



## **Consultation Document on Listing Eligibility and Conservation Actions**

### ***Hibbertia abyssa* (Bandalup buttercup)**

You are invited to provide your views and supporting reasons related to:

- 1) the eligibility of *Hibbertia abyssa* (Bandalup buttercup) for inclusion on the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) threatened species list in the Endangered category; and
- 2) the necessary conservation actions for the above species.

Evidence provided by experts, stakeholders and the general public are welcome. Responses can be provided by any interested person.

Anyone may nominate a native species, ecological community or threatening process for listing under the EPBC Act or for a transfer of an item already on the list to a new listing category. The Threatened Species Scientific Committee (the Committee) undertakes the assessment of species to determine eligibility for inclusion in the list of threatened species and provides its recommendation to the Australian Government Minister for the Environment.

Draft information for your consideration of the eligibility of this species for listing as Endangered starts at page 3 and information associated with potential conservation actions for this species starts at page 7. To assist with the Committee's assessment, the Committee has identified a series of specific questions on which it seeks your guidance at page 8.

Responses are to be provided in writing either by email to:  
[species.consultation@environment.gov.au](mailto:species.consultation@environment.gov.au)

or by mail to:

The Director  
Marine and Freshwater Species Conservation Section  
Wildlife, Heritage and Marine Division  
Department of the Environment  
PO Box 787  
Canberra ACT 2601

**Responses are required to be submitted by date.**

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## **General background information about listing threatened species**

The Australian Government helps protect species at risk of extinction by listing them as threatened under Part 13 of the EPBC Act. Once listed under the EPBC Act, the species becomes a Matter of National Environmental Significance (MNES) and must be protected from significant impacts through the assessment and approval provisions of the EPBC Act. More information about threatened species is available on the department's website at:

<http://www.environment.gov.au/biodiversity/threatened/index.html>.

Public nominations to list threatened species under the EPBC Act are received annually by the department. In order to determine if a species is eligible for listing as threatened under the EPBC Act, the Threatened Species Scientific Committee (the Committee) undertakes a rigorous scientific assessment of its status to determine if the species is eligible for listing against a set of criteria. These criteria are available on the Department's website at:

<http://www.environment.gov.au/biodiversity/threatened/pubs/guidelines-species.pdf>.

As part of the assessment process, the Committee consults with the public and stakeholders to obtain specific details about the species, as well as advice on what conservation actions might be appropriate. Information provided through the consultation process is considered by the Committee in its assessment. The Committee provides its advice on the assessment (together with comments received) to the Minister regarding the eligibility of the species for listing under a particular category and what conservation actions might be appropriate. The Minister decides to add, or not to add, the species to the list of threatened species under the EPBC Act. More detailed information about the listing process is at:

<http://www.environment.gov.au/biodiversity/threatened/nominations.html>.

To promote the recovery of listed threatened species and ecological communities, conservation advices and where required, recovery plans are made or adopted in accordance with Part 13 of the EPBC Act. Conservation advices provide guidance at the time of listing on known threats and priority recovery actions that can be undertaken at a local and regional level. Recovery plans describe key threats and identify specific recovery actions that can be undertaken to enable recovery activities to occur within a planned and logical national framework. Information about recovery plans is available on the department's website at:

<http://www.environment.gov.au/biodiversity/threatened/recovery.html>.

## **Information about this consultation process**

Responses to this consultation can be provided electronically or in hard copy to the contact addresses provided on Page 1. All responses received will be provided in full to the Committee and then to the Australian Government Minister for the Environment.

In providing comments, please provide references to published data where possible. Should the Committee use the information you provide in formulating its advice, the information will be attributed to you and referenced as a 'personal communication' unless you provide references or otherwise attribute this information (please specify if your organisation requires that this information is attributed to your organisation instead of yourself). The final advice by the Committee will be published on the department's website following the listing decision by the Minister.

Information provided through consultation may be subject to freedom of information legislation and court processes. It is also important to note that under the EPBC Act, the deliberations and recommendations of the Committee are confidential until the Minister has made a final decision on the nomination, unless otherwise determined by the Minister.

# *Hibbertia abyssa*

Bandalup buttercup

## Taxonomy

Conventionally accepted as *Hibbertia abyssa* J.A. Wege & K.R.Thiele

## Species/Sub-species Information

### Description

Erect shrub in the family Dilleniaceae to 1.2 m high; branchlets minutely stellate-hairy, becoming glabrescent. Leaves spirally arranged, fairly crowded, linear to subulate, smooth or with occasional protuberances, the margins tightly revolute, the apex a pungent mucro. Flower peduncle 8–13 mm long, glabrous (or with a few uncinata hairs just below the flowers). Sepals with uncinata and scattered minute stellate hairs on the outer surface, the inner surface glabrous or with scattered minute stellate hairs. Petals 5, bright golden yellow. Stamens 5, arranged on one side of the carpels. Carpels densely hairy.

### Distribution

The Bandalup buttercup is a narrow range endemic, known from three extant, and one extinct population near Bandalup Hill, 40 km southeast of Ravensthorpe, Western Australia. Habitat descriptions for the populations are as follows:

Population 1: Approximately 137 000 plants in 2010 (Department of Environment and Conservation 2010). Located near the Ravensthorpe Nickle Mine site. Restricted to a distinctive geological substrate consisting of Pallinup Siltstone and silica caprock over ultramafic rock. The populations occur in shallow red-brown light clay in *Eucalyptus-Banksia-Melaleuca* open mallee shrublands (Wege and Thiele 2009);

Population 2: As for population 1. This population was extirpated due to mine clearing in 2008. At the time, the combined estimate for Populations 1 and 2 was ~1000-5000 plants (Department of Environment and Conservation 2010).

Population 3: Approximately 21 000 plants in 2010 (Department of Environment and Conservation 2010). Sandstone/siltstone, rocky terrain and saprolite breakaway.

Population 4: Approximately 13 500 plants in 2009 (Department of Environment and Conservation 2010). Mallee woodland, over orange/brown sandy clay, over silcrete rock

Extent of occurrence is <100km<sup>2</sup>, area of occupancy is <10km<sup>2</sup> (Department of Environment and Conservation 2010).

### Relevant Biology/Ecology

Occurs in shrub stratum under *Eucalyptus – Banksia – Melaleuca* open mallee-shrublands. Dominant taxa include *Eucalyptus lehmannii* subsp. Northern (M. French 425), *E. pleurocarpa*, over *Banksia lemanniana*, *Melaleuca pentagona* var. *latifolia* and *Beaufortia orbifolia*, over a mid-dense shrub layer which includes *Hibbertia abyssa*, *Rhadinothamnus rudis*, *Hovea acanthoclada*, *Calothamnus quadrifidus*, *Beyeria brevicaulis* and a mid-dense shrub layer of *Lepidosperma* sp. Fitzgerald River (A.S. George 9935), *Schoenus subclaxus* mid-high sparse sedgeland.

Flowering specimens have been collected in October, November and February. There are no records of fruiting. Reproductive strategies and response to disturbance have not been studied, although it appears to regenerate from seed after fire. Good recruitment was observed in November 2008 in an area burnt in 2002 (Department of Environment and Conservation 2010).

## Threats

Mining and associated exploration activities are a threat to the Bandalup buttercup. The species is confined to Bandalup Hill which has been severely impacted by nickel mining. Direct impacts associated with mining include clearing of vegetation, development of overburden storage facilities and topsoil stockpiles. Indirect impacts include interruptions to surface drainage and ponding of surface water, edge effects from changes to hydrology and soil moisture regimes and dust impacts.

Insecure land tenure contributes to the threats to the species as all populations are found on land tenure that is not for the purpose of conservation.

Inappropriate fire regimes may be a threat to all populations of the Bandalup buttercup. The species regenerates after fire through germination of soil-stored seed, however the timing of fire may impact on recruitment. Fire may also facilitate weed invasion and should be followed up with appropriate weed control.

The susceptibility of the Bandalup buttercup to cinnamon fungus (*Phytophthora cinnamomi*) is unknown although other members of the genus *Hibbertia* can be susceptible. While Bandalup Hill is currently considered dieback-free, mining activities may introduce the pathogen to the site. Infestations are present a few kilometres to the south of the hill on Mason Bay Rd.

## Assessment of available information in relation to the EPBC Act Criteria and Regulations

<b>Criterion 1. Population size reduction (reduction in total numbers)</b>			
Population reduction (measured over the longer of 10 years or 3 generations) based on any of A1 to A4			
	<b>Critically Endangered Very severe reduction</b>	<b>Endangered Severe reduction</b>	<b>Vulnerable Substantial reduction</b>
<b>A1</b>	<b>≥ 90%</b>	<b>≥ 70%</b>	<b>≥ 50%</b>
<b>A2, A3, A4</b>	<b>≥ 80%</b>	<b>≥ 50%</b>	<b>≥ 30%</b>
<p>A1 Population reduction observed, estimated, inferred or suspected in the past and the causes of the reduction are clearly reversible AND understood AND ceased.</p> <p>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.</p> <p>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]</p> <p>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.</p>	<p><i>based on any of the following</i></p> <ul style="list-style-type: none"> <li>(a) direct observation [except A3]</li> <li>(b) an index of abundance appropriate to the taxon</li> <li>(c) a decline in area of occupancy, extent of occurrence and/or quality of habitat</li> <li>(d) actual or potential levels of exploitation</li> <li>(e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites</li> </ul>		

## Evidence:

The total population size of the species is approximately 172 000 individuals. One of the previously known populations was extirpated via clearing by mining activities. However, at the time the combined size of the then two known populations was only 1000-5000 individuals. Subsequent surveys located more individuals and the remaining component of that population is now estimated to comprise approximately 137 000 individuals. Given this discrepancy, it is not possible to put the decline due to the previous lost population into context.

The data presented above appear to demonstrate that there are insufficient data to determine if the species is eligible for listing under this criterion. However, the purpose of this consultation

document is to elicit additional information to better understand the species' status. This conclusion should therefore be considered to be tentative at this stage, as it may be changed as a result of responses to this consultation process.

<b>Criterion 2. Geographic distribution as indicators for either extent of occurrence AND/OR area of occupancy</b>			
	<b>Critically Endangered Very restricted</b>	<b>Endangered Restricted</b>	<b>Vulnerable Limited</b>
B1. Extent of occurrence (EOO)	< 100 km <sup>2</sup>	< 5,000 km <sup>2</sup>	< 20,000 km <sup>2</sup>
B2. Area of occupancy (AOO)	< 10 km <sup>2</sup>	< 500 km <sup>2</sup>	< 2,000 km <sup>2</sup>
AND at least 2 of the following 3 conditions indicating distribution is precarious for survival:			
(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			

### **Evidence:**

The Bandalup buttercup is confined to Bandalup Hill, which has been severely impacted by nickel mining. It has an extent of occurrence of <100km<sup>2</sup> and area of occupancy <10km<sup>2</sup>. There are three extant populations and a continuing decline may be inferred in area of occupancy and quality of habitat.

The data presented above appear to demonstrate that the species is **eligible for listing as Endangered** under this criterion. However, the purpose of this consultation document is to elicit additional information to better understand the species' status. This conclusion should therefore be considered to be tentative at this stage, as it may be changed as a result of responses to this consultation process.

Criterion 3. Population size and decline			
	Critically Endangered Very low	Endangered Low	Vulnerable Limited
Estimated number of mature individuals	< 250	< 2,500	< 10,000
AND either (C1) or (C2) is true			
C1 An observed, estimated or projected continuing decline of at least (up to a max. of 100 years in future)	Very high rate 25% in 3 years or 1 generation (whichever is longer)	High rate 20% in 5 years or 2 generation (whichever is longer)	Substantial rate 10% in 10 years or 3 generations (whichever is longer)
C2 An observed, estimated, projected or inferred continuing decline AND its geographic distribution is precarious for its survival based on at least 1 of the following 3 conditions:			
(a) (i) Number of mature individuals in each subpopulation	≤ 50	≤ 250	≤ 1,000
(a) (ii) % of mature individuals in one subpopulation =	90 – 100%	95 – 100%	100%
(b) Extreme fluctuations in the number of mature individuals			

The total population size of the species is approximately 172 000 individuals. As this is substantially greater than 10 000 the number of mature individuals is not considered to be limited.

The data presented above appear to demonstrate the species is not eligible for listing under this criterion. However, the purpose of this consultation document is to elicit additional information to better understand the species' status. This conclusion should therefore be considered to be tentative at this stage, as it may be changed as a result of responses to this consultation process.

Criterion 4. Number of mature individuals			
	Critically Endangered Extremely low	Endangered Very Low	Vulnerable Low
Number of mature individuals	< 50	< 250	< 1,000

#### Evidence:

The total population size of the species is approximately 172 000 individuals. As this is substantially greater than 1000 the number of mature individuals is not considered to be low.

The data presented above appear to demonstrate the species is not eligible for listing under this criterion. However, the purpose of this consultation document is to elicit additional information to better understand the species' status. This conclusion should therefore be considered to be tentative at this stage, as it may be changed as a result of responses to this consultation process.

Criterion 5. Quantitative Analysis			
	Critically Endangered Immediate future	Endangered Near future	Vulnerable Medium-term future
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

### Evidence:

Population viability analysis appears not to have been undertaken, there are insufficient data to demonstrate if the species is eligible for listing under this criterion. However, the purpose of this consultation document is to elicit additional information to better understand the species' status. This conclusion should therefore be considered to be tentative at this stage, as it may be changed as a result of responses to this consultation process.

## Conservation Actions

### Recovery Plan

A decision about whether there should be a recovery plan for this species has not yet been determined. The purpose of this consultation document is to elicit additional information to help inform this decision.

It should be noted that there is a Western Australian Department of Environment and Conservation Interim Recovery Plan in place for this species (Department of Environment and Conservation 2010).

### Conservation and Management Actions

The following conservation actions are drawn from the *Hibbertia abyssa* Interim Recovery Plan 2011-2015 and their order reflects the priority within that plan (Department of Environment and Conservation 2010).

- Collect seeds and cuttings from all populations of Bandalup buttercup to ensure the genetic diversity of the species is captured.
- Notify land owners and managers of the presence and listing status of Bandalup buttercup. In particular, liaise with the mine owners to ensure that populations of Bandalup buttercup are not accidentally damaged or destroyed during mining operations and environmental conditions, including monitoring of impacts and flora, are adhered to. Indigenous consultation should take place to determine if there are any issues or interests in areas that are habitat for Bandalup buttercup.
- Achieve long term protection of habitat through declaration as reserves for the conservation of flora and fauna.
- A fire management strategy should be developed that recommends fire frequency, intensity, season, and control measures. Fire should be excluded from the habitat of populations, except where it is being used experimentally as a recovery tool. Where fire occurs, consider appropriate management of weeds during regrowth.

### Survey and Monitoring priorities

- Potential suitable habitat should be surveyed for the presence of Bandalup buttercup during its flowering period. All surveyed areas should be recorded and the presence or absence of the species documented to increase survey efficiency and reduce unnecessary duplicate surveys. Where possible, volunteers from the local community, landcare groups, The Wildflower Society of WA (Inc) and naturalists clubs should be involved.



- Monitoring disease, grazing, weed invasion, habitat degradation, hydrology, population stability (expansion or decline), pollinator activity, seed production, recruitment, and longevity is essential. Further quantification of population numbers and survey of population boundaries is required.

### **Information and research priorities**

Knowledge of the biology and ecology of the species will provide a scientific basis for management of Bandalup buttercup in the wild. Studies should include:

- Study of the soil seed bank dynamics and the role of various factors including disease, disturbance, competition, drought, inundation and grazing in recruitment and seedling survival.
- Study the role of fire in regeneration from seed, and whether standing individuals are killed by fire or may resprout.
- Determination of reproductive strategies, phenology and seasonal growth.
- Investigation of the mating system and pollination biology.
- Investigation of population genetic structure and levels of genetic diversity.
- The impact of changes in hydrology in the habitat.
- Determine susceptibility of the species to cinnamon fungus (*Phytophthora cinnamomi*).

### **Collective list of questions – your views**

#### **Biological information**

1. Can you provide any additional or alternative references, information or estimates on longevity, average life span and generation length?
2. Can you provide information about distance and mode of dispersal, either of seed or of pollen?

#### **Population size**

3. Has the survey effort for this species been adequate to determine its national adult population size? If not, please provide justification for your response.
4. Do you have any information on how the population size estimates were derived? If so, please provide sufficient detail to enable the method to be understood and evaluated.

#### **Current Distribution/range/extent of occurrence, area of occupancy**

5. Does the information consider the entire geographic extent and national extent of the species? If not, please provide justification for your response.
6. Has the survey effort for this species been adequate to determine its national distribution? If not, please provide justification for your response.
7. Do you have any information on how the extent of occurrence and/or area of occupancy were derived? If so, please provide sufficient detail to enable the method to be understood and evaluated.

#### **Past Distribution/range/extent of occurrence, area of occupancy**

8. Do you consider that the way historical distributional information has been estimated is appropriate? Please provide justification for your response?
9. Do you agree with the determination in the draft conservation advice that there are 4 separate extant populations? Please provide, where possible, additional information to support your response. This may include, but need not be limited to, comments on



distance between populations, the nature of habitat between those populations or mode of dispersal of seeds.

#### **Change in status/rate of change**

10. Is the information used to identify the nationally threatened status of the species robust? Have all the underlying assumptions been made explicit? Please provide justification for your response.

#### **General**

11. Can you provide additional data or information relevant to this assessment?
12. Have you been involved in developing this nomination? If so, in what capacity?

#### **Threats**

13. Do you agree that the threats listed are correct and that their effect on the species is significant?
14. To what degree are the identified threats likely to impact on the species in the future?
15. Can you provide additional or alternative information on threats, past, current or potential that may adversely affect this species at any stage of its life cycle?
16. Can you provide supporting data/justification or other information for your responses to these questions about threats?

#### **Management**

17. What planning, management and recovery actions are currently in place supporting protection and recovery of the species? To what extent have they been effective?
18. Can you recommend any additional or alternative specific threat abatement or conservation actions that would aid the protection and recovery of the species?
19. What individuals or organisations are currently, or potentially could be, involved in management and recovery of the species?

#### **References cited in the advice**

- Department of Environment and Conservation (2010) *Hibbertia abyssa* Interim Recovery Plan 2011-2015. Interim Recovery Plan No. 309. Department of Environment and Conservation, Western Australia.
- Wege, J.A. and Thiele, K.R. (2009) Two new species of *Hibbertia* (Dilleniaceae) from near Ravensthorpe in Western Australia. *Nuytsia* 19 (2): 303-310.