

Canopy Rope Bridge - Additional Monitoring 2022/2023

Frederickton to Eungai Pacific Highway Upgrade

Prepared for Transport for NSW

October 2023

Document control

Project no.: 1702 (PI 6.5)
 Project client: Transport for NSW
 Project office: Port Macquarie
 Document description: Frederickton to Eungai Aerial Crossing Monitoring
 Project Director: Lawrence Smith
 Project Manager: Radika Michniewicz
 Authors: Shannon Baker, Radika Michniewicz
 Internal review: Radika Michniewicz
 Document status: Rev0
 Local Government Area: Kempsey

Niche Environment and Heritage

Excellence in your environment.
 ABN: 19 137 111 721

Head Office

Level 4, 460 Church Street
 Parramatta NSW 2150
 All mail correspondence to:
 PO Box 2443
 North Parramatta NSW 1750
 Email: info@niche-eh.com

Locations

Canberra
 Illawarra
 Sydney
 Central Coast
 Port Macquarie
 Coffs Harbour
 Brisbane
 Cairns

Document revision status

Author	Revision number	Internal review	Date issued
Shannon Baker	D1	Radika Michniewicz	18/10/2023
Radika Michniewicz	R0		18/10/2023
Radika Michniewicz	R1		30/10/2023

© Niche Environment and Heritage, 2023

Copyright protects this publication. Except for purposes permitted by the Australian Copyright Act 1968, reproduction, adaptation, electronic storage, and communication to the public is prohibited without prior written permission. Enquiries should be addressed to Niche Environment and Heritage, PO Box 2443, Parramatta NSW 1750, Australia, email: info@niche-eh.com.

Any third party material, including images, contained in this publication remains the property of the specified copyright owner unless otherwise indicated, and is used subject to their licensing conditions.

Cover photograph: Left: Site 1 Camera 5 26/06/2023 (20:13:31) departure and Right: 26/06/2023 (21:41:06) return.

Executive summary

Context

This report documents the results of additional monitoring of the canopy rope bridges within the Frederickton to Eungai (F2E) section of the Pacific Highway Upgrade (the Project). This monitoring was in addition to the three monitoring cycles required by the F2E Ecological Monitoring Program (EMP, RMS 2016) for aerial crossing monitoring in order to demonstrate successful use of the canopy rope bridges. Transport for NSW (TfNSW) is required to manage and monitor the effectiveness of biodiversity mitigation measures implemented as part of the Project.

As gliders have been recorded using both eastern and western glider poles and the median glider poles at all sites on multiple occasions, it was considered that indicators of success in relation to successful complete crossings of the glider poles by glider species have been met (Niche 2020b) and glider poles have not been further monitored/discussed.

Aims

The aims of this report are to summarise the results of the additional monitoring and determine if performance measures have been met, as per the EMP.

Methods

Each of the three rope bridge crossing zones (Sites 1, 2 and 3) was monitored in 2022-2023 through the use of automated cameras. The period of monitoring for the different zones varied due to multiple troubleshooting actions required to ensure correct functioning of the cameras. Photos were not removed during troubleshooting actions and all photos captured since early 2022 were considered in the results review.

Key results

- A total of 46 fauna records were analysed. One target arboreal species, Common Brushtail Possum (*Trichosurus vulpecula*) was recorded by Camera 5 on multiple occasions at the western side of Site 1. Camera 4 (eastern side of Site 1) could not be accessed and therefore rapid succession photos were not obtained.
- Although Camera 4 (Site 1 east) could not be accessed, there was strong evidence for frequent successful return trips by a Brushtail Possum, i.e., photos of an individual travelling east (away from the camera), always followed by a return photo of an individual travelling west (toward the camera) within a period of 1-4 hours on multiple occasions.

Conclusions

Although Camera 4 (Site 1 east) could not be accessed, there was strong evidence for frequent successful return trips by a Brushtail Possum, i.e., photos of an individual travelling east (away from the camera).

Management implications

Given the strong evidence of behaviour indicating routine use of the canopy rope bridge by a Brushtail Possum at Site 1, it is recommended that this evidence be considered as demonstrating the success of the canopy rope bridge in facilitating movement and maintaining connectivity for arboreal fauna and that monitoring be discontinued.

Table of Contents

Executive summary	iii
1. Introduction	1
1.1 Context.....	1
1.2 Monitoring framework	1
1.3 Baseline data	2
1.4 Purpose of this report.....	2
1.5 Performance measures.....	2
1.6 Monitoring timing.....	2
1.7 Reporting.....	2
2. Survey Methods	3
2.1 Survey sites	3
2.2 Survey method	3
3. Results.....	5
3.1 Remote cameras.....	5
3.2 Cumulative analysis	5
4. Discussion.....	7
4.1 Performance measures.....	7
5. Recommendations	8
5.1 Contingency measures.....	8
5.2 Recommendations.....	8
6. References.....	9
Annex 1 – Remote camera results	10

List of Figures

Figure 1: Location of aerial crossings.....	4
---	---

List of Tables

Table 1: Cumulative canopy rope bridge records for the entire three-year monitoring period.....	6
Table 2: Indicators of success for the canopy rope bridges	7
Table 3: Signs of the rope bridges being unsuccessful	7
Table 4: Contingency measures.....	8

1. Introduction

1.1 Context

As part of the Frederickton to Eungai (F2E) Pacific Highway Upgrade Project (the Project), Transport for NSW (TfNSW) have implemented an Ecological Monitoring Program in accordance with the Minister for Planning's Condition of Approval (MCoA) No. 3.1. This Ecological Monitoring Program (RMS 2016) (hereafter referred to as the EMP) combines the approval conditions provided within the Ministers Conditions of Approval (MCoA) and Statement of Commitments (SoC), and defines the mitigation and monitoring requirements for threatened species and ecological communities impacted by the Project.

Aerial crossings (glider poles and canopy rope bridges) have been installed to reduce the impacts on fauna, facilitate movement and maintain connectivity for existing glider/arboreal mammal populations (RMS 2016). These structures were monitored to assess their effectiveness.

As gliders have been recorded using both eastern and western glider poles and the median glider poles at all sites on multiple occasions, it was considered that indicators of success in relation to successful complete crossings of the glider poles by glider species have been met (Niche 2020b) and glider poles have not been further monitored/discussed.

However, while arboreal fauna have been recorded on the canopy rope bridges at all sites, successful complete crossings have not been confirmed using remote cameras or recaptures during arboreal trapping. Niche 2020 therefore recommended ongoing downloading of aerial camera data to capture additional crossings by fauna for a period of one year, or less if the canopy rope bridges are deemed successful within the year, to determine success in accordance with the performance measures. This report considers an initial phase of monitoring within that one-year period.

1.2 Monitoring framework

The EMP states the following regarding monitoring:

"It is proposed that monitoring of the glider crossings be undertaken in order to provide long term insights into the mitigation effectiveness once the carriageway becomes operational. With this in mind, monitoring would commence 6 months after the structures have been installed and focus on a 4 week sampling period in autumn and spring in 2017, 2018, and 2019, after which the need for further monitoring would be reviewed in consultation with EPA".

To date, these monitoring events have been undertaken and reported on as follows:

- *Autumn and spring 2017: Aerial Crossing Monitoring 2017 (Niche 2018a)*
- *Autumn and spring 2018: Aerial Crossing Monitoring 2018 (Niche 2019a)*
- *Autumn and spring 2019: Aerial Crossing Monitoring 2019 (Niche 2020a).*
- *Autumn 2020: Aerial Crossing Monitoring 2020 (Niche 2020b)*
- *Autumn and winter 2023: Rope Bridge Monitoring 2023 (current report).*

The 2023 monitoring was in addition to the three monitoring cycles required by the EMP in order to demonstrate successful use of the canopy rope bridges. In consultation with TfNSW, the Department of Planning and Environment (DPE) and the NSW Environment Protection Authority (EPA), it was determined that the Niche 2020b recommendation for additional monitoring should be completed.

1.3 Baseline data

The EMP provides the following background information:

“Table A3 provides results of surveys in the vicinity of the three nominated aerial crossing locations. Yellow-bellied Glider has been recorded at or near each of the three crossing locations as have Brush-tailed Phascogale and other common arboreal fauna including Common Brushtail Possum, Sugar Gliders and Feathertail Glider”.

Table A3 is provided in the original EMP (Lewis 2013) and presents the results of systematic surveys for the Kempsey to Eungai Environmental Assessment (Lewis 2005).

1.4 Purpose of this report

The aims of this report are to summarise the results of the additional monitoring and determine if performance measures have been met, as per the EMP.

1.5 Performance measures

The EMP specifies the performance indicators for the rope bridges as follows:

Indicators of success for the rope canopy bridges would include one or more of the following:

- *Photographic evidence of any arboreal species using both sides of the rope ladder to indicate a successful passage.*
- *One or more arboreal species with left ear tag/notch occurring on the western side of the carriageway and arboreal fauna with right ear tag/notch occurring on the eastern side of the carriageway.*

Signs of the canopy rope bridges being unsuccessful will be based on:

- *No photographic evidence of arboreal fauna successfully crossing the rope bridge or other evidence of complete crossings (i.e. ear tags, notches).*
- *Unacceptable levels of road strike (presence of deceased individuals during each sampling period for either year). For example, recording one or more gliders as road strike in both the winter and spring would be considered as unsuccessful and require contingency measures.*

Note, trapping and therefore tagging of animals did not form part of the current monitoring.

1.6 Monitoring timing

Monitoring was undertaken in autumn and spring of 2017, 2018 and 2019, with an additional 60-day aerial crossing monitoring period in autumn 2020 and the current rope bridge monitoring 6 March 2022 until 7 September 2023.

1.7 Reporting

This report includes:

- A description of the monitoring methodology employed
- Results, including field data, of the monitoring surveys
- A discussion of the results, including how the results compare against key performance criteria
- General recommendations including the need for any corrective actions/contingency measures.

This report will be submitted to NSW DPE and the NSW EPA.

2. Survey Methods

2.1 Survey sites

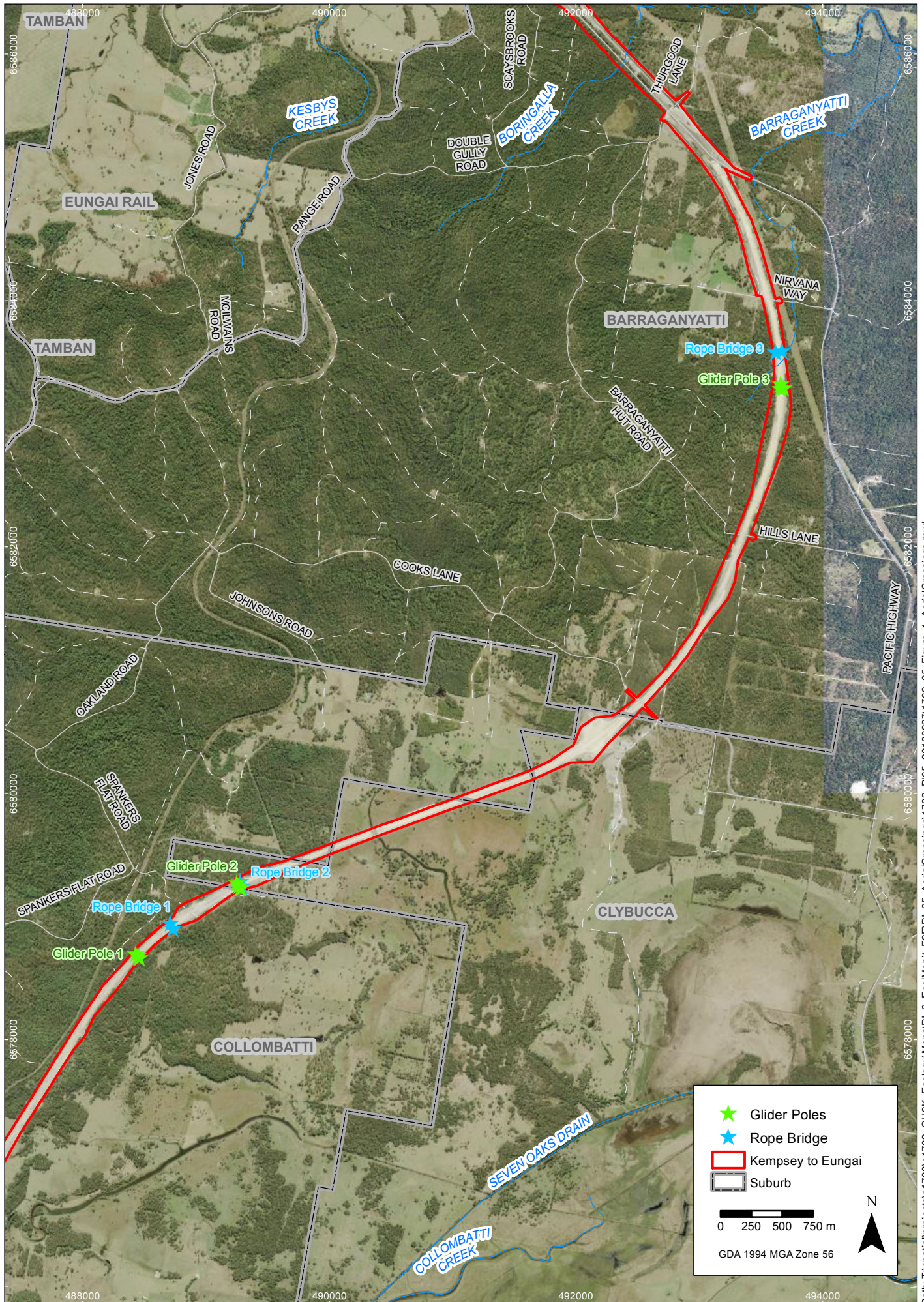
Three aerial crossing zones (hereafter Sites 1, 2 and 3) are specified in the EMP. Site 1 and 2 each have a single canopy rope bridge and a set of glider poles consisting of a pole on each opposing road verge and a single median pole. Site 3 has a single canopy rope bridge and a single glider pole crossing, consisting of two median poles and one road verge pole (east), due to existing suitable trees to glide from/to on the opposing (western) road verge. The location of each crossing structure is provided in Figure 1.

2.2 Survey method

2.2.1 Remote cameras

Automated cameras were installed at the top of each crossing structure pole. A single camera was installed on each glider pole and a single camera was installed at each end of the canopy rope bridges. Customised surveillance systems were installed at glider crossings and canopy rope bridges using BuckEye Cam X7D Covert IR wireless surveillance cameras (minimum response time 200 milliseconds) and standard antennae. Cameras were mounted on a customised adjustable camera mount or strut. Power is provided via a solar panel and extension power cable connected to a battery housing near ground level, which is mounted on each pole. Rope bridges were fitted with an external dual active infrared sensor to trigger cameras. All cameras were calibrated for short focus and reduced infrared output to maximise species identification. Images were downloaded wirelessly to ground level via X-Manager software installed on a laptop.

Drawn by: RJ Project Manager: CMcE Project Number: 1702 6.5 Date: 28/09/2018



Path: T:\spatial\projects\1700\1702_OH2K_Ecology\Maps\PL_6_EcolMonit_F2E\PL_65_AerialCrossings\1702_P165_20180927\1702_65_Figure_1_AerialCrossings.mxd

Location of Aerial Crossings
Frederickton to Eungai Pacific Highway Upgrade

FIGURE 1

Imagery: (c) LPI 2014-09-18

3. Results

Detailed remote camera data and photos (Plate 1 - Plate 7) are presented in Annex 1.

3.1 Remote cameras

The 2023 monitoring period was 6 March 2022 until 7 September 2023. Cameras 4, 5 (Site 1) 6, 7 (Site 2) and 14, 15 (Site 3) were accessed for photographic data during this time. All cameras underwent troubleshooting during this period and were therefore not functional for the entire period. In addition, Camera 4 was not able to be accessed during the download, therefore any photos were not able to be retrieved from the device.

3.1.1 Data summary

The following records were obtained and reviewed:

- Camera 4: Not accessed
- Camera 5: 43 fauna records
- Camera 6: No fauna records
- Camera 7: No fauna records
- Camera 14: No fauna records
- Camera 15: Three fauna records.

A total of 46 fauna records were analysed. One target arboreal species, Common Brushtail Possum (*Trichosurus vulpecula*), was recorded by Camera 5 on multiple occasions at the western side of Rope Bridge 1. Other species recorded during the survey period include Jacky Winter (*Microeca fascinans*), Australian Magpie (*Gymnorhina tibicen*) and an unidentified mouse or *Antechinus* sp.

3.1.2 Canopy rope bridges

Photographic data was analysed for the detection of the same species in rapid succession at both the western and eastern ends of the crossing as an indication of a successful crossing.

Two arboreal mammal species, the Brushtail Possum and an unidentified mouse or *Antechinus* sp. were detected using the canopy rope bridges. On several occasions a Brushtail Possum was observed on the western side of Site 1, travelling east and then returning west between one and four hours later in the same evening. Camera 4 (eastern side of Site 1) could not be accessed and therefore rapid succession photos were not obtained, however this behaviour would indicate routine use of the crossing by the Brushtail Possum. It should be noted that the departure and return photos considered as demonstrating successful use of the canopy rope bridge were sequential images, i.e. there were no other images between these events.

The unidentified mouse or *Antechinus* was identified once on three separate nights, providing no strong evidence of a successful crossing.

3.2 Cumulative analysis

3.2.3 Canopy rope bridges

To date, the outcome of the canopy rope bridge use by arboreal species is provided in Table 1 and can be summarised as follows:

Site 1

- Arboreal species have not been detected at **both** the eastern and western ends.
- There have been no quick succession records between the eastern and western ends.
- Feathertail Gliders and Brushtail Possums have been detected at the western end.

Site 2

- Arboreal species have not been detected at **both** the eastern and western ends.
- There have been no quick succession records between the eastern and western ends.
- Sugar and Feathertail Gliders have been detected at the western end.

Site 3

- Sugar and Feathertail Gliders have been detected at both the eastern and western ends.
- There have been no quick succession records between the eastern and western ends.
- Brushtail Possums have been detected at the eastern end.

Table 1: Cumulative canopy rope bridge records for the entire three-year monitoring period

Species	Site 1		Site 2		Site 3	
	Eastern	Western	Eastern	Western	Eastern	Western
Feathertail Glider		✓ (27)		✓ (29)	✓ (38)	✓ (43)
Sugar Glider				✓ (1)	✓ (2)	✓ (2)
Brushtail Possum		✓ (35)			✓ (2)	
Australian Magpie		✓ (1)	✓ (1)	✓ (1)		
<i>Corvus</i> spp.	✓ (55)	✓ (21)	✓ (18)	✓ (54)		
Laughing Kookaburra				✓ (10)		
Small bird				✓ (1)		
Butcher Bird				✓ (2)		
Kite/bird of prey				✓ (1)		
Jacky Winter		✓ (9)				
Unidentified mouse or <i>Antechinus</i>						✓ (3)

(n) = number of separate occasions the species was detected.

4. Discussion

4.1 Performance measures

A summary of the current, and the cumulative results in relation to the performance indicators is provided in Table 2 and Table 3.

Table 2: Indicators of success for the canopy rope bridges

Indicators of success	Discussion
Photographic evidence of any arboreal species using both sides of the rope ladder to indicate a successful passage.	This performance indicator of success has not been met. No individual has been recorded using both sides of a crossing in rapid succession. However, although Camera 4 (Site 1 east) could not be accessed, there was strong evidence for frequent successful return trips by a Brushtail Possum, i.e., photos of an individual travelling east (away from the camera), always followed by a return photo of an individual travelling west (toward the camera) within a period of 1-4 hours on multiple occasions.
One or more arboreal species with left ear tag/notch occurring on the western side of the carriageway and arboreal fauna with right ear tag/notch occurring on the eastern side of the carriageway.	This performance indicator of success has not been met. Implantation of PIT microchips was implemented (in consultation with TfNSW, DPIE and the EPA) as an alternative method to ear notching to identify individual animals. There were no captures of individually marked animals on both sides of the road.

Table 3: Signs of the rope bridges being unsuccessful

Signs of the rope bridges being unsuccessful	Discussion
No photographic evidence of arboreal fauna successfully crossing the rope bridge or other evidence of complete crossings (i.e. ear tags, notches).	This sign of unsuccessful mitigation has been met. No individual has been recorded using both sides of a crossing in rapid succession, although there are some indicators of successful use by arboreal mammals (such as repeated observations of Brushtail Possum travelling east and appearing to return west within a few hours).
Unacceptable levels of road strike (presence of deceased individuals during each sampling period for either year). For example, recording one or more gliders as road strike in both the winter and spring would be considered as unsuccessful and require contingency measures.	This sign of unsuccessful mitigation has not been met. There have been no records of road kill glider species from the road kill monitoring results.

5. Recommendations

5.1 Contingency measures

The EMP lists potential problems and contingency measures for various components of the monitoring program. The relevance of the contingency measures to the aerial crossing monitoring program are listed and discussed in Table 4.

Table 4: Contingency measures

Potential problem	Contingency measure proposed in EMP	Discussion of proposed measure
No fauna recorded using the poles or rope ladder canopy bridges	<ul style="list-style-type: none"> Review other monitoring data. Review planting schedules/status of vegetation bordering the poles and/or rope ladder canopy bridges. 	<p>Rope bridges: Successful crossings of canopy rope bridges have not been confirmed. However, although Camera 4 (Site 1 east) could not be accessed, there was strong evidence for frequent successful return trips by a Brushtail Possum, i.e., photos of an individual travelling east (away from the camera), always followed by a return photo of an individual travelling west (toward the camera) within a period of 1-4 hours on multiple occasions.</p> <p>Based on previous reviews and actions (Niche 2020a, Niche 2020b), these contingency measures are not considered relevant for canopy rope bridges.</p>
No evidence or marked/tagged gliders crossing the carriageway.	<ul style="list-style-type: none"> Review monitoring program and make necessary adjustments. Consider placing lead/lure ropes from neighbouring trees to the poles and/or rope ladder canopy bridges. 	<p>These contingency measures are not considered relevant.</p> <p>There have been no road kill records of glider species.</p>
Unacceptable levels of road strike for gliders (>1 during each monitoring event for Year 1, Year 2, Year 3)	<ul style="list-style-type: none"> Review current information of glider pole plane angles. Consider design adjustment that could improve the usability of the poles and/or rope ladder canopy bridges. Review the extent of vegetation in the median. 	<p>These contingency measures are not considered relevant.</p> <p>There have been no road kill records of glider species.</p>

5.2 Recommendations

Given the strong evidence of behaviour indicating routine use of the canopy rope bridge by a Brushtail Possum at Site 1, it is recommended that this evidence be considered as demonstrating the success of the canopy rope bridge in facilitating movement and maintaining connectivity for arboreal fauna and that monitoring be discontinued.

6. References

Lewis, B.D. (2013). Ecological Monitoring Report: Frederickton to Eungai Upgrade. Report prepared for Roads and Maritime Services by Lewis Ecological Surveys.

Lewis, B.D. (2005). Kempsey to Eungai Pacific Highway Upgrade: Fauna Survey. Report prepared by Lewis Ecological Services for Parsons Brinckerhoff-Sydney.

Niche (2018a). Aerial Crossing Monitoring 2017. Prepared for NSW Roads and Maritime Services.

Niche (2018b). Fauna Underpasses and Associated Fauna Fence Monitoring Report 2017/2018. Prepared for NSW Roads and Maritime Services.

Niche (2019a). Aerial Crossing Monitoring 2018. Prepared for NSW Roads and Maritime Services.

Niche (2019b). Fauna Underpasses and Associated Fauna Fence Monitoring Report 2018/2019. Prepared for NSW Roads and Maritime Services.

Niche (2019c). Nest Box Monitoring 2018/2019. Prepared for NSW Roads and Maritime Services.

Niche (2020a). Aerial Crossing Monitoring 2019. Prepared for Transport for NSW.

Niche (2020b). Aerial Crossing Monitoring 2020. Prepared for Transport for NSW.

RMS (2016). Frederickton to Eungai Pacific Highway Upgrade Ecological Monitoring Program. Roads and Maritime Update to report prepared by Lewis Ecological Surveys, May 2016.

Annex 1 – Remote camera results

Site	Camera	Pole	Date	Time	Species	Direction	Notes
1	5	West	14/03/2023	22:56:12	<i>Trichosurus vulpecula</i>	W	
1	5	West	14/03/2023	22:56:14	<i>Trichosurus vulpecula</i>	W	
1	5	West	19/03/2023	0:48:38	<i>Trichosurus vulpecula</i>	E	
1	5	West	19/03/2023	0:48:40	<i>Trichosurus vulpecula</i>	E	
1	5	West	22/03/2023	1:05:41	<i>Trichosurus vulpecula</i>	W	
1	5	West	17/04/2023	11:10:10	<i>Microeca fascinans</i>	N/A	
1	5	West	23/04/2023	2:25:43	<i>Trichosurus vulpecula</i>	W	
1	5	West	23/04/2023	2:25:44	<i>Trichosurus vulpecula</i>	W	
1	5	West	23/04/2023	2:25:47	<i>Trichosurus vulpecula</i>	W	
1	5	West	23/04/2023	2:25:49	<i>Trichosurus vulpecula</i>	W	
1	5	West	23/04/2023	2:25:50	<i>Trichosurus vulpecula</i>	W	
1	5	West	23/04/2023	2:25:52	<i>Trichosurus vulpecula</i>	W	
1	5	West	23/04/2023	2:29:54	<i>Trichosurus vulpecula</i>	E	
1	5	West	23/04/2023	2:29:55	<i>Trichosurus vulpecula</i>	E	
1	5	West	1/05/2023	9:49:59	<i>Microeca fascinans</i>	N/A	
1	5	West	15/05/2023	7:25:40	<i>Microeca fascinans</i>	N/A	
1	5	West	17/05/2023	19:15:34	<i>Trichosurus vulpecula</i>	E	
1	5	West	17/05/2023	20:44:53	<i>Trichosurus vulpecula</i>	W	
1	5	West	17/05/2023	20:44:54	<i>Trichosurus vulpecula</i>	W	
1	5	West	21/05/2023	6:27:15	<i>Microeca fascinans</i>	N/A	
1	5	West	21/05/2023	20:23:25	<i>Trichosurus vulpecula</i>	E	Likely successful crossing
1	5	West	22/05/2023	2:14:12	<i>Trichosurus vulpecula</i>	W	Likely successful crossing
1	5	West	24/05/2023	18:19:08	<i>Trichosurus vulpecula</i>	E	Likely successful crossing
1	5	West	24/05/2023	22:27:45	<i>Trichosurus vulpecula</i>	W	Likely successful crossing
1	5	West	24/05/2023	22:27:46	<i>Trichosurus vulpecula</i>	W	
1	5	West	1/06/2023	21:15:36	<i>Trichosurus vulpecula</i>	E	Likely successful crossing
1	5	West	2/06/2023	0:42:48	<i>Trichosurus vulpecula</i>	W	Likely successful crossing
1	5	West	2/06/2023	12:37:50	<i>Microeca fascinans</i>	N/A	
1	5	West	4/06/2023	9:32:19	<i>Microeca fascinans</i>	N/A	
1	5	West	4/06/2023	9:32:20	<i>Microeca fascinans</i>	N/A	
1	5	West	5/06/2023	19:40:49	<i>Trichosurus vulpecula</i>	E	Likely successful crossing
1	5	West	5/06/2023	22:20:38	<i>Trichosurus vulpecula</i>	W	Likely successful crossing
1	5	West	11/06/2023	19:22:22	<i>Trichosurus vulpecula</i>	E	
1	5	West	11/06/2023	19:22:24	<i>Trichosurus vulpecula</i>	E	Likely successful crossing
1	5	West	11/06/2023	20:48:15	<i>Trichosurus vulpecula</i>	W	Likely successful crossing
1	5	West	18/06/2023	11:35:16	<i>Gymnorhina tibicen</i>	N/A	
1	5	West	21/06/2023	21:17:37	<i>Trichosurus vulpecula</i>	E	
1	5	West	21/06/2023	21:17:39	<i>Trichosurus vulpecula</i>	E	Likely successful crossing
1	5	West	21/06/2023	22:20:10	<i>Trichosurus vulpecula</i>	W	Likely successful crossing
1	5	West	26/06/2023	7:46:36	<i>Microeca fascinans</i>	N/A	
1	5	West	26/06/2023	7:46:37	<i>Microeca fascinans</i>	N/A	

Site	Camera	Pole	Date	Time	Species	Direction	Notes
1	5	West	26/06/2023	20:13:31	<i>Trichosurus vulpecula</i>	E	Likely successful crossing
1	5	West	26/06/2023	21:41:06	<i>Trichosurus vulpecula</i>	W	Likely successful crossing
3	15	West	5/01/2023	5:24:03	Unidentified Antechinus or Mouse	W	
3	15	West	6/01/2023	5:11:09	Unidentified Antechinus or Mouse	E	
3	15	West	8/01/2023	4:50:59	Unidentified Antechinus or Mouse	E	

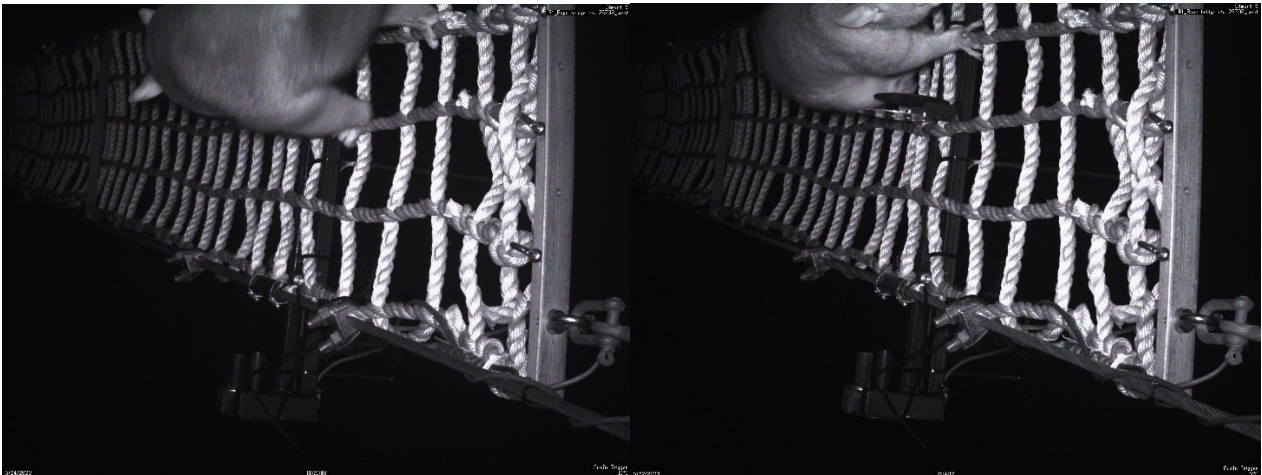


Plate 1: 21/5/2023 (20:23:25) departure and 22/05/2023 (02:14:12) return

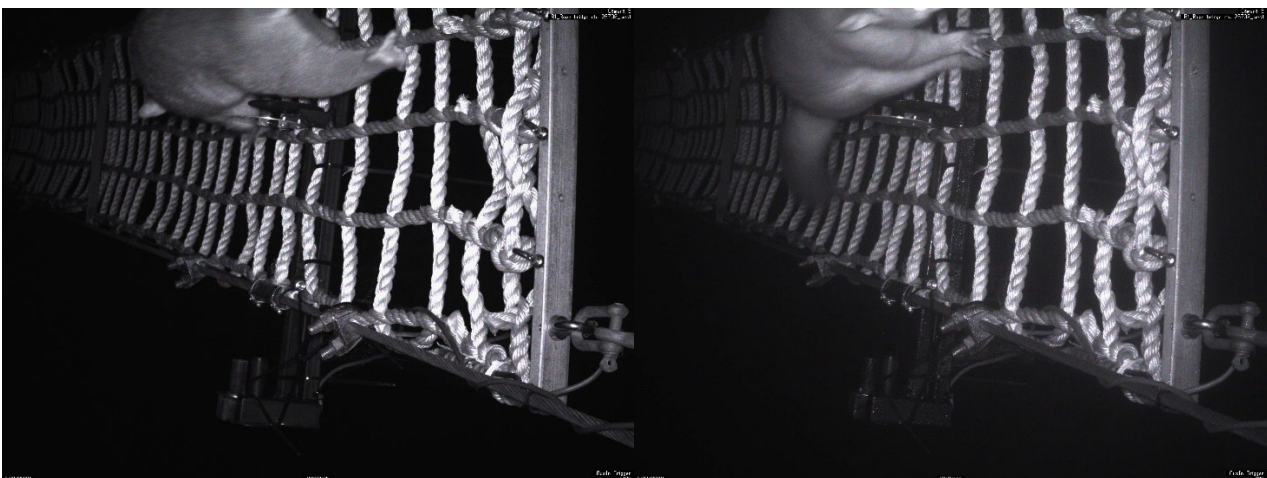


Plate 2: 24/5/2023 (18:19:08) departure and 24/05/2023 (22:27:45) return

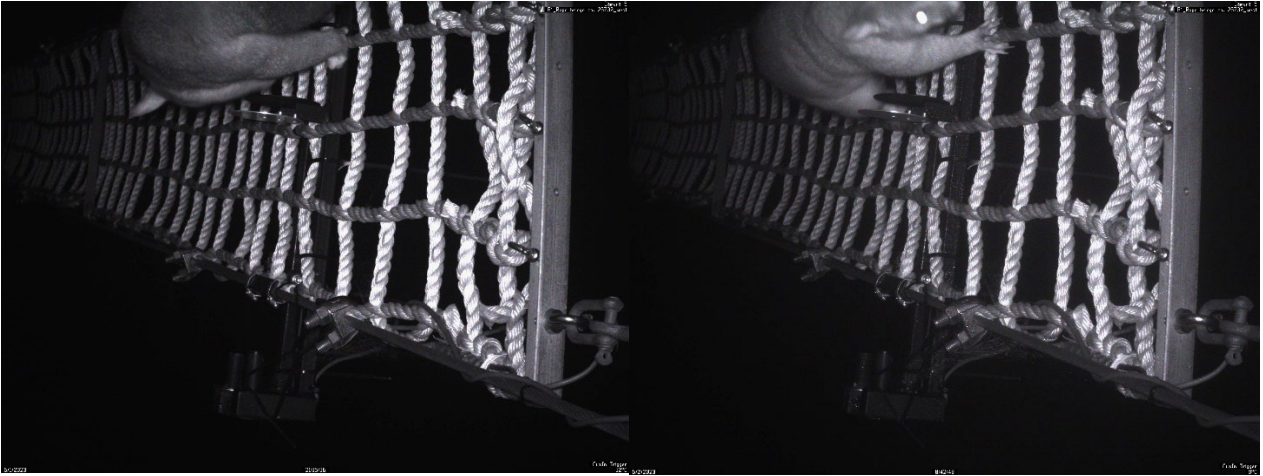


Plate 3: 01/06/2023 (21:15:36) departure and 02/06/2023 (0:42:48) return

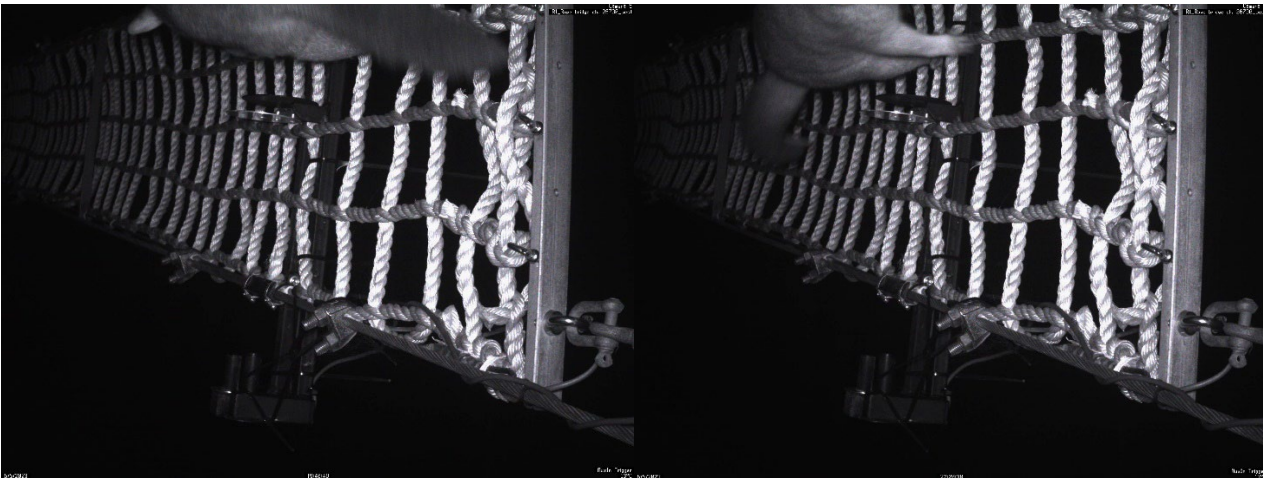


Plate 4: 05/06/2023 (19:40:49) departure and 05/06/2023 (22:20:38) return

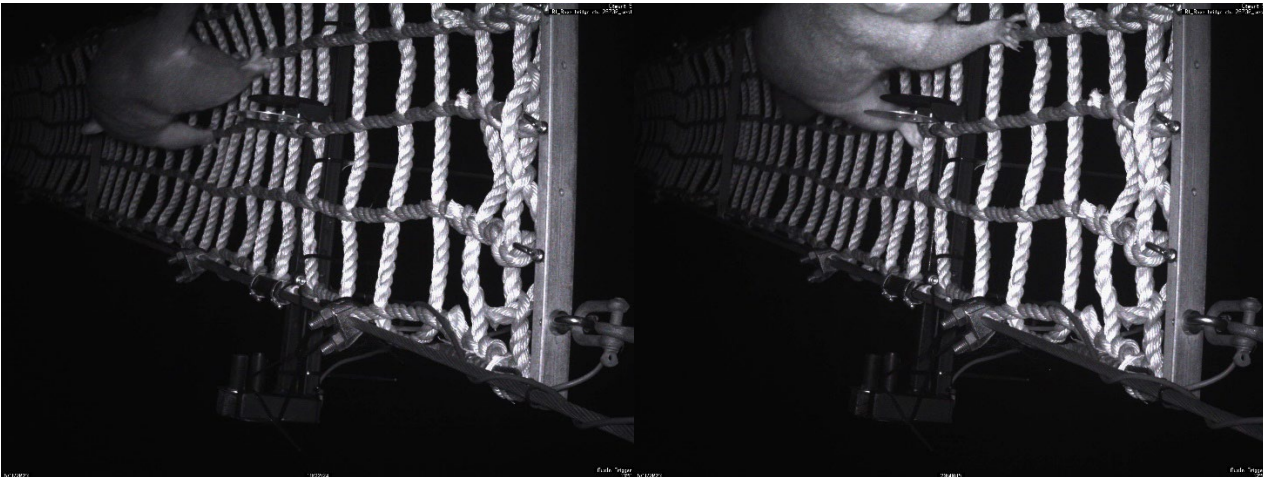


Plate 5: 11/06/2023 (19:22:24) departure and 11/06/2023 (20:48:15) return

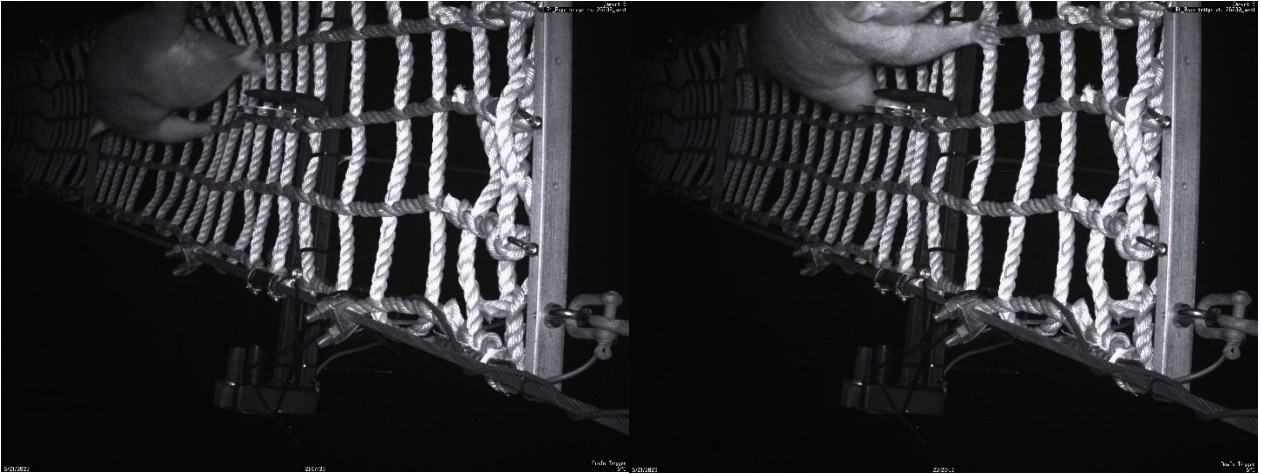


Plate 6: 21/06/2023 (21:17:39) departure and 21/06/2023 (22:20:10) return

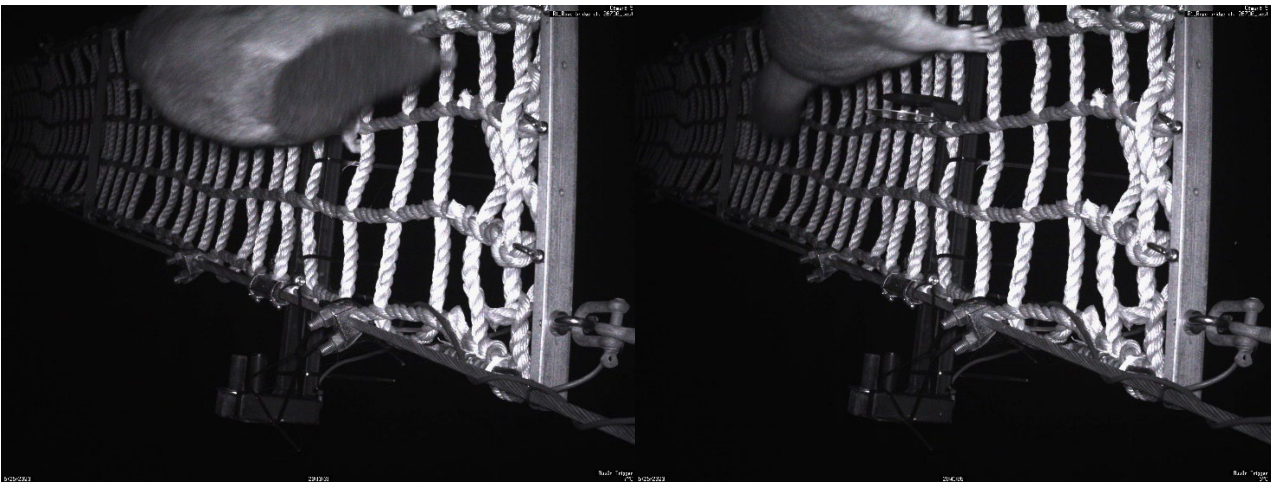


Plate 7: 26/06/2023 (20:13:31) departure and 26/06/2023 (21:41:06) return

Niche Environment and Heritage

A specialist environmental and heritage consultancy.

Head Office

Niche Environment and Heritage

PO Box 2443 North Parramatta NSW 1750

Email: info@niche-eh.com

All mail correspondence should be through our Head Office