Nomination for listing species as critically endangered, endangered or vulnerable

under the NSW *Biodiversity Conservation Act, 2016*

This nomination form contains the following information:

Section 1 – The assessment and listing process

Section 2 – Nomination form including Nominator information and declaration

Section 3 – Definitions

Section 4 – Listing Criteria, References and links to further information

Section 1 – The assessment and listing process

The NSW Threatened Species Scientific Committee (NSW TSSC) assesses the eligibility of species that are known to occur in NSW, for listing as a threatened species (ie Critically Endangered, Endangered or Vulnerable species) in the Schedules of the *NSW Biodiversity Conservation Act, 2016* (BC Act). The NSW TSSC also identifies species that are extinct or extinct in the wild.

Under the BC Act, the NSW TSSC must initially assess a species’ risk of extinction in Australia. If a species is not threatened at the national scale then the NSW TSSC can assess the extinction risk of the species in NSW. The [BC Act](https://www.legislation.nsw.gov.au/#/view/act/2016/63) and NSW Biodiversity Conservation Regulation, 2017 sets out the criteria used to make these assessments. These criteria are based on the assessment criteria developed by the International Union for Conservation of Nature (IUCN). The guidelines in NSW TSSC (2017) provide information on how the BC Act and regulations listing criteria should be interpreted.

* 1. Common Assessment Method for national assessments

The NSW Government has signed a Memorandum of Understanding (MOU) with the Commonwealth Government and other State and Territory jurisdictions to implement a Common Assessment Method (CAM) of species using IUCN criteria.

The CAM will ensure there is a consistent approach based on IUCN criteria to assess threatened species in Australia. Through information sharing and mutual recognition of assessments, national assessments undertaken by one jurisdiction may be accepted by other jurisdictions. This will ensure a species is listed at the same level of extinction risk at both the Commonwealth and State level and reduce the duplication of assessments.

NSW Endemic species (species that are historically and currently only found NSW)

Under the CAM MOU, the NSW TSSC will undertake assessments for species that are endemic to NSW. The Committee may forward your nomination to other people, researchers and organisations to seek advice on the information provided and/or to obtain more information relevant to the assessment and management of the species.

Species that are not endemic to NSW

Under the CAM MOU the Commonwealth Threatened Species Scientific Committee (CW TSSC) is predominantly responsible for listing and assessing species that occur in one or more State or Territory jurisdictions in Australia. The CW TSSC may negotiate with NSW and other jurisdictions to determine the lead jurisdiction for a national assessment. Consequently, any nominations for a species that is not endemic to NSW will be referred to the CW TSSC. You may wish to submit your nomination for species that are not endemic to NSW directly to the CW TSSC.

With the agreement of the Australian Capital Territory Government, NSW may also undertake assessments for species found in both NSW and the ACT.

State Listings

Under the NSW BC Act, a national assessment must be undertaken for all species and a State assessment can only be considered if a species is not likely to be nationally threatened.

* 1. Assessment and listing stages
* Where the NSW TSSC has accepted a nomination for assessment the Committee will review the nomination and determine if there is any further information required to assess the species and where to obtain that information.
* After reviewing all the information received the Committee will assess the species against each of the listing criteria. A species must meet at least one of the criteria to be eligible to be listed. By following the CAM, NSW endemic species that are eligible to be listed under the BC Act may also be listed as a threatened species under the Commonwealth’s *Environment Protection and Biodiversity Conservation (EPBC) Act, 1999*.
* Where a species is eligible for listing, the Committee may forward its preliminary assessment to the CW TSSC for mutual recognition of the assessment. As part of an information sharing agreement in the MOU the nomination including your name, address and contact details may be provided to the CW TSSC.
* The Committee will place a Preliminary Determination on public exhibition for comment. As the nominator, the Committee will advise you when a Preliminary Determination is publicly released.
* Any submissions received during the public exhibition period will be considered by the Committee which will then make a Final Determination to either list the species or reject the listing. As the nominator, the Committee will advise you when a Final Determination is publicly released.
* The species is added to the Schedules of the BC Act when a Final Determination to list the species is published on the NSW legislation website.
	1. Timeframe for assessments

The NSW TSSC is a part-time Committee and prioritises its nominations on an annual basis and within its resource capacity. The Committee’s nomination priorities are available on the Committee’s webpage.

<http://www.environment.nsw.gov.au/committee/HowToNominateASpeciesAsThreatened.htm>

In addition to considering the Committee’s priorities the following factors can affect the assessment time for a nomination:

* The nomination is incomplete or contains only anecdotal information and further information is required from the nominator,
* The species in not endemic to NSW and must be referred to the CW TSSC for a cross jurisdictional national assessment,
* Advice is required from experts and researchers,
* Difficulty locating and accessing unpublished information relevant to the assessment,
* insufficient data, published information or other evidence with supporting information available to assess the species against the criteria.

Assessment can be delayed for one or more of the above reasons. Where information is readily available the assessment and listing process for a NSW endemic species can take from 8 to 12 months. Any delays will extend that timeframe.

* 1. How to complete the nomination form

The criteria for listing threatened species under the BC Act and Regulations are included in section 4 of this nomination together with some questions to help you provide the information necessary to address the criteria. The criteria are based on IUCN criteria (see section 4) which includes numerical thresholds that will assist with interpreting the BC Regulation listing criteria (see NSW TSSC (2017)). A species must be assessed by the Committee as meeting at least one of the BC Regulation listing criteria to be eligible for listing as a threatened species.

Complete as much of the nomination as you can. While the Committee will seek advice from other sources, any information not provided in the nomination will delay the assessment process.

Words with asterisks (\*) are explained in the definitions section (Section 3) and additional information can be found in the Committee’s guidelines in NSW TSSC (2017).

Include references to published journal articles or other material that support the information you have provided. Unsupported or anecdotal information may not provide sufficient evidence to demonstrate the species meets the criteria for listing.

Do not quote or provide information you have obtained from other people (usually referenced as personal communications) unless you have obtained the agreement of those people to use those statements in the nomination.

Do not provide information you have obtained on a confidential basis or data under a data licence that prohibits its release to other parties unless you have obtained permission to publicly release the confidential information or data.

Ensure you know and agree to how the Committee will use and share your nomination and the information contained in the nomination and any attachments including your personal details by signing the declaration section.

**DO NOT DELETE ANY SECTION OF THE NOMINATION FORM INCLUDING SECTIONS LEFT BLANK**

* 1. Lodgement of nomination

The original, signed hard copy of the nomination can be posted or scanned and a pdf emailed to:

The Chairperson,

NSW Threatened Species Scientific Committee

PO Box 1967

HURSTVILLE BC NSW 1481

Scientific.committee@environment.nsw.gov.au

In addition to the signed copy, completed nominations can also include supporting documentation in WORD, Excel (may be used for data) or PDF formats.

Section 2. Nomination Form

1. **General information**

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| 1.1 Scientific name and author of the species, or phrase name if undescribed (for the purposes of the BC Act subspecific taxa such as subspecies and varieties, are called species – see Definitions).  |
|       |
| 1.2 Common name(s) (if any) by which the species is known. |
|       |
| 1.3 Is the species endemic to NSW (ie. is the species only found in NSW)? |
|       |
| 1.4 Has the species been recorded in the following areas? |
| Lord Howe Island:      | Australian Capital Territory:      |
| 1.5 Is the species currently listed under the NSW *Biodiversity Conservation Act, 2016* (or prior legislation ie NSW *Threatened Species Conservation Act, 1995*)? If so what is the threat category?  |
|       |
| 1.6 What is the category for which the species is nominated under the NSW *Biodiversity Conservation Act, 2016*? |
|       |
| 1.7 Is the species currently listed under the Commonwealth *Environment Protection Biodiversity Conservation Act, 1999* (EPBC)? If so what is the threat category? |
|       |
| 1.8 Is the species listed as threatened under legislation in other State or Territories in Australia? If so please list the jurisdiction and threat category? |
| Jurisdiction:       | Threat category:      |
| Jurisdiction:       | Threat category:      |
| Jurisdiction:       | Threat category:      |
| Jurisdiction:       | Threat category:      |
| Jurisdiction:       | Threat category:      |

1. **Species information**

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| 2.1 Is the species conventionally accepted? (eg, is the species accepted in PlantNET, the Australian Plant Census or the Australian Faunal Directory and/or in any other scientific literature or research)If the species is conventionally accepted, provide a description of the species and the source of the description. |
|       |
| 2.2 If the species is not conventionally accepted, please provide:* a description of the species in a form suitable for publication in conventional scientific literature (attach the information to this form); information on the morphological features that distinguish this species from other species, how distinct is the species and is it likely to be misidentified as another species in field observations.
* for an undescribed (new) species indicate in which scientific institution (s) specimens are housed and provide collection/reference numbers.Institution (s): …………………………………………………………………………………..Collection/reference number (s): ……………………………………………………………….
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1. **Geographic Distribution**

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| 3.1 Describe the species’ distribution in Australia and attach a map of the known distribution and sites. |
|       |
| 3.2 For species not endemic to NSW please indicate the other areas where the species has been recorded (other states and territories of Australia, and other countries). |
|       |
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| 3.3 For flora, and where applicable, for fauna, detail the site, land tenure, survey date(s), and estimated number of individuals of the species.  |

|  |  |  |  |
| --- | --- | --- | --- |
| Site | Land tenure | Date of most recent survey, or record and its source | Number of individuals at site (mature\*, juveniles) |
|       |       |       |       |
|       |       |       |       |
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Any other relevant information for these sites |
|       |
| 3.4 What is the species’ total estimated extent of occurrence\* (in km2) (see Definition section) |
|       |
| 3.5 What is the species’ total estimated area of occupancy\* (in km2) (see Definition section) |
|       |
| 3.6 How many locations\* do you consider the species occurs in and why? Note: “The term ‘location’ defines a geographically or ecologically distinct area in which a single threatening event can rapidly affect all individuals of the taxon present.” (IUCN 2017) |
|       |
| 3.7 Has the species been reasonably well surveyed?  |
|       |

1. **Species ecology/biology**

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| 4.1 Describe the species’ habitat (e.g. aspect, topography, substrate, climate, vegetation type, associated species). |
|       |
| 4.2 Provide a description of the life cycle of the species. If possible, provide details for the length of time for juveniles to mature, and the estimated generation length\*?Note: Generation length is the average age of parents of the current cohort (i.e. newborn individuals in the population). |
|       |
| * 1. 4.3 Provide any details on:

Fauna: key habitat requirements, breeding biology, diet, social biology, territoriality/home range.Flora: Environmental requirements, evidence for ongoing recruitment or otherwise (including any information on pollination biology or seed bank dynamics or dormant life stages). |
|       |
| * 1. 4.4 What is the dispersal mechanism and how far is the species likely to be dispersed (for fauna (adults); for plants (seeds or other propagules)?
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|       |
| 4.5 How does the species respond to disturbance regimes such as fire, floods, drought, storms?  |
|       |
| 4.6 Is there any other information regarding the species ecology or biology relevant to a conservation status assessment? |
|       |

1. **Species Abundance**

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| 5.1 What is the number of mature individuals\*? Indicate if the number is based on observation, or if it is estimated or inferred (give lower and upper bounds). Where possible, estimate for each (sub)population or site (use the table above). Evidence needs to be provided on how the bounds were estimated or inferred. |
|       |
| 5.2 Describe the population structure at known sites. Is there evidence of ongoing successful recruitment of new individuals? |
|       |

1. **Extreme Fluctuations**

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| 6.1 Is there any evidence of extreme fluctuations\* in: i. the species’ abundance in Australia and NSW; |
|       |
| ii. the species’ geographic distribution\* in Australia and NSW. |
|       |

1. **Threats**

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| 7.1 Identify past, current and future threats indicating whether they are actual or potential. For each threat describe:1. how and where the threat impacts on this species
2. what the effect of the threat has been so far (indicate whether it is known or suspected; does it only affect certain populations)
3. what is the expected effect of the threat in the future (is the threat only suspected; does it only affect certain populations).
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|       |
| 7.2 Where possible, provide information on threats for each occurrence/site. (use the larger box below if needed) List all sites given in 3.3. (indicate if information is unavailable for certain sites.)  |
| Threat | Impact on the species and/or its habitat  | Sites affected | Is it a past, current or future threat | Current management activities  |
|       |       |       |       |       |
|       |       |       |       |       |
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| 7.3 Identify key management documentation for the species e.g. recovery plans, conservation plans, threat abatement plans etc. |
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1. **Fragmentation of the species population or habitat**

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| 8.1 Is there evidence of severe fragmentation\* of the species populations, geographic distribution or habitat? If so, specify the nature and degree of the isolation between populations, and species movement between populations or habitat patches. |
|       |
| 8.2 Are there any biological, abiotic, geographic, human induced or other barriers or processes operating to reduce the size or increase isolation of habitat patches or reduce species movement. |
|       |

1. **Population Reduction and Continuing Decline**

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| 9.1 Is there evidence and estimates of the magnitude of past, or projected future, or a combination of past and projected future reductions based on any of the following: 1. the species’ abundance in Australia and NSW;
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|       |
| 1. the species’ geographic distribution\* in Australia and NSW (area of occupancy, extent of occurrence);
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|       |
| 1. the area, extent and/or quality of habitat in Australia and NSW;
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|       |
| 1. actual or potential levels of exploitation of the species.
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|       |
| 1. the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites.
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All estimates of reductions need to specify the time period over which they were observed, estimated, inferred or suspected to have occurred, or are projected to occur in future. The assessment needs to be over a time frame appropriate to the life cycle and habitat characteristics of the species (i.e. 3 generations or 10 years, whichever is the longer). If possible, estimate status for each population (in a table, for example). Pattern of decline: linear, exponential or accelerated. Provide details for any assumptions made in inferring generation length, or rates of decline.

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| 9.2 Is there a quantitative analysis that allows estimation of the extinction risk of the species? If so, please provide details. |
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1. **Appendices and Information sources**

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| 10.1 If you have attached any information to his nomination please list or describe the information below.  |
| Appendix 1 |       |
| Appendix 2 |       |

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| 10.2 Has this document been refereed? If so, indicate by whom. |

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Postal Address | Telephone | Email |
|  |  |  |  |
|  |  |  |  |

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| 10.3 Document all written sources, published and unpublished. |
|       |

1. **Nominator information**

**Declaration**

I declare that the information in this nomination and any attachments is true and correct to the best of my knowledge.

I permit the NSW Threatened Species Scientific Committee to provide a copy of the nomination and any attachments to other people or organisations for expert comment or advice.

I permit the NSW Threatened Species Scientific Committee to provide location details or data included in the nomination and any attachments to the Office of Environment and Heritage for inclusion in GIS databases managed by OEH, including publicly accessible databases.

I permit the NSW Threatened Species Scientific Committee to use, reproduce, publish, communicate and distribute information contained in the nomination and any attachments, in Committee publications including determinations, assessment reports, documents for public information and on the Committee’s website.

I permit the NSW Threatened Species Scientific Committee to provide a copy of the nomination and any attachments including my name, address and contact details to Commonwealth, State and Territory government agencies and associated committees or other bodies undertaking threatened species and ecological community assessments for those agencies.

Signed:       Date:

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| 11.1 Nominator’s details |
| Name |       |
| Organisation |       |
| Postal address(required information) |       |
| Email |       |
| Phone |        |

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| 11.2 Do you wish your personal information (ie name, address and contact details) to be regarded as confidential? (Note: information relating to a Body, Organisation or Company are not personal details and may be publicly released) |
|  |

**Please note**: The Committee is subject to the provisions of the Government Information (Public Access) Act 2009 and access to the nomination and any accompanying information may be sought in accordance with that Act.

Section 3 – Definitions

**Definitions**

Please see the NSW TSSC (2017) for more details.

**Extreme fluctuations**

“Extreme fluctuations can be said to occur in a number of taxa where population size or distribution area varies widely, rapidly and frequently, typically with a variation greater than one order of magnitude (i.e., a tenfold increase or decrease).” (IUCN 2017)

**Generation Length**

Generation length is the average age of parents of the current cohort (i.e. newborn individuals in the population).

**Geographic distribution**

Geographic distribution is the area or areas in which a species or ecological community occurs, excluding cases of vagrancy in species. This may be assessed by estimating the extent of occurrence and the area of occupancy.

**Extent of occurrence**
Extent of occurrence is defined as “the area contained within the shortest continuous imaginary boundary which can be drawn to encompass all the known, inferred or projected sites of present occurrence of a taxon, excluding cases of vagrancy” (IUCN 2017). (see Figure 1). “Extent of occurrence can often be measured by a minimum convex polygon (the smallest polygon in which no internal angle exceeds 180 degrees and which contains all the sites of occurrence).” (IUCN 2017).

**Area of occupancy**
“Area of occupancy is defined as the area within its 'extent of occurrence' (see above) which is occupied by a taxon, excluding cases of vagrancy. The measure reflects the fact that a taxon will not usually occur throughout the area of its extent of occurrence, which may contain unsuitable or unoccupied habitats. In some cases (e.g. irreplaceable colonial nesting sites, crucial feeding sites for migratory taxa) the area of occupancy is the smallest area essential at any stage to the survival of existing populations of a taxon.” (IUCN 2017)

IUCN (2017) recommends using a standard scale based on 2 x 2 km grid cells (a cell area of 4 km2). The scale is determined by the thresholds in the criteria, i.e. valid use of the criteria requires that AOO is estimated at scales that relate to the thresholds in the criteria.



***Figure 1.*** *Two examples of the distinction between extent of occurrence and area of occupancy.*

*(A) is the spatial distribution of known, inferred or projected sites of present occurrence*

*(B) shows one possible boundary to the extent of occurrence, which is the measured area within this boundary*

*(C) shows one measure of area of occupancy which can be achieved by the sum of the occupied grid squares.*

**Locations**

The term ‘location’ defines a geographically or ecologically distinct area in which a single threatening event can rapidly affect all individuals of the taxon present.” (IUCN 2017)

**Mature individuals**

“The number of mature individuals is the number of individuals known, estimated or inferred to be capable of reproduction. When estimating this quantity the following points should be borne in mind:

• Mature individuals that will never produce new recruits should not be counted (e.g., densities are too low for fertilization).

• In the case of populations with biased adult or breeding sex ratios, it is appropriate to use lower estimates for the number of mature individuals, which take this into account.

• Where the population size fluctuates, use a lower estimate. In most cases this will be much less than the mean.

• Reproducing units within a clone should be counted as individuals, except where such units are unable to survive alone (e.g., corals).

In the case of taxa that naturally lose all or a subset of mature breeding individuals at some point in their life cycle, the estimate should be made at the appropriate time, when mature individuals are available for breeding.

• Re-introduced individuals must have produced viable offspring before they are counted as mature individuals.” (IUCN 2017).

**Severely fragmented**

“The phrase ‘severely fragmented’ refers to the situation in which increased extinction risks to the taxon results from the fact that most of its individuals are found in small and relatively isolated subpopulations (in certain circumstances this may be inferred from habitat information). These small subpopulations may go extinct, with a reduced probability of recolonization.” (IUCN 2017) NSW TSSC (2017) provides further details to aid interpretation of severe fragmentation.

**Species**

The BC Act defines a species to include:

(a) a defined subspecies, and

(b) a taxon below a subspecies, and

(c) a recognisable variant of a subspecies or taxon, and

(d) a population of a particular species (being a group of organisms, all of the same species, occupying a particular area).

Section 4 - Criteria for listing critically endangered, endangered and vulnerable species

The clause numbering follows the clause numbering in the *Biodiversity Conservation Regulation, 2017*.

A species must be assessed by the Committee as meeting at least one of the BC Regulation criteria to be eligible for listing as a threatened species.

The NSW TSSC will assess the information you provide and any available information from other sources against each of these criteria. While you do not have to assess the species against these criteria you should provide as much information as you can that will assist the Committee with addressing these criteria.

Clause 4.2 – Reduction in population size of species

(IUCN criterion A)

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| **(1) - The species has undergone or is likely to undergo within a time frame appropriate to the life cycle and habitat characteristics of the taxon:** |
|  | (a) | for critically endangered species | a very large reduction in population size, or |
|  | (b) | for endangered species | a large reduction in population size, or |
|  | (c) | for vulnerable species | a moderate reduction in population size. |
| **(2) - The determination of that criteria is to be based on any of the following:** |
|  | (a) | direct observation, |
|  | (b) | an index of abundance appropriate to the taxon, |
|  | (c) | a decline in the geographic distribution or habitat quality, |
|  | (d) | the actual or potential levels of exploitation of the species, |
|  | (e) | the effects of introduced taxa, hybridisation, pathogens, pollutants, competitors or parasites. |

Clause 4.3 - Restricted geographic distribution of species and other conditions

(IUCN criterion B)

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| **The geographic distribution of the species is**: |
|  | (a) | for critically endangered species | very highly restricted, or |
|  | (b) | for endangered species | highly restricted, or |
|  | (c) | for vulnerable species | moderately restricted, |
| **and at least 2 of the following 3 conditions apply**: |
|  | (d) | the population or habitat of the species is severely fragmented or nearly all the mature individuals of the species occur within a small number of locations, |
|  | (e) | there is a projected or continuing decline in any of the following: |
|  |  | (i) | an index of abundance appropriate to the taxon, |
|  |  | (ii) | the geographic distribution of the species, |
|  |  | (iii) | habitat area, extent or quality, |
|  |  | (iv) | the number of locations in which the species occurs or of populations of the species, |
|  | (f) | extreme fluctuations occur in any of the following: |
|  |  | (i) | an index of abundance appropriate to the taxon, |
|  |  | (ii) | the geographic distribution of the species, |
|  |  | (iii) | the number of locations in which the species occur or of populations of the species. |

Clause 4.4 - Low numbers of mature individuals of species and other conditions

(IUCN criterion Clause C)

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| **The estimated total number of mature individuals of the species is:** |
|  | (a) | for critically endangered species | very low, or |
|  | (b) | for endangered species | low, or |
|  | (c) | for vulnerable species | moderately low, |
| **and either of the following 2 conditions apply:** |
|  | (d) | a continuing decline in the number of mature individuals that is (according to an index of abundance appropriate to the species): |
|  |  | (i) | for critically endangered species | very large, or |
|  |  | (ii) | for endangered species | large, or |
|  |  | (iii) | for vulnerable species | moderate, |
|  | (e) | both of the following apply: |
|  |  | (i) | a continuing decline in the number of mature individuals (according to an index of abundance appropriate to the species), and |
|  |  | (ii) | at least one of the following applies: |
|  |  |  | (A) | the number of individuals in each population of the species is: |
|  |  |  |  | (I) | for critically endangered species | extremely low, or |
|  |  |  |  | (II) | for endangered species | very low, or |
|  |  |  |  | (III) | for vulnerable species | low, |
|  |  |  | (B) | all or nearly all mature individuals of the species occur within one population, |
|  |  |  | (C) | extreme fluctuations occur in an index of abundance appropriate to the species. |

Clause 4.5 - Low total numbers of mature individuals of species

(IUCN criterion D)

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| **The total number of mature individuals of the species is:** |
|  | (a) | for critically endangered species | extremely low, or |
|  | (b) | for endangered species | very low, or |
|  | (c) | for vulnerable species | low. |

Clause 4.6 - Quantitative analysis of extinction probability

(IUCN criterion E)

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| **The probability of extinction of the species is estimated to be:** |
|  | (a) | for critically endangered species | extremely high, or |
|  | (b) | for endangered species | very high, or |
|  | (c) | for vulnerable species | high. |

Clause 4.7 - Very highly restricted geographic distribution of species–vulnerable species (IUCN criterion D2)

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| For vulnerable species,  | the geographic distribution of the species or the number of locations of the species is very highly restricted such that the species is prone to the effects of human activities or stochastic events within a very short time period. |

IUCN Red List Criteria for Species

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| **A. Population size reduction** Population reduction (measured over the longer of 10 years or 3 generations) based on any of A1 to A4 |
|  | **Critically Endangered** | **Endangered** | **Vulnerable** |
| **A1** | **≥ 90%** | **≥ 70%** | **≥ 50%** |
| **A2, A3, A4** | **≥ 80%** | **≥ 50%** | **≥ 30%** |
| A1 Population reduction observed, estimated, inferred or suspected in the past and the causes of the reduction are clearly reversible AND understood AND ceased.A2 Population reduction observed, estimated, inferred or suspected in the past where the causes of the reduction may not have ceased OR may not be understood OR may not be reversible.A3 Population reduction, projected or suspected to be met in the future (up to a maximum of 100 years) [(*a) cannot be used for A3*]A4 An observed, estimated, inferred, projected or suspected population reduction where the time period must include both the past and the future (up to a max. of 100 years in future), and where the causes of reduction may not have ceased OR may not be understood OR may not be reversible. | (a) direct observation [*except A3*](b) an index of abundance appropriate to the taxon*based on any of the following:*(c) a decline in area of occupancy, extent of occurrence and/or quality of habitat(d) actual or potential levels of exploitation(e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites |

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| **B. Geographic range in the form of either B1 (extent of occurrence) AND/OR B2 (area of occupancy)** |
|  | **Critically Endangered** | **Endangered** | **Vulnerable** |
| B1. Extent of occurrence (EOO) | **< 100 km2** | **< 5,000 km2** | **< 20,000 km2** |
| B2. Area of occupancy (AOO) | **< 10 km2** | **< 500 km2** | **< 2,000 km2** |
| AND at least 2 of the following 3 conditions: |
| (a) Severely fragmented OR Number of locations | **= 1** | **≤ 5** | **≤ 10** |
| (b) Continuing decline observed, estimated, inferred or projected in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) area, extent and/or quality of habitat; (iv) number of locations or subpopulations; (v) number of mature individuals |
| (c) Extreme fluctuations in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) number of locations or subpopulations; (iv) number of mature individuals |

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| **C. Small population size and decline** |
|  | **Critically Endangered** | **Endangered** | **Vulnerable** |
| Number of mature individuals | **< 250** | **< 2,500**  | **< 10,000**  |
| AND at least one of (C1) or (C2) |  |  |  |
| C1 An observed, estimated or projected continuing decline of at least (up to a max. of 100 years in future) | **25% in 3 years or 1 generation****(whichever is longer)** | **20% in 5 years or 2 generation****(whichever is longer)** | **10% in 10 years or 3 generations****(whichever is longer)** |
| C2 An observed, estimated, projected or inferred continuing decline AND at least 1 of the following 3 conditions: |  |  |  |
| (a) | (i) Number of mature individuals in each subpopulation  | **≤ 50** | **≤ 250** | **≤ 1,000** |
| (ii) % of mature individuals in one subpopulation = | **90 – 100%** | **95 – 100%** | **100%** |
| (b) Extreme fluctuations in the number of mature individuals |  |  |  |

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| **D. Very small or restricted population**  |
|  | **Critically Endangered** | **Endangered** | **Vulnerable** |
| D. Number of mature individuals | **< 50** | **< 250** | **D1. < 1,000** |
| D2. Only appies to the VU categoryRestricted area of occupancy or number of locations with a plausible future threat that could drive the taxon to CR or EX in a very short time | **\_** | **\_** | **D2. Typically:****AOO < 20 km2 or** **number of** **locations ≤ 5** |

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| **E. Quantitative Analysis**  |
|  | **Critically Endangered** | **Endangered** | **Vulnerable** |
| Indicating the probability of extinction in the wild to be:  | **≥ 50% in 10 years or** **3 generations, whichever is longer (100 years max.)** | **≥ 20% in 20 years or 5 generations, whichever is longer (100 years max.)** | **≥ 10% in 100 years**  |

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References:

IUCN (2017) IUCN Standards and Petitions Subcommittee. Guidelines for Using the IUCN Red List Categories and Criteria. Version 13. Prepared by the Standards and Petitions Sub Committee.

NSW TSSC (2017) Guidelines for interpreting listing criteria under the Biodiversity Conservation Act.

Further reading and links:

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| Atlas of Living Australia | <https://www.ala.org.au/> |
| Australian Fauna Directory | <https://biodiversity.org.au/afd/search/names> |
| Australian Plant Census (APC) | <https://biodiversity.org.au/nsl/services/apc> |
| Commonwealth threatened species and ecological communities | <http://www.environment.gov.au/biodiversity/threatened> |
| Commonwealth Threatened Species Scientific Committee nomination forms | <http://www.environment.gov.au/biodiversity/threatened/nominations/forms-and-guidelines> |
| Intergovernmental memorandum of understanding - Agreement on a common assessment method for listing of threatened species and threatened ecological communities | <http://www.environment.gov.au/biodiversity/threatened/publications/mou-cam> |
| IUCN Red List Categories and Criteria | <http://www.iucnredlist.org/technical-documents/categories-and-criteria> |
| NSW Biodiversity Conservation Act, 2016 | <https://www.legislation.nsw.gov.au/#/view/act/2016/63> |
| NSW Biodiversity Conservation Regulation, 2017 | <https://www.legislation.nsw.gov.au/#/browse/inForce/regulations/B> |
| NSW BioNet Atlas – Office of Environment and Heritage | <http://www.bionet.nsw.gov.au/> |
| NSW threatened species profiles | <http://www.environment.nsw.gov.au/threatenedSpeciesApp/> |
| NSW TSSC Guidelines for interpreting the listing criteria under the BC Act | <http://www.environment.nsw.gov.au/committee/scientificcommitteepublications.htm> |
| PlantNET – National Herbarium of NSW, Royal Botanic Gardens and Domain Trust | <http://plantnet.rbgsyd.nsw.gov.au/search/simple.htm> |