






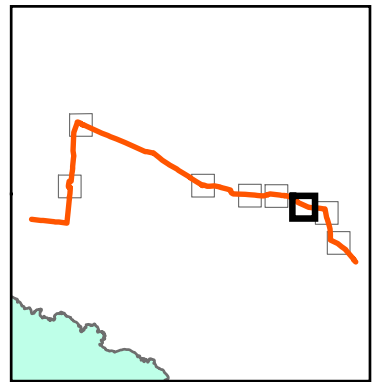
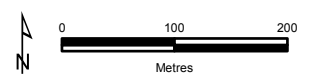




- Legend**
-  Construction RoW
  -  Horizontal Directional Drilling
  -  Potential Growing Grass Frog Habitat Assessed
  -  Damp Heathy Woodland
  -  Plains Grassy Wetland
  -  Swamp Scrub
  -  Swampy Riparian Woodland



**Figure 2**  
**Survey Sites and Ecological Features**  
*Targeted Fauna Survey, Halladale and Speculant Project*








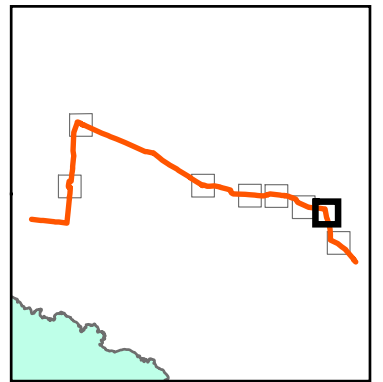
VicMap Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.

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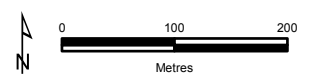




- Legend**
-  Construction RoW
  -  Horizontal Directional Drilling
  -  Camera Locations
  -  Damp Heathy Woodland
  -  Swampy Riparian Woodland



**Figure 2**  
**Survey Sites and Ecological Features**  
*Targeted Fauna Survey, Halladale and Speculant Project*








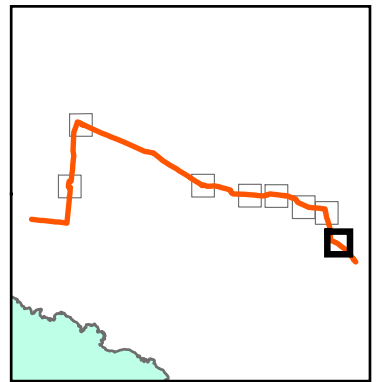
VicMap Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.

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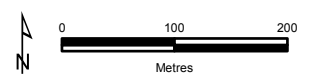




- Legend**
-  Construction RoW
  -  Horizontal Directional Drilling
  -  Camera Locations
  -  Damp Heathy Woodland
  -  Swampy Riparian Woodland



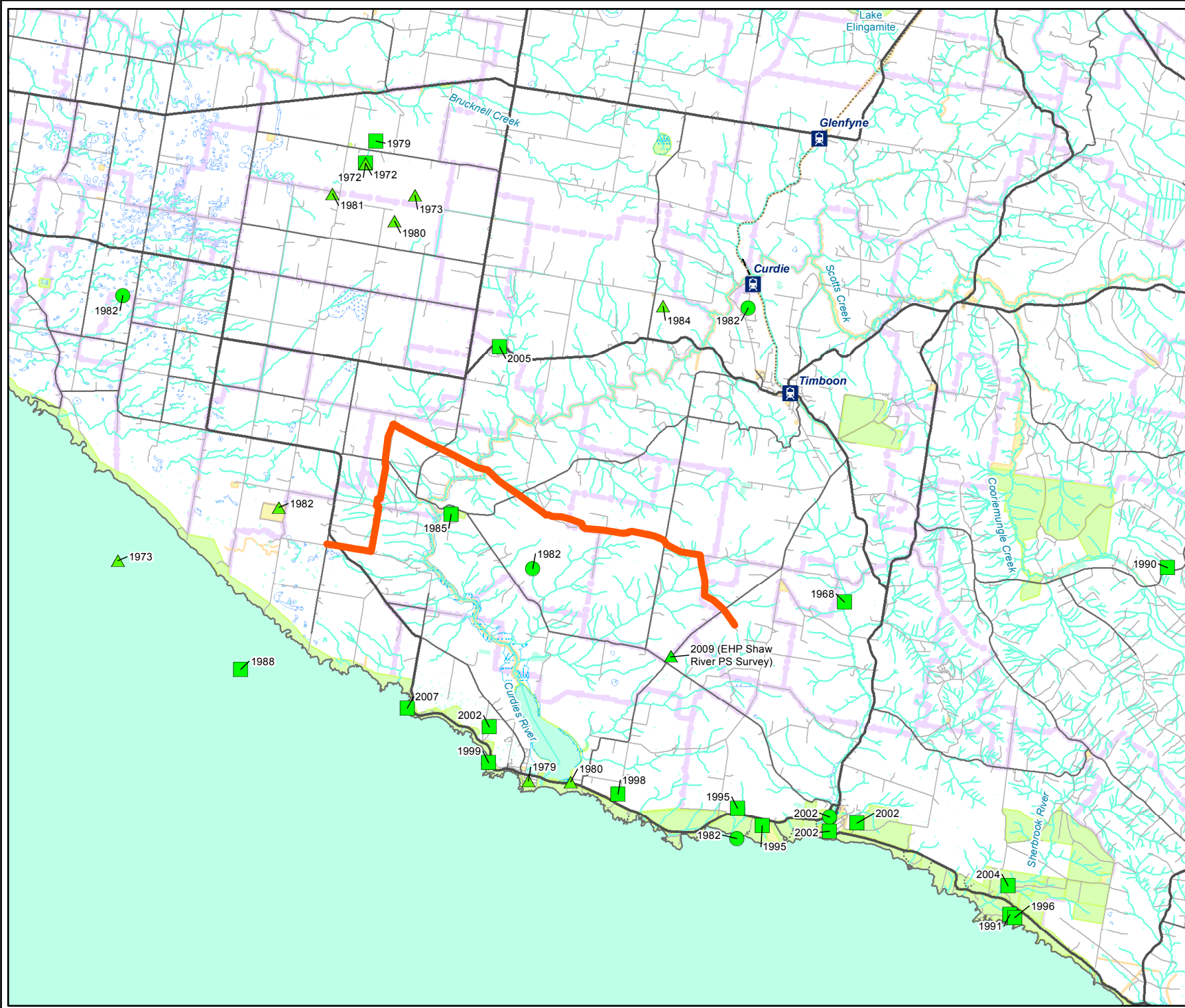
**Figure 2**  
**Survey Sites and Ecological Features**  
*Targeted Fauna Survey, Halladale and Speculant Project*



VicMap Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.

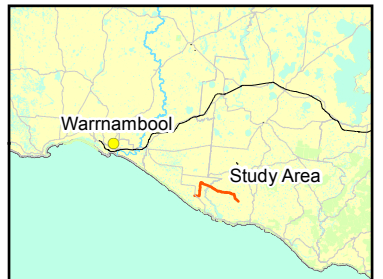
6581 Fig02 EcoFeatures 25/05/2015 cbrowning



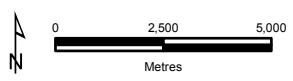


**Legend**

- Study Area
- Southern Brown Bandicoot Records
- ▲ Long-nosed Potoroo Records
- Growling Grass Frog Records
- Major Road
- Collector Road
- Minor Road
- Walking Track
- Minor Watercourse
- Permanent Waterbody
- Land Subject to Inundation
- Wetland/Swamp
- Parks and Reserves
- Crown Land
- Localities



**Figure 3**  
**Target Species Records (VBA)**  
*Targeted Fauna Survey, Halladale and Speculate Project*



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6581\_Fig03\_Sp\_Records 8/04/2015 cbrowning

## APPENDICES

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## APPENDIX 1 - SURVEY RESULTS

### Appendix 1.1: Weather conditions during the field surveys

**Table A1** Weather conditions during the field surveys

Date	Survey Event	Temperature			9:00 AM			3:00 PM		
		Min (°C)	Max (°C)	Rain (mm)	Temp. (°C)	Relative humidity (%)	Wind speed (km/h)	Temp. (°C)	Relative humidity (%)	Wind speed
03/02/15	GGF survey #1	13.2	19.1	0	14.6	79	7	17.6	62	24
04/02/15	Remote Camera Survey #1	12.5	19.2	0	15.1	79	24	18.1	50	30
05/02/15		12.8	22.2	0	16.6	77	22	21.5	61	37
06/02/15		11.1	36.6	0	18.8	72	20	34.4	21	17
07/02/15		18.8	33.8	0	29.4	31	24	27.6	47	2
08/02/15		15.8	21.1	0	16.9	76	22	19.5	69	28
09/02/15		12.9	21.8	0	16.0	64	20	20.2	62	19
10/02/15		8.1	24.9	0	16.4	86	9	23.6	60	24
11/02/15		15.1	25.9	0	16.0	100	2	23.7	60	13
12/02/15		13.2	21.4	0	17.1	60	19	19.1	57	37
13/02/15		10.1	35.9	0	20.5	76	20	32.1	37	24
14/02/15		17.6	28.0	7.2	19.9	89	20	26.6	48	22
15/02/15		15.7	37.8	0	19.6	76	22	37.0	28	15
16/02/15		12.3	21.1	0	17.4	81	20	19.1	66	31
17/02/15		14.2	20.1	0	15.7	80	7	18.7	64	20
18/02/15		14.4	22.0	0	16.0	79	9	21.0	59	31
19/02/15	GGF Survey #2	13.8	26.7	0	17.4	83	7	25.0	58	19
20/02/15	Remote Camera Survey #2	13.6	24.6	0	16.2	100	13	22.1	66	31
19/03/15		13.6	26.5	0	22.1	56	22	22.2	56	41
20/03/15		9.6	19.3	0.4	12.1	90	13	18.1	51	28
21/03/15		5.9	19.9	0.2	13.0	65	7	18.4	49	28
22/03/15		2.1	31.0	0	10.4	99	17	29.7	25	31
23/03/15		10.4	22.0	0.4	20.5	52	33	16.1	88	35
24/03/15		11.2	15.0	3.2	11.6	77	20	14.4	56	30
25/03/15		7.8	21.0	0	11.9	66	17	18.6	38	30
26/03/15		6.8	13.6	5.2	8.5	90	28	11.6	97	33
27/03/15		8.5	16.9	20.2	12.7	84	28	14.1	82	28
28/03/15		10.5	16.6	0.6	12.0	99	13	15.9	67	15
29/03/15		6.1	21.4	0	11.3	92	15	20.6	48	17
30/03/15		8.2	21.3	0	11.9	99	11	20.3	62	20
31/03/15		8.5	26.2	0	10.8	100	13	25.3	43	7
01/04/15		10.7	28.2	0.2	17.2	62	22	27.3	23	35
02/04/15	11.2	16.6	2.6	13.4	64	31	14.6	51	33	

**Source:** Australian Bureau of Meteorology - Temperature, humidity, wind, and rainfall observations from Warrnambool Airport (Station 090186). <http://www.bom.gov.au/products/IDV60801/IDV60801.94837.shtml>

## Appendix 1.2: Targeted Southern Brown Bandicoot and Long-nosed Potoroo Survey Results

**Table A2** Results: Remote Camera Survey 1 (03/04 February - 19/ 20 February 2015)

Site	Shots	Feral Cat		Red Fox		European Rabbit		Rodent sp.		European Hare		EG Kangaroo		Ringtail Possum	
		Count	Dates	Count	Dates	Count	Dates	Count	Dates	Count	Dates	Count	Dates	Count	Dates
S1	17													1	13/02/15
S2	41					4	6/02/15, 08/02/15, 11/02/15, 14/02/15								
S3	218					12	6/02/15, 07/02/15, 08/02/15, 10/02/15, 11/02/15, 13/02/15, 14/02/15, 15/02/15, 16/02/15, 17/02/15, 19/02/15, 20/02/15	4	10/02/15, 14/02/15, 16/02/15, 18/02/15					1	16/02/15
S4	993					17	4/02/15, 05/02/15, 06/02/15, 07/02/15, 08/02/15, 09/02/15, 10/02/15, 11/02/15, 12/02/15, 13/02/15, 14/02/15, 15/02/15, 16/02/15, 17/02/15, 18/02/15, 19/02/15, 20/02/15								
S5	4929					1	5/02/2015								
S6	3453	4	5/02/15, 12/02/15, 13/02/15, 14/02/15	1	10/02/2015	1	11/02/2015	5	11/02/15, 14/02/15, 16/02/15, 16/02/15, 17/02/15	3	17/02/2015, 18/02/15, 19/02/15	1	8/02/15		
S7	3612											1	15/02/15		
S8	2183											1	8/02/15		
S9	18			1	9/02/15										

**Table A3** Results: Remote Camera Survey 2 (19 March - 02 April 2015)

Site	Shots	Feral Cat		Red Fox		European Rabbit		Rodent sp.		EG Kangaroo		Brush-tail Possum	
		Count	Dates	Count	Dates	Count	Dates	Count	Dates	Count	Dates	Count	Dates
S1	183	1	26/03/15			1	31/03/15	8	20/03/15, 20/03/15, 20/03/15, 21/03/15, 21/03/15, 24/03/15, 26/03/15, 30/03/15			1	29/03/15
S2	209			1	30/03/15								
S3	108					2	26/03/15, 28/03/15	4	31/03/15, 31/03/15, 01/04/15				
S4	10												
S5	738					7	21/03/15, 22/03/15, 23/03/15, 27/03/15, 31/03/15, 31/03/15, 01/04/15	5	20/03/15, 20/03/15, 21/03/15, 22/03/15, 25/03/15	2	23/03/15		
S6	55					2	21/03/15, 28/03/15						
S7	146									1	21/03/15		
S8	98			1	28/03/15			3	24/03/15, 27/03/15, 28/03/15				
S9	1757			2	28/03/15, 30/03/15			10	20/03/15, 20/03/15, 21/03/15, 27/03/15, 28/03/15, 29/03/15, 30/03/15, 31/03/15, 01/04/15, 02/04/15			3	21/03/15, 27/03/15, 30/03/15



## APPENDIX 2

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### Appendix 2.1: Significance Assessment - Growling Grass Frog

#### EPBC Act significance assessment

##### **Will the action lead to a long-term decrease in the size of an important population of a species?**

This species was not recorded during recent targeted surveys; however the presence of suitable habitat indicates a potential presence (medium likelihood) within the large wetland located south of Squibbs Road (GGF 2, Figure 2). There will be no direct impacts on the wetland habitat, as the project footprint lies approximately five metres north of the waterbody, encompassing grazed pasture and a small patch of Swampy Riparian Woodland. Mitigation measures employed by Origin will ensure there are no indirect impacts on the waterbody (e.g. sediment run-off).

If present, Growling Grass Frogs have the potential to use land within the construction footprint during dispersal; however there are limited refuge opportunities. The project will result in the short-term disturbance of this dispersal habitat. It is therefore considered unlikely that the project would lead to a long-term decrease in the size of a population potentially occurring within the wetland and surrounding landscape.

##### **Will the action reduce the area of occupancy of an important population?**

Impacts arising from construction in the vicinity of the wetland will be temporary, with dispersal habitat reinstated as pasture (with no physical barriers to movement) following the construction phase. As such, it is unlikely that the project would decrease the area of occupancy of this species.

##### **Will the action fragment an existing important population into two or more populations?**

The project will not result in any areas of potential Growling Grass Frog habitat becoming fragmented or isolated from other areas of habitat.

##### **Will the action adversely affect habitat critical to the survival of a species?**

No critical habitat has been listed for Growling Grass Frog to date. No areas within the project footprint are considered critical to the survival of this species.

##### **Will the action disrupt the breeding cycle of an important population?**

Given the short-term nature of disturbance proposed, the project would not disrupt the breeding cycle of any Growling Grass Frog populations potentially present.

**Will the action modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline?**

The proposed works are short-term and potential dispersal habitat disturbed will be reinstated to pasture (with no physical barriers to movement) on completion. As such, the proposed activity will not affect the availability or quality of potential habitat for this species.

**Will the action result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat?**

It is highly unlikely that invasive species (such as introduced predators) that are potentially harmful to the Growling Grass Frog would become further established as a result of the project.

**Will the action introduce disease that may cause the species to decline?**

Construction activities within waterways and riparian zones across the study area have the potential to further spread and introduce Chytrid Fungus. Waterways within the study area exist within an agricultural setting, with the majority frequently accessed by stock. Construction activities will be undertaken in accordance with the project CEMP and are unlikely to significantly increase the risk of Chytrid infection.

**Will the action interfere with the recovery of the species?**

The project is unlikely to interfere with the recovery of this species.

**Conclusion**

Growling Grass Frog was not recorded during targeted surveys, however owing to the availability of potential habitat, it is considered to have a medium likelihood of occurrence within the wetland located south of Squibbs Road (GGF2).

The Significant Impact Guidelines for the species (DEWHA 2009) recommend incorporating a minimum 200 metre buffer around waterbodies in temperate zones. As the existing pipeline alignment occurs within close vicinity to the waterbody, the preferred setback cannot be achieved. However, the wetland will not be directly impacted as part of the proposed activity and indirect impacts will be avoided through the employment of management measures prescribed (see Section 5.3).

A small area of marginal dispersal habitat adjoining the wetland will be temporarily disturbed during pipeline trenching activities. Following construction activities the dispersal habitat will be reinstated to pasture and the project will not create barriers to frog movement in the long-term.

Based on the findings of this assessment, the project is not likely to have a significant impact on Growling Grass Frog, or interfere with its recovery.



## Appendix 2.2 – Significance Assessment - Southern Brown Bandicoot

### EPBC Act significance assessment

#### **Will the action lead to a long-term decrease in the size of a population?**

It is assumed that approximately 0.31 hectares of potential habitat for Southern Browning Bandicoot would be affected by the project. This species has not been recorded in the study area during recent surveys, and is considered unlikely to be present, or if present, in very low numbers. Assuming presence, the clearing of 0.31 hectares of potential habitat for this species (across the entire study area) is unlikely to lead to a long-term decrease in the size of a local population.

#### **Will the action reduce the area of occupancy of the species?**

The removal of 0.31 hectares of potential habitat would reduce the area of potential occupancy for this species. However, given the species' foraging home range, the removal of this potential habitat is not considered significant. Furthermore, vegetation within the cleared alignment will be allowed to passively regenerate following construction and no permanent barriers to fauna movement will be created in the long-term.

#### **Will the action fragment an existing population into two or more populations?**

Any Southern Brown Bandicoots present are likely to use similar habitat resources outside the project footprint. Therefore, it is not likely that the project would isolate habitat or fragment an existing population into two or more populations.

#### **Will the action adversely affect habitat critical to the survival of a species?**

No critical habitat is listed for this species under the EPBC Act. While the project would remove approximately 0.31 hectares of potential habitat, this area is not considered to be critical to the survival of this species.

#### **Will the action disrupt the breeding cycle of a population?**

The breeding cycle of any Southern Brown Bandicoots present would not be disrupted by the proposed activity, as the extent of clearing will not limit the movement of species through linear habitats present.

#### **Will the action modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline?**

The project would affect approximately 0.31 hectares of potential habitat for this species. This species is listed as endangered and accordingly, the removal of habitat, albeit potential, is likely to add incrementally to processes that already threaten this species. However, as this species occupies a relatively large home range and habitat of similar and greater value to what is proposed for removal would be retained in the study area and surrounding landscape, the project is not likely to result in the decline of this species.

**Will the action result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat?**

It is unlikely that invasive species (such as introduced predators) that are potentially harmful to the Southern Brown Bandicoot would become further established as a result of the project.

**Will the action introduce disease that may cause the species to decline?**

It is unlikely that disease would be introduced or spread by the action.

**Will the action interfere with the recovery of the species?**

It is unlikely that the proposed works will significantly interfere with this species' recovery.

**Conclusion**

This species has not been recorded in the study area during recent surveys, and is considered unlikely to be present, or if present, in very low numbers. The project would remove approximately 0.31 hectares of potential foraging habitat. While the project would reduce available habitat (albeit potential) in the short-term, the extent and linear nature of clearing proposed is unlikely to inhibit the movement of the species' through retained habitat corridors (i.e. no significant barriers to dispersal).

Based on the findings of this assessment, the project is not likely to have a significant impact on the Southern Brown Bandicoot, or interfere with its recovery.



## Appendix 2.3 – Significance Assessment - Long-nosed Potoroo

### EPBC Act significance assessment

#### **Will the action lead to a long-term decrease in the size of an important population of a species?**

Under the EPBC Act, important populations are:

- Likely to be key source populations either for breeding or dispersal;
- Likely to be necessary for maintaining genetic diversity; and/or
- At or near the limit of the species range.

If present, the populations of Long-nosed Potoroo in the study area would not be considered important populations, as no breeding habitat would be significantly affected by the project, and the project does not occur at this species distributional limit. Furthermore, the study area (and project locality) is not included on the list of important populations published in the FFG Act Action Statement for Long-nosed Potoroo (DEPI 2013a).

#### **Will the action reduce the area of occupancy of an important population?**

If present, a population of Long-nosed Potoroo would not be classified as an important population.

#### **Will the action fragment an existing important population into two or more populations?**

If present, a population of Long-nosed Potoroo would not be classified as an important population.

#### **Will the action adversely affect habitat critical to the survival of a species?**

No critical habitat is listed for this species under the EPBC Act. The project would remove approximately 0.31 hectares of potential habitat, however this area is not considered to be critical to the survival of this species.

#### **Will the action disrupt the breeding cycle of an important population?**

If present, a population of Long-nosed Potoroo would not be classified as an important population.

#### **Will the action modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline?**

The project would affect approximately 0.31 hectares of potential habitat for this species. This species is listed as endangered and accordingly, the removal of habitat, albeit potential, is likely to add incrementally to processes that already threatens this species. However, as this species occupies a relatively large home range and habitat of similar and greater value to what is proposed for removal would be retained in the study area and surrounding landscape, the project is not likely to result in the decline of this species.

**Will the action result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat?**

It is unlikely that invasive species (such as introduced predators) that are potentially harmful to the Long-nosed Potoroo would become further established as a result of the project.

**Will the action introduce disease that may cause the species to decline?**

It is not likely that disease would be introduced or spread by the action.

**Will the action interfere with the recovery of the species?**

It is unlikely that the proposed works will significantly interfere with this species recovery.

**Conclusion**

This species has not been recorded in the study area during recent surveys, and is considered unlikely to be present, or if present, in low numbers. If present, the populations of Long-nosed Potoroo in the study area would not be considered important populations. The project would remove approximately 0.31 hectares of potential foraging habitat. While the project would reduce available habitat (albeit potential) in the short-term, the extent and linear nature of clearing proposed is unlikely to inhibit the movement of the species' through retained habitat corridors (i.e. no significant barriers to dispersal).

Based on the findings of this assessment, the project is not likely to have a significant impact on the Long-nosed Potoroo, or interfere with its recovery.