

Updated Species of Concern list for Victoria, relevant to onshore wind energy facilities

November 2024



This document provides supporting information about the update to the Species of Concern list for onshore wind energy facilities (WEFs) in Victoria.

Background

The Victorian government is committed to a rapid transition to renewable energy to achieve net-zero emissions by 2045. However, renewable energy projects, in particular onshore WEFs, can have negative impacts on biodiversity, especially when bats and birds collide with turbines. To enable assessments, approval processes and mitigations to be proportionate to the risks, the species that may be at risk of population-level impacts from WEFs need to be identified.

In 2019, the (former) Department of Environment, Land, Water and Planning (DELWP) developed a science-based, transparent, and reproducible approach to identify which species should be considered when assessing the impacts of collisions with turbines at Victorian WEFs (Lumsden et al. 2019). All threatened bird and bat species listed under the Victorian *Flora and Fauna Guarantee Act 1988* (FFG Act) or Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (in both the threatened and migratory categories) were assessed. These 139 species, defined as ‘Species of Interest’, included species irrespective of whether they occurred in areas with or without currently operating WEFs, so that the list would remain applicable if wind energy expanded into new areas in the future. From this process a reduced list of ‘Species of Concern’ was developed, comprised of 55 species that were assessed as being at greatest risk.

Since this time, new species have been listed under the EPBC and FFG Acts, and the conservation status (e.g. ‘Vulnerable’, ‘Endangered’) has changed for others. Therefore, an update to this list was warranted. This update only considered species relevant to onshore WEFs as there are separate processes underway to assess species impacted by offshore WEFs. Accordingly, seabirds were excluded from this assessment.

Approach

The approach taken in 2019 developed a likelihood/consequences risk matrix (Lumsden et al. 2019). The likelihood of collisions was assessed based on flight height and habitat preferences for each species. The consequences were assessed using the risk factors of population concentration, demographic resilience (i.e. how readily a population can recover from additional mortalities), population size and conservation status.

The criteria used to assess the *likelihood* of risk

Criteria A	Criteria B
Known or likely frequency of flights within rotor-swept height	Habitat preference within general environments of WEF site. Does taxon frequent open areas coinciding with microenvironments suitable for turbines?

The criteria used to assess the *consequences* of risk

Criteria C	Criteria D	Criteria E	Criteria F
Highly localised or concentrated population (for whole or part of lifecycle), such that siting of WEF could have significant consequence to the Victorian population	Impact on population relative to demographic capacity to replace fatalities (i.e. combination of dispersal capacity of potential replacements, fecundity and generation time)	Known or estimated size of Victorian population	Listed conservation status

For most threatened species there are insufficient data available to quantify each of these criteria. Therefore, an expert elicitation process was undertaken where bird and bat experts used their knowledge of the target and related species, as well as their understanding of the available research, to make an assessment for each criterion for each threatened species. The experts were provided definitions for each category in each criteria, and asked to rate the risk for each as Low, Medium or High (see Appendix 1). The ratings of the experts were combined and an overall risk level for both likelihood and consequences of collisions was calculated for each species. These were combined into a likelihood/consequences risk matrix and based on the resulting probabilities for each species, a policy decision was made in 2019 on a threshold for determining which species would be considered Species of Concern. Species were listed as of ‘Probable Concern’ where there was greater certainty around their categorisation, or of ‘Precautionary Concern’ if there was more uncertainty.

The 2024 update of the Species of Concern list

The approach taken for the 2024 assessment was to update the Species of Concern list rather than do a full revision. Therefore, the assessment focused on newly-listed species or species where a recent change in conservation status may have changed their risk ratings (since conservation status is one of the four criteria for the consequences risk component). Experts assessed the likelihood and consequences scores for three newly listed species and two additional species for which there was new information, using the approach and criteria developed in 2019. For 70 species where the conservation status had changed since 2019, the new conservation status was applied to the original ratings for the other variables, and a new risk rating calculated. The same policy settings that were developed in 2019 were applied to determine if species fitted the ‘Species of Probable Concern’ or ‘Species of Precautionary Concern’ categories.

As there remains uncertainty in the extent of risk posed to many species, a precautionary approach has been taken in developing this list of Species of Concern while further information is obtained.

The update resulted in five species of bats and 53 species of birds meeting the definition of ‘Species of Concern’. All five bat species are considered of ‘Probable Concern’. For the birds, 41 species are considered of ‘Probable Concern’ and 12 of ‘Precautionary Concern’. The revised Species of Concern list is provided below. Changes to the list have resulted from species being both added and removed from the FFG and EPBC Act lists since 2019 (e.g. Gang-gang Cockatoo has been added), new information on collision risk for some species (e.g. White-throated Needletail), and some species have been removed from the list as they no longer met the criteria (e.g. Australasian Shoveler).

Many ‘Species of Interest’ are considered to be at minimal or mild risk from the impacts of collisions with turbines. The development of a ‘Species of Concern’ list has reduced the number of threatened species that need to be

considered for risk assessments at wind farms from all threatened birds and bats (i.e. 123 'Species of Interest' in 2024) to 58 'Species of Concern'. Therefore, its creation has more than halved the number of species that need to be considered.

Mortalities recorded for Species of Concern

Not all Species of Concern have been recorded during post-construction mortality monitoring surveys at Victorian WEFs. There are a number of likely explanations as to why some species may not have been recorded, including:

- The distribution of the species does not overlap with the regions where WEFs are currently operating. However, if WEFs were developed within their range they could be at risk in the future.
- There are few currently operating WEFs within the species range, but more are planned in the future.
- The species is extremely rare in Victoria reducing the likelihood of encounters with turbines.
- The main habitats used by the species does not overlap extensively with the locations of WEFs, however these species do fly over these environments at times.
- For Critically Endangered species with very low population sizes their inclusion on the list is based on the consequences being very high if there were mortalities, while the risk of collisions is lower than for some other species.
- In addition, as not all individuals that are killed at wind turbines are found during post-construction mortality monitoring, it is also possible that some rare or threatened species have been missed. The smaller and rarer the species, the more likely they are to be incorrectly recorded as not having any mortalities.

Species not on the Species of Concern list

One threatened species which is not on the 'Species of Concern' list that has been recorded in mortality surveys at Victorian WEFs is the Blue-wing Parrot. This species was recently listed under the EPBC Act. For this species the likelihood of collisions was rated as High, however, the consequences were rated as Low due to collisions being unlikely to lead to declines of the Victorian population.

In addition, there are other species that are killed in relatively high numbers that are not currently listed as threatened species, and so are not formally on the Species of Concern list. However, some of these are culturally significant to First Nations people (e.g. Wedge-tailed Eagles) or have the potential to become threatened in the future (e.g. White-striped Freetail Bats).

Reference

Lumsden, L.F., Moloney, P. and Smales, I. (2019). *Developing a science-based approach to defining key species of birds and bats of concern for wind farm developments in Victoria*. Arthur Rylah Institute for Environmental Research Technical Report Series No. 301. Department of Environment, Land, Water and Planning, Heidelberg, Victoria. https://www.ari.vic.gov.au/_data/assets/pdf_file/0015/435300/ARI-Technical-Report-301-Developing-a-science-based-approach-to-defining-key-species-of-concern-for-wind-farm-developments.pdf

The 2024 list of Species of Concern relevant to onshore wind energy facilities

FFG Act and EPBC Act threatened status: CR Critically Endangered, EN Endangered, VU Vulnerable. Some species are listed under the EPBC Act as Migratory, which is separate to being listed under the threatened categories. Species that have been recorded as mortalities at Victorian wind farms are indicated.

Common name	Scientific name	Group	FFG Act	EPBC Act threatened	EPBC Act Migratory	Recorded fatalities
BATS						
<u>Probable concern</u>						
Southern Bent-wing Bat	<i>Miniopterus orianae bassanii</i>	Bats	CR	CR		Yes
Eastern Bent-wing Bat	<i>Miniopterus orianae oceanensis</i>	Bats	CR			
South-eastern Long-eared Bat	<i>Nyctophilus corbeni</i>	Bats	EN	VU		
Yellow-bellied Sheath-tail Bat	<i>Saccolaimus flaviventris</i>	Bats	VU			
Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	Bats	VU	VU		Yes
BIRDS						
<u>Probable concern</u>						
Gull-billed Tern	<i>Gelochelidon nilotica</i>	Gulls, Terns	EN		Yes	
Little Tern	<i>Sternula albifrons</i>	Gulls, Terns	CR		Yes	
Fairy Tern	<i>Sternula nereis</i>	Gulls, Terns	CR	VU		
Australian Bustard	<i>Ardeotis australis</i>	Ground dwelling birds	CR			
Bush Stone-curlew	<i>Burhinus grallarius</i>	Ground dwelling birds	CR			
Plains-wanderer	<i>Pedionomus torquatus</i>	Ground dwelling birds	CR	CR		
Regent Honeyeater	<i>Anthochaera phrygia</i>	Land birds	CR	CR		
Fork-tailed Swift	<i>Apus pacificus</i>	Land birds			Yes	Yes
White-throated Needletail	<i>Hirundapus caudacutus</i>	Land birds	VU	VU	Yes	Yes

Common name	Scientific name	Group	FFG Act	EPBC Act threatened	EPBC Act Migratory	Recorded fatalities
Major Mitchell's Cockatoo	<i>Lophochroa leadbeateri</i>	Parrots	CR	EN		
Scarlet-chested Parrot	<i>Neophema splendida</i>	Parrots	EN			
Red-tailed Black Cockatoo	<i>Calyptorhynchus banksii graptogyne</i>	Parrots	EN	EN		
Swift Parrot	<i>Lathamus discolor</i>	Parrots	CR	CR		
Orange-bellied Parrot	<i>Neophema chrysogaster</i>	Parrots	CR	CR		
Elegant Parrot	<i>Neophema elegans</i>	Parrots	VU			
Eastern Osprey	<i>Pandion haliaetus</i>	Raptors, Owls			Yes	
Grey Goshawk	<i>Accipiter novaehollandiae</i>	Raptors, Owls	EN			
Grey Falcon	<i>Falco hypoleucos</i>	Raptors, Owls	VU	VU		
Black Falcon	<i>Falco subniger</i>	Raptors, Owls	CR			Yes
White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>	Raptors, Owls	EN			Yes
Little Eagle	<i>Hieraaetus morphnoides</i>	Raptors, Owls	VU			Yes
Square-tailed Kite	<i>Lophoictinia isura</i>	Raptors, Owls	VU			
Barking Owl	<i>Ninox connivens</i>	Raptors, Owls	CR			
Masked Owl	<i>Tyto novaehollandiae</i>	Raptors, Owls	CR			
Red Knot	<i>Calidris canutus</i>	Shorebirds	EN	VU	Yes	
Great Knot	<i>Calidris tenuirostris</i>	Shorebirds	CR	VU	Yes	
Lesser Sand Plover	<i>Charadrius mongolus</i>	Shorebirds	EN	EN	Yes	
Eastern Curlew	<i>Numenius madagascariensis</i>	Shorebirds	CR	CR	Yes	
Whimbrel	<i>Numenius phaeopus</i>	Shorebirds	EN		Yes	
Australian Painted Snipe	<i>Rostratula australis</i>	Shorebirds	CR	EN		
Grey-tailed Tattler	<i>Tringa brevipes</i>	Shorebirds	CR		Yes	
Wood Sandpiper	<i>Tringa glareola</i>	Shorebirds	EN		Yes	

Common name	Scientific name	Group	FFG Act	EPBC Act threatened	EPBC Act Migratory	Recorded fatalities
Marsh Sandpiper	<i>Tringa stagnatilis</i>	Shorebirds	EN		Yes	
Terek Sandpiper	<i>Xenus cinereus</i>	Shorebirds	EN	VU	Yes	
Intermediate Egret	<i>Ardea intermedia plumifera</i>	Waterbirds	CR			
Little Egret	<i>Egretta garzetta nigripes</i>	Waterbirds	EN			
Australian Little Bittern	<i>Ixobrychus dubius</i>	Waterbirds	EN			
Magpie Goose	<i>Anseranas semipalmata</i>	Waterbirds	VU			
Brolga	<i>Antigone rubicunda</i>	Waterbirds	EN			Yes
Australasian Bittern	<i>Botaurus poiciloptilus</i>	Waterbirds	CR	EN		
Glossy Ibis	<i>Plegadis falcinellus</i>	Waterbirds			Yes	
Precautionary concern						
Common Tern	<i>Sterna hirundo</i>	Gulls, Terns			Yes	
Red-chested Button-quail	<i>Turnix pyrrhothorax</i>	Ground dwelling birds	EN			
Night Parrot	<i>Pezoporus occidentalis</i>	Parrots		EN		
Superb Parrot	<i>Polytelis swainsonii</i>	Parrots	EN	VU		
Gang-gang Cockatoo	<i>Callocephalon fimbriatum</i>	Parrots	EN	EN		
Glossy Black-Cockatoo	<i>Calyptorhynchus lathamii</i>	Parrots	VU	VU		
Sooty Owl	<i>Tyto tenebricosa</i>	Raptors, Owls	EN			
Bar-tailed Godwit	<i>Limosa lapponica</i>	Shorebirds	VU	EN	Yes	
Black-tailed Godwit	<i>Limosa limosa</i>	Shorebirds	CR	EN	Yes	
Inland Dotterel	<i>Peltodytes australis</i>	Shorebirds	VU			
Eastern Great Egret	<i>Ardea alba modesta</i>	Waterbirds	VU		Yes	
Freckled Duck	<i>Stictonetta naevosa</i>	Waterbirds	EN			

Appendix 1. Criteria used in 2019 for determining relative risk, taken from Lumsden et al. (2019)

Six criteria were used to assess risk. Two of these assessed the likelihood of collisions and four assessed the consequences of these collisions at a Victorian population scale. Full details are provided in the Lumsden et al. (2019) report, with a summary provided below.

Criteria used to assess likelihood:

A. Flight height: Known or likely frequency of flights within rotor-swept height.

The rankings used were:

low = species that rarely flies within rotor-swept height;

moderate = species in which a preponderance of flight activity is concentrated below rotor-swept height, but taxon does fly at rotor-swept height during some activities, or this aspect is uncertain;

high = species in which a high proportion of flight activity is within rotor-swept height.

B. Habitat preference within general environments of WEF site. Does the taxon frequent open areas coinciding with microenvironments suitable for turbines?

The rankings used were:

low = species that are quite sedentary and obligate inhabitants of environments unsuitable for wind turbines (for example forests and woodlands), and that are significantly confined to such environments;

medium = species that use both open environments suitable for turbines and other habitats, or preferentially use specific habitats not suitable for turbines, such as large wetlands or forest patches, but may fly through wind farm sites when moving between preferred habitats;

high = species that are generally resident within open landscapes favoured as sites for turbines, or regularly use these habitats.

Criteria used to assess consequences:

C. Geographic population concentration. Highly localised or concentrated population (for whole or part of lifecycle), such that siting of WEFs could have significant consequence to Victorian population.

The rankings used were:

low = species that are widely dispersed within areas of suitable habitat and the habitat itself is relatively widely dispersed;

medium = species, such as some shorebirds, that may be more widespread or have greater flexibility in the range of suitable habitat availability, but where a high proportion of the Victorian population is likely to be concentrated at sites where they do occur. Species could also be included in this category if they have highly restricted habitat availability;

high = bat species that have major aggregations at a few caves, or species of birds that have very restricted distributions or may be seasonally concentrated at very few small locations.

D. Demographic resilience. Impact on population relative to demographic capacity to replace fatalities (i.e. a combination of dispersal capacity of potential replacements, fecundity and generation time).

The rankings used were:

low = species that form breeding territories and that have a reasonable proportion of the population as non-breeding 'floaters' that can rapidly replace breeding territorial adults if lost; species that may or may not form breeding territories and that are short-lived and have high fecundity; species that have capacity for long-range or widespread juvenile or sub-adult dispersal;

medium = species with life-history characteristics that sit between the low and high descriptions here;

high = species that form breeding territories but where there is limited capacity for a lost breeding adult to be readily replaced; species that do not form breeding territories and that are long-lived and/or have low fecundity; species that may have short-distance juvenile or sub-adult dispersal capacity only.

E. Population size. Known or estimated size of Victorian population.

The rankings used were:

low = known Victorian population is estimated to number more than 20,000 individuals.

medium = known Victorian population is estimated to number between 1000 and 20,000 individuals.

high = known Victorian population is estimated to number less than 1000 individuals.

F. Listed conservation status for species listed as threatened under the FFG or EPBC Act, using the highest rating if it differed between the two Acts.

The rankings used were:

medium = Vulnerable

high = Endangered or Critically Endangered

We acknowledge Victorian Traditional Owners and their Elders past and present as the original custodians of Victoria's land and waters and commit to genuinely partnering with them and Victoria's Aboriginal community to progress their aspirations.



© The State of Victoria Department of Energy, Environment and Climate Action November 2024.

Creative Commons

This work is licensed under a Creative Commons Attribution 4.0 International licence, visit the [Creative Commons website](http://creativecommons.org/licenses/by/4.0/) (<http://creativecommons.org/licenses/by/4.0/>).

You are free to re-use the work under that licence, on the condition that you credit the State of Victoria as author. The licence does not apply to any images, photographs or branding, including the Victorian Coat of Arms, and the Victorian Government and Department logos.

ISBN 978-1-76136-518-8 (pdf/online/MS word)

Disclaimer

This publication may be of assistance to you but the State of Victoria and its employees do not guarantee that the publication is without flaw of any kind or is wholly appropriate for your particular purposes and therefore disclaims all liability for any error, loss or other consequence which may arise from you relying on any information in this publication.

Accessibility

To receive this document in an alternative format, phone the Customer Service Centre on 136 186, email customer.service@delwp.vic.gov.au, or contact National Relay Service on 133 677. Available at <https://engage.vic.gov.au/a-better-approach-to-managing-the-biodiversity-impacts-of-renewable-energy>