

NSW SCIENTIFIC COMMITTEE

Fontainea oraria Jessup & Guymer (Euphorbiaceae)

Review of Current Information in NSW

January 2008

Current status:

Fontainea oraria (Coastal Fontainea) is currently listed as Endangered under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The NSW Scientific Committee recently determined that *Fontainea oraria* meets criteria for listing as Critically Endangered in NSW under the *Threatened Species Conservation Act 1995* (TSC Act), based on information contained in this report and other information available for the species

Species description:

Fontainea oraria is described by James & Harden (1990, p. 411) as follows: “Shrub or small tree to 5 m high. Leaves with lamina elliptic to obovate, usually 6-9 cm long, 2.5-4 cm wide, glabrous; glands 0.5-4 mm above base of lamina; petiole jointed, 3-25 mm long. Female floral axes 8-10 mm long; male floral axes 5-6 mm long. Fruit ± globose, 18-22 mm long, 22-24 mm diam., red; seed with endocarp wrinkled and grooved.”

Taxonomy:

Fontainea oraria was described by Jessup & Guymer (1985) who considered it to be most closely related to *F. australis*. It has since been widely accepted in all the taxonomic literature as a distinct species.

Distribution and number of populations:

Fontainea oraria is restricted to a small area at Lennox Head on the far North Coast of NSW. All plants occur within a 600 m radius (NSW DEC 2005) one to two kilometres south of the Lennox Head township. The linear distribution of the species is approximately 1.2 km from north to south. Three subpopulations occur on privately owned land at the southern limit of the species while a disjunct subpopulation to the north occurs in a council reserve. Recent genetic research has shown that only one of the subpopulations has contributed to the current class of juveniles and seedlings (Rossetto *et al.* 2000; NSW DEC 2005). The plants in the remaining three subpopulations, including the disjunct northerly subpopulation, have apparently failed to contribute to the current seedlings (NSW DEC 2005). It is also believed, however, that prior to clearing and fragmentation of the area the “existing genotypes were connected once as a more or less continuous population” (NSW DEC 2005, p.5). Given this former connectivity, and the relatively close proximity of all plants, all the remaining plants are treated as belonging to a single, fragmented population for the purposes of this assessment.

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Ecology:

Key habitat requirements

All four subpopulations of *F. oraria* are in remnant stands of littoral rainforest dominated by *Guioa semiglauca* (NSW DEC 2005). Littoral rainforest in the NSW North Coast, Sydney Basin and South East Corner bioregions is listed as an Endangered Ecological Community (EEC) in NSW under the TSC Act. These highly fragmented remnants grow on rich krasnozem soils derived from basalt. The altitude is approximately 50 m above sea level and all subpopulations are within 1 km of the ocean.

Life history

The species is thought to be a slow-growing obligate-seed regenerator with a relatively low rate of fruit/seed production. Little is known about the pollination or breeding systems of *F. oraria*.

Number of mature individuals:

The total population of *F. oraria*, as of 2005, was known to be 55 wild plants (NSW DEC 2005). Of these only 10 plants are mature adults while the remaining 45 are classified as seedlings or juveniles. An additional eight seedlings have been grown from seed and reintroduced into the northern subpopulation. Like several taxa in the Euphorbiaceae, *F. oraria* is primarily a dioecious species with male and female flowers usually occurring on separate plants. To date only a single adult plant is confirmed as female while the status of several of the other adult plants remains unknown (NSW DEC 2005).

Threats:

NSW DEC (2005) lists a number of threatening processes to *F. oraria*. These include further habitat destruction and fragmentation, competition with exotic woody weeds, stormwater management and erosion control, cattle grazing, ocean wind shear, inbreeding, dieback, wildfires, and collection of seed for propagation. NSW NPWS (2002) also list vandalism and illegal collection by rare-plant enthusiasts. These last two threats are particularly relevant given the easily accessible locations of most of the plants. The landholder who manages the three southern subpopulations is aware of the significance of *F. oraria* and has agreed to manage the block in a manner that minimises any further disturbance to the species.

Extreme fluctuations:

There is currently no evidence of extreme fluctuation in the population size of *F. oraria*. The total number of plants has been closely monitored since its discovery in 1982 and there appears to have been few mortalities and relatively modest seedling recruitment.

Population reduction and continuing declines:

NSW DEC (2005) states that "It is likely that the Coastal Fontainea was more widespread within the littoral rainforest on krasnozem soil at Lennox Head. The majority of this vegetation has been

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cleared in the area and presumably plants of the Coastal *Fontainea* were destroyed at the same time. Genetic research indicates that there was gene flow between these locations prior to clearing (Rossetto & McNally 2000). It was likely that existing genotypes were connected once as a more or less continuous population". Rossetto *et al.* (2000, p.217) also state that "The *F. oraria* site was cleared and burned in the 1950s for agricultural purposes and native vegetation was only left as windbreaks on the steep rocky edges". From these reports it can be inferred that a significant reduction in the numbers of *F. oraria* would almost certainly have occurred during the clearing events of the 1950's. This time scale is likely to be appropriate to the life cycle of the species, as individual trees are likely to live for at least several decades, however there is insufficient information available to estimate the magnitude of this reduction. Since the species was discovered in 1982 there is little evidence of further decline except for the death of an adult tree in the northern subpopulation in 1996 (NSW DEC 2005). The threats listed above, however, suggest that the species is at risk of future decline.

Extent of Occurrence (EOO) & Area of Occupancy (AOO):

The distribution of *F. oraria* extends in a narrow strip a few hundred metres wide and approximately 1.2 km from north to south. If one treats all four 'subpopulations' as a single, interbreeding entity (which it formerly was), then the EOO and AOO will be the same. Based on the 2 x 2 km grid size recommended by the IUCN (2008), the AOO for *F. oraria* is estimated to be 4 km².

Severe fragmentation:

It is thought likely that widespread clearing of the littoral rainforest around Lennox Head would have affected individuals of *F. oraria* (NSW DEC 2005; Rossetto *et al.* 2000). Genetic data presented by Rossetto *et al.* (2000) also implies that *F. oraria* has been severely fragmented as there is little evidence that recent geneflow has occurred between subpopulations. It is therefore reasonable to infer that *F. oraria* has undergone severe fragmentation.

References:

IUCN (2008) 'Guidelines for using the IUCN Red List Categories and Criteria. Version 7.0.'

(Standards and Petitions Working Group of the IUCN Species Survival Commission Biodiversity Assessments Sub-committee: Switzerland).

<http://intranet.iucn.org/webfiles/doc/SSC/RedList/RedListGuidelines.pdf>.

James TA, Harden GJ (1990) '*Euphorbiaceae*. In 'Flora of New South Wales, Vol. 1.' (Ed. GJ Harden) pp. 389-430. (University of New South Wales Press: Sydney)

Jessup LW, Guymmer GP (1985) A revision of *Fontainea* Heckel (Euphorbiaceae-Cluytieae). *Austrobaileya* 2, 112-125.

NSW NPWS (2002) 'Threatened Species of the Upper North Coast of New South Wales: Flora.' NSW NPWS, Hurstville.

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NSW DEC (2005) 'Draft Recovery Plan for *Fontainea oraria* (Coastal Fontainea).' NSW DEC, Hurstville.

Rossetto M, McNally J (2000) '*Fontainea oraria* Genetic Research: Final Report.' Unpublished report to the NSW NPWS, Southern Cross University Centre for Plant Conservation Genetics, Lismore.

Rossetto M, McNally J, Henry RJ, Hunter J, Matthes M (2000) Conservation genetics of an endangered rainforest tree (*Fontainea oraria* – Euphorbiaceae) and implications for closely related species. *Conservation Genetics* **1**, 217–229.

Explanatory note

Between 2007 and 2009 the NSW Scientific Committee undertook a systematic review of the conservation status of a selection of plant and animal species listed under the Threatened Species Conservation Act. This species summary report provides a review of the information gathered on this species at the time the Review was undertaken.

The Scientific Committee's report on the Review of Schedules project and final determinations relating to species that were either delisted or had a change in conservation status can be found on the following website: www.environment.nsw.gov.au.

The Committee gratefully acknowledges the past and present Committee members and project officers who ably assisted the Committee in undertaking the Review of Schedules Project. Information on the people involved in the project can be found in the Acknowledgement section of the project report entitled "Review of the Schedules of the Threatened Species Conservation Act 1995. A summary report on the review of selected species" which is available on the abovementioned website.

This species summary report may be cited as:

NSW Scientific Committee (2008) *Fontainea oraria* Review of current information in NSW. January 2008. Unpublished report arising from the Review of the Schedules of the Threatened Species Conservation Act 1995. NSW Scientific Committee, Hurstville.