



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

### ***Hibbertia spanantha* (Julian's hibbertia)**

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

- 1) the eligibility of *Hibbertia spanantha* (Julian's hibbertia) for inclusion on the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) threatened species list in the Critically 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 Critically Endangered starts at page 6 and information associated with potential conservation actions for this species starts at page 10. To assist with its assessment, the Committee has identified a series of specific questions on which it seeks your guidance at page 12.

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:

Jason Ferris  
Species Information and Policy Section  
Wildlife, Heritage and Marine Division  
Department of the Environment  
PO Box 787  
Canberra ACT 2601

**Responses are required to be submitted by 30 June 2016.**

<b>Contents of this information package</b>	<b>Page</b>
General background information about listing threatened species	2
Information about this consultation process	2
Draft information about the Julian's hibbertia and its eligibility for listing	3
Conservation actions for the species	10
Collective list of questions – your views	12
References cited	13

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 of the Environment (the Department). In order to determine if a species is eligible for listing as threatened under the EPBC Act, 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 Committee's final advice 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 spanantha***

### **Julian's hibbertia**

#### **Taxonomy**

Conventionally accepted as *Hibbertia spanantha* Toelken & Robinson, 2015.

This species is considered a new taxon by the National Herbarium of NSW based on advice from hibbertia authority Dr Hellmut Toelken from the State Herbarium of South Australia.

#### **Species Information**

##### **Description**

Julian's hibbertia (Family: Dilleniaceae) is a shrublet that grows up to 30 cm high, with wiry / woody branches. Its leaves, approximately 6 mm long and less than 1 mm wide, are linear or slightly wider at the apex than the base, and are hairy when young, becoming rough later with down-curved margins. The flowers are stalkless, bright yellow and approximately 20 mm in width, with many slender anthers (Toelken & Robinson, 2015). (Image credit: Andrew Robinson, NSW).



##### **Distribution**

Julian's hibbertia is endemic to the NSW Central Coast botanical region. It is known from three populations (referred to here as Population A, B and C) in three proximate Sydney suburbs within the Lane Cove River catchment (Toelken & Robinson 2015).

The species' Area of Occupancy is 12 km<sup>2</sup> according to the IUCN 2x2 km grid method of calculation.

##### **Relevant Biology/Ecology**

The species grows on sandy to light clay soils. The vegetation communities at all known populations have been identified as Coastal Enriched Sandstone Dry Forest or Coastal Shale Sandstone Forest within the broader vegetation classes of Sydney Coastal Dry Sclerophyll Forests and Northern Hinterland Wet Sclerophyll Forests (Keith 2004). Julian's hibbertia occurs in the Tall Open-Forest and Open-Forest as the structural formations described by Specht et al. (1995). All known populations occur under a dominant tree canopy of *Eucalyptus pilularis*, *E. resinifera*, *Corymbia gummi fera* and *Angophora costata*. There are few other suitable sites within the area that contain this uncommon assemblage of species and conditions. A desktop assessment and field observations indicate the species would originally have had a fairly limited distribution.

Julian's hibbertia mostly flowers in October and November, but has been observed to produce flowers at other occasions through the year (OEH 2015). Little is known about the age at which flowering occurs, how the species is pollinated, and how seed is produced and dispersed (Toelken & Robinson 2015).

Julian's hibbertia grows most vigorously in sites exposed to greater sunlight and with limited competition from other mid and ground story species, or in places where light penetration has been increased through natural disturbance (Toelken & Robinson 2015). By contrast, shaded plants appeared to have fewer and shorter stems and leaves (Toelken & Robinson 2015). In light of this, fire, and possibly other physical disturbances that increase light levels without impacting upon the soil profile are likely to play a role in providing for the recruitment and long term persistence of the species (Toelken & Robinson 2015). "As with most hibbertia species in the fire prone environment of the Sydney region [...] fire is obviously the necessary disturbance event for these persistent soil stored seedbanks to re-establish" (Orme pers. comm. 2014).

A fire trial on three individuals within Population A was conducted on 11 February 2014. The fire was considered to be an “understory/sub canopy fire” of moderate intensity, with an average flame height of two metres (Robinson pers. comm. 2016). 102 seedlings were noted as having emerged from the site of the trial as at December 2015 (Robinson pers. comm. 2015), prior to which no seedlings had been recorded.

### Threats

The extremely restricted population and distribution of Julian’s hibbertia (18 mature individuals) combined with the limited remaining suitable habitat (in the case of Population A, 60 m to either side of a ridge top), mean that this species is particularly vulnerable to the existing and potential threats detailed below.

Threat factor	Threat type and status	Evidence base
Fire		
Lack of fire (at intervals appropriate for the species)	Known/Current	<p>After a fire trial in 2014, all burnt mature individuals re-established through vigorous re-sprouting via either coppicing or suckering from rootstock, or both (Toelken &amp; Robinson 2015). Fire also triggered germination from the soil stored seed bank (Toelken &amp; Robinson 2015). Recruitment has, in fact, ‘only taken place in burnt areas’ (Toelken &amp; Robinson 2015).</p> <p>More information is required about the juvenile period, longevity, and soil seed bank formation before a definitive fire interval could be inferred.</p> <p>Anecdotal observations suggest that standing plants may enter senescence in long-unburnt (c. &gt;50 years) areas and that competitors may exclude hibbertia (Robinson pers. comm. 2015).</p>
Habitat loss and fragmentation		
Land clearance	Known/Past (Population A)	Population A is confined to a ridge top. Remaining suitable habitat for this population is limited due to past development.
Rail development	Suspected/Past (Population B)	The North West Rail Link Project is in close proximity to this population. The above ground infrastructure for the creation of the rail link may have been a previous threat. Currently, all but one disjunct individual is contained within an enclosure (Robinson pers. comm. 2016).
Herbicide spraying	Potential/Future (Population C)	Efforts have been undertaken to inform bush managers that herbicide spraying should not be undertaken in these areas. Herbicide drift or application by unqualified personnel is a potential future threat for this species (Robinson pers. comm. 2016).
Dumping of mulch and rubbish	Known/Current (Population C)	Dumping of mulch and rubbish at the site may be an ongoing threat and could disturb the soil profile.

<b>Threat factor</b>	<b>Threat type and status</b>	<b>Evidence base</b>
Unmitigated public access	Known/Current	Population A is proximate to areas of high traffic. Evidence of degradation and creation of informal pathways were included in the nomination to demonstrate the extent of the threat (Robinson pers. comm. 2015).  Public access without sufficient protective measures in place has generated a number of observed threatening processes, including soil compaction, fragmentation, changed hydrology, physical damage (trampling), as well as issues associated with the presence of dog excrement. At least one mature plant has been killed through a combination of trampling and effects of dog excrement (Andrew Orme pers. comm.).
Invasive species		
Rabbits	Known/ Current (Population B)	Rabbit herbivory has been observed at Population B.
	Potential/Future (Population A)	Rabbits were sighted near Population A but there was no evidence of their presence in the immediate vicinity of the population.
Disease		
<i>Phytophthora cinnamomi</i>	Potential/ Future	Phytophthora Root Rot disease is known to affect some eastern Australian hibbertia, although susceptibility of Julian's hibbertia is unknown
Low population		
Few mature individuals	Potential/Current	Less than 20 (n=18) mature individuals have been counted across three populations.

## 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			
	Critically Endangered Very severe reduction	Endangered Severe reduction	Vulnerable Substantial reduction
<b>A1</b>	≥ 90%	≥ 70%	≥ 50%
<b>A2, A3, A4</b>	≥ 80%	≥ 50%	≥ 30%
A1 Population reduction observed, estimated, inferred or suspected in the past and the causes of the reduction are clearly reversible AND understood AND ceased. A2 Population reduction observed, estimated, inferred or suspected in the past where the causes of the reduction may not have ceased OR may not be understood OR may not be reversible. A3 Population reduction, projected or suspected to be met in the future (up to a maximum of 100 years) [(a) cannot be used for A3] A4 An observed, estimated, inferred, projected or suspected population reduction where the time period must include both the past and the future (up to a max. of 100 years in future), and where the causes of reduction may not have ceased OR may not be understood OR may not be reversible.	based on any of the following <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 estimate as at December 2015, following the discovery of an additional two populations in the area, stands at 18 mature individuals (Robinson, pers. comm. 2015).

Since the species was first observed in 2007, one mature individual in Population A has perished through what is thought to have been a combination of threats related to unmitigated public access, including trampling and altered soil conditions through the introduction of dog excrement. The death of this individual represents a 5.5% decline in the total number of mature individuals across all populations. There is no evidence currently available to indicate declines in the other two populations.

The data presented above appear to be insufficient 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.

<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 Area of Occupancy for Julian's hibbertia is 12 km<sup>2</sup>. However it should be understood that Julian's hibbertia occupies only a very small portion of each of the three 2x2km grid squares used to calculate this area.

There are few other sites within the area that contain the uncommon assemblage of species and conditions in which Julian's hibbertia grows. A desktop assessment combined with field observations indicate that the species would originally have had a fairly limited distribution. This view is supported by the limited extent of co-occurrence of canopy species associated with Julian's hibbertia (Robinson pers. comm. 2015).

Vegetation structure and composition begin to change about 60 m to either side of the ridge on which Population A is situated, suggesting Julian's hibbertia is also limited to this area. In light of this information, the nominator provides an estimate of a maximum suitable habitat of 8000 m<sup>2</sup>, within which the present Area of Occupancy is only 3000 m<sup>2</sup> (Robinson pers. comm. 2015).

An Extent of Occurrence of less than 100 km<sup>2</sup> (B1) indicates this species' geographic distribution is 'precarious for survival.' Given the distribution is severely fragmented by urban development, there are only three known locations (a), and there is sufficient evidence of a continuing decline (b), existing data would suggest this species distribution is 'very restricted' as defined under this Criterion.

The data presented above appear to demonstrate that the species is **eligible for listing as Critically 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			

#### Evidence:

There are very low numbers of Julian's hibbertia with only 18 known individuals (<250, i.e. 'very low').

There are three known populations, containing 12, five and one mature individual respectively, for a total of 18 mature individuals (i.e. <50 in each population). The largest population (12) represents 66.6% of the total number of mature individuals. There are no data to indicate extreme fluctuations in the number of mature individuals.

The data presented above appear to demonstrate that the species is **eligible for listing as Critically 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 4. Number of mature individuals

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

#### Evidence:

There are 18 known individuals which is <50 (i.e. 'extremely low').

The data presented above appear to demonstrate that the species is **eligible for listing as Critically 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.

<b>Criterion 5. Quantitative Analysis</b>			
	<b>Critically Endangered Immediate future</b>	<b>Endangered Near future</b>	<b>Vulnerable Medium-term future</b>
Indicating the probability of extinction in the wild to be:	<b>≥ 50% in 10 years or 3 generations, whichever is longer (100 years max.)</b>	<b>≥ 20% in 20 years or 5 generations, whichever is longer (100 years max.)</b>	<b>≥ 10% in 100 years</b>

**Evidence:**

As 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.

### **Primary Conservation Actions**

Reintroduce fire, conserve existing habitat, prevent any loss of remaining mature and re-sprouting individuals, protect emerging juveniles, and continue *ex situ* germination.

Please note that the conservation actions listed below must only be conducted following the approval of the relevant management authority.

### **Conservation and Management Priorities**

- Fire
  - Reintroduce fire: Fire should be integrated into management guidelines for the areas in which Julian's hibbertia occurs. The recommended interval between—and intensity of—ecological burns should be clearly outlined, noting that the interval may need to be significant to allow sufficient time for development of juveniles and seed bank formation.
  - Any fire regime implemented should have in place pre-burn precautionary measures as well as post-burn management (weeding *et cetera*) of the site.
  - Strong buffers against the reoccurrence of fire will need to be put in place following any prescribed burn for a significant period of time (at least a decade or longer).
- Habitat loss and fragmentation
  - Individuals must be protected: Population A is currently receiving monthly maintenance as part of Ku-ring-gai Council's prioritised Bushland Restoration Program. Rabbit proof fencing has been completed at Population A, as well as at Population C. Ryde Council has installed physical barriers around the majority of Population B.
  - Habitat must not be disturbed: Some maintenance activities including herbicide spraying have been discontinued at Macquarie Park in light of warnings of potential damage to Julian's hibbertia.
  - Prevent further habitat disturbance by pedestrians and dogs in the short term by fencing the remaining unprotected individuals, with a view to minimising impact on the use of formal tracks, and in the understanding that restrictions to public access should be reduced once the population recovers adequately. Signage in conjunction with fencing may help to prevent further damage associated with the dumping of mulch and rubbish.
- Invasive species
  - Ensure that fencing/barriers put in place are rabbit proof to prevent grazing. This is particularly important for juvenile plants.
- Disease
  - Where susceptibility is established, suitable hygiene protocols should be implemented to protect known populations from a potential outbreak of Phytophthora Root Rot disease (*Phytophthora cinnamomi*). Fencing of the remainder of the unfenced population should assist in preventing transmission.
- Low population
  - *Ex situ* seed germination/propagation has been undertaken and should be continued using seed or samples of soil seed bank where the seeds are shown to be long-lived.
  - Investigate suitable additional habitat to facilitate the further recovery of the population.

### **Survey and Monitoring priorities**

- Survey work post-fire events is particularly important for this species and should look at germination, number of mature plants (if any) and juveniles on site at intervals, and closely monitor sites for encroachment by weeds, seed predation or other damaging activities.
- Survey work into other likely sites where additional populations may exist should be undertaken. Ideally, habitat that is likely to be suitable should be surveyed post-fire, when the seed bank would be stimulated.
- Design and implement a monitoring program to assess the effectiveness of management actions on removing pressures associated with public access. Surveyors should look to record evidence of trampling, soil compaction, fragmentation, any other signs of physical damage, and the presence of animal faeces that could have an adverse impact. Hydrology and soil composition should also be monitored. Surveys should aim to build on existing understandings of the species' ecology and behaviour.

### **Information and research priorities**

- Suitable soils and vegetation types should be identified to prioritise sites for future survey work.
- Steps should be taken to establish whether Julian's hibbertia is susceptible to Phytophthora Root Rot disease (*Phytophthora cinnamomi*).
- Establish whether there may be other locations that could be suitable for establishing additional populations.
- Consider providing information to maintenance personnel who conduct work on or near the site, which outlines what steps can be taken to avoid inadvertent damage to Julian's hibbertia (e.g. trampling, herbicide drift *et cetera*).
- Consider a prescribed burn trial in an area of suitable habitat where there may be a dormant seed bank present. Such research-driven burns should only be undertaken alongside strict precautionary measures and an understanding of the impact of the prescribed burn on other flora and fauna.

## **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 or generation length?
2. Can you provide any additional or alternative references, information or estimates on aspects of the ecology of the species?

### **Past distribution/range/extent of occurrence/area of occupancy**

3. Can you provide estimates of the former extent of occurrence and/or area of occupancy?
4. Can you provide any more general indication of the former extent of the remnant vegetation community (similar to Shale Sandstone Transition Forest) prior to development of the area?
5. Please provide (if known) any additional evidence which shows the populations are stable, increasing or declining.

### **Threats**

6. Do you agree that the threats listed are correct and that their effect on the species is significant?
7. Can you provide any additional or alternative information on threats, past, current or potential, that may adversely affect this species at any stage of its lifecycle? Provide supporting data where available.

### **General**

8. Can you provide additional data or information relevant to this assessment?
9. Can you provide evidence to support a recommended minimum and/or maximum time period between fire/disturbance events?

### **Management**

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

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

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### **Other sources cited in the advice**

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