

Appendix 5: Guidance for developing Bat and Avifauna Management (BAM) Plans for onshore wind energy facilities

This guidance outlines information that can be included in a BAM Plan for threatened bird and bat species for onshore wind energy facilities. The specific monitoring, reporting and adaptive management requirements to include in a BAM Plan may vary depending on the project, the risks and impacts to threatened bird or bat species and the level of effectiveness or uncertainty of measures adopted under the mitigation hierarchy.

1. Objectives

A BAM Plan is used to monitor and report on the impacts of a wind energy facility once it has commenced operation. They also support the systematic collection and reporting of data that can be used to improve understanding of the local and cumulative impacts of wind energy facilities on threatened bird and species, which can inform and improve future decisions in relation to wind energy facilities.

The BAM Plan must be consistent with this Handbook and, where required, any conditions of the planning permit for the wind energy facility. Any required revisions to the BAM Plan may be undertaken as secondary consents (post-approval) to satisfy specific permit requirements.

The BAM Plan may also contain requirements related to the following:

- Monitoring the presence and behaviour of birds and bats and the impacts of the wind energy facility on threatened bird and bat species at the site or in the surrounding area.
- Avoid, minimise and mitigation measures to be applied to manage risks and impacts to threatened bird and bat species and how these will be monitored.
- The implementation actions for delivery of compensatory measures, if any, as per Section 6.4 of the Handbook.
- Defining triggers and procedures for the adaptive management of residual impacts from the wind energy facility and / or in response to new information and/or conditions.

- Methods for post-construction mortality monitoring for bird and bat species as per Appendix 4.
- Procedures for the collection and disposal of bird and bat carcasses under turbines and the care of injured birds and bats on site for the life of the wind energy facility. This includes working with Traditional Owners and First Nations groups where appropriate.
- Procedures, formats and frequency for periodic reporting to the responsible planning authority and DEECA within agreed-upon timeframes and making reports publicly available (subject to any necessary redactions for confidentiality or privacy reasons or related to ecologically sensitive information).

2. Project Description

Description of the project including project type, scale and anticipated operating life.

Site and project description

Describe the site location and project, including the number and specifications of turbines such as hub height, minimum and maximum rotor swept height, power.

Site Map

The Site Map must include grid lines in decimal degrees, and show water bodies and native and non-native vegetation, major and minor roads, turbine locations, numbers and elevation contours. It must also mark which turbines will be searched during post-construction mortality monitoring.

Planning Permit conditions (where applicable)

Include a table that demonstrates each of the conditions relating to bird and bat management listed in the planning permit for the wind energy facility.

Species occurring or likely to occur at the site or in the surrounding area

Outline all threatened bird and bat species occurring or likely to occur at the site or in the surrounding area.

Clearly identify if any threatened bird and bat species are listed on DEECA's Species of Concern List.

Clearly identify if any bird and bat species have been identified by Traditional Owners or First Nations groups as being of cultural significance.

3. Pre-construction Utilisation Surveys

Pre-construction utilisation surveys document a baseline of threatened bird and bat activity recorded at the project area and surrounding area prior to construction and operation of the wind energy facility.

Include information on pre-construction bird and bat utilisation surveys and specific monitoring and desktop assessments undertaken for Species of Concern, including the methods, survey effort and limitations. This will ensure the information it is accessible to stakeholders, regulators, and the public.

4. Post-construction utilisation surveys

Post-construction utilisation surveys provide information about bird and bat activity at and near the site following turbine commissioning and provide context for interpreting mortality results. Such surveys can be used to compare the levels of bird and bat activity before and after the construction and operation of the turbines to help interpret the mortality data and more fully understand the potential impacts from any displacement, disturbance or barrier effects that might result from a wind energy facility.

Include information on post-construction bird and bat utilisation surveys and specific monitoring and desktop assessments undertaken for Species of Concern, including the methods, survey effort and limitations. This will ensure the information is accessible to stakeholders, regulators, and the public.

5. Post-construction mortality monitoring

The aim of post-construction monitoring is to record and understand the impacts that the wind energy facility is having on bird and bat species, including Species of Concern, and to enable annual mortality estimates to be calculated. This requires information from mortality searches, including trials to determine searcher efficiency rates (the likelihood of carcasses present to be found by searchers) and carcass persistence rates (how long a carcass is likely to remain available to be found) at the facility.

Describe methods for post-construction monitoring, taking into account the guidance in **Appendix 4**.

Proponents are required to record and report all mortalities of bird and bat species as part of their reporting obligations (see below).

Estimating the actual impacts of a wind energy facility on birds and bats enables an assessment of whether measures under the mitigation hierarchy are required to manage residual impacts to acceptable levels and informs decision-making and research on cumulative impacts.

Length of monitoring period

Describe the post-construction monitoring period, including the total length of time, period of continuous monitoring and subsequent intervals of monitoring [see **Section 7.1** of the Handbook].

6. Applying measures under the mitigation hierarchy

Avoid, minimise and mitigation measures

Describe the avoid, minimise and mitigation measures that will be applied to manage the operational impacts of the wind energy facility and how these will be monitored.

Compensation arrangements

Where a proponent has agreed to deliver compensatory measures to manage residual risks and impacts from the wind energy facility, describe those measures and the implementation plan.

[see **Section 6.4** of the Handbook]

7. Adaptive management triggers and actions

Outline the adaptive management approach to be adopted for the wind energy facility to manage residual impacts and / or impacts that arise from new information and/or conditions. This should include triggers that define an impact threshold and measures the operator will undertake in the event a threshold impact is reached.

Defining triggers should factor in the avoid, minimise and mitigation measures to be applied to the wind energy facility, and specifically consider the potential for increased level of impacts than what was predicted as part of pre-construction assessment.

Measures to mitigate and/or compensate for the impacts above thresholds should be clearly outlined, including an explanation about how they respond to the impact and are proportionate to the nature and significance of the impact. Flexible approaches can be adopted by outlining options for adaptive management measures when triggers are met. In this case, the process to determine which option will be applied, including any consultation with DEECA or the responsible planning authority, must be clearly outlined.

All triggers and adaptive management measures should be based on the best available information.



8. Reporting requirements

Notification of mortalities

Outline agreed triggers and timeframes within which DEECA and the responsible planning authority – and Traditional Owners if requested – will be notified of mortalities to threatened bird and bat species. Examples of where this may be required include:

- mortalities of Species of Concern
- if the wind energy facility has been assessed as having significant residual impacts
- where the wind energy facility is located in close proximity to an important ecological feature for threatened bird or bat species
- where there is a spike in mortalities recorded compared to other reporting periods.

Specific notification triggers may be set out in planning permit conditions.

Notification of mortalities ensures that regulators are aware of emerging impacts and the potential need for imminent review of responses. This is separate to and distinct from full reporting requirements (outlined below).

Annual and periodic reporting of mortalities

A key responsibility for an operator of a wind energy facility is reporting of the results of post-construction monitoring. The operator of the wind energy facility should notify the responsible planning authority and DEECA once post-construction monitoring has commenced. The notification should include a schedule of when the responsible planning authority and DEECA will receive the submitted annual reports.

An annual report must be prepared after each year (12 months) of continuous monitoring. The first 12 months commences on the day of commencing operation of the wind energy facility, noting that there may be a need for monitoring activity based on staged development and commissioning of a facility [see **Section 7.1** of the Handbook]. For periodic monitoring, a report should be prepared at the end of the period.

Matters to be addressed in reports include, but are not limited to:

- A brief description of the management prescriptions implemented, and identification of any modifications made to the original management practices.
- The survey methods (including list of observers, dates, and times of observations).
- Results of carcass searches and incidental carcass observations.
- Estimates of bird and bat mortality rates (total mortality at the facility per year and mortalities per turbine per year) based on statistical analysis, factoring in search effort (frequency and number of turbines), searcher efficiency rates and carcass persistence rates. Species-specific annual mortality estimates will be calculated for Species of Concern and any other specific species as directed by DEECA.
- Seasonal and annual variation in the number and composition of bird and bat strikes, where detectable.
- Any mortality notification and adaptive management triggers that occurred in the monitoring period and a summary of the response/s implemented.
- Information related to any specific obligation contained in the planning approval.
- A discussion of the results, including:
 - mortality impacts to bird and bat species, specifically identifying if they are Species of Concern
 - the effectiveness of measures under the mitigation hierarchy applied to the wind energy facility to manage risks and impacts
 - any further recommendations for reducing mortality, if necessary
 - a comparison of current and previous post-construction monitoring periods (not required for the first annual report).
 - comparisons of the estimated number of birds and bat mortalities (from the statistical analysis of monitoring data) against the predicted level of impacts from the bird and bat impact assessments.

Raw data and the reports should be submitted to DEECA and the responsible planning authority within two months of the completion of each 12 months or relevant period of mortality monitoring. The raw data must be in the form set in out in Section 9 of this BAM Plan guidance.

All records of threatened bird and bat species should also be entered into the Victorian Biodiversity Atlas (VBA).

9. BAM Plan: Raw Data spreadsheet

Wind Farm Name	Date found	Turbine number/code	Scientific Name	Common Name	Type (Bird/ Bat)	Distance from turbine (m)

[illegible]