

THREATENED SPECIES SCIENTIFIC COMMITTEE

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

The Minister's delegate approved this conservation advice on 01/10/2015

Conservation Advice

Daphnandra johnsonii

Illawarra socketwood

Conservation Status

Daphnandra johnsonii (Illawarra socketwood) is listed as Endangered under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) (EPBC Act). The species is eligible for listing as Endangered as, prior to the commencement of the EPBC Act, it was listed as Endangered under Schedule 1 of the *Endangered Species Protection Act 1992* (Cwlth).

The main factors that are the cause of the species being eligible for listing in the Endangered are the small population size (the species is highly clonal and it is not possible to determine the number of genetic individuals at a site without genetic analysis; some sites are likely to contain a single genetic individual), small distribution, and inferred decline in habitat as a result of land clearing (NSW DEC, 2005).

Description

A medium sized aromatic rainforest tree to 20 m. Leaves are 6-12 cm long, elliptic to ovate in shape, opposite and coarsely toothed, mid-vein raised on upper surface. The inflorescence is a many-flowered panicle borne from the base of the leaves. The petals are 2.5 to 3.5 mm long, pale greenish white and sometimes tinged pink. The fruit are ellipsoid achenes and are uniformly silky (NSW DEC, 2005). There are prominent leaf scars on the stems, branchlet nodes are conspicuously flattened and, where larger branchlets have broken away there are 'ball and socket joints' on the main stem (hence 'socketwood' name) (Floyd, 1978).

Distribution

The Illawarra socketwood is endemic to the Illawarra region of NSW where it has been recorded from 41 sites within the local government areas of Wollongong, Shellharbour, Kiama and Shoalhaven. The main distribution extends 27 km from Avondale to Toolijooa. An outlying site at Scarborough is located approximately 35 km north of this main distribution. The species' western distributional limit follows the upper slopes of the Illawarra escarpment (NSW DEC, 2005).

Threats

Known threats:

- Further loss and fragmentation of habitat.
- Habitat degradation as a result of:
 - weed invasion (e.g., Cape ivy, madeira vine and lantana),
 - altered hydrological conditions (e.g., from residential develop),
 - rubbish dumping,
 - grazing and trampling (e.g., by livestock and deer) (NSW DEC, 2005).

Potential threats:

- Fire, including prescribed burning (NSW DEC, 2005).

Conservation and Management Actions

Prevent habitat loss from clearance

- Protect areas of known occurrence and potential habitat from clearing and further habitat fragmentation (NSW OEH, 2015).
- Continue to protect populations on private land, through enforcement of legislative protection as well as conservation agreements and covenants (NSW DEC, 2005).

Prevent damage to plants and their habitat

- Control threatening weeds where necessary, but avoid non-target herbicide damage to the species and surrounding native vegetation.
- Consider off-site impacts (including changes to groundwater hydrology and weed invasion) in the assessment of nearby developments (NSW OEH, 2015).
- Limit vehicle access to known sites of occurrence to deter rubbish dumping.
- Raise awareness and education of residential neighbours and the local community about the damaging impact of illegal dumping of rubbish and implement compliance.

Prevent damage from livestock grazing and trampling

- Negotiate with landholders for protection of populations on private land to prevent any inadvertent action that may damage sites or plants and to provide for protection work by managers (e.g., fencing, buffers).
- Install fencing/signage to exclude livestock and machinery (NSW OEH, 2015).

Prevent damage from frequent fire and inappropriate bushfire hazard reduction activities

It is likely that the Illawarra socketwood is adversely affected by prescribed burning and mechanical vegetation clearance for bushfire hazard reduction purposes (NSW DEC, 2005).

- Manage sites to exclude fire (NSW OEH, 2015),
- Place the Illawarra socketwood on the Threatened Species Hazard Reduction List (NSW DEC, 2005),
- Ensure fire management maps include locations of known sites.

Undertake Habitat Restoration

- Restore degraded habitat using bush regeneration techniques (NSW OEH, 2015).
- Negotiate with landholders for restoration of habitat on private land, including the installation of fencing/signage to exclude livestock and machinery (NSW OEH, 2015).
- Assess the value of, and if feasible plant new populations of Illawarra socketwood.

Ex-situ conservation

- Evaluate the need for an ex-situ collection of Illawarra socketwood seed as a contingency measure to protect against the loss of genetic material that may result from unexpected local extinctions.
- In undertaking the above, high priority sites for seed collection include sites near the species' distributional limits, sites containing unusual habitat for the species, site that form populations with low numbers of individuals.

Stakeholder Engagement

- Raise awareness of property managers of the species and its threats, to prevent any inadvertent action that may damage sites or plants, and support protection work by managers (e.g., fencing, buffers).
- Promote sympathetic management of grazing by property managers and landholders, for example by limiting livestock access to known and potential locations of the species,
- Negotiate with landholders for restoration of habitat on private land, including the installation of fencing/signage to exclude livestock and machinery.

- Ensure that when local planning documents are developed, they take account of threatened species locations and needs, including the Illawarra socketwood so that awareness of, and levels of protection, are appropriate for the species.
- Raise awareness and education of residential neighbours and the local community about the damaging impact of illegal dumping of rubbish.

Survey and Monitoring Priorities

- Survey the known and potential locations of Illawarra socketwood individuals, and map known sites and potential habitat for new sites (NSW OEH, 2015).
- Determine the status and extent of sites located on freehold land (NSW, DEH, 2005).
- Ensure the information on site locations and potential habitat is accessible to land managers.
- Monitor the progress of recovery, including the effectiveness of management actions and the need to adapt them if necessary.
- Following any natural burning event, undertake post-fire research to elucidate the species' response to burning.

Information and Research Priorities

Low levels of seed production are suspected, with stems at most sites appearing to only produce 'pseudo-fruit' which lack seeds (NSW DEC, 2005).

- Investigate seed production levels across populations and possible limitations (lack of pollinators, self-incompatibility, small population size, pollen sterility);
- Investigate seed predation levels, seed dispersal, dormancy and germination requirements.
- Quantify seedling recruitment rates at undisturbed sites and restored sites.

References cited in the Advice

Floyd, AG (1978) NSW rainforest trees part VII: Families Proteaceae, Santalaceae, Nyctaginaceae, Gyrostemonaceae, Annonaceae, Eupomatiaceae, Monimiaceae. Forestry Commission of NSW. Research Note 35.

NSW DEC (Department of Environment and Conservation) (2005). *Daphnandra* sp. C 'Illawarra' (Illawarra Socketwood) Recovery Plan. New South Wales Department of Environment and Conservation, Hurstville, NSW.

NSW OEH (Office of Environment and Heritage) (2015). Illawarra Socketwood – profile. Downloaded from <http://www.environment.nsw.gov.au/threatenedspeciesapp/profile.aspx?id=10201> on 22 June 2015.