lot 44 on SP207822 (Freehold)

1.7 **Local Government Area and Council contact (if known)**

If the project is subject to local government planning approval, provide the name of the relevant council contact officer.

Broc Smith / Shahadat Hossain
City Development, Nerang
City of Gold Coast
T: (07) 5582 8866
PO Box 5042
Gold Coast Mail Centre QLD 9729
cityofgoldcoast.com.au

Andrew Finch
Department of Local Government and Planning
Queensland Government
T: (07) 5644 3221
PO Box3290,
Australia Fair, Southport QLD 4215
www.dlg.qlg.gov.au

1.8 **Time frame**

Specify the time frame in which the action will be taken including the estimated start date of construction/operation.

The project is in the process of obtaining all necessary State and Local Government approvals to commence post confirmation of EPBC requirements and will start construction in line with market demand. The project has an anticipated currency of 15 to 20 years.

1.9	**Alternatives to proposed action** Were any feasible alternatives to taking the proposed action (including not taking the action) considered but are not proposed?	**X**	**No** There are no feasible alternatives to the proposed action. This is primarily based on the site's strategic designation within the Coomera Town Centre Structure Plan supporting higher density residential development, open space areas, conservation corridors and major arterial connections. The proposal has been designed in accordance with planning and land use intent for the site by **City of Gold Coast** and is influenced by surrounding land uses and the site's proximity to existing infrastructure. Any alternative locations would extend beyond the ownership boundaries of the proponent and would be in conflict with existing Local and State Government approvals.
			Yes, you must also complete section 2.2
1.10	**Alternative time frames etc.** Does the proposed action include alternative time frames, locations or activities?	**X**	**No** No alternative timeframes are proposed.
			Yes, you must also complete Section 2.3. For each alternative, location, time frame, or activity identified, you must also complete details in Sections 1.2-1.9, 2.4-2.7 and 3.3 (where relevant).
1.11	**State assessment** Is the action subject to a state or territory environmental impact assessment?	**X**	**No** The project is not subject to a state environmental impact assessment. A number of State Government approvals were required to be achieved, however these are mutually exclusive to the EPBC process or any bilateral agreements.
			Yes, you must also complete Section 2.5
1.12	**Component of larger action** Is the proposed action a component of a larger action?	**X**	**No** The proposed action is not a component of a larger project and exists separately to development approvals over adjacent properties which are subject to separate land ownership.
			Yes, you must also complete Section 2.7
1.13	**Related actions/proposals** Is the proposed action related to other actions or proposals in the region (if known)?	**X**	**No** The action is not related to other proposals in the area. Development approvals exist surrounding the development, however they are the subject of different uses, separate approvals and different land ownership.
			Yes, provide details:
1.14	**Australian Government funding** Has the person proposing to take the action received any Australian Government grant funding to undertake this project?	**X**	**No** The proponent has not received Commonwealth Government funding for the project.
			Yes, provide details:
1.15	**Great Barrier Reef Marine Park** Is the proposed action inside the Great Barrier Reef Marine Park?	**X**	**No** The proposed action is not located inside or adjoining to the Great Barrier Reef Marine Park.
			Yes, you must also complete Section 3.1 (h), 3.2 (e)

2 Detailed description of proposed action

NOTE: It is important that the description is complete and includes all components and activities associated with the action. If certain related components are not intended to be included within the scope of the referral, this should be clearly explained in section 2.7.

2.1 Description of proposed action

This should be a detailed description outlining all activities and aspects of the proposed action and should reference figures and/or attachments, as appropriate.

The proposed action is described as "Coomera Woods" and will be developed as a residential master planned community supporting medium and high density residential uses with integrated open space and conservation areas.

The project site includes a number of existing approvals and current applications for a variety of development uses and construction works. The development of Coomera Woods is proposed to be undertaken in accordance with the proposed Coomera Woods Locality Plan (refer **Plan 1**) which has been designed in accordance with the Coomera Town Centre Structure Plan included in the Gold Coast Planning Scheme (refer **Plan 2**).

Primary uses proposed as part of the Coomera Woods Locality Plan include:

- Detached residential dwellings
- Attached and detached medium density residential dwellings (duplex lots)
- Mixed use management lots (proposed for medium and high density residential development with densities ranging from 40 dwellings/ha to 150 dwellings/ha for total yield of 3,722 dwellings)
- Four neighbourhood nodes encompassing retail and commercial uses
- Recreational parkland
- Stormwater management (quality treatment and detention)
- Ecological/ nature conservation linked parklands
- Trunk and non-trunk roads

Overall, the proposed Coomera Woods Locality Plan (refer **Plan 1**) provides for a range of residential densities between 25 dwellings/net hectares up to 150 dwellings/net hectares comprised of two residential precincts (Precinct A and Precinct B) and open space (Precinct C). The alignment of major roads and ecological corridors is consistent with existing adjoining approvals and the Coomera Town Centre Structure Plan (refer **Plan 2**). New allotments will be serviced by local roads and trunk collector roads with direct connectivity to the existing road network.

The vision for Coomera Woods is provide a vibrant mixed use development for the growing East Coomera community, which is strategically located close to public transport, shopping centres and parkland. The proximity of the site to Coomera Train Station and Bus Interchange presents an opportunity to create a sustainable transit orientated development surrounded by neighbourhood nodes encompassing retail, commercial and residential uses. Coomera Woods is anticipated to be developed over 12 stages and a 15 to 20 year timeframe.

Construction is expected to commence upon resolution of this referral and continue in accordance with the northern Gold Coast Community.

The key statistics for the action are:

Area	**=**	147.331 hectares
Development Footprint	=	137.181 hectares
Open Space	=	10.15 hectares

For the purposes of impacts on MNES this action is summarised as:

- Clearing of 137 ha of predominately remnant vegetation retaining a number of known primary and secondary koala trees.
- Functional loss of 10 ha of vegetation retaining known koala trees in an urban setting.
- New roads and trunk infrastructure through an isolated bushland fragment.
- Increase in domestic animals (specific conditions of approval mandate animal controls - refer to **Section 4**).
- Increase in hardstand and stormwater run-off in close proximity to existing site drainage lines.

2.2 Alternatives to taking the proposed action

This should be a detailed description outlining any feasible alternatives to taking the proposed action (including not taking the action) that were considered but are not proposed (note, this is distinct from any proposed alternatives relating to location, time frames, or activities – see section 2.3).

There are no alternatives proposed. Refer to **Response 1.9.**

2.3 Alternative locations, time frames or activities that form part of the referred action

If you have identified that the proposed action includes alternative time frames, locations or activities (in section 1.10) you must complete this section. Describe any alternatives related to the physical location of the action, time frames within which the action is to be taken and alternative methods or activities for undertaking the action. For each alternative location, time frame or activity identified, you must also complete (where relevant) the details in sections 1.2-1.9, 2.4-2.7, 3.3 and 4. Please note, if the action that you propose to take is determined to be a controlled action, any alternative locations, time frames or activities that are identified here may be subject to environmental assessment and a decision on whether to approve the alternative.

There are no alternative locations, timeframes or activities proposed. Refer to **Response 1.10.**

2.4 Context, planning framework and state/local government requirements

Explain the context in which the action is proposed, including any relevant planning framework at the state and/or local government level (e.g. within scope of a management plan, planning initiative or policy framework). Describe any Commonwealth or state legislation or policies under which approvals are required or will be considered against.

The site is located within Gold Coast's northern growth corridor which is subject to the Coomera Town Centre Structure Plan, supporting **City of Gold Coast** (GCCC) intention for the area to become a key regional centre. As shown by the zoning plan in **Plan 2**, the subject site is zoned for 'Medium Density Residential' and 'High Density Residential' The site retains a number of existing approvals which will guide future development applications. These include two environmental conservation corridors and areas of open space under the Coomera Structure Plan. Proposed and existing land uses adjoining the site include the Coomera Activity Centre, Showroom and Bulky Goods, Industrial and Medium Density Residential. The site is located within the Urban Footprint under the *South East Queensland Regional Plan 2009-2035*.

A number of approvals exist over the application area which include:

- Development Permit for Reconfiguration of a Lot -10 Management Lots; Preliminary Approval for Operational Works – Vegetation Clearing; and Preliminary Approval for Operational Works – Preliminary Bulk Earthworks, Associated retaining Walls and Civil Works (Request to change: 27 March 2015– ROL201400195) (Date of original application: 26 May 2010 – ROL2800145) (Date of most recent decision: 01 April 2015 – ROL201400195).
- Development Permit for Operational Works for Change to Ground Level (1 April 2015 –OPW201401308).
- Development Permit for Operational Works for Vegetation Management (31 March 2015 – OPW201401310).

A Preliminary Approval and Development Permit for the Reconfiguration of a Lot was approved by **GCCC** on 11 September 2015 (Council Ref: MCU201400732 / ROL20140013 (refer **Attachment A**):

- Combined Development Application for Section 242 Preliminary Approval varying the Planning Scheme (in accordance with Section 899 of the *Sustainable Planning Act 2009*) for development in accordance with the Coomera Woods Locality Plan (Lot 1 on SP165372 and Lot 44 on SP207822); and
- Development Permit for Reconfiguration of a Lot over Lot 1 on SP165372 and Lot 44 on SP207822 for 492 lots (407 detached dwelling lots and 85 management lots, roads and public open space).

Current and future development applications will be assessed against the Preliminary Approval- Coomera Woods – Development Code, which reflects the intention of the Coomera Town Centre Structure Plan.

As part of existing approvals, a number of development and management plans have been approved or conceptually approved by **GCCC** for Coomera Woods which include:

- Lot 44 Tree Clearing Staging Plan – Coomera Woods, Coomera (**Planit Consulting** – 21 November 2014)
- Amended Vegetation Management Plan, George Alexander Way, Coomera, Lot 1 SP165374 & Lot 44 SP207822, prepared for Polaris Coomera Pty Ltd (**Planit Consulting** – July 2014)
- Vegetation Management Plan, George Alexander Way, Coomera, Lot 1 SP165374 & Lot 44 SP207822, prepared for Polaris Coomera Pty Ltd (**Planit Consulting** – July 2014)
- Lot 44 Tre Clearing Staging Plan Retained Trees at Earthworks Interface (**Planit Consulting** – 2 June 2014)
- Final Preclearing Fauna Assessment & Management Plan, George Alexander Way, Coomera Lot 1 SP165354 & Lot 44 SP207822
- Environmental Corridor Rehabilitation Strategy (**Planit Consulting** – August 2009).
- Coomera Woods Development – Revised Flood Assessment V2 (**Cardno** – 17 December 2014)
- Report on Geotechnical Investigation for the Proposed Residential Subdivision, No. 49 to 51 George Alexander Way, Coomera (**Geotch Investigations** -April 2014).
- Coomera Woods – Erosion and Sediment Control Master Plan (**DesignFlow** - December 2014)

2.5 Environmental impact assessments under Commonwealth, state or territory legislation

If you have identified that the proposed action will be or has been subject to a state or territory environmental impact statement (in section 1.11) you must complete this section. Describe any environmental assessment of the relevant impacts of the project that has been, is being, or will be carried out under state or territory legislation. Specify the type and nature of the assessment, the relevant legislation and the current status of any assessments or approvals. Where possible, provide contact details for the state/territory assessment contact officer.

Describe or summarise any public consultation undertaken, or to be undertaken, during the assessment. Attach copies of relevant assessment documentation and outcomes of public consultations (if available).

The project is not subject to an environmental impact assessment. Refer to **Response 1.11.**

2.6 Public consultation (including with Indigenous stakeholders)

Your referral must include a description of any public consultation that has been, or is being, undertaken. Where Indigenous stakeholders are likely to be affected by your proposed action, your referral should describe any consultations undertaken with Indigenous stakeholders. Identify the relevant stakeholders and the status of consultations at the time of the referral. Where appropriate include copies of documents recording the outcomes of any consultations.

The intention to develop the Coomera Town Centre area has been part of the Gold Coast Planning Scheme (v.1.0) since 2003 with the inclusion of the Coomera Town Centre Local Area Plan. During its design, this planning scheme underwent public consultation in accordance with the *Integrated Planning Act 1997*. The Coomera Town Centre Structure Plan has also been a part of subsequent revisions of the Gold Coast Council Planning Scheme in 2007 (v.1.1) and 2010 (v.1.2) which have similarly gone through the public consultation process in accordance with the *Integrated Planning Act 1997* and *Sustainable Planning Act 2009,* respectively.

2.7 A staged development or component of a larger project

If you have identified that the proposed action is a component of a larger action (in section 1.12) you must complete this section. Provide information about the larger action and details of any interdependency between the stages/components and the larger action. You may also provide justification as to why you believe it is reasonable for the referred action to be considered separately from the larger proposal (eg. the referred action is 'stand-alone' and viable in its own right, there are separate responsibilities for component actions or approvals have been split in a similar way at the state or local government levels).

The proposed action is not part of a staged development or a component of a larger project. Refer to **Responses 1.12 and 1.13**. The project area is within the broader planning areas of the Coomera Town Centre which retains multiple land ownership.

3 Description of environment & likely impacts

3.1 Matters of national environmental significance

Describe the affected area and the likely impacts of the proposal, emphasising the relevant matters protected by the EPBC Act. Refer to relevant maps as appropriate. The interactive map tool can help determine whether matters of national environmental significance or other matters protected by the EPBC Act are likely to occur in your area of interest.

Your assessment of likely impacts should refer to the following resources (available from the Department's web site):

- specific values of individual World Heritage properties and National Heritage places and the ecological character of Ramsar wetlands;
- profiles of relevant species/communities (where available), that will assist in the identification of whether there is likely to be a significant impact on them if the proposal proceeds;
- *Significant Impact Guidelines 1.1 – Matters of National Environmental Significance*; and
- associated sectoral and species policy statements available on the web site, as relevant.

Your assessment of likely impacts should consider whether a bioregional plan is relevant to your proposal. The Minister has prepared four marine bioregional plans (MBP) in accordance with section 176. It is likely that the MBP's will be more commonly relevant where listed threatened species, listed migratory species or a Commonwealth marine area is considered.

Note that even if your proposal will not be taken in a World Heritage area, Ramsar wetland, Commonwealth marine area, the Great Barrier Reef Marine Park or on Commonwealth land, it could still impact upon these areas (for example, through downstream impacts). Consideration of likely impacts should include both direct and indirect impacts.

3.1 (a) World Heritage Properties

Description

Not applicable. The site is not located within close proximity of a World Heritage Property.

Nature and extent of likely impact

Address any impacts on the World Heritage values of any World Heritage property.

No impact.

3.1 (b) National Heritage Places

Description

Not applicable. The site is not located with close proximity of a National Heritage Place.

Nature and extent of likely impact

Address any impacts on the National Heritage values of any National Heritage place.

No impact.

3.1 (c) Wetlands of International Importance (declared Ramsar wetlands)

Description

The site is within 5 kilometres of Moreton Bay Ramsar Wetlands via approved adjoining development sites.

Nature and extent of likely impact

Address any impacts on the ecological character of any Ramsar wetlands.

The proposal is anticipated to have a negligible impact on Moreton Bay which is located approximately 5k east of the site. While a number of natural drainage lines traverse the site, it is noted that these drainage features flow via a number of adjoining development properties into the degraded Pimpama River to the north. This river system flows through a heavily degraded and urbanised catchment making up the development areas of upper Coomera, Pimpama and Jacobs Well. Run off from the site would firstly flow through this highly urbanised system before reaching Moreton Bay. The nature of impacts on water quality associated with the development is expected to be negligible given the existing matrix of residential development within the Pimpama River catchment. Erosion and Sediment Control Plans and Stormwater Management Plans will be developed in accordance with State and Local Government water quality objectives, controls and management requirements. These State and Local Government requirements as embedded in the site's approvals and mandate water quality standards for run-off exiting the site.

3.1 (d) Listed threatened species and ecological communities

Description

MNES Desktop Assessment

A Protected Matters Search Tool using a 2 kilometre radius around the site identified the following matters protected under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) as having potential to occur on site:

- Two (2) Threatened Ecological Communities (TECs):
  - *Lowland Rainforest of Subtropical Australia* (Critically endangered) – community likely to occur
  - *Subtropical and Temperate Coastal Saltmarsh* (Vulnerable) – community likely to occur
- 12 Listed Threated Flora Species
- 19 Listed Threated Fauna Species

Table 2 provides a summary of these search results, with the full search results provided in **Attachment B**.

MNES Field Assessments

A number of field assessments have been undertaken across the application site to assess potential presence and impacts to MNES. These were undertaken by:

- **Biolink**
  - During 2006 and 2007
  - As part of the East Coomera Koala Conservation Project
  - Koala assessment via SAT survey (200 SATs in the East Coomera area)
  - Koala capture, health assessment and translocation
- **Planit Consulting**
  - During November 2003 to May 2004 and February to March 2008

- Vegetation assessment via random meander/diversity searches and transects
- Fauna assessment including diurnal survey, nocturnal survey and habitat assessments

- **Saunders Havill Group** (April 2015)
  - During April 2015
  - Vegetation assessment via random meander/diversity searches and transects
  - Koala assessment via SAT survey
  - Fauna assessment including opportunistic searches and deployment of fauna cameras

The results of these assessments have been used to inform the Likelihood of Occurrence Schedule (refer **Table 2**) and the site record comments.

Table 2: PMST Likelihood of Occurrence Schedule

Listed Threatened Ecological Communities					
Name	**Status**	**Type of Presence**	**Description of Community**	**Likelihood of Occurrence**	**Site**
Lowland rainforest of Subtropical Australia	Critically Endangered	This Threatened Ecological Community is listed as a community that may occur within the area.	Typically there is a relatively low abundance of species from the genera *Eucalyptus, Melaleuca* and *Casuarina*. Buttresses are common as is an abundance and diversity of vines. This community is usually associated Regional Ecosystems 12.3.1, 12.5.13, 12.8.3, 12.8.4, 12.8.13, 12.11.1, 12.11.10, 12.12.1, and 12.12.16.	No species representing these characteristics or vegetation communities were observed within the assessment area. The site is not mapped as containing any regional ecosystem communities associated with this ecological community. **TEC is unlikely to occur.**	Not recorded
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	This Threatened Ecological Community is listed as a community likely to occur within the area	This ecological community consists mainly of salt-tolerant vegetation (halophytes) including: grasses, herbs, sedges, rushes and shrubs. Succulent herbs, shrubs and grasses generally dominate and vegetation is generally of less than 0.5 m height (with the exception of some reeds and sedges). This community is usually associated with Regional Ecosystem 12.1.2.	No species representing these characteristics or vegetation communities were observed within the assessment area. The site is not mapped as containing any regional ecosystem communities associated with this ecological community. **TEC is unlikely to occur.**	Not recorded

Birds						
Species	**Common Name**	**Status**	**EPBC Code**	**Description of Community / Habitat**	**Likelihood of Occurrence**	**Site**
Anthochaera phrygia	Regent Honeyeater	Endangered	82338	Regent Honeyeaters mostly occur in dry Box-Ironbark Eucalypt woodland and dry sclerophyll forest associations in areas of low to moderate relief, wherein they prefer moister, more fertile sites. These areas are generally associated with creek flats and river valleys and foothills. These woodlands have significantly large numbers of mature trees, high canopy cover and abundance of mistletoes. They are a generalist forager, which mainly feed on nectar from a wide range of eucalypts and mistletoes.	The Regent Honeyeater has been recorded at 15 sites across Queensland, primarily south of the Sunshine Coast and Chinchilla. These records have been on Bribie Island and in the Granite Belt. Regular records in the Gore-Karara area suggest a small breeding population may have been present in the mid-1990s. The Regent Honeyeater is also known as a visitor to the Sundown National Park. Given the disturbed nature of the site and the lack of specific recordings of the species in the surrounding area, it is unlikely to occur on site. **The species is unlikely to occur.**	Not observed

Botaurus poiciloptilus	Australasian Bittern	Endangered	1001	The Australasian Bittern occurs in terrestrial wetlands and, rarely, estuarine habitats, mainly in the temperate southeast and southwest. It favours wetlands with tall dense vegetation, where it forages in still, shallow water up to 0.3 m deep, often at the edges of pools or waterways, or from platforms or mats of vegetation over deep water. It favours permanent and seasonal freshwater habitats, particularly those dominated by sedges, rushes and / or reeds or cutting grass growing over muddy or peaty substrate.	No suitable habitat was observed throughout the assessment area. **Species is unlikely to occur.**	Not observed
Dasyornis brachypterus	Eastern Bristlebird	Endangered	533	The Eastern Bristlebird inhabits low dense vegetation in a broad range of habitat types including sedgeland, heathland, swampland, shrubland, sclerophyll forest and woodland, and rainforest. It occurs near the coast, on tablelands and in ranges. The Eastern Bristlebird is found in habitats with a variety of species compositions, but is defined by a similar structure of low, dense, ground or understorey vegetation.	No suitable habitat was observed throughout the assessment area. **Species is unlikely to occur.**	Not observed
Erythrotriorchis radiatus	Red Goshawk	Vulnerable	942	A wide ranging and highly mobile species generally observed over eucalypt habitats. This species prefers forest and woodland with a mosaic of vegetation types, large prey populations (birds) and permanent water. The vegetation types include eucalypt woodland, open forest, tall open forest, gallery rainforest, swamp sclerophyll forest and rainforest margins. Habitat has to be open enough for fast attack and manoeuvring in flight, but provide cover for ambushing of prey.	While some aspects of its habitat occurs on site not all requirements to be considered critical habitat for the species were identified. The species was not recorded during field surveys. **Species is unlikely to occur.**	Not observed
Geophaps scripta scripta	Squatter Pigeon (southern)	Vulnerable	64440	This species inhabits open grasslands and woodlands typically with a native understorey although may occur in artificial pasture.	No confirmed local records. The species is now very rarely observed in southern Queensland. Not expected onsite and no direct impact from proposed actions. **Species is unlikely to occur.**	Not observed
Lathamus discolour	Swift Parrot	Endangered	744	Swift Parrots breed in Tasmania during spring to early summer. During autumn and winter the species migrates to the mainland where it follows a nomadic existence linked to the availability and timing of flowering of trees in various locations.	Site trees provide some aspects of required critical habitat for the species, particularly during flowering and fruiting events. No local records were identified and the species were not recorded during site surveys. **Low potential for species to occur.**	Not observed

Peophila cincta cincta	Black-throated Finch (southern)	Endangered	64447	The Black-throated Finch (southern) occurs mainly in grassy, open woodlands and forests, typically dominated by Eucalyptus, Corymbia and Melaleuca, and occasionally in tussock grasslands or other habitats (for example freshwater wetlands), often along or near watercourses, or in the vicinity of water. It has been absent from Brisbane and its surrounds since the 1930s.	Due to a lack of records within the local area, it is unlikely that this species will occur. **Species is unlikely to occur.**	Not observed
Rostratula australis	Australian Painted Snipe	Endangered	77037	The Australian Painted Snipe is usually found in shallow inland wetlands, either freshwater or brackish, that are either permanently or temporarily filled. The species has a scattered distribution throughout many parts of Australia, with a single record from Tasmania.	No suitable habitat was observed throughout the assessment area. **Species is unlikely to occur.**	Not observed
Turnix melanogaster	Black-breasted Button-quail	Vulnerable	923	Typical habitat occurs in dry rainforest and vegetation immediately adjacent to rainforest. However the species has also been recorded in a variety of low coastal heathlands around Frazer Island and nearby mainland. Deep leaf litter in which the species can forage appears to be particularly favoured.	Little to no suitable habitat for this species occurs and it has not been recorded in the area. **Species is unlikely to occur.**	Not observed
Mammals						
Species	**Common Name**	**Status**	**EPBC Code**	**Description of Community / Habitat**	**Likelihood of Occurrence**	**Site**
Chalinolobus dwyeri	Large-eared Pied Bat	Vulnerable	183	The Large-eared Pied Bat roosts on sandstone cliffs and fertile woodland valley habitat within close proximity of each other. However in South-east Queensland habitat includes rainforest and moist eucalypt forest habitats at high elevations.	No confirmed local records of this uncommon species. Inhabits mesic vegetation and the species was not recorded in any of the site surveys Not expected to occur and no impact expected. **Species is unlikely to occur.**	Not observed
Dasyurus maculatus maculatus	Spot-tailed Quoll	Endangered	75184	The Spot-tailed Quoll has a preference for mature wet forest habitat. Unlogged forest or forest that has been less disturbed by timber harvesting is also preferable. This predominantly nocturnal species rests during the day in dens. Habitat requirements include suitable den sites such as hollow logs, tree hollows, rock outcrops or caves. individuals require an abundance of food such as birds and small mammals, and large areas of relatively intact vegetation through which to forage.	Due to the large amount of disturbances and lack of suitable rocky outcrops, no suitable habitat was observed throughout the assessment area. **Species is unlikely to occur.**	Not observed

Petrogale penicillata	Brush-tailed Rock-wallaby	Vulnerable	225	This species prefers rocky habitat, including loose boulder-piles, rocky outcrops, steep rocky slopes, cliffs, gorges and isolated rock stacks. Although rocky outcrops are crucial, vegetation structure and composition is also considered to be important. This species appears closely associated with dense arboreal cover, especially fig trees however dense rainforest, wet sclerophyll forest, vine thicket, dry sclerophlyy forest and open forests are important.	No suitable habitat or evidence was observed throughout the assessment area. Species was not observed or recorded in historical or contemporary field surveys. **Species is unlikely to occur.**	Not observed
Phascolarctos cinereus	Koala	Vulnerable	85104	They are found in a range of habitats, from coastal islands and tall eucalypt forests to low woodlands inland. The species is known from the surrounding area and evidence has been recorded on-site.	The species is known to occur in broader East Coomera Area, with several individuals previously removed from the site. Recent survey confirmed the presence of one juvenile koala on site as well as evidence of scats across the referral area. **Species confirmed.**	Evidence of Koalas in the form of a sighted individual and of scats was observed
Potorous tridactylus tridactylus	Long-nosed Potoroo	Vulnerable	66645	Species generally prefers rainforest and adjacent to wet sclerophyll forest, coastal heathlands and similar habitats with a dense understorey. Like all Potoroos, fungi are the major component of the diet and is also known to feed on invertebrates.	No suitable habitat was observed throughout the assessment area. **Species is unlikely to occur.**	Not observed
Pseudomys novaehollandiae	New Holland Mouse, Pookila	Vulnerable	96	Across the species' range, the New Holland Mouse is known to inhabit open heathland, open woodland with a heathland understory and vegetated sand dunes.	No suitable habitat was observed throughout the assessment area. **Species is unlikely to occur.**	Not observed
Pteropus poliocephalus	Grey-headed Flying Fox	Vulnerable	186	Species generally roosts in camps in trees adjacent to larger permanent watercourse. The Grey-headed flying fox requires foraging resources and roosting sites. It is a canopy-feeding frugivore and nectarivore, which utilises vegetation communities including rainforests, open forests, closed and open woodlands, Melaleuca swamps and Banksia woodlands. It also feed son commercial fruit crops.	No individuals or roosting camps were observed throughout the assessment area or located within close proximity to the site.. Suitable feeding and roosting habitat was recorded on site This species is highly likely to occur when the Eucalypts are in flower. **Species has potential to occur.**	Not observed
Xeromys myoides	Water Mouse, False Water Rat, Yirrkoo	Vulnerable	66	Although the Water Mouse had been documented in three distinct locations (Northern Territory, central south Queensland, south-east Queensland) they require similar habitat including mangroves and the associated saltmarsh, sedgelands, clay pans, heathlands and freshwater wetlands. The main habitat difference at each location is the littoral, supralittoral and terrestrial vegetation which differs in structure and composition.	No suitable habitat was observed throughout the assessment area. **Species is unlikely to occur.**	Not observed

Plants						
Species	**Common Name**	**Status**	**EPBC Code**	**Description of Community / Habitat**	**Likelihood of Occurrence**	**Site**
Arthraxon hispidus	Hairy-joint Grass	Vulnerable	9338	Hairy-joint grass is found in or on the edges of rainforest and in wet eucalypt forest, often near creeks or swamps, as well as woodland.	No suitable habitat was observed throughout the assessment area. **Species is unlikely to occur.**	Not recorded
Bosistoa selwynii	Heart-leaved Bosistoa	Vulnerable	13702	The Heart-leaved Bosistoa is similar to the Three-leaved Bosistoa and is conserved within Mt Warning National Park, Numbinbah Nature Reserve, Limpinwood Nature Reserve and When Whian State Forest. While population information is unavailable, it is thought to be common in its range. It generally grows in wet sclerophyll forest, dry sclerophyll forest and rainforest up to 3oo meters in altitude. It is commonly associated with *Argyrodendron trifoliolatum, Syzygium hodgkinsoniae, Endiandra pubens, Dendrocnide photinophylla, Acmena ingens, Diploglottis australis* and *Diospyros mabacea.*	No suitable habitat was observed throughout the assessment area. **Species is unlikely to occur.**	Not recorded
Bosistoa transversa	Three-leaved Bosistoa	Vulnerable	16091	The Three-leaved Bosistoa is conserved within Mt Warning National Park, Numbinbah Nature Reserve, Limpinwood Nature Reserve and Whian Whian State Forest. While population information is unavailable, it is thought to be common in its range. It generally grows in wet sclerophyll forest, dry sclerophyll forest and rainforest up to 3oo meters in altitude. It is commonly associated with *Argyrodendron trifoliolatum, Syzygium hodgkinsoniae, Endiandra pubens, Dendrocnide photinophylla, Acmena ingens, Diploglottis australis* and *Diospyros mabacea*.	No suitable habitat was observed throughout the assessment area. **Species is unlikely to occur.**	Not recorded
Corchorus cunninghamii	Native Jute	Endangered	14659	The Native Jute occurs in the ecotone of wet sclerophyll forest and dry to dry-subtropical rainforest (e.g. araucarian microphyll vine forest), and in Hoop Pine (*Araucaria cunninghamii)* plantations. It often occurs on hill crests, exposed slopes, ridges or upper slopes of hilly terrain on south or south-east aspect	No suitable habitat was observed throughout the assessment area. **Species is unlikely to occur.**	Not recorded
Cryptocarya foetida	Stinking Cryptocarya, Stinking Laurel	Vulnerable	11976	The Stinking Cryptocarya is restricted to coastal sands, or if not, then close to the coast occurring in littoral rainforest on old sand dunes and subtropical rainforests over slate and occasionally on basalt to an altitude of 150m. Associated species include *Syzygium hemilamprum* (Broad-leaved Lilly Pilly), *Acronychia imperforata* (Beach Acronychia), *Cryptocarya triplinervis* (Three-veined Laurel), *Cupaniopsis anacardioides* (Tuckeroo), *Flindersia bennettiana* (Bennet's Ash), *Lophostemon confertus* (Brush Box) and *Syzygium luehmannii* (Small-leaved Lilly Pilly).	No suitable habitat was observed throughout the assessment area. **Species is unlikely to occur.**	Not recorded

Endiandra floydii	Floyd's Walnut	Endangered	52955	The species restricted to paleozoic metamorphics but with overlying basalt soils in the Mount Warning area of New South Wales, and a couple of adjacent areas in Queensland. Floyd's Walnut grows in rainforest and is also found as an understorey plant in Brush Box ecotone areas, on moderately steep slopes no higher than 430 metres above sea level.	No suitable habitat was observed throughout the assessment area. **Species is unlikely to occur.**	Not recorded
Macadamia integrifolia	Macadamia Nut, Queensland Nut, Smooth-shelled Macadamia, Bush Nut, Nut Oak	Vulnerable	7326	The Macadamia Nut grows in remnant rainforest preferring partially open areas such as rainforest edges. Vegetation communities in which the Macadamia Nut is found range from complex notophyll mixed forest, extremely tall closed forest, simple notophyll mixed very tall closed forest to simple microphyll-notophyll mixed mid-high closed forest with *Araucaria* and *Argyrodendron* emergents.	No suitable habitat was observed throughout the assessment area. **Species is unlikely to occur.**	Not recorded
Phaius australis	Lesser Swamp Orchid	Endangered	5872	The Lesser Swamp-orchid is commonly associated with coastal wet heath/sedgeland wetlands, swampy grassland or swampy forest and often where Broad-leaved Paperbark or Swamp Mahogany are found. Typically, the Lesser Swamp-orchid is restricted to the swamp-forest margins, where it occurs in swamp sclerophyll forest (Broad-leaved Paperbark/Swamp Mahogany/Swamp Box (Lophostemon suaveolens), swampy rainforest (often with sclerophyll emergent), or fringing open forest. It is often associated with rainforest elements such as Bangalow Palm (Archontophoenix cunninghamiana) or Cabbage Tree Palm (Livistona australis).	No suitable habitat was observed throughout the assessment area. **Species is unlikely to occur.**	Not recorded
Phebalium distans	Mt Berryman Phebalium	Critically Endangered	81869	Mt Berryman Phebalium is found in semi-evergreen vine thicket on red volcanic soils, or in communities adjacent to this vegetation type. Geology of the area in which this species occurs is deeply weathered basalt with undulating to hilly terrain. Soils range from red-brown earths to brown clays (derived from siltstone and mudstones), and lithosols to shallow, gravelly krasnozems (very dark brown loam), derived from the Main Range Volcanics of the Tertiary period.	No suitable habitat was observed throughout the assessment area. **Species is unlikely to occur.**	Not recorded
Planchonella eerwah	Shiny-leaved Condoo, Black Plum, Wild Apple	Endangered	17340	The species grows in subtropical rainforest, dry rainforest and Hoop Pine (*Araucaria cunninghamii*) vine scrub. All known areas in which the Shiny-leaved Condoo occurs are warm and subtropical with an annual rainfall of between 650–1000 mm.	No suitable habitat was observed throughout the assessment area. **Species is unlikely to occur.**	Not recorded
Plectranthus habrophyllus	-	Endangered	64589	*Plectranthus habrophyllus* is a woody, square stemmed herb with scented foliage and is known to occur in only 6 locations across South East Queensland. This includes Oxley Creek in Greenbank (10km east), Opposum Creek, Springfield (1.5km east), White Rock Conservation Park (3km south) and Ormeau (50km east). Opposum Creek and White Rock Conservation Park are both located in close	*Plectranthus habrophyllus* has been recorded in very specific locations within SEQ. Given that there are no records of the species on or near the site and it was not recorded during field surevys. **Species is unlikely to occur.**	Not recorded

				proximity to the site, suggesting that there is potential for the herb to occur on the subject site. Given the specific known locations of the herb, it is likely that the herb does not occur on the site. It occurs on rock outcrops of sandstone or chart in shaded situations in Eucalypt woodland often close to vine forest.		
Thesium australe	Austral Toadflax	Vulnerable	15202	Austral Toadflax is semi-parasitic on roots of a range of grass species notably Kangaroo Grass (*Themeda triandra*) (Scarlett et al. 1994). It occurs in subtropical, temperate and subalpine climates over a wide range of altitudes. It occurs on soils derived from sedimentary, igneous and metamorphic geology on a range of soils including black clay loams to yellow podzolics and peaty loams	No suitable habitat was observed throughout the assessment area. **Species is unlikely to occur.**	Not recorded
Reptiles						
Species	**Common Name**	**Status**	**EPBC Code**	**Description of Community / Habitat**	**Likelihood of Occurrence**	**Site**
Coeranoscincus reticulatus	Three-toed Snake-tooth Skink	Vulnerable	59628	Found mostly in closed forest and possibly open layered Eucalyptus forest. Generally recorded in moist layered forest on loamy basaltic soils, but also found in closed forest overlying silica sand dunes at Cooloola. Within forests, this species is found in well-mulched, loose, friable rainforest soil in leaf litter, often immediately adjacent to fallen tree trunks. Much of the lowland closed forest within its range has been cleared for agriculture and grazing, pasture improvement, crop production, tropical fruit production, and native forest logging. Suitable habitat has generally been reduced to patches, especially in lowland areas.	No suitable habitat was observed throughout the assessment area. **Species is unlikely to occur.**	Not observed
Delma torquata	Collared Delma	Vulnerable	1656	The Collard Delma inhabits eucalypt-dominated woodlands and open-forests in Land Zones 3 (Alluvium), 9 (undulating country or fine-grained sedimentary rocks), 10 (sandstone ranges). Common Regional Ecosystems (RE) include RE 11.3.2, RE 11.9.10, RE 11.10.1 and RE 11.10.4. These REs are located in Bioregion 11 (Brigalow Belt), located to the north and west of South East Queensland. The species is also known in the Toowoomba Ranges in habitats associated with exposed rocky outcrops on ridges or slopes in vegetation communities dominated by Narrow-Leaf Ironbark (*Eucalyptus crebra*). Other areas where the species has been recorded is the Mt Crosby and Moggill State Forest sites, as well as Anstead and Pinjarra Hills.	Important populations of the species are associated with important habitats found in the Brigalow Belt (Bioregion 11). Larger population records of the species west of Brisbane include Kenmore, Pinjarra Hills, Anstead, Mt Crosby, Lake Manchester and Karana Downs. The species has not been recorded on, or in close proximity to the site. **Species is unlikely to occur.**	Not observed

MNES Threatened Species and TECs Assessment

As summarised in **Table 2**, a review of specific habitat niches and distribution of these listed flora and fauna species and TECs using the SPRAT database, Queensland's Wildlife Online Search Tool, previous reporting in the local area and Queensland's Regional Ecosystem and Essential Habitat mapping ruled out the potential for most of these listed matters to occur. This was primarily due to combined impacts from:

- Lack of suitable niche habitat across the site, such as large waterbodies, rocky outcrops and coastal habitats.
- Influences from surrounding development, particularly expanding residential developments, roads and the railway line, as well as surrounding major commercial development.
- Fragmentation of the site, adjoining the Gold Coast Rail Line and Pacific Motorway to the west and southwest, Foxwell Road to the south and southeast and residential development to the north and east.
- Evidence of exotic weeds throughout the site.
- Evidence of site usage by domestic dogs from surrounding residential areas.
- Consistent usage of the site for unlawful land uses including motorbikes and 4wd.

Overall, desktop and field surveys identified the potential for *Pteropus poliocephalus* (Grey-headed Flying-fox) and *Phascolarctos cinereus* (Koala), both of which are listed as Vulnerable under the EPBC Act, to occur on the site due the availability of potential habitat and recordings for the species in the local area. No other species or TECs were observed during field surveys or considered likely to occur on site.

Assessment of Occurrence and Field Survey Results

Over 15 to 18 April 2015, senior ecologists from **Saunders Havill Group** (SHG) conducted a field assessment across the site to survey for MNES flora as well as the potential habitat for MNES fauna. A summary of these results in contained within the Technical Memo in **Attachment C**. Overall, the site was found to be highly disturbed as a result of maintained access tracks, motorbike and four wheel drive impacts, weed infestations, evidence of dogs and dumping of domestic rubbish across the site. Previous ecological surveys by **Planit Consulting** were undertaken over the referral area in 2004 and 2008. The results of these previous assessments as well as contemporary field assessment by **SHG** have informed the baseline ecological condition for the site permanently or even seasonally.

Grey-headed Flying-fox (*Ptreopus poliocephalus*)

The Grey-headed Flying-fox is listed as Vulnerable under the EPBC Act. The species was not recorded on the subject site during 2004 and 2008 field surveys by **Planit Consulting** or in 2015 field survey by **SHG**. On these occasions no individuals or roosting camps were observed. The availability of eucalypt woodland on site however provides suitable foraging habitat for the species. Consequently, the species is considered to have potential to occur as a visitor during eucalypt flowering events. However as the project area does not currently support a flying-fox roosting camp and with suitable foraging habitat widespread throughout the greater Brisbane and Gold Coast region, the project area is not considered likely to support an 'important population' of Grey-headed Flying-fox. Overall, this is a common, highly mobile species that is able to utilise foraging resources over a large area. Given the wide spread distribution of the species across SEQ and the availability of habitat throughout the greater area, the project is considered unlikely to have a significant impact on the Grey-headed Flying-fox. A considering in assessing the value of the site for Flying Fox is the constant noise and influence from adjoining rail and roads.

Distribution and Population

The Grey-headed Flying-fox occurs between Rockhampton in Queensland to Melbourne in Victoria. The species will usually selectively forage where food is available and as such, its patterns of occurrence and relative abundance vary between seasons and years. There are no separate or distinct populations due to the constant genetic exchange and movement between camps throughout its geographic range.

Threats

The primary threat to the Grey-headed Flying-fox is shooting and culling to protect commercial fruit farms. In addition, habitat loss and fragmentation creates competition for food sources and the loss of roosting camps is also considered to be a threat.

Field Survey Results

Given the availability of eucalypts throughout the site, it is considered likely to provide suitable foraging habitat infrequently or seasonally to the Grey-headed Flying-fox as part of its greater home range. No individuals were observed on-site and more importantly, no roosting camps were observed during 2004, 2008 and 2015 field survey.

Significant Impact Assessment

To determine whether the proposed action is likely to have a significant impact on the Grey-headed Flying-fox, an assessment against the *Significant impact Guidelines 1.1* is provided in **Table 3.**

Table 3: Significant Impact Assessment – Vulnerable Grey-Headed Flying-Fox

Significant Impact Criteria	Description	Impact
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:		
1. Lead to a long term decrease in the size of an important population of a species.	While the site does contain potential foraging habitat for the Grey-headed Flying-fox, no individuals were observed on site and no roost camps were seen on or near the site nor are any known to or recorded in the general area. South East Queensland has a permanent and abundant population of Grey-headed Flying-fox and available habitat is spread throughout the region given the high prevalence of eucalypts. The site is not considered to support an important population of the species and the proposed action is unlikely to lead to a long term decrease in the size of any local Grey-headed Flying-fox populations.	**No significant impact**
2. Reduce the area of occupancy of an important population.	No roost camps or individuals were observed across the site. The project will not have a significant impact on any population of the species. While the proposed action will remove available foraging habitat, given the abundant availability of eucalypts in the surrounding landscape and the greater SEQ region, the development proposal is unlikely to have a significant impact on the area of occupancy of the species.	**No significant impact**
3. Fragment an existing important population into two or more populations.	The SPRAT species profile outlines that while there are spatially structured colonies of Grey-headed Flying-fox, there are no separate or distinct populations due to the constant genetic exchange and movement between camps throughout the species' geographic range. In addition, given the high mobility of the species, the proposed action is unlikely to fragment a population into two or more populations.	**No significant impact**
4. Adversely affect habitat critical to the survival of a species.	While the proposed action results in the removal of potential foraging habitat, this habitat is highly disturbed and subject to edge effects from surrounding development. Further, this habitat is not considered to be unique or of special value. The SEQ landscape provides abundant eucalypt and similar genera which are available for foraging. The habitat on site is not considered to be critical to the survival of the Grey-headed Flying-fox.	**No significant impact**
5. Disrupt the breeding cycle of an important population.	The site surveys did not identify any evidence of breeding Grey-headed Flying-fox. Mating normally occurs within autumn, and females generally give birth in October, where they carry their young to feeding sites for four to five weeks after giving birth. As no roosting camps were observed on or near the site, the proposed action is unlikely to disrupt the breeding cycle of an important population.	**No significant impact**
6. Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	The habitat on site did not contain any special or unique values. Its removal is unlikely to have a significant impact on the availability of habitat in the landscape, given the vast quantity and availability of eucalypts in the surrounding area.	**No significant impact**
7. Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	The proposed action is unlikely to result in the introduction of invasive species.	**No significant impact**

8. Introduce disease that may cause the species to decline.	The project is unlikely to introduce disease into the area.	**No significant impact**
9. Interfere substantially with the recovery of the species.	Recovery of the species has specifically targeted the broad scale culling of the species. In addition, conservation efforts have led to the protection of known roosting sites and important habitat. The site has not been identified as an important habitat or roost site and the action is unlikely to interfere with the recovery of the species.	**No significant impact**

The above assessment against the *Significant impact Guidelines 1.1* indicates the proposed action is unlikely to have a significant impact on the Grey-headed Flying-fox.

Koala (*Phascolarctos cinereus*)

Conservation Status

Under the EPBC Act, Koala populations in Queensland, New South Wales and the Australian Capital Territory are listed as Vulnerable. The Koala is also listed as Vulnerable under Queensland's *Nature Conservation Act 1992* (NCA). The site is located within the modelled distribution of the Koala, within the 'coastal context' as per the EPBC Act Referral Guidelines for the Vulnerable Koala (Koala Referral Guidelines).

Habitat

As described in the Koala SPRAT species profile, Koalas inhabit a wide range of temperate, sub-tropical and tropical forest, woodland and semi-arid communities dominated by eucalypt species. Under the Koala Referral Guidelines (p.5), Koala habitat is defined as:

> "*any forest or woodland containing species that are known koala food trees, or shrubland with emergent food trees. This can include remnant and non-remnant vegetation in natural, agricultural, urban and peri-urban environments. Koala habitat is defined by the vegetation community present and the vegetation structure; koalas do not necessarily have to be present*".

Distribution

Koalas are endemic to Australia and have a known distribution from north-eastern Queensland to south-eastern South Australia. The species is widespread within coastal and inland areas, however densities of Koalas are higher within coastal areas with higher average annual rainfalls. South East Queensland is known to support Queensland's highest density of Koalas.

Threats

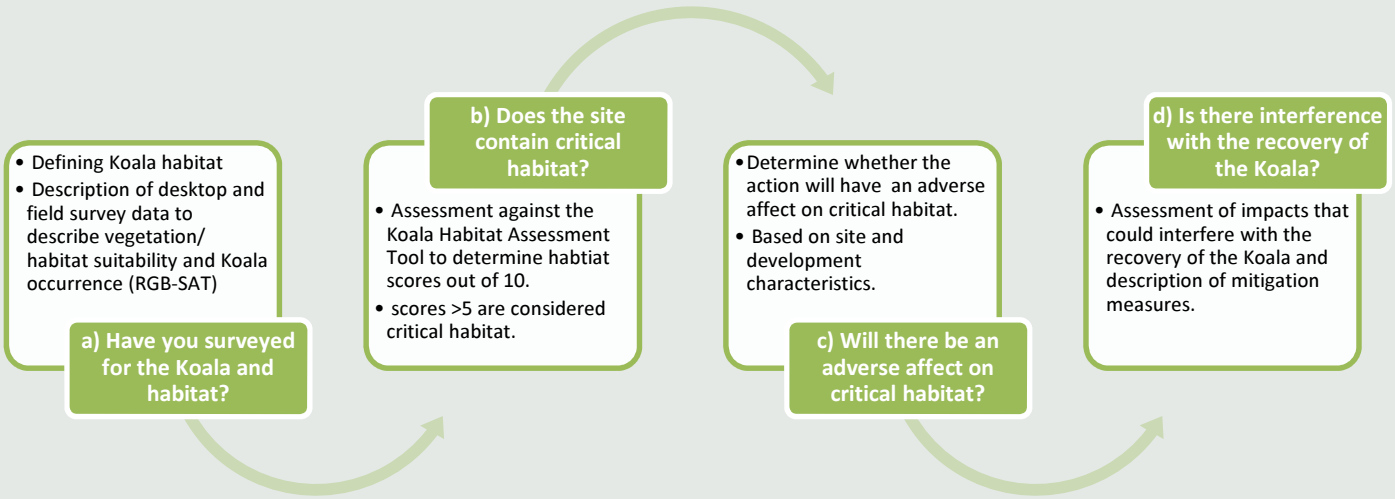
The three (3) main threats to Koala have been identified within the SPRAT profile as:

- Habitat loss and fragmentation,
- Vehicle strike, and
- Predation by domestic and/or feral dogs.

In addition, the prevalence of disease such as the *Chlamydia* virus in many Koala populations has led to symptoms such as infections of the eyes, urinary tract, repertory tract and reproductive tract, with the later having the potential to head to infertility in females. More recently, Koala Retrovirus (KoRV) has had an increasing impact on most of Queensland's Koala populations. While most Koalas carry the disease, environmental stresses such as poor nutrition and overcrowding lead to conditions caused by KoRV such as leukaemia and immunodeficiency syndrome.

Assessment Against the EPBC Act Referral Guidelines for the Vulnerable Koala

The referral site is located within the Koala Referral Guidelines modelled distribution as 'known/likely to occur' and within the 'coastal context'. As stated above, South East Queensland is known to support Queensland's highest density of Koalas. Further the species has been recorded within the broader Coomera area. As such, the following provides a detailed assessment against the Koala Referral Guidelines to determine whether the proposed action, being Coomera Woods, will a significant impact on the Koala or Koala habitat. The Koala Referral Guidelines provides an assessment approach using the following processes displayed in the flow chart below:



Flow Chart: EPBC Koala Assessment Process

- **Koala Occurrence and Habitat Surveys**

1. **<u>Translocation Program – City of Gold Coast</u>**

City of Gold Coast (GCCC) completed a Koala conservation project for the East Coomera area in June 2014, in accordance with the provisions of a Scientific Purpose Permit issued by the Queensland **Department of Natural Resources and Mines** (DNRM) and corresponding Animal Ethics Committee approval issued by the then **Queensland Department of Employment, Economic Development and Innovation** (DEEDI), now **Department of Agriculture and Fisheries** (DAF). In 2006-07, an estimated 500 koalas were thought to live in the koala habitat area at East Coomera, covering approximately 3,640 hectares of which 1,000 hectares is committed for development of the Coomera Town Centre. The East Coomera Koala Conservation Project (ECKCP) involved:

- Relocation of the most at-risk Koalas from areas where habitat will be cleared to other areas of secure habitat in the Gold Coast Local Government area. Recipient sites included Lower Beechmont Conservation Area and Wongawallan Conservation Area.
- Monitoring Koalas in the East Coomera area as well as those relocated to other areas.
- Habitat restoration in the Pimpama River Conservation Area to enhance available Koala habitat north of the new town centre.
- Engagement with landowners, residents and the broader community.
- Preparation and implementation of a Koala Conservation Plan (KCP) for East Coomera. The KCP was adopted by **GCCC** in November 2014 and is currently being implemented.

Twenty (20) Koalas were captured and relocated from the site in accordance with Phase 1 of the ECKCP with 180 Koalas relocated from development sites and locations of imminent danger in the East Coomera area. Thirty (30) resident Koalas have been recruited into the in-situ monitoring program for East Coomera and eighteen (18) for Lower Beechmont Conservation Area. Sixteen (16) of the koalas currently being monitored in-situ at East Coomera will need to be relocated as development encroaches into their locations are/or they disperse into high risk areas. There are currently over eighty (80) Koalas in the radio tracking program.

2. **<u>Site Survey – Saunders Havill Group</u>**

Between15-18 April 2015, senior ecologists from **SHG** conducted a field survey across the site with weather conditions fine and sunny. The purpose of the survey was to determine the level of Koala usage across the site and to assess the availability of suitable Koala habitat. The assessment involved the following methods:

- Spot Assessment Technique (SAT) development by Philips and Callaghan (2011)
- Opportunistic Searches

SAT Survey Results

The SAT method is an assessment of Koala activity involving a search for any Koalas and signs of Koala usage. The SAT involves identifying a non-juvenile tree of any species within the site that is either observed to have a Koala or scats or known to be food trees or otherwise important for Koalas and recording any evidence of Koala usage (including any Koalas, identifiable scratches, or scats). The nearest non-juvenile tree is then identified and the same data recorded. The next closest non-juvenile tree to the first tree is then assessed and so on until 30 trees have been recorded. The number of trees showing evidence of Koalas is expressed as a percentage of the total number of trees sampled to indicate the frequency of Koala usage. Assessment of each tree involves a systematic search for Koala scats beneath the tree within 1 m radius of the trunk. After approximately 1 minute of searching for scats, the base of the trunk is observed for scratches.

Site specific searches observed the presence of one (1) small juvenile Koala within the north eastern drainage line on Day 1of the four (4) the survey period, which was not resighted over the remaining three (3) days. Scats were also located in several locations over the site, primarily along gully lines and foothills. Sixteen (16) SAT surveys were conducted across the application area, as shown by the Field Survey Effort presented in **Plan 3** and summarised in **Table 4**. While SAT surveys traditionally rely on the identification of a scat to complete the assessment, three (3) of the sixteen (16) SAT surveys were conducted at random to ensure a thorough assessment of the entire referral site was undertaken. In most locations (6 of the 16), SAT surveys recorded evidence consistent with the "low" category for Koala use (<22.52% of trees with scats) in coastal regions as defined by the **Australian Koala Foundation's** Koala Activity Level Classification Table, extracted below as **Table 5.** This assessment has been based using the East Coast (Medium- High) Density Area which is applicable in habitats dominated by residual, transferral or alluvial type landscapes considered med-high nutrient soils with good water holding capacity (Steve Phillips, personal communication) (refer to **Response 3.3.** for further information on soils and landform). Four (4) of the SATs however recorded evidence consistent with the "high" use category (>33.84% of trees with scats) while three (3) SATs recorded evidence consistent with the "normal" use category (≥22.52% but ≤33.83% of trees with scats).

Table 4: SAT Survey Results

SAT Survey	Scats	%of Trees with Scats	Usage Level
SAT 1	Yes	36.3	High
SAT 2	Yes	13.3	Low
SAT 3	Yes	13.3	Low
SAT 4	Yes	23.3	Normal
SAT 5	Yes	20.0	Low
SAT 6	Nil	-	No Use
SAT 7	Yes	23.3	Normal
SAT 8	Nil	-	No Use
SAT 9	Yes	50.0	High
SAT 10	Yes	43.4	High
SAT 11	Yes	3.33	Low
SAT 12	Yes	16.6	Low
SAT 13	Yes	23.3	Normal
SAT 14	Yes	33.3	High
SAT 15	Yes	13.3	Low
SAT 16	Nil	-	No Use

Table 5: AKF Koala Activity Level Classification Table

ACTIVITY CATEGORY	LOW USE	MEDIUM (NORMAL) USE	HIGH USE
Area (density)			
East Coast (low)	< 9.47%	≥ 9.47% but ≤ 12.59%	> 12.59%
East Coast (med – high)	< 22.52%	≥ 22.52% but ≤ 32.84%	> 32.84%
Western areas (med – high)	< 35.84%	≥ 35.84% but ≤ 46.72%	> 46.72%

Flora and Koala Habitat Results

Under the Koala Referral Guidelines, Koala habitat is defined as:

> "*any forest or woodland containing species that are known koala food trees, or shrubland with emergent food trees. This can include remnant and non-remnant vegetation in natural, agricultural, urban and peri-urban environments. Koala habitat is defined by the vegetation community present and the vegetation structure; koalas do not necessarily have to be present*".

Queensland's Koala Habitat Values Map, attached as **Figure 3**, shows the site has been identified as containing areas of Medium and Low Value Bushland and Medium and Low Value Rehabilitation. A small area to the east is mapped as Generally Not Suitable for the species. Regional Ecosystem Mapping, attached as **Figure 4**, shows that the majority of the site is mapped as containing Least Concern RE12.11.5 which is mapped as containing areas of essential habitat for Koala. Small patches of Of Concern RE12.3.11 are mapped in the eastern drainage line and along the western boundary. The remainder of the site, predominately along ridgelines, is mapped as Category X (non-remnant). This is a result of a history of disturbance across the site due to fire, grazing and slashing.

Field surveys confirmed site the contained a high abundance of invasive weeds including four species declared under the *Land Protection (Pest and Stock Route Management) Act 2002*. These include Groundsel (*Baccharis hamifolia*) – Class 2, Fireweed *(Senecio madagascariensis*) – Class 2, Camphor Laurel (*Cinnamonmum camphora*) – Class 3, and Lantana (*Lantana camara*) – Class 3.

Overall, the site is dominated by Eucalypt Woodland/Open Forest located on minor alluvial deposit, or on metamorphosed sedimentary rocks associated with the Neranleigh-Fernvale formation beds. The understory across the majority of the site is routinely slashed and typically dominated by regenerating eucalypts, native shrubs and grasses. Three broad eucalypt associations were identified across the site (refer **Plan 3**):

1. Forest Red Gum/Ironbark/Bloodwood Association (Broad Gullies and Drainage Lines)
    - Existing canopy vegetation includes predominately stems of *Eucalyptus tereticornis, E. siderophloia* and *Corymbia intermedia* within the lower flowpath and *E. tindaliae, E. resinifera, E. propinqua, E. carnea, C. citriodora, Angophora leiocarpa, E. fibrosa and E. acmenoides* on the gully banks. Common elements of the small tree (T2) layer include *Lophostemon suaveolens, Melaleuca quinquenervia, Allocasuarina littoralis, Acacia spp., Alphitonia exclesa* and *Callistemon salignus.*

2. Tallowwood/White Mahogany/Grey Gum Association (Mid-slope Areas)
    - The canopy varies in composition but is mostly dominated by White Stringybark (*Eucalyptus tindaliae*) and Broadleaved White Mahogany (*E. carnea*) in association with varying sub-dominance of Ironbarks (*E. siderophloia* and *E. fibrosa*), Pink Bloodwood (*Corymbia intermedia*), Smoothbarked Apple (*Angophora leiocarpa*) and Grey Gum (*Eucalyptus propinqua*). In the moister parts and on the more sheltered slopes it includes some Tallowwood (*Eucalyptus microcorys*) and a greater proportion of Grey gum. The drier areas include some Spotted Gum and Brush Box (*Lophostemon confertus*) with Blue Gum sporadically occurring on the lower slopes.

3. Spotted Gum/Ironbark Association (Ridgelines and Balance Areas)

    - The canopy is dominated by Spotted Gum (*Corymbia citriodora*) and Broad-leaved Ironbark (*Eucalyptus fibrosa*)/or Grey Ironbark (*E. siderophloia*) with White Stringybark (*E. tindaliae*), Broadleaved White Mahogany (*E. carnea*), Narrow-leaved Ironbark (*E crebra*), Smoothbarked Apple (*Angophora leiocarpa*), Pink Bloodwood (*Corymbia intermedia*) and Grey Gum (*Eucalyptus propinqua*) common.

Summary of Findings

The key findings from the assessment are:

- Twenty (20) koalas have previously been translocated from the site as part of the East Coomera Koala Conservation Project by **GCCC**.
- One (1) juvenile male koala was observed on Day 1 of the survey, however was not resighted during field survey indicating that is not confined or solely dependent on the application site.
- Scats were observed in several locations across the application area, with six (6) of the sixteen (16) SAT surveys recording 'low' use', four(4)recording 'normal' use and three (3) recording 'high' use by use by Koala.
- The site is dominated by associations of *Eucalyptus tereticornis* (Blue Gum) / *E. siderophloia* (Grey Ironbark) / *Corymbia intermedia* (Pink Bloodwood), *Corymbia citriodora* (Spotted Gum) / *Eucalyptus fibrosa* (Broad-leaved Ironbark) / *E. siderophloia* (Grey Ironbark), and *Eucalyptus tindaliae* (White Stringybark) / *E. carnea* (Broadleaved White Mahogany) / *Eucalyptus propinqua* (Grey Gum). These species are considered Koala food trees under the Koala Referral Guidelines.

- **Does the site contain critical habitat to the survival of the Koala?**

In accordance with the Koala Referral Guidelines, habitat which receives a score of **5 or more** using the Koala Habitat Assessment Tool is considered to be critical habitat. As assessment of the site using the Koala Habitat Assessment Tool has been undertaken in **Table 6** which indicates the site has been given a critical habitat score of **4** and therefore is **not** considered to be critical habitat for Koala. The Habitat Assessment Tool score and justification were discussed with **DoE** through meetings prior to the lodgement of this referral. While the site is **not** considered to contain critical habitat in this assessment for the Koala, due to its size and known Koala populations in the area, the action warranted referral to the Department.

Table 6: Koala Habitat Assessment Tool

Attribute	Score	Comment
Koala occurrence	2	The EPBC Act Protected Matters Search Tool identified the Koala as having potential to occur on site. A search of Queensland's Wildlife Online Search Tool using a 10 kilometre radius found 372 records of the Koala, while 11 sightings had been recorded within a 1 kilometre radius of the site. While there is evidence of Koala occurrence on the site, it is noted that East Coomera Koala Conservation Project has involved the relocation of 180 'at risk' Koalas out of the imminent Coomera development area in June 2014. This has included the removal of 20 Koalas off the referral site as well as surrounding areas the site as part of Phase 1, significantly reducing the number of Koalas in the area. The East Coomera Koala Conservation Project is expected to continue throughout the construction phase of Coomera Town Centre to ensure all Koalas are removed from high risk development areas. Recent survey, since the relocation of Koalas off the site, noted a single juvenile male was observed on Day 1 of the 4 day field survey and was not resighted on the following three (3) days. In addition, while scats were observed in several locations across the site, these were concentrated to gully lines and foothills and overall use of the site by the species is

		considered to be "low". Further, while scats were observed across the site, it is unknown how long they have been on site (i.e. prior to relocation in June 2014), with survey noting in many locations as being 'old'. **As there is evidence of Koala occurrence is the previous two years, this attribute has been scored 2.**
Vegetation composition	2	A detailed description of the vegetation composition on site is provided in **Response 3.1**, and based on the results from 2004, 2008 and 2015 ecological field survey. Overall, the site was found to be dominated by species that achieve the definition of 'woodland' and 'forest' as referenced in the Koala Referral Guidelines. Ecological survey of the site shows the referral area is predominately dominated by Eucalyptus and Corymbia species. Specifically, these species included *Eucalyptus tereticornis* (Forest Red Gum), E*ucalyptus siderophloia* (Grey Gum), *Corymbia intermedia* (Pink Bloodwood), *Corymbia citriodora* (Spotted Gum) and Broad-leaved Ironbark (*Eucalyptus fibrosa*)/or Grey Ironbark (*E. siderophloia*). Further, there was a high dominance of *Allocasuarina littoralis* (Black She-oak), *A. torulosa* (Forest She-oak) and Wattles (*Acacia disparrima, A. leiocalyx, A. melanoxylon*) throughout the shrub layer and a number of weed species were identified. As vegetation composing of canopy species on site is made up of more than two species considered to be Koala food trees, this attribute has been given a score of 2. **Two or more Koala food trees were identified in the canopy, resulting in an attribute score of 2.**
Habitat connectivity	0	Contextually, the site is bound by the Gold Coast Railway Line to the west, Foxwell Road the south and existing and approved development to the north and east. While current aerial imagery shows vegetated patches to the south, southwest and east (refer **Plan 4**), connectivity to this vegetation is segregated by existing arterial and rail infrastructure and future development and EPBC approvals. Urban development has expanded significantly in the wider Coomera area over the past decade, with residential estates now dominating the landscape to the east and west of the Pacific Motorway. A primary barrier to dispersal between the site and bushland directly to the west is the Gold Coast Railway Line and Coomera Train Station. Trains travel along this portion of the line between Brisbane and the Gold Coast roughly every half an hour between 5am and 12pm. The high frequency of train movements along the track poses significant threats of injury or death to dispersing Koalas. In addition, vegetation clearing of isolated pockets between the railway line and Pacific Motorway associated with Westfield's Northern Frame Precinct (EPBC2014/7291) and Shopping Centre (EPBC20147292) has commenced under current approvals and all remaining vegetation within this wedge is expected to be cleared by the end of the year. The State Government recently committed to $47.4million, in addition to the existing $410 million commitment from the Australian Government and $17.3 million commitment from the developers of the Coomera Town Centre, for the upgrade of the existing interchange connected to the Pacific Motorway and Coomera Exit 54 located at Foxwell Road. This financial commitment demonstrates the obligation from all levels of Government for Foxwell Road to be developed as a major arterial. This upgrade is required to cater for continued growth of the Cooomera Area. While currently Foxwell Road provides a barrier for dispersal to the south and southeast, upgrades to this road, which are expected to commence late 2015, will significantly impede potential connectivity opportunities as future roads have not been designed to incorporate fauna crossings.

		The Coomera Town Centre Structure Plan, provided in **Plan 2**, shows that the surrounding Coomera area is expected to undergo even further development in the future. The subject site comprises a significant proportion of this development zone and as such, will be surrounded by existing and future development. Consequently, the referral area will become a completely isolated patch fragmented from habitat patches elsewhere in the landscape once surrounding development is complete. Operational works approval for vegetation clearing associated with Stage 5 of Big Sky Coomera to the east of the application area, has been issued by Council and while no EPBC approval have been granted, it is inevitable that this site will be developed in accordance with the Coomera Structure Plan and evidently cleared. No viable movement corridors or retention of Koala habitat has been planned in this area as part of the Coomera Town centre Structure Plan. Further, Council have taken direct action through the East Coomera Koala Conservation Project, to relocate the large Koala population (estimated to be approximately 500 Koalas) outside of the Coomera Town Centre to areas designated for Koala conservation in the Gold Coast Areas. A minor network of lineal open space has been achieved in fragments through developments to the north and east. These areas range in width from 20m to 60m. No conservation measures have been incorporated into this system (i.e. fencing, signage, Koala tree planting program). Additionally, the linear system is severed by several minor and major roads and in other locations the full width of open space caters for storm water treatment devices. This lineal system is not assessed as supportive of connectivity in relation to critical habitat to and from the site (refer **Plan 4**). Overall, the site is significantly disconnected from large contiguous patches of bushland. While limited movement opportunities are currently exist to the east, future development intent and Council approvals over these areas will inevitable see this vegetation cleared for residential development. Once approvals are in place, contiguous vegetation within the landscape will be confined to the referral site and vegetated properties to the north and south, comprising 185ha. In addition, as no viable movement corridors or areas of Koala habitat have are planned to be retained adjoining the site. The attribute value for habitat connectivity has been determined to be 0. **No habitat connectivity values will be retained in the short or long term surrounding the site, resulting in an attribute score of 0.**
Key existing threats	0	Detailed knowledge is known 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. The following data is provided from Council's Reports surrounding this strategy and reports on threats at a time when East Coomera was substantially less developed than to the current day. **<u>Vehicle Strike:</u>** Between 2012 and 2013 **Wildcare Australia** recorded six (6) koala fatalities from vehicle strike within East Coomera. In the same period Gold Coast City Council 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 strike records were made 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 60,000 registered dogs within the Gold Coast area with the majority of these residing in urban settings and occurring and proposed 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 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 **Gold Coast City Council** commenced the unorthodox strategy of physically capturing and relocating the koalas from the East Coomera area. The Coomera Woods site is almost completely surrounded by these threat factors either through already constructed residential areas and roads or through approved and under construction areas, the majority of which also retain EPBC clearance. **Due to the existence of key threats, the attribute has been scored 0.**
Recovery value	0	The interim recovery objective for coastal areas is based upon protecting and conserving large, connected areas of Koala habitat, particularly where Koalas are genetically diverse/ distinct, free of disease or have a low incidence of disease or where there is evidence of breeding. None of these elements are considered to be present on the referral site and as such its recovery value is assessed as being 0. This is primarily because, as shown in **Plan 4**, the site is heavily fragmented and will inevitably be isolated from large, continuous patches of Koala habitat, as local development expands in accordance with the Coomera Town Centre Structure Plan. Further, the site makes up significant proportion of the Coomera Town Centre development area and adjoins the Activity Centre Precinct and Rail Station. If the development does not proceed it dramatically effects all existing development and proposed development in the Coomera area. The referral site is already highly fragmented and isolated by surrounding roads and rails, and while some connectivity remains to the east, future approvals will remove connectivity opportunities between the site and areas of potential koala habitat. Further, this development will result in the isolated site surrounded by increased key threats to the species including roads and domestic pets. The site is not considered large enough in isolation to function and sustain koala populations. While a small juvenile male was observed on the site during the first day of field survey, it was not resighted on the remaining 3 days by field ecologists suggesting it, or other potential individuals, are not confined to the referral site. Further, while evidence of scats on site indicated a 'low' level of usage by the species, the age of these scats cannot be ascertained and it is likely that many of the scats recorded as part of the SATs were left prior to relocation of koalas off the site as part of the East Coomera Koala Conservation Project in June 2014. Further previous field work as well as research undertaken as part of the East Coomera Koala Conservation Project indicates the site in isolation does not support a viable subpopulation of koalas. As shown in **Plan 2**, the Coomera Town Centre Structure Plan, planning intent is for the area to be completely developed, with no conservation linkages proposed to be retained within the landscape. While two slithers of Conservation land area mapped over the referral site, and are to be retained by the development, these have been designated due to topographical constraints and reflect drainage lines. The will not in isolation support viable movement corridors for the species and were not designed to form part of conservation linkages for Koala movement in the Coomera Town Centre. The western slither of conservation land adjoins and mapped Recreational Open Space/Urban Parkland linkage which connects the site to parkland associated with Oxley Creek to the west of the

		railway line. This corridor is intended as a recreational corridors for residents a visitors and will be embellished with amenities. No Environmental Corridors or meaningful areas of conservation are mapped within or adjoining to connect the site with external koala habitat areas. Further, over 180 koalas have been relocated from the area as part of the East Coomera Koala Conservation Project, including twenty (20) individuals from the site itself due to it being identified as a 'high risk' development area. Planning intent and actions by Council do not support the retention of habitat for koala or existing populations in the area. Overall, the site does not meet the interim recovery objectives for coastal regions and as such, is given an attribute score of 0. **As the referral site does not meet the interim recovery objectives, the attribute has been scored 0.**
Total	**4**	**Critical Habitat**

- **Will there be adverse impacts on critical habit?**

The above assessment concludes that the site **does not** contain critical habitat for the Koala as it achieves a **habitat score of 4.** Field surveys however have identified that the site is utilised infrequently by Koalas and that vegetation composition on the referral site is supportive of Koala habitat, consisting primarily of species considered to be Koala food trees. Potential impacts to the species under the Koala Referral Guidelines therefore have been considered through the "yes/no" flowchart provided within the Koala Referral Guidelines as Figure 2 to determine if the action will adversely affect habitat critical to the survival of the Koala:

1. **Does your impact area contain critical habitat to the survival of the koala (habitat score ≥ 5).**
   - No, the habitat on site has been given a score of 4.

2. **Does the area proposed to be cleared contain known Koala food trees?**
   - Yes. Overall, the site was found to be dominated by species that achieve the definition of 'woodland' and 'forest' as referenced in the Koala Referral Guidelines. Ecological survey of the site identified canopy species within the referral area are predominately dominated by Eucalyptus and Corymbia species including *Eucalyptus tereticornis* (Forest Red Gum), E*ucalyptus siderophloia* (Grey Gum), *Corymbia intermedia* (Pink Bloodwood), *Corymbia citriodora* (Spotted Gum) and Broad-leaved Ironbark (*Eucalyptus fibrosa*)/or Grey Ironbark (*E. siderophloia*).

3. **Are you proposing to clear ≤2 hectares of critical habitat containing known Koala food trees in an area with a habitat score of 5?**
   - No. The action requires clearing 137 hectares of vegetation, however scores derived using Habitat Assessment Tool do not achieve the minimum requirements to be considered critical habitat for the Koala.

4. **Are you proposing to clear ≥20 hectares of critical habitat containing known Koala food trees with a habitat score of ≥8?**
   - No. The action requires clearing 137 hectares of vegetation which varies in condition. Approximately114 hectares of the clearing areas is mapped as remnant vegetation, 90 hectares of which is associated with 'essential habitat' for the Koala. The remaining impact is made up of 33 hectares of non-remnant vegetation. This vegetation however was assessed using the Habitat Assessment Tool and is not considered critical habitat for the Koala.

5. Assessment on Characteristics

- There are a number of characteristics of the referral site that reduce the adversity of impacts caused by the clearing of vegetation. These include:
    - The surrounding Coomera area has been subject to the East Coomera Koala Conservation Project, a translocation program aimed at removing Koalas from at risk development areas into protected conservation areas. Council has indicated a preference for removing Koalas from the Coomera Town Centre Structure Plan extents in response to the high level of development anticipated in the surrounding area. As such, approximately 180 Koalas have been removed from the surrounding area.
    - The vegetation on site is not considered critical habitat for Koala, as it achieves a habitat assessment score of 4.
    - Site vegetation is surrounded by urban development, roads and rail with future expansion of the Coomera area intended to occur. Consequently, while a large vegetated patch, the site will be completed isolated from continuous areas of Koala habitat and no viable or safe Koala movement opportunities to and from the site will exist (refer **Plan 4**).
    - As, conditioned by **GCCC**, no clearing can occur on site without direct involvement of a registered Fauna Spotter Catcher. Further an approved Fauna Management Plan has prepared for the site which details mitigation, management and monitoring actions proposed by the development (refer **Section 4**).
    - Each of these characteristics restricts the site's ability to achieve the interim recovery objectives for the coastal areas. As such, the retention of site vegetation will not advance the objective of the Commonwealth to protect large and continuous areas of Koala habitat.
    - Given these factors, the short and long term impacts on Koalas as a result of the proposed action are not considered to be significant.

Overall, the adversity of impacts as a result of the proposed development are minimal as the vegetation is not considered to achieve the definition of critical habitat. Existing barriers to Koala dispersal to and from the site coupled with current Local, State and Commonwealth approvals around the referral area drastically influence the long term ecological function of the site within the broader landscape.

6. Could the action interfere substantially with the recovery of the Koala?

In addition to considering adverse impacts on critical habitat, the potential for the action to interfere with the recovery of the Koala must also be considered as per the Koala Referral Guidelines. Possible impacts listed in the guidelines that must be considered include:

- Introducing or increasing the risk of vehicle strike
- Introducing or increasing koala fatalities due to dog attacks
- Creating a barrier to movement
- Facilitating the introduction or spread of disease
- Increasing the risk of high-intensity fires
- Degrading critical habitat due to hydrological changes

These impacts as well as mitigation measures to address these impacts are discussed in **Table 7**. In summary, the project is considered unlikely to interfere substantially with the recovery of the species.

Table 7: Potential Impacts

Impact	Likelihood	Comments
Dog attack	Unlikely	While the proposed action introduces residential uses across the site, this will consist of medium to high density dwellings such as apartments and townhouses which are unlikely to encourage a notable increase in dog ownership. In the context of the greater Coomera area, which is characterised by low density residential areas, the project will not increase the level of dog ownership to a point and in a location which is likely to increase the prevalence of dog attacks. **No residual impacts are identified.**
Vehicle Strike	Potential	The development will result in an increase in vehicle usage on the newly created residential roads which includes trunk arterials. Given the already high level of vehicle usage on Foxwell Road, and expected increases in the future, risk of vehicle strike in the area is already high. As the site is to be surrounded by urban development, with remaining bushland on site predominately cleared, retained areas for koala movement in the Coomera area will be greatly restricted as intended by **GCCC**. Nevertheless, an increase in vehicle usage adjacent to bushland areas does create the potential for vehicle strikes. These impacts will be mitigated through road design principles and signage techniques encouraging high visibility and low speed limits. **No residual impacts are identified.**
Barriers to Dispersal	Unlikely	The site is already fragmented from other habitat areas as a result of existing barriers, including the Gold Coast Railway Line, Foxwell Road, existing urban development to the north and expanding residential to the east which will result in the clearing of the majority of remaining vegetated properties adjoining the site. The proposed action will not result in further fragmentation of other habitat areas. No residual impacts are identified as the site will not result in the creation of fragmentation or barriers to dispersal. **No residual impacts are identified.**
Hydrological change	Potential	Two drainage lines, which flow north and northeast will be retained by the development in open space. These drainage features will be retained within open space/conservation corridors, in keeping with retained widths downstream, to maintain natural drainage and hydrology. These features are noted to be highly degraded and capture stormwater run-off from surrounding development downstream. While the development will result in an increase in impervious surfaces, detailed hydrological modelling, Bulk Earthworks Plans, Stormwater Management Plans and Erosion and Sediment Control Plans will be prepared to manage and mitigate impacts associated with run-off from the development to maintain water quality in accordance with as State and Local water quality objectives and standards. Potential changes to hydrology are extremely unlikely to result in the degradation of critical habitat elsewhere. **No residual impacts are identified.**
Fire	Unlikely	The project is extremely unlikely to increase the frequency or intensity of bushfires as it primarily results in the removal of fuel load from the east. **No residual impacts are identified.**
Spread of Disease	Unlikely	One of the primary threats to Koalas is the spread of disease, with disease making up a significant proportion of overall mortality in Koalas. South East Queensland

		Koalas are known to carry Koala Retrovirus (KoRV), which is spread by transmission of genetics from parent to offspring, and by close contact between Koalas. Almost half of South East Queensland's Koala population has been estimated to carry reproductive diseases that can lead to infertility caused by the *Chlamydia* virus. Again, this is passed on by Koala to Koala contact. Given the already high prevalence of disease and its transmission by close Koala to Koala contact, the proposed action is extremely unlikely to result in the spread of disease or pathogens into the existing Koala population. **No residual impacts are identified.**

Nature and extent of likely impact

Address any impacts on the members of any listened threatened species (except a conservation dependent species) or any threatened ecological community, or their habitat.

Grey Headed Flying Fox

The nature of impacts on the Grey-headed Flying-fox is restricted to the loss of potential foraging habitat throughout the site. This is unlikely to have a notable impact given the extensive availability of habitat throughout South East Queensland which is not intermittingly influenced by trains and vehicle traffic nor surrounded by expanding urban development. No roost camps or individuals were recorded on site, thus it is unlikely that the proposed action will cause the displacement of individuals. An assessment against the Grey-headed Flying-fox significant impact criteria is included in **Table 3.**

Koala

Ecologists from **SHG** undertook a recent investigation across the site to determine the level of Koala usage and assess the vegetation composition to determine the value of the site in terms of providing Koala habitat. One (1) juvenile male was identified during the first day of field survey as a well a number of scats in several locations along gully lines across the site. Sixteen (16) SAT surveys were conducted across the site. Of the 480 trees searched, scats were recorded at the base of 94 trees, which equates to 19.6% of the SAT trees and correlates to an overall "low" usage of the site by Koalas. Some areas however, particularly along drainage lines were considered 'normal' to 'high' usage by Koala while highly disturbed areas along the southern and eastern boundaries as well as the central ridgeline indicates no usage by Koalas

Overall, the site was found to be dominated by species that achieve the definition of 'woodland' and 'forest' as referenced in the Koala Referral Guidelines. Ecological survey of the site identified canopy species within the referral area are predominately dominated by Eucalyptus and Corymbia species including *Eucalyptus tereticornis* (Forest Red Gum), E*ucalyptus siderophloia* (Grey Gum), *Corymbia intermedia* (Pink Bloodwood), *Corymbia citriodora* (Spotted Gum) and Broad-leaved Ironbark (*Eucalyptus fibrosa*)/or Grey Ironbark (*E. siderophloia*) many of which are considered Koala food trees. Shrub layers however were dominated by *Allocasuarina littoralis* (Black She-oak), *A. torulosa* (Forest She-oak) and Wattles (*Acacia disparrima, A. leiocalyx, A. melanoxylon*) throughout the shrub layer which was noted to be infested with weeds around access paths and property boundaries.

The Habitat Assessment Tool derived a habitat score of 4, which falls below the critical habitat threshold of ≥5 under the Koala Referral Guidelines. However, due to the presence of species considered Koala food trees and evidence of "low" usage by Koalas across the site, potential impacts to MNES from the proposed action have been identified as:

- Removal of 137.33 hectares of habitat as a result of direct clearing; and
- Functional loss of 10.15 hectares of habitat within conservation corridors.

A number factors have been identified which limit the adversity of impacts caused by the proposed clearing. These can be summarised as:

- As part of the East Coomera Conservation Project, 180 Koalas have been removed from the surrounding areas and relocated to conservation parks, including 20 individuals from the referral site itself. The project aims at removing risk Koalas from areas subject to development approvals within the Coomera Town Centre.
- The clearing of 137 hectares of vegetation with varying condition, which is made up of 114 hectares of remnant vegetation and 33 hectares of non-remnant vegetation.
- The habitat Assessment Tool delivered a score of 4, and therefore the site is not considered to contain critical habitat for Koala.
- No residual impacts on the Koala were identified. As such, the project will not substantially interfere with the recovery of the Koala.

- As the site is surrounded by the Gold Coast Railway Line to the west, Foxwell Road to the south and existing and approved residential development to the north and east, the referral area is completely fragmented from large, continuous areas of Koala habitat. As such, retention of vegetation on site would not achieve the interim recovery objectives for coastal areas.
- The site will retain two conservation corridors along the northern drainage lines which will provide potential habitat connectivity within the broader landscape.
- The already fragmented nature of the site ensures that no further fragmentation of large, continuous habitat areas will occur.
- Vegetation clearing will be undertaken sequentially, under the guidance of a fauna spotter-catcher, ensuring that impacts from clearing are minimised. Further an approved Fauna Management Plan has been prepared for the site which details mitigation, management and monitoring actions proposed by the development.

When complete the Coomera Woods project will result in the removal of a relatively large infill area of koala habitat currently adjoining the Coomera Train Station and expanding Town Centre. This outcome has very much been created through long term planning and infrastructure programmes established by **GCCC** and predominantly complete or under construction projects which surround the periphery of the Coomera Woods site. These factors influence the Habitat Assessment Tool Score through the logical assignment of zero for Connectivity, Koala Threats and Recovery Value which in turn under the matrix of the assessment tool results in the site not being considered as Critical Habitat for the Koala. The area is considered to be already functionally lost in terms of providing any future value to the koala, which is a result largely driven by adjoining developments and infrastructure and the lack of linkage provided within proximity of the site. Despite this position koalas are historically and contemporarily known to the site and it retains healthy semi mature and mature koala feed trees known as primary and secondary species to for the Gold Coast region.

While under the Habitat Assessment Tool Assessment the site is not assessed as retaining Critical Habitat the need to carefully manage and resolve impacts through construction and development is important to ensure no significant impact on the species. Koala scats have been persistently located on the project site. A single koala was observed during site survey post the extensive translocation of animals from the site by **GCCC**. These issues were discussed with **DoE** at an official pre-lodgement meeting held in Canberra on the 2nd of June 2015. Specific concerns raised by the Department centred around the inability for works on site to flush or direct koalas to non-threatening environments through sequential and directional clearing.

A key component of resolving this issue as outlined by the Department was the management of the species immediately prior to the during the construction process, which in the first instance includes sequential vegetation clearing. An EPBC Fauna Management Plan drafted and completed in accordance with the 'Environmental Management Plan Guidelines' prepared by **DoE** in 2014 was discussed as a logical tool to assist in this process. The Department also noted that although "translocation" of animals was generally not supported in this instance was a method that warranted further exploration. Extensive State Government Applications and Permits are required to incorporate translocation in any fauna management methodology, however these permits have been held and implemented on the project site by the Local Government Authority as recently as 12 months ago.

This referral includes an EPBC Fauna Management Plan which incorporates an outline for fauna management and thresholds in which Translocation maybe considered and or implemented relative to the sequencing of clearing on-site and the finding of an animal during any pre-clearance surveys. The EPBC Fauna Management Plan is included as **Attachment D**.

3.1 (e) Listed migratory species

The EPBC Act Protected Matters Search Tool using a 2km radius of the site identified a number of migratory species as having potential to occur. **Table 8** provides a description of the habitat requirements of each of these species and assess their likelihood of occurrence:

Table 8: Likelihood of Occurrence Schedule (Migratory Species)

Migratory Marine Birds						
Species	**Common Name**	**Status**	**EPBC Code**	**Description of Community / Habitat**	**Likelihood of Occurrence**	**Site**
Apus pacificus	Fork-tailed Swift	Migratory	678	This species is almost exclusively aerial and mostly occur over inland palins but sometimes above foothills or in coastal areas.	Possible as a fly over species however no impact to this species is likely to occur. **Species is unlikely to occur.**	Not observed
Migratory Terrestrial Species						
Species	**Common Name**	**Status**	**EPBC Code**	**Description of Community / Habitat**	**Likelihood of Occurrence**	**Site**
Cuculus saturatus	Oriental Cuckoo, Horsfield's Cuckoo	Migratory	86651	The Oriental Cuckoo mainly inhabits forests, occurring in coniferous, deciduous and mixed forest. It feeds mainly on insects and their larvae, foraging for them in trees and bushes as well as on the ground. It is usually secretive and hard to see.	No suitable habitat was observed throughout the assessment area. **Species is unlikely to occur.**	Not observed
Hirundapus caudacutus	White-throated Needletail	Migratory	682	The White-throated needletail is almost exclusively aerial. This species has been recorded roosting in trees in forests and woodlands, both among dense foliage in the canopy or in hollows. The species breeds in wooded lowlands and sparsely vegetated hills, as well as mountains covered with coniferous forests.	Low potential to occur on site within roosting periods. **Species is unlikely to occur.**	Not observed

Merops ornatus	Rainbow Bee-eater	Migratory	670	The rainbow bee-eater occurs mainly in open forests and woodlands, shrublands, and in various cleared or semi-cleared habitats, including farmland and areas of human habitation.	Habitat available on site due to the presence of Eucalypts. Species was not recoded during field survey. **Species has potential to occur.**	Not observed
Monarcha melanopsis	Black-faced Monarch	Migratory	609	The Black-faced Monarch mainly occurs in rainforest ecosystems, including semi-deciduous vine thickets, complex notophyll vine forests, tropical (mesophyll) rainforest, subtropical (notophyll) rainforest, mesophyll (broadleaf) thicket/shrubland, warm temperate rainforest, dry (monsoon) rainforest and occasionally cool temperate rainforest.	No suitable habitat was observed throughout the assessment area. **Species is unlikely to occur.**	Not observed
Monarcha trivirgatus	Spectacled Monarch	Migratory	610	The Spectacled Monarchs natural habitats are subtropical or tropical moist lowland forests, subtropical or tropical mangrove forests, and subtropical or tropical moist montane forests. Its preference is for thick understorey areas.	No suitable habitat was observed throughout the assessment area. **Species is unlikely to occur.**	Not observed
Myiagra cyanoleuca	Satin Flycatcher	Migratory	612	Satin Flycatchers inhabit heavily vegetated gullies in eucalypt dominated forests and taller woodlands, and on migration occur in coastal forests, woodlands, mangroves and drier woodlands and open forests.	No suitable habitat was observed throughout the assessment area. **Species is unlikely to occur.**	Not observed
Rhipidura rufifrons	Rufous Fantail	Migratory	592	The Rufous fantail mainly inhabits wet sclerophyll forests, often in gullies dominated by Eucalypts such as Eucalyptus microcorys, Eucalyptus pilularis, Eucalyptus resiniferia and a number of other Eucalyptus species	Habitat available on site due to the presence of Eucalypts. Species was not recoded during field survey. **Species has potential to occur.**	Not observed

Migratory Wetland Species						
Species	**Common Name**	**Status**	**EPBC Code**	**Description of Community / Habitat**	**Likelihood of Occurrence**	**Site**
Ardea alba	Great Egret	Migratory	59541	The Great Egret has been recorded in a wide range of wetland habitats including inland and coastal, freshwater and slaine, permanent and ephemeral, open and vegetated, large and small, natural and artificial.	No suitable habitat was observed throughout the assessment area. **Species is unlikely to occur.**	Not observed
Ardea ibis	Cattle Eget	Migratory	59542	The Cattle egret occurs in tropical and temperate grasslands, wooded lands and terrestrial wetlands. It often forages away from water on low lying grasslands, improved pastures and croplands and is commonly found in cattle fields and other farm areas that contain livestock.	No suitable habitat was observed throughout the assessment area. **Species is unlikely to occur.**	Not observed
Gallinago hardwickii	Latham's Snipe	Migratory	863	Latham's Snipe occurs in permanent and ephemeral wetlands. They usually inhabit open, freshwater wetlands with low, dense vegetation.	No suitable habitat was observed throughout the assessment area. **Species is unlikely to occur.**	Not observed
Limosa lapponica	Bar-tailed Godwit	Migratory	844	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.	No suitable habitat was observed throughout the assessment area. **Species is unlikely to occur.**	Not observed
Pandion haliaetus	Osprey	Migratory	952	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.	No suitable habitat was observed throughout the assessment area. **Species is unlikely to occur.**	Not observed

Description

A search using the EPBC Act Protected Matters Search Tool with a 2 kilometre radius, identified 13 migratory species as having potential to occur on site (refer **Table 8**). Field surveys undertaken in 2004, 2008 and 2015 did not observe any of these listed migratory species on site. While the site was found to contain some habitat resources for the Rufous Fantail and Rainbow Bee-eater, the habitat was not considered to represent an important area of habitat for migratory species. This is because the site does not contain marine and riparian systems such as shorelines, mudflats and sandflats and deep water.

Nature and extent of likely impact

Address any impacts on the members of any listed migratory species, or their habitat.

The proposed action is not considered to have a significant impact on migratory species given the lack of important habitats on site and surrounding urban development.

3.1 (f) Commonwealth marine area

(If the action is in the Commonwealth marine area, complete 3.2(c) instead. This section is for actions taken outside the Commonwealth marine area that may have impacts on that area.)

Description

Not applicable. The site is not located within close proximity to a Commonwealth Marine Area.

Nature and extent of likely impact

Address any impacts on any part of the environment in the Commonwealth marine area.

Not applicable.

3.1 (g) Commonwealth land

(If the action is on Commonwealth land, complete 3.2(d) instead. This section is for actions taken outside Commonwealth land that may have impacts on that land.)

Description

If the action will affect Commonwealth land also describe the more general environment. The Policy Statement titled *Significant Impact Guidelines 1.2 - Actions on, or impacting upon, Commonwealth land, and actions by Commonwealth agencies* provides further details on the type of information needed. If applicable, identify any potential impacts from actions taken outside the Australian jurisdiction on the environment in a Commonwealth Heritage Place overseas.

Not applicable.

Nature and extent of likely impact

Address any impacts on any part of the environment in the Commonwealth land. Your assessment of impacts should refer to the *Significant Impact Guidelines 1.2 - Actions on, or impacting upon, Commonwealth land, and actions by Commonwealth agencies* and specifically address impacts on:

- ecosystems and their constituent parts, including people and communities;
- natural and physical resources;
- the qualities and characteristics of locations, places and areas;
- the heritage values of places; and
- the social, economic and cultural aspects of the above things.

Not applicable.

3.1 (h) The Great Barrier Reef Marine Park

Description

Not applicable. The site is not located in or within close proximity to the Great Barrier Reef Marine Park.

Nature and extent of likely impact

Address any impacts on any part of the environment of the Great Barrier Reef Marine Park.

Not applicable.

Note: If your action occurs in the Great Barrier Reef Marine Park you may also require permission under the *Great Barrier Reef Marine Park Act 1975* (GBRMP Act). If so, section 37AB of the GBRMP Act provides that your referral under the EPBC Act is deemed to be an application under the GBRMP Act and Regulations for necessary permissions and a single integrated process will generally apply. Further information is available at www.gbrmpa.gov.au

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3.1 (i) A water resource, in relation to coal seam gas development and large coal mining development

Description

If the action is a coal seam gas development or large coal mining development that has, or is likely to have, a significant impact on water resources, the draft *Policy Statement Significant Impact Guidelines: Coal seam gas and large coal mining developments—Impacts on water resources* provides further details on the type of information needed.

Not applicable.

Nature and extent of likely impact

Address any impacts on water resources. Your assessment of impacts should refer to the draft *Significant Impact Guidelines: Coal seam gas and large coal mining developments—Impacts on water resources*.

Not applicable.

3.2 Nuclear actions, actions taken by the Commonwealth (or Commonwealth agency), actions taken in a Commonwealth marine area, actions taken on Commonwealth land, or actions taken in the Great Barrier Reef Marine Park

You must describe the nature and extent of likely impacts (both direct & indirect) on the whole environment if your project:

- is a nuclear action;
- will be taken by the Commonwealth or a Commonwealth agency;
- will be taken in a Commonwealth marine area;
- will be taken on Commonwealth land; or
- will be taken in the Great Barrier Reef marine Park.

Your assessment of impacts should refer to the *Significant Impact Guidelines 1.2 - Actions on, or impacting upon, Commonwealth land, and actions by Commonwealth agencies* and specifically address impacts on:

- ecosystems and their constituent parts, including people and communities;
- natural and physical resources;
- the qualities and characteristics of locations, places and areas;
- the heritage values of places; and
- the social, economic and cultural aspects of the above things.

3.2 (a)	**Is the proposed action a nuclear action?**	**X**	**No**
			Yes (provide details below)
	If yes, nature & extent of likely impact on the whole environment		

3.2 (b)	**Is the proposed action to be taken by the Commonwealth or a Commonwealth agency?**	**X**	**No**
			Yes (provide details below)

	If yes, nature & extent of likely impact on the whole environment		
3.2 (c)	**Is the proposed action to be taken in a Commonwealth marine area?**	**X**	**No**
			Yes (provide details below)
	If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(f))		
3.2 (d)	**Is the proposed action to be taken on Commonwealth land?**	**X**	**No**
			Yes (provide details below)
	If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(g))		
3.2 (e)	**Is the proposed action to be taken in the Great Barrier Reef Marine Park?**	**X**	**No**
			Yes (provide details below)
	If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(h))		

3.3 Other important features of the environment

Provide a description of the project area and the affected area, including information about the following features (where relevant to the project area and/or affected area, and to the extent not otherwise addressed above). If at Section 2.3 you identified any alternative locations, time frames or activities for your proposed action, you must complete each of the details below (where relevant) for each alternative identified.

3.3 (a) Flora and fauna

Numerous ecological surveys have been carried out over the site including ecological field assessment by **Plannit Consulting** in 2003-2004 and again in 2008, as well as various studies for Koala undertaken by **Biolink** on behalf of **GCCC** as part of the East Coomera Koala Conservation Project. Contemporary survey to identify existing ecological values at the site, was undertaken by **SHG** ecologists over four (4) days between the 15 and18 April 2015. The survey effort is shown on **Plan 3**. The survey was carried out to address all MNES, however, a focus was placed on Koalas as they are known to occur in the region and on the site. The following provides a brief description of flora and fauna values found on site based on historical and contemporary field surveys:

Flora

Queensland's Regulated Vegetation Management Map shows the site contains areas of Category B Remnant Vegetation (refer **Figure**

4). The Vegetation Management Support Map identifies this remnant vegetation as being made up the following regional ecosystems:

- RE 12.3.11 (Of Concern)
    - *Eucalyptus tereticornis* +/- *E. siderophloia* and *Corymbia intermedia* open forest to woodland. *Corymbia tessellaris, Lophostemon suaveolens* and *Melaleuca quinquenervia* frequently occur and often form a low tree layer. Other species present in scattered patches or low densities include *Angophora leiocarpa, E. exserta, E. grandis, C. trachyphloia, C. citriodora subsp. variegata, E. latisinensis, E. tindaliae, E. racemosa* and *Melaleuca sieberi. E. seeana* may be present south of Landsborough and *Livistona decora* may occur in scattered patches or low densities in the Glenbar SF and Wongi SF areas. Occurs on Quaternary alluvial plains and drainage lines along coastal lowlands. Rainfall usually exceeds 1000mm/y. (BVG1M: 16c).

- RE12.11.5 (Least Concern)
    - Open forest complex in which spotted gum is a relatively common species. Canopy trees include *Corymbia citriodora subsp. variegata, Eucalyptus siderophloia* or *E. crebra* (sub coastal ranges), *E. major* and/or *E. longirostrata* and *E. acmenoides or E. portuensis* and/or *E. carnea* and/or *E. eugenioides*.

Other species that may be present and abundant locally include *Corymbia henryi, C. intermedia, C. trachyphloia, Eucalyptus tereticornis, E. propinqua, E. biturbinata, E. moluccana, E. melliodora, E. fibrosa subsp. fibrosa* and *Angophora leiocarpa. Lophostemon confertus* often present in gullies and as a sub-canopy or understorey tree. Mixed understorey of grasses, shrubs and ferns. Occurs on hills and ranges of Palaeozoic and older moderately to strongly deformed and metamorphosed sediments and interbedded volcanics. (BVG1M: 10b)

- RE12.11.5 is an essential habitat factor for Koala.

Under Queensland's State Planning Policy (SPP), the site has been identified as containing the following Matters of State Environmental Significance:

- Wildlife Habitat (Koala)
- Regulated Vegetation
- Regulated Vegetation Intersecting a Watercourse

The following general flora observations were recorded throughout field survey across the proposed development site:

- Twelve (12) threatened plants and two (2) listed Threatened Ecological Community (TEC) described as *Lowland Rainforest of Subtropical Australia* and *Subtropical and Temperate Coastal Saltmarsh* were considered to have potential to occur on-site (i.e. within in 2km radius). None of these protected matters were recorded on or in vicinity to the site due disturbances and nature of site in the broader area (refer **Table 2**).

- Twenty-two (22) listed threatened plants protected under the *Nature Conservation Act 1992* (Qld) (NCA) were considered to have potential to occur across the site (i.e. within a 10km radius). No specimens were recorded at the time of assessment.

- Fifty-nine (59) flora species were identified on site throughout the field assessment, with sixteen (16) of these species being introduced. Four (4) of these introduced species are considered Class2 and Class 3 weed species under the *Land Protection (Pest and Stock Route Management) Act 2002*, and six (6) are considered environmental weeds within the Gold Coast Region.

- The site is dominated by Eucalypt Woodland/Open Forest associated located on minor alluvial deposit, or on metamorphosed sedimentary rocks associated with the Neranleigh-Fernvale formation beds. The understory across the majority of the site has been routinely slashed and typically was dominated by regenerating eucalypts, native shrubs and grasses.

- Across the majority of the site, canopy trees varied from 20-30m in height and were generally widely spaced with an average of about 20m between tree stems. The crown cover varied from about 50-70% with proportions of the higher areas in the northern and southern parts of the site being cleared of canopy trees altogether. The major gully, which is mapped as 'non-remnant' vegetation, exhibited a higher crown cover due to higher percentage of younger aged regrowth reflective of RE12.3.11. This area is contained within the planned 100m wide corridor to be retained and rehabilitated as part of the development.

As discussed, the majority of the site is mapped as remnant vegetation (refer **Figure 4**) consisting of Least Concern RE12.11.5 (*Corymbia citriodora* subsp. *variegata*, *Eucalyptus siderophloia*, *E. major* open forest on metamorphics +/- interbedded volcanics) and Of Concern RE12.3.11 (*Eucalyptus tereticornis* +/- *Eucalyptus siderophloia*, *Corymbia intermedia* open forest on alluvial plains usually near coast). RE 12.3.11 is associated with three small areas of the main drainage lines, whereas RE 12.11.5 covers the balance of the remnant vegetation mapping. Areas not identified as remnant occur in the northern portions of the site, adjacent to the railway line and in cleared areas in the centre. It is considered by **Planit Consulting** (2008) that some additional areas of the site (mostly within locations recently cleared as a result of sewer installation and machinery tracks) are currently mapped as remnant however do not contain vegetation with height and spread requirements to meet the remnant definition. Contemporary field assessment by **SHG** (2015) confirmed the presence of mapped RE12.11.5 and RE12.3.11, however noted that primarily only canopy species were present.

Overall, the site has been categorised into three broad vegetation communities (refer to **Plan 3**). Brief descriptions of these identified communities is presented below:

Forest Red Gum/Ironbark/Bloodwood Association – Broad Gullies and Drainage Lines

- This community is best described as Forest Red Gum/Ironbark/Bloodwood Association [non-remnant and RE12.3.11] and is present within broad drainage areas are associated with the lower areas at the base of a number of ridgelines. *Eucalyptus tereticornis* (Forest Red Gum) were observed dominating the canopy layer throughout these areas, with sub-dominant canopy trees including *Corymbia intermedia* (Pink Bloodwood) and *Eucalyptus siderophloia* (Ironbark).

- This community is confined to the lowest proportions of the site and most noticeable within the planned 100m wide environmental corridor. Most areas exhibit an advanced stage of regrowth with some areas mapped as containing remnant RE12.3.11. Some small pockets are also present in the western areas adjacent the railway line.

- With the2015 field assessment by **Saunders Havill Group** following significant rainfall periods, pools of water and were observed within the drainage areas, and it is in these areas that stands of regrowth *Melaleuca* dominated. The drainage lines were not observed to contain aquatic flora.

- Existing canopy vegetation includes predominately stems of *Eucalyptus tereticornis, E. siderophloia* and *Corymbia intermedia* within the lower flowpath and *E. tindaliae, E. resinifera, E. propinqua, E. carnea, C. citriodora, Angophora leiocarpa, E. fibrosa and E. acmenoides* on the gully banks. Common elements of the small tree (T2) layer include *Lophostemon suaveolens, Melaleuca quinquenervia, Allocasuarina littoralis, Acacia spp., Alphitonia exclesa* and *Callistemon salignus.*

- Additional natives of the lower layers include (but are not limited to) regenerating eucalypts, melaleuca, acacia and swamp box (dense layer to 2.5-3m) with native grasses and ground covers present including *Imperata cylindrica, Themeda triandra*, *Goodenia rotundifolia, Cymbopogon refractus, Lobelia purpurascens*, *Lomandra longifolia, L, multiflora, Xanthorrhoea johnsonii, Pteridium esculentum*, *Dianella caerulea*, *Baumea articulata*, *Cyperus polystachyos*, *Juncus* spp., *Typha orientalis*, *Lepidosperma laterale, Peripleura hispidula, Pultenaea villosa, Desmodium rhytidopyllum, Laxmannia gracilis, Ozothamnus diosmifolius, Pimelea linifolia, Hibbertia diffusa, Lomatia silaifolia* and *Notelea ovata.*

Phtotos: Forest Red Gum/Ironbrak/Bloodwood within broad gully lines


Phtotos: Forest Red Gum/Ironbark/Bloodwood within broad gully lines

Tallowwood/White Mahogany/Grey Gum Association – Mid-slope Areas

- This community is best described as Broad Leaved White Mahogany/White Stringybark/Grey Gum Association [non-remnant and RE12.11.5a]_and was observed along mid-slope areas was a species mix containing *Eucalyptus acmenoides* (White Mahogany), *Eucalyptus microcorys* (Tallowwood), *Eucalyptus major and Eucalyptus propinqua* (Grey Gum) within the T1 and T2 layers.

- This community is dominant over the site and generally occupies the sloping areas on bony soil types. It intergrades with the Blue Gum/Ironbark associations on the lower alluvial deposits and Spotted Gum/Ironbark associations towards the ridges and higher slopes in the north. The lower layers have been cleared as elsewhere on the site.

- The canopy varies in composition but is mostly dominated by White Stringybark (*Eucalyptus tindaliae*) and Broadleaved White Mahogany (*E. carnea*) in association with varying sub-dominance of Ironbarks (*E. siderophloia* and *E. fibrosa*), Pink Bloodwood (*Corymbia intermedia*), Smoothbarked Apple (*Angophora leiocarpa*) and Grey Gum (*Eucalyptus propinqua*). In the moister parts and on the more sheltered slopes it includes some Tallowwood (*Eucalyptus microcorys*) and a greater proportion of Grey gum. The drier areas include some Spotted Gum and Brush Box (*Lophostemon confertus*) with Blue Gum sporadically occurring on the lower slopes.

- Scattered elements of a tree sub layer still occasionally exist (mostly adjacent to fence-lines and beneath large trees in areas that cannot easily be routinely slashed) which includes Black She-oak (*Allocasuarina littoralis*), Forest She-oak (*A. torulosa*), Wattles (*Acacia disparrima, A. leiocalyx, A. melanoxylon*), Red Ash (*Alphitonia excelsa*), White Bottlebrush (*Callistemon salignus*) and Swamp Box (*Lophostemon suavolens*) and immature eucalypts.

- The ground layer is generally covered by a sparse covering of grasses (*Imperata cylindrica, Cymbopogon refractus, Themeda triandra*) and other hardy groundcovers (*Lomandra spp, Dianella caerulea, Goodenia spp, Geitonoplesium cymosum, Thysanotus tuberosus, Laxmannia gracilis, Xanthorrhoea spp, Lepidosperma laterale etc*).


Photos: Mid-slope areas with dominance of Stringybarks

Spotted Gum/Ironbark Association – Ridgelines and Balance Areas

- This community is best described as Spotted Gum and Ironbark Association [non-remnant and RE12.11.5e] and consists of Lightly timbered ridgelines were identified in the central portion of these properties and were dominated by *Corymbia citriodora* (Spotted Gum), with other canopy species including *Eucalyptus siderophloia* (Northern Grey Ironbark), *Corymbia intermedia* (Pink Bloodwood), and *Eucalyptus acmenoides* (White Mahogany).

- This community is found on the highest hill tops in the northern and central parts of the site to the west of the Cunningham Drive road reserve. It intergrades with the Stringybark (Zone 2) Community on the adjacent slopes and contains elements of this association in the canopy. The diversity in the under storey is reduced through prior disturbances but mostly due to the ongoing maintenance slashing activities.

- The canopy is dominated by Spotted Gum (*Corymbia citriodora*) and Broad-leaved Ironbark (*Eucalyptus fibrosa*)/or Grey Ironbark (*E. siderophloia*) with White Stringybark (*E. tindaliae*), Broadleaved White Mahogany (*E. carnea*), Narrow-leaved Ironbark (*E crebra*), Smoothbarked Apple (*Angophora leiocarpa*), Pink Bloodwood (*Corymbia intermedia*) and Grey Gum (*Eucalyptus propinqua*) common.

- The lower strata are slashed although regenerating acacias and eucalypts occur with additional common native species such as *Themeda triandra, Lomandra multiflora, Dianella revoluta, Laxmannia gracilis, Jacksonia scoparia, Acacia disparrima, Pultenea villosa, Allocasuarina torulosa, Desmodium rhytidopyllum* and *Xanthorrhoea johnsoni* present.

- The site was found to be disturbed, particularly along ridgelines and in proximity to access tracks as a result of historical thinning illegal motor-cross and four wheel driving creating dirt tracks throughout the site, and the dumping of domestic waste in the more accessible areas across the site.

- Other sporadically occurring native species noted include: *Hovea acutifolia, Breynia oblongifolia, Babingtonia similis, Cassinia subtropica, Pultenea villosa, Ozthamnus diosmifolius, Pimelia linifolia, Hibbertia diffusa, Lomatia silaifolia, Notelea ovata, Phyllantus virgata, Glycine spp.* In many areas the lower strata have been reduced to exposed soil as a result of track formation, illegal recreational vehicle access or overgrazing.


Photos: Disturbance surrounding dirt tracks


Photos: Non-remnant areas on top of ridgelines, and vegetation dominated by Spotted Gum

Overall, the site was disturbed as result of historical land use including logging, slashing and grazing as well as the invasion of weeds as a result of the creation vehicle access tracks. It is noted:

- A history of disturbance due to fire, grazing, logging and slashing is evident across the site with the most heavily impacted areas reflective of 'non-remnant' vegetation.

- A number of weeds were identified throughout the site including four weeds declared under the *Land Protection (Pest and Stock Route Management) Act 2002* which were Groundsel (*Baccharis hamifolia*) – Class 2, Fireweed *(Senecio madagascariensis*) – Class 2, Camphor Laurel (*Cinnamonmum camphora*) – Class 3, and Lantana (*Lantana camara*) – Class 3 as well as six (6) environmental weeds within the Gold Coast Region.

Fauna

A fauna assessment was conducted by **SHG** (2015) in conjunction with the vegetation assessment over the application site and was designed to build on the knowledge of extensive surveys already completed by **Planit Consulting** and **Biolink**. The purpose of the survey was to identify habitat opportunities, observations of species presence and activity, and undertake targeted searches for actual usage by threatened and significant fauna species. It is noted that previous fauna assessment were also undertaken by **Planit Consulting** during November 2003 to May 2004 and again in February to March 2008 which reported results consistent with the 2015 survey. A summary of fauna observations based on historical and contemporary fauna survey has been provided below:

- Nineteen (19) threatened fauna listed under the provisions of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) are considered to have potential to occur within the vicinity of the application site (i.e. within a 2km radius). None of these protected matters were observed on or in the vicinity of the site (refer **Table 2**), with the exception of the observation of one (1) koala in the north-east portion of the site.

- Twenty-three (23) threatened fauna species listed under the *Nature Conservation Act 1992* (NCA) are considered to have potential to occur within the vicinity of the site (i.e. within a 10km radius). Again, none of these species, with the exception of the Koala, were considered likely to occur.

- The site's ability to support listed threatened fauna species which are generally highly sensitive, specialised and require particular habitat features is highly unlikely for the majority of the listed EPBC Act or NCA protected species.

- A number of common bird species were found to utilise the site as part of their broader home range, including the Noisy Miner, Rainbow Lorikeet, Torresian Crow, Magpies and Butcherbirds.

- Fauna cameras were deployed at two locations within drainage areas where it was considered likely that visitation for water would be high (see **Plan 3** for locations). The only fauna recorded were common bird species, including the Pale Headed Rosella (*Platycercus adscitus*) and Noisy Minor (*Manorina melanocephala*). See photos extracted from the videos below.

- A few small rocky areas were observed within the subject site close to the ridgelines contained little to no habitat value due to the absence of suitable overhangs, crevices or hollows.

- Limited habitat is available for ground dwelling fauna as a result of previous clearings, impediments to movement and ongoing slashing. Most areas contained reduced values with sparse cover of grasses and leaf litter. The highest structural diversity of the lower strata was restricted to the gully area which are not regularly slashed.

- Extensive areas of eucalypt forest/ woodland are available for typical dry sclerophyll species (particularly avifauna and koalas).

- High edge to ratio remnants increasing opportunity for transient, aggressive species on road frontages and within the open areas created through previous / ongoing clearing.

- Semi-permanent gully lines are considered potentially suitable for a variety of frogs, reptiles and avifauna.

- High seasonal forage values including nectar, seed, insects and foliage are available due to extensive areas of eucalypt forest / woodland. A very low abundance of suitable fruiting species for frugivores is present.

- Low numbers of suitable mature / post mature eucalypt species incorporating hollows are present within the site.

- Survey did not locate any large or unusual nests associated with migratory, rare birds or birds of prey on site.

- Debris and timber pikes provide potential habitat for species commonly associated with areas of human use or farming purposes (i.e. snakes, lizards, mice etc.).