

GUIDELINES FOR ELIGIBILITY FOR LISTING UNDER THE *THREATENED SPECIES PROTECTION ACT 1995*

INTRODUCTION

The *Threatened Species Protection Act 1995* ("the Act") is an Act to provide for the protection and management of Tasmania's threatened native flora and fauna, and to enable and promote the conservation of native flora and fauna. The Act provides Schedules of taxa that have different degrees of threatened status. It also establishes mechanisms for the listing and delisting of taxa.

The functions of the Scientific Advisory Committee (SAC) established under S8 of the Act include to advise the Minister and the Secretary on the listing and de-listing of taxa of flora and fauna. The SAC has a statutory responsibility for preparing guidelines on how the five criteria specified in S15 *Eligibility for listing* are to be applied to particular taxonomic groups and must, from time to time, publish those guidelines in the Tasmanian Government Gazette.

These Guidelines fulfil that responsibility.

These Guidelines apply to both public nominations and SAC-generated nominations. The listing process is described in Division 2 of the Act, *Listing of threatened flora and fauna*. For SAC-generated nominations there is an ability to appeal the nomination. For public nominations, there is an opportunity for public comment but no appeal rights.

In determining the criteria for listing, the SAC must have regard only to matters of nature conservation and not to social and economic matters. In developing the Guidelines, the SAC may consult with the broader scientific community, as it considers appropriate.

In order to develop the original Guidelines, the SAC convened a workshop of relevant scientists and used the results from the workshop together with consideration of scientific literature and guidelines used in other jurisdictions. This revision of the Guidelines is derived from the draft Guidelines that were prepared in 2006 and comment was invited from the public and specialists.

There are two forms of listing guidelines currently available elsewhere:

- (a) simple qualitative statements supported by expert opinion, which are similar to those currently in the Tasmanian Act *and*
- (b) quantitative criteria such as those proposed by the IUCN (International Union for the Conservation of Nature) or modified forms of these.

It is the intent of the SAC to have guidelines that are transparent, quantitative and checkable. However, there must also be flexibility in application of the criteria to ensure that each individual species proposed for listing or de-listing is treated on its merits and particular circumstances. Thus the Guidelines are not prescriptive, but are used as a screen to inform the recommendation process. From time to time the SAC will review the relevance, applicability and knowledge base for the Guidelines in each taxonomic group, and develop revised Guidelines to be published in the Tasmanian Government Gazette.

The major taxonomic groups considered by the SAC in the development of these Guidelines were terrestrial vascular flora and non-vascular flora, fungi, vertebrate fauna, invertebrate fauna, and marine organisms. The general guidelines for listing are outlined below. They are based as far as possible on the IUCN Criteria, but recognise the State and Commonwealth legislative responsibilities, and the local geographic and biological knowledge base and expert assessment of threatening impacts in Tasmania. In the case of some taxonomic groups such as non-vascular plants and some marine organisms, there are special caveats that will apply. These are also outlined below.

CRITERION (1) – ENDANGERED¹

An extant taxon of native flora or fauna may be listed as endangered if it is in danger of extinction because long-term survival is unlikely while the factors causing it to be endangered continue operating. (Section 15(1) of the Act).

The following criteria (A–D) may provide evidence of the level of threat. In order to be considered as endangered at least ONE of the criteria A–D should apply.

(A) Total population reduction in the form of EITHER of the following:

1. an observed, estimated, or inferred² reduction of at least 50% over the last 10 years or within the past three generations of the species, whichever is the longer (to a maximum of 100 years), based on (and specifying) any ONE of the following:
 - a. direct observation;
 - b. an index of abundance appropriate for the taxon;
 - c. a decline in area of occupancy³, extent of occurrence⁴ and/or quality of habitat;
 - d. actual or potential levels of exploitation; or
 - e. the effects of introduced taxa, hybridisation, pathogens, pollutants, competitors or parasites.
2. a reduction of at least 50%, projected to be met within the next ten years or the next three generations, whichever is the longer (to a maximum of 100 years), based on (and specifying) any one of (b), (c), (d), or (e) above.

Criterion A would not be applied to species that could reasonably be expected to have very large and widespread populations not subject to the agency of decline. The Committee would normally take a flexible and pragmatic approach towards species that show exceptionally high inter-annual variation in abundance.

(B) Extent of occurrence estimated to be less than 5,000 km² or area of occupancy estimated to be less than 500 km² for mobile taxa (occurrence less than 500 km² or occupancy less than 0.1 km², i.e. 10 hectares, for sessile taxa), and any TWO of the following apply:

1. Severely fragmented⁵ or known to exist at no more than five locations.
2. Continuing decline⁶, inferred, observed or projected, in any one of the following:
 - a. extent of occurrence;
 - b. area of occupancy;
 - c. area, extent and/or quality of habitat;
 - d. number of locations⁷ or subpopulations; or
 - e. number of mature⁸ individuals.

3. Extreme fluctuations in any one of the following:
 - a. extent of occurrence;
 - b. area of occupancy;
 - c. number of locations or subpopulations; or
 - d. number of mature individuals.

(C) Total population estimated to number fewer than 2,500 mature individuals and EITHER:

1. an estimated continuing decline of at least 20% within 5 years or two generations, whichever is the longer (to a maximum of 100 years); OR
2. a continuing decline⁶, observed, projected, or inferred, in numbers of mature individuals and population structure in the form of either:
 - a. i. severely fragmented (i.e. no subpopulation estimated to contain more than 250 mature individuals); or
 - ii. at least 90% of all mature individuals in a single subpopulation; or
- b. extreme fluctuations in number of mature individuals.

Criteria B and C both include estimates of numbers of mature individuals. Reference to the IUCN guidelines suggests that, in the case of species with fluctuating numbers of mature individuals, a best estimate at the time of lowest numbers should be adopted. In the case of some short-lived plant species, this could be zero in a year when suitable conditions for germination did not occur. The S.A.C. considers that these estimates refer to numbers of mature individuals in years allowing for the germination and establishment of mature individuals.

(D) Total population extremely small or area of occupancy very restricted. EITHER:

1. total population estimated to number fewer than 250 mature individuals; OR
2. total population with an area of occupancy less than 0.01 km² (1 hectare), and typically in five or fewer locations that provide an uncertain future due to the effects of human activities or stochastic events, and thus capable of becoming extinct within a very short time period.

CRITERION (2) - ENDANGERED (presumed extinct)

A taxon of native flora or fauna may be listed as endangered because it is presumed to be extinct on the ground that no occurrence of the taxon in the wild can be confirmed during the past 50 years. (Section 15(2) of the Act).

For a taxon to be confirmed to have occurred in the wild during the past 50 years, there must be a verified specimen or a record of a sighting that is considered to be reliable.

CRITERION (3) - VULNERABLE

A taxon of native flora or fauna may be listed as vulnerable if it is likely to become an endangered taxon while the factors causing it to be vulnerable continue operating. (Section 15(3) of the Act).

The following criteria (A–D) may provide evidence of the level of threat. In order to be considered as vulnerable at least ONE of the criteria A–D should apply.

(A) Total population reduction in the form of EITHER of the following:

1. an observed, estimated, or inferred reduction of at least 20% over the last 10 years or within the past three generations, whichever is the longer (to a maximum of 100 years), based on (and specifying) any ONE of the following:
 - a. direct observation;
 - b. an index of abundance appropriate for the taxon;
 - c. a decline in area of occupancy extent of occurrence and/or quality of habitat;
 - d. actual or potential levels of exploitation; or
 - e. the effects of introduced taxa, hybridisation, pathogens, pollutants, competitors or parasites.
2. a reduction of at least 20%, projected to be met within the next ten years or the next three generations, whichever is the longer, based on (and specifying) any of (b), (c), (d) or (e) above.

Criterion A would not be applied to species that could reasonably be expected to have very large and widespread populations not subject to the agency of decline. The Committee would normally take a flexible and pragmatic approach towards species that show exceptionally high inter-annual variation in abundance.

(B) Extent of occurrence estimated to be less than 20,000 km² or area of occupancy estimated to be less than 2,000 km² for mobile flora and fauna (or occurrence less than 2,000 km² or occupancy less than 0.5 km², i.e. 50 hectares, for sessile taxa), and any TWO of the following apply:

1. severely fragmented or known to exist at no more than ten locations.
2. continuing decline⁶, inferred, observed or projected, in any one of the following:
 - a. extent of occurrence;
 - b. area of occupancy;
 - c. area, extent and/or quality of habitat;
 - d. number of locations or subpopulations; or
 - e. number of mature individuals.
3. extreme fluctuations in any one of the following:
 - a. extent of occurrence;
 - b. area of occupancy;
 - c. number of locations or subpopulations; or
 - d. number of mature individuals.

(C) Total population estimated to number fewer than 10,000 mature individuals and ANY ONE OF THE FOLLOWING:

1. an estimated continuing decline⁶ of at least 10% within 10 years or three generations, whichever is the longer (to a maximum of 100 years); OR
2. a continuing decline, observed, projected, or inferred, in numbers of mature individuals and population structure in the form of either:
 - a. severely fragmented (i.e. no subpopulation estimated to contain more than 1,000 mature individuals; or
 - b. all individuals are in a single subpopulation; OR
3. a continuing decline⁶, observed, projected, or inferred, in numbers of mature individuals combined with extreme fluctuations in number of mature individuals.

Criteria B and C both include estimates of numbers of mature individuals. Reference to the I.U.C.N. guidelines suggests that, in the case of species with fluctuating numbers of mature individuals, a best estimate at the time of lowest numbers should be adopted. In the case of some short-lived plant species, this could be zero in a year when suitable conditions for germination did not occur. The S.A.C. considers that these estimates refer to numbers of mature individuals in years allowing the germination and establishment of mature individuals.

(D) Total population very small or area of occupancy restricted. EITHER:

1. total population estimated to number fewer than 1,000 mature individuals; OR
2. total population with an area of occupancy less than 0.05 km² (5 hectares) and typically in five or fewer locations that provide an uncertain future due to the effects of human activities or stochastic events, and thus capable of becoming endangered in a very short time period.

CRITERION (4) - RARE

A taxon of native flora or fauna may be listed as rare if it has a small population in Tasmania that is not endangered or vulnerable but is at risk. (Section 15(4) of the Act).

The following criteria may provide evidence of the level of threat. In order to be considered as rare at least ONE of the criteria A-B should apply.

(A) A taxon of limited distribution or numbers, threatened by existing on-going processes occurring over sufficient of their range to suggest that they would satisfy the indicative criteria for vulnerable unless the threatening process was abated based on (and specifying) any one of the following:

1. the extent of occurrence is less than 80x80 km or 2,000 km²;
2. the area of occupancy is not more than 0.5 km² (50 hectares);
3. taxa that are not B1 or B2 above, but that have very small and localised subpopulations wherever they occur (generally no subpopulation with an area of occupancy greater than 0.01 km² (1 hectare) and no more than 1,000 mature individuals).

(B) Total population small or restricted and at risk in the form of EITHER of the following:

1. the total population consists of fewer than 10,000 mature individuals, and no more than 2,500 mature individuals occur on land that is in an area free from sudden processes capable of causing largely irreversible loss of individuals or habitat⁹; OR
 2. 90% of mature individuals occur in 15 or fewer subpopulations or locations and no more than 5 of these occur in an area that is free from sudden processes capable of causing largely irreversible loss of individuals or habitat.
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CRITERION (5) - TAXA BELOW THE LEVEL OF SUBSPECIES

A taxon of native flora or fauna which is below the level of sub-species and which is narrowly defined owing to its taxonomic position, environmental conditions or geography may be listed only if, in addition to the requirements of this section, there is a special need to conserve it in Tasmania. (Section 15(5) of the Act)

Caveats for Specific Taxonomic Groups

The SAC intends to use all of the above guidelines in their considerations of vascular flora and vertebrate fauna. The approach for invertebrate fauna and for marine flora and fauna generally will use parts A and B of the above guidelines.

Information on distribution and population size and numbers is often very limited for non-vascular flora and for flora that typically do not emerge on an annual basis, and accordingly it is difficult to apply strictly quantitative criteria. The approach the SAC intends to adopt for evaluation of listing and de-listing of such taxa is to use expert knowledge of the inferred habitat of taxa together with the known distributional data to make an assessment of likely threats or risks to the habitats of the taxa across their range.

ENDNOTES

1. The IUCN categories include both 'Critically Endangered' and 'Endangered'. The Tasmanian *Threatened Species Protection Act 1995* does not make provision for this distinction, and all species listed as Endangered have equal status under the Law. However, they do not necessarily have the same degree of urgency for protective management, and the category of threat is not necessarily sufficient to determine priorities for conservation action.
2. Inferred (or suspected) reductions have the potential to be highly subjective. It is expected that justification for inferences will be supported by objective evidence that will be provided when recommendations are made public.
3. Area of occupancy is defined as the area within its 'extent of occurrence' 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.
4. 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. This measure may exclude discontinuities or disjunctions within the overall distributions of taxa (e.g. large areas of obviously unsuitable habitat). 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).
5. The phrase 'severely fragmented' refers to the situation in which increased extinction risk 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 low probability of recolonization.

For flora, fragmentation is considered relevant if:

- a. it increases the risk of disease or weed invasion by increasing edge effects; or
 - b. it increases inbreeding effects, or decreases reproductive output by reduced pollinator visitation or by decreasing cross compatibility (e.g. because of a decreasing number of *S alleles* in subpopulations).
6. A continuing decline is a recent, current or projected future decline (which may be smooth, irregular or sporadic) which is liable to continue unless remedial measures are taken. Fluctuations will not normally count as continuing declines, but an observed decline should not be considered as a fluctuation unless there is evidence for this.
 7. Subpopulations or locations

Subpopulations are defined as geographically or otherwise distinct groups in the population between which there is little demographic or genetic exchange (typically one successful migrant individual or gamete per year or less).

For most plants, separation by at least one kilometre would be enough to warrant classification as separate subpopulations. For species known or believed to have very strong dispersal potential (for example, many aquatic species and species with effective wind dispersal of seeds), subpopulations would need to be separated by greater distances.

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. The size of the location depends on the area covered by the threatening event and may include part of one or many subpopulations. Where a taxon is affected by more than one threatening event, location should be defined by considering the most serious plausible threat.

If the total population occurs across a number of private properties on which land use may change with change of ownership, it may be more appropriate to consider the number of landowners rather than the number of subpopulations for relevant criteria.

8. 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 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.

9. The loss of individuals or habitat is qualified as largely irreversible because the cost or the time frame of reversing the loss may be prohibitive. Examples of sudden processes capable of causing largely irreversible loss of individuals or habitat include changes in land use, and indirect or offsite impacts (e.g. impacts of dam construction on downstream populations or habitats). As many taxa require specific management/disturbance regimes for their persistence, it should not be assumed that they are not subject to threatening processes because they occur in a reserve or occur on land that has had a management plan prepared for them unless actual protection and management are appropriate for those taxa, and such management can be demonstrated to be occurring. Other threatening processes such as wildfire or disease may not be precluded from protection by reservation or management.