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Mumblin Wind Farm

Bat and Avifauna Management Plan

**Prepared for
RE Future Pty Ltd**

September 2025
Report No. 22238.03B (1.4)

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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 and present.

Document History and Status

The following table outlines the revisions made to this document

Version	Date of Issue	Description	Issued By	Reviewed by	Approved by
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V 1.1	20/06/2025	Second draft	Mike Hitchcock	Inga Kulik	Inga Kulik
V 1.2	25/06/2025	Final draft	Inga Kulik	Inga Kulik	Inga Kulik
V1.3	15/8/25	Response to DCCEEW comments	Sergio Nolazco Plasier	Kate Callister	Inga Kulik
V1.4	16/9/25	Response to DCCEEW comments	Kate Callister	Kate Callister	Inga Kulik

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Glossary of terms

BACI	Before-After-Control-Impact
BAMP	Bat and Avifauna Management Plan
BUS	Bird utilisation survey
Commissioning	All activities, including turning of turbines, after the components of the wind turbines are installed.
Cwth	Commonwealth
DEECA	(VIC) Department of Energy, Environment and Climate Action (previously DELWP)
DELWP	(VIC) Department of Environment, Land, Water and Planning
DCCEEW	(Cwth) Department of Climate Change, Energy, the Environment and Water
DSEWPaC	(Cwth) Department of Sustainability, Environment, Water, Populations and Communities
DTP	(VIC) Department of Transport and Planning.
EPBC Act	(Cwth) <i>Environment Protection and Biodiversity Conservation Act 1999</i>
FFG Act	(VIC) <i>Flora and Fauna Guarantee Act 1988</i>
Full operation	Once all wind turbines have been commissioned and are able to operate simultaneously.
Listed species	Any bird/bat species listed as threatened or migratory under the EPBC Act or listed as threatened under the FFG Act.
MNES	Matters of national environmental significance under the EPBC Act
MWF	Mumblin Wind Farm
Non-listed species	Any bird/bat species not listed as threatened or migratory under the EPBC Act or not listed as threatened under the FFG Act.
OH&S	Occupational Health and Safety
RSA	Rotor swept area (64-252 m)
Suitably qualified ecologist	A person who has relevant professional qualifications and at least three years of work experience preparing and implementing management plans for the conservation of and habitat improvement for the MNES relevant to the management plan which they are preparing and can give an authoritative assessment and advice on the habitat requirements of that/those MNES using relevant protocols, standards, methods and/or literature.
WTG	Wind turbine generator

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1. Introduction

1.1. Background, project description and location

Nature Advisory Pty Ltd was engaged by RE Future (the Proponent) to develop a draft Bat and Avifauna Management Plan (BAMP) to accompany the permit application for the Mumblin Wind Farm (MWF). Any conditions that are required upon approval will be added to the BAMP for approval by the responsible authority.

The Project is located approximately 10 km south-west of Cobden, Victoria, within the Corangamite Shire Council (Figure 1). RE Future is proposing to develop a wind energy facility with a combined capacity of approximately 54 MW, that involves eight wind turbine generators (WTGs) and associated utility installations, which will connect directly to an existing powerline along Cobden – Warrnambool Rd (Figure 1).

The primary objective of the Project is to supply renewable energy into the National Electricity Market (NEM). In doing so, the Project will contribute significantly to the Victorian Government’s transition towards renewable energy—in line with its 2050 net-zero emissions target—by supplying carbon-free power to approximately 35,000 homes.

1.2. Environmental Outcomes

The environmental outcomes that this BAMP aims to achieve are:

- Minimising the impacts from the MWF on threatened and migratory bird and bat species listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and/or the Victorian *Flora and Fauna Guarantee Act 1988* (FFG Act), and non-listed species identified as particularly vulnerable to collisions (herein referred to as ‘species of concern’, see Section 1.3);
- Improving understanding of the risk of turbine collision on listed threatened and migratory bird and bat species that are regularly recorded on the Project Site;
- Improving understanding of whether or how project site usage by listed threatened and migratory bird species that are regularly recorded changes due to wind farm construction and operation;
- Monitoring for the timely identification of turbine collisions and the timely collection and analysis of data;
- Timely and regularly validating and updating the impact assessment framework for listed threatened and migratory bird and bat species that are regularly recorded on the Project Site, using monitoring data to support a robust adaptive management approach to reducing impacts, where possible; and
- Where required, developing and implementing tangible, on-ground management actions to promote a long-term reduction in the risk of turbine collision impacts on listed threatened and migratory bird and bat species.

These environmental outcomes will be achieved through a combination of ongoing monitoring (of both bat and bird activity and wind farm impacts) and adaptive management and mitigation.

1.3. Species of concern

This BAMP specifically emphasises the following key species of concern that were recorded during baseline assessments or identified as species that may occur on site and may be vulnerable to collisions:

Birds

- **Blue-winged Parrot** (EPBC Act: Vulnerable, FFG Act: Vulnerable)
- **White-throated Needletail** (EPBC Act: Vulnerable and Migratory, FFG Act: Vulnerable)
- **Fork-tailed Swift** (EPBC Act: Migratory)
- **Gang-gang Cockatoo** (EPBC Act: Endangered, FFG Act: Endangered)
- **Wedge-tailed Eagle** (Not listed threatened)
- **Common Greenshank** (EPBC Act: Vulnerable and Migratory, FFG Act: Vulnerable)
- **Curlew Sandpiper** (EPBC Act: Critically Endangered and Migratory, FFG Act: Critically Endangered)
- **Red-necked Stint** (EPBC Act: Migratory)
- **Sharp-tailed Sandpiper** (EPBC Act: Vulnerable and Migratory, FFG Act: Vulnerable)
- **Latham’s Snipe** (EPBC Act: Migratory, FFG Act: Vulnerable)
- **Australasian Bittern** (EPBC Act: Endangered, FFG Act: Endangered)
- **Glossy Ibis** (EPBC Act: Migratory, FFG Act: Vulnerable)

Bats

- **Southern Bent-winged Bat** (EPBC Act: Critically Endangered, FFG Act: Critically Endangered)
- **Yellow-bellied sheath-tailed Bat** (FFG Act: Vulnerable)
- **Grey-headed Flying-fox** (EPBC Act: Vulnerable, FFG Act: Vulnerable)

This management plan was written and reviewed by a team from Nature Advisory, comprising Dr Sergio Nolasco Plasier (Senior Zoologist), Dr Kate Callister (Senior Ecologist & Project Manager) and Dr Inga Kulik (Director).

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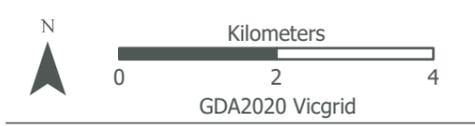
Figure 1: Location of Mumblin Wind Farm

Project No: 22238.03
 Project location: Mumblin, VIC
 Date: 19/06/2025

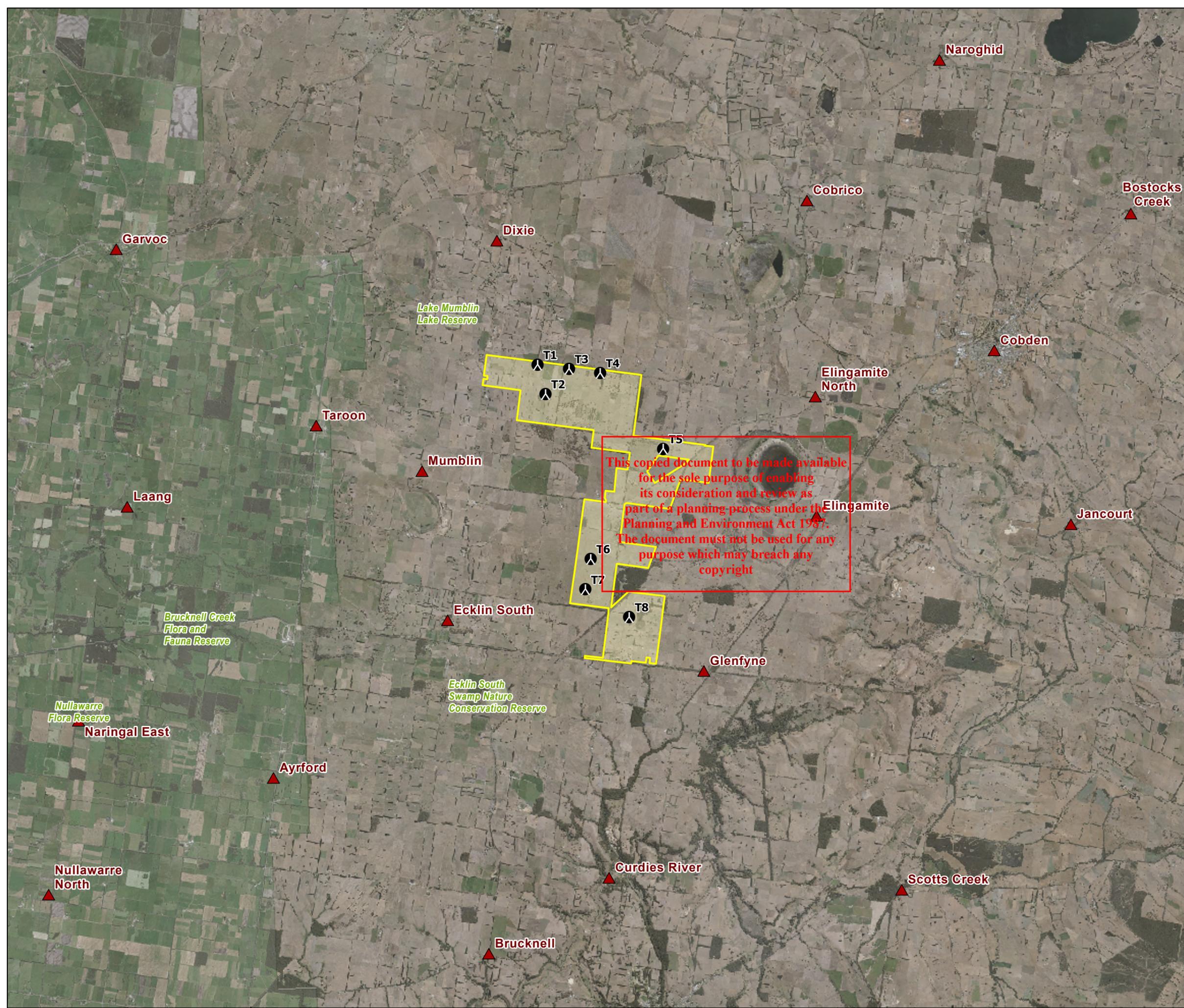
-  Site boundary
-  Wind turbine
-  Town

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2. Pre-construction baseline monitoring program

This section of the plan presents a summary of relevant baseline (pre-construction) surveys carried out at MWF.

2.1. Baseline (pre-construction) monitoring

Baseline bird and bat investigations have been ongoing at MWF since 2021. The surveys presented in Table 1 below gathered baseline data to inform future monitoring.

Table 1: Baseline (pre-construction) surveys conducted at the MWF

Survey –assessments	Date
Birds	
Bird Utilisation Surveys – EHP	<ul style="list-style-type: none"> • Winter 2021: 9 –11 August 2021 • Spring 2021: 22 – 24 November 2021 • Summer 2022: 31 January – 3 February 2022 • Ongoing surveys are being conducted to complete two years of pre-construction surveys across all four seasons.
Brolga (Level 1 Assessment) - EHP	<ul style="list-style-type: none"> • Publication date: August 2024
Bats	
Bat Utilisation Surveys – EHP	<ul style="list-style-type: none"> • Spring/Summer 2021: 29 September – 2 December 2021 • Summer/Autumn 2022: 31 January – 28 March 2022
Southern Bent-winged Bat – EcoAerial/EHP	<ul style="list-style-type: none"> • Autumn/Winter 2022: 25 April – 19 June 2022 (cave assessment) • Spring/Summer/Autumn 2021-2022: August 2021 – May 2022
Southern Bent-winged Bat and Yellow-bellied Sheath-tail Bat – EHP/Nature Advisory	<ul style="list-style-type: none"> • Spring 2021: 24 November – 2 December 2021 • Summer/Autumn 2022: 31 January – 28 March 2022 • Spring/Summer 2022: 9 November – 21 December 2022 • Summer/Autumn 2023: 20 February – 3 April 2023 • Summer/Autumn 2023: 20 February – 3 April (met mast survey) • Winter 2023: 7 August – 27 August (met mast survey) • Spring 2023: 18 October – 30 November (met mast survey) • Summer/Autumn 2024: 15 January – 3 March (met mast survey)

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Before and After Control Impact Design

The pre-construction surveys are designed to be statistically robust, adhering to the guidelines for studies on birds and bats outlined in the *Ecological Assessments of the Best Practice Guidelines for the Australian Wind Industry* (Appendix 7 in CEC 2018). Specifically, the BUS is designed for a 'Before and After Control Impact' (BACI) analysis, using quantitative data from both reference (control) and impact (treatment) predetermined locations. Reference sites are at a sufficient distance from the proposed turbine locations to obtain data outside the zone of influence of the turbines. Each fixed

point is assessed twice during four daily periods (early morning, late morning, early afternoon, late afternoon), resulting in eight observation periods per site per survey. Fixed points were located in habitats representative of those across the Project Site. Post-commissioning surveys will be conducted at the same locations for two years using the same methodology (see Section 3.1). The comparative analysis will provide descriptive and quantitative analysis on changes in species diversity and composition from before to after construction.

2.2. Species of concern from baseline surveys

A species of concern is defined as a species of conservation significance that is thought to be of high-risk of turbine collision based on data collected during pre-construction surveys. These species are generally listed as threatened under the EPBC Act and/or FFG Act, though non-listed species can also qualify if they are thought to be at particularly high risk to the impacts of concern. Please note that other listed species may be involved with turbine collisions at the MWF, but as at this stage they are not considered to be of high-risk of turbine collisions and are covered under the more general framework of the BAMP (See Section 4.1.1).

Birds

During the baseline surveys, the following bird species of concern were identified as potentially vulnerable to collisions:

- **Blue-winged Parrot** *Neophema chrysostoma* (EPBC Act: Vulnerable, FFG Act: Vulnerable)
- **White-throated Needletail** *Hirundapus caudacutus* (EPBC Act: Vulnerable and Migratory, FFG Act: Vulnerable)
- **Fork-tailed Swift** *Apus pacificus* (EPBC Act: Migratory)
- **Gang-gang Cockatoo** *Callocephalon fimbriatum* (EPBC Act: Endangered, FFG Act: Endangered)
- **Wedge-tailed Eagle** *Aquila audax* (Not listed/threatened)

Other species of concern include waterbirds (wetland-associated species), primarily migratory shorebirds, listed below. These, along with any other listed waterbirds not specifically mentioned, will be addressed under the species-specific management strategy outlined in Section 5.

- **Common Greenshank** *Tringa nebularia* (EPBC Act: Vulnerable and Migratory, FFG Act: Vulnerable)
- **Curlew Sandpiper** *Calidris ferruginea* (EPBC Act: Critically Endangered and Migratory, FFG Act: Critically Endangered)
- **Red-necked Stint** *Calidris ruficollis* (EPBC Act: Migratory)
- **Sharp-tailed Sandpiper** *Calidris acuminata* (EPBC Act: Vulnerable and Migratory, FFG Act: Vulnerable)
- **Latham’s Snipe** *Gallinago hardwickii* (EPBC Act: Migratory, FFG Act: Vulnerable)
- **Australasian Bittern** *Botaurus poiciloptilus* (EPBC Act: Endangered, FFG Act: Endangered)
- **Glossy Ibis** *Plegadis falcinellus* (EPBC Act: Migratory, FFG Act: Vulnerable)

Other listed birds

Some other listed species recorded during surveys are considered as **not susceptible** to impacts from the MWF project, as they are not at risk of collision or unlikely to occur. However, any species beyond those specifically addressed above, will be managed under the general framework of the BAMP (see Section 4), which can be adapted as necessary.

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Bats

During baseline surveys, the following bat species of concern were identified as potentially vulnerable to collisions:

- **Southern Bent-winged Bat** *Miniopterus orianae bassanii* (EPBC Act: Critically Endangered, FFG Act: Critically Endangered)
- **Yellow-bellied sheath-tailed Bat** *Saccolaimus flaviventris* (FFG Act: Vulnerable)
- **Grey-headed Flying-fox** *Pteropus poliocephalus* (EPBC Act: Vulnerable, FFG Act: Vulnerable)

All other species, beyond those specifically addressed above, will be managed under the general framework of the BAMP (see Section 4), which can be adapted as necessary.

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3. Operational (post-construction) phase monitoring

Operational phase monitoring will include bird utilisation surveys, microbat surveys, and carcass monitoring. At this stage, no targeted pre-construction surveys have been recommended, as neither field observations nor limited historical records suggest regular presence of species for which collision risk modelling (CRM) would be appropriate. Should operational bird utilisation surveys indicate otherwise, CRM may be incorporated and validated against carcass monitoring results to enable timely implementation of corrective actions if the findings suggest that environmental outcomes are not met or may not be achieved.

3.1. Bird utilisation surveys

Post-construction BUS will be conducted for a period of two years during four seasons each year to replicate pre-construction surveys. These surveys will provide further information to determine whether the site continues to be utilised by the range of species identified in the pre-construction surveys and whether any turbines pose a particular risk to identified species of concern, as well as any other listed species.

Relevant details of the post-construction BUS are detailed below.

- The timing of the surveys will be agreed with the regulator;
- Surveys will be undertaken at the same survey points and reference points used in the pre-construction surveys, using the same methodology; and
- BUS will provide a context for the carcass searches and elucidate the indirect effects of the wind farm on bird use of the site by comparing the bird abundance and diversity recorded during post-construction surveys with the baseline BUS data.

3.2. Microbat surveys

Post-construction microbat surveys will be conducted at commissioning, and during the first two years of operation, focusing on the two species of concern (Southern Bent-winged Bat and Yellow-bellied Sheath-tailed Bat). These surveys will be done in a way that replicates the pre-construction surveys. These surveys will seek to demonstrate whether the site continues to be utilised by the range of species identified in the pre-construction surveys, whether any turbines pose a particular risk to threatened species, and to detect activity patterns that may align with any carcass search results to further inform mitigation measures.

Relevant details of the microbat surveys are presented below.

- Surveys will be undertaken at approximately the same survey points and timing used in the pre-construction surveys, using the same methodology;
- Surveys will provide a context for the carcass searches and elucidate the indirect effects of the wind farm on bat use of the site; and
- Surveys will specifically focus on the presence of, and potential impacts on, species of concern identified during pre-construction bat surveys and the bird and bat risk assessment.

3.3. Carcass monitoring

3.3.1. Purpose of carcass monitoring

Ongoing monitoring of mortality from blade strike at operating wind farms typically serves to:

- (i) Provide data that can inform adaptive management of the collision risk (i.e., patterns of mortality related to seasonal changes, local conditions or turbine operating periods); and
- (ii) Detect and estimate general mortality of listed and non-listed bird and bat species for the wind farm, which can be used to understand actual bird and bat impacts.

Implementation of bird and bat monitoring programs in Australia is still developing, and the techniques described here are based on lessons from several such programs already implemented (e.g., Hull et al. 2013), knowledge of experimental design and statistical analysis, and recent feedback from regulatory authorities.

To manage potential long-term mortality impacts on relevant species as a result of turbine collision and barotrauma, this BAM Plan includes a long-term monitoring approach that aligns with the minimum requirements of the *Onshore Wind Farm Guidance – Best practice approaches when seeking approval under Australia’s national environment law* (DCCEEW 2024). These requirements are presented in Table 2, along with the sections in which each is addressed.

Table 2: Onshore Wind Farm Guidance (DCCEEW 2024) requirements for mortality monitoring and BAM Plan section reference

Guidance requirements	BAM Plan Sections
Include details of the nature, timing and frequency of monitoring to inform progress against achieving the environmental outcomes, and be sufficient to determine if the BAM Plan is likely to achieve those environmental outcomes in adequate time to implement all necessary corrective actions.	Section 6 & 7
Demonstrate how site-specific and species-specific risks and uncertainties have informed the design of the monitoring program (for example, scavenger activity, searcher efficiency), including engagement with relevant research bodies (for example, Universities)	Appendix 1
Include a proposed timeframe for the regular validation and update of the CRM using site-specific data collected through ongoing monitoring activities	Section 3
Include a commitment to DNA test carcasses that cannot be otherwise identified by a suitably qualified bird or bat expert	Appendix 1
Include a commitment for carcass persistence trials to maximise turbine collision detection in a timely manner	Appendix 1
Include a commitment for searcher efficiency trials to maximise carcass detection in a timely manner to maximise carcass detection in a timely manner, and a commitment that these trials are blind trials'	Appendix 1
Results of long-term mortality monitoring should be transparently recorded. Please use the Data Template for Mortality Surveys	Appendix 1

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3.3.2. Definition of ‘mortality’

Mortality is defined as any dead bird or bat detected within the specified search radius (Appendix 1). Detection can be either during the formal carcass searches (designed to generate an estimate in accordance with a statistically rigorous sampling design) or at other times (incidental observation, often by operational staff). A protocol is triggered whenever a carcass is found, either within the formal searches or incidentally, to collect consistent and useful data on the fatality event (see below).

It will be conservatively assumed that any bird or bat carcass, or bird feather spot (defined as a clump of five feathers or more with no associated carcass), detected beneath an operating turbine has died because of collision with turbine blades, unless there are obvious signs of another cause of death. Feather spots will be assumed to be remains of a bird carcass after scavenging and the scavenger correction factor will not be applied to them (details in Appendix 1).

3.3.3. Overview of approach

The carcass monitoring program for the MWF once implemented, will consist of two approaches:

1. **Incidental carcass detection** (refer to Section 3.3.4); and
2. **Formal carcass searches** – to be implemented after all turbines operate and export electricity simultaneously. This program will run for a period of at least two years (refer to Section 3.3.5 for more details).

3.3.4. Incidental carcass detection

During the commissioning phase of the wind farm, once turbine components are installed but not operating, a risk to birds and bats exists. While the risk of collision with stationary structures is minimal compared with operating wind turbines, this risk is not negligible. Noting that active construction sites are subject to strict Occupational Health and Safety (OH&S) requirements, hence it is difficult to schedule formal carcass searches during construction. Therefore, during this time:

- There will be increased worker activity on and around turbine hardstands and surrounding areas as commissioning activities are occurring;
- Incidental carcass detection will be conducted by the Proponent’s personnel and contractors who are approved to work within the construction zones that will exist around the hardstands;
- Any carcasses detected during this period will be recorded in accordance with the incidental finds protocol as described below. Awareness training will be provided to the Proponent and contractor teams to ensure that protocol can be implemented effectively;
- The incidental carcass detection will continue as the primary carcass detection method, until the formal carcass search program commences;
- Incidental carcass detection is a core element of the BAMP to ensure impacted birds and bats can be recorded prior to the implementation of the formal carcass search program, despite site access still being limited by construction activities; and
- Incidental carcass detection will remain a key element of bat and bird monitoring throughout the lifespan of the project, from construction, through full operation of the wind farm and subsequent decommissioning or recommissioning. In this case, the carcass will be handled according to the Carcass Detection Protocol and the Bird and Bat Handling Protocol outlined in Appendix 1.

Incidental carcass protocol

Personnel working at the Project Site may incidentally find carcasses during construction, commissioning, day-to-day operations, and maintenance activities. In this case, the carcass will be

handled according to the Carcass Detection Protocol and Bird and Bat handling protocol outlined in Appendix 1. All construction and operation personnel will be made aware of this carcass handling protocol as part of their site training and induction.

3.3.5. Formal carcass search program

The formal carcass search program will commence within one month of the completion of reliability tests of all turbines and the wind farm is in full operation and supplying electricity. This post-commissioning monitoring program will be undertaken for a minimum of two years. After two years of mortality monitoring, a detailed report will be prepared reviewing the mortality detection program and providing recommendations for the future in response to any confirmed issues—see Section 6 for reporting requirements. This will be reviewed with the regulator to determine how the monitoring program will continue in a manner that responds to any confirmed significant impacts on species of concern. This provides an opportunity to focus future monitoring on key impacts detected in the initial two years of carcass searches.

The sampling design of the carcass monitoring program at MWF aims to provide reliable estimates of both bird and bat mortality rates, together with an estimate of sampling precision. Several factors, such as carcass scavenging and carcass detectability, can affect mortality rate estimates and must be measured and included in any estimate of overall mortality rates. To account for these factors, mortalities will be adjusted using scavenger and detectability corrections as detailed in Appendix 1. Human (or canine) detectability of carcasses is also a potential confounding variable, and protocols have been developed to control this factor in the final mortality estimates (see Appendix 1 for details).

Detailed descriptions of the carcass search methodology, and bird and bat handling protocol are presented in Appendix 1.

3.3.6. Turbine selection

Given that MWF, with eight turbines, is a relatively small wind farm, all turbines will be searched for bird and bat carcasses to maximise the accuracy of the estimated mortality rates. This will not be particularly time-consuming or expensive to undertake.

Each turbine that is searched for will have basic information recorded including number of carcasses, location and information on vegetation and habitats.

3.3.7. Estimating annual mortality due to collision

The results of the carcass searches will be analysed to provide information on:

- The species, number, age and sex (if possible) of birds and bats being struck by the turbine blades;
- Separate estimated annual mortality rates for all birds and all bats (and for listed species with available data), including an estimate of the number of carcasses per turbine per year; and
- Any detected spatial or temporal variation in the number of bird and bat strikes.

The search results will be detailed in the first annual report. In addition to cumulative search results, the analysis and mortality estimates will be detailed in the second annual report. The latter will also identify if further investigations or mitigation measures are required. The median annual mortality rates will be reported and will be used as the benchmark to determine significant impacts. Upper and lower confidence bounds will be also reported.

In addition to the annual reports, an incident report will be prepared and provided to the relevant regulatory authorities—Australian Department of Climate Change, Energy, Environment and Water

(DCCEEW) and Victorian Department of Energy, Environment and Climate Action (DEECA)—if an EPBC Act listed species is found dead or injured during carcass searches.

Mortalities will be estimated with a Horvitz-Thompson style estimator (Huso 2011), with an extract of the equations provided below.

$$\hat{M}_{ij} \cong \frac{C_{ij}}{(\hat{g}_{ij})} \tag{1}$$

where

- \hat{M}_{ij} is the estimated mortalities at turbine i during search j
- C_{ij} is the number of carcasses found
- \hat{g}_{ij} is the estimate of the detection probability for that search and turbine

For a given turbine, \hat{g}_{ij} is a function of

$$\hat{g}_{ij} \cong a_i r_{ij} p_{ij} \tag{2}$$

- a_i is the fraction of total carcasses within the searched area (note this is *not* the same as the fraction of area searched)
- r_{ij} is the fraction of the carcasses that arrived at turbine i but have not been lost to scavenge or decay before search j
- p_{ij} is the probability that an existing carcass will be detected by the searcher

Therefore, a robust mortality program requires the following components:

- a formal mortality monitoring survey where found carcasses are recorded, to determine C_{ij}
- an estimate of the fall zone of carcasses to determine a_i (this also accounts for potentially only searching a subset of all turbines)
- scavenger trials to estimate r_{ij}
- searcher efficiency trials to estimate p_{ij}

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4. Adaptive Management

This adaptive management section has been developed to achieve environmental outcomes by establishing effective and timely response measures. The key points include:

- Definition of impact triggers for listed and non-listed species;
- Implementation of an adaptive decision-making framework for these triggers;
- Establishment of a framework that integrates investigations, monitoring and reporting; and
- Adoption of management measures, including corrective actions and offsets, to ensure environmental outcomes are achieved.

4.1. Impact triggers

This section identifies the circumstances that will result in notification, further investigation and additional mitigation for impact triggers. If an impact trigger is met, there must be an investigation into the cause of the impact, immediate stepped-up carcass monitoring to determine if the impact is ongoing or a one-off occurrence, and the development of mitigation measures informed by evidence-based studies.

The procedure to respond adaptively to impact triggers documented in this section will be implemented at any time an impact trigger is detected for the life of the project, from the commencement of operations until decommissioning. The aim is to understand how the impact happened or may have happened and to identify and design targeted mitigation measures. If scientific uncertainty results in an incomplete understanding of whether an unacceptable impact is occurring this will not prevent the implementation of mitigation measures.

Ultimately, the approval holder will be responsible for implementation of the BAMP and the decision-making that goes with it, with technical support provided by the approved expert. Importantly, a clear basis for informing and consulting with DEECA and DCCEEW (as relevant) is documented and will be followed.

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4.1.1. Impact triggers for listed bird and bat species

Definition of impact trigger

An **Impact Trigger** for a listed species occurs if a bird or bat (or recognisable parts thereof) listed as threatened and/or migratory under the Commonwealth EPBC Act or Victoria FFG Act is found dead or injured within the specified search radius during any mortality search or incidentally during commissioning or operation.

In addition to the standard operating procedures for listed species, specific and comprehensive management strategies are provided (Section 5) for species of concern identified during the pre-construction studies at the Project Site.

Operational procedure

If a listed species **Impact Trigger** occurs, further investigation will immediately be commenced, and the procedures outlined below and in Figure 2 will be followed.

- Immediate reporting of the impact trigger to Mumblin Wind Farm Environment Manager, who will report it to DCCEEW and DEECA within two business days of it being recorded;
- Immediate investigation (within 10 business days) by an appropriately qualified ecologist of the on-site occurrence of the affected bird or bat species to identify any particular risk behaviours

that could have led to the collision or could lead to further collisions. An investigation is necessary to determine the actual cause of death/injury. The investigation should focus on determining the likelihood of further occurrences (e.g., through engagement with key species experts, undertaking a literature review, assessment of habitat, etc) and identifying suitable mitigation measures for immediate implementation (see next point);

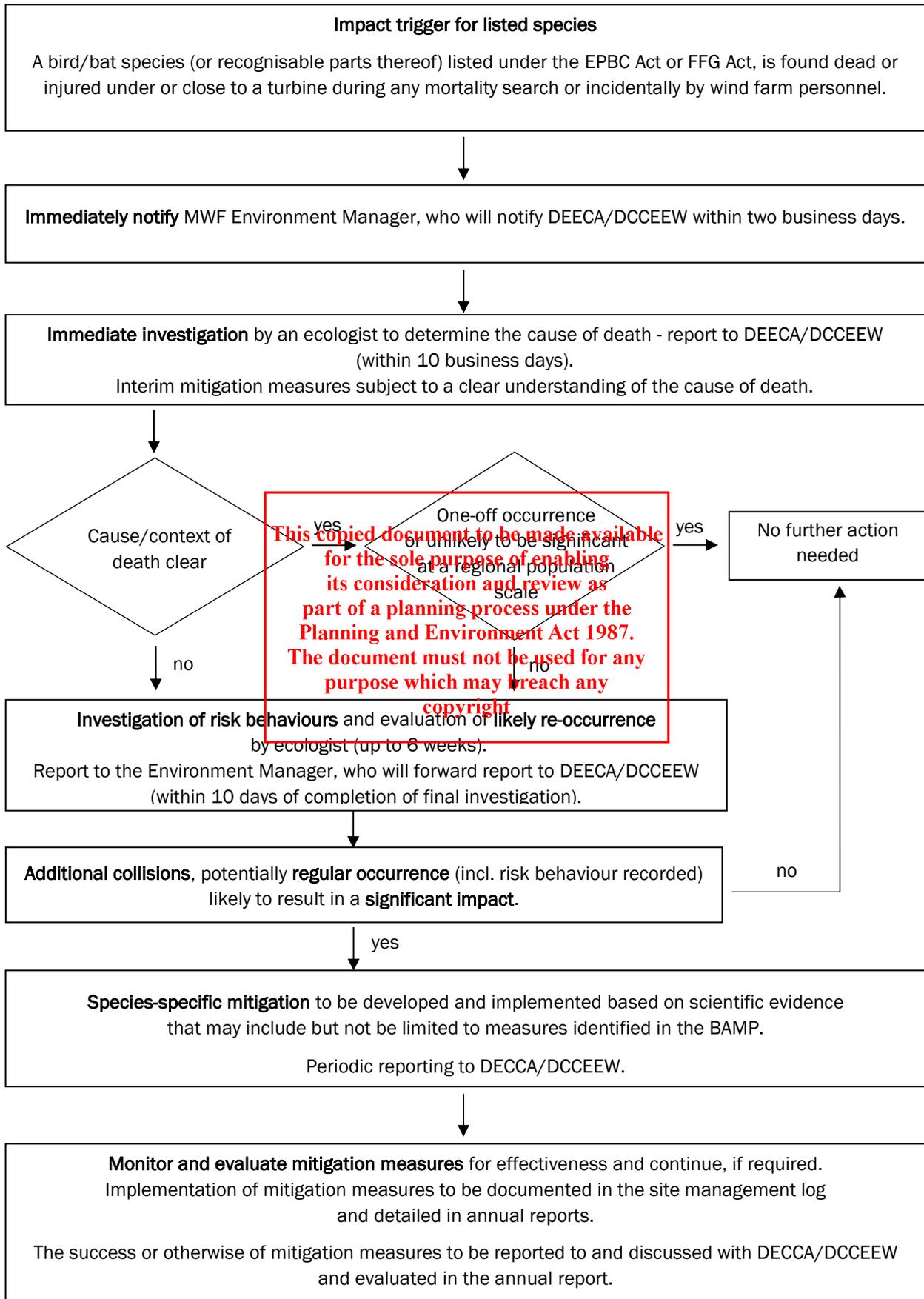
- The rapid one-week investigation will identify, if possible, the most effective mitigation measure(s) and will ensure that the mitigation is implemented quickly;
- If the fatality is deemed to be a one-off occurrence (e.g., an extremely unlikely occurrence given a species' usual behaviour) or unlikely to result in a significant impact, no further action will be necessary;
- If the cause of the impact trigger is not clear, further onsite investigation of risk behaviours and evaluation of likely re-occurrence will be required over the following weeks (up to six weeks). If these investigations suggest that the impact trigger was a one-off or unlikely to result in a significant impact, no further action will be necessary;
- If the onsite investigation suggests that the impact trigger may be a regular occurrence or it is likely to result in a significant impact, species-specific monitoring may be required. During the monitoring period, periodic (three-monthly at first) reports will be provided to DEECA; and
- Responsive mitigation measures will be developed and implemented as needed and in a timely manner, in consultation with DEECA. Examples of mitigation measures may include but are not limited to those outlined in Section 4.1.3.

If mitigation measures are not possible or effective, offsetting measures will be implemented, as outlined in Section 4.1.4. In some circumstances, both mitigation and offsetting may be required.

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Figure 2: Decision-making framework for identifying and mitigating impact triggers for listed species



4.1.2. Impact triggers for non-listed bird and bat species

Definition of impact trigger

An **Impact Trigger** for a non-listed species occurs if a bird or bat (or recognisable parts thereof) is found dead or injured within the specified search radius during any mortality search or incidentally during commissioning or operation more than four times under a turbine during two successive searches in a two-month period. Exceptionally, the **impact trigger for Wedge-tailed Eagle** is set at two or more carcasses (or recognisable parts thereof) found within two consecutive months.

An impact trigger for non-listed species **will not apply to ravens, magpies or introduced species** such as Eurasian Skylark; however, any detected mortalities for these species will still be reported as part of the annual reporting process.

Operational procedure

If a non-listed species **Impact Trigger** occurs, further investigation will immediately be commenced, and the procedures outlined in Figure 3 will be followed. DEECA will be notified of the impact trigger within five business days of recording the event. An appropriate scale to consider population effects (e.g., local, regional, entire population) will be agreed between DEECA and the proponent on a case-by-case basis with consideration given to the species in question.

A report on the investigation will be delivered to DEECA within three weeks of the impact trigger. If the evaluation indicates that the event was a one-off occurrence or is unlikely to be a significant impact at a relevant population scale for the species in question, no further action will be necessary (as outlined in Figure 3). If the event is deemed to be a potentially regular occurrence or likely to be a significant impact at a relevant population scale for the species in question, species-specific monitoring may be required (Figure 3).

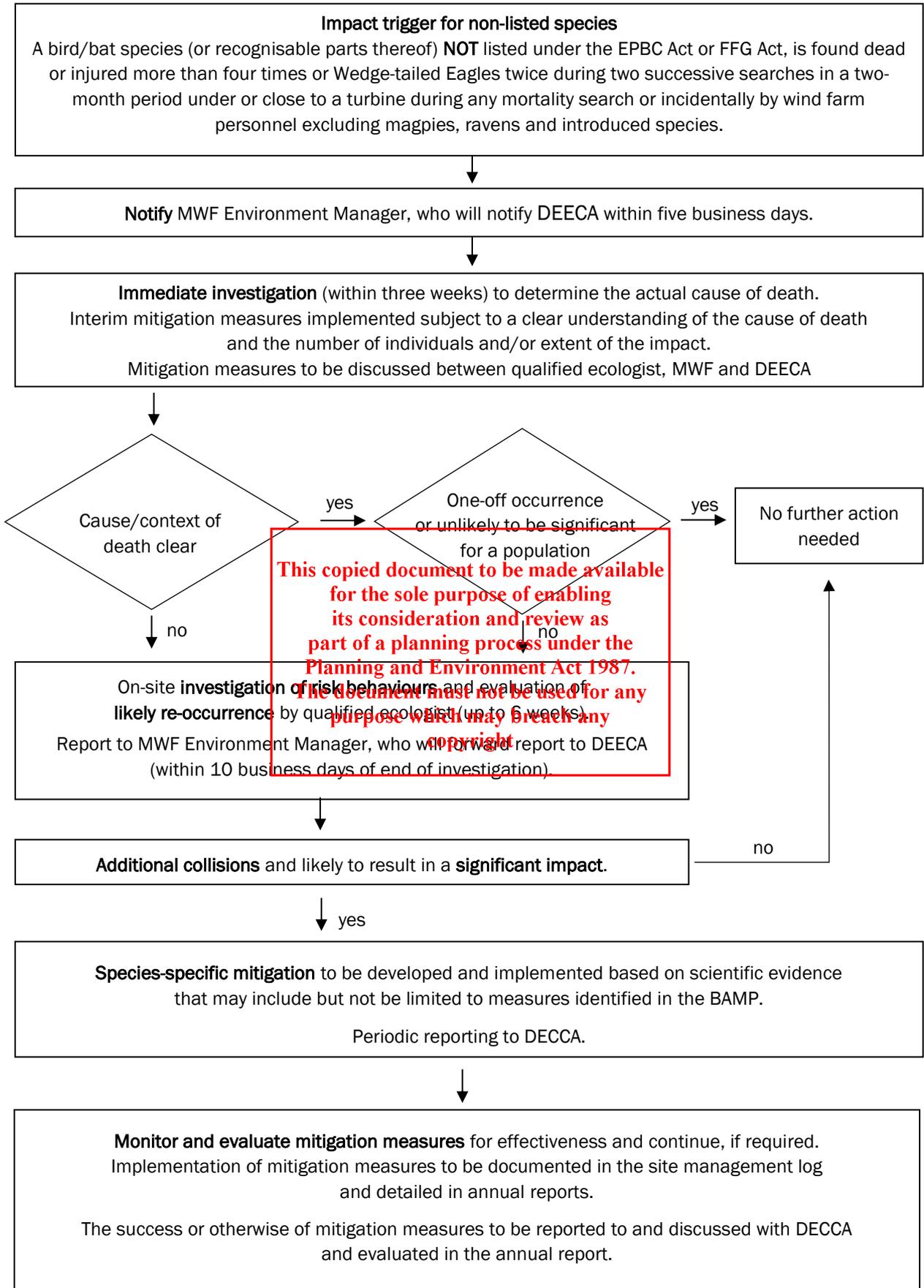
If the cause of the impact trigger is not clear, further onsite investigation of risk behaviours and evaluation of likely re-occurrence will be required over the following weeks (up to six weeks). If these investigations suggest that the impact trigger was a one-off or unlikely to result in a significant impact, no further action will be necessary. However, if further monitoring confirms that impacts are likely to be significant at a relevant population scale, mitigation measures will be required. Potential mitigation measures are outlined in Section 4.1.3, however specific mitigation measures will be determined based on the species involved and outcome of investigations. Any evaluation of impacts and decisions regarding mitigation and/or offsets required will be undertaken in consultation with and agreement from DEECA.

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Figure 3: Decision-making framework for identifying and mitigating impact triggers for non-listed species



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4.1.3. Mitigation and management measures

Depending on the nature, cause and significance of the impact trigger, mitigation and offsetting may be required. The objective of mitigation and offset measures after impact triggers or as preventive measures is to ensure that the MWF does not lead to significant impacts on listed or non-listed bats and/or birds and that the environmental outcomes set out in Section 1.2 are achieved. This approach aims to pursue a neutral net impact of the project on birds and bats, especially threatened species, in accordance with the Victorian *Planning Guidelines for Development of Wind Energy Facilities* (DTP 2023).

Mitigation measures

Mitigation measures deemed necessary will be developed and implemented and guided by the results of monitoring outcomes, mortality estimates, and/or impact triggers. These mitigation measures may include but not be limited to the following:

- Habitat modification, vegetation planting/removal;
- Changes in land use practices (including stock management, stock grain-feeding) near turbines, subject to negotiation with landowners;
- No or reduced cropping/sowing around or near turbines;
- Bird deterrence;
- Increasing turbine and powerline conspicuousness by rotor patterns, marking and/or audible signals;
- Changes to lighting of turbines (including the general requirements below);
- Temporary turbine curtailment for high-risk periods/locations;
- Using ultrasonic deterrents to deter bats at night, and
- Bird protection systems that automatically curtail turbines on approach to reduce raptor fatalities (e.g., Bioseco®, IdentiFlight®; Duerr et al. 2023, Szurlej-Kielanska & Pilacka 2022).

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It is difficult to anticipate how a significant impact may arise and therefore what mitigation would be required. However, if a significant impact is detected, the cause may be evident immediately (e.g., particular land use practice) in which case immediate mitigation must be implemented (within seven days). Where a solution is not immediately evident, it will be the subject of further investigation and subsequent response. If further investigations show that mitigation measures are not possible or effective, offsetting measures will be implemented, as outlined in the following section (Section 4.1.4).

Any required investigation, and recommended management and mitigation measures, will be documented in a final management plan, consistent with the consent conditions of the Planning Permit Approval. A monitoring program will be implemented to assess the effectiveness of ongoing mitigation measures, with an appropriate duration and frequency to effectively evaluate their success or failure.

Preventive management measures

Although most mitigation actions will be triggered by fatalities associated with the proposed development, some mitigations will be applied as a preventive strategy to avoid and reduce the risk of an impact trigger occurring or continuing to occur as follows.

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Carcass removal

Carcass removal is recommended to reduce the attractiveness of the site to raptors (birds of prey) and therefore reduce the chances of fatal collisions by this group of birds. Carrion is defined as the dead and decaying flesh of an animal that often serves as a food source for scavengers.

To provide for the regular removal of carcasses likely to attract raptors to areas near turbines the procedures below will be adopted.

- Designate a suitable local person or wind farm staff member to perform the function of Carrion Removal Coordinator who will undertake the following activities:
 - Weekly inspections of the entire wind farm site by on-site personnel will be undertaken to search for any stock, introduced or native mammal and bird carcasses that may attract raptors (e.g., kangaroos, sheep, cows);
 - Weekly inspections will be undertaken via a vehicle or motorbike and will search the entire wind farm, focusing on the area within 250 metres of turbines; and
 - During lambing season any lamb carcass identified by landholders or wind farm personnel will be immediately removed.
- Any incidental finds of birds and bats will follow the Incidental Carcass Protocol (depending on carcass location; Section 3.3.4),
- Any carcasses and/or remains found will be reported immediately to the site manager who will organise for collection and disposal of the carcass as soon as possible in a manner that will avoid attracting raptors close to turbines. All disposal efforts will be carried out far from turbines and placed in pits or in treed areas or shrubland.
- Carcass occurrence and removal will be recorded in a "management logbook" maintained by site personnel; and
- A summary of carcass removal, based on the 'management logbook' will be incorporated into the annual report.

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Lighting avoidance or reduction

To reduce features within the wind farm that may attract additional bats or avifauna, there will be no turbine lighting unless specifically required by regulatory authorities, and facility lighting will be avoided within 500 m of turbines.

Blade feathering

As a precautionary measure, blade feathering will be implemented across all turbines during periods when bat activity is expected to be highest. This mitigation measure involves adjusting the blade pitch so that the rotor blades are aligned parallel to the wind, or the turbine is rotated out of the wind, thereby reducing or stopping blade rotation. This measure has been shown to significantly reduce microbat fatalities, particularly since microbats exhibit heightened activity at low wind speeds (Arnett et al. 2013, Whitby et al. 2024).

Initially, the following design will be implemented:

- Feathering (i.e., blade rotation is locked or limited to 1-2 rotations per minute) will be implemented until the cut-in speed is detected; and

- These measures will be implemented between 30 minutes before sunset to 30 minutes after sunrise, from January to May.

Due to limited research on this mitigation measure in Australia, the above design's effectiveness will be assessed during operational monitoring and may be adjusted as considered necessary.

Low Wind Speed Curtailment

The following low wind speed curtailment regime will be implemented in order to mitigate the potential risk posed to microbats by the project:

- Curtailment to consist of increasing the cut-in wind speed for all wind turbines from 3.0 m/s to 4.5 m/s;
- Curtailment to be implemented during spring, summer and autumn (September to May);
- Curtailment to commence from the commencement of commercial operation of the wind farm (i.e., following commissioning); and
- Curtailment to commence 30 minutes before sunset and extend until 30 minutes after sunrise.

The curtailment regime will be reviewed at regular intervals, in line with the overarching BAM Plan, and redesigned where warranted in light of intervening developments in scientific research, government policy and alternative mitigation measures, such as acoustic deterrence.

Microbat acoustic deterrents

Trial the use of ultrasonic acoustic deterrents; if proven effective on site, they will be implemented across all turbines and may eventually replace curtailment, or be used alongside adjusted curtailment, subject to discussion and agreement with DEECA and DCCEEW as relevant (see also Section 5).

4.1.4. Offsetting a significant impact

In the unlikely event that a significant impact occurs to any EPBC Act listed species, as a result of the operation of the MWF, offsetting will be investigated and implemented. Offsets will be implemented in accordance with EPBC Act Environmental Offset Policy 2012 (DSEWPaC 2012). Any offset will be developed in consultation with, and approved by, DEECA and DCCEEW, as relevant.

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5. Species-specific management strategies

The following species-specific management strategies have been developed for species of concern. Species-specific management strategies may be developed for other species if data from operational monitoring indicates that they are also at elevated risk of impacts from turbine collisions. Species specific management strategies provide a more detailed and focused response in the event of an impact trigger involving the following species:

- Blue-winged Parrot / White-throated Needle-tail / Fork-tailed Swift / Gang-gang Cockatoo; and
- Grey-headed Flying-fox.

A group-specific response has also been developed for the following bird groups that may pass over the Project Site from the nearby Lake Elingamite or that may occur occasionally on-site, and for listed microbats:

- Waterbirds of concern (Migratory shorebirds, Australian Bittern, Latham's Snipe and Glossy Ibis, for a list of species, see Section 2.2); and
- Microbats of concern (Southern Bent-winged Bat, Yellow-bellied Sheath-tailed Bat, and any other listed microbat).

These strategies allow for focused management efforts, improving the effectiveness of mitigation measures in response to impact triggers.

A framework for responding to an impact trigger involving listed microbats (**MB**), waterbirds (**WB**), Blue-winged Parrot (**BWP**), White-throated Needle-tail (**WTNT**), Fork-tailed Swift (**FTS**), Gang-gang Cockatoo (**GGC**) and Grey-headed Flying Fox (**GHFF**) is outlined in Table 3.

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Table 3: Specific trigger actions in response to listed species mortalities at MWF

Impact Trigger	Actions	Description	Timing
Level 1: A mortality event involving a listed species mentioned above occurs on the site (one or more carcasses, feather spots or injured animals detected under a turbine during a carcass search)	Label the turbine as a “high risk – impact trigger level one (T1)” turbine.	This event activates the species-specific management strategy as follows.	Immediately following mortality.
	More frequent carcass searches to assess the extent of the impact, minimise the chances of scavenging and maximise carcass detections	Additional searches (120m radius) of all turbines including repeated (70 m radius) searches if a listed MB species was hit.	Within a week of the mortality.
		The findings of the searches will be recorded and reported to DEECA/DCCEEW as required.	Within one month of the mortality, or as agreed with DEECA/DCCEEW.
Further investigation	<p>MB: Installation of acoustic recording devices to monitor microbat activity all turbine locations. Locations and activity levels of the species will be analysed, including the timing and possible reasons for periods of higher risk. Bat detectors will be placed at ground level and on turbine nacelles.</p> <p>GHFF: Part of a planning process, produce an investigation report on the timing and timing of flying fox activity to understand the factors that may have led to the collision and whether they are still occurring (e.g., weather pattern, location, food availability, active camps, etc.).</p> <p>WB: Targeted monthly monitoring over three months at all turbine locations. Locations, flights at RSA, movement patterns, and nesting activity will be recorded, including the timing and possible reasons for periods of higher risk.</p> <p>BWP/WTNT/FTS: Monthly monitoring of targeted species activity over three months at all turbine locations (or during the remaining time that the species is expected on site). For BWP this should include the closest woodland habitat (i.e., woodland patches and tree lines). Locations, movements/patterns of the species will be recorded, including the timing and possible reasons for periods of higher risk.</p>	<p>MB: Installation of acoustic recording devices to monitor microbat activity all turbine locations. Locations and activity levels of the species will be analysed, including the timing and possible reasons for periods of higher risk. Bat detectors will be placed at ground level and on turbine nacelles.</p> <p>GHFF: Part of a planning process, produce an investigation report on the timing and timing of flying fox activity to understand the factors that may have led to the collision and whether they are still occurring (e.g., weather pattern, location, food availability, active camps, etc.).</p> <p>WB: Targeted monthly monitoring over three months at all turbine locations. Locations, flights at RSA, movement patterns, and nesting activity will be recorded, including the timing and possible reasons for periods of higher risk.</p> <p>BWP/WTNT/FTS: Monthly monitoring of targeted species activity over three months at all turbine locations (or during the remaining time that the species is expected on site). For BWP this should include the closest woodland habitat (i.e., woodland patches and tree lines). Locations, movements/patterns of the species will be recorded, including the timing and possible reasons for periods of higher risk.</p>	First monthly monitoring to occur within two weeks of the mortality event.

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Impact Trigger	Actions	Description	Timing	
	Assignment and reassignment of risk	If investigations and analyses of the survey results do not suggest an increase in species activity, and no additional fatality events occur at the site, and it is concluded that any previous fatality was an isolated incident and that the turbine does not pose a high risk to the listed species, no further monitoring or mitigation actions will be required and the turbine will be reassigned again as 'low risk.'	Within three consecutive months from the date of the mortality event. ¹	
		If investigations and analyses of the survey results suggest that the fatality is unlikely to be a one-off event or that an ongoing impact is possible for the species, additional carcass searches and targeted monthly monitoring to continue for one year and the turbine will remain assigned to the 'high risk – level one' category.	For one year, or for the remaining period that species is expected to be most actively moving across the site.	
	Incident Reporting	Submit a report to the Responsible Authority.	<p>The investigation will seek to assess any relevant attributes associated with the mortality event.</p> <p>The report will include:</p> <ul style="list-style-type: none"> ▪ Date and time of mortality; ▪ Identify, if possible, wind direction and speed when the species was struck; ▪ Weather conditions; ▪ Location of mortality relative to habitat, vegetation, and water sources; ▪ Analysis of any other mortality on the site; ▪ Conclusions of investigation regarding risk to the species and likelihood of further mortalities on-site; ▪ Recommendations for future actions to mitigate impacts on the species. 	Within one month of the mortality, or as agreed with DEECA/DCCEEW.
		The investigation will seek to assess any relevant attributes associated with the mortality event.		

¹ In the case of SBWB timing will depend on the availability of bat call analysis experts.

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Impact Trigger	Actions	Description	Timing
Level 2: A second mortality event involving a listed species occurs on the site (one or more carcasses feather spots or injured animals of that species are detected under a turbine during a subsequent carcass search)	Label the turbine as a “high risk – impact trigger level two (T2)” turbine.	This event activates the species-specific management strategy as follows.	Immediately following mortality.
	More frequent carcass searches to assess the extent of the impact, minimise the chances of scavenging and maximise carcass detections	Additional searches (120 m radius) of all turbines including repeated (70 m radius) searches if a listed MB species was hit.	Within a week of the mortality.
		The findings of the searches will be recorded and reported to DEECA/ DCCEEW as required.	Within one month of the mortality, or as agreed with DEECA.
	Further investigation	Further investigation of target species to recommence, if not already continuing from Level 1 trigger. These investigations will include acoustic and/or field-based surveys of the wind farm and surrounding area.	First monthly monitoring to occur within two weeks of the mortality event, if not continuing from Level 1 trigger.
Adaptive management and assignment and re-assignment of risk	If investigations and analyses of the survey results do not suggest an increase in species activity, and no additional fatality events occur at the site, and it is concluded that any previous fatality was an isolated incident and that the turbine does not pose a high risk to the listed species, no further monitoring or mitigation actions will be required and the turbine will be reassigned again as ‘low risk.’	Within two months of second mortality event.	

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Impact Trigger	Actions	Description	Timing
		<p>If investigations and analyses of the survey results suggest that the fatality is unlikely to be a one-off event or that an ongoing impact is possible for the species, a Level 2 Mitigation Plan will be developed in consultation with DEECA and/or DCCEEW. This mitigation plan will seek to develop mitigation measures which are commensurate to the risk posed to the target species, with the ultimate goal of ensuring the wind farm does not result in an ecologically significant impact on the target species at a population level, taking into account the results of further investigations and the level of mortality observed.</p> <p>Until such time as the Level 2 Mitigation Plan is finalised and implemented the turbine will remain assigned to the 'high risk – level two' category and additional carcass searches and targeted surveys will continue where warranted.</p>	Preparation of mitigation plan to commence immediately following conclusion of Level 2 investigation.
		<p>An assessment of population level impacts will be conducted to evaluate the effectiveness of the Level 2 Mitigation Plan and the estimated impact over the current year. The results will be presented and discussed with DEECA/DCCEEW, as relevant, to determine if a new set of actions is necessary if evidence indicates that a significant impact at the population level is anticipated.</p>	Assessment to commence following finalisation of mitigation plan.
	Incident Reporting	<p>Submit a report to the Responsible Authority.</p> <p>The investigation will seek to assess any relevant attributes associated with the mortality event.</p> <p>The report will include:</p> <ul style="list-style-type: none"> ▪ Date and time of mortality; ▪ Identify, if possible, wind direction and speed when the bat was struck; ▪ Weather conditions; ▪ Location of mortality relative to habitat, vegetation, and water sources; ▪ Analysis of any other mortality on the site; 	Immediately following conclusion of Level 2 investigation.

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Impact Trigger	Actions	Description	Timing
		<ul style="list-style-type: none"> Conclusions of investigation regarding risk of ecologically significant impact to the species and likelihood of further mortalities on-site; Recommendations for future actions to mitigate impacts on the species. 	
Level 3: A third mortality event involving a listed species occurs on the site (one or more carcasses, feather spots or injured animals of that species are detected under a turbine during a subsequent carcass search)	Label the turbine as a “high risk – impact trigger level three (T3)” turbine.	This event activates the species-specific management strategy as follows.	Immediately following mortality.
	More frequent carcass searches to assess the extent of the impact, minimise the chances of scavenging and maximise carcass detections	Additional searches (120 m radius) of all turbines including repeated (70 m radius) searches if a listed MB species was hit.	Within a week of the mortality.
		The findings of the searches will be recorded and reported to DEECA/DCCEEW as required.	Within one month of the mortality.
	Further investigation	Further investigation of target species to recommence, if not already continuing from Level 1 or Level 2 trigger. These investigations will include acoustic and/or field-based surveys of the wind farm and surrounding area.	First monthly monitoring to occur within two weeks of the mortality event, if not continuing from Level 1 or Level 2 trigger.
	Adaptive management and assignment and re-assignment of risk	If investigations and analyses of the survey results do not suggest an increase in species activity, and no additional fatality events occur at the site, and it is concluded that any previous fatality was an isolated incident and that the turbine does not pose a high risk to the listed species, no further monitoring or mitigation actions will be required and the turbine will be reassigned again as ‘low risk.’	Within two months of third mortality event.

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Impact Trigger	Actions	Description	Timing
	Adaptive mitigation	<p>If investigations and analyses of the survey results suggest that the fatality is unlikely to be a one-off event or that an ongoing impact is possible for the species, a Level 3 Mitigation Plan will be developed in consultation with DEECA and/or DCCEEW. This mitigation plan will seek to develop mitigation measures which are commensurate to the risk posed to the target species, with the ultimate goal of ensuring the wind farm does not result in an ecologically significant impact on the target species at a population level, taking into account the results of further investigations and the level of mortality observed.</p> <p>Until such time as the Level 3 Mitigation Plan is finalised and implemented the turbine will remain assigned to the 'high risk – level two' category and additional carcass searches and targeted surveys will continue where warranted.</p>	Preparation of mitigation plan to commence immediately following conclusion of Level 3 investigation.
		<p>An assessment of population level impacts will be conducted to evaluate the effectiveness of the Level 3 Mitigation Plan and the estimated level of mortality over the current year 1987. This assessment will be presented and discussed with DEECA/DCCEEW, as relevant, to determine if a new set of actions is necessary if evidence indicates that a significant impact at the population level is anticipated.</p>	Assessment to commence following finalisation of mitigation plan.
	Incident Reporting	<p>Submit a report to the Responsible Authority</p> <p>The investigation will seek to assess any relevant attributes associated with the mortality event</p> <p>The report will include:</p> <ul style="list-style-type: none"> ▪ Date and time of mortality; ▪ Identify, if possible, wind direction and speed when the bat was struck; ▪ Weather conditions; ▪ Location of mortality relative to habitat, vegetation, and water sources; 	Within four months of finalisation of Level 3 Mitigation Plan.

Impact Trigger	Actions	Description	Timing
		<ul style="list-style-type: none"> ▪ Analysis of any other mortality on the site; ▪ Conclusions of investigation regarding risk to the species and likelihood of further mortalities on-site; and ▪ Recommendations for future actions to mitigate impacts on the species. 	

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6. Reporting and review

This section of the plan outlines the main reporting arrangements for this BAMP. Specific reporting guidelines may also be discussed in their respective sections, and therefore further clarification should be sought in those sections if sufficient detail is not provided below. Review meetings may be required after reports are submitted and therefore the actual date of these meetings will be determined in a responsive manner.

Standard BAMPs undertake monitoring for a minimum of two years after the commencement of wind farm operations. This BAMP outlines a two-year program. This management plan is adaptive, in that results in one year may influence monitoring in the following year. A review of results and impacts will be undertaken after the first year to inform any requirements for change to the second year of monitoring.

New technologies may also become available that are more time or cost efficient to implement or more effective. The scope of any changes to monitoring would be developed in consultation with DEECA and be subject to their approval.

The first annual report will be prepared after twelve months of monitoring. This will focus on presenting the results from each year of carcass monitoring. Matters to be addressed in the annual reports include but will not be limited to the following.

- Summary of post-construction carcass search results and total survey days;
- Discussion of any apparent seasonal or yearly variation in the number of bird or bat strikes within the first year;
- Summary of bird utilisation surveys, in-circuit surveys, and targeted monitoring;
- Summary of any additional targeted monitoring surveys that were required (if relevant) as part of mitigation measures or species-specific monitoring in response to impact triggers;
- Changes to and final protocol of the methodology, for example, alterations to duration and frequency and areas sampled;
- Once available, this report will be presented to a review meeting with the Regional Manager at DEECA (or their delegate) and the Responsible Authority. The results of the carcass searches will be reviewed and refinements to the monitoring program (if necessary) will be agreed; and
- Raw data and the annual report will be submitted to DEECA and the Responsible Authority within three months of completion of 12 months of mortality monitoring.

The **second annual report** will comprehensively analyse two years of monitoring and will include but will not be limited to the following.

- Detailed monitoring methods (including list of observers, dates and times of observations);
- Summary of post-construction carcass search results and total survey days;
- Overall mortality estimates for birds and bats, including estimates by size classes and for specific species where statistically possible, analysed by a suitably qualified statistician, and detected numbers for all species recorded during the carcass searches;
- Any other mortality recorded on site but not during designated carcass searches (i.e., incidental records by site personnel, etc.);

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- Comparison of bird utilisation surveys with pre-construction surveys, and a summary of microbat and targeted monitoring;
- Summary of any additional targeted monitoring surveys that were required (if relevant) as part of mitigation measures or species-specific monitoring in response to impact triggers;
- A discussion of the results, including the following:
 - Whether the level of mortality was ecologically significant or affected listed species of birds or bats (including species of concern to DEECA). If a Population Viability Assessment (PVA) exists for the affected species, it will be used in consultation with species experts to provide an objective and quantifiable approximation of the consequences of impacts;
 - Any differences between years that may have arisen due to wet and dry conditions;
 - Any recommendations for reducing mortality, if necessary; and
 - Any mitigation or offset measures implemented, and the success or otherwise of these measures.
- Raw data and the annual report will be presented to the Regional Manager at DEECA (or their delegate) and the Responsible Authority within three months of completion of the 24-month monitoring period.

Following completion of each annual report, the proponent must, within three months, publish on the project public website a summary of monitoring results and details demonstrating compliance with approval conditions, in accordance with DCCEEW (2024). Annual compliance reports will also be submitted to DCCEEW to review the implementation of the approved BAM Plan and will include the following, as outlined in the *Onshore Wind Farm Guidance – Best practice approaches when seeking approval under Australia’s national environmental law (DCCEEW 2024)*. These reports will include:

- Update target species risk assessment based on actual turbine strike impacts to date, including monitoring data and incidental species sightings
- Re-analyse flight path and habitat predictions and turbine strike impact predictions as required, compared against actual turbine strike impacts to date (including monitoring data and incidental species sightings)
- Re-analyse individual turbine strike risk based on monitoring data and incidental species sightings, including justification for any proposed changes to risk ratings based on ongoing monitoring and survey efforts
- Reference improvements and updates to the monitoring program, including the methodology applied
- incorporate adjustments to impact thresholds and provide details of associated adaptive management actions taken, including a review of the effectiveness of any implemented BBMP mitigation measures. (Note: these should not generally be reduced without significant evidence over multiple years demonstrating a sustained reduction in risk)
- Reference ongoing process improvement and incorporation of new information and technology; for example, improved turbine strike mitigation measures and strike detection technology
- Outline unforeseen limitations or issues identified during wind farm operation, and any other matters requested by the decision-maker.

Following completion of two years of monitoring, results will be reviewed by DEECA and the Responsible Authority to determine if further monitoring and reporting are required. If it is deemed the program should continue as is, the methodology and scope will be similar to that outlined in this report. If changes are required, an amended method will be developed in consultation with and approval of DEECA.

If an impact trigger is detected, MWF will notify DEECA via email within two working days for listed species and ten working days for non-listed species of the impact trigger being recorded, in line with Section 7 of this BAMP.

An **adaptive management response report** must be submitted to DCCEEW within 3 months if any changes are made to the adaptive management approach are made (DCCEEW 2024). This report should follow the format of the annual compliance report (see above), but with a focus on the implemented adaptive management response.

6.1. Endorsement and Review of BAM Plan

In order to avoid the potential for duplication of conditions of approval under both Commonwealth and State legislation, it is proposed that this BAM Plan is endorsed and reviewed by the Victorian Department of Energy, Environment, and Climate Change, in consultation with the Commonwealth Department of Climate Change, Energy, the Environment and Water.

Under such an arrangement, the endorsed version of this BAM Plan would be prepared in accordance with a range of standard conditions concerning the preparation and endorsement of BAM Plans in Victoria, including but not limited to the requirement for the BAM Plan to be endorsed prior to the commencement of the permitted use.

Finally, it is proposed that the BAM Plan is reviewed on an annual or biennial basis to ensure that monitoring and mitigation measures are updated in line with intervening developments in scientific research, government policy and mitigation technologies.

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7. Management actions and report timing

Management actions, survey details and report timelines for post-construction bird and bat impact monitoring are summarised in Table 4.

Table 4: Timeline for surveys and reporting to DEECA and the Responsible Authority after commissioning of turbines at the MWF.

Management Action	Details	Report timing	Responsible
Carcass searches	All turbines (eight) will be searched every month, initially for a minimum of two years. The methodology will be subject to a review after a year with any refinements to the method implemented in consultation with and with the approval of DEECA. Continuation of searches after two years would depend on the extent of significant impacts on bird and bat populations of concern.	Incorporated into annual reports.	Qualified ecologist
Impact trigger reports (incl. species of concern)	Impact triggers for listed species outlined in Section 4.1.1 require immediate reporting (and action) to DEECA and relevant authorities as per Figure 2.	Inform DEECA within 2 business days of an impact trigger. Initial report delivered to DEECA within one week of recording the incident, which should include likely effective mitigation recommendations (to be implemented as soon as possible).	Proponent
	Impact triggers for non-listed species outlined in Section 4.1.2 require reporting (and action) to DEECA and relevant authorities as per Figure 3.	Inform DEECA within 5 business days of recording the potential impact. Initial report delivered to DEECA within three weeks of recording the incident.	Proponent
First year report	Comprehensive report of surveying methods and results (given mid-collection), a summary of carcass search results, operational BUS, microbat and targeted monitoring. Review of methodology and results to inform ongoing monitoring. Discussion may include recommendations.	Where significant changes are required for carcass monitoring methods, these will be immediately notified, and revisions prepared in consultation with DEECA.	Proponent

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Management Action	Details	Report timing	Responsible
		Full reporting will be provided three months after one year of monitoring.	
Second year report	Comprehensive report of two years of surveying methods and results, including annual mortality estimates, comparisons between operational and pre-construction BUS and a summary of microbat and targeted monitoring. Discussion will include (but not limited to) any significant impacts and implications for future monitoring, if required, including the frequency and duration of further surveys on target species or fauna groups.	Where significant changes are required for carcass monitoring methods, these will be immediately notified, and revisions prepared in consultation with DEECA. Full reporting will be provided three months after two years of monitoring.	Proponent

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8. Roles and responsibilities

This section identifies all stakeholders involved in the implementation and oversight of this BAMP and their respective responsibilities.

8.1. Proponent/Project owner

The proponent/project owner will be responsible for implementation of all aspects of this BAMP and the decision-making that goes with it, with technical support provided by a qualified ecologist.

8.2. Qualified ecologist

The qualified ecologist will be retained by the proponent to provide advice on and oversee the implementation of this BAMP, as well as prepare all reports for DEECA and assist in the development of mitigation measures and their implementation, as well as consultations with DEECA on suitable measures.

8.3. DEECA

DEECA will receive reports from the proponent arising from the routine (e.g., annual reports or reports of listed species impacts) or impact trigger response reporting. It will also be responsible for participating in conversations reviewing proposed mitigation measures, and ultimately working with the proponent to ensure what is done is to its satisfaction.

8.4. Minister for Planning

The Responsible Authority (Minister for Planning) will ultimately determine the acceptability of impact mitigation and offset measures and will receive all reporting (both routine and impact trigger response reporting).

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9. References

- Adams, E. Williams, K. and Gulka, J. 2021, A review of the effectiveness of operational curtailment for reducing bat fatalities at terrestrial wind farms in North America, *PLoS ONE* 16(11): e0256382.
- Arnett, E.B., Johnson, G.D., Erickson, W.P. and Hein C.D. 2013, *A synthesis of operational mitigation studies to reduce bat fatalities at wind energy facilities in North America: A report submitted to the National Renewable Energy Laboratory*, Bat Conservation International, Austin.
- Australian Wind Energy Association (AusWEA) 2005, *Wind Farms and Birds: Interim Standards for Risk Assessment*. Report prepared by: Brett Lane and Associates and AIRA Professional Services; Report No. 2003.35(2.2), July 2005.
- Bennett, E.M., Florent, S.N., Venosta, M., Gibson, M., Jackson, A. and Stark E. 2022, Curtailment as a successful method for reducing bat mortality at a southern Australian wind farm' *Austral Ecology*, 47(6): 1329-1339.
- Clean Energy Council (CEC) 2018, *Best Practice Guidelines for the Australian Wind Industry*. <https://assets.cleanenergycouncil.org.au/documents/advocacy-initiatives/community-engagement/wind-best-practice-implementation-guidelines.pdf>
- DCCEEW (Department of Climate Change, Energy, the Environment and Water) 2024, *Onshore Wind Farm Guidance Best practice approaches when seeking approval under Australia's national environment law (Draft, May 2024)*, Canberra.
- DTP (Department of Transport and Planning) 2023, *Planning Guidelines for Development of Wind Energy Facilities*, published by Victorian Government Department of Transport and Planning.
- Duerr, A.E., Parsons, A.E., Nagy, P.R., Kuehn, M.J., Bloom, P.H. 2023, Effectiveness of an artificial intelligence-based system to curtail wind turbines to reduce eagle collisions. *PLOS ONE* 18(1): e0278754.
- Hull, C.L., Stark, E.M., Peruzzo C, and Sims, C.C. 2013, Avian collisions and two wind farms in Tasmania, Australia. *NZ J Zool* 40:47-62.
- Huso, M. 2011, An estimator of wildlife fatality from observed carcasses. *Environmetrics* 22(3):318-329.
- Lentini, P.E., Lumsden, L.F., and van Harten, E.M. 2025, *Assessment, mitigation and monitoring of onshore wind turbine collision impacts on wildlife: A systematic review of the international peer-reviewed literature, and its relevance to the Victorian context*. Arthur Rylah Institute for Environmental Research Technical Report Series No. 389. Department of Energy, Environment and Climate Action, Heidelberg, Victoria.
- Maclaurin, G., Hein, C., Williams, T., Roberts, O., Lantz, E., Buster, G. and Lopez, A. 2022, National-scale impacts on wind energy production under curtailment scenarios to reduce bat fatalities, *Wind Energy*, 25(9): 1514-1529.
- Szurlej-Kielanska, A. and Pilacka, L.A. 2022, Sustainable development of green energy-automated bird protection at wind farms. *Global Journal of Zoology*, 7(1), 019-023.
- Whitby, M.D., O'Mara, M.T., Hein, C.D., Huso, M. and Frick, W.F. 2024, A decade of curtailment studies demonstrates a consistent and effective strategy to reduce bat fatalities at wind turbines in North America. *Ecological Solutions and Evidence* 5(3): e12371.

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Appendix 1: Carcass search protocol

Searches will be undertaken by qualified ecologists or personnel trained in carcass searches, with potential use of scent dogs if available, all under the regular oversight of the supervising ecologist.

The search area beneath each turbine has been determined as the area to find bats and bird carcasses with turbines of this size (Hull & Muir 2010). Based on applying the Hull and Muir model to the Mumblin Wind Farm turbine model, 95% of bat carcasses are expected to be found within 74m of the turbine, and carcasses of medium to large birds are expected to be reasonably evenly distributed out to 122m. Carcasses of very large birds (e.g., Wedge-tailed Eagle) may be found a little further out, but 95% are expected to be within 130m of the turbine.

All turbines will be searched once per month once operational. Each search and carcasses found will be documented in the form provided in the Onshore Wind Farm Guidance under Australia's national environment law (available at: <https://consult.dcccew.gov.au/onshore-wind-farm-guidance>).

Human searcher option

Given this, inner and outer circular search zones have been designated. The inner zone targets the detection of carcasses of bats and small to medium and large sized birds. In the inner zone, a circle is formed with a 70m radius from the turbine and transects are spaced every 6m (Figure 1). The outer zone will comprise the zone between the 70m and 130m radius circles. Although they may be recorded in the inner zone, the outer zone will ensure the adequate detection of carcasses of medium to larger sized birds, which can fall further away from turbines. Search transects in the outer zone are spaced at 12m and carried out from the edge of the inner zone out to the edge of the outer zone.

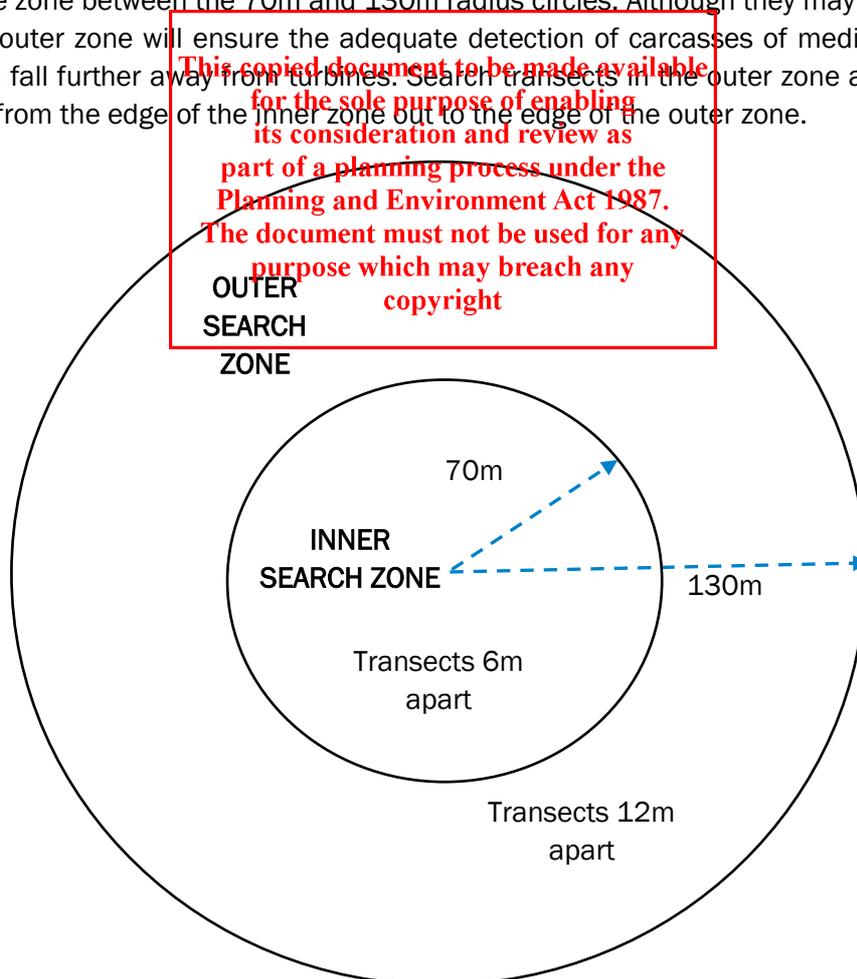


Figure 1: Inner and outer carcass search zones underneath the turbines

Scent dog option

Trained dogs could also be used to undertake the carcass searches. Trained dogs are preferred over humans for undertaking carcass searches due to their detectability capacities (Bennett 2014). However, this will depend upon the availability of trained dogs and dog handlers familiar with the territory and with the appropriate skills to undertake the searches. Searching protocol will be based on a minimum detection ability where dogs must maintain at a searcher efficiency of 50% or greater during efficiency trials. If both humans and dogs are used, adjustments will be made through searcher efficiency estimates to account for differences in detectability.

If dogs are used for the searches, a suitable method will be developed in conjunction with their handler. This will generally involve the dogs working on a reference transect line from downwind to upwind. The handler will start down wind of the turbine and walk across the direction of the wind allowing the dog to freely zig zag across the searcher's transects, using whistle commands to control how far the dog moves to each side of the transect (i.e., 30 metres). This will ensure all scent cone areas will be encountered (Figure 2). The dog does not 'look' for carcasses but finds them via scent. Therefore, it does not need to cover as much ground as if it were looking with its eyes. It only needs to cover enough ground to encounter all possible 'scent cones' within the search radius. Carcasses found outside the defined search area will be recorded and collected as an incidental find.

The scent cone is the area downwind of the target, in this case a carcass, in which the scent will drift with the wind. So, if the wind is strong; the scent will drift further but in a narrower scent cone, and if the wind is light, the scent cone will be wider but will not drift as far. In the case of strong wind, then transects will need to be narrow to ensure scent cone areas are encountered. Whereas transects of approximately 30 metres wide will be adequate to cover an area in moderate wind conditions, this will be reduced to 10 or 20 metres in conditions with no wind or strong wind.

A GPS collar will be fitted to the dog which will allow the handler to track movements in real time and allow the handler to ensure the entire search area has been effectively covered by the dog. Search areas will be loaded onto GPS prior to commencing searches to allow the handler to see the exact borders of the area and the dog's movements within it. GPS data will be made available to regulators on request.

Dog handler(s) must have demonstrated capacity to identify bird and bat species of south-east Australia.

Search regime

All turbines will be searched out to 130 metres once per month. The order of turbines searched will be randomized between searches.

To maximize detectability, particularly for species prone to quicker scavenging than larger ones such as small birds and bats, a secondary 'pulse' search will be undertaken every month during the monitoring program. Pulse searches entail searching in the same way the 'inner zone' (out to 70 metres) again after the initial search. This ensures most species of concern are unlikely to be missed during a search round and helps to promptly identify any collisions at the start of wind farm operations, enabling efficient and timely responses if needed.

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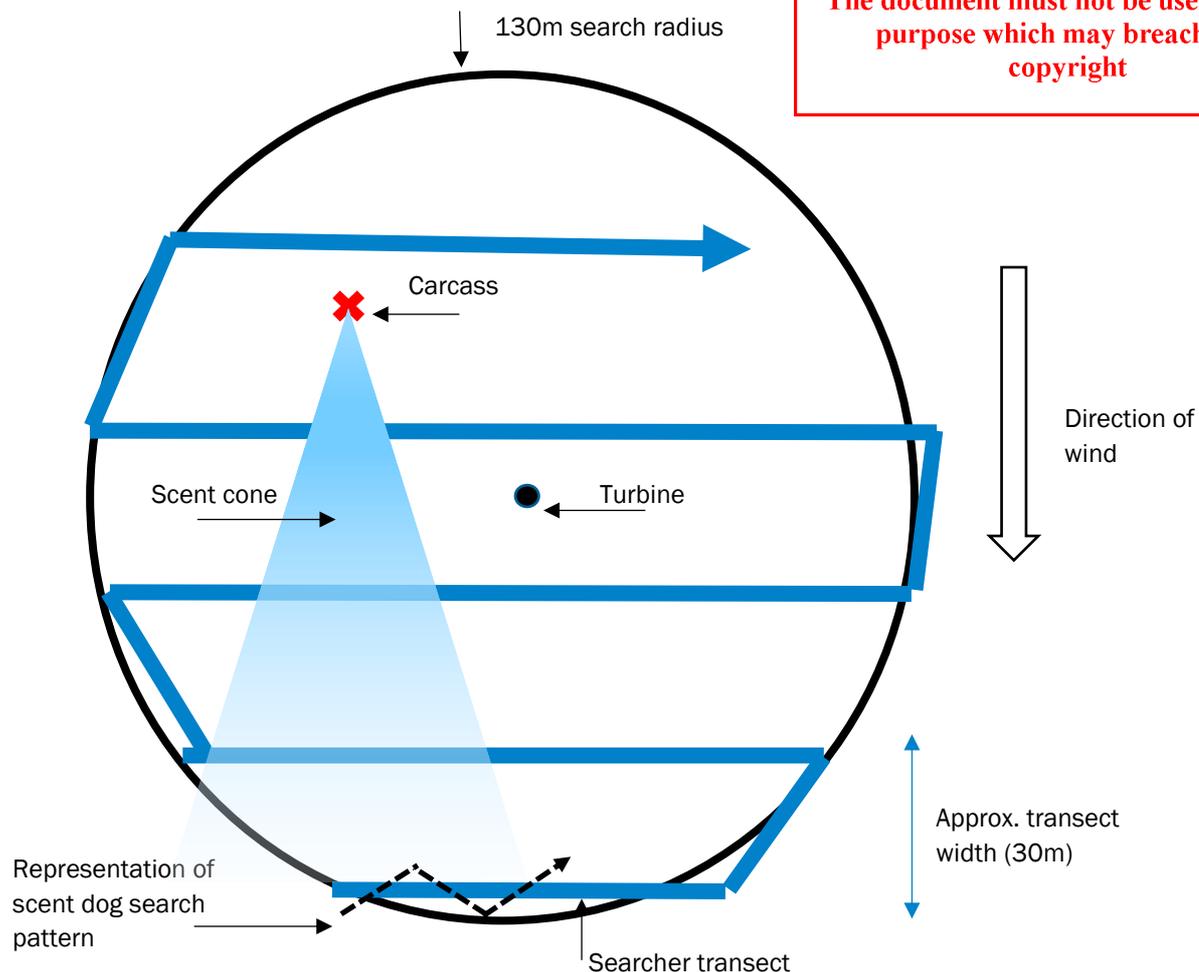


Figure 2: Search pattern for scent dog – across the wind turbine search radius

Carcass detection protocol

This carcass detection protocol applies to both incidental carcass finds and the formal carcass search program. If a carcass is detected (a 'find') the following variables will be recorded in the Mortality Survey Data template provided by in the Onshore Wind Farm Guidance under Australia's national environment law (available at: <https://consult.dcceew.gov.au/onshore-wind-farm-guidance>). Included in this form or as additional notes, the following information will be recorded:

- Position of carcass in relation to the turbine i.e. distance in metres and compass bearing of the carcass from the base of the turbine;
- substrate and vegetation;
- species, age, number, sex (if possible), signs of injury and estimated date of strike;
- weather (including recent extreme weather events, if any), visibility, maintenance of the turbine and any other factors that may affect carcass discovery; and
- if the species is not able to be immediately identified (e.g., an incidental find, and there is not an ecologist on site), photographs must be provided to the qualified ecologist immediately for

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identification purposes. The ecologist must reply within two business days, for the possible reporting of an impact trigger. If carcass identification is not possible and there is a suspicion it may be a listed species or species of concern, samples will be sent for DNA analysis.

Bird and bat handling protocol

Carcasses will be handled according to standard procedures, as follows:

- The carcass will be removed from the turbine site to avoid re-counting;
- the carcass will be handled by personnel wearing rubber gloves, packed into a plastic bag, then placed in a second plastic bag;
- the clearly labelled by including a copy of its completed Carcass Search Data Sheet in the second plastic bag to ensure that its origin can be traced later, if required; and
- the double-bagged and wrapped carcass will be transferred to an on-site freezer (at the Project Site office) for storage. The carcass will be available for a second opinion on the species identity, if necessary. The freezer will only be used for holding carcasses and not for other uses.

It will be necessary for the wind farm operator to obtain from DEECA a permit under the *Wildlife Act 1975* (Vic) to handle and keep native wildlife (even dead wildlife) as part of the monitoring program. An application for this permit will be submitted in a timely manner to ensure approval has been obtained prior to commissioning of the turbines. An application for this permit will be submitted in a timely manner to ensure approval has been obtained prior to commissioning of the turbines. Collected carcasses will be retained for 12 months prior to disposal.

In addition to carcass handling, the protocol also covers the response to injured wildlife encountered on site. All on-site staff and monitoring personnel will be advised of the correct procedure for assisting injured wildlife. Construction and Operations personnel and Environmental Officers will be required to report the find to the Project's Responsible Officer, who will organise recovery of, and treatment for the animal. If safe to do so, place the animal immediately into a dark place, e.g., box or cloth bag for transfer to the nearest wildlife carer or veterinarian. Alternatively, Wildlife Victoria (1300 094 535) will be contacted and informed of any injured wildlife. A member of that organisation will be required to collect any wildlife injured.

Contact details of local veterinary staff and wildlife carers are provided in Table 1 to ensure that if injured wildlife is found and cannot readily be released back to the wild, they are treated accordingly and in a timely manner.

All persons who handle injured or dead animals must wear gloves and understand the applicable OH&S requirements. Special care² will be taken to avoid bat borne viruses (i.e., Australian Bat Lyssavirus and Hendra Virus), and only people with appropriate vaccinations will handle bats (living or deceased).

The Injured Bird and Bat Protocol is valid for two years after commissioning and will be reviewed after this time frame. If it requires change this will be included in an amended BAMP.

² Infectious diseases: guidelines and advice

(<https://www.health.vic.gov.au/public-health/infectious-diseases-guidelines-and-advice>, accessed April 2022)

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Table 1: Vet and wildlife carer details for the local region

Name	Phone	Location/Address	Bats (Y/N?)
Hampden Vet Clinic	03 5595 1100	40 Curdie St, Cobden	Y
Camperdown Vet Centre	03 5593 1077	1 Leura St, Camperdown	Y
Terang and Mortlake Vet Clinic	03 5592 2111	20 Estcourt St, Terang	Y
The Vet Group	03 5558 6666	99 Bailey St, Timboon	Y

Scavenger rate and detectability (searcher efficiency) trials

This BAMP does not propose project-specific scavenger trials or searcher efficiency trials and instead adopts the findings of the Symbolix report *Post construction bird and bat monitoring at wind farms in Victoria (2020)* as summarised in Table 2 and 3. Due to the ubiquitous nature of scavengers in Victoria, the limitations of achieving sufficient sample sizes at a single wind farm, and the availability of multi-site data, this approach offers a broader and more robust baseline for mortality estimation. It reflects consistent scavenger activity and typical farmland wind farm conditions across Victoria, making it a more representative and practical alternative to isolated site specific trials.

Table 2: Searcher Efficiency

Observer/Searcher	Species Type	Searcher Efficiency	Confidence Interval
Human	Bird	88%	[85%, 91%]
Human	Bat	52%	[44%, 61%]
Dog	All (Bird or Bat)	84%	[80%, 88%]

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Table 3: Carcass loss to scavenger

Category	Average number of days to be scavenged	Confidence Interval
Large birds (Wedge-tailed Eagle)	287 days	[130.1, 634.5]
Other birds	5.68 days	[4.75, 6.79]
Bats	2.69 days	[2.11, 3.43]

The results of the Symbolix report will be used in the analysis of on-site mortality data to correct for searcher efficiency and scavenger removal rates. Estimates of carcass removal by scavengers (expressed as the average carcass duration) will correct for scavenging effects on carcass detection. As there is no evidence for significant seasonal variation in scavenger activity, general scavenger and detectability correction factors will be applied instead of seasonal estimates.

References

Bennett, E 2014, Observations from the use of dogs to undertake carcass searches at wind farm facilities in Australia. *Wind and Wildlife* 1: 113–123.

Hull CL and Muir S 2010, Search areas for monitoring bird and bat carcasses at wind farms using a Monte-Carlo method. *Austr. J. Env. Management* 17: 77-87.

Symbolix 2020, Post Construction Bird and Bat Monitoring at Wind Farms in Victoria, Melbourne. Public report, 13th Wind Wildlife Research Meeting 2020.

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