

APA Transmission Pty Limited

# Southern Brown Bandicoot Targeted Survey Report

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## EXECUTIVE SUMMARY

APA Transmission Pty Limited, a wholly owned subsidiary of the APA Group (together referred to as APA) is proposing to construct and operate a 56.2 km in length high pressure gas pipeline which will connect AGL's proposed Gas Import Jetty at Crib Point to the Victorian Transmission System (VTS), east of Pakenham.

Monarc Environmental (Monarc) is providing ecological and environmental services to support the regulatory approval process for the CPP Pipeline on behalf of APA Transmission Pty Limited, including undertaking of targeted fauna surveys to inform State and Commonwealth Referral applications.

This report summarises the findings from targeted surveys for the Southern Brown Bandicoot undertaken between 1 March 2018 until the beginning of August 2018. Also included is an outline of the methods used to conduct surveys, description of the habitat characteristics of each survey site.

The overall aim of this survey was to determine if the Southern Brown Bandicoot was present or is likely to be present within or adjacent to the pipeline alignment. Presence would inform future management actions for the project in order to minimise or mitigate impacts on the Southern Brown Bandicoot. A total of 35 locations were selected for Southern Brown Bandicoot Targeted Surveys from Woolleys Road, Bittern (KP1.95) to McDonalds Drain Road, Pakenham South (KP49.0). The survey method followed the recommended method outlined by the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) survey guidelines (DoEE, 2018a).

A total of 134 camera survey weeks at 35 sites were used to detect the presence of Southern Brown Bandicoot within the Right of Way. The survey method followed the recommended approach outlined in the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) survey guidelines (DoEE, 2018). Of these 35 sites, bandicoots were positively recorded or assumed to be present at 16, or greater than 50% of the survey sites. This corresponds with the 8 positive recordings and the further 8 locations that have presumed presence due to recent records.

Southern Brown Bandicoots will be present along the alignment in the section where it intersects watercourses (eg Cardinia, Toomuc, and Deep Creeks) between the South Gippsland Highway (KP30.3) and the Princes Freeway (KP54.4).

Assessment of potential impacts to the Southern Brown Bandicoot and actions to mitigation those impacts are addressed in the Flora, Fauna and Impact Assessment report for this project, prepared by Monarc, and the Environmental Management Plan (EMP) and Operational EMP for the project being prepared by APA.



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# 1 Introduction

Monarc Environmental (Monarc) was commissioned to undertake targeted Southern Brown Bandicoot *Isoodon obesulus obesulus* surveys to support APA's legislative environmental approvals process. This survey and results report informs the environmental impact assessment provided in the Flora and Fauna Report for the Crib Point Pakenham Pipeline August 2018.

## 1.1 Project Overview

APA Transmission Pty Limited, a wholly owned subsidiary of the APA Group (together referred to as APA) is proposing to construct and operate a high pressure gas pipeline which will connect AGL's proposed Gas Import Jetty at Crib Point to the Victorian Transmission System (VTS), east of Pakenham.

Refer to the Flora and Fauna Assessment - Crib Point Pakenham Pipeline (Monarc 2018) for a full description of the project.

## 1.2 Purpose of this report

Monarc Environmental (Monarc) is providing ecological and environmental services to support the regulatory approval process for the CPP Pipeline on behalf of APA, including undertaking of targeted fauna surveys to inform State and Commonwealth Referral applications.

This report summarises the findings from targeted surveys of the Southern Brown Bandicoot undertaken during 2018. This report outlines the methodology used to conduct surveys, describes the habitat characteristics of each site surveys, and presents the results of the surveys in terms of species presence.

## 1.3 Study Area

The proposed pipeline is to be installed between Crib Point, approximately 63km south-south-east of Melbourne on Victoria's Mornington Peninsula and Pakenham, about 56km east-south-east of Melbourne. Refer to **Figure 1** for an overview of the pipeline alignment.

The total alignment will be approximately 56.2km in length, with a project corridor up to 30 metres in width. In environmentally sensitive areas, subject to the results of studies undertaken for the project, the project corridor may be reduced to avoid or minimise impacts to sensitive features.

The following is a brief description of the proposed route:

- From the Crib Point jetty, the route heads in a westward direction, crossing The Esplanade and entering private property (BP owned) where it turns north heading towards Woolleys Road. It then travels north-west, adjacent to Woolleys Road within the Esso/APA easement (PL11/46) before crossing Woolleys Road. It continues in a north-westerly direction through private property and entering Warringine Park at approximately KP3.25.
- The route travels in a north-westerly direction until approximately KP3.8 where it turns and heads directly north. It travels in this direction through the park for approximately 1.1km before turning westwards inside the park, along Reid Parade, before exiting Warringine Park, (KP 5.2). From here it turns northwards to follow the Frankston-Flinders Road service lane for approximately 900 metres. At this point it turns east into High St where it enters the Stony Point

rail easement for 500 metres before heading turning left into Cool Store Road at KP6.8. It then turns back into Frankston-Flinders Road to continue northwards for a further two kilometres on the eastern side of the road.

- The route crosses Graydens Road then heads northwards, then east through private land, crossing the Stony Point Rail line and Frankston-Flinders Road to the north of Hastings at approximately KP9.8 to travel in a north-easterly direction for the remainder of the route through to Pakenham.
- As it heads north-easterly, the route follows Esso's pipeline easement (PL27/35) from KP10.4, south of Denhams Road, Hastings to KP29.7 near the South Gippsland Highway. The route is directly adjacent to the Esso easement for this component and travels through private land parcels, crossing several major and minor road easements and key drainage lines connected to the Western Port Ramsar Wetland.
- From the South Gippsland Highway, the route branches away from the Esso easement, travelling north-easterly through private land parcels, major and minor road easements and drainage lines before crossing the Princes Freeway and Princes Highway to meet PL75 within private land.

## 1.4 Scope of Works

The scope of works comprised the following:

- A desktop assessment of previous Southern Brown Bandicoots in close proximity to the alignment,
- Identification of suitable habitat for Southern Brown Bandicoot along the alignment,
- Camera Trapping at suitable Southern Brown Bandicoot locations along the alignment.
- A report indicating the results of the habitat identification and camera trapping.

## 1.5 Limitations

Refer to the Flora and Fauna Assessment - Crib Point Pakenham Pipeline (Monarc 2018) for a discussion of limitations associated with all flora and fauna assessments undertaken for the project by Monarc.

## 2 Background

### 2.1 Species Status

The Southern Brown Bandicoot is listed as Endangered under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Within Victoria, the species is Listed as Threatened under the *Flora and Fauna Guarantee Act 1989* (FFG Act) and Near Threatened under the Victorian Department of Environment, Land, Water and Planning (DELWP) '*Advisory List of Threatened Vertebrate Fauna in Victoria*' (DSE, 2013).

Actions (projects) that may have a significant impact on EPBC-listed species or their habitat may require a Referral to the Minister of the Commonwealth Department of Environment and Energy (DoEE, 2018). The Minister bases their decision as to whether approval is necessary and if so, the type of assessment required on the Referral (DoEE, 2018).

### 2.2 Species Characteristics

The Southern Brown Bandicoot is between 280-360mm in length with a 90-145mm tail and they weigh between 500-1850 grams. They have a grizzled pelage of black spiny bristle hairs and soft dark grey hairs that appear brown from a distance. Inner limbs and ventral surface are a yellowish-grey. The tail is short and often mutilated, or missing, from intraspecific fighting (Brown and Main, 2010).

### 2.3 Habitat preferences

Habitat is variable ranging from intact native vegetation to highly disturbed patches in agricultural or semi-urban areas, where weeds dominate the vegetation. Southern Brown Bandicoots are usually associated with coastal or near-coastal heathlands and healthy woodlands over sandy soil, however, they are also found in lowland forests with a healthy understorey or a dense cover of tussock grasses or rushes and bracken. It prefers sandy soil with scrubby vegetation and is nocturnal and prefers to stay close to cover when in search of food. They feed on earthworms, other invertebrates, fungi and plant material. The critical habitat feature appears to be the dense cover of low growing vegetation (as summarised by Brown and Main, 2010).

### 2.4 Species distribution

The Southern Brown Bandicoot exists in variable numbers throughout the south-eastern states of Australia including NSW, Victoria and South Australia with Victoria appearing to hold the most significant population. The species predominately exist along coastal fringes throughout all three states, however; several populations exist in inland ranges (Brown and Main, 2010).

The Southern Brown Bandicoot follows a similar distribution pattern in Victorian with five major groups or loose sub-populations centered around Portland - Mt Gambier, Grampians National Park, Otway Ranges, South-central (Port Phillip - Western Port - Wilson's Promontory) and East Gippsland (Brown and Main, 2010).

It is noted that studies into the home range of the Southern Brown Bandicoot is limited, however, it is suggested that the species has a home range of between 0.5 - 10 Ha and can disperse up to 2.5 km (as summarised by Brown and Main, 2010). With a gestation period of fewer than 15 days and lactation

period of approximately 60 days, the species has a potentially high reproductive output (Menkhorst and Seebeck, 1995) and may be able to recolonise areas if the habitat is suitable and predators are controlled.

## 3 Methods

### 3.1 Desktop Assessment

A desktop review was undertaken to ascertain the potential presence of the Southern Brown Bandicoot along the alignment based on known records in the area.

The south-central region of Victoria that includes Port Phillip Bay and Western Port area has been extensively surveyed for the Southern Brown Bandicoot (Brown and Main, 2010). Surveys undertaken in this region indicate that historical records of the Southern Brown Bandicoot coincide with remnant patches of the Heath and Heathy Woodland Broad Vegetation Type (MPWPBRF, 2008). Remnants of this vegetation type which have historical recordings of the Southern Brown Bandicoot that occur on the Mornington Peninsula include; Langwarrin Flora and Fauna Reserve, The Pines Flora and Fauna Reserve, Yaringa and the Royal Botanic Gardens at Cranbourne (MPWPBRF, 2008). In contrast, Brown and Main (2010) suggest that it is vegetation structure that is an important contributor to Southern Brown Bandicoot habitat.

Past studies have identified sites of Southern Brown Bandicoot habitat that are traversed or adjacent to the pipeline alignment (Ecology Australia, 2009). These sites are Cardinia Creek, Toomuc Creek/Lower Gum Scrub Creek, Hagelthorns Drain (south of Soldiers Rd) and Healesville-Koo Wee Rup Road.

The majority of the pipeline alignment falls with the Southern Brown Bandicoot Management Area as defined in the Sub-Regional Species Strategy for the Southern Brown Bandicoot (DEPI, 2014). The Southern Brown Bandicoot occurs between KPs 15 - 28 and 35.5 - 52.5 approximately. The remaining areas between KP0 and KP 52.5 are situated in areas identified for the possible extension of the Southern Brown Bandicoot. Within this region, most records for the species occur between the northern sections of the Mornington Peninsula and Western Port Bay with a concentration between Frankston and Tooradin. Most records in the sub-region are associated with either patches of remnant vegetation, road reserves, rail lines, drainage lines or watercourses (DEPI, 2014). The pipeline alignment intersects or is adjacent to many of these potential habitat features.

There is ongoing research on Southern Brown Bandicoot within the Southern Brown Bandicoot, including at least one Ph.D. thesis (Maclagan pers comm). In addition to this research, monitoring for the Victorian Desalination Project has also occurred. This monitoring indicated the persistence of Southern Brown Bandicoots at Wenn Drain (Deep Creek) at Ballarto Road, Cardinia, three years post pipeline construction (AECOM, 2015).

A search of the Victorian Biodiversity Atlas (DELWP, 2018) for existing records of species occurring within the general vicinity of the proposed pipeline corridor resulted in more than 150 records of the Southern Brown Bandicoot since 1963, of which 119 records are from within the last 15 years.

Information from the databases and aerial imagery were compiled to obtain a preliminary list of locations that may provide suitable Southern Brown Bandicoot habitat to be surveyed within the vicinity of the proposed pipeline corridor. Following the desktop assessment, on-ground habitat assessments were undertaken to confirm habitat suitability. A total of 35 locations were identified and surveyed.

## 3.2 Targeted Surveys

Targeted surveys for Southern Brown Bandicoot were undertaken by experienced field zoologists and ecologists from Monarc between March and August 2018. A total of 134 camera survey weeks have currently been completed and over 37 000 images reviewed. A summary of fauna survey effort is provided in **Table 2**, along with pre-survey rainfall data.

Surveys were conducted in accordance with the Commonwealth's EPBC Act guidelines for surveying threatened mammals (DSEWPaC, 2011) but also meet the recommended approach for camera trapping outlined in the SPRAT advice for Southern Brown Bandicoots (DoEE, 2018a):

- daytime searches for potentially suitable habitat, such as areas with a dense understorey and thick ground-cover,
- daytime searches for signs of activity, including tracks, scats, nests and diggings,
- baited camera traps using one camera per 5 ha in affected areas greater than 30ha (DoEE, 2018a). Autumn is preferred but can be year-round if validated with supporting evidence\*. A minimum of two surveys, each of 14-day duration, should be conducted, timed at least one month apart and at least one undertaken following significant rainfall,
- community liaison to detect the location of additional populations of the species.

\*Supporting evidence, in this case, was the actual presence of Southern Brown Bandicoots present during the surveys. With this evidence in hand, the surveys continued into August 2018.

Based on the approximate area of the pipeline Right of Way (ROW), which is larger than the actual construction footprint for the the project, the DoEE (2018a) recommended survey effort would be 33 cameras (1 per 5ha) with 924 survey days or 132 survey weeks. The survey effort presented in this report equates to 35 cameras and 134 survey weeks.

Based on the habitat assessments and discussions with landowners, camera surveys sites were chosen where there were signs of bandicoot activity such as the characteristic conical holes in the ground, suitable habitat including indigenous and non-indigenous vegetation (*Phalaris* sp, Blackberry *Rubus fruticosus* agg and Hawthorn *Crataegus monogyna*) and local landowner sightings.

Combinations of Little Acorn and UOVision infra-red motion cameras were deployed for the surveys. These cameras were set up approximately 50cm above ground level on a tree, fence post or star post. The cameras were set to take a burst of three images, with a 10-second interval between bursts, normal sensitivity and operating 24 hours a day.

The "bait" used was a mixture of peanut butter, vegetable oil, golden syrup and small amounts of vanilla essence and pistachio essence. Absorbent cotton pads (used for chemical spills) cut to size were soaked in this mixture and then placed inside enclosed PVC tubes. These tubes were pegged to the ground approximately 2 metres in front of the camera and left in place for a minimum of 14 days.

The same methodology was applied for the second camera trapping survey one month later. Only those sites that didn't record bandicoots, or the photos were inconclusive during the first round of surveys were set up for a second survey effort.

## 4 Results

A total of 35 locations were selected for Southern Brown Bandicoot Targeted Surveys based on desktop research, a review of aerial imagery and on-ground assessments for suitable habitat. Figures 2A and 2B show the location of the survey sites in reference to the pipeline alignment.

Positive sightings of Southern Brown Bandicoots were recorded at eight survey sites along the alignment. These sightings were at roadsides and watercourses (eg Cardinia, Toomuc, and Deep Creeks) between South Gippsland Highway (KP30.3) and the Princes Freeway (KP54.4) (See Table 1 and Figures 2A and 2B).

The Southern Brown Bandicoot is also assumed to occur at eight additional sites based on proximity to known populations or records from the targeted surveys. Of these eight sites, five were subject to targeted surveys, as indicated in Table 1, and three sites were not subject to targeted survey, as follows:

- CPT107 - Adjacent to Toomuc Creek
- CPT113 -Parallel to Hagelthornes Drain
- McDonalds Drain Road, north from Pakenham Creek
- Bald Hills Road
- Properties adjacent to Gippsland Rail Line, to Oaklands Drive.

### 4.1 Habitat Descriptions

Based on the desktop assessment, review of available research and personal knowledge of this species and their habitat use, the 35 chosen sites ranged from remnant native vegetation with various degrees of weediness to areas infested with weeds such as Blackberry, Phalaris, and Hawthorn. A brief description of the habitat at each survey location along with KP and can be found in Table 1.

**Table 1. Southern Brown Bandicoot Targeted Survey Locations**

| Easement Number | KP   | Location                                | Brief Description                            | Presence |
|-----------------|------|---|--|----------|
| CPT009 (1)      | 1.95 | Woolleys Rd (Jacks Beach Pastoral)      | Planted Melaleucas with Kikuyu understorey   |          |
| CPT009 (2)      | 2.25 | Jacks Beach Pastoral                    | Heathy Woodland on edge of the paddock       |          |
| CPT012 (1)      | 3.2  | Warringine Park #4                      | Swamp Scrub with a grassy understorey        |          |
| CPT012 (2)      | 3.9  | Warringine Park #3                      | Swamp Scrub mosaic with a grassy understorey |          |
| CPT014 (1)      | 4.1  | Warringine Park #2                      | Swamp Scrub                                  |          |
| CPT014 (2)      | 4.25 | Warringine Park #1                      | Swamp Scrub                                  |          |
| CPT025          | 9.8  | 1750 Frankston-Flinders Rd              | A large patch of Gorse                       |          |
| CPT040a         | 14   | Bluescope Steel (alternative alignment) | Swamp Scrub (drainage line)                  |          |
| CPT045 (1)      | 14.9 | BlueScope Steel                         | Heathy Woodland                              |          |

| Easement Number | KP                     | Location  | Brief Description  | Presence |
|-----------------|------------------------|---|--|----------|
| CPT045 (2)      | 15.1                   | BlueScope Steel   | Swampy Riparian Woodland   |          |
| CPT052 (1)      | 19.1                   | Watsons Creek #1<br>(Revision 5 alignment)  | Swamp Scrub / Coastal Saltmarsh ecotone with a thick understorey         |          |
| CPT052 (2)      | 19.1                   | Watsons Creek #2  | Heathy Woodland / Coastal Saltmarsh ecotone                              |          |
| Road reserve    | 20.25                  | South Boundary Rd<br>(adjacent to CPT056)   | Swamp Scrub  |          |
| Road reserve    | 25.1                   | Baxter-Tooradin Rd<br>(adjacent to CPT066)  | Swamp Scrub with grassy understorey beside the road                      |          |
| Road reserve    | 30.3                   | South Gippsland Highway / Lynes Rd<br>(adjacent to CPT076)                          | Swamp Scrub beside the highway   |          |
| CPT078          | 31                     | Western Outlet Drain<br>(Revision 5)  | A mixture of exotic and native grasses                                   |          |
| CPT085          | 33.4                   | Muddy Gates Drain   | A mixture of exotic and native grasses                                   | A        |
| Road reserve    | 33.4                   | Muddy Gates Lane<br>(adjacent to CPT086)  | Under a thick Cypress Hedge  | A        |
| CPT087          | 33.5                   | South Gippsland Railway Line<br>(inactive)  | A mixture of exotic and native grasses                                   | A        |
| CPT088          | 34.6                   | Adjacent to Manks Road  | Planted Vegetation along fenceline                                       | R        |
| CPT091          | 35.4                   | Adjacent to Tooradin Station Road   | Fallen pine tree in a heavily grassed roadside plantation                | R        |
| CPT097          | 37.1                   | Tooradin Inlet Drain  | Blackberries and Phalaris on top of drain bank                           | R        |
| CPT098          | 37.5                   | Adjacent to Ridgeways Drain   | Hawthorn hedge with blackberries   | A        |
| CPT101 (1)      | 38.6                   | West of Dalmore Rd (#1)   | Hawthorn and Phalaris along minor drainage line on the property boundary |          |
| CPT101 (2)      | 38.8                   | West of Dalmore Rd (#2)   | Hawthorn hedge along heavily-grassed road reserve                        |          |
| CPT106          | 40.0                   | Cardinia Creek<br>(Bloomfield Lane)   | Heavily planted creek embankment   | R        |
| CPT105          | 40.4,<br>40.8,<br>41.3 | Lower Scrub Gum Creek east of and adjacent to the construction footprint            | Heavily planted creek embankment   | R        |
| CPT108          | 41.6                   | Deep Creek  | The heavily grassed area adjacent to a watercourse                       | R        |
| CPT 111         | 43.0                   | Paddock drain (adjacent on the southern boundary of CPT111, south of Soldiers Road) | A narrow strip dense vegetation along a paddock drain.                   | R        |
| CPT118          | 46.25                  | Hagelthornes Drain  | Dense phalaris beside drain with Phragmites and blackberries             | A        |
| CPT120 (1)      | 46.3                   | East of Koo Wee Rup Rd (#1)   | Adjacent to Swamp Scrub in the road reserve                              | R        |
| CPT120 (2)      | 46.5                   | East of Koo Wee Rup Rd (#2)   | Adjacent the dense phalaris and Phragmites and outside of the ROW.       | A        |

| Easement Number | KP   | Location                                  | Brief Description                                       | Presence |
|-----------------|------|---|---|----------|
| CPT125          | 48.4 | Pakenham Creek                            | On levee bank of creek amongst gorse and swamp scrub    | A        |
| Road reserve    | 48.4 | McDonalds Drain Road (Adjacent to CPT126) | In road reserve amongst blackberries and outside of ROW | A        |

R - recorded

A - assumed present

The survey site descriptions are further discussed below. A photographic log of many of these sites is provided in Figure 3.

### CPT009 Woolleys Rd (Jacks Beach Pastoral) (1.95)

This camera site was in the planted vegetation immediately north of Woolleys Road, Crib Point. The vegetation consisted of large, drooping honey myrtles *Melaleuca armillaris* with a thick understorey of exotic grasses primarily Kikuyu *Pennisetum clandestinum*. Animal tunnels were observed through the understorey.

### CPT009 Jacks Beach Pastoral (KP2.25)

This remnant patch of vegetation belonged to EVC 793 Damp Heathy Woodland. It had an overstorey of eucalypts with a mixed shrub layer of wattles and Burgan. The ground cover consisted of native and exotic grasses with both large and small logs present throughout the patch. This remnant patch was only 20-30 away from the Jacks Beach Reserve providing suitable connectivity to large areas of native vegetation.

### CPT012 Warringine Park (Site #4) (KP3.2)

The most southerly of the four sites within Warringine Park was within EVC 53 Swamp Scrub with a thick grassy understorey comprising a mixture of native and exotic grasses. The melaleucas provided a canopy to approximately 3m. This area bordered more open grassy areas with matt-rushes and grasses providing cover for ground fauna.

### CPT012 Warringine Park (Site #3) (KP3.9)

This camera site was within regenerating vegetation over an existing pipeline. The vegetation consisted of a thick regrowth of wattles to approximately 3m with matt-rushes, goodenias and other ground cover species forming a dense understorey.

### CPT014 Warringine Park (Site#2) (KP4.1) and Warringine Park #1 (KP4.25)

These two sites were within a substantial area of mature Swamp Scrub. The ground at the time of surveys was dry, however, is subject to inundation during wet times. There were large amounts of ground cover vegetation, fallen branches and leaf litter at each of the sites providing ample foraging areas.

### CPT025 1750 Frankston-Flinders Rd, Tyabb (KP9.8)

This site was adjacent to the Stony Point rail corridor containing a mixture of native and exotic plant species. The actual camera site was set up at the edge of an extensive patch of Gorse *Ulex europaeus* which provided potential connectivity to the rail reserve and vegetation on adjoining private property.

### CPT 040a BlueScope Steel (alternative alignment) (KP14.0)

This site was on a proposed alternative alignment, running parallel with the existing ESSO pipeline easement (PL27 / 35). The area contained Swamp Scrub on a minor drainage line, adjacent to Heathy Woodland, with a relatively thick understorey, to the north and east.

### CPT 045 BlueScope Steel (KP14.9)

This camera site was set up in Heathy Woodland, again parallel to the same ESSO pipelines as above. The understorey was dense with a good cover of low shrubs and graminoids including matt-rushes providing suitable cover for ground mammals including bandicoots.

### CPT 045 BlueScope Steel (KP15.1)

The vegetation along this drainage line was a thick cover of grasses, rushes, and sedges providing good cover for ground fauna. The shrub layer consisted of mixed shrubs including melaleucas and wattles which created a dense cover in the vicinity of the camera survey site.

### CPT052 Watsons Creek #1 (Revision 5 alignment) (KP19.1)

This camera site, on the proposed Revision 5 alignment, was situated under Swamp Paperbark *Melaleuca ericifolia* in the ecotone between Swamp Scrub and Coastal Saltmarsh EVCs. The understorey consisted of native and exotic grasses and large areas of Blackberries providing potential habitat for bandicoots and other ground fauna.

### CPT052 Watsons Creek #2 (KP19.1)

This site, on the current alignment (Revision 7), was again in an ecotone, this time between Coastal Saltmarsh and Heathy Woodland. The nearby ground cover contained dense clumps of Spiny-headed Mat-rush, Bracken *Pteridium esculentum*, and low shrubs, grading out to the saltmarsh community.

### South Boundary Rd (adjacent to CPT056) (KP20.25)

This survey site was within Swamp Scrub EVC with a mixed understorey of native and exotic grasses, succulents and low shrubby vegetation. There were also dense areas of blackberry and Common Reed *Phragmites australis* nearby.

### Baxter-Tooradin Rd (adjacent to CPT066) (KP25.1)

This site contained a narrow strip of Swamp Scrub with a grassy understorey on the southern side of the Baxter-Tooradin Road reserve. The understorey grasses were namely Kikuyu *Pennisetum clandestinum* and veldt-grass *Ehrharta* sp.

### South Gippsland Highway / Lynes Rd (adjacent to CPT076) (KP30.3)

This Swamp Scrub site was at the corner of South Gippsland Highway and Lynes Road. Under the Swamp Scrub canopy, the understorey consisted of blackberries with some native and exotic graminoids.

#### **Western Outlet Drain (Revision 5 alignment) (KP31.0)**

This site was a mixture of exotic and native grasses growing on the levee bank beside the drain. The drain itself contained thick stands of Cumbungi *Typha* sp. and had varying water levels during the surveys.

#### **CPT085 Muddy Gates Drain (KP33.4)**

The habitat along Muddy Gates Drain is similar to other drains surveyed in that it is a mixture of native and exotic grasses, primarily Phalaris, blackberries and the occasional juvenile Swamp Paperbark, and some semi-aquatic vegetation growing up the levee bank from the drain.

#### **Muddy Gates Lane (adjacent to CPT086) (KP33.4)**

This camera site was under a mature Cypress hedge with grasses and blackberries underneath. This site is adjacent to the inactive South Gippsland Railway. The lower cypress branches along with the grasses and blackberries make for quite a dense understorey potentially suitable for bandicoots.

#### **CPT087 South Gippsland Railway Line (KP33.6)**

The area within the rail easement that the camera was set up consisted of a mixture of exotic and native grasses including Phalaris and Common Reed as well as juvenile Swamp Paperbark and blackberries, all contributing to a thick cover of vegetation.

#### **CPT088 Manks Road (KP34.6)**

The site along Manks Road consisted of planted trees and large shrubs along the fence line with a mixture of Common Reed, blackberries and grasses as the groundcover. There were also small amounts of fallen branches that helped add to the structural diversity of this site.

#### **CPT091 Tooradin Station Road (KP35.4)**

Based on discussions with the landowner about bandicoots in the local area, this camera site was set up beside a fallen pine tree in the heavily grassed roadside “plantation”. The fallen pine and the vegetation growing up through it provided structural cover for the bandicoots. This site was within the Revision 5 of the pipeline alignment.

#### **CPT097 Tooradin Inlet Drain (KP37.1)**

This survey site was set up on top of the drain embankment where a large patch of blackberries was growing. This area of blackberries was surrounded by Phalaris along the embankment and into the adjacent paddocks.

#### **CPT098 (Adjacent to) Ridgeways Drain (KP37.5)**

The camera site in this location was situated under a Hawthorn hedge with large areas of blackberries and adjacent to Ridgeways Drain. The drain has primarily exotic vegetation consisting of Phalaris and blackberries and another Hawthorn hedge immediately to the east.

#### CPT101 (west of) Dalmore Rd #1 (KP38.6)

This site was amongst low Hawthorn and thick Phalaris along a minor drainage line on the western property boundary.

#### CPT101 (west of) Dalmore Rd #2 (KP38.8)

This site was inside the property boundary and consisted of a Hawthorn hedge with the Dalmore Road reserve being heavily-grassed at the time, with large areas of blackberry north of the alignment. Just south of the alignment

#### CPT106 Cardinia Creek (Bloomfield Lane) (KP40.0)

These two sites were on the levee bank of Cardinia Creek, between the creek and a smaller drain to the west. The sites were amongst the heavily planted vegetation consisting of a variety of wattles, other native shrub and ground layer species, and patches of weeds like blackberries and pasture grasses.

#### CPT105 Lower Gum Scrub Creek (KP41.5)

This survey site was at the confluence of Lower Gum Scrub Creek and Toomuc Creek. It was heavily vegetated with a range of native species including Swamp Paperbark, Hop Goodenia *Goodenia ovata*, and Common Tussock-grass *Poa labillardieri*. Common Reed, blackberries and rushes *Juncus* sp. were also nearby, providing suitable habitat for bandicoots.

#### CPT108 Deep Creek (KP41.6)

The Deep Creek site was in a more open location near the creek. The dense vegetation consisted solely of graminoids including Common Reeds, pasture grasses like Phalaris and Cocksfoot *Dactylus glomerata* and rushes.

#### CPT111 South of Soldiers Rd (KP43.0)

The Soldiers Road survey site included a narrow strips of Swamp Scrub and shrubby weeds (Flax-leaved Broom *Genista linifolia*) in the drainage lines along the southern boundary of CPT 111, which is south of Soldiers Road.

#### CPT118 Hagelthornes Drain (KP46.25)

This site was beside Hagelthornes Drain, to the west of Koo Wee Rup Road. The camera was set just off of the edge of the drain amongst a dense area of Phalaris. Hagelthornes Drain contained substantial amounts of Phalaris and Common Reeds for a considerable length of the drain in this location, providing a suitable corridor for the movement of bandicoots in this area.

#### CPT120 East of Koo Wee Rup Rd #1 (KP46.3)

This site, just inside the boundary fence, was an open paddock, however, the Koo Wee Rup Road reserve consisted of Swamp Scrub closer to the road and Phalaris interspersed in a thick cover of blackberries closer to the fence.

### CPT120 East of Koo Wee Rup Rd #2 (adjacent to KP46.6)

The camera in this location was set up on a fence post looking into the same paddock as the previous site. On the other side of the property boundary was an undeveloped road reserve, with Common Reed and a mixture of pasture grasses forming a dense cover throughout.

### CPT125 Deep Creek (KP48.4)

The Deep Creek site was positioned up on the levee bank, rather than on the maintained creek line. The site consisted of a mixture of Swamp Scrub vegetation and exotic weeds like Gorse *Ulex europaeus*, blackberry, Spear Thistle *Cirsium vulgare* and pasture grasses.

### McDonalds Drain Road (Adjacent to CPT146) (KP49.0)

This final site was within the road reserve adjacent to CPT146. The site consisted of Swamp Gum *Eucalyptus ovata* overstorey with large areas of blackberries and pasture grasses forming thick cover to the road edge.

## 4.2 Incidental Species Recorded

A total of 33 fauna species were recorded from the 35 sites over the 134 weeks of camera surveys. These included three species of reptile, 18 species of bird including the threatened Lewin's Rail *Lewinia pectoralis pectoralis* and 12 species of mammal including the targeted Southern Brown Bandicoot (See Table 4).

## 5 Summary

A total of 134 camera survey weeks at 35 sites were used to detect the presence of Southern Brown Bandicoot along the alignment. The survey method followed the recommended approach outlined in the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) survey guidelines (DoEE, 2018). Of these 35 sites, bandicoots were positively recorded or assumed to be present at 16 sites. This corresponds with the 8 positive recordings and the further 8 locations that have presumed presence due to recent records.

Southern Brown Bandicoots will be present along the alignment in the section where it intersects watercourses (eg Cardinia, Toomuc, and Deep Creeks) between the South Gippsland Highway (KP30.3) and the Princes Freeway (KP54.4).

Assessment of potential impacts to the Southern Brown Bandicoot and actions to mitigation those impacts are addressed in the Flora, Fauna and Impact Assessment report for this project, prepared by Monarc, and the Construction Environmental Management Plan (CEMP) and Operational EMP for the project being prepared by APA Transmission Pty Limited.

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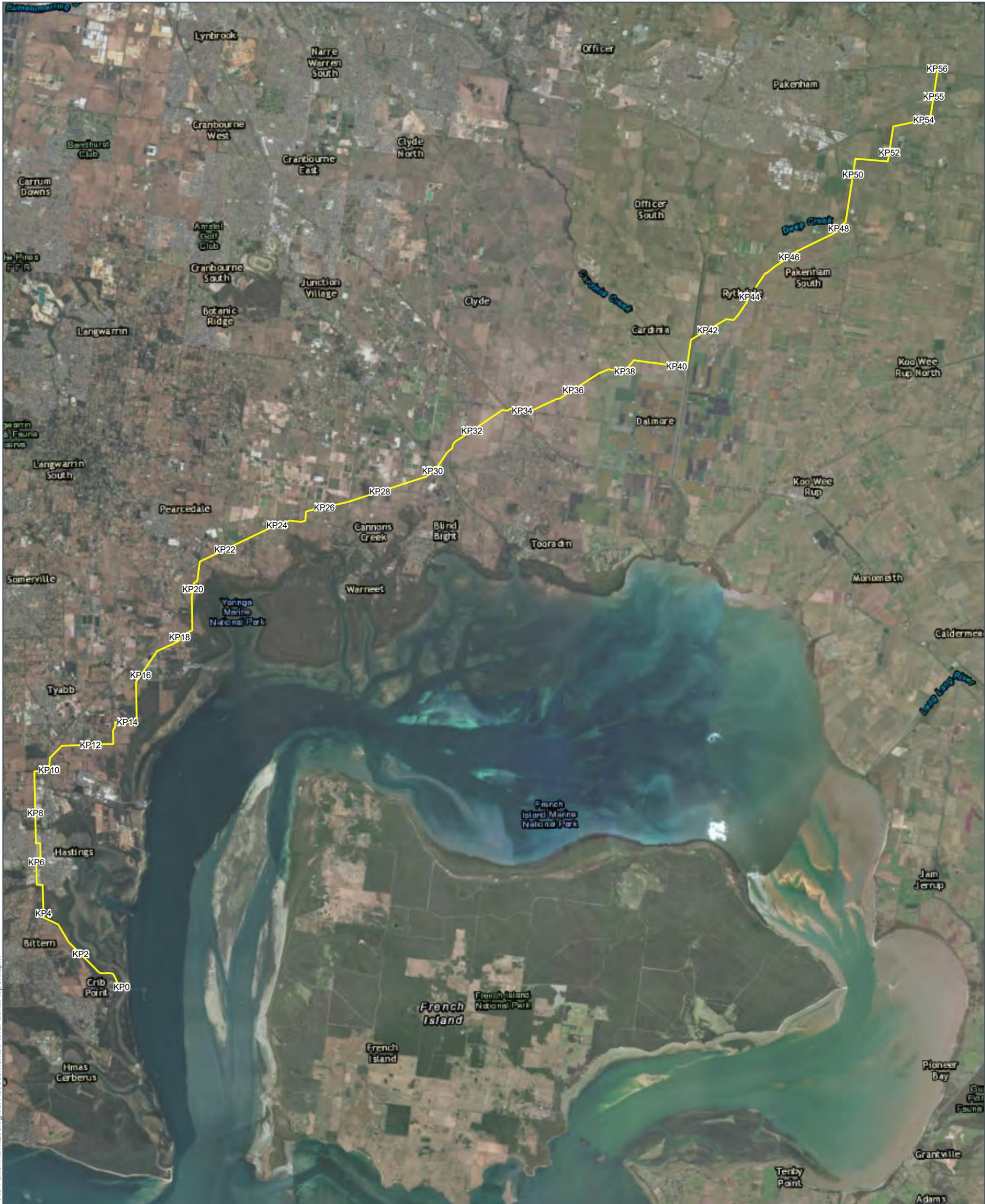
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## Figure 1: Overview of Pipeline Alignment



APA Transmission Pty Limited- 31-02984.00

**Crib Point Pakenham Pipeline Project**  
**Figure 1: Overview of Pipeline Alignment**

WORK REQUEST NUMBER: 31-02984.00

DATA SOURCES:  
 Service Layer Credits: Reference/World\_Boundaries\_and\_Places: Esri, HERE, Garmin  
 DeLorme World Basemap: Copyright:© 2018 Garmin  
 World\_Imagery: Earthstar Geographics, CNES/Airbus DS

LEGEND

— Pipeline Alignment

| ISSUE DATE | AUTHOR | QA CHECK | APPROVED | MAP REV. | REVISION NOTE     |
|------------|--------|----------|----------|----------|-------------------|
| 20/08/2018 | AB     | JH       | MV       | B        | Issued for Review |
| 09/07/2018 | KH     | JH       | CC       | A        | Issued for Review |

LOCATION DIAGRAM

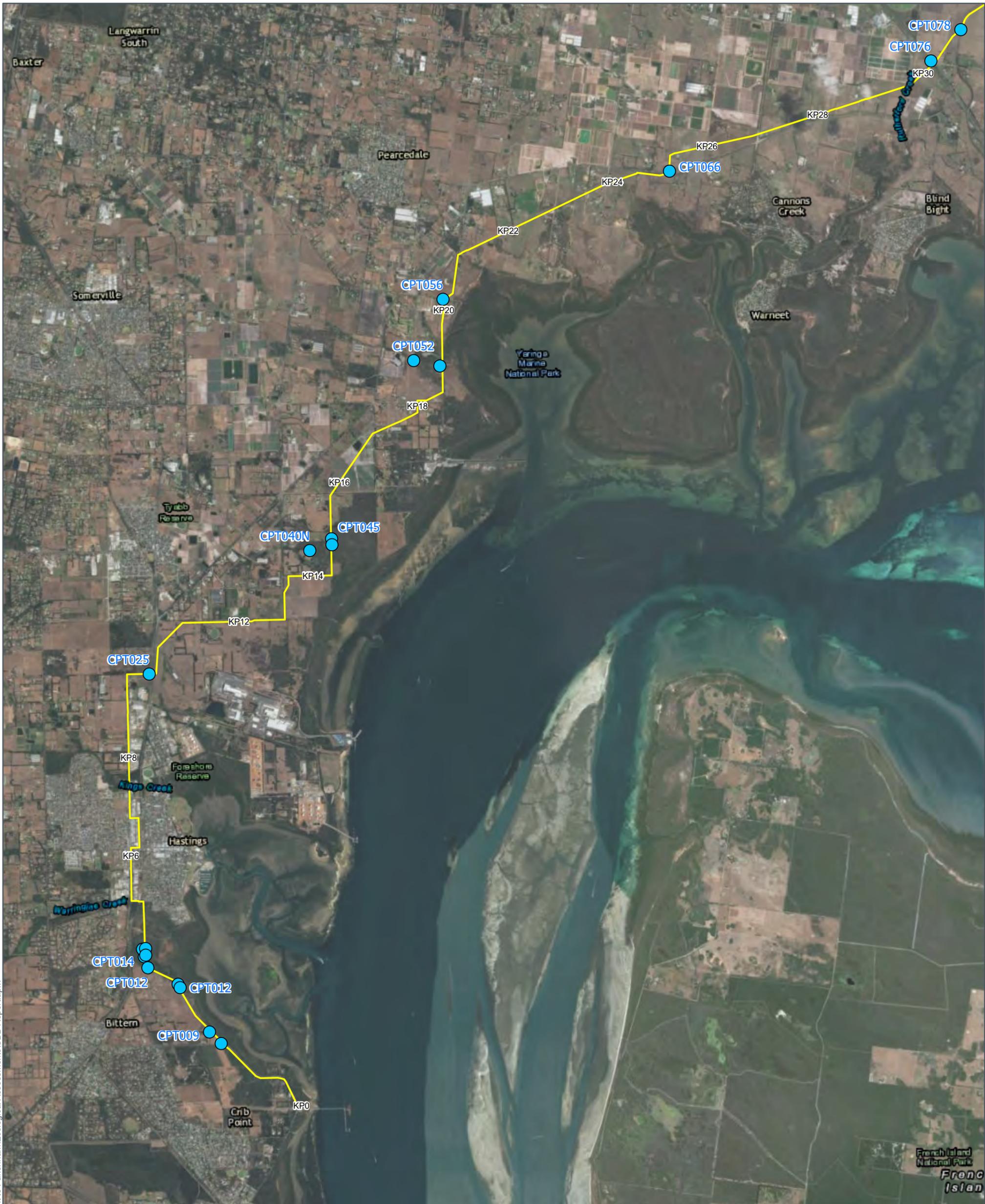
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 (A3) GDA 1994 MGA Zone 55

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## Figure 2A: Southern Brown Bandicoot Survey Location Map

KP0.0 - 30.0



APA Transmission Pty Limited - 31-02984.00 LEGEND LOCATION DIAGRAM

**Crib Point Pakenham Pipeline Project**  
**Figure 2A: Southern Brown Bandicoot**  
**Targeted Survey Locations**  
**- KP0 to KP30**

**Targeted Survey Locations**

- SBB present
- SBB absent
- Pipeline Alignment

WORK REQUEST NUMBER: 31-02984.00

DATA SOURCES:  
 Service Layer Credits: Reference/World\_Boundaries\_and\_Places: Esri, HERE, Garmin  
 DeLorme World Basemap: Copyright:© 2018 Garmin  
 World Imagery: Earthstar Geographics, CNES/Airbus DS

| ISSUE DATE | AUTHOR | QA CHECK | APPROVED | MAP REV. | REVISION NOTE     |
|------------|--------|----------|----------|----------|-------------------|
| 20/08/2018 | AB     | JH       | MV       | B        | Issued for Review |
| 13/07/2018 | KH     | JH       | CC       | A        | Issued for Review |

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**Figure 2B: Southern Brown Bandicoot Survey Location Map**  
**KP30.0 - 55.6**



APA Transmission Pty Limited- 31-02984.00

**Crib Point Pakenham Pipeline Project  
Figure 2B: Southern Brown Bandiooct  
Targeted Survey Locations  
- KP30 to KP55.6**

WORK REQUEST NUMBER: 31-02984.00

DATA SOURCES:  
Service Layer Credits: Reference/World\_Boundaries\_and\_Places: Esri, HERE, Garmin  
DeLorme World Basemap: Copyright:© 2018 Garmin  
World Imagery: Earthstar Geographics, CNES/Airbus DS

**LEGEND**

- Targeted Survey Locations
- SBB present
- SBB absent
- Pipeline Alignment

| ISSUE DATE | AUTHOR | QA CHECK | APPROVED | MAP REV. | REVISION NOTE     |
|------------|--------|----------|----------|----------|-------------------|
| 20/08/2018 | AB     | JH       | MV       | B        | Issued for Review |
| 30/07/2018 | KH     | JH       | CC       | A        | Issued for Review |

**LOCATION DIAGRAM**

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(A3) GDA 1994 MGA Zone 55

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### Figure 3: Photographic Log



Photo 1: Typical camera set-up (CPT118 - KP46.3)



Photo 2: CPT012 - Warringine Creek #4 (KP3.2)



Photo 3: CPT045 BlueScope Steel #2 (KP15.1)



Photo 4: CPT052 Watsons Creek #2 (KP19.1)



Photo 5: South Gippsland Highway (KP30.3)



Photo 6: CPT091 Adjacent to Muddy Gates Lane (KP35.4)



**Photo 7:** CPT097 Tooradin Inlet Drain (KP37.1)



**Photo 8:** CPT105 Cardinia Creek #1 (KP38.6)



**Photo 9:** CPT 120 East of Koo Wee Rup Road (KP46.3)



**Photo 10:** Southern Brown Bandicoot - CPT091 (KP35.4)



**Photo 11:** Southern Brown Bandicoot - CPT111 South of Soldiers Road (KP43.0)



**Photo 12:** Lewins Rail - CPT012- Warringine #3 (KP3.9)

Table 2: Southern Brown Bandicoot Survey Details - Rainfall, Start/Finish Dates, Survey Days and Number of Images

| Survey Location        | Survey 1 (S1)            |            |            |                |                  | Survey 2   |            |            |                |                  |
|------------------------|--------------------------|------------|------------|----------------|------------------|--|------------|------------|----------------|------------------|
|                        | Rainfall Previous 7 Days | Start      | Finish     | Number of Days | Number of Images | Rainfall Previous 7 Days   | Start      | Finish     | Number of Days | Number of Images |
| CPT009 (1)             | 23mm                     | 19/04/2018 | 3/05/2018  | 14             | 91               | 23mm   | 5/06/2018  | 19/06/2018 | 14             | 45               |
| CPT009 (2)             | 23mm                     | 19/04/2018 | 3/05/2018  | 14             | 114              | 23mm   | 5/06/2018  | 19/06/2018 | 14             | 63               |
| CPT012 (1)             | 1mm                      | 6/03/2018  | 20/03/2018 | 14             | 1266             | 15mm   | 19/04/2018 | 3/05/2018  | 14             | 24               |
| CPT012 (2)             | 1mm                      | 6/03/2018  | 20/03/2018 | 14             | 1391             | 15mm   | 19/04/2018 | 3/05/2018  | 14             | 549              |
| CPT014 (1)             | 1mm                      | 28/02/2018 | 21/03/2018 | 21             | 2192             | 15mm   | 19/04/2018 | 3/05/2018  | 14             | 121              |
| CPT014 (2)             | 1mm                      | 28/02/2018 | 21/03/2018 | 21             | 688              | 15mm   | 19/04/2018 | 3/05/2018  | 14             | 307              |
| CPT025                 | 15mm                     | 8/05/2018  | 23/05/2018 | 15             | 207              | 4mm  | 26/06/2018 | 11/07/2018 | 15             | 63               |
| CPT040a                | 23mm                     | 5/06/2018  | 19/06/2018 | 14             | 271              | 8mm  | 19/07/2018 | 2/08/2018  | 14             | 111              |
| CPT045 (1)             | 23mm                     | 5/06/2018  | 19/06/2018 | 14             | 363              | 8mm  | 19/07/2018 | 2/08/2018  | 14             | 367              |
| CPT045 (2)             | 23mm                     | 5/06/2018  | 19/06/2018 | 14             | 169              | 8mm  | 19/07/2018 | 2/08/2018  | 14             | 99               |
| CPT052 (R5) (1)        | 33mm                     | 16/05/2018 | 30/05/2018 | 14             | 123              | 8mm  | 3/07/2018  | 19/07/2018 | 16             | 229              |
| CPT052 (2)             | 33mm                     | 16/05/2018 | 30/05/2018 | 14             | 21               | 8mm  | 3/07/2018  | 19/07/2018 | 16             | 325              |
| South Boundary Rd East | 1mm                      | 1/03/2018  | 21/03/2018 | 20             | 1522             | 15mm   | 19/04/2018 | 3/05/2018  | 14             | 81               |
| Baxter-Tooradin Rd     | 15mm                     | 8/05/2018  | 23/05/2018 | 15             | 194              | 4mm  | 26/06/2018 | 11/07/2018 | 15             | 303              |
| South Gippsland H'way  | 23mm                     | 19/04/2018 | 3/05/2018  | 14             | 537              | 23mm   | 5/06/2018  | 19/06/2018 | 14             | 129              |
| CPT078                 | 24mm                     | 29/03/2018 | 17/04/2018 | 19             | 2657             | 33mm   | 16/05/2018 | 30/05/2018 | 14             | 49               |
| CPT085                 | 33mm                     | 16/05/2018 | 30/05/2018 | 14             | 219              | 8mm  | 19/07/2018 | 2/08/2018  | 14             | xx               |
| Muddy Gates Lane       | 15mm                     | 8/05/2018  | 23/05/2018 | 15             | 241              | 4mm  | 26/06/2018 | 11/07/2018 | 15             | 95               |
| CPT087                 | 23mm                     | 5/06/2018  | 19/06/2018 | 14             | 218              | 8mm  | 19/07/2018 | 2/08/2018  | 14             | 63               |
| CPT088                 | 15mm                     | 8/05/2018  | 23/05/2018 | 15             | 783              | Not Required (SOUTHERN BROWN BANDICOOT recorded during Survey 1) |            |            |                |                  |
| CPT091                 | 24mm                     | 29/03/2018 | 17/04/2018 | 19             | 1337             | Not Required (SOUTHERN BROWN BANDICOOT recorded during Survey 1) |            |            |                |                  |
| CPT097                 | 24mm                     | 29/03/2018 | 17/04/2018 | 19             | 4001             | Not Required (SOUTHERN BROWN BANDICOOT recorded during Survey 1) |            |            |                |                  |

| Survey Location               | Survey 1 (S1)            |            |            |                |                  | Survey 2   |            |            |                |                  |
|-------------------------------|--------------------------|------------|------------|----------------|------------------|--|------------|------------|----------------|------------------|
|                               | Rainfall Previous 7 Days | Start      | Finish     | Number of Days | Number of Images | Rainfall Previous 7 Days   | Start      | Finish     | Number of Days | Number of Images |
| CPT098                        | 15mm                     | 8/05/2018  | 23/05/2018 | 15             | 123              | 4mm  | 26/06/2018 | 19/07/2018 | 23             | 1892             |
| CPT101 (1)                    | 15mm                     | 8/05/2018  | 23/05/2018 | 15             | 495              | 4mm  | 26/06/2018 | 19/07/2018 | 23             | 3369             |
| CPT101 (2)                    | 15mm                     | 8/05/2018  | 23/05/2018 | 15             | 597              | 4mm  | 26/06/2018 | 19/07/2018 | 23             | 813              |
| CPT106                        | 24mm                     | 29/03/2018 | 17/04/2018 | 19             | 266              | Not Required (SOUTHERN BROWN BANDICOOT recorded during Survey 1) |            |            |                |                  |
| CPT105 (R5) (2)               | 24mm                     | 29/03/2018 | 17/04/2018 | 19             | 600              | Not Required (SOUTHERN BROWN BANDICOOT recorded during Survey 1) |            |            |                |                  |
| CPT105 (3)                    | 1mm                      | 1/03/2018  | 21/03/2018 | 20             | 1212             | Not Required (SOUTHERN BROWN BANDICOOT recorded during Survey 1) |            |            |                |                  |
| CPT108                        | 1mm                      | 1/03/2018  | 21/03/2018 | 20             | 1414             |  |            |            |                |                  |
| CPT111 South of Soldiers Road | 23mm                     | 19/04/2018 | 3/05/2018  | 14             | 324              | Not Required (SOUTHERN BROWN BANDICOOT recorded during Survey 1) |            |            |                |                  |
| CPT118                        | 33mm                     | 16/05/2018 | 30/05/2018 | 14             | 30               | 8mm  | 3/07/2018  | 19/07/2018 | 16             | 51               |
| CPT120 (1)                    | 15mm                     | 8/05/2018  | 23/05/2018 | 15             | 2428             | Not Required (SOUTHERN BROWN BANDICOOT recorded during Survey 1) |            |            |                |                  |
| CPT120 (2)                    | 15mm                     | 8/05/2018  | 23/05/2018 | 15             | 108              |  |            |            |                |                  |
| CPT125                        | 24mm                     | 29/03/2018 | 17/04/2018 | 19             | 1461             | 33mm   | 16/05/2018 | 30/05/2018 | 14             | 112              |
| McDonalds Drain Road          | 15mm                     | 8/05/2018  | 23/05/2018 | 15             | 75               | 4mm  | 26/06/2018 | 11/07/2018 | 15             | 54               |

Rainfall data has been taken from Cerberus, Victoria <http://www.bom.gov.au/climate/dwo/201807/html/IDCJDW3014.201807.shtml>

Table 3: Results of Camera Surveys for Southern Brown Bandicoot including other species recorded

| Scientific Name                 | Common Name                  | CPT009 (1) | CPT009 (2) | CPT012 (1) | CPT012 (2) | CPT014 (1) | CPT014 (2) | CPT025 | CPT040a | CPT045 (1) | CPT045 (2) | CPT052(R5) | CPT052 | South Boundary | Baxter-Tooradin | South Gippsland | CPT078 | CPT085 | Muddy Gates Lane | CPT 087 | CPT088 (1) | CPT091 (2) | CPT097 | CPT 098 | CPT101 (1) | CPT101 (2) | CPT106 | CPT105 (3) | CPT108 | CPT111 | CPT118 | CPT120 (1) | CPT120 (2) | CPT125 | McDonalds Drain Rd |  |
|---------------------------------|------------------------------|------------|------------|------------|------------|------------|------------|--------|---------|------------|------------|------------|--------|----------------|-----------------|-----------------|--------|--------|------------------|---------|------------|------------|--------|---------|------------|------------|--------|------------|--------|--------|--------|------------|------------|--------|--------------------|--|
| <b>MAMMALS</b>                  |                              |            |            |            |            |            |            |        |         |            |            |            |        |                |                 |                 |        |        |                  |         |            |            |        |         |            |            |        |            |        |        |        |            |            |        |                    |  |
| <i>Antechinus agilis</i>        | Agile Antechinus             |            |            |            | X          |            |            |        |         | X          |            |            |        |                |                 |                 |        |        |                  |         |            |            |        |         |            |            |        |            |        |        |        |            |            |        |                    |  |
| <i>Cervus unicolor*</i>         | Sambar                       |            |            |            |            |            |            |        | X       |            |            |            |        |                |                 |                 |        |        |                  |         |            |            |        |         |            |            |        |            |        |        |        |            |            |        |                    |  |
| <i>Felis catus*</i>             | Cat                          |            |            |            |            |            |            |        |         |            |            |            |        |                |                 |                 |        |        |                  |         |            |            |        |         |            | X          |        |            |        |        |        |            |            | X      |                    |  |
| <i>Isodon obesulus obesulus</i> | Southern Brown Bandicoot     |            |            |            |            |            |            |        |         |            |            |            |        |                |                 |                 |        | P      | P                | P       | X          | X          | X      | P       |            |            | X      | X          | X      | X      | P      | X          | P          | P      | P                  |  |
| <i>Mus musculus*</i>            | House Mouse                  |            |            |            | X          | X          |            |        |         |            |            |            |        | X              |                 | X               |        |        |                  |         |            |            |        |         | X          |            |        | X          |        |        |        |            |            | X      |                    |  |
| <i>Oryctolagus cuniculus*</i>   | European Rabbit              |            | X          |            | X          |            |            | X      | X       |            |            | X          | X      |                |                 | X               |        |        |                  |         | X          |            |        |         |            |            | X      |            |        |        |        | X          |            | X      |                    |  |
| <i>Pseudocheirus peregrinus</i> | Common Ringtail Possum       |            |            |            |            |            |            |        |         |            |            |            |        | X              |                 | X               |        |        |                  |         |            |            |        |         |            |            |        |            |        |        |        |            |            |        |                    |  |
| <i>Rattus lutreolus</i>         | Swamp Rat                    | X          |            |            | X          | X          |            |        |         |            |            |            |        | X              | X               |                 |        |        |                  |         | X          |            |        |         |            |            |        |            |        |        |        |            |            |        |                    |  |
| <i>Rattus rattus*</i>           | Black Rat                    | X          | X          |            | X          | X          | X          | X      |         |            |            | X          |        | X              | X               | X               |        | X      | X                | X       | X          | X          | X      |         | X          | X          | X      |            |        | X      | X      | X          | X          | X      | X                  |  |
| <i>Tachyglossus aculeatus</i>   | Short-beaked Echidna         |            |            |            | X          |            |            |        |         |            | X          |            |        |                |                 |                 |        |        |                  |         |            |            |        |         |            |            |        |            |        |        |        |            |            |        |                    |  |
| <i>Trichosurus vulpecula</i>    | Common Brushtail Possum      |            | X          |            |            |            |            |        | X       |            | X          |            |        |                |                 |                 |        |        |                  |         |            |            |        |         |            |            |        |            |        |        |        |            |            |        |                    |  |
| <i>Vulpes vulpes*</i>           | Red Fox                      | X          | X          | X          | X          | X          | X          | X      | X       | X          | X          | X          | X      | X              |                 |                 | X      | X      | X                | X       | X          |            |        |         | X          | X          |        |            | X      | X      |        | X          | X          | X      |                    |  |
| <i>Wallabia bicolor</i>         | Black Wallaby                |            |            |            | X          | X          | X          |        | X       | X          | X          | X          | X      |                |                 |                 |        |        |                  |         |            |            |        |         |            |            |        |            |        |        |        |            |            |        |                    |  |
| <b>REPTILES</b>                 |                              |            |            |            |            |            |            |        |         |            |            |            |        |                |                 |                 |        |        |                  |         |            |            |        |         |            |            |        |            |        |        |        |            |            |        |                    |  |
| <i>Lampropholis guichenoti</i>  | Garden Skink                 |            |            | X          |            |            |            |        |         |            |            |            |        |                |                 |                 |        |        |                  |         |            |            |        |         |            |            |        |            |        |        |        |            |            |        |                    |  |
| <i>Liopholis whitii</i>         | White's Skink                |            |            |            |            |            |            |        |         |            |            |            |        |                |                 |                 |        |        |                  |         |            |            |        |         |            |            |        |            |        |        |        |            |            |        |                    |  |
| <i>Tiliqua nigrolutea</i>       | Blotched Blue-tongued Lizard |            |            |            | X          |            |            |        |         |            |            |            |        |                |                 |                 |        |        |                  |         |            |            |        |         |            |            |        |            |        |        |        |            |            |        |                    |  |
| <b>BIRDS</b>                    |                              |            |            |            |            |            |            |        |         |            |            |            |        |                |                 |                 |        |        |                  |         |            |            |        |         |            |            |        |            |        |        |        |            |            |        |                    |  |
| <i>Acridotheres tristis*</i>    | Common Myna                  |            |            |            |            |            |            |        |         |            |            |            |        |                |                 |                 |        |        |                  |         | X          |            |        |         |            |            |        |            |        |        |        |            |            |        |                    |  |
| <i>Colluricincla harmonica</i>  | Grey Shrike-thrush           |            |            | X          |            |            | X          |        |         |            |            |            |        |                |                 | X               |        |        |                  |         |            |            |        |         |            |            |        |            |        |        |        |            |            |        | X                  |  |
| <i>Corvus sp.</i>               | Raven                        |            |            |            |            |            |            |        |         |            |            |            |        |                |                 |                 |        |        |                  |         |            |            |        |         |            |            |        |            |        |        |        |            |            | X      |                    |  |
| <i>Cracticus torquatus</i>      | Grey Butcherbird             |            |            |            |            |            |            |        |         |            |            |            |        |                |                 |                 |        |        | X                |         |            |            |        |         |            |            |        |            |        |        |        |            |            |        |                    |  |
| <i>Eopsaltria australis</i>     | Eastern Yellow Robin         |            |            |            | X          | X          | X          |        |         |            |            |            |        |                |                 |                 |        |        |                  |         |            |            |        |         |            |            |        |            |        |        |        |            |            |        |                    |  |
| <i>Falco berigora</i>           | Brown Falcon                 |            |            |            |            |            |            |        |         |            |            |            |        |                |                 |                 |        |        |                  |         |            |            |        |         |            |            |        |            |        |        |        |            |            | X      |                    |  |
| <i>Gallirallus philippensis</i> | Buff-banded Rail             |            |            |            |            |            |            |        |         |            |            |            |        |                |                 |                 |        |        |                  |         | X          |            |        |         |            |            |        |            |        |        |        |            |            |        |                    |  |
| <i>Grallina cyanoleuca</i>      | Magpie-lark                  |            |            |            |            |            |            |        |         |            |            |            |        |                |                 |                 |        |        |                  |         |            |            |        |         |            |            |        |            |        |        |        |            |            | X      |                    |  |

| Scientific Name                      | Common Name            | CPT009 (1) | CPT009 (2) | CPT012 (1) | CPT012 (2) | CPT014 (1) | CPT014 (2) | CPT025 | CPT040a | CPT045 (1) | CPT045 (2) | CPT052(R5) | CPT052 | South Boundary | Baxter-Tooradin | South Gippsland | CPT078 | CPT085 | Muddy Gates Lane | CPT 087 | CPT088 (1) | CPT091 (2) | CPT097 | CPT 098 | CPT101 (1) | CPT101 (2) | CPT106 | CPT105 (3) | CPT108 | CPT111 | CPT118 | CPT120 (1) | CPT120 (2) | CPT125 | McDonalds Drain Rd |  |
|--------------------------------------|------------------------|------------|------------|------------|------------|------------|------------|--------|---------|------------|------------|------------|--------|----------------|-----------------|-----------------|--------|--------|------------------|---------|------------|------------|--------|---------|------------|------------|--------|------------|--------|--------|--------|------------|------------|--------|--------------------|--|
| <i>Gymnorhina tibicen</i>            | Australian Magpie      |            |            |            |            |            |            |        |         |            |            |            |        |                |                 |                 |        | X      |                  |         |            |            |        |         |            |            |        |            |        |        |        |            |            |        |                    |  |
| <i>Lewinia pectoralis pectoralis</i> | Lewin's Rail           |            |            |            | X          |            |            |        |         |            |            |            |        |                |                 |                 |        |        |                  |         |            |            |        |         |            |            |        |            |        |        |        |            |            |        |                    |  |
| <i>Malurus cyaneus</i>               | Superb Fairywren       |            | X          | X          | X          | X          | X          | X      |         |            |            |            |        |                |                 | X               |        |        |                  |         |            |            |        |         | X          |            |        |            |        | X      | X      | X          | X          |        |                    |  |
| <i>Phaps chalcoptera</i>             | Common Bronzewing      |            |            |            |            |            |            |        |         |            |            |            |        | X              |                 |                 |        |        |                  |         |            |            |        |         |            |            |        |            |        |        |        |            |            |        |                    |  |
| <i>Phaps elegans</i>                 | Brush Bronzewing       |            |            |            |            |            |            | X      | X       |            |            |            | X      |                |                 |                 |        |        |                  |         |            |            |        |         |            |            |        |            |        |        |        |            |            |        |                    |  |
| <i>Rhipidura leucophrys</i>          | Willie Wagtail         |            |            |            |            |            |            |        |         |            |            |            |        |                |                 |                 |        |        |                  |         |            |            |        |         |            |            |        |            |        |        |        |            | X          |        |                    |  |
| <i>Strepera graculina</i>            | Pied Currawong         |            |            |            |            |            |            |        | X       |            |            |            |        |                |                 |                 |        |        |                  |         |            |            |        |         |            |            |        |            |        |        |        |            |            |        |                    |  |
| <i>Streptopelia chinensis*</i>       | Spotted Turtle-Dove    |            |            |            |            |            |            |        |         |            |            |            |        |                |                 |                 |        |        |                  | X       |            |            |        |         |            |            |        |            |        |        |        |            |            | X      |                    |  |
| <i>Sericornis frontalis</i>          | White-browed Scrubwren |            |            |            | X          | X          | X          |        |         |            |            |            |        |                |                 | X               |        |        |                  |         |            |            |        |         |            |            |        |            |        |        |        |            |            | X      |                    |  |
| <i>Turdus merula*</i>                | Common Blackbird       |            | X          | X          | X          |            |            | X      | X       |            |            |            |        | X              | X               | X               |        |        | X                | X       | X          |            |        |         | X          | X          |        |            |        |        |        |            |            | X      |                    |  |