

***Banksia vincentia* Stimpson & P.H.Weston (Proteaceae)**

Distribution: Endemic to NSW

Current EPBC Act Status: Not Listed

Current NSW TSC Act Status: Critically Endangered

Proposed change for alignment: List on EPBC Act as Critically Endangered

Conservation Advice: *Banksia vincentia* Stimpson & P.H.Weston.

Summary of Conservation Assessment

Banksia vincentia is eligible for listing as Critically Endangered under Criteria A4b; B1ab(iii) (v); B2ab (iii) (v); C1, C2ai, ii; and D1.

The main reasons for the species being eligible for listing in the Critically Endangered category are i) high rate of decline of existing mature plants; ii) that the species has a very highly restricted geographic range with an area of occupancy (AOO) and extent of occurrence estimated to be approximately 4 km². AOO is based on a single 2 x 2 km grid cell, the scale recommended for assessing AOO by IUCN (2016); iii) a continuing decline is estimated in area and extent and quality of habitat and the number of mature individuals; iv) all mature individuals are observed or inferred to occur within one population; v) very few mature individuals remain in the wild.

Assessment against IUCN Red List criteria

Criterion A Population Size reduction.

Assessment Outcome: Critically Endangered via A4b.

Justification: Decline of mature individuals remaining at the one known has been very high in the past few years. Generation length is currently unknown but the species has a lignotuber and is likely to be long lived (>20-50 years). Recent declines in the mature population in the last 2 years have seen the death of 7/14 mature plants (50%) with one plant unhealthy and two mature plants that cannot be relocated. Extrapolating this rate of decline into the future over even a short time frame (much less than even the minimum likely 3 generation lengths) would indicate the species may go extinct in the very near future. The species therefore qualifies as Critically Endangered via A4b, even though there is some uncertainty due to the limited time series of data available.

Criterion B Geographic range

Assessment Outcome: Critically Endangered under Criterion B1 (a), (b) (iii) (v); B2 (a), (b) (iii) (v).

Justification: The geographic distribution of *Banksia vincentia* is very highly restricted. The extent of occurrence (EOO) and the area of occupancy (AOO) are both estimated to be 4 km² (for AOO this is based on a single (2 x 2 km) grid cells, the scale recommended for assessing AOO by IUCN (2016)). and at least 2 of the following:

a) the population or habitat is observed or inferred to be severely fragmented or known to exist at a single location,

Assessment Outcome: subcriterion met.

Justification: The species is only known from one location, despite survey in surrounding habitat. It is likely to be severely fragmented as its habitat is fragmented by clearing for urbanisation and the remaining known habitat is likely to be smaller than would be required to support a viable population.

b) a projected or continuing decline is observed, estimated or inferred.

Assessment Outcome: subcriterion met.

Justification: A projected continuing decline is inferred in (iii) quality of habitat, and (v) number of mature individuals. This is mainly due to adverse effects of clearing, disturbance, impacts of the pathogen *Phytophthora cinnamomi*, and a fire that all combined have resulted in the death of mature individuals.

c) extreme fluctuations:

Assessment Outcome: subcriterion not met.

Justification: The species is not thought to undergo extreme fluctuations as mature plants have a lignotuber than provides some resilience to disturbance.

Criterion C Small population size and decline.

Assessment Outcome: Critically Endangered via C1, C2ai, ii.

Justification: The total number of mature individuals of *Banksia vincentia* is less than 20.

C1. An estimated continuing decline of at least 25% within 3 years or 1 generations, whichever is longer.

Assessment Outcome: subcriterion met at Critically Endangered threshold.

Justification: Generation length is currently unknown but the species has a lignotuber and is likely to be long lived (>20-50 years). Recent declines in the mature population in the last 2 years have seen the death of 7/14 mature plants (50%) with two mature plants that cannot be relocated; This rate of declines exceeds the Critically Endangered thresholds in C1 if even short generation lengths are assumed;

or

C2. Continuing decline in number of mature individuals

Assessment Outcome: subcriterion met.

Justification: Continuing decline is inferred in the abundance of *Banksia vincentia* from the impact of *Phytophthora cinnamomi*, adverse fires and habitat disturbance;

And one of the following three:

(a)(i) the number of mature individuals in each population is <50:

Assessment Outcome: subcriterion met.

Justification: The one population has less than 50 mature individuals

(a)(ii) the % mature individuals in one population is 90-100%.

Assessment Outcome: subcriterion met.

Justification: all mature individuals occur in one population.

b) Extreme fluctuations in the number of mature individuals

Assessment Outcome: subcriterion not met.

Justification: The species is not thought to undergo extreme fluctuations as mature plants have a lignotuber than provides some resilience to disturbance.

Criterion D Very small or restricted population.

Assessment Outcome: Critically Endangered via D1.

Justification: D1. Population size estimated to number fewer than 20 mature individuals.

Criterion E Quantitative Analysis.

Assessment Outcome: Data deficient.

Justification: Insufficient data to assess.

Description

NSW Scientific Committee (2016) state that “*Banksia vincentia* Stimpson & P.H.Weston (family Proteaceae) is described as a “lignotuberous shrub, c. twice as wide as it is high, 0.30–0.75m high x 1–2 m wide. Stems basally prostrate from a lignotuber, i.e. divergent and \pm horizontal in basal 20–30 cm, then ascending to erect more distally; stems under 12 months old densely covered in a 2-layered indumentum of tightly curled trichomes forming a felted layer c. 0.2 mm thick, overtopped by a much sparser layer of straight, antrorse to patent trichomes 0.2–1.3 mm long; stems older than 12 months gradually sheading (sic) trichomes until glabrescent after about 3–4 years; axillary buds prominent in immature leaves. Leaves narrowly oblong-obovate, rounded to truncate; petiole 1–3.5 mm long, moderately to densely covered in an indumentum resembling that of the stem, more sparse abaxially; lamina 12–47 mm long, 2–6.5 mm wide, entire or with 1–6 marginal teeth in the distal 1/5–1/15 of the lamina, sometimes with one or more toothless undulations replacing teeth, with slightly recurved margins; adaxial surface sparsely to moderately covered in a mixture of short, tightly curled trichomes and appressed, straight trichomes 0.2–0.5 mm long when immature, becoming glabrescent or with a few residual trichomes along the midvein when mature, RHS colour green group 139A–D when fresh; abaxial surface of lamina densely covered in a tomentum of tightly curled trichomes with a sparse layer of emergent, straight, appressed trichomes either side of the midvein, sparsely covered in straight, appressed trichomes without an underlying tomentum on the midvein, RHS colour greyed green group 195A–D when fresh, browning slightly on drying, becoming darker with age; adaxial midvein shallowly impressed proximally, flat distally; abaxial midvein 0.3–0.4 mm wide, prominently protruding; lamina apex mucronate. Conflorescence surrounded by a whorl of 1–4-year old branches, 75–167 mm long developing basipetally; flowers divergent, with 14–17 columns of flower pairs. Involucral bracts subulate, with abaxial spine, thickened at base, villous, 1.5–3 mm long. Common bract with one thickened keel extending from apex to base of the exposed part of the bract, silky; margins distally convex; apex rounded. Perianth yellow or cream with a white to beige indumentum of appressed, straight trichomes, to orange with ferruginous indumentum; claw 19–25 mm; limb 2.5–4 mm long. Anthers 0.5–1 mm long. Style apically hooked, 26–35 mm long from ovary to bend, 5–7 mm long from bend to apex; discolourous, green for 12–16 mm above ovary, distally grading from red to maroon to black just prior to anthesis. Infructescence of similar length to conflorescences, 125–135 mm in circumference.” (Stimpson *et al.* 2014).”

“*Banksia vincentia* was first discovered in 2008 near Vincentia, Jervis Bay on the south coast of New South Wales (NSW), and was referred to as *Banksia* sp. Jervis Bay. The species was formally described as *Banksia vincentia* in 2014 (Stimpson *et al.* 2014). *Banksia vincentia* is within the *Banksia spinulosa* complex and differs from other taxa in the complex by having a semi-prostrate growth habit (Stimpson *et al.* 2014). Shrubs of *B. vincentia* have a low stature with stems basally prostrate from the lignotuber for 20–30 cm, then distally ascending (Stimpson *et al.* 2014).”

Distribution

NSW Scientific Committee (2016) state that “*Banksia vincentia* is currently only known from the Shoalhaven local government area of the south coast of NSW where it is restricted to a single location in the Vincentia area, Jervis Bay. It occurs within sclerophyllous shrubland dominated by *Allocasuarina littoralis*, *B. ericifolia*, *Hakea teretifolia* with *Persoonia mollis*, *Lambertia formosa*, *Isopogon anemonifolius*, *H. laevipes*, *Aotus ericoides* and ground cover dominated by species of Restionaceae and Cyperaceae (Stimpson *et al.* 2014). It grows in sandy soil over clay on sandstone. *Banksia ericifolia*, *B. spinulosa* and *B. paludosa* co-occur with *Banksia vincentia*. Parts of the habitat appear to have been disturbed in the past, leading to an open shrub vegetation structure (T. Auld pers. comm. July 2015).”

Ecology

NSW Scientific Committee (2016) state that “The number of mature individuals of *Banksia vincentia* is extremely low with fewer than 20 plants occurring in the only known population.”

A fire (caused by arson) that burnt half the site in November 2014 killed several *B. vincentia* plants. Of six plants that were burnt 4 were killed, while one resprouted from a lignotuber, one was only partly scorched and the unscorched branch survived for a while before dying. 12 and 16 seedlings respectively, recruited below two of the burnt plants, while no seedlings recruited in the vicinity of the other plants.

Threats

NSW Scientific Committee (2016) state that “*Banksia vincentia* is prone to the effects of human activities or stochastic events within a very short time period in an uncertain future because it has a very highly restricted geographic distribution occurring at only one location. There is a road through the middle of the population of *Banksia vincentia*, with a number of plants on or near the road verge. It is thought the construction and presence of the road may have altered the drainage of the site and consequently led to the poor health of some of the plants (Stimpson *et al.* 2014). The presence of the road has also led to a number of additional threats including: road maintenance activities, the spraying of herbicide and dumping of roadside rubbish. The presence of trail bike riding in the area (M. Stimpson pers. comm. July 2015) may also have adverse impacts on the species and its habitat. Recent sampling has found that the pathogen *Phytophthora cinnamomi* is present at the site on both sides of the small road that bisects the remaining plants. Further work on the extent of *P. cinnamomi* at the site and the susceptibility of *B. vincentia* to the pathogen are planned. (T. Auld *in litt* May 2016). An inappropriate fire regime may also pose a threat for the species’ survival. Until the response of *B. vincentia* to fire is better understood, fire should be excluded from the site (T. Auld pers. comm. October 2015).”

Recent sampling (2016) has shown that *Phytophthora cinnamomi* is widespread throughout the one known location. The road through the population has now been closed.

Conservation and Management Actions

There is no recovery plan for this species but there is a draft NSW Saving Our Species site managed program for the species.

Habitat loss, disturbance and modification

- Prevent clearing or disturbance of known and suitable habitat;
- Ensure infrastructure construction and maintenance (e.g., roads and tracks) does not damage plants or remaining habitats.
- Instigate appropriate fire management that is not detrimental to the species. This requires consideration of all components of the fire regime and adherence to any fire frequency thresholds developed in the NSW Rural Fire Service Bush Fire Code Threatened Species Hazard Reduction list for plants.
http://www.rfs.nsw.gov.au/__data/assets/pdf_file/0017/24335/ThreatenedSpeciesHazardReductionList-Part1-Plants.pdf
- Restrict site location information to avoid loss of plants by illegal collection.

Invasive species

- Reduce impact of pathogen *Phytophthora cinnamomi* on known populations.
- Investigate susceptibility of the species (including seedling and juvenile plants) to the pathogen *Phytophthora cinnamomi*.
- Reduce impact of weeds at known site using methods that do not adversely impact on survival or growth of *B. vincentia*.

Ex situ conservation

- Develop a targeted seed collection program for *ex situ* seed banking.
- Examine the potential for a living *ex situ* collection given the very small number of plants remaining in the wild.
- Develop *ex-situ* populations for planned translocations through cutting propagation and seed germination.
- Identify suitable translocation sites free of *Phytophthora cinnamomi*.

Stakeholder Management

- Inform land owners and managers of sites where there are known populations and consult with these groups regarding options for conservation management and protection of the species.

Survey and Monitoring priorities

- Monitor known site to determine trends in population size over time.
- Monitor impact of fire and *Phytophthora cinnamomi* on habitat quality and population numbers.

Information and research priorities

- Undertake further ecological research into the species' life history, ecology and germination requirements relevant to the persistence of the species. Priorities are to investigate the conservation genetics of the species and allied taxa; the time to gain fire resistance in juvenile plants; factors controlling seed production levels; and habitat suitability requirements for translocation.

References

IUCN Standards and Petitions Subcommittee (2016) Guidelines for Using the IUCN Red List Categories and Criteria. Version 12. Prepared by the Standards and Petitions Subcommittee.

<http://www.iucnredlist.org/documents/RedListGuidelines.pdf>

NSW Scientific Committee (2015) Final Determination to list *Banksia vincentia* Stimpson & P.H.Weston as a CRITICALLY ENDANGERED SPECIES. Accessed 15th August 2016.

<http://www.environment.nsw.gov.au/resources/threatenedspecies/determinations/FDBankvincCR.pdf>

Stimpson ML, Bruhl JJ, Weston PH (2014) Could this be Australia's rarest *Banksia*? *Banksia vincentia* (Proteaceae), a new species known from fourteen plants from south-eastern New South Wales, Australia. *Phytotaxa* **163**, 269–286.