



The Arthur Rylah Institute has undertaken research to determine species at potential risk to wind turbine collisions, at the Victorian population level. This fact sheet provides a summary of the research and key findings.

Summary

The research used an expert elicitation process to determine the probability of bird and bat species being at risk to the impacts of wind turbine collisions.

The process involved ten specialists that analysed 166 bird and bat 'species of interest' (159 birds and seven bats). The 'species of interest' included all bird and bat species listed:

- on the Advisory List of Threatened Vertebrate Fauna in Victoria
- as threatened under the *Flora and Fauna Guarantee Act 1988*
- as migratory or threatened under the *Environment Protection and Biodiversity Conservation Act 1999*.

All Victorian species in these categories were considered, irrespective of whether they occur in areas where wind energy facilities are currently operating. Seabird species were included in anticipation of the potential development of off-shore wind energy facilities.

The process also considered non-listed species that have the potential to become threatened by the development of wind farms. Three non-listed species, known to collide with wind turbines (White-striped Freetail Bat, Wedge-tailed Eagle and Little Eagle) were assessed against the International Union for Conservation of Nature (IUCN) criteria to determine if these species have the potential to be included on the Advisory List, for any reason, including from the impacts of wind turbine collision risks. For each of these species, the assessment determined that at present, their Victorian populations were not considered to be at risk such that they would become more threatened under IUCN criteria from wind turbine collisions.

The experts assessed the likelihood and consequence of collisions against six criteria to develop a risk matrix for each species. Each criterion was assessed to be 'high', 'medium' or 'low'.

Table 1. The criteria used to assess likelihood of risk:

Criterion A	Criterion B
Known or likely frequency of flights within rotor-swept height	Habitat preference within general environments of wind farm site. Does the species frequent open areas that coincide with microenvironments suitable for turbines (on- & offshore)?

Table 2. The criteria used to assess consequence of risk:

Criterion A	Criterion B	Criterion C	Criterion D
Highly localised or concentrated population (for whole or part of lifecycle) such that siting of wind farm could have significant consequence to Victorian population.	Impact on population relative to demographic capacity to replace fatalities (i.e. generalised combination of dispersal capacity of potential replacements, fecundity and generation time)	Known or estimate size of Victorian population	Listed conservation status as per DELWP <i>Advisory List</i> (IUCN criteria for Victorian population)

Key findings

The ARI report provides probabilities for each species being of 'minimal', 'mild', 'concern' or 'extreme concern' to the impacts of wind turbine collisions, at the state-wide population level.

It found that wind turbine collision risks varied between species.

Many species of interest were consistently identified by the experts as being at minimal or mild risk from the impacts of wind turbine collisions, at the state-wide level.

For some species, there is a higher probability that they are of 'concern' or 'extreme concern' from the impacts of wind turbine collisions at the state-wide population level, compared to the other categories of 'minimal' and 'mild' concern.

Table 3. Land-based bird and bat species that scored a higher probability of being of 'concern/extreme concern' compared to their probability of being of 'minimal/mild' concern.

Note: not all species occur within areas currently being developed for wind farms, but the full list is provided for future reference in the event of expansion into new areas.

Common name	Scientific name
Australasian Bittern	<i>Botaurus poiciloptilus</i>
Australian Bustard	<i>Ardeotis australis</i>
Australian Little Bittern	<i>Ixobrychus minutus dubius</i>
Australian Painted Snipe	<i>Rostratula australis</i>
Barking Owl	<i>Ninox connivens</i>
Black Falcon	<i>Falco subniger</i>
Brolga	<i>Grus rubicunda</i>
Bush Stone-curlew	<i>Burhinus grallarius</i>
Eastern Bent-wing Bat	<i>Miniopterus orianae oceanensis</i>
Eastern Curlew	<i>Numenius madagascariensis</i>
Eastern Osprey	<i>Pandion cristatus</i>
Elegant Parrot	<i>Neophema elegans</i>
Fairy Tern	<i>Sternula nereis</i>
Fork-tailed Swift	<i>Apus pacificus</i>
Great Knot	<i>Calidris tenuirostris</i>
Greater Sand Plover	<i>Charadrius leschenaultii</i>
Grey Falcon	<i>Falco hypoleucos</i>
Grey Plover	<i>Pluvialis squatarola</i>
Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>

Grey-tailed Tattler	<i>Tringa brevipes</i>
Intermediate Egret	<i>Ardea intermedia</i>
Lesser Sand Plover	<i>Charadrius mongolus</i>
Little Egret	<i>Egretta garzetta</i>
Magpie Goose	<i>Anseranas semipalmata</i>
Masked Owl	<i>Tyto novaehollandiae</i>
Orange-bellied Parrot	<i>Neophema chrysogaster</i>
Plains-wanderer	<i>Pedionomus torquatus</i>
Red Knot	<i>Calidris canutus</i>
Red-tailed Black Cockatoo	<i>Calyptorhynchus banksii graptogyne</i>
Regent Honeyeater	<i>Anthochaera phrygia</i>
South-eastern Long-eared Bat	<i>Nyctophilus corbeni</i>
Southern Bent-wing Bat	<i>Miniopterus orianae bassanii</i>
Square-tailed Kite	<i>Lophoictinia isura</i>
Swift Parrot	<i>Lathamus discolor</i>
Terek Sandpiper	<i>Xenus cinereus</i>
White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>

How is DELWP using this information?

DELWP has used the information from the ARI report to determine the species for the development of assessment and mitigation guidelines. The species most at risk are the species that scored a higher probability of being of 'concern' or 'extreme concern', compared to the other risk categories of 'minimal' and 'mild' concern. The priority species include Brolga, Southern Bent-wing Bat, Black Falcon, White-bellied Sea-Eagle and Red-tailed Black Cockatoo, as in addition to having a higher probability of being of 'concern/extreme' concern compared to the other categories, their key distribution overlaps with where wind farms are likely to be located. The development of assessment and mitigation guidelines are being prioritised for these species.

The species whose distribution does not overlap with where wind farms currently, or are likely to occur in the near future, are not a priority at this stage for the development of assessment and mitigation guidelines.

Many species were consistently identified by the experts as being of negligible risk from the impacts of wind turbine collisions, at the state-wide population level. For this reason, these species will not be the focus of the development of assessment and mitigation guidelines.

Given the current low scale of offshore wind farm development, seabird species are not currently a priority for developing assessment and mitigation guidelines.

DELWP will continue to assess the risks to other species as wind technology and the location of future wind farms is identified.