



**ecosure**  
improving ecosystems

**CONSTRUCTION MONITORING PROGRAM  
– SPRING**

December 2021

TRANSPORT FOR NEW SOUTH WALES

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# 1 Introduction

Transport for New South Wales (TfNSW) engaged Ecosure to monitor the Parramatta Park grey-headed flying-fox (*Pteropus poliocephalus*; GHFF) camp along with two control camps as part of the Parramatta Light Rail project (the project) Conditions of Approval.

## 1.1 Background

This construction monitoring program seeks to assess and respond to potential impacts of the Parramatta Light Rail construction on the flying-fox camp at Parramatta Park. Pre-construction monitoring was undertaken by Ecosure to provide a baseline of normal flying-fox behaviour at the Parramatta Park camp compared with the two control sites: Clyde and Gladesville. Control sites provide a benchmark of normal regional flying-fox behaviour during construction works.

These data:

- allow for an assessment of impacts of the project’s enabling-works and construction of the project on the Parramatta Park flying-fox camp, particularly:
  - patterns of occupation (population size)
  - demographic composition (sex and age class)
  - species composition
  - key behaviours (including reproductive status)
  - area of occupancy (location and extent of roosting flying-foxes)
- inform ongoing construction monitoring and additional mitigation measures if required.

Construction of the Parramatta Light Rail commenced in July 2019. Monitoring for this program is undertaken quarterly by Ecosure, and monthly by TfNSW. This report represents the eleventh construction monitoring event (spring) for this monitoring period (Table 1). Monitoring for the construction phase is due to be completed by autumn 2023.

Table 1 Monitoring schedule

Monitoring event	Scheduled	Completed
Initial		August 2018
Spring	27 November 2018	4 December 2018
Summer	February 2019	27 February 2019
Construction commencement March 2019		
Autumn	April 2019	8 April 2019
Winter	June 2019	9 August 2019

Monitoring event	Scheduled	Completed
Spring	October 2019	31 October 2019
Summer	February 2020	26 February 2020
Autumn	April 2020	24 April 2020
Winter	July 2020	23 July 2020
Spring	October 2020	30 October 2020
Summer	January 2021	29 January 2021
Autumn	April 2021	15 April 2021
Winter	July 2021	Not undertaken due to COVID-19 restrictions within Greater Sydney and per the PLR COVID Contingency Plan
Spring	October 2021	16 November 2021

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## 2 Methods

Monitoring was undertaken by Ecosure on Tuesday, 16 November 2021 at Parramatta Park, Clyde, and Gladesville.

Data was collected via an electronic data capture app synced to an online cloud database.

### 2.1 Data

#### 2.1.1 Weather conditions

Ambient weather conditions including temperature, rainfall and wind were recorded from the Bureau of Meteorology (BOM).

#### 2.1.2 Flying-fox demographics

The number and species of flying-foxes present, approximate ratio of females to males, health condition (including morbidity/mortality), breeding activity (including young present) were recorded for each camp. A daytime static count was used to estimate abundance at the camps.

#### 2.1.3 Flying-fox behaviour

The following flying-fox behaviours were recorded for each camp:

- resting
- grooming
- vocalising and interacting
- mating or breeding activity
- lifting in response to sudden noise
- signs of stress.

#### 2.1.4 Camp extent

Camp areas of occupancy (spatial extent of the camp) were recorded.

#### 2.1.5 Management and public use

Community use of Parramatta Park for events and detectable impacts from infrastructure construction were recorded to inform a complete understanding of the surrounding context.

## 3 Results

### 3.1 Weather conditions

In the week leading up to monitoring, there were two heavy rainfall events recorded at the closest BOM Station to Parramatta Park (No. 66124 Parramatta North), on 11 (16 mm) and 12 (24 mm) November (BOM 2021). 0.2 mm of rain was recorded on the day of monitoring (Table 2).

Table 2 Weather conditions during summer monitoring event (BOM station 66124)

Monitoring event	Max temp (°C)	Min temp (°C)	Rainfall (mm)	Wind Ave (km/h)	Wind Max (km/h)	Condition
16 November 2021 (Parramatta Park, Clyde and Gladesville)	21.3	11.2	0.2	11	Not recorded	Overcast

### 3.2 Flying-fox demographics

Parramatta Park camp contained 4,260 GHFF and is currently a maternity camp, with almost every roost tree containing mothers with dependent pups (2,100 dependent young in total). Gladesville camp contained 1,078 GHFF, of which 300 were dependant young, and Clyde camp contained 160 GHFF with no dependant young observed. No little red flying-foxes (*Pteropus scapulatus*; LRFF) or black flying-foxes (*Pteropus alecto*; BFF) were observed roosting at any camp during this monitoring period.

Table 3 Flying-fox demographics

Camp	GHFF	BFF	LRFF	Male %	Female %	Females visibly pregnant	Juveniles	Dependent young	Body condition	Morbidity/mortality
Parramatta Park	4,620	0	0	50	50	0	0	2,100	good	0
Gladesville	1,078	0	0	50	50	0	0	300	good	0
Clyde	160	0	0	60	40	0	0	0	good	0

### 3.3 Flying-fox behaviour and camp extent

GHFF at Parramatta Park exhibited occasional stress behaviours (taking flight) in response to construction or aircraft noise during monitoring (Table 4). No stress behaviours were recorded at Gladesville or Clyde camps during monitoring. A local bat carer undertaking bush regeneration at Gladesville camp noted that occasional high-pitched screeches have been heard recently, potentially from orphaned pups, though this was not observed during monitoring. The carer noted that the flying-foxes have otherwise been relaxed and healthy.

Clyde camp appeared substantially smaller in abundance and extent since April monitoring (most recent Ecosure monitoring period) and flying-foxes were restricted to approximately six tree canopies. The Parramatta Park and Gladesville camp extents were similar to previous monitoring (April 2021). Flying-fox camp extents at Parramatta Park, Clyde, and Gladesville and shown in Figures 1 – 3.

Table 4 Flying-fox behaviour and camp characteristics.

Camp	Stress indicators	Behavioural observations	% camp occupied	% available habitat	Vegetation condition
Parramatta Park	Occasional take-off in response to PLR-related construction (occurring on the western side of Parramatta River) and/or aircraft noise	Maternity camp, generally calm and chatting	85	90	<i>Casuarina</i> , deciduous, and <i>Eucalypt</i> trees dominate the overstory; understory thick with wetland and invasive vegetation and short laurel trees.
Gladesville	Normal vocalisations	Occasional high-pitched screeches, according to local bat carer; though generally calm and chatting during monitoring.	70	80	<i>Casuarina</i> , <i>Banksia</i> , and <i>Eucalypt</i> wetland to wet sclerophyll, fringed by mangrove forest.
Clyde	Normal vocalisations	Generally calm and chatting	3	5	Overstory composed of <i>Casuarina spp.</i> , weeping willow, and other introduced trees. Midstory thick with <i>Lantana camara</i> .



**Figure 1: Parramatta Park camp extent**

Transport for New South Wales  
 PLR Construction Monitoring Program

- Camp extent (November 2021)
- Property boundary



Job number: PR4093  
 Revision: 0  
 Author: EK  
 Date: 24/11/2021



GCS GDA 1994  
 Datum: GDA 1994  
 Units: Degree

316,600

6,254,200

6,254,200



6,254,000

316,600

6,254,000

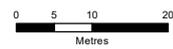
### Figure 2: Clyde camp extent

Transport for New South Wales  
PLR Construction Monitoring Program

- Camp extent (November 2021)
- Property boundary



Job number: PR4093  
Revision: 0  
Author: EK  
Date: 24/11/2021



GDA 1994 MGA Zone 56  
Projection: Transverse Mercator  
Datum: GDA 1994  
Units: Meter

327,400

6,254,600

6,254,600



6,254,400

6,254,400

327,400

### Figure 3: Gladesville camp extent

Transport for New South Wales  
PLR Construction Monitoring Program

- Camp extent (November 2021)
- Property boundary



Job number: PR4093  
Revision: 0  
Author: EK  
Date: 24/11/2021



GDA 1994 MGA Zone 56  
Projection: Transverse Mercator  
Datum: GDA 1994  
Units: Meter

## 4 Discussion

GHFF were observed at all three camps, with no BFF or LRFF recorded. Dependent young GHFF were observed at Parramatta Park and Gladesville camp. Flying-foxes were not observed breeding at the Clyde camp, and this camp appeared to have decreased in both size and extent since April 2021. Overall, flying-foxes exhibited low levels of stress at all three camps.

### 4.1 Management actions and public use

Construction works were occurring on the western side of Parramatta River during this monitoring event. Some flying-foxes exhibited signs of stress (take-off) in response to construction and aircraft noises, though the camp remained generally calm. No additional management actions are required (Table 5).

Table 5 Management actions required.

Camp	Public use	Impacts to camp	Project works	Non-project related disturbance	Actions required
Parramatta Park	High public use of bike and walkway	Runoff, human traffic, PLR-related construction noise, and aircraft noise	None	Some disturbance from aircraft	None
Gladesville	Walkway along extent of colony	Runoff, human traffic	N/A	None	None
Clyde	Walkway	Runoff, human traffic	N/A	None	None

### 4.2 Recommended actions

As main construction activities are coming to an end, and little impact to flying-foxes has been observed thus far, quarterly monitoring may be adequate moving forward (rather than monthly monitoring). Reactive monitoring should be undertaken if flying-foxes begin exhibiting signs of stress during remaining construction activities. Monthly monitoring should be resumed if stress behaviours are determined to be caused by construction activities. It is also important that TfNSW continues to meet the requirements of the project's Conditions of Approval.

## References

BOM 2021, Climate Data Online Station: Parramatta North (Masons Drive) No. 66124, Available: <http://www.bom.gov.au/climate/dwo/IDCJDW2107.latest.shtml>, accessed 23 November 2021.

Ecosure 2018, *Grey-headed flying-fox Baseline Monitoring Program; Parramatta Light Rail Project*, report for Transport for New South Wales, Brisbane.

## Revision History

Revision No.	Revision date	Details	Prepared by	Reviewed by	Approved by
00	24/11/2021	Construction Monitoring Report – Autumn 2021	Ellie Kirke, Wildlife Biologist	James Tallant, Senior Wildlife Biologist	
01	3/12/2021	Construction Monitoring Report – Autumn 2021	Ellie Kirke, Wildlife Biologist	Jess Bracks, Principal Wildlife Biologist	

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