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23 November 2020

Dear Alexandra and Carl

## **Request for additional information - Beerburrum to Nambour Rail Upgrade Project**

Please see below responses to the additional information requested in relation to the EPBC Referral for the Beerburrum to Nambour Rail Upgrade Project (Referral number EPBC 2020/8803). Our responses reference and summarise information provided in the B2N Commonwealth Matters Ecological Report that was attached as supporting information for the referral, and where relevant additional information is provided.

### **1. Clarify the likelihood of presence, any surveys completed, and an assessment utilising the Significant Impact Guidelines 1.1 – Matters of National Environmental Significance against all listed Matters of National Environmental Significance (MNES) identified within a 2 km buffer of the referral area as listed within the Department's Protected Matters Search Tool.**

An EPBC Protected Matters Search for a 5 km buffer area around the project alignment was conducted in September 2019<sup>1</sup> and this was used as the basis for the likelihood of occurrence assessment in the REF and also the likelihood of occurrence that is described in Section 3.3.1 of the B2N Commonwealth Matters Ecological Report. The results of the likelihood assessment are provided in Section 4.3.1 (Table 6) Section 4.4.2 (Table 7) of the Commonwealth Matters Ecological Report for flora and fauna respectively.

The likelihood of occurrence conducted for the REF included the full list of species from the EPBC Protected Matters Search and identified those with low, moderate or high likelihood of occurrence. However, the Commonwealth Matters Ecological Report focused on those species identified as having a moderate or high likelihood of occurrence. For completeness, the table below (Table 1) provides the 'low' likelihood fauna species with reason for the likelihood. Note that the flora likelihood documented in Table 6 of the Commonwealth Matters Ecological Report includes all species from the PMST (including low likelihood) therefore this is not repeated here.

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<sup>1</sup> Note there is an error in Section 3.3 of the B2N Commonwealth Matters Ecological Report which states that the PMST search was conducted in 2016. The correct search date is 20/09/19.

The likelihood of occurrence assessment of each threatened species was assessed based on the species' known distribution, habitat quality within the study area, species occurrence within the region and species occurrence during surveys.

Table 1 Low likelihood fauna species as assessed for the REF

Class	Scientific Name	Common Name	EPBC Status	Type of Presence	Likelihood of Occurrence
Amphibian	<i>Mixophyes fleayi</i>	Fleay's Frog	E	Species or species habitat likely to occur within area	Low, a lack of suitable habitat within the alignment.
Bird	<i>Ardea alba modesta</i>	Eastern Great Egret	Marine Migratory	Species or species habitat known to occur within area	Low, a lack of suitable habitat within the alignment.
Bird	<i>Botaurus poiciloptilus</i>	Australasian Bittern	E	Species or species habitat likely to occur within area	Low. Lack high quality habitat within the alignment.
Bird	<i>Calidris ferruginea</i>	Curlew Sandpiper	CE	Species or species habitat may occur within area	Low. Lack high quality habitat within the alignment.
Bird	<i>Erythroriorchis radiatus</i>	Red Goshawk	V	Species or species habitat known to occur within area	Low. Lack high quality habitat within the alignment.
Bird	<i>Gallinago hardwickii</i>	Latham's Snipe	Marine Migratory	Species or species habitat may occur within area	Low. Lack of suitable habitat.
Bird	<i>Numenius madagascariensis</i>	Eastern Curlew	CE	Species or species habitat may occur within area	None, lack of suitable habitat.
Bird	<i>Pandion haliaetus</i>	Osprey	Migratory	Breeding known to occur within area	None, lack of suitable habitat.
Bird	<i>Poephila cincta cincta</i>	Black-throated Finch (southern)	E	Species or species habitat may occur within area	None, lack of suitable habitat.
Bird	<i>Rostratula australis</i>	Australian Painted Snipe	E	Species or species habitat may occur within area	Low. Lack of suitable habitat.
Bird	<i>Thinornis rubricollis rubricollis</i>	Hooded Plover (eastern)	V	Species or species habitat may occur within area	Low. Lack of suitable habitat.
Bird	<i>Tringa nebularia</i>	Common Greenshank	Migratory	Species or species habitat likely to occur within area	None, lack of suitable habitat.
Bird	<i>Turnix melanogaster</i>	Black-breasted Button-quail	V	Species or species habitat likely to occur within area	None, lack of suitable habitat.

Mammal	<i>Dasyurus hallucatus</i>	Northern Quoll	E	Species or species habitat likely to occur within area	Low. Rarely recorded as far south as the Project area.
Mammal	<i>Dasyurus maculatus maculatus</i>	Spot-tailed Quoll	E	Species or species habitat may occur within area	Low. Likely to occur in the wider area, but closer to the alignment the habitat is highly fragmented. Increasing traffic and dogs likely to have had negative effects.
Mammal	<i>Petauroides volans</i>	Greater Glider	V	Species or species habitat likely to occur within area	Low. Low abundance of tree hollows in some larger areas of native vegetation. Project area highly fragmented. Higher quality potential habitat has restricted spatial extent.
Mammal	<i>Potorous tridactylus tridactylus</i>	Long-nosed Potoroo (SE Mainland)	V	Species or species habitat likely to occur within area	Low. Lack of preferred habitat and microhabitat.
Reptile	<i>Delma torquata</i>	Collared Delma	V	Species or species habitat may occur within area	Low. Lack of preferred habitat and microhabitat.
Reptile	<i>Furina dunmalli</i>	Dunmall's Snake	V	Species or species habitat may occur within area	None. Lack of suitable habitat.
Reptile	<i>Saiphos reticulatus</i>	Three-toed Snake-tooth Skink	V	Species or species habitat may occur within area	Low. Lack of preferred microhabitat.
Insects	<i>Argynnis hyperbius inconstans</i>	Australian Fritillary	CE	Species or species habitat may occur within area	Low. Lack of preferred microhabitat.

The likelihood of occurrence assessment was then used as the basis to determine target species for the 2020 field surveys. Appropriate survey methodologies were then developed to detect these species and map areas of habitat. The likelihood of occurrence for known, likely and moderate occurrence species was updated post-field survey to account for survey results (provided in Section 4 of the Commonwealth Matters Ecological Report). Significant impact assessments against the EPBC Act Significant Impact Guidelines 1.1 were then conducted for those species known or likely to occur in the study area, and are provided in Appendix C of the Commonwealth Matters Ecological Report. Note that a combined significance assessment was completed for migratory species (also provided in Appendix C of the Commonwealth Matters Ecological Report).

Ecological survey methodologies and results are provided in Section 3.4 and Section 5 of the Commonwealth Matters Ecological Report.

## 2. Clarify that Koala habitat mapping is consistent with the Department's EPBC Act Referral Guidelines for the Vulnerable Koala

### Methodology

The methodology for Koala habitat mapping is described in Section 5.3.4 of the Commonwealth Matters Ecological Report. Based on the results of the ecological field investigations and review of mapping available for the survey area (i.e. State regional ecosystem [RE] mapping, essential habitat mapping, State Koala habitat mapping for Southeast Queensland and aerial imagery of the project boundary), critical Koala habitat values were mapped for the study are consistent and in accordance with the *EPBC Act Referral Guidelines for the Vulnerable Koala*. The assessment and mapping found that there was approximately 25 ha of habitat critical to the survival of the species within the project area.

As discussed in the Commonwealth Matters Ecological Report, based on the application of the habitat assessment tool from Table 4 of the guidelines, resulting in a score of 6, habitat critical to the survival of Koala in the project area is of moderate quality.

The assessment is based on the understanding that habitat critical to the survival of the species is a subset of Koala habitat. Not all areas of Koala habitat present would constitute 'habitat critical to the survival of the species'. Koala habitat is defined in the *EPBC Act Referral Guidelines for the Vulnerable Koala* Glossary 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."

Table 1 of the guidelines also provides Koala context attributes (the coastal attributes apply to this project) such as large connected areas, windbreaks, food and/or shelter trees, etc.

However, 'habitat critical to the survival of the species' (note we used the term interchangeably with 'critical Koala habitat') is defined separately in the *EPBC Act Referral Guidelines for the Vulnerable Koala* Glossary as:

"Koala habitat that is considered to be important for the species' long-term survival and recovery. An impact area that scores five or more using the habitat assessment tool for the Koala in Table 4 of these guidelines is highly likely to contain habitat critical to the survival of the Koala."

The Queensland Government Koala mapping available for the survey area includes RE mapping and State Koala habitat mapping recently released to support the *South East Queensland Koala Conservation Strategy 2019-2024*, which are shown in Figure 10 of the Commonwealth Matters Ecological Report. In particular, the State Koala habitat mapping includes mapping of Core Koala Habitat Areas which is intended to represent the best quality Koala habitat in Southeast Queensland, and the Core Koala Habitat Areas are generally consistent with the RE mapping of regional ecosystems that Koala would inhabit. The ecological field surveys found that the observed REs were generally consistent with the RE mapping. Therefore, the assessment considered any Core Koala Habitat Areas falling within the project area as meeting 'habitat critical to the survival of the species', and this also assisted in maintaining a consistent approach to mapping critical Koala habitat for the length of the project area.

Note that the intention is not to apply State legislation or policy to an EPBC Act assessment for Koala, but rather, the State Koala habitat mapping was used as a desktop information source for what is already known about Koala habitat values in the project boundary.

Please also note the following site-specific attributes of the project area, which are relevant to whether an area of Koala habitat would be ‘habitat critical to the survival of the species’:

- Overall, Koala habitat located within the study area is already fragmented by the existing railway and roads which pose a considerable barrier to koala movement. Remaining habitat fragments in the study area around the railway to be upgraded are disturbed and dominated by edge environments. The majority of the project boundary can be classed as ‘urban area’ with existing effects of habitat loss, fragmentation, vehicle strike, dog attack and degradation of habitat by weeds and other threats from human activities.
- There is an existing lack of connectivity from west to east due to the existing railway alignment and existing main roads such as Steve Irwin Way and Old Landsborough Road.
- Based on Koala SAT surveys combined with detection dogs survey, there appears to be generally low Koala density and abundance in the areas in and near to the project boundary. Surveys showed no evidence for Koala activity except at two locations adjacent to the project boundary at Landsborough (i.e. one faecal pellet and possible Koala scratch marks on a tree).
- The project will not result in broad-scale clearing of vegetation that is Koala habitat. The impacts to Koala habitat are mostly clearing the edges of vegetation patches that are present on either side of the existing rail line (and these edges are usually the most weed impacted and disturbed part of the patch). Most of the proposed alignment follows the existing rail line, thereby minimising the footprint of the project in relation to Koala habitat.

Not all vegetation and not all Koala habitat attributes within the project boundary would constitute ‘habitat critical to the survival of the species’, particularly considering the outcomes of field surveys for Koala and vegetation types falling within the project boundary (e.g. including vegetation types not associated with Koala such as rainforest, street trees in urban area and screen plantings of shrubs). Much of the vegetation within the project boundary generally consists of agricultural land, non-remnant vegetation, plantings or areas dominated by exotic plants, and disturbed area like road verges.

#### Current mapping

In response to the information request and discussions with DAWE, we understand DAWE’s concerns regarding areas of ‘functional loss’ of Koala habitat resulting from the project as well as describing all potential Koala habitat in the project area and not only critical Koala habitat.

Therefore, the assessment of critical Koala habitat has been reviewed to identify new patches of mapped core Koala habitat in or adjacent to the project area that, although they would not be directly impacted, may lose ‘functionality’ for Koala, e.g. will become isolated as a result of the project. These areas total 5.2 ha.

Also included is an assessment of other Koala habitat in the project area (considered to be of low quality and not critical to the survival of the species). These other Koala habitat areas were mapped with reference to aerial photography and included all vegetated patches

within the project area (this is expected to be conservative as not all vegetation within the Project Boundary would contain Koala food trees). The assessment has determined that there is a total of approximately 55.7 ha of other vegetation in the study area that may form low quality Koala habitat.

Figure 11 from the Commonwealth Matters Ecological Report has been updated in Figure 1 below to show these areas.

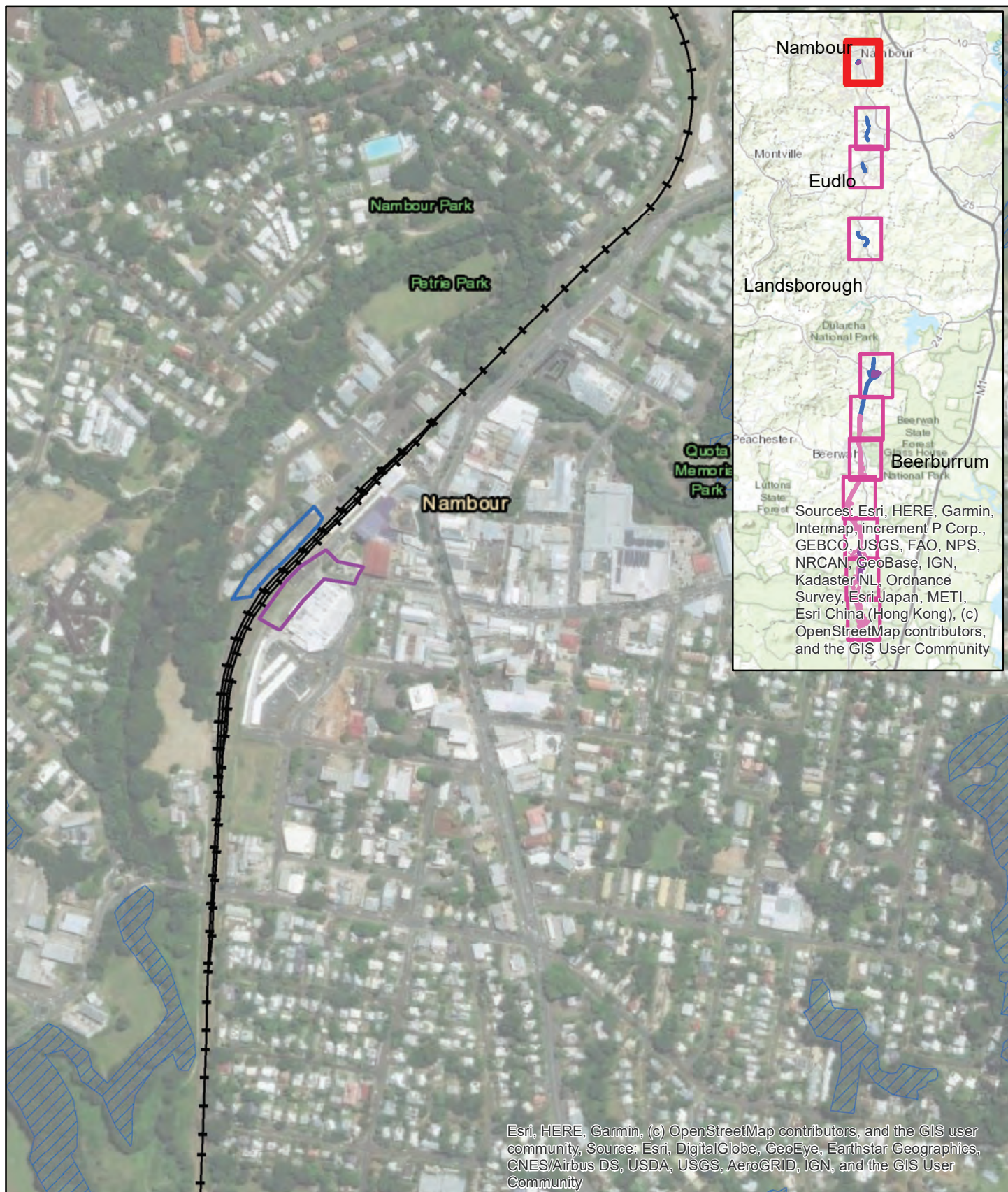
These areas of other vegetation include:

- Non remnant vegetation / vegetated areas that are not recognised as core Koala habitat
- Small fragments of vegetation
- Isolated areas between road and rail (often disjointed, narrow windbreaks)

The assessment also considered the site-specific attributes of the project area as discussed above, i.e. existing fragmentation and large proportion of modified/developed area, existing lack of connectivity, low density and abundance of Koala evidenced from Koala surveys, and the majority of vegetation impacts being to the edges of vegetation patches along the alignment (not broad-scale clearing).

In conclusion, the ecological assessment for the project, which is supported by desktop analysis and field survey and is in accordance with the EPBC Referral guidelines for the Vulnerable Koala, has identified that the project will directly impact 25 ha of 'habitat critical to the survival of the Koala'. A further 5.2 ha may lose functionality as habitat due to being isolated as a result of the project. However due to the site-specific attributes outlined above, and with reference to the MNES Significant Impact Criteria, the project is not considered to be having a significant impact to the Koala. The Significant Impact Assessment for the Koala is provided in Appendix C of the Commonwealth Matters Ecological Report.





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## Legend

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Client

**Department of Transport and Main Roads**

Job Title

**Beerburum to Nambour Rail Upgrade Project**

Map Title

**Koala Habitat Values Mapping**

Meters  
0 30 60 120 180 240 300

Issue	Date	By	Chkd	Appd
D1	23/11/2020	MTM	RM	EP

# ARUP

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Map Status

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Coordinate System

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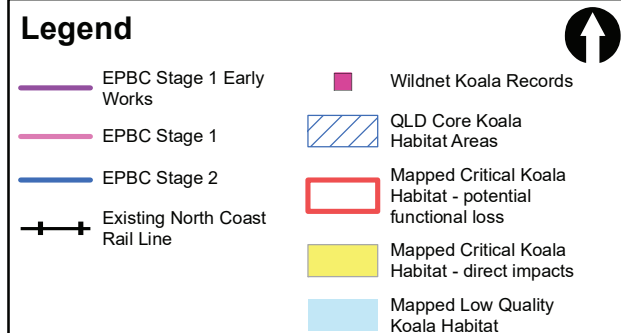
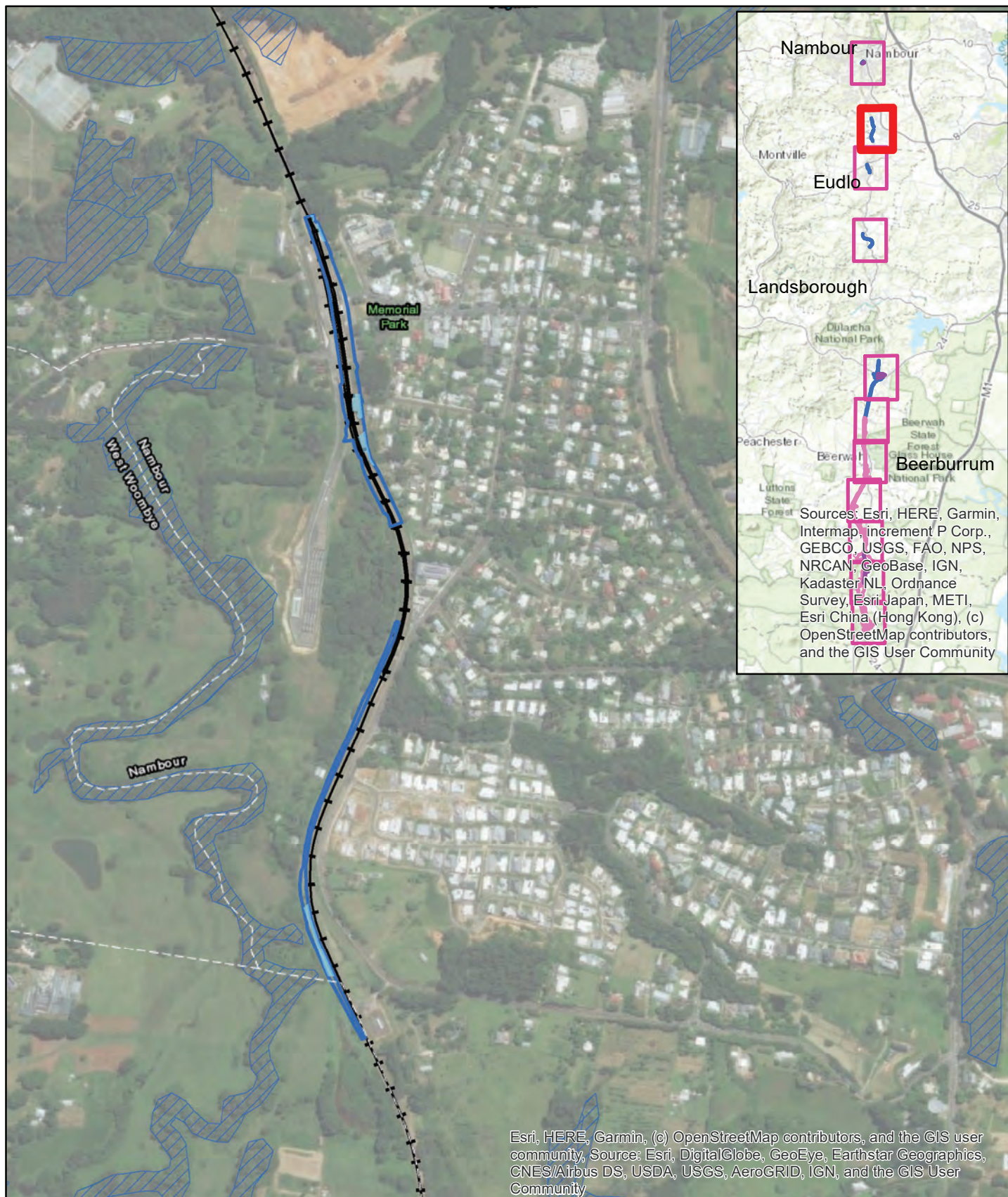
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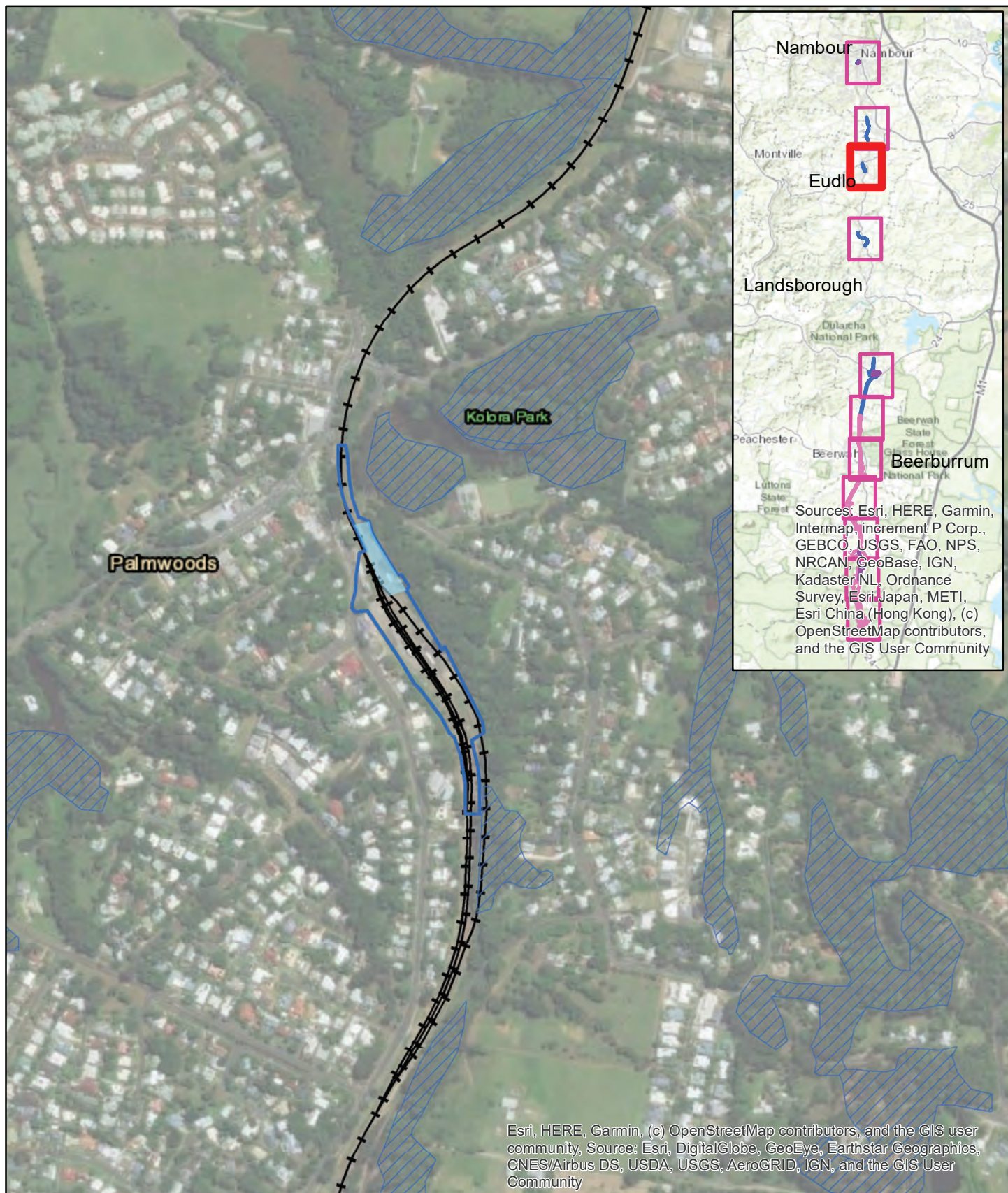
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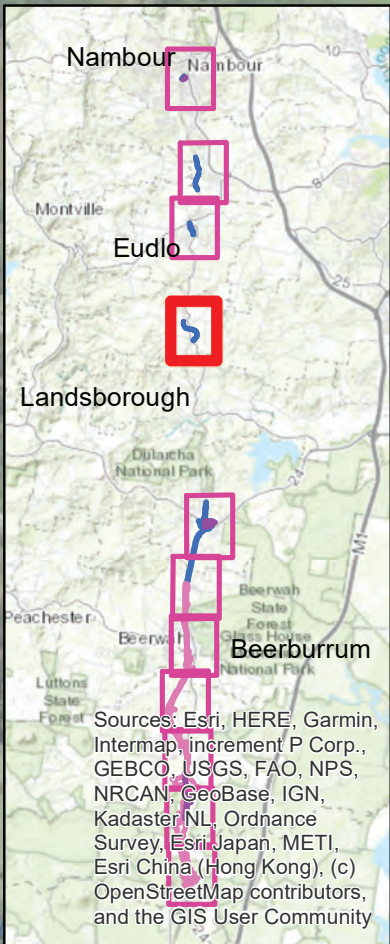
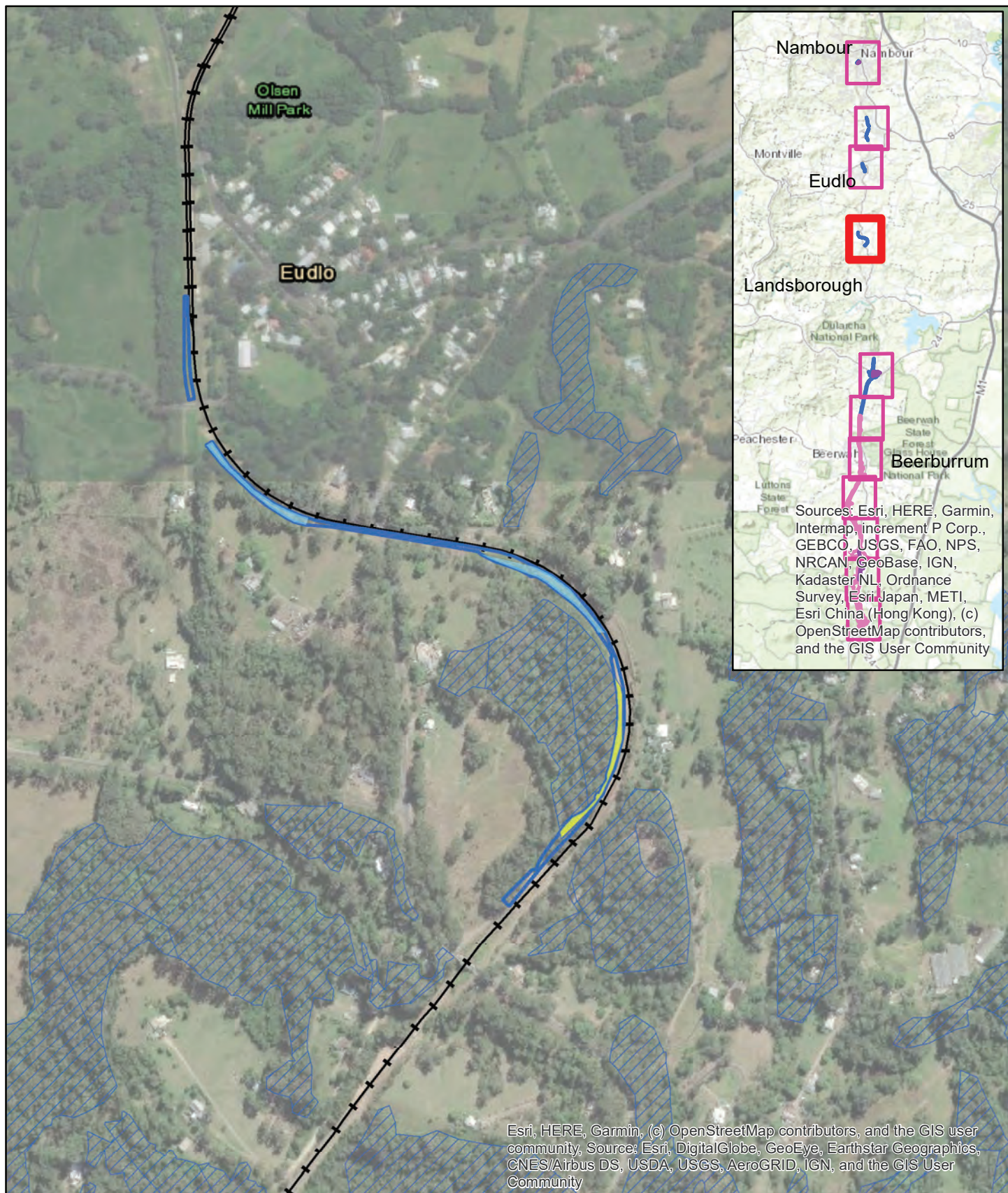
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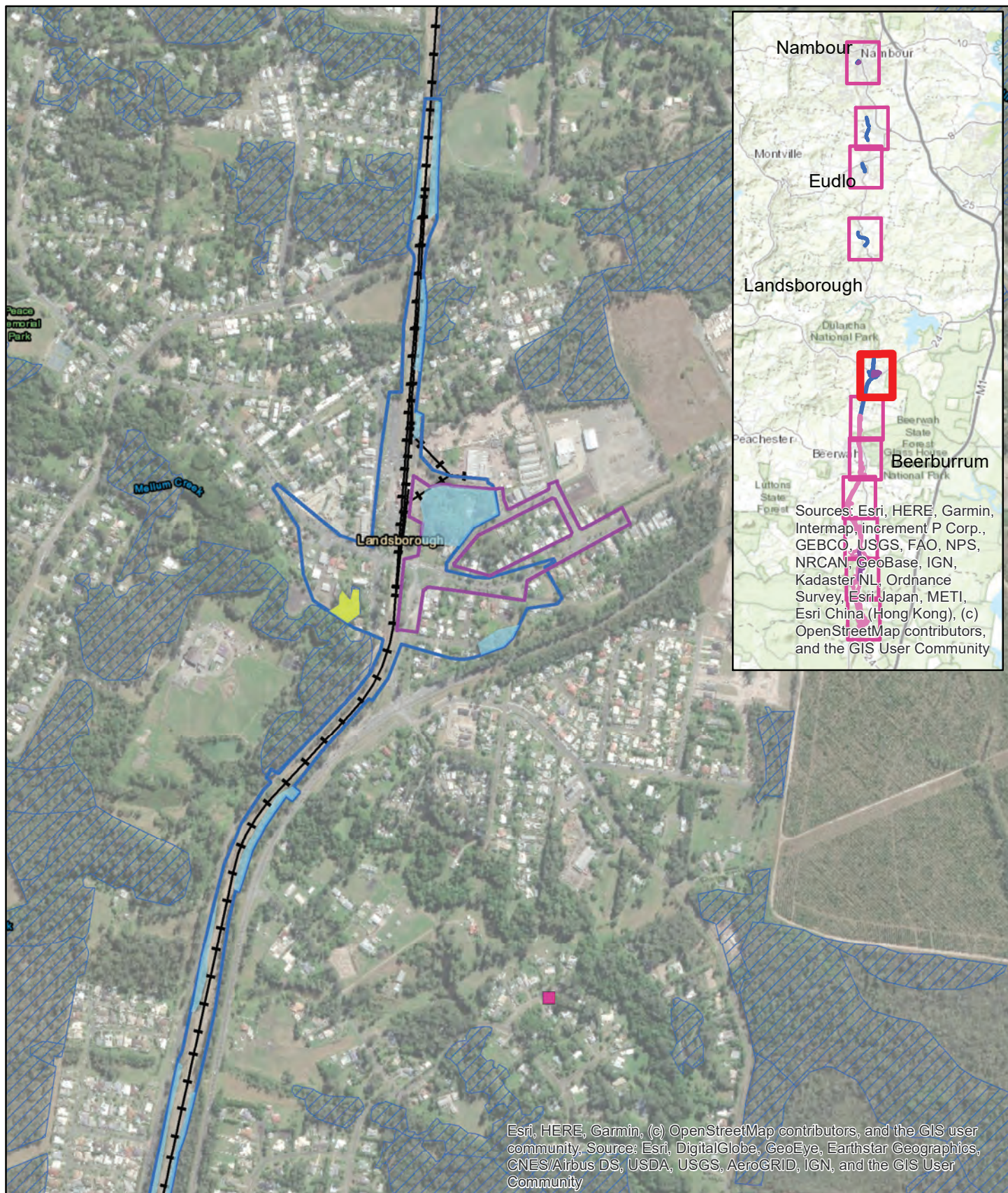
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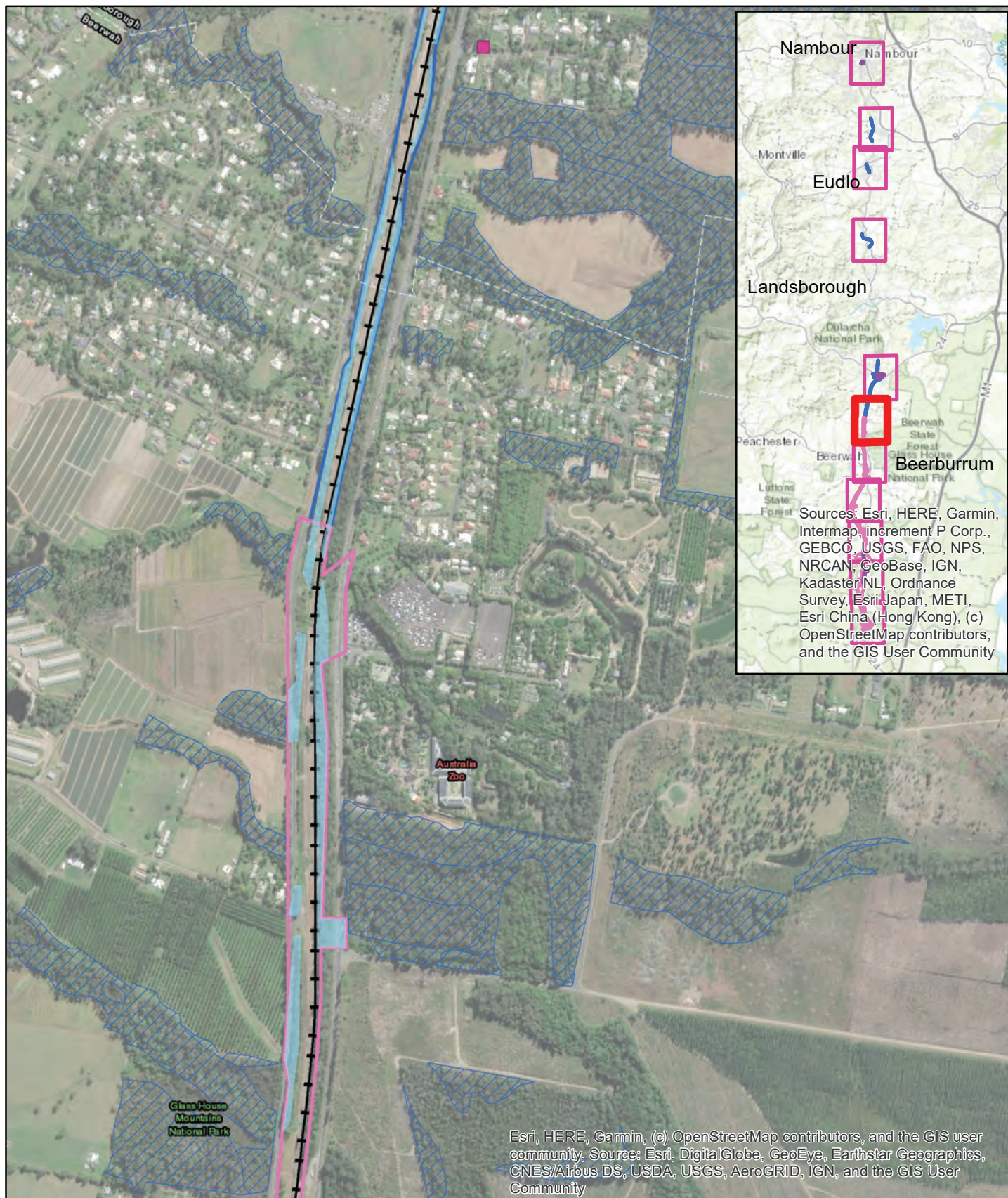
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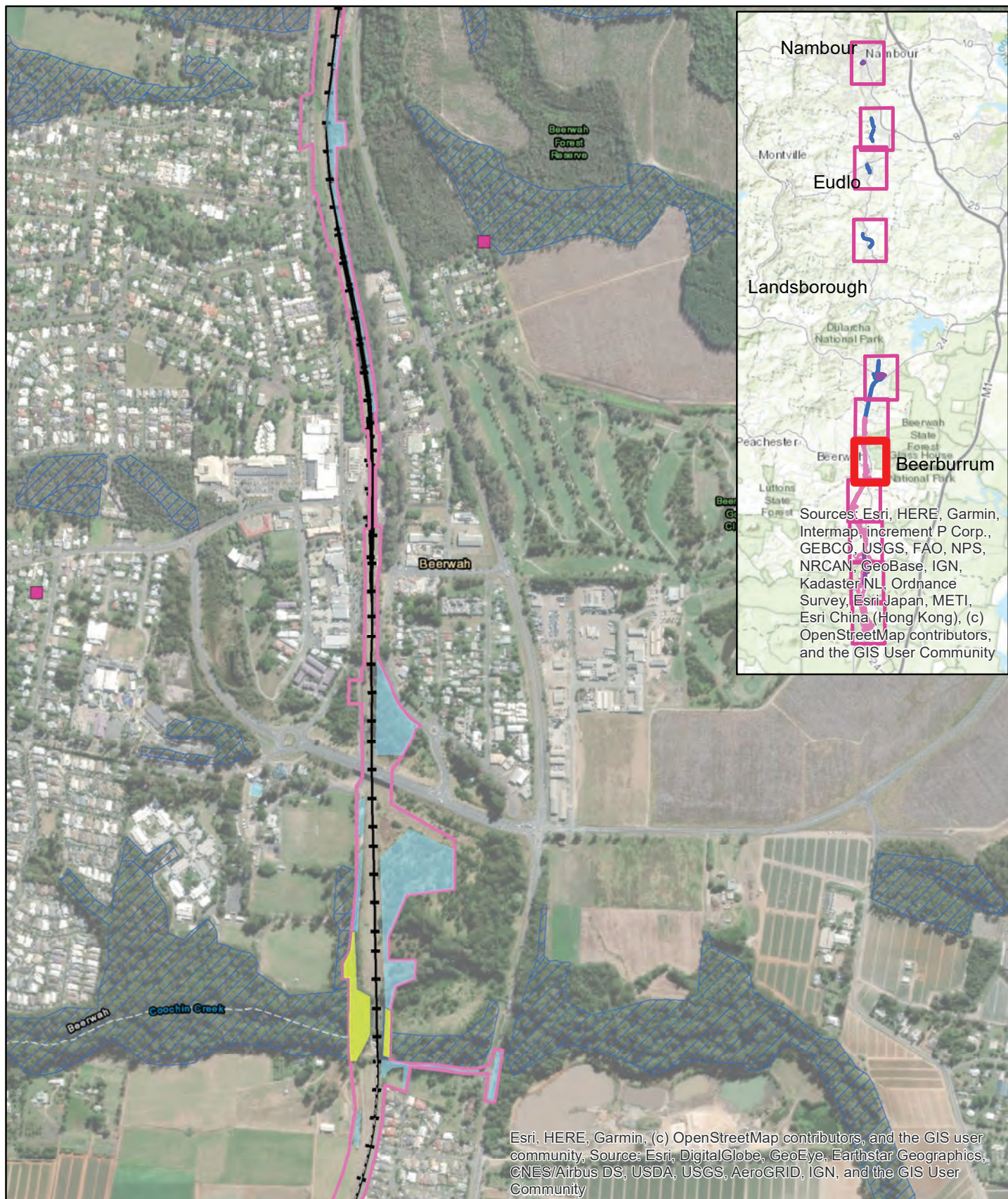
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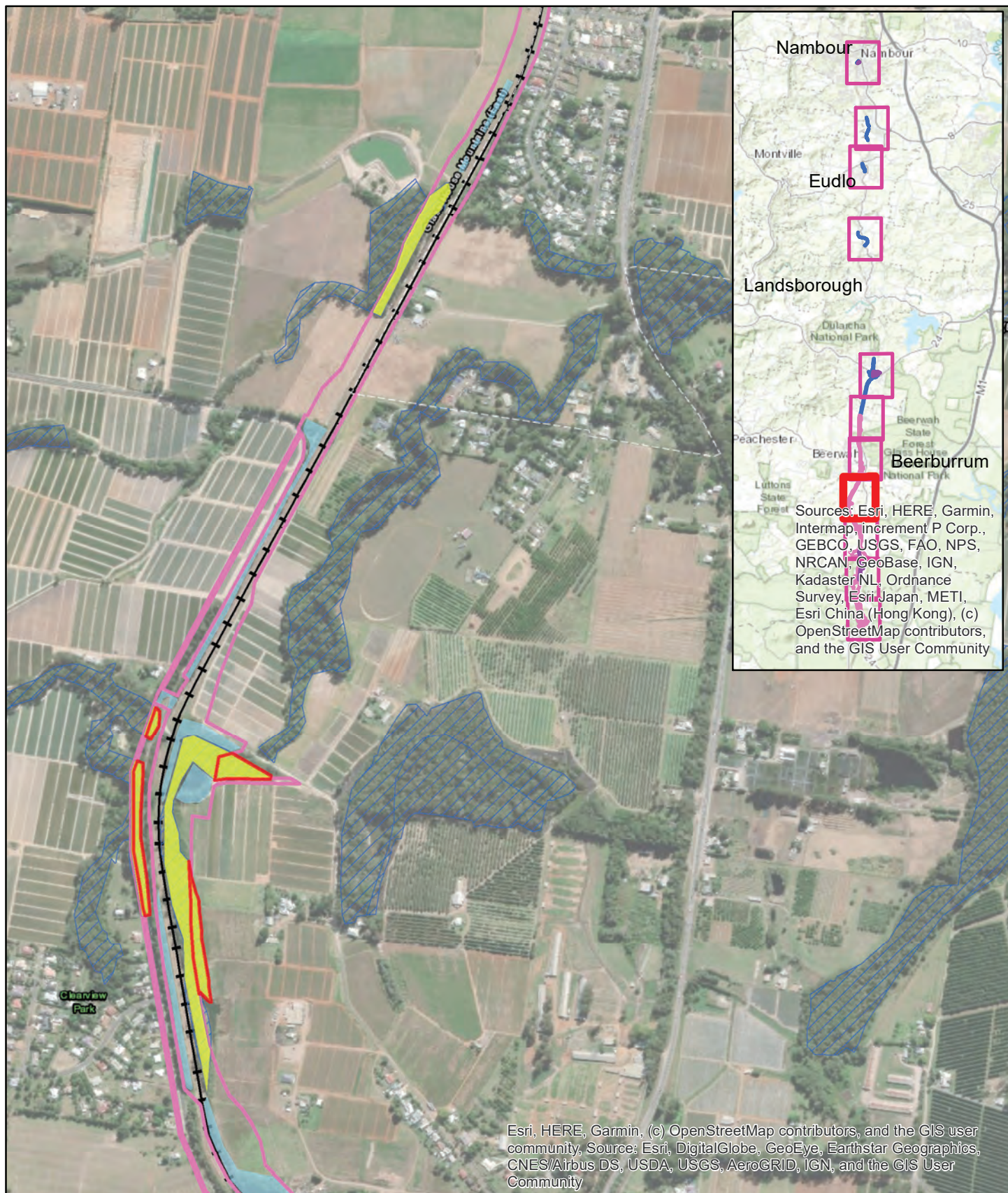
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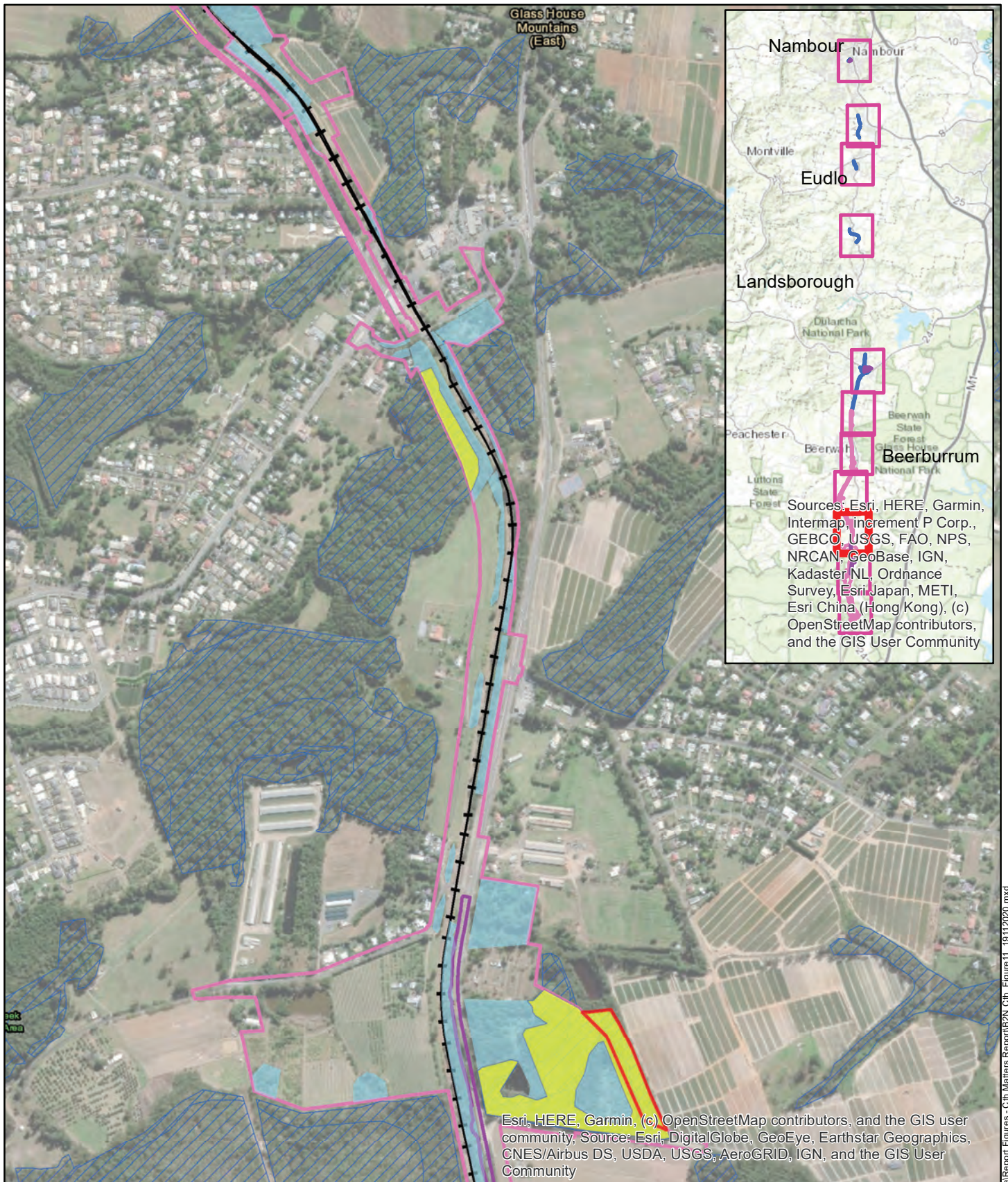
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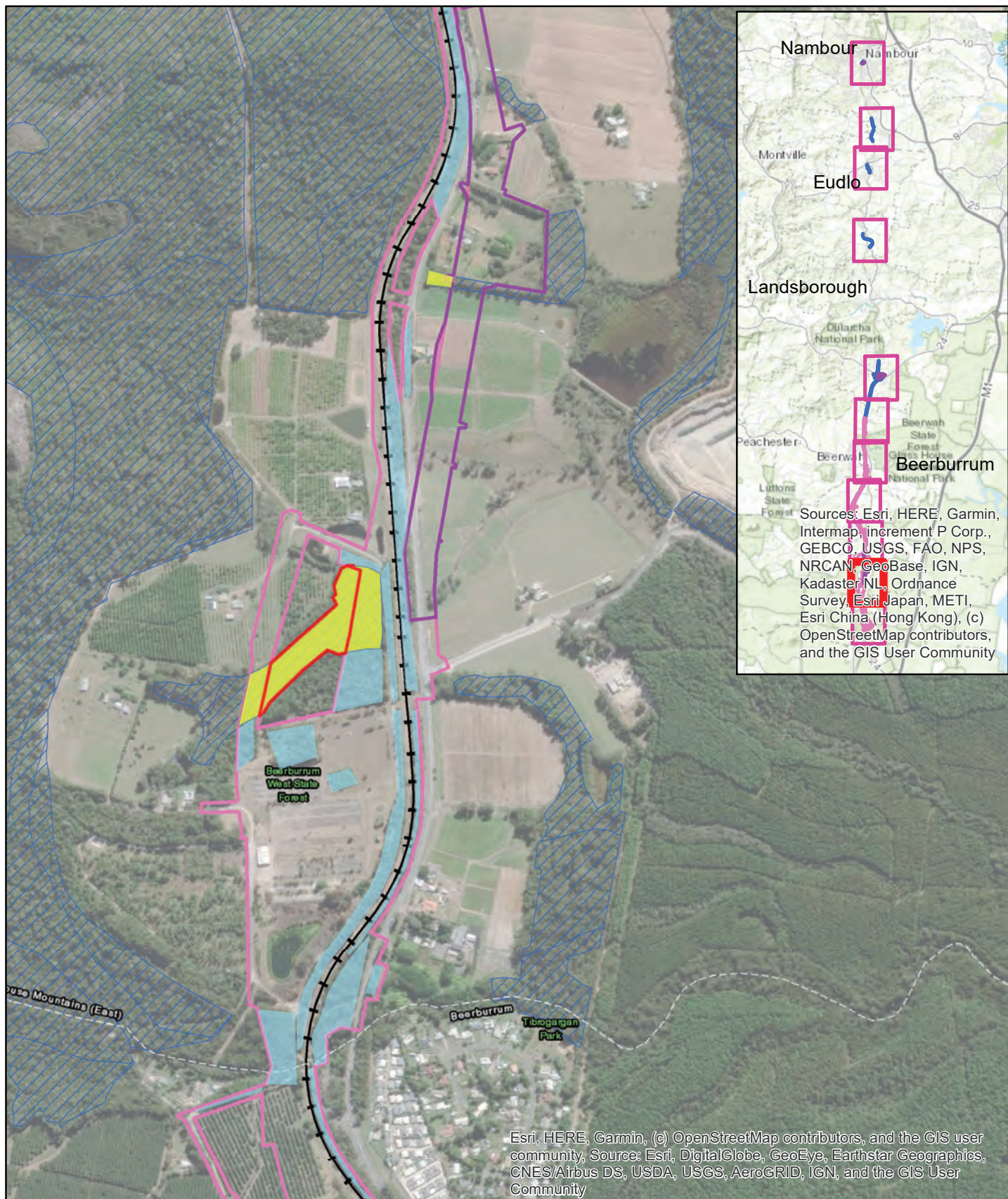
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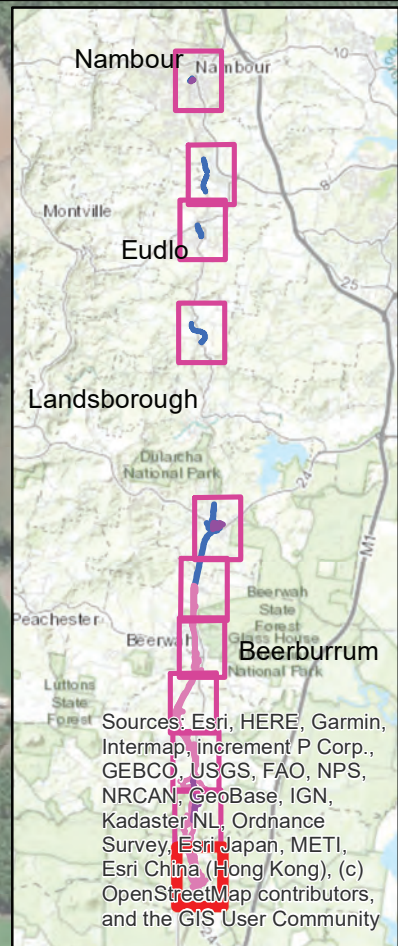
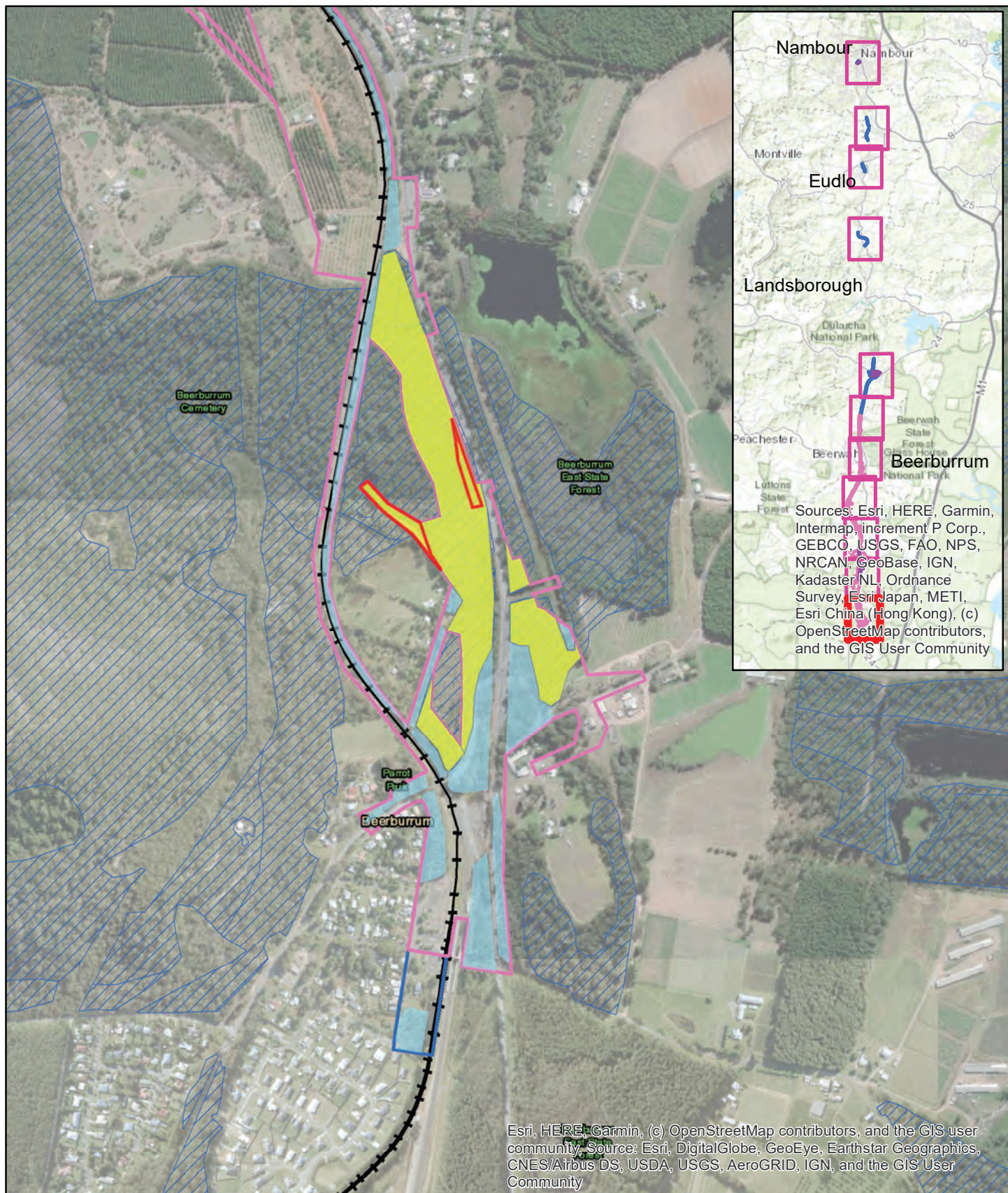
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Issue	Date	By	Chkd	Appd
D1	23/11/2020	MTM	RM	EP

# ARUP

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Scale at A4

**1:11,500**

Map Status

**Final**

Coordinate System

**GDA2020 MGA Zone 56**

Job No

**271725-00**

Figure and Page No.

**1-11**



**3. Clarify that the impact area for the Koala across early works, Stage 1 and Stage 2 takes into account both direct and indirect impacts and is consistent with the Department's EPBC Act Referral Guidelines for the Vulnerable Koala.**

The assessment of impacts to Koala habitat was undertaken for the project boundary which is a conservative assessment as not all areas within the project boundary will require clearing works. It is acknowledged that indirect impacts such as weed incursion, dust and noise may also occur in other areas adjacent to the project boundary. Whilst these have not been quantified, they were considered in the assessment of impacts and the Significant Impact Assessments undertaken for each relevant MNES as provided in Appendix C of the Commonwealth Matters Ecological Report.

Direct impacts discussed include clearing of habitat (particularly 'habitat critical to the survival of the Koala' in accordance with *EPBC Act Referral Guidelines for the Vulnerable Koala* (Department of the Environment 2014)) and key threats such as car strikes and dog threat. Indirect impacts discussed include disturbance and fragmentation to habitat.

The significant impact assessment against the criteria in the *Matters of National Environmental Significance: significant impact guidelines 1.1* (DoE 2013), in Appendix C of the Commonwealth Matters Ecological Report, also demonstrated consideration of these significant impact criteria that relate to indirect impacts to the species:

- Adversely affect habitat critical to the survival of a species;
- Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline;
- Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat;
- Introduce disease that may cause the species to decline; and
- Interfere substantially with the recovery of the species.

A range of mitigation measures will be in place to avoid or minimise indirect impacts in adjacent habitats. This includes contractual requirements between TMR and the Construction Contractor for the development of environmental management plans, incorporating the following measures:

- Early delineation of clearing extents and no-go zones on construction drawings and in the field to minimise clearing footprint as much as possible, especially in sensitive areas such as remnant vegetation, adjacent to protected areas or waterways
- Installation and maintenance of erosion and sediment controls in accordance with the International Erosion Control Association (IECA) guidelines during construction to minimise impacts to water quality and downstream habitats, as well as ongoing water quality monitoring during construction with early identification and rectification of issues
- Dust suppression is to be regularly undertaken, for example, through the use of water carts
- Weed control and maintenance of revegetated areas to occur after construction completion. Weed invasion and spread will be controlled through the implementation of weed and hygiene protocols e.g. plant/vehicle washdowns, weed declaration for material being imported to site and regular weed treatment as part of the site maintenance requirements
- Setting of Key Performance Indicators (KPIs) to manage contractor performance in Koala habitat areas and promote a reduction of impact to Koala habitat.

**4. Provide justification as to why the early works are not considered to be a component of a larger action. Alternatively clarify that early works will not impact any Koala habitat consistent with the above definitions, or other MNES or their habitat.**

In pre-referral meetings with DAWE in February and August 2020, TMR identified that due to timing of the proposed early works, they would likely occur prior to the EPBC referral decision. Advice from DAWE indicated that the referral would need to clearly state that the early works are not part of the proposed action, and provide an assessment showing that the early works would not be likely to have a significant impact on MNES.

Appendix B of the Commonwealth Matters Ecological Report provides a summary of the assessment of impacts to MNES from the early works and this has been updated in the extracts below to more clearly identify the potential impacts to vegetated areas, in particular to potential Koala habitat. The works were assessed through desktop and/or field assessment to identify environmental values, impacts and mitigation.

Early works include geotechnical investigations, topographic ground surface surveys, realignment of a portion of Steve Irwin Way with associated public utility plant relocations and provision of additional parking spaces at Landsborough and Nambour Stations.

The early works are largely located in areas that have been subject to previous disturbance, however, some vegetation clearing will be required for the Steve Irwin Way realignment (Figure 2 below), including:

- Approximately 0.22 ha of mapped remnant vegetation that is also mapped as core Koala habitat under State mapping that is on an existing agricultural property. This area is already fragmented by agricultural clearing and the presence of Steve Irwin Way to the west.
- Approximately 0.13 ha of non-remnant vegetation that is not mapped as core Koala habitat that lines an existing farm access road
- Approximately 1.2 ha of non-remnant vegetation that is not mapped as core Koala habitat, between the existing road and rail for the relocation of public utility plant. This vegetation was assessed in flora surveys and contains open Eucalyptus and Casuarina woodland. The vegetation is disturbed given its location between the railway and road.

The Landsborough Station carpark expansion will affect some vegetation (non-remnant and not mapped under State mapping as Koala habitat), totalling approximately 0.9 ha (Figure 3 below). This vegetation is isolated and separated from other vegetation by roads, rail and residential and industrial areas therefore would be low value as Koala habitat.

In total the early works will impact approximately 2.45 ha of vegetation, of which 0.22 ha is critical Koala habitat (mapped as core habitat under State mapping) and therefore would also potentially serve as a foraging resource for Grey-headed Flying Fox. The other vegetated areas are fragmented and separated from other vegetation by barriers therefore are likely to be low value as Koala habitat.

The other aspects of the early works (geotechnical investigations and Nambour Station carpark) do not require any vegetation clearing (except potentially some landscaping in the case of Nambour Station carpark, refer Figure 4 below).

Desktop and field assessment did not identify any other habitat for MNES in the areas of the early works.

Due to the small amount of remnant vegetation to be cleared, the disturbed nature of the majority of the early works locations (existing road or rail reserve and agricultural land) and the lack of MNES found in field surveys, these works have been assessed as not likely to result in a significant impact to MNES.



Figure 2 Steve Irwin Way early works - showing location of mapped core Koala habitat (green) and other vegetation





Figure 3 Landsborough carpark early works location - showing isolated vegetated areas

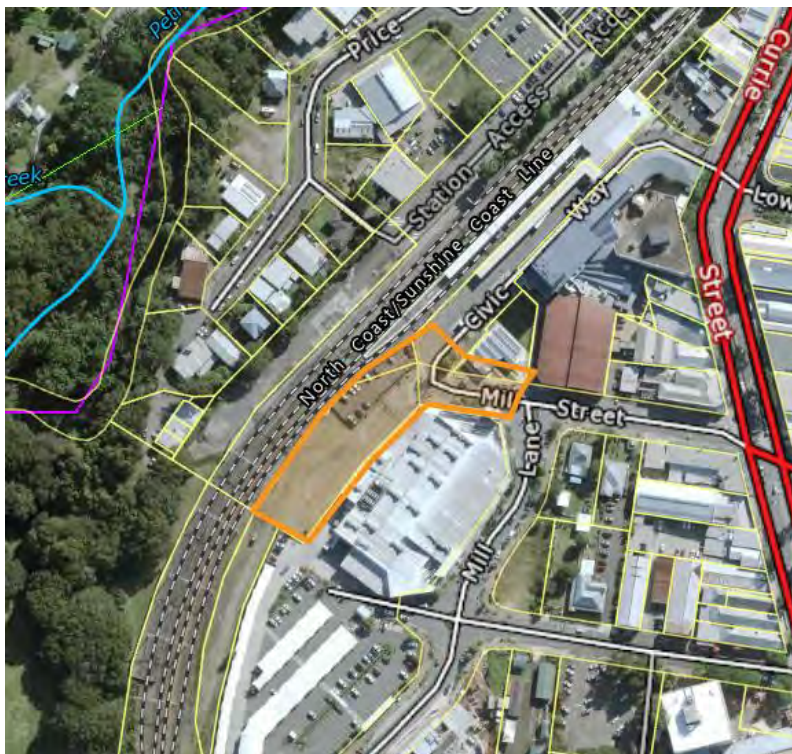


Figure 4 Nambour carpark early works location – showing lack of vegetation

**5. Provide a discussion regarding the suitability of Koala surveys provided only within the non-breeding season and shoulder period of the breeding season for a species that is inherently cryptic and is known for seasonal variability.**

Survey for Koala *Phascolarctos cinereus* presence and activity in the study area was undertaken using the Koala Spot Assessment Technique (SAT) and using detection dogs. The effectiveness of the SAT method, which was developed by the Australian Koala Foundation, has been demonstrated and published in a peer-reviewed publication.

SAT is an indirect detection method and more likely to detect evidence of Koala, compared to direct observation methods which rely on sightings of this cryptic fauna. Koala faecal pellets would stay on the ground even after the animal has left the area and provide evidence of the animal's presence without direct observation required. The EPBC referral guideline for the vulnerable Koala recognises that indirect methods are often the most effective for gathering presence/absence data, due to the difficulty in observing koalas and the variable density of koalas across the landscape. Note that during the SAT surveys, the survey team also visually checked the trunk and branches of the surveyed tree, thus including a combination of direct observation in the survey area.

This survey method, as with any indirect survey for fauna, must take into account the effects of various factors on sign detectability – rate of faecal pellet decay by uncontrollable factors (e.g. sunlight, moisture, local weather, etc). This has been acknowledged in the methodology in Section 5.3.4 of the Commonwealth Matters Ecological Report, which also added that while there was rainfall occurring during the weeks before the additional 2020 surveys, in particular the February survey, it is not likely that Koala faecal pellets deposited during those weeks would have decayed to a point where they became un-detectable.

The use of Koala detection dogs trained to detect Koala faecal pellets has the above benefits of the SAT technique and furthermore, it has been shown in peer reviewed literature (referenced in methodology in Section 5.3.4 of the Commonwealth Matters Ecological Report – Cristescu et al. 2015), to be more accurate and efficient than human surveys in locating Koala faecal pellets. The Koala dog surveys were undertaken in August 2020 which is early in the Koala breeding season, and during the Koala detection dog survey, the dog was not constrained by the handler and could therefore freely follow any scent.

The survey methods and timing are therefore considered to be suitable for detecting Koala in the landscape.

**6. Review the scores provided in the Koala Habitat Assessment Tool including that clearing is proposed to occur within a contiguous habitat, and provide further evidence that the habitat is not important to achieve interim recovery objectives, consistent with the interim recovery objectives description provided within the guidelines.**

Section 5.3.4 of the Commonwealth Matters Ecological Report provides the EPBC Act Koala Habitat Values Assessment and key points are provided below, with additional information provided as required.

Contiguous landscape

The EPBC Referral Guideline for the vulnerable Koala defines contiguous landscape as:

*An area of Koala habitat that is greater than 300ha in the coastal context..., which encompasses no barriers but is bounded by barriers.*

The definition of barrier is:

*A feature (natural or artificial) that is likely to prevent the movement of Koalas. Artificial barriers may include infrastructure (such as roads, rail, mines, large fences etc) without effective Koala passage measures.*

The project alignment and mapped critical Koala habitat within the project boundary are not considered to be part of a contiguous landscape due to:

- The project boundary is within a fragmented landscape with multiple existing barriers. Remaining habitat fragments in the study area around the railway to be upgraded are already disturbed and dominated by edge environments.
- The largest contiguous area of habitat within the project area (that is not fragmented by existing barriers) is located near Beerburrum, to the east of Glass House National Park. This area is less than 20 ha in size (of which approximately 10 ha is impacted by the project) and is separated from other areas of contiguous habitat by barriers which include the existing rail line to the west and Steve Irwin Way to the east.

Therefore, whilst there are areas of contiguous Koala habitat greater than 300ha/500ha in the wider area, the impacts from the project are separated from these contiguous areas by existing barriers (as defined in the guideline). Therefore, the habitat connectivity score in accordance with the Koala habitat assessment tool should be 0, but was conservatively provided as 1 in the assessment documented in the Commonwealth Matters Ecological Report.

The project boundary mostly follows the existing rail line, thereby minimising the impacts of the project on Koala habitat. The impacts to Koala habitat are mostly clearing the edges of vegetation patches that exist on either side of the existing rail line (and these edges are usually the most weed impacted and disturbed part of the patch). The project will not result in broad-scale clearing of vegetation that is Koala habitat.

Note that not all vegetation within the project boundary would constitute habitat critical to the survival of the Koala species, particularly considering the outcomes of field surveys for Koala and vegetation types falling within the project boundary (e.g. including street trees in urban area and screen plantings of shrubs). The remaining vegetation within the project boundary generally consists of agricultural land, non-remnant vegetation, plantings or dominated by exotic plants and disturbed area like roads and verges.

At Beerburrum, the new rail corridor will be east of the existing corridor, and is aligned more closely with Steve Irwin Way. The old rail corridor adjacent to Glasshouse Mountains National Park will no longer be used, with rail infrastructure removed, and ultimately will become a rail trail. The disused rail corridor is proposed to be rehabilitated to maximise Koala habitat and improve connectivity through this area. Therefore, the old rail corridor will no longer constitute a barrier between the National Park and the other areas of vegetation to the east, thus creating a larger area of contiguous habitat. This and other additional mitigation measures, in addition to mitigation measures proposed in the Commonwealth Matters Ecological Report, are documented below.

#### Interim recovery objectives

Table 1 of the EPBC Act Referral Guidelines for the Vulnerable Koala identifies the interim recovery objectives for the species. For coastal habitats, this includes:

- Protect and conserve large, connected areas of Koala habitat
- Maintain corridors and connective habitat that allow movement of Koalas between large areas of habitat.

Most areas of vegetation in the project boundary, including the mapped critical Koala habitat, have been impacted from existing disturbance and fragmentation. Koala habitat within the project area is already fragmented, often surrounded by developed areas and susceptible to exotic fauna disturbance. As stated above, the impacts to Koala habitat are mostly clearing the edges of vegetation patches that are present on either side of the existing rail line (and these edges are usually the most weed impacted and disturbed part of the patch). It is also critical to note that the project boundary mostly follows the existing rail line, thereby minimising the impacts of the project on Koala habitat. Where the project alignment deviates from the existing alignment (ie at Beerburrum), this creates an opportunity to consolidate areas of habitat by removing rail infrastructure from the disused corridor and creating a larger area of contiguous habitat.

There is an existing lack of connectivity from west to east due to the existing railway alignment and existing main roads such as Steve Irwin Way and Old Landsborough Road. The project will not significantly increase these threats as the project is adjacent to existing barriers. The majority of the project boundary can be classed as 'urban area' with existing effects of habitat loss, fragmentation, vehicle strike, dog attack, degradation of habitat by weeds and other threats from human activities.

Koala SAT surveys combined with detection dog survey, indicate that there is generally low Koala density and abundance in the areas within and adjacent to the project boundary. Surveys showed no evidence for Koala activity, except at two locations adjacent to the project boundary at Landsborough (i.e. one faecal pellet and possible Koala scratch marks on a tree).

With reference to the clarifications provided by DAWE (11/11/2020), the following are identified by DAWE as potential corridors that would have increased fragmentation as a result of the project:

- Adjacent to Glass House Mountains National Park at Beerburrum
- Two sections of east/west connectivity at Glass House Mountains (Coonowrin Creek and tributary)
- Coochin Creek south of Beerwah.



At each of the above locations, there are vegetated areas either side of the existing and proposed rail crossing. However, these potential corridors are already constrained by the existing rail corridor and in the case of Beerburrum, by the presence of Steve Irwin Way. Alignment of the new rail corridor with existing transport infrastructure, assists to minimise additional fragmentation. Furthermore, at both Coonowrin and Coochin Creeks, fauna passage will be provided at the new bridges to minimise the extent of additional fragmentation from the project.

The DAWE Information Request references a figure showing a mapped Regional Biodiversity Corridor in the Beerburrum area. This State mapping is high level mapping that does not account for existing barriers in the landscape (including existing rail and roads) and does not have legislative effect.

Additional mitigation measures have been identified for the Beerburrum area of the project, since the submission of the Referral, that will serve to maintain corridors and connective habitat to allow movement of fauna (in particular Koala). These additional measures will form project commitments that will be implemented in the design and construction of the project, and include:

- The rehabilitation of approximately 3.5 ha of vegetation (i.e. through planting of Koala habitat trees) on either side of the disused rail corridor at Beerburrum, from Beerburrum Road to the northern end of the National Park. This will assist in reducing fragmentation and facilitate fauna movement. Figure 5 below shows the proposed revegetation.
- Dry fauna passage will be provided under the new rail corridor north of Beerburrum, with appropriate fauna fencing to encourage use by Koalas and other fauna. Figure 6 below shows a sketch of the fauna passage proposed.
- An overhead rope ladder bridge will be provided over Steve Irwin Way for other arboreal fauna.

The location of these measures is shown in Figure 7 below.

Other mitigation that is documented in the Commonwealth Matters Ecological Report includes:

- Dry fauna passage including for Koalas at suitable bridge crossings, including Coochin Creek, Coonowrin Creek and Tibrogargan Creek.
- Opportunities will also be investigated for fauna passage to be incorporated at the Steve Irwin Way and Beerburrum Road intersection.
- Fauna exclusion fencing to be used in conjunction with fauna mitigation structures, and is to include Koala fencing where fauna mitigation structures are adjacent to mapped core Koala habitat. The location and extent of fauna exclusion fencing is to be located to direct fauna into the fauna mitigation structures.

Provision of fauna mitigation structures will be developed by suitably qualified and experienced personnel as the design progresses and documented in an Environmental Design Report (EDR).

In conclusion, the score of 1 against the 'Recovery Value' item in the Habitat Assessment Tool is considered appropriate and conservative as the habitat that is impacted by the project is not likely to be important for the achieving the interim recovery objectives outlined in Table 1 of the EPBC Referral Guideline for the Vulnerable Koala. This is due to the impact being to multiple small patches of vegetation that are already fragmented by existing infrastructure.

Sketch is representative only, revegetation with native species will be designed to maximise connectivity for fauna.

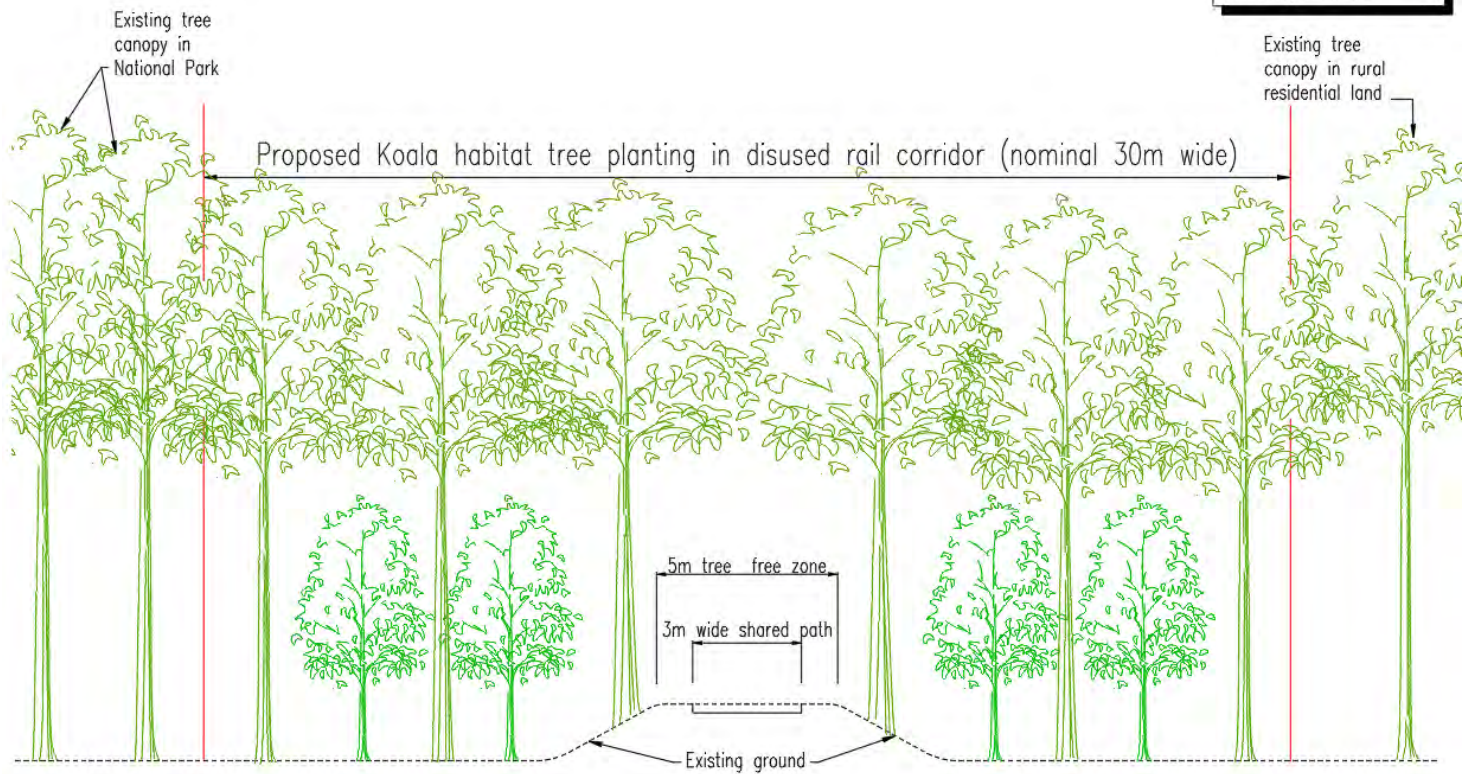


Figure 5 Rehabilitation of disused rail corridor near Beerburrum (indicative)

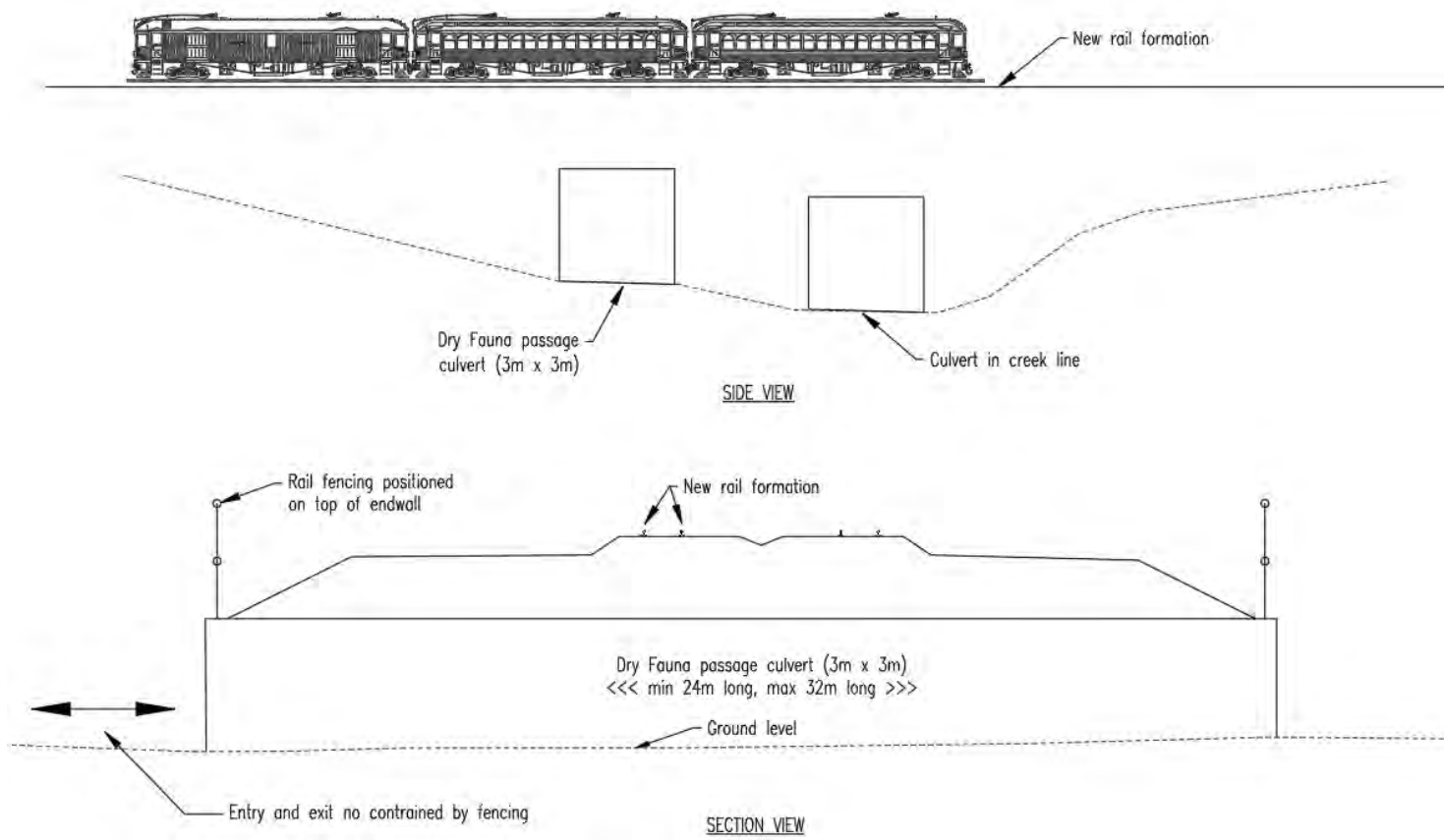


Figure 6 – Proposed fauna passage culvert near Beerburrum (indicative)



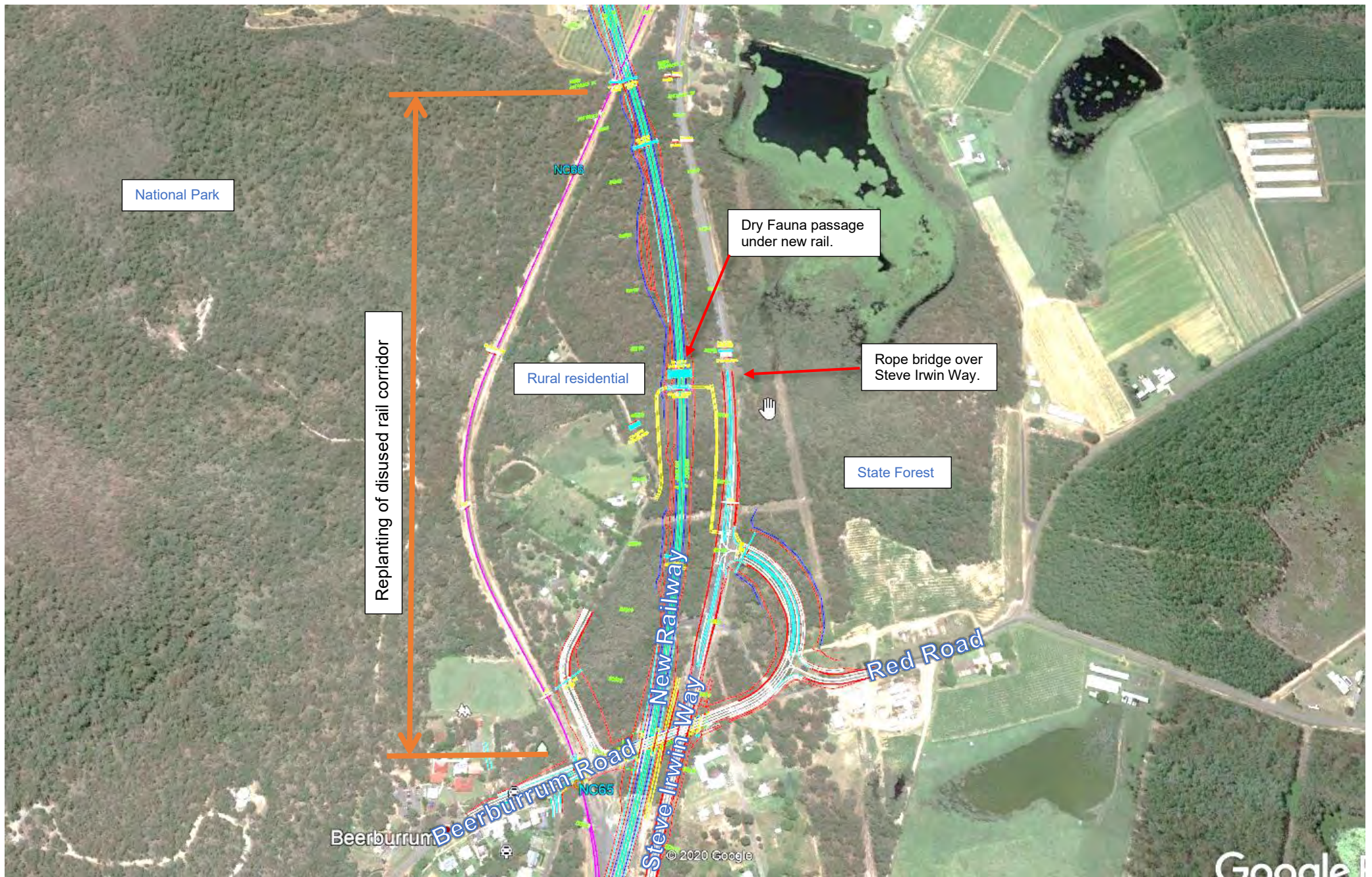


Figure 7 – Location of proposed additional mitigation measures



**7. Provide a map clearly showing the proposed impacts in proximity to nearby Grey-headed Flying fox roost sites and any indirect and/or direct impacts to foraging habitat within the disturbance footprint. Please provide an assessment of the available alternative winter and spring foraging resources in the area.**

A map of the roost sites and the project boundary is provided in Figure 4 of the Commonwealth Matters Ecological Report. The proximity between each roost site and the project boundary are also provided in Table 12 of the report.

Winter and spring foraging resources are present in the project area, including winter to spring flowering *Eucalyptus* species such as Scribbly Gum, Forest Red Gum, Tindale's Stringybark, Swamp Mahogany and Grey Ironbark. Other native flowering trees providing nectar in winter to spring such as *Banksia integrifolia* are also present

The project will directly impact approximately 27.5 ha of foraging habitat for Grey-headed Flying Fox. At the local and regional contexts, the loss of foraging habitat from the project will comprise a very small proportion of the foraging habitat available for this species in the study area, being limited to the narrow, linear alignment of proposed railway upgrade and mostly modified/agricultural areas.

The approach to assessing impacts to Grey-Headed Flying Fox habitat was consistent with DAWE's perspective that foraging habitat for this species and Koala habitat are analogous:

- It has been estimated that approximately 25 ha of mapped critical Koala habitat would be directly impacted by the project. The vegetation types that support Koala contain Eucalyptus, Corymbia and Melaleuca trees which are not only food sources for Koala but would also be nectar resources for Grey-headed Flying Fox, including winter flowering trees that provide seasonal nectar. Therefore, it is considered that approximately 25 ha of suitable foraging habitat for Grey-headed Flying Fox will be impacted.
- To account for scattered trees and shrubs that are not mapped as critical Koala habitat but would also provide nectar resources, a further 10% increase of the estimated Koala habitat would result in a conservative estimate of approximately 27.5 ha of Grey-headed Flying Fox nectar resources being in the project boundary. This is 11% of the approximately 253 ha within the project boundary. However scattered trees and shrubs that are more isolated, i.e. not within a remnant vegetation patch, would likely provide opportunistic foraging opportunities and less likely to be preferred / primarily used foraging habitat by Grey-headed Flying Fox.

As discussed in Appendix C1.6 of the Commonwealth Matters Ecological Report, this is considered an overall conservative approach to mapping Grey-headed Flying Fox nectar resources, as not all areas of Koala habitat or isolated shrubs/trees would contain nectar resources (these areas would not entirely consist of the particular shrub/tree species that provide seasonal nectar). Furthermore, the Koala habitat mapping would include many patches of exotic Pine trees that are too small and scattered to map at the scale of the project, and exotic Pine trees do not provide habitat resources for Grey-headed Flying Fox.

Alternative winter and spring foraging resources

Grey-headed Flying-foxes forage over extensive areas. Important winter and spring habitats include vegetation communities that contain *Eucalyptus tereticornis*, *E. albens*, *E. crebra*, *E. fibrosa*, *E. melliodora*, *E. paniculata*, *E. pilularis*, *E. robusta*, *E. siderophloia*, *Banksia integrifolia*, *Castanospermum australe*, *Corymbia citriodora citriodora*, *C. eximia*, *C. maculata* (south of Nowra, New South Wales), *Grevillea robusta* or *Melaleuca*

*quinquenervia* (as listed in the Draft National Recovery Plan for the Grey-headed Flying-fox *Pteropus poliocephalus* (DECCW 2009)).

Assessment of available alternative winter and spring foraging resources for this species within a 5 km radius of the project boundary notes an abundance (14,462 ha) of available remnant vegetation. Many of the regional ecosystems (RE) in this vegetation have tree species including the winter and spring flowering trees listed above. These mapped REs containing those tree species cover approximately 9,200 ha within a 5 km radius of the project boundary.

The project area itself is narrow and linear at the landscape context and will not result in the broad-scale clearing of Grey-headed Flying-fox foraging habitat; however, the existing remnant foraging vegetation that would be impacted by the project would account for approximately 0.3 % of available foraging resources within 5 km of the project boundary (27.5 ha out of 9,200 ha).

**8. Provide an assessment utilising the Significant Impact Guidelines 1.1 regarding the proposed action's potential impacts on Glass House Mountains National Landscape, with reference to the criterion and values as identified in the Glass House Mountains National Landscape Gazettal notice. Please provide clear mapping showing the boundaries of the proposed project footprint and the boundary of the Glass House Mountains National Landscape.**

Appendix C (Section C1.1) of the Commonwealth Matters Ecological Report provides an assessment against the Significant Impact Guidelines for the Glass House Mountains National Heritage Place, with reference to the values of the National Heritage Place. The assessment determined that the project is not likely to have a significant impact on the values of the National Heritage Place.

In addition to the assessment provided in Appendix C of the report, a further review has been conducted of the potential for hydrological impacts from the project. The potential for significant hydrological impacts is low as the project is downstream from the National Heritage Place, the new rail alignment is further from the heritage place boundary. Approximately 1 km of the old rail alignment that is currently adjacent to the heritage place will be decommissioned. Construction management measures will be in place to avoid or minimise indirect impacts where works are adjacent to the National Heritage Place.

Figure 9 of the Commonwealth Matters Ecological Report shows the Glass House Mountains National Park (which overlaps the National Heritage Place) in relation to the proposed project footprint.

**9. Provide clarification regarding overlap with any existing EPBC actions.**

As identified in the referral and Section 1.1 of the Commonwealth Matters Ecological Report, the Landsborough to Nambour (L2N) Rail Project is a separate Queensland Government project including duplication of the North Coast Line between Landsborough and Nambour (with significant sections of duplication outside the existing rail corridor). At this stage, no detailed pre-investment planning has been progressed for the L2N future rail upgrade project. The delivery of the L2N project, if it occurs, will be subject to funding availability and State-wide prioritisation and is not currently under consideration for delivery in advance of 2032.



The L2N project area only overlaps with the B2N project area at Nambour, where it is proposed that early works for the B2N project include additional carparking at Nambour Station.

TMR has commenced the motion to withdraw the L2N EPBC Referral (EPBC 2008/4151). Works at Nambour for the B2N project (in the area overlapping the project area from the L2N referral) will not commence until the L2N Referral is withdrawn.

Yours sincerely



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