



Australian Government

Department of the Environment and Water Resources

Guidelines for assessing sustainability of commercial harvesting of native flora from the wild



Prepared by the National Flora Network February 2007

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Introduction

The following guidelines and methods have been developed to ensure that native plant products which are being harvested and exported are assessed for sustainability in a consistent manner by all states and territories. The application of these guidelines will ensure that the assessment undertaken complies with Part 13A of the *Environment Protection and Biodiversity Conservation Act (1999)*.

There are three stages to the assessment

1. A pre-assessment
2. Sustainability assessment (or risk assessment)
3. Guidance for making recommendations following the assessment undertaken

The extent to which these guidelines are used to make an assessment will depend on the type of flora harvesting being proposed, the sensitivity of the flora to that harvesting, and the quantity or extent of the proposed harvest operation.

Stage 1

This stage is to be used when there is an application from a proponent to harvest a species.

1 Pre Assessment

Before undertaking a full assessment of native plant species proposed for harvest from wild stands first ascertain if there

- Are any circumstances existing which may prohibit harvesting
- Is there enough information to undertake an assessment. (The onus is on the applicant to provide all the information required for the assessment to be undertaken).

1. Has the applicant had the species properly identified (eg by the local herbarium) and is the applicant able to demonstrate that they and/or the harvesters can recognise the target species in the field?

Yes. proceed to question 2

Evidence must be provided from either from a state herbarium or the applicant must be able to demonstrate that harvesters have the expertise to identify the species particularly where the target species may be easily confused with a non target species.

No. Evidence of proper identification of the plant species must be provided before the assessment can proceed (see above).

2. Is the plant species proposed for harvest, protected under any state, territory and/or national legislation?

Yes Where a separate permit is required, the applicant must be either eligible for or provide a permit (depending on the state/territory requirements) for the “taking/collection” of this species under the relevant Act before any further assessment can be undertaken.

No. Proceed to question 3

3. Does the species occur in or near areas or sites that potentially contain features of conservation value protected under state, territory or national legislation?

Yes. Field surveys of the areas **may** be required.

Any permits that **may** be required will need to have been obtained, before the assessment can be undertaken for harvest proposals. For example National Estate, threatened species/ecological communities, RAMSAR wetlands, etc.

No. Proceed to question 4

4. Is the species available for harvesting in commercial quantities from legally available sources?

Yes. Proceed to question 5

No. The applicant must provide evidence of approval for access to proposed areas of harvest before the assessment can proceed.

In general, no assessment will be undertaken for harvest proposals for lands that are classed as reserves under state, territory, or national legislation unless the reserve type and/or management plan allow for such activities to occur in which case the applicant must have the appropriate authorisations before this assessment can proceed.

5. Is the proposal for harvesting of whole plants?

Yes. Proceed to question 7

No. Proceed to question 9

7. Is non-salvage harvest allowed in the state/territory?

Yes. Proceed to question 9

No. Proceed to question 8

8. Has evidence been provided that the harvest of whole plants is legitimate salvage as defined below?

Salvage harvest: the harvest of plants that will be destroyed for reasons other than the harvest. This should be demonstrated through restriction to activities involving clearing of land that have been given approval under the state or territory legislation. Examples include vegetation clearing associated with mining, infrastructure or urban or industrial development.

Yes. Proceed to question 9

No. The applicant must provide evidence that the salvage harvest is legitimate before the assessment can proceed.

9. Does the application make clear what the applicant is proposing to do?

Yes. Proceed to stage 2

No. The applicant must submit a proposal with all the information which is required for an assessment to be undertaken. (See guidelines/form for information applicant is required to submit *NB this will depend on state requirements and each state should develop their own*).

Suggestions for information that may need to be included are:-

- Full name and contact details
- Species to be harvested
- Areas where harvest is proposed to be undertaken shown on a map identifying correct tenure eg private land, crown land (scale of map will depend on what is available in each state). The detail of harvesting location will depend on the scale of the assessment being undertaken.
- Evidence of permission to access the sites
- Description of where the harvesting is being undertaken
- What is being harvested (plant parts and quantity) and when
- How is the harvest being undertaken
- Measures to prevent spread of disease
- Measures to reduce erosion

Check List

Q1	No	<input type="checkbox"/>	Yes	<input type="checkbox"/>
Q2	No	<input type="checkbox"/>	Yes	<input type="checkbox"/>
Q3	No	<input type="checkbox"/>	Yes	<input type="checkbox"/>
Q4	No	<input type="checkbox"/>	Yes	<input type="checkbox"/>
Q5	No	<input type="checkbox"/>	Yes	<input type="checkbox"/>
Q6	No	<input type="checkbox"/>	Yes	<input type="checkbox"/>
Q7	No	<input type="checkbox"/>	Yes	<input type="checkbox"/>
Q8	No	<input type="checkbox"/>	Yes	<input type="checkbox"/>
Q9	No	<input type="checkbox"/>	Yes	<input type="checkbox"/>

Stage 2

The Sustainability Assessment

Introduction

The sustainability assessment is composed of three sections:

Section 1 assesses the sensitivity of the species to harvesting in general. It is used to give an indication of how well the species may be able to recover from disturbance, in the case of a harvesting activity. This section can be done pre or post an application to harvest it.

Section 2 assesses the sensitivity of the harvest areas. There are two options:

- *Section 2a*: For assessing areas on a regional scale. This is used to undertake a broader regional assessment to help determine if harvesting the species from the wild is feasible and might be included in a regional plan for harvesting a species such as a Wildlife Trade Management plan.
- *Section 2b*: For assessing specific harvest sites. This section is done when a harvest proposal is submitted for assessment for individual harvest operators.

Section 3 assesses the ecological sustainability of a harvest proposal by determining what impact it may have on the species and its habitat. This section is done when a harvest proposal is submitted for assessment for individual harvest operators.

Explanation of each section

Section 1: Species Sensitivity

This section looks at the ecological and biological attributes of the target species to provide an indication of how the species may respond to the harvest regime proposed. The attributes chosen are considered to be those which will produce the best indication of the sensitivity of the species to disturbance and are as follows:-

- abundance
- regeneration strategies
- growth and maturation
- ecological requirements
- species significance

One or more criteria will be used to assess the sensitivity of the species for each of these attributes.

Abundance (or stock)

Determining species abundance can be done at state, regional or site level. To determine the “stock” of the target species, i.e. what amount is available for harvest requires a determination how much of the species is in an area and what proportion of the total stock of a species is actually available for harvesting.

This assessment will help avoid inadvertently placing pressure on species’ populations in cases where, for example, a common species that is abundant and having harvest rates set on that basis without considering that most of it occurs in reserves or other tenures not available for harvesting or in inaccessible areas (for example where there are no access roads). In this case the stock available for harvesting is potentially much reduced and harvesting could, if not managed properly, put undue pressure on those populations which are available for harvesting. Similarly, only certain age classes may be available for harvesting, and an understanding of population structure will also be important in some cases.

Determining total stock for an area

Where population census data exists this can be used to determine the abundance of the species and will need to be qualified with additional information such as distribution extent and age structure. Where population census data does not exist (which will be in most cases) it is potentially possible at

the site level to undertake field-work to generate the population data required. However for assessments done on larger areas such as at the state or regional level this approach is not generally possible and the assessment will need to be based on more qualitative information. In this case abundance can be indicated by using a combination of:

- the distribution of the species across an area
- the pattern of the spread,
- the habitat specificity
- the extent or the distribution of the habitat or associated vegetation community/s of the species,
- professional opinion, and
- significant values attributed to species such as rare or endemic.

Setting thresholds for what is considered abundant and what is not will depend on the scale (state, regional, site) at which the assessment is being undertaken and the potential impact of the harvest operation (eg whole plant compared to seed or leaf harvest). It is likely that thresholds are already set for rare species however thresholds above that will need to be determined based on the scale of the area being assessed. For sites it might be based on minimum population sizes which will vary according to the species being harvested and the product taken. For assessments done at the state level it may be difficult to set meaningful thresholds in terms of absolute numbers of individuals and broader indicators of the species' abundance such as distribution patterns will need to be used to help determine these. For example a species may have 50 million individuals but it occurs in only 1 bioregion in two vegetation types restricted to the coastal margin, half of which is in reserves. Such a species may be considered for the purposes of this assessment only moderately abundant.

Determining availability

A species will potentially not be available for harvest on sites/areas where:

- it occurs on tenures that are not available for harvest such as reserves and sites or areas where there are species/ecological communities or other features of conservation value protected under State, Territory or national legislation
- it occurs in areas that are not physically accessible.

The amount of the species available for harvest is the proportion of the total stock that can be reasonably accessed. This information will help determine if the level of harvest proposed is sustainable and to also ensure at a broader regional level that not all populations of a species are subject to harvesting. For individual applications to harvest a species consideration will also need to be given to the amount of pressure that the species is already being subjected to, including development, drought and climate change, as there may be areas where no more harvesting can be allowed based on existing quotas.

Reproductive strategies

This attribute is used to determine the ability of the species to reproduce itself which will help in predicting how it may respond to having foliage and/or flowers removed from it periodically. For example a species that can regrow and/or spread vegetatively, flowers prolifically and produces many viable offspring is going to be less sensitive to being harvested than a species that cannot regenerate vegetatively in any way and only produces a few flowers and few viable offspring. It will help determine if the type and quantity of target material proposed for harvest will have a negative impact on the species' ability to recover and reproduce itself and maintain the reproductive potential of the population.

Growth and Maturation

This attribute is used to determine how quickly a species or harvested plant may be able to be replaced and become sexually mature and/or regain reproductive viability. It will help to determine if the target material and quantity harvested may overtime cause population declines taking into consideration the harvest method/s used.

Ecological requirements

This attribute is used to determine the degree of natural disturbance a species can tolerate and will help determine if the type and degree of disturbance that may occur due to harvesting will exceed that which

the species can tolerate. This includes information regarding the species' sensitivity to pests and diseases.

Species significance

This attribute is used to ascertain if the target species is significant in any sense (other than those protected by legislation and relating to rarity and endemism) and will help in qualifying judgements regarding what might be acceptable regarding the harvesting of significant species. For example a species may be biogeographically significant in areas proposed for harvest, (eg edge of range or a disjunct population) of scientific significance or a primitive species and this may influence the decision on the level of harvest (if any) and where harvesting of the species would be acceptable.

Section 2: Site sensitivity

This section assesses the sensitivity of the habitat or sites where the species is to be harvested from. This can be done at state, regional scale or on a site- by-site basis. The attributes chosen are those that will give the best indication of the degree to which the site/habitat is prone to damage and potential degradation over time in response to the proposed harvest activity, for example the effect of vehicle access, or foot traffic at the site. Consideration will also be given to the conservation significance of the site/habitat, for example if the area contains conservation values. A sensitive site is one that has features that:

- are easily damaged mechanically such as bogs and marshes,
- make the site prone to weed invasion,
- make the site prone to disease invasion particularly *Phytophthora cinnamomi*,
- have been recently disturbed or stressed, for example drought, fire or flood,
- are considered to be of significance such as:
 - species of significance and/or
 - significant or sensitive non target populations and/or
 - plant and/or animal communities of significance and/or
 - geo-heritage features of significance and/or
 - indigenous or non-indigenous cultural heritage of significance,

If there are multiple harvest sites then a site assessment may need to be done for each site particularly where sites are very different (eg different vegetation types, habitats). For large regional assessments, site based assessments will not be possible. In this case a more general habitat assessment needs to be undertaken to identify whether the species potentially occurs on sensitive sites, for example if it occurs in habitats/areas which are known to be or have the potential to be infected with *Phytophthora cinnamomi*. If particularly sensitive sites are identified they may be excluded from harvest.

Section 3: Harvest Regime

This section seeks to determine whether the harvest proposal is likely to cause a negative impact on individual plants and/or plant populations given the sensitivity of the species and or the site/s given the sensitivity of the site/habitat. This impact could be a potential population decline of the target &/or not target species because of the sensitivity of the plants. The declines could be for example the result mechanical damage and/or damage to the site causing ongoing degradation.

Impact of Harvest on target species

To establish the possible response of the species and the site/s to harvest and thus the appropriateness of the harvest proposal it needs to be established if the species is able to cope with:

- the removal of material (single incident and cumulative harvests),
- the harvest technique, and
- the time of harvest.

Impact of Harvest Regime on the site/s/habitat/s

The response of the site/habitat to the harvest needs to be assessed for the type and level of disturbance expected, to determine if the site is able to recover from the disturbance which results from the harvesting operation, for example vehicular access.

The Assessment

The assessment aims to determine “the risk” of the harvest not being sustainable to the target species, its community and habitat. The assessment can be done at State, regional or site level, for one or many harvest proposals. For larger regional assessments it is recommended that the species sensitivity assessment be done first. This can be done in conjunction with a general regional assessment of the sensitivity of the habitat of a species. Assessments on harvest impact and site sensitivity can then be undertaken as harvest proposals come in for a species.

There are two steps to the assessment

- Step 1 fill in and score the 3 assessment sections using the scoring criteria outlined below
- Step 2 once each section has been completed the final scores from each section are used to determine the sustainability of the proposal as per the instruction below.

Scoring Criteria.

For each of the criteria under the attributes four scoring options are given:

- **low**
- **medium**
- **high**
- **very high**

Each score option has been “defined” to provide guidance as to which is the best score level in each case for the species being assessed.

Where the information is not known a score of high should be given.

Because the criteria are already defined for each score level there is generally only a need to fill in the reason/explanation field to provide some insight into why the score was given if it is not already obvious from the criteria definition.

Where an attribute has a number of criteria the criteria are scored individually and then totalled. The total score is then the score for that attribute.

Once all the criteria for each attribute have been scored and totalled the scores for each of the attributes are totalled and added. The result becomes the final score for that section of the assessment.

For scoring using low medium, high and very high categories

The score from Sections 1 to 3 are then used in a matrix of possible score combinations to determine if the proposal is sustainable or not.

Determining the result, attributes and sections

Score totals where

- | | |
|--|------------------|
| • very highs equal more than half | Very High |
| • very highs plus highs equal more than half where there are more very highs | Very high |
| • very highs plus highs equal more than half where there are more highs | High |
| • very highs plus highs equal more than half where they are equal | Very High |
| • medium plus highs equal more than half where there are more highs | High |
| • medium plus highs equal more than half where there are more mediums | Medium |
| • medium plus highs equal more than half where they are equal | High |
| • there are no highs and mediums equal more than half | Medium |
| • mediums and lows are equal | Medium |
| • more than half are low | Low |

In cases where there are three criteria and there is even numbers of categories then

- | | |
|-----------------------------------|------------------|
| • very high plus high plus medium | Very high |
| • very high plus high plus low | High |
| • very high plus medium plus low | High |
| • high plus medium plus low | Medium |

In cases where there are only two criteria for an attribute the highest score takes precedent thus where there is

- Very high plus high **Very High**
- Very high plus medium **Very High**
- Very high plus low **Very High**
- High plus medium **High**
- High plus low **High**
- Medium plus low the result is **Medium**

Step 1 fill in the three assessment sections

Sustainability Assessment For Doggy eared orchid (Woofus limpii)		
Section 1 Sensitivity assessment		
Attributes	Criteria Scores Risk	Reason/Explanation Examples only
<p>Abundance State scale of abundance assessment (eg state, regional, site). For regional and site assessments indicate location and size of area involved.</p>		Assessment undertaken for the whole of the state of Tasmania.
<p>Geographical range of species (scored for site assessments) Low Very widespread occurs across most of the region Medium Widespread but may be absent from some areas within the region High restricted. Limited range eg only on in two bioregions or on the lower south east coast. Very High very restricted and highly localised</p>	High	<p>*</p> <ul style="list-style-type: none"> Occurs in only two bioregions.
<p>Distribution Low Contiguous Medium some fragmentation occurs High highly fragmented Very High only occurs in isolated populations</p>	High	<ul style="list-style-type: none"> Populations widely separated (> 5 x 10KM grid squares) within the bioregions.
<p>Distribution pattern Low Scattered and dense Medium Scattered but not dense OR frequent clumps High Scattered and sparse OR infrequent clumps Very high Very sparsely scattered and occasional. Rarely find more than a few plants in close proximity to each other.</p>	High	<ul style="list-style-type: none"> Species usually occur in medium to large infrequent clumps.
<p>Habitat specificity Low Non specific occurs in a wide rage of habitats and/or vegetation types. Medium Has a preference for a limited range of habitat types (ie wet gullies) and/or occurs in only one or two broad vegetation types (which may incorporate many vegetation community types) eg Wet forests, heath-lands. High Very specific occurs in very few habitats and/or restricted to only a few vegetation communities (eg heath on calcarinite). Very High. Highly specific occurs in only 1 habitat type (eg occurs only on the trunks of tree ferns) and/or one community type.</p>	Med	<ul style="list-style-type: none"> Prefers coastal heathlands in areas where there has been some disturbance and impeded drainage.
<p>Extent of habitat Low widespread and contiguous occurs across nearly all of the area being assessed.</p>		<ul style="list-style-type: none"> Heathlands occurs

<p>Medium Moderately widespread occurs across between 30 – 70% of the area being assessed not always contiguous.</p> <p>High restricted, occurs in between 15-30% of the areas being assessed.</p> <p>Very high very restricted occurs in less than 15% of the area being assessed.</p>	Med	<p>extensively on the coastal margins in Tasmania their stronghold is in the two bioregions in which this species occurs.</p>
<p>Number of individuals</p> <p>Low Uncountable many millions individuals</p> <p>Medium Between 1 to 5 million individuals or for sites more than 10 00 individuals.</p> <p>High Between 500 000 to 1 million individuals or for sites between 1 000 to 10 00 individuals.</p> <p>Very High Has been assessed as uncommon or rare or there is less than 500,000 individuals or for sites less than 1 000 individuals.</p>	Med	<ul style="list-style-type: none"> • Each clump has many 1000's of individuals.
<p>Number of Populations (not scored for site assessments)</p> <p>Low Uncountable</p> <p>Medium Between 500 to 1000</p> <p>High Between 50 to 500 populations</p> <p>Very High Less than 50 populations</p>	Med	<ul style="list-style-type: none"> • In ideal locations over 100 clumps in an area of 100 hectares has been counted.
<p>Age Class (fill in for sites only)</p> <p>Low all age classes present, or not relevant as species is short lived.</p> <p>Medium all age classes present but some are poorly represented</p> <p>High. some age classes are absent</p> <p>Very High there is only one age class present</p>	Low	
<p>Biogeographical significance of species (may be for species as a whole or only for some sites where the species occurs)</p> <p>Low None</p> <p>Medium has one significant attribute eg either endemic, edge of range, key populations, genetically unique population, interest but not uncommon.</p> <p>High has more than one significant attribute eg endemic to state and/or edge of range, and/ or key populations, and/or genetically unique interest population and/or but not uncommon.</p> <p>Very High has more than one significant attribute, eg endemic to state and/or edge of range, and/ or key populations, and/or genetically unique population and uncommon.</p>	Med	<ul style="list-style-type: none"> • Endemic to Tasmania
<p>Availability of resource: Physical</p> <p>Low Easily accessed by road or foot terrain flat and open</p> <p>Medium Road access limited, terrain can be variable and not all is easily accessed by foot.</p> <p>High Very limited road access,(ie few roads mainly gravel or unformed tracks requiring 4wd to access). Terrain very variable and most of areas not easily accessed by foot.</p> <p>Very high. In highly remote areas that can only be accessed by boat or helicopter or long walks requiring overnight stays.</p>	Low	

<p>Availability of resource: tenure (eg private, public land reserved, public land not reserved). Low More than 60% of the species distribution occurs on tenures available for harvest.</p> <p>Medium Between 30- 60% of the species distribution occurs on tenures available for harvest.</p> <p>High Between 15%-30 % of the species distribution occurs on tenures available for harvest.</p> <p>Very High less than 15% of the species distribution occurs on tenures available for harvest.</p>	High	
<p>Availability of resource: competing uses</p> <p>Low no competing uses known</p> <p>Medium Species moderately harvested OR All available licenses are not yet taken up OR Quotas not yet full.</p> <p>High Species heavily harvested OR Quotas almost full OR Nearly all available licenses are taken up OR species reserved for traditional use on a seasonal basis.</p> <p>Very High Species very heavily harvested OR Quotas currently full OR all available licenses are taken up OR species reserved for traditional use only all seasons</p>	Low	
<p>Availability of resource: Threats = security and persistence of stands</p> <p>Low target species likely to persist at sites for many years</p> <p>Medium target species at some risk from temporarily or permanently disappearing from sites.</p> <p>High target species at high risk of temporarily or permanently disappearing from sites (eg in fire prone area).</p> <p>Very High target species will temporarily disappear from sites and will take a long time period before re-establishing or permanently disappear from sites on a regular basis (eg within logging coupes).</p>	High	Area subject to 4wd drive activity which can cause gross soil disturbance and annihilate populations.
<p>Any addition information</p>		
Score for Abundance attribute	5 highs 5 mediums 3 lows	High

<u>Regeneration Strategies</u>		
<p>Vegetative Regeneration ability</p> <p>Low Regeneration is rapid and immediate. May have epicormic buds or lignotubers, layers easily, stolons etc.</p> <p>Medium Regeneration is moderate. Can only produce new growth from stem/branch nodes, underground tubers, corms, bulbs.</p> <p>High Regeneration is slow can produce new growth from stem/branch nodes but there are no specialised structures for vegetative regeneration.</p> <p>Very high Unable to regenerate vegetatively (eg pines).</p>	Med	Regenerates vegetatively from underground tubers. Flowers cannot be removed without leaves and plant will not regrow until the next spring.

<p>Reproductive Regeneration ability</p> <p>Low Produces masses of seed and once released, seed germinates readily in light, moisture and temperature conditions that commonly occur over a long seasonal period. Post germination survival is high and may or may not be density dependant.</p> <p>Medium Produces moderate to masses amount of seed but recruitment is episodic (eg seed release dependant on fire). Or Produces only moderate amounts of seed and seed germinates readily in light, moisture and temperature conditions that occur over a long seasonal period once released. Post germination survival is moderate and may or may not be density dependant.</p> <p>High Produces few seed Or produces moderate to masses amount of seed with low and/or sporadic germination and/or post germination survival is low and density dependant.</p> <p>Very High Produces very few or no seed Or produces moderate to masses amount of seed with very low and or sporadic germination and/or post germination survival is very low and density dependant.</p>	<p>High</p>	<p>Produces masses of seed but germination is low and germinants are heavily predated on by insect grazers. Germination dependant on appropriate species mycorrhizal associate being present in soil. Requires moderate ground disturbance.</p>
<p>Reproductive structures (eg spikes, individual flowers, umbels, berries, nuts, cones) : abundance</p> <p>Low many reproductive produced per individual majority of individuals produce.</p> <p>Medium Majority of individual produce but only moderate amount.</p> <p>High Only a few individuals produce Or less than five produced per individual</p> <p>Very High Only one produced per individual or very few individuals produce.</p>	<p>High</p>	<p>Each plant only produces one terminal flower.</p>
<p>Reproductive frequency</p> <p>Low Reproduces at least once a year or more often</p> <p>Medium</p> <p>High Does not reproduce every year biennial or dependant on specific environmental conditions to stimulate flowering (eg fire).</p> <p>Very High Rarely reproduces May need very specific conditions to trigger reproduction.</p>	<p>Low</p>	<p>Flowers produced in Spring</p>
<p>Reproductive period (flowering till seed, spore production etc.)</p> <p>Low Very long over many months not necessarily seasonal. The flowering period may be extended and/or seed is retained for months or years before dispersal</p> <p>Medium Seasonal over 3-4 months</p> <p>High Seasonal and limited to only a few weeks or over long time period but very sporadic.</p> <p>Very High Seasonal but very brief and/or sporadic.</p>	<p>High</p>	
<p>Dispersal ability</p> <p>Low disperses widely, over 100's of meters , (windblown, water-born or animal vector involved eg birds)</p> <p>Medium disperses close to parent, (projectiles release mechanism, winged)</p> <p>High limited seed remains in close range to parent (seed large and heavy)</p> <p>Very High very limited or not dispersed seed remains on parent till death or dropped in immediate vicinity</p>	<p>Med</p>	<p>Seed light and fine, generally drops in immediate vicinity of plant but may disperse further if release happens on a very windy day.</p>

<p>Seed Bank Persistence</p> <p>Low Viable seed can persist in seed bank for more than 10 years</p> <p>Medium Viable seed can persist in seed bank between 5-10 years.</p> <p>High Viable seed can persist in seed bank between 1-4 years, after which viability declines rapidly.</p> <p>Very High Seed does not persist in seed bank, viability declines rapidly and/or heavily predated pre or post release</p>	Med	
Any additional information		
Score for Regeneration Strategies Attribute	3 high 3 medium 1 Low	High

<u>Growth and Maturation</u>		
<p>Life span</p> <p>Low Annual or biennial</p> <p>Medium Short lived perennial (2-25 years)</p> <p>High Long lived perennial (25 -50 years)</p> <p>Very High 50 plus years</p>	Med	
<p>Growth rates</p> <p>Low rapid</p> <p>Medium moderate to rapid depending on season</p> <p>High slow to moderate depending on season</p> <p>Very High very slow regardless of season</p>	Low	Re-grows rapidly from corms in spring
<p>Age of reproductive maturity</p> <p>Low < 2 years of age</p> <p>Medium 2-5 years of age</p> <p>High 5-10 years of age</p> <p>Very High > than 10 years of age</p>	Low	
Any Additional information		
Score for Growth and Maturation Attribute	1 medium 2 low	Low

<u>Ecological requirements</u>		
<p>Symbiotic/parasitic associations</p> <p>Low none</p>		

<p>Medium Requires non specific hosts</p> <p>High Restricted to a limited number of hosts</p> <p>Very High Totally dependant on 1 species as a host</p>	Low	Dependant on specific mycorrhiza for seed germination.
<p>Substrate preferences</p> <p>Low none</p> <p>Medium Has preferences for certain substrates on which it is better adapted to but can survive on other types.</p> <p>High Can only survive in a limited number of substrate types.</p> <p>Very High Can only survive on 1 type of substrate (eg lithophyte or calcarinite soils, trunks of man ferns).</p>	Med	Only grows in sandy soils
<p>Vegetation community preferences</p> <p>Low none</p> <p>Medium</p> <p>High only occurs in a limited number of vegetation communities usually of the same vegetation types (restricted to rainforests of which there are a number of veg types)</p> <p>Very High Highly specific occurring in very few vegetation communities</p>	Med	
<p>Environmental preferences</p> <p>Low Very hardy can tolerate most conditions</p> <p>Medium Moderately hardy may be sensitive to certain conditions (eg frost, drought, shade) but will recover unless the events are severe and prolonged.</p> <p>High Sensitive to a number of conditions does not tolerate well and has difficulty recovering from</p> <p>Very High Very Sensitive requires very specific conditions the absence of which it can not tolerate for very long.</p>	Med	Frost sensitive
<p>Disturbance</p> <p>Low Very tolerant of a wide range of disturbance types of varying severity, often requires disturbance for regeneration, no recorded susceptibility to a pest or diseases</p> <p>Medium tolerant may require some disturbance for regeneration but has a sensitivity to some kinds of disturbance or to some disturbance when they are severe (eg sub surface roots sensitive to soil disturbance) OR is know to be at risk of some kinds of pest and/or diseases</p> <p>High Low tolerance to disturbance and/or know to be highly susceptible to one or more a pest and /or disease</p> <p>Very High Does not tolerate disturbance and/or highly susceptible to a pest and /or disease</p>	Med	Requires moderate ground disturbance and openness to thrive cannot cope with severe or prolonged disturbance.
<p>Score for Ecological Requirements Attribute</p>	4 medium 1 low	Medium

Species Significance		
<p>Significance for conservation (other than biogeographical significance)</p> <p>Low Of no known significance</p>		Tasmania is the Type locality for

<p>Medium is scientifically significant or primitive, or, low reservation level, or has some other significance rating (eg RFA priority species) and is a common species</p> <p>High is significant on more than one of the following attribute scientifically significant, primitive, low reservation level and is a common species or is significant t on more than one attribute and is and uncommon species</p> <p>Very High is an uncommon species which significant on all attributes scientifically significant, primitive, and/or low reservation level</p>	Med	this species.
<p>Social/cultural significance</p> <p>Low. Of no known significance</p> <p>Medium. Of some significance is used culturally (crafts etc), to a moderate degree, of local significance in some regions.</p> <p>High Once used traditionally by indigenous peoples and/or is popular, used as an emblem high profile (eg Warratah) and strongly identified with by some organisations, communities or states.</p> <p>Very High is scientifically significant and/or primitive, and/or low reservation level and is an uncommon species or is a common species which is significant on all attributes.</p>	Low	
<p>Score for Species Significance Attribute</p>	<p>1 medium 1 low</p>	Medium
<p>Total Score for Section 1</p>	<p>2 high 2 medium 1 low</p>	High

Section 2a

Habitat/community sensitivity for Species in Tasmania

Attributes	Criteria Scores Risk	Reason/Explanation Examples only
<p>Brief habitat description Describe the habitat requirements for the species and the main community types it occurs in.</p>	Not scored	Occurs in coastal heath lands on the eastern side of the state within several different heathland community types mainly in areas of poor drainage in sands.
<p>Susceptibility to weed invasion Low habitat/community type not prone to major weed infestations unless highly disturbed.</p> <p>Medium habitat/community type can prone to major weed infestations even when disturbance is moderate.</p> <p>High habitat/community type can very prone to major weed infestations even when disturbance is very low.</p> <p>Very High habitat/community type highly prone to major weed infestations even in the absence of disturbance and when disturbed infestations can become rampant.</p>	High	Spanish heath is a problematic and invasive weed in these communities particularly on the east coast.
<p>Susceptibility to disease invasion potential Low habitat/community type/s not known to be prone infestation/infection by pests/disease</p> <p>Medium habitat/community type/s known to be moderately prone infestation/infection by pests/disease.</p> <p>High habitat/community type/s known to be very prone infestation/infection by pests/disease.</p> <p>Very High habitat/community type/s known to be highly prone infestation/infection by pests/disease and such infestations can be devastating.</p>	High	PC is evident in all of these heathland communities.
<p>Mechanical damage potential</p> <p>Low Most habitat/community type/s have no or very few features and/ prevailing environmental conditions which would make it sensitive to mechanical damage. The habitat/community type/s could cope with a high degree of mechanical disturbance under a range of environmental conditions and recover.</p> <p>Medium Most habitat/community type/s has a some features and/or prevailing environmental conditions which would make it sensitive to mechanical damage. The habitat/community type/s could cope with a moderate degree of mechanical disturbance under a range of environmental conditions and recover.</p> <p>High Many of the habitat/community type/s have many features and/or prevailing environmental conditions that would make sensitive to mechanical damage. The habitat/community type/s could only cope with a low degree of mechanical disturbance under and/or there are environmental conditions that regularly prevail (eg wet seasons) that would make recovery slow.</p>	High	Most heathlands are on deep sandy soils which are highly susceptible to disturbance Many species present in heathland are not able to tolerate disturbance to root systems.

<p>Very High Most habitat/community types very sensitive to most kinds of disturbance under all conditions and may not recover even if disturbance is of a low level.</p>		
<p>Condition Low Majority of the habitat/community types have been subjected to some form of disturbance and are likely to be highly disturbed /modified Medium Majority of the habitat/community types have been subjected to some form disturbance and are likely to be moderately disturbed /modified High Some of the habitat/community types have been subjected to some form disturbance and are likely to be moderately or highly disturbed /modified Very High Majority of the habitat/community types have not been subjected to some form disturbance and are likely to be in excellent condition</p>	<p>Medium</p>	<p>Heath lands in general have been highly modified and disturbed there are few in pristine condition.</p>
<p>Presence of values (not protected by legislation) Low None recorded Medium There are some values eg rare community, scenic High The site is significant with more than one of the following values present, eg endemic species, rare species, rare communities, scenic, disjunct population of a species and so on. Very High The sight is highly significant, with all values or significance present and/or is considered a biodiversity hot spot and/or is proposed for protection.</p>	<p>Low</p>	<p>Some of the heathland communities are protected as threatened communities.</p>
<p>Total score for section 2a</p>	<p>3 Highs 1 Medium 1Low</p>	<p>High</p>

<p>Very High Highly sensitive to most kinds of disturbance under all conditions and may not recover even if disturbance is of a low level.</p>		
<p>Condition Low The majority of the site is highly disturbed /modified</p> <p>Medium Some areas of the site are highly disturbed and/or the majority of site/s is moderately disturbed/modified</p> <p>High Some areas of the site are moderately disturbed and/or majority of the site/s is in excellent condition not modified</p> <p>Very High The site is in almost pristine condition with very little or no disturbance.</p>	<p>Medium</p>	<p>Some grazing has occurred and there are a number of trail bike and walking tracks crisscrossing the site.</p>
<p>Presence of values (not protected by legislation) Low None recorded</p> <p>Medium There are some values eg rare community, scenic,</p> <p>High The site is significant with a number of values, eg endemic species, rare species, rare communities, scenic, disjunct population of a species and so on.</p> <p>Very High The site is highly significant with many values</p>	<p>Low</p>	<p>Only large area of heath left in the region.</p>
<p>Total score for section 2b</p>	<p>3 Highs 1 Medium 1Low</p>	<p>High</p>

Section 3
Impact of Harvesting
(indicate what operation/s assessment is for)

Harvest Impact	Criteria Scores Risk	Reason/Explanation Examples only
<u>Impact of Harvest on target species</u>		
<p>Impact of removal of target material</p> <p>Low can sustain substantial loss of biomass and still recover and/or Material removed will be rapidly replaced with no ill effect on plant health or viability</p> <p>Medium can sustain moderate loss of biomass and still recover and/or plant will take some time to recover and/or viability is temporarily reduced</p> <p>High can sustain only very limited amounts of biomass or removal of biomass so massive plant is lost (death or removal) and/or will recover slowly high, likelihood of death and/or viability reduced for many seasons.</p> <p>Very High will not recover (eg whole plant removal)</p>	Medium	Flower and leaf material will not be replaced till following season and flowering does not always occur annually dependant on sufficient rain through winter.
<p>Impact of time of harvest</p> <p>low harvest occurs at a time which is not likely to effect the health or viability of the plants and/or removal is unlikely to reduce the capacity of the population as a whole to regenerate</p> <p>medium harvest occurs at a time when the health of the plants is not optimal, viability is already reduced, or the plants are unable to regenerate quickly (non growing season) and/or removal may reduce the capacity of the population as a whole to regenerate for a limited time (1-5 years).</p> <p>high harvesting occurs at a time when the health and viability of the plants are poor and/or unlikely to regenerate within 12 months and/or removal may reduce the capacity of the population as a whole to regenerate for many years (more than 5 years)</p> <p>Very High harvesting occurs at a time when the health and viability of the plant are very poor and/or will not regenerate and/or removal may permanently reduce the capacity of the population as a whole to regenerate.</p>	Medium	Last two years has been low rainfall at site and this is predicted to continue this may affect number of flowers produced and lower viability of population.
<p>Impact of harvest interval</p> <p>Low Harvest interval is of the right frequency to allow for full recovery after previous harvest (ie no evidence of harvest) (full regeneration of plants and population)</p> <p>Medium Harvest interval may be too frequent and undertaken before plants or population is able to fully recover.</p>	Low	

<p>High Harvest interval is too frequent and will not enable the plants or the populations to recover and will likely cause significant decline in viability and health of the plants and the overall population</p> <p>Very High Harvest interval will lead to the extinction of the population as it causes permanent removal of individual and does not allow for regeneration within the population.</p>		
<p>Score for Impact of Harvest on target species</p>	<p>2 medium 1 lows</p>	<p>Medium</p>

<p><u>Impact of Harvest Regime on the site/s/habitat/s</u></p>		
<p>Likelihood of weed introduction or spread due to harvest</p> <p>Low very low risk that weeds with the potential to invade the site may be introduced or spread by harvesters</p> <p>Medium moderate risk that weed with the potential to invade the site s may be introduced or spread by harvesters</p> <p>High High risk of weeds with the potential to invade the site being introduced or spread by harvest e.g. a number of species in the community are highly susceptible to <i>Phytophthora</i> which may be spread by harvesters and their equipment</p> <p>Very High Very high risk of weeds with the potential to invade the site being introduced or spread by and it would be difficult to employ measures to prevent it happening</p>	<p>High</p>	<p>Spanish heath close by which is very easily picked up and transported on vehicles wheels of soles of shoes and creases in clothing.</p>
<p>Likelihood of diseases/pests introduction or spread due to harvest</p> <p>Low very low risk that pests/diseases with the potential to infest species at the site may be introduced or spread by harvesters</p> <p>Medium moderate risk that pests/disease with the potential to infest the site may be introduced or spread by harvesters</p> <p>High High risk of pests/disease with the potential to invade the site being introduced or spread by harvest e.g. a number of species in the community are highly susceptible to <i>Phytophthora</i> which may be spread by harvesters and their equipment</p> <p>Very High if harvesting occurs disease or pests will be introduced into the area</p>	<p>High</p>	<p>In a PC management Zone. Community highly susceptible to PC</p>
<p>Likelihood of significant indirect impacts on other species.</p> <p>Low target species is not likely to be a key source of habitat, shelter, food or other resources for other species and/or the harvest is very low tech and damage or destruction of other species is minimal.</p> <p>Moderate target species is a moderately important source of habitat, shelter, food or other resources to other species and/or or the harvest used equipment or methods may cause moderate damage or destruction of other species .</p> <p>High target species is a very important source of habitat, shelter, food or other resources to other species and/or or the harvest used equipment or methods may cause moderate damage or destruction of other species</p>	<p>Low</p>	

<p>Very High target species is considered a keystone species and/or is a key source of habitat, shelter, food or other resources for other species</p>		
<p>Likelihood of any other significant e.g. nutrient depletion, soil erosion, altering of site hydrology etc.</p> <p>Low Unlikely e.g. disturbance and biomass removed by harvest is very low and unlikely to significantly impact on nutrient levels, soil, hydrology or other ecosystem processes</p> <p>Moderate Likely that some minor impacts may occur e.g. disturbance and biomass removed by harvest is moderate and may have a some minor impacts on nutrient levels, soil, hydrology or other ecosystem processes</p> <p>High Likely that significant impacts will occur e.g. harvest causes high levels of disturbance or removes significant amounts of biomass that may have long-term impacts on nutrient levels, soil, hydrology or other ecosystem processes e.g. harvest removes material with high nutrient content which may represent a significant nutrient loss e.g. harvest causes substantial soil disturbance which may lead to significant erosion</p> <p>Very High Likely that highly significant impacts will occur e.g. harvest causes high levels of disturbance or removes significant amounts of biomass that may have severe, long-term and irreversible impacts on nutrient levels, soil, hydrology or other ecosystem processes</p>	<p>Low</p>	
<p>Score for Impact of Harvest Regime on the site/s/habitat/s</p>	<p>2 highs 2 lows</p>	<p>High</p>
<p>Total score for section 3</p>		<p>High</p>

Step 2 Determine the risk of the harvest being unsustainable

Using the low, medium, high, very high, categories

Once all the sections (species sensitivity, site sensitivity and harvest impact) have been completed fill in the score in table 1 or 2 using table 4.

Table 1 Determining sustainability for regional assessments

Assessment Section			Total
1	Species sensitivity	High	High
2a	Habitat/community sensitivity	High	
3	Harvest Impact	High	

Or

Table 2 Determining sustainability site based assessments

Assessment Section			Total
1	Species sensitivity	High	High
2b	Site sensitivity	High	
3	Harvest Impact	High	

Table 3 provides some general recommendations for an assessment outcome for each of the risk categories.

Table 3 Recommendations for assessment outcome

Score	General recommendation
Low	Harvesting be allowed with minimal conditions
Medium	Harvesting be allowed as long as <ul style="list-style-type: none"> • operator can reasonably demonstrate that what is being proposed is sustainable. • monitoring is undertaken by operator if required. • conditions are rigorous. • conditions to ensure sustainability can be feasibly undertaken by operator.
High	No Harvesting be allowed unless <ul style="list-style-type: none"> • operator can provide hard evidence that the proposal is sustainable. • monitoring is undertaken by operator. • conditions are strict and non negotiable. • operator can unequivocally demonstrate that all conditions to ensure sustainability can and will be met. • it is as a salvage operation.
Very High	No Harvesting be allowed unless <ul style="list-style-type: none"> • it is a legitimate salvage operation.

Table 4. Matrix for assessing “the risk” of a harvest to a specie/s region or site

Section Score	Section Score	Section Score	Overall Score
VH	VH	VH	VH
VH	VH	H	VH
VH	VH	M	VH
VH	VH	L	VH
VH	H	H	H
VH	H	M	H
VH	H	L	H
VH	M	M	H
VH	M	L	H
VH	L	L	H
H	H	H	H
H	H	M	H
H	H	L	H
H	M	M	M
H	M	L	M
H	L	L	M
M	M	M	M
M	M	L	M
M	L	L	L
L	L	L	L