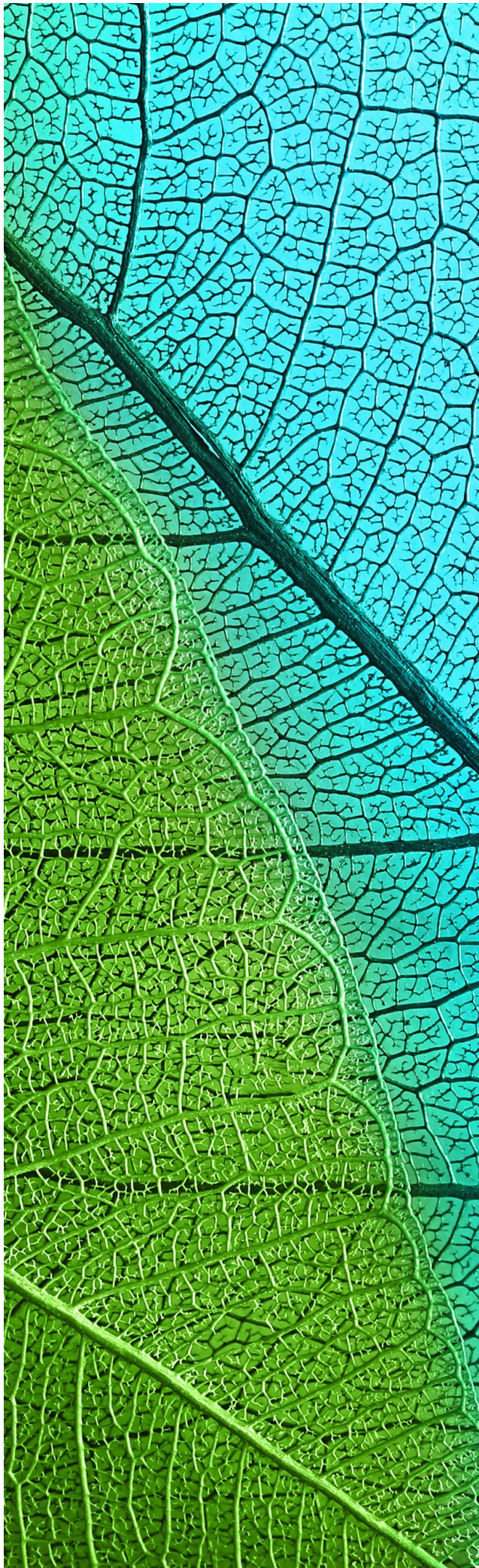




Bango Wind Farm

White-striped Free-tailed Bat Trigger Investigation

Prepared for Bango Wind Farm

March 2024
Report No. 18173.6 (1.2)



**Nature
Advisory**

5/61-63 Camberwell Road
Hawthorn East, VIC 3123
PO Box 337, Camberwell VIC 3124
(03) 9815 2111
www.natureadvisory.com.au

Nature Advisory acknowledges the traditional owners and sovereign custodians of the land on which we work from – the Wurundjeri people of the Woi Wurrung language group. We extend our respect to their Ancestors and all First Peoples and Elders past, present, and future.

Contents

1. Introduction 1

2. White-striped Free-tailed Bat – Investigation Report 2

 2.1. Taxonomy 2

 2.2. Australian Range Description 2

 2.3. Habitat and Ecology..... 2

 2.1. Occurrence near Bango Wind Farm 3

 2.2. Threats 3

 2.3. Conservation Status of White-striped Free-tailed bat 3

 2.4. Impact of Casualties at Bango Wind Farm 3

 2.5. Risk Assessment..... 4

3. Conclusions and Recommendations 5

 3.1. Conclusions..... 5

 3.2. Recommendations 5

4. References 6

Figures

Figure 1: Range of White-striped Free-tailed Bat (Atlas of Living Australia 2024) 2

1. Introduction

The Bird and Bat Adaptive Management Plan (BBAMP) for the Bango Wind Farm (BWF) (Nature Advisory 2021b) sets a framework for identifying and managing the impacts of the wind farm on birds and bats.

Under Section 4.2.1 of the BWF BBAMP; an Impact Trigger for a non-threatened species is defined as:

“a total of four or more bird or bat carcasses, or parts thereof, of the same species in two successive searches at the same or adjacent turbine(s) of a non-threatened species, excluding sulphur-crested cockatoo, galah, magpies, crows, ravens, pipits and introduced species (i.e., a total of four or more carcasses of the same species in two successive searches)”

During the December 2023 and January 2024 surveys at BWF; 29 White-striped Free-tailed Bat mortalities were detected in total with four mortalities detected under Turbine 1 and 2 combined, four mortalities detected under Turbine 16 and 17 combined and six mortalities detected under turbine 36, 37 and 38 combined (Appendix 1). The carcasses were identified by a zoologist from Nature Advisory Pty Ltd during monthly monitoring as part of the implementation of the BWF BBAMP.

This represents a non-threatened species trigger under the above description and as such; the decision-making framework under Section 4.2.2 and Figure 5 of the BBAMP must be implemented. The framework is provided in Appendix 2 and a notification was submitted to BWF on 12th of February 2024 and was submitted to the regulator on the 13th of February 2024. As per the decision-making framework, a desktop investigation (this report) evaluating the impacts on the species at a ‘bioregional population’ scale is to be provided to the Department of Climate Change, Energy, the Environment and Water (DCCEEW) and recommendations given on whether the impact is likely to be a regular occurrence, and if species specific monitoring is required.

The carcasses that were found were in various states of decomposition and condition. A data sheet was completed for each, photographs taken and the carcasses bagged, tagged and stored in the freezer on site. These have not been included given the number of carcasses found, but can be made available on request. A spreadsheet of summarised data is provided in Appendix 1.

This immediate investigation assesses:

- **Status of knowledge on the White-striped Freetail Bat** including literature review and database search of past records from the local and wider region;
- **Distribution and occurrence** in Australia and locally to BWF and any known migration/movement patterns;
- **Habitat availability** in and around BWF to understand what habitat may be available to the species in the vicinity of the site;
- **Initial assessment of the significance of the impact** on the bioregional population of the species;
- **Conduct a risk assessment** of the likelihood of reoccurrence; and
- **Evaluate possible additional monitoring** and next steps to identify ongoing or additional impacts.

This report includes the following sections:

Section 2 presents the desktop investigation, and

Section 3 provides conclusion and recommendations.

This investigation has been carried out by a team from Nature Advisory including; Divyang Rathod (Zoologist) and Jackson Clerke (Ecologist and Project Manager).

2. White-striped Free-tailed Bat – Investigation Report

The follow section provides review of species' ecology and its occurrence in the BWF vicinity.

2.1. Taxonomy

Scientific Name: *Austronomus australis*

Common Name(s): White-striped Free-tailed bat

2.2. Australian Range Description

The White-striped Free-tailed Bat primarily occurs in southern areas of Australia (Figure 1) (Churchill 2008). They migrate seasonally, spending November to February restricted to areas south of 30°S. From April to September their range expands 1200 kilometres further north and they predominantly inhabit this area north of 30°S. They were previously thought to be occasional vagrants in Tasmania (Cawthen 2012), however it is now believed there exists a resident population that are present in Tasmania year-round (S. Cawthen, pers comm.).

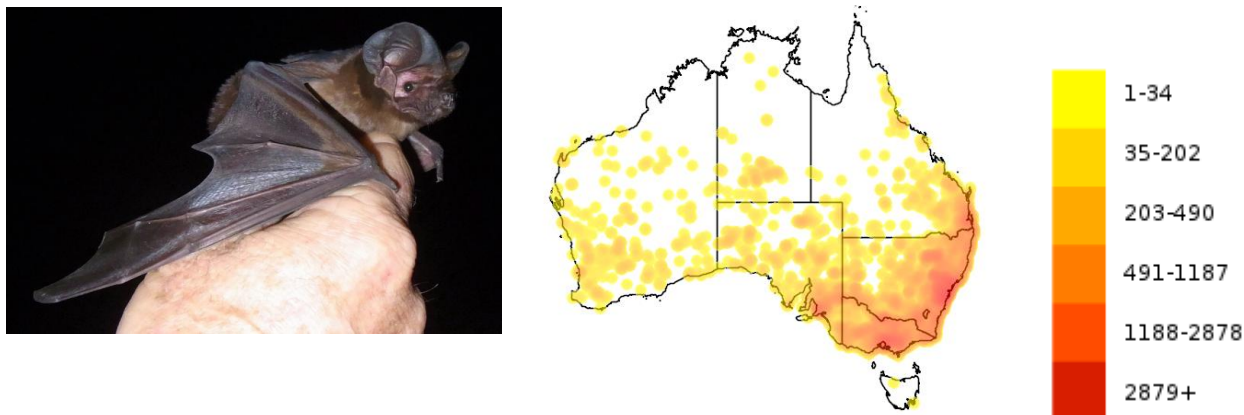


Figure 1: Range of White-striped Free-tailed Bat (Atlas of Living Australia 2024)

2.3. Habitat and Ecology

White-striped Free-tailed Bats can occur in a variety of habitats including urban areas, forests, woodland, shrubland, open farmland with scattered stands of trees, grasslands and deserts and their diet consists of moths, beetles, grasshoppers, and other non-flying ants and beetles (Churchill 2008).

Patterns of migration appear to be temperature dependent, as they require temperatures of less than 21 degrees Celsius to dissipate heat generated by their flight action. This drives a tendency to forage late at night and causes their movement to southern areas of Australia during summer. The species can enter torpor over the cooler months but is not known to hibernate (Churchill 2008).

Individuals tends to roost in old eucalypt trees within large hollows with multiple entrances or hollow tree branches (Churchill 2008). During the warmer months (September–May), they roost in tree cavities in mature to overmature eucalypts either singly, in small groups, or in maternity colonies (Richards 1995). Ovulation, copulation, and fertilisation occur late in the austral winter with females giving birth between mid-December and mid-January and aggregating in tree roosts (Rhodes 2007). Like many temperate-zone tree-roosting bats, White-striped Freetail Bats have complex social structures. Small groups of individual bats roost together and maintain strong social associations over many years (Griffiths *et al.* 2019). These smaller core groups regularly switch tree roosts and mix with members of other nearby roosting groups (Rhodes 2007, Godinho *et al.* 2015). Group sizes are quite variable and change across seasons (during breeding versus non-breeding seasons), for example; core groups typically comprise five

to 10 individual bats that roost together over multiple years (Evans 2009, Griffiths *et al.* 2019) and these smaller groups also congregate in communal roosts with large groups that can contain 50-300 individuals (Rhodes 2006). It is unknown the numbers of roosts or individuals that may be on or in the vicinity on BWF.

The White-striped Free-tailed Bat is an open-space adapted species that typically flies high above the ground (Moloney *et al.* 2019). They are a fast flyer and forage in open areas, capturing their prey 50 metres or more above the ground (Bullen & McKenzie 2001, Churchill 2008). White-striped Free-tailed Bats can travel distances of up to 20 kilometres from roost sites to reach feeding areas at an average speed of more than 40km/h (Rhodes 2006).

2.1. Occurrence near Bango Wind Farm

Four sightings of White-striped Free-tailed Bat were found in the BioNet database near the wind farm site, with the last sighting recorded in November of 2011 (ALA 2024). The lack of records reported is unlikely to reflect the true species occurrence, which is expected to be relatively common in the area due to potential habitat for foraging and roosting. It more likely represents a lack of survey effort in the wider region, and the species cryptic nature. BWF preconstruction bat surveys undertaken in 2012 & 2019 recorded White-striped Free-tailed Bat across three monitoring sites out of the five total sites (BL&A 2019).

Operational phase surveys have been conducted at BWF by Nature Advisory during October 2023 and February 2024, however this data has yet to be analysed by bat experts formally. Sites included 16 ultrasonic recorder locations at ground level around BWF and one recorder at nacelle height. This data, once reviewed, will provide further information into the usage and activity of the species on site and further analysis will be provided in annual reporting (within three months of August 2024 as per BWF BBAMP).

2.2. Threats

The general main threats, described in published literature, associated with the White-striped Free-tailed Bat include:

- Collision with wind turbines (Moloney *et al.* 2019, Smales 2012, Symbolix 2020).
- Loss of habitat from land clearing (Rhodes 2006).

2.3. Conservation Status of White-striped Free-tailed Bat

The White-striped Free-tailed Bat is not listed under the *Biodiversity Conservation (BC) ACT 2016* or nationally in Australia under the Commonwealth *Environment Protection and Biodiversity Conservation (EPBC) Act 1999*.

2.4. Impact of Casualties at Bango Wind Farm

Section 4.2.2 of the BBAMP requires assessment of whether the event is a '*one-off occurrence or an unacceptable impact at a bioregional population scale*'. NPWS (2003) defines this bioregion as the South Eastern Highlands Bioregion, which lies just inland from the coastal bioregions of the South East Corner and the Sydney Basin, bounded by the Australian Alps and South Western Slopes bioregions to the south and west. The bioregion includes most of the ACT and extends south into Victoria.

To date, 41 White-striped Freetail Bat mortalities have been observed at BWF; two during November and five in December 2023, 24 during January and another 10 in February 2024. The comparatively higher numbers detected during January are, in part, reflective of the carcass search survey effort that took place at that time. Formal monthly searches (BBAMP Section 2.6), Super Parrot survey (BBAMP Section

2.6.4) and Threatened Species Trigger searches (BBAMP Section 4.1.2) all coincided during January 2024. The species may also be more active generally during this time given the recruitment of juveniles post breeding times (mid-December to mid-January)

The species' range covers most of Australia and is not limited to the bioregion. Their preferred habitat is widespread and their movements are thought to be migratory, to some extent, so relevant population scales, aside from the bioregion, are difficult to define. Currently, population estimates for Australian tree-roosting microbats are not available, making estimating population-level impacts caused by cumulative mortalities at operational wind farms problematic at any scale. Given the White-striped Freetail Bat is common and widespread across much of the continent (Churchill 2008), it seems unlikely the impacts reported at BWF alone, so far, would be responsible for an unacceptable impact to the species at a bioregional scale. However, given the lack of population dynamics data, it is unknown what the significance of the impacts are.

The locations of impacts detected so far are relatively evenly distributed across the site, and the current data available does not indicate any particular high-risk areas for the species at BWF. Preferred habitat of the species (i.e., scattered woodlands, forest, open farmland) is present to different extents across the site. And further monitoring may reveal patterns of mortality and identify high risk areas.

2.5. Risk Assessment

The elements of the risk of likelihood of reoccurrence as drawn from the above literature and data are summarised below:

- Scattered stands of remnant eucalypt trees and open farmland present at BWF may provide potentially suitable habitats for the White-striped Free-tailed Bat to roost and forage respectively. They are likely to continue to utilise the BWF site.
- The White-striped Freetail Bat is an open-space adapted species that commute and forage for high-flying insects in airspace well-above tree canopy height (O'Neill and Taylor 1986, Hull and Cawthen 2012). Consequently, they often fly at RSA heights, resulting in a risk of collision with turbines.
- Several studies have identified that White-striped Free-tailed Bat mortalities are frequently recorded during searches at operational wind farms in south eastern Australia and they often account for the largest overall number of carcasses reported for any bird or bat species (Moloney et al. 2019, Smales 2012, Symbolix 2020, Bennett et al. 2022).
- Observations by Nature Advisory (unpublished data) at various wind farms in other parts of these species' range are consistent with these findings.

Based on this assessment, White-striped Freetail Bat mortalities are likely to continue to occur at BWF, however, whether a trigger event for this species is likely to occur regularly is difficult to assess. Further mortality is most likely to occur over the warmer months between October and April when both insect and White-striped Free-tailed Bat activity are highest in NSW.

3. Conclusions and recommendations

3.1. Conclusions

The following conclusions are considered in line with the decision-making framework Section 4.2.2 of the BBAMP:

“If the evaluation indicates that the event was a one-off occurrence or is unlikely to be an unacceptable impact at a bioregional population scale for the species in question, no further action will be necessary (as outlined in Figure 5).

If the event is deemed to be a potentially regular occurrence or likely to lead to an unacceptable impact on the species in question, species-specific monitoring may be required (Figure 5). If further monitoring confirms that impacts are likely to lead to an unacceptable impact on the species, mitigation measures will be required.”

- The circumstances leading to collisions are that the wind farm falls within the species range while moving between roosts or feeding sites. It may also utilise the BWF site while moving across its range, and that it likely flies at RSA heights while doing so.
- Nature Advisory investigation experience and available public records indicate that further mortalities are likely to occur annually during September to April (approximately).
- Since there is very limited data on population dynamics for the species, it is difficult to assess the significance of the impact at either the bioregional or population-wide scale. The significance of the impact is unclear.

3.2. Recommendations

Given that mortalities are considered likely to continue, and that the significance of the impact is unclear, further monitoring is recommended.

Section 2.5 of the BBAMP requires bat surveys to be undertaken twice in the first year. These surveys have already occurred (but have yet to be analysed) so a further year of surveys should be undertaken to provide further data on site utilisation of White-striped Freetail Bat (and other species). The first year of surveys focused on ground-based survey sites (16 sites, with one at height), so it is proposed that another year of surveys focus on activity at turbine nacelle height. Suggested methods are described below:

- 16 recorder sites, with eight positioned near the base of eight turbines and the remaining eight placed at the nacelle of those turbines. This will enable a basic comparison of species activity at height and ground.
- Detailed nightly wind speed activity should also be collected at each turbine (provided by BWF where possible, or at the overall site level if not) to compare with activity levels of species detected in various nightly conditions. This will provide information of the species risk profile while utilising BWF.
- Survey length will cover a period of six to eight weeks to include January to March 2025.
- Survey methods will be confirmed with NSW DCCEEW prior to implementation.

Carcass surveys will continue as per Section 2.6 of the BBAMP. Review of impacts to the species will be considered further in annual reporting. At the conclusion of the initial two-year monitoring period, mortality estimation for bat species aggregated will be possible. This will further inform impact assessment on the species from BWF at that time, and allow for further recommendations.

4. References

- Atlas of Living Australia. Available at: <https://biocache.ala.org.au/occurrences/09463549-e155-4ada-b7c3-9c711826f511#occurrenceDataset> (Accessed: 28 February 2024).
- Bennett, E.M., Florent, S.N., Venosta, M., Gibson, M., Jackson, A., Stark, E., 2022. Curtailment as a successful method for reducing bat mortality at a southern Australian wind farm. *Austral Ecology* 47, 1329–1339
- Brett Lane and Associates (BL&A), 2019. Bango Wind Farm – Bird and Bat Baseline Data. Prepared for CWP Renewables Pty. Ltd., report no. 18173 (2.1).
- Bullen, RD, & McKenzie, NL, 2001, Bat airframe design: flight performance, stability and control in relation to foraging ecology. *Australian Journal of Zoology*, 49, pp. 235-261.
- Cawthen, L 2012, White-striped freetail bat in Tasmania – resident, vagrant or climate change migrant? *Australian Mammalogy*, 35 (2), pp. 251-254.
- Churchill, S 2008, *Australian Bats*, 2nd edn, Allen & Unwin, Sydney.
- Department of Environment, Land, Water and Planning (DELWP) 2022, *Victorian Biodiversity Atlas 3.2.5*, Department of Environment, Land, Water and Planning, East Melbourne, Victoria, viewed 4th May 2022, < <https://vba.dse.vic.gov.au>>.
- Evans, L.N., 2009. Roosting behaviour of urban microbats: the influence of ectoparasites, roost microclimate and sociality (PhD). University of Melbourne.
- Griffiths, SR, Lumsden, LF, Bender, R, Irvine, R, Evans, LN, Visintin, C, Eastick, DL, Robert, KA, Lentini, PE, 2019. Long-term monitoring suggests bat boxes may alter local bat community structure. *Australian Mammalogy* 41, 273–278.
- Godinho, LN, Lumsden, LF, Coulson, G, Griffiths, SR, 2015. Network analysis reveals cryptic seasonal patterns of association in Gould’s wattled bats (*Chalinolobus gouldii*) roosting in bat-boxes. *Behaviour* 152, 2079–2105.
- Hull CL & Cawthen L 2012. Bat fatalities at two wind farms in Australia: bat characteristics, and spatial and temporal patterns, *New Zealand Journal of Zoology* 40(1): 5-15.
- Moloney, P.D, Lumsden, L.F & Smales, I 2019, Investigation of existing post-construction mortality monitoring at Victorian wind farms to assess its utility in estimating mortality rates. Arthur Rylah Institute for Environmental Research Technical Report Series No. 302. Department of Environment, Land, Water and Planning, Heidelberg, Victoria.
- Nature Advisory Pty. Ltd, 2021a. Bango Wind Farm – Interim report on baseline bat and avifauna assessments. Prepared for CWP Renewables Pty. Ltd., report no. 18173 (3.4).
- Nature Advisory Pty. Ltd, 2021b. Bango Wind Farm – Bird and Bat Adaptive Management - Prepared for Bango Wind Farm Pty. Ltd., report no. 18173 (1.25).
- NSW National Parks and Wildlife Service (NPWS) (2003) *The Bioregions of New South Wales: their biodiversity, conservation and history* NSW National Parks and Wildlife Service Hurstville
- O’Neill MG & Taylor RJ 1986, Observations of the flight patterns and foraging behaviour of Tasmanian bats, *Australian Wildlife Research* 13: 427-432.
- Richards, GC, 1995, White-striped freetail-bat *Nyctinomus australis* (Gray, 1838). In: Strahan, R. Ed., *The Mammals of Australia: the National Photographic Index of Australian Wildlife*. Chatswood: Reed Books, Australian Museum, pp. 487-488.

- Rhodes, M, 2006, The ecology and conservation of the White-striped freetail bat (*Tadarida australis*) in urban environments. PhD Thesis, Griffith University, Queensland.
- Rhodes, M, 2007, Roost Fidelity and Fission – Fusion dynamics of White-striped free-tailed bats (*Tadarida australis*), *Journal of Mammalogy*, 88 (5), pp. 1252 – 1260.
- Smales, I. 2012, “Fauna Collisions with Wind Turbines: Effects and Impacts, Individuals and Populations. What Are We Trying to Assess?” In *Wind and Wildlife: Proceedings for the Conference on Wind Energy and Wildlife Impacts*, 23–40. Springer.
- Symbolix 2020, Post construction bird and bat monitoring at wind farms in Victoria. Public report, 13th Wind Farm Research Meeting 2020.

1 Appendix 1: White-striped Freetail Bat mortality trigger summary information

Month	Date	Common Name	*Find Reference	Turbine number	Distance from turbine (m)	Freezer or disposed of?	Notes	Search type
December	11/12/2023	White-striped Free-tailed Bat	C23.12.3	37	19	Freezer	Decomposing, forearm length = 5.5cm, tail extends, body length = 8.3cm	Initial
December	11/12/2023	White-striped Free-tailed Bat	C23.12.7	31	27	Freezer	Decomposed wings & ears, Chocolate brown in colour, extended tail, forearm length = 6cm, tail = 1.6cm long (extension part)	Initial
December	12/12/2023	White-striped Free-tailed Bat	C23.12.8	16	40	Freezer	Old, lower abdomen decomposing, chocolate brown fur on back, forearm length = 5.6cm, tail extends	Initial
December	13/12/2023	White-striped Free-tailed Bat	C23.12.16	6	70	Freezer	Chocolate brown fur, extended tail, tail length = 2.2cm, forearm length = 5.9cm	Initial
December	13/12/2023	White-striped Free-tailed Bat	C23.12.19	2	61	Freezer	Chocolate brown fur, tail extends, tail length = 2.1cm, forearm length = 5.6cm, no head	Initial
January	9/01/2024	White-striped Free-tailed Bat	INC24.01.1	1	10	Freezer	Very waterlogged, free-tailed bat, extended tail, broken wing, body length = 11cm, FA length = 5.7cm	Superb Parrot
January	9/01/2024	White-striped Free-tailed Bat	INC24.01.2	7	86	Freezer	Very waterlogged, free-tailed bat, extended tail, full of maggots, FA length = 5.7cm	Superb Parrot
January	10/01/2024	White-striped Free-tailed Bat	INC24.01.6	44	10	Freezer	<48hrs old, tail extended, chocolate brown fur on back, white patch on chest, FA length = 5.9cm	Superb Parrot
January	11/01/2024	White-striped Free-tailed Bat	INC24.01.7	38	80	Freezer	Decomposed, broken wing, one wing missing, FA = 4.9cm	Superb Parrot
January	11/01/2024	White-striped Free-tailed Bat	INC24.01.8	38	36	Freezer	<48hrs, male, extended tail, extended tail length = 2.2cm, wing and ear membrane decomposing, male, FA = 6cm	Superb Parrot
January	11/01/2024	White-striped Free-tailed Bat	INC24.01.10	36	38	Freezer	Decomposed back, chocolate brown fur on back,	Superb Parrot

Month	Date	Common Name	*Find Reference	Turbine number	Distance from turbine (m)	Freezer or disposed of?	Notes	Search type
							white fur patch on chest & under wings along body, extended tail, FA = 5.7cm	
January	11/01/2024	White-striped Free-tailed Bat	INC24.01.11	36	45	Freezer	Decomposed and waterlogged, chocolate brown fur with white patches under wings, extended tail, FA = 5.5cm	Superb Parrot
January	15/01/2024	White-striped Free-tailed Bat	INC24.01.15	17	47	Freezer	Extended tail, white fur patch on chest, very waterlogged, decomposing to lower abdomen, FA = 5.95cm	Superb Parrot
January	15/01/2024	White-striped Free-tailed Bat	INC24.01.19	14	18	Freezer	Decomposing, waterlogged, tail extended, large ears that go to front of face, broken wing, FA = 5.75cm	Superb Parrot
January	22/01/2024	White-striped Free-tailed Bat	C24.01.1	45	16	Freezer	Old, decomposed, long extended tail, large ears, FA = 5.65cm	Initial
January	22/01/2024	White-striped Free-tailed Bat	C24.01.2	45	21	Freezer	Decomposed, large ears, white fur under wing, long extended tail, FA = 5.7cm	Initial
January	22/01/2024	White-striped Free-tailed Bat	C24.01.11	37	38	Freezer	Extended tail, big ears, chocolate fur on back, very decomposed, FA = 5.7cm	Initial
January	22/01/2024	White-striped Free-tailed Bat	C24.01.12	30	92	Freezer	1x wing separate from body, head and upper body found 0.3m away, dark large ears, FA = 5.6cm. Second wing found behind turbine on hardstand, some white fur.	Initial
January	23/01/2024	White-striped Free-tailed Bat	C24.01.20	2	60	Freezer	Extended tail, grass tangled around wing & head, no identifying head features, lighter fur under wings, FA = 5.7cm	Initial
January	24/01/2024	White-striped Free-tailed Bat	C24.01.26	22	49	Freezer	Large ears, decomposed, extended tail, FA = 5.6cm	Pulse
January	24/01/2024	White-striped Free-tailed Bat	C24.01.27	2	48	Freezer	<24hrs old, extended tail, white fur along sides of body, big ears, male, FA = 5.95cm	Pulse
January	24/01/2024	White-striped Free-tailed Bat	C24.01.28	10	50	Freezer	<24hrs old, extended tail, white fur along sides of body, big ears, injury to lower abdomen, FA = 5.60cm	Pulse

Month	Date	Common Name	*Find Reference	Turbine number	Distance from turbine (m)	Freezer or disposed of?	Notes	Search type
January	25/01/2024	White-striped Free-tailed Bat	C24.01.31	9	50	Freezer	Decomposed, extended tail, white fur along side of body, large ears, FA = 5.7cm	Initial
January	29/01/2024	White-striped Free-tailed Bat	C24.01.32	13	36	Freezer	Decomposed, broken wing, FA = 5.8cm	Pulse
January	29/01/2024	White-striped Free-tailed Bat	C24.01.34	16	32	Freezer	Part of a wing (2x bones), FA = 5.65cm	Pulse
January	29/01/2024	White-striped Free-tailed Bat	C24.01.35	16	47	Freezer	Part of a wing, FA = 3cm	Pulse
January	30/01/2024	White-striped Free-tailed Bat	INC24.01.23	19	83	Freezer	Old, decomposing, extended tail, large ears, FA = 5.5cm (Marked as INC24.01.3T in freezer)	Trigger
January	31/01/2024	White-striped Free-tailed Bat	INC24.01.26	46	53	Freezer	<48 hrs, large ears, chocolate brown, wing membrane decomposed, extended tail, FA = 4.8cm (Marked as INC24.01.6T in freezer)	Trigger
January	31/01/2024	White-striped Free-tailed Bat	INC24.01.29	27	21	Freezer	<48hrs, extended tail, male, white fur on chest, large ears, dark brown fur on back, wounds on back, FA = 4.7cm (Marked as INC24.01.9T in freezer)	Trigger

Appendix 2: BBAMP Non-threatened Species trigger decision making framework

4.2.1 Definition of Impact trigger

The circumstances that define an impact trigger and significant impact for non-threatened birds and/or bats under this BBAMP are detailed below. Note native species not listed as protected are not considered of conservation significance and therefore are not subject to adaptive management or this impact trigger. These species are Sulphur-crested Cockatoos, galahs, magpies, crows, ravens, pipits and introduced bird species¹. All other native bird and bat species are subject to adaptive mitigation arising from this impact trigger.

Impact Trigger for Non-threatened Species: The trigger is defined as a total of four or more bird or bat carcasses, or parts thereof, of the same species in two successive searches at the same or adjacent turbine(s) of a non-threatened species (excluding species mentioned above).

Note that although the impact trigger does not include ravens, magpies, Sulphur-crested Cockatoos, corellas, pipits and introduced species, detected mortalities for these species will still be reported as part of the annual reporting process.

Non-threatened species are not listed under the Commonwealth EPBC Act so this section only applies to species of concern at a state level that are not threatened. For this reason, reporting to DAWE is not required, only to DPIE.

4.2.2 Decision Making Framework

In the event that an impact trigger for non-threatened species is detected the following steps will be followed:

- DPIE and DAWE will be **notified** of the impact trigger within seven days of recording the event;
- An **evaluation** of impacts to the non-threatened species' bioregional population will be undertaken; and
- A **report** on the investigation will be provided to DPIE and DAWE within three weeks.

If the evaluation indicates that the event was a one-off occurrence or is unlikely to be an unacceptable impact at a bioregional population scale for the species in question, no further action will be necessary (as outlined in Figure 5).

If the event is deemed to be a potentially regular occurrence or likely to lead to an unacceptable impact on the species in question, species-specific monitoring may be required (Figure 5). If further monitoring confirms that impacts are likely to lead to an unacceptable impact on the species, mitigation measures will be required. Potential mitigation measures are outlined in Table 4, however specific mitigation measures will be determined based on the species involved and the outcome of investigations.

Any evaluation of impacts and decisions regarding mitigation measures and further investigations required will be undertaken in consultation with DPIE and DAWE. Any required investigation, and recommended management and supplementary mitigation measures, will be documented in the site management logs and detailed in annual reports. This log will be available for inspection by DPIE and DAWE.

Figure 5: Decision making framework for identifying and mitigating impacts on non-threatened species

