Daphnandra sp. C 'Illawarra'

Schodde

Common name: Illawarra Socketwood

The following information is provided to assist authors of Species Impact Statements, development and activity proponents, and determining and consent authorities, who are required to prepare or review assessments of likely impacts on threatened species pursuant to the provisions of the *Environmental Planning and Assessment Act* 1979. These guidelines should be read in conjunction with the NPWS *Information Circular No. 2: Threatened Species Assessment under the EP&A Act: The '8 Part Test' of Significance* (November 1996).

Survey

Survey for *Daphnandra* sp. C 'Illawarra' may be undertaken at any time of the year. A combination of leaf, branch and habit characteristics should enable the species to be identified in the absence of flowers.

D. sp. C 'Illawarra' can be confused with the morphologically similar *Doryphora sassafras* (sassafras) which occupies similar habitats. The two species can be readily differentiated however by the mid-vein on the upper surface of the leaf, which is raised for *D.* sp. C 'Illawarra'. Also, the inflorescence of *D.* sp. C 'Illawarra' consists of a many-flowered panicle while that of Sassafras is a three flowered cluster on a short stalk (Harden 1990).

Other useful diagnostic features of the *Daphnandra* genus described in Floyd (1978) include:

- Prominent leaf scars;
- Conspicuously flattened branchlet nodes; and
- "Ball and socket" joints (from which the Socketwood common name is derived) on the main stem where larger branchlets have broken away.

Low stem numbers and a limited extent of occurrence are characteristic of *D.* sp. C 'Illawarra' sites. Consequently, the search effort that is required to confirm the presence or absence of the species at a particular site is high.

Where new sites are located, sites details including stem numbers, habitat and location should be recorded and forwarded to the DEC.

Life cycle of the species

The ecology of *D.* sp. C 'Illawarra' is described in the recovery plan and summarised in the species profile. Proposals that are likely to effect the life cycle of the species include those that contribute to the following:

- Loss of individuals

The significance of a particular activity that destroys stems will require examination of the number of individuals to be destroyed in relation to the size of the population and a discussion of how recruitment, gene flow and the overall health of the population will be affected.

It is not possible to determine the number of genetic individuals (genets) of *D.* sp. C 'Illawarra' that are present at a site without genetic investigation. In the absence of a genetic study demonstrating otherwise, all stems of *D.* sp. C 'Illawarra' must be considered to be genetically distinct.

Primarily as a consequence of the uncertainty of survival in the long term, translocation should not be considered to be an appropriate means of compensating for the loss of individuals.

- Loss and fragmentation of habitat

As the breeding system of *D.* sp. C 'Illawarra' is not understood, the effects of loss and fragmentation of its habitat

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are not known. Total destruction of habitat will place a population at risk of extinction.

- Modification of habitat

Urban development in close proximity to *D.* sp. C 'Illawarra' sites is likely to cause modification of habitat through altered hydrological conditions and soil pH, soil nutrification, weed invasion, potential introduction of plant pathogens and altered fire frequency. Subsequent increases in pedestrian and/or vehicular traffic to sites may result in trampling, soil compaction, soil erosion and the rubbish dumping.

Quarrying activities upstream of *D.* sp. C 'Illawarra' sites have the potential to modify its habitat by altering hydrological conditions including the quality and quantity of surface and groundwater flows.

The grazing and slashing of understorey vegetation will modify the habitat of the species.

- Damage to soil seedbank

Disturbances that will destroy or prevent germination of *D.* sp. C 'Illawarra' seed include rubbish dumping, the removal of leaf litter and topsoil, and spraying with residual herbicides that are capable of killing seeds in the soil. Frequent disturbances (from grazing, slashing, herbicide spraying or burning for example) may prevent any soil seed bank of the species from being recharged.

- Burning of habitat

Any proposal that increases the susceptibility of a population to fire is likely to put that population at risk of extinction.

Threatening processes

There are four key threatening processes listed in Schedule 3 of the NSW *Threatened Species Conservation Act* 1995 (TSC Act) that are potentially relevant to *D.* sp. C 'Illawarra'. These are:

- *Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands;*
- *Anthropogenic climate change;*
- *Clearing of native vegetation;* and
- *High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition.*

The NSW Scientific Committee made a preliminary determination to list '*Herbivory and environmental degradation caused by feral deer'* in October 2003. If a final determination is made to list this KTP, it will be relevant to *D.* sp. C 'Illawarra'.

In addition to these key threatening processes, a number of other threats to the survival of *D.* sp. C 'Illawarra' exist. These include weed invasion, rubbish dumping, grazing and trampling by livestock and feral deer, and habitat modification resulting from upslope and upstream developments (DEC 2005).

Viable local population of the species

The viable population size for *D.* sp. C 'Illawarra' is unknown. Small population size is not likely to be a relevant factor when assessing the viability of the species, as most recruitment appears to result from vegetative reproduction. In the absence of a detailed assessment demonstrating otherwise, all populations should be assumed to be viable.

A significant area of habitat

Assessment of habitat significance for *D.* sp. C 'Illawarra' requires consideration of the following:

- Number of genetic individuals present and whether the population is capable of producing viable seed;
- Location in relation to the current distributional limits of the species and proximity to the nearest reserved population;
- Size, condition and connective importance of the habitat; and
- Management potential including the likelihood of ameliorating any existing threatening processes.

The DEC considers all populations as occupying a significant area of habitat until such times as adequate and representative examples are conserved across the species' range.

Isolation/fragmentation

D. sp. C 'Illawarra' habitat has been fragmented by vegetation clearance for agriculture, urban development and quarrying across its range. Fragmentation is greatest on the low-lying areas of the coastal plain and is less significant on the upper slopes of the Illawarra escarpment.

The distance between populations of *D*. sp. C 'Illawarra' that will create genetic isolation is unknown, as its pollen vectors and seed dispersal mechanisms are unknown. The clearing of interconnected or proximate areas of habitat for the species (or its pollen/seed vectors) is clearly undesirable as this may expose populations to an increased risk of genetic isolation and subsequent decline.

Regional distribution of the habitat

The known distribution of *D*. sp. C 'Illawarra' is confined to the Sydney Basin Bioregion as defined in the Interim Biogeographic Regionalisation of Australia (Thackway & Cresswell 1995).

Limit of known distribution

The known distribution of *D*. sp. C 'Illawarra' extends from Scarborough in Wollongong local government area to Toolijooa in Kiama local government area. The species' western distributional limit follows the upper slopes of the Illawarra escarpment.

Adequacy of representation in conservation reserves or other similar protected areas

D. sp. C 'Illawarra' is not considered to be adequately represented in conservation reserves.

Critical habitat

Critical habitat has not been declared for *D*. sp. C 'Illawarra'.

For Further Information contact

Threatened Species Unit, Metropolitan Region, Environment Protection and Regulation Division, Department of Environment and Conservation (NSW), PO Box 1967, Hurstville NSW 2220 Phone 02 9585 6678.www.npws.nsw.gov.au

References

Floyd, A.G. (1978) *NSW Rainforest Trees Part VII: Families Proteaceae, Santalaceae, Nyctaginaceae, Gyrostemonaceae, Annonaceae, Eupomatiaceae, Monimiaceae*. Forestry Commission of NSW. Research Note 35.

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Thackway, R. & Cresswell, I.D. (1995). *An Interim Biogeographic Regionalisation for Australia: A Framework for Setting Priorities in the National Reserves System Cooperative Program*. Version 4.0. Australian Nature Conservation Agency, Canberra.

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