

# THREATENED SPECIES SCIENTIFIC COMMITTEE

Established under the *Environment Protection and Biodiversity Conservation Act 1999*

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The Minister's delegate approved this Conservation Advice on 13/07/2017.

## Conservation Advice

### *Lambertia echinata* subsp. *occidentalis*

western prickly honeysuckle

#### Conservation Status

*Lambertia echinata* subsp. *occidentalis* (western prickly honeysuckle) is listed as Endangered under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) (EPBC Act) effective from 16 July 2000. The species is eligible for listing under the EPBC Act as on 16 July 2000 it was listed as Endangered under Schedule 1 of the *Endangered Species Protection Act 1992* (Cwlth).

The Western Australian Government identifies that the subspecies is eligible for listing in the Critically Endangered category under the *Wildlife Conservation Act 1950*.

The main factors that are the cause of the subspecies being eligible for listing in the Endangered category are its projected severe future declines as a result of pathogens, its restricted geographic distribution that is precarious to the subspecies survival and projected high rates of continuing declines in abundance.

#### Description

The western prickly honeysuckle is a small shrub (to 3 m) with five-flowered flower heads. Flowers are yellow and crowded at the ends of the branchlets (Stack & Brown, 2003).

Morphological characters that distinguish *Lambertia echinata* subspecies include: that *L. e.* subsp. *echinata* has pink-red flowers, and; that *L. e.* subsp. *citrina* has vegetative and floral leaves with 3-5 rigid points whereas the margins of the western prickly honeysuckle are entire (Stack & Brown, 2003). The other *Lambertia echinata* subspecies have a disjunct distribution, occurring on the south coast (ALA, 2016).

#### Distribution

The western prickly honeysuckle occurs in Western Australia in the Swan Coastal Plain IBRA region. The subspecies is known from one natural site at the base of the Whicher Range, south-east of Busselton. In 2003, this site had less than 100 plants (Stack & Brown, 2003). Four translocation sites are known in the vicinity of the natural site, however, in 2003 only two were extant with an unknown number of surviving plants (Stack & Brown, 2003). Given the location of records, the subspecies Extent of Occurrence is estimated to be 12 km<sup>2</sup> and its Area of Occupancy is estimated to be 8 km<sup>2</sup>.

#### Relevant Biology/Ecology

The western prickly honeysuckle occurs in winter-wet shrubland over shallow sands over ironstone at the base of the Whicher Range (Stack & Brown, 2003). It occurs entirely within the Shrublands on southern Swan Coastal Plain Ironstones ecological community, which is listed as Endangered in the EPBC Act list of threatened ecological communities.

## Threats

The western prickly honeysuckle is known to be threatened by dieback disease (*Phytophthora cinnamomi*). Potential threats to the subspecies include fire, hydrological change and invasive species.

Table 1 – Threats impacting the western prickly honeysuckle in approximate order of severity of risk, based on available evidence.

Threat factor	Threat type and status	Evidence base
Disease		
<i>Phytophthora cinnamomi</i>	known	The western prickly honeysuckle is known to be susceptible to <i>P. cinnamomi</i> (Stack & Brown, 2003). This disease has been implicated in the deaths of plants at two of the translocation sites (Stack & Brown, 2003). <i>P. cinnamomi</i> effects physiological and biochemical pathways in infected plants (DoE 2014). Up-take of water is often the first pathway to be effected and in susceptible species healthy plants can suddenly die (DoE 2014).
Fire		
Fire frequency	potential	The western prickly honeysuckle is an obligate seeder that is killed by fire then regenerates from seed following fire. Although impacts of inappropriate fire frequency have not been observed in situ, it is assumed that population health and abundance may decline with (Stack & Brown, 2003) too frequent fire that doesn't allow plants to sexually mature (and replenish the seed-bank).
Hydrology		
Waterlogging	potential	Surface runoff and recharge of the groundwater may have increased at the natural site due to the extensive clearing for agriculture that has impacted its ironstone habitat (Tille & Lantzke, 1990, cited in Stack & Brown, 2003). Waterlogging is not an immediate threat but requires monitoring.
Invasive species		
Weeds	potential	In 2003, weeds were a problem at all translocation sites (Stack & Brown, 2003). These sites were purchased as cleared land in 1999 and were in the process of being gradually rehabilitated. Weeds suppress plant growth and may increase fire hazard (Stack & Brown, 2003).
Rabbits	potential	In the wild population, rabbit ( <i>Oryctolagus cuniculus</i> ) browsing may prevent recruitment by selectively grazing seedlings and young growth (Stack & Brown, 2003).

## **Conservation Actions**

### **Conservation objective**

Increase population size through protection from impacts associated with dieback disease and establishing additional sites.

### **Conservation and Management priorities**

#### Disease

- Implement a *P. cinnamomi* management plan to ensure that the fungus is not introduced into locations of the threatened species and that the spread in areas outside of, but adjacent to population is mitigated (DoE 2014).
- Ensure that appropriate hygiene protocols are adhered to when entering or exiting the known location of the threatened species, such as those outlined in Podger et al. (2001).
- Implement a hygiene management plan and risk assessment to protect known populations from further outbreaks of *P. cinnamomi*. This may include but is not limited to:
  - Contaminated water is not used for firefighting purposes,
  - Contaminated soil is not introduced into the area as part of restoration, translocation, infrastructure development or revegetation activities,
  - Ensure that areas where the threatened species is known to occur that are *P. cinnamomi* free are sign posted and hygiene stations are implemented and maintained.
- Implement mitigation measures in areas that are known to be infected by *P. cinnamomi*, this may include but is not limited to;
  - Application of phosphite ( $H_3PO_3$ ), noting the potential deleterious effects as a fertiliser with prolonged usage.

#### Fire

- Fires must be managed to ensure that prevailing fire regimes do not disrupt the life cycle of the threatened species, that they support rather than degrade the habitat necessary to the threatened species, that they do not promote invasion of exotic species, and that they do not increase impacts of grazing.
- Physical damage to the habitat and individuals of the threatened species must be avoided during and after fire operations.
- Fire management authorities and land management agencies should use suitable maps and install field markers to avoid damage to the western prickly honeysuckle
- Ensure that fires do not occur in winter or spring, avoiding the exposure of sub-mature seedling recruits to desiccating conditions over summer.
- Ensure that intervals between successive fires take into account the longevity of the standing plant population.
- Avoid any use of fire research and other activities that impact upon the persistence of the population unless there is evidence to show the impact would be a positive and enduring effect on the western prickly honeysuckle persistence.

## Hydrology

- Actions that may lead to draining or waterlogging of sites should be avoided. Ensure that land managers act in accordance with guidance provided in the *Shrubland Association on Southern Swan Coastal Plain Ironstone (Busselton area) (Southern Ironstone Association) Interim recovery plan no. 215* (Meissner & English, 2005).

## Invasive species (including threats from grazing, trampling, predation)

- Opportunistically monitor the impacts of rabbit browsing on the species. If assessed as a severe threat at a given site, implement appropriate control measures. Control measures for rabbits are identified in the *Threat abatement plan for competition and land degradation by rabbits* (DoEE 2016).
- Determine if any of the weeds at the translocation sites are impacting the species or are a risk of impacting the species in the future. Implement appropriate weed control measures if deemed necessary and, if herbicide applications is considered, avoid possible disturbance/overspray threats associated with the control method.

## Ex situ Strategies

- Establish an ex situ population for use in reestablishment of new populations.
- Ex situ seed-banks provide an important capacity for medium to long-term storage of diaspores of threatened plant species. Where seeds are available seed-banking should be undertaken in consultation with relevant seed storage professional advice as to appropriate conditions (collection and post-harvest treatment; pre-storage drying; storage temperature; curation and auditing) to ensure diaspore viability is retained.
- Seed should be appropriately sourced and stored in a seed-bank facility using best practice seed storage guidelines and procedures to maximise seed viability and germinability.

## Translocation

- Using habitat suitability modelling as guidance, identify suitable sites for the establishment of additional populations in the wild and for linking existing populations. Relevant policies should be referred to for guidance for undertaking translocations (e.g. Vallee et al. 2004).

## Survey and Monitoring priorities

- Develop habitat suitability models to determine the ecological/environmental indices responsible for the western prickly honeysuckle distribution, and how it may change due to the impending threats. Appropriate methods are outlined by Guisan and Zimmermann (2000).
- Using habitat suitability modelling as guidance, undertake surveys in suitable habitat and potential habitat to locate any additional occurrences. Report new records to the Western Australian State Government.
- Monitor the size and structure and reproductive status of populations at different stages in the fire cycle, taking opportunities to monitor after planned and unplanned fires (where they occur) and improve understanding of the fire response of the species.
- Precise fire history records must be kept for the habitat and extant populations (confirmed and suspected) of the threatened species.

## Information and research priorities

- The following research into the ecological requirements of the species has been recommended: soil seed-bank dynamics; pollination biology of the species; requirements of pollinators; reproductive strategies, phenology and seasonal growth of plants; the population genetic structure of the species; the impact of dieback disease and control techniques on the species and its habitat; the impact of borers and other insects; the impact of canker (*Armillaria luteobubalina*); and the impact and changes in the level of waterlogging and salinity on the species and its habitat (Stack & Brown, 2003).
- Improve understanding of the mechanisms of response to different fire regimes and identify appropriate fire regimes for conservation of the western prickly honeysuckle by undertaking appropriately designed experiments in the laboratory.
- Identify optimal fire regimes for regeneration (vegetative regrowth and/or seed germination), and response to other prevailing fire regimes.

## References cited in the advice

- DoE (Department of the Environment) (2014). Threat abatement plan for disease in natural ecosystems caused by *Phytophthora cinnamomi*. Canberra; ACT: Department of the Environment. Available from: <http://www.environment.gov.au/resource/threat-abatement-plan-disease-natural-ecosystems-caused-phytophthora-cinnamomi>
- DoEE (Department of the Environment and Energy) (2016). Threat Abatement Plan for competition and land degradation by rabbits. Commonwealth of Australia. Canberra, ACT: Commonwealth of Australia. Available from: <http://www.environment.gov.au/biodiversity/threatened/publications/tap/competition-and-land-degradation-rabbits-2016>.
- Guisan, A., & Zimmermann, N.E. (2000). Predictive habitat distribution models in ecology. *Ecological Modelling* 135, 147-186.
- Meissner, R., & English, V. (2005). Shrubland Association on Southern Swan Coastal Plain Ironstone (Busselton area) (Southern Ironstone Association) Interim recovery plan no. 215. Department of Environment and Conservation. Available from: <http://www.environment.gov.au/biodiversity/threatened/publications/recovery/shrublands-assoc-on-sthn-scp-ironstone.html>
- Podger FD, James SH, & Mulcahy MJ. (2001). *Phytophthora Cinnamomi* and Disease Caused By It- A protocol for identifying 'Protectable Areas' and their priority for management. Draft report prepared for Department of Parks and Wildlife. Available from [https://www.dpaw.wa.gov.au/images/documents/conservation-management/pests-diseases/disease-risk-areas/Protecting\\_the\\_Protectable\\_and\\_Protocols\\_for\\_Defining\\_Protectable\\_Areas.pdf](https://www.dpaw.wa.gov.au/images/documents/conservation-management/pests-diseases/disease-risk-areas/Protecting_the_Protectable_and_Protocols_for_Defining_Protectable_Areas.pdf)

Stack, G., & Brown, A. (2003). Western Prickly Honeysuckle (*Lambertia echinata* subsp. *occidentalis*) Interim Recovery Plan 2003-2008. Available from:

<http://www.environment.gov.au/biodiversity/threatened/publications/recovery/l-echinata/index.html>

Vallee, L., Hogbin, T., Monks, L., Makinson, B., Matthes, B., & Rossetto, M. (2004). Guidelines for the translocation of threatened plants in Australia - Second Edition. Canberra, ACT: Australian Network for Plant Conservation.

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

ALA (Atlas of Living Australia) (2016). Atlas of Living Australia. Available from:

<http://www.ala.org.au/>