DELINEATION of IMPORTANT HABITATS of THREATENED PLANT SPECIES in SOUTH-EASTERN NEW SOUTH WALES

RESEARCH REPORT
to the
Australian Heritage Commission

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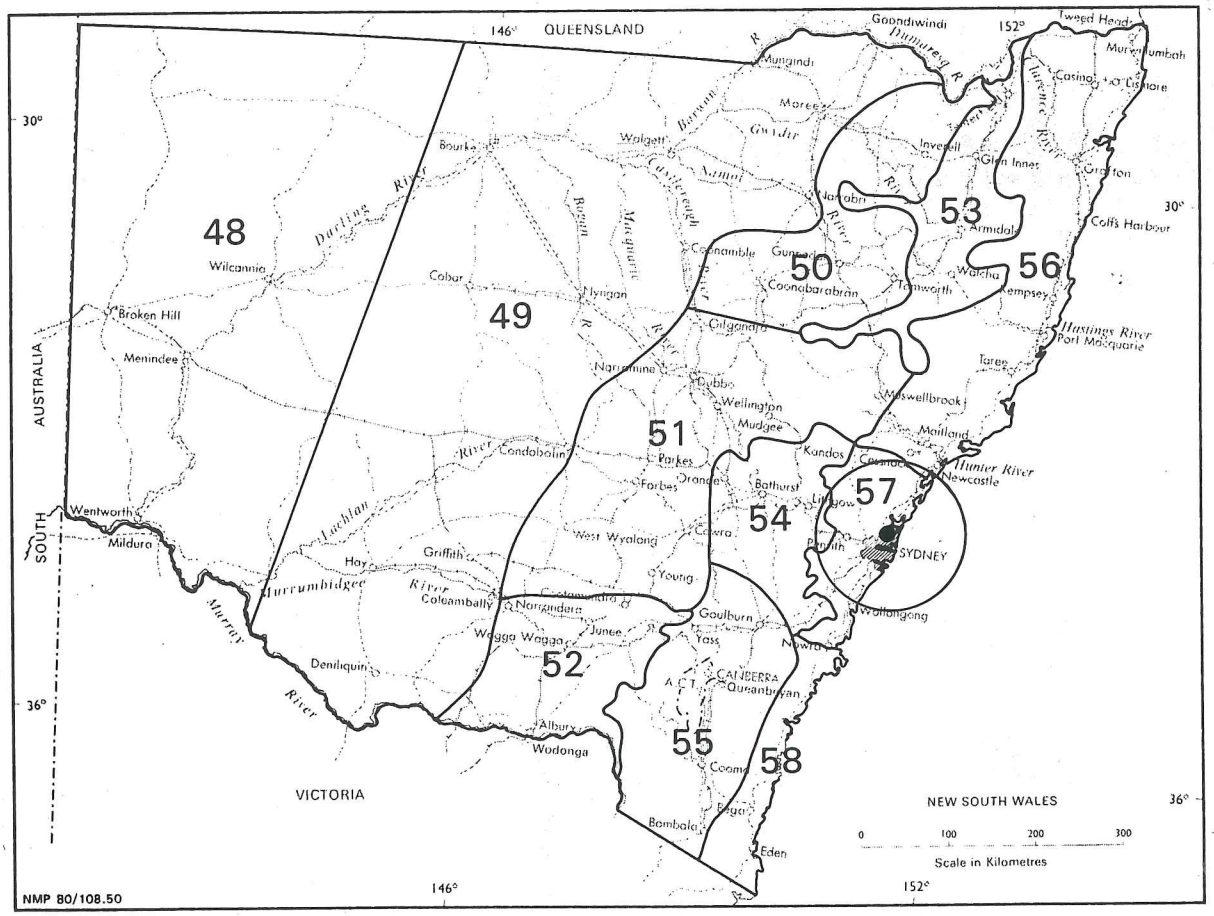
Haloragodendron lucasii Family: Haloragaceae
(Maiden & Betche) Orch.
Conservation Status: Endangered (Code 2ECi/N/57C)

A mature shrub emergent from a dense ground cover of *Gleichenia* fern.

Description

Erect, hairless shrub up to 1.5 m high with 4-winged branches arising in pairs, with each pair at right angles to the next. Large plants often produce vertical shoots from several nodes along old decumbent stems which have become buried in litter. However, no rooting has been observed from such nodes. *Leaves* stalkless, arranged in pairs with the adjacent pairs at right angles to each other. Individual leaves are oblong, 2.5-4.5 cm long and

Distribution of Haloragodendron lucasii



4-5 mm wide, being widest one-third below the pointed tip. The leaf margins have 10-16 teeth or notches mainly in the upper two-thirds. *Flowers* creamy-white, borne singly in the axils of the leaves of the young stems with many flowers grouped together to form a leafy inflorescence. Individual flowers are almost stalkless and have 4 triangular, erect sepals 1 mm long and 1.5 mm wide and 4 creamy-white lanceolate petals 9.5-14 mm long and 2-2.5 mm wide. In bud the petals are twisted, untwisting as the flower opens and twisting again as it withers. *Fruit* is a nut.

Flowering: August to November.

Several plants of *H. lucasii* (light green shrubs) growing at the base of a low sandstone cliff. Numerous branched stems arise from the litter-covered decumbent stems of old plants.

Distribution

Known only from a single population of between 300 and 500 plants in a part of Davidson State Recreation Area between the northern Sydney suburbs of East Saint Ives and Barra Brui. Prior to the discovery of this population by Mr C. Dickman in 1986 the species was Presumed Extinct (Leigh *et al.*, 1984). The Type collection had been made in 1908 from 'a wild gully near Gordon' by H. Lucas. Five other collections had also been made early

this century 4-5 km east of Hornsby in the vicinity of Ku-ring-gai Chase (Orchard, 1975, Leigh *et al.*, 1984). The species had last been collected in 1926 and was Presumed Extinct, with urban development and frequent fires believed to have caused its extinction (Leigh *et al.*, 1984).

In view of the habitat information now available from the St Ives site, it is possible that other small populations of *H. lucasii* may also survive in nearby areas of either Davidson State Recreation Area or in Ku-ring-gai Chase National Park. No attempt was made to locate other populations during the current project. The East St Ives site had been surveyed in detail by Benson (1986) prior to J.D.B.'s visit.

In 1985 a specimen of what may be *H. lucasii* was collected by a bushwalker from Wollongambe Creek near Mount Tootie in the Blue Mountains (J. Benson, pers. comm.). Since then flowering and fruiting material of the Blue Mountains taxon has been collected by R. Lembitt from Yarramun Creek north-north-west of Mt Wilson and it is now the opinion of P. Wilson (pers. comm. and Orchard, 1990) that the Blue Mountains material represents an undescribed species. Orchard (1990), however, is uncertain about the taxonomic status of that population and currently considers it a variant of *H. lucasii*. This difference of taxonomic opinion remains unresolved. The Blue Mountains taxon was listed in Briggs and Leigh (1988) as *H.* sp. 1 (Wollongambe Creek) with conservation code 2KC-. The Blue Mountains sites were not surveyed during the current project.

Habitat Summary

Sandy soils overlying sandstone on the lower south-facing slopes of a gully below a low broken cliff line. The site is relatively moist and supports *Eucalyptus - Angophora* woodland with a moderately dense shrub and heath understorey.

Threats

Habitat invasion by several woody and herbaceous weed species threatens the East St Ives site. As reported by Benson (1986), privet, camphor-laurel, croften weed, wandering jew and lantana have infested the gully slopes immediately west of the *H. lucasii* site and any spread of these eastward will lead to loss of *Haloragodendron* plants and habitat. Increased nutrient levels due to run-off from houses upslope may be promoting the establishment of weeds.

The species response to fire is presently unknown but it has been speculated (Leigh *et al.*, 1984; Benson, 1986) that *H. lucasii* may be fire sensitive and that its present rarity may be due in part to its elimination from some sites by relatively frequent fires over the past several decades. Benson (1986) noted that there is evidence that the East St Ives site has not been burnt for 20 years or more and suggested that such an absence of frequent fire may have allowed the population to persist there.

No information is available on the size and condition of the Blue Mountains populations.

Reservation

The East St Ives population is within Davidson State Recreation Area controlled by the New South Wales National Parks and Wildlife Service, but the vegetation is not specifically protected within such an area. The Wollongambe and Yarramun Creek populations are within the Blue Mountains National Park.

Cultivation

The species does not have horticultural appeal. It can be readily propagated from cuttings and a total of 107 plants from 5 individuals are in cultivation at the Australian National Botanic Gardens, Canberra (M. Richardson, pers. comm.).

Recommendations

The East St Ives site has been nominated for inclusion on the Register of the National Estate. Further surveys, particularly along the Fraser Brook, Caley Brook, Lovers Jump Creek and Cowan Creek valleys 4-5 km east of Hornsby are warranted in an effort to locate additional populations in the north Sydney area. The East St Ives site should be regularly monitored by the New South Wales National Parks and Wildlife Service and protective action, such as weed control, taken if necessary. Research into the species response to fire is necessary before a long-term management plan can be prepared.

Further survey and taxonomic study as suggested by Orchard (1990) should be undertaken on the Blue Mountains *Haloragodendron* taxon in order to clarify its taxonomic status and distribution.

SITE DETAILS

Site 1 - East Saint Ives

Latitude and Longitude: 33° 44' 36", 151° 10' 13".

Altitude: 100-110 m.

Location: Gully between the Sydney suburbs of East Saint Ives and Barra Brui. The population is centred 400 m east from the locked gate south of the junction of Hunter Avenue and Yarrabung Road along an aboveground pipeline and then about 70 m south. The population extends in a narrow belt 25-50 m wide along the base of a low sandstone cliff for 150-200 m. The nominated site extends from the level of the aboveground pipeline down to the creek at the bottom of the gully and is bounded on the west side by a straight line joining the Hornsby 1:25,000 map sheet 9130-4-S grid reference points 30406450-30406465 and is bounded on the east side by a straight line joining the grid reference points 30656443-30656460. (See map page 108).

Looking east along the low broken cliff line below which *H. lucasii* grows. Numerous plants of *H. lucasii* (the erect, light-green shrubs) can be seen in the more open area at the base of the sandstone cliff.

Land Status: Davidson State Recreation Area which is under the control of the New South Wales National Parks and Wildlife Service.

Area: ca. 0.5 ha.

Population: Benson (1986) estimated about 1000 plants but during the present survey M. Richardson and J.D.B. estimated a lower number of between 300 and 500 individuals. This difference in estimate may be due to the fact that the stems of many old plants had fallen over, become buried in litter and had subsequently produced several new vertical shoots scattered along the old stem. Benson may have counted these vertical shrubs as individuals rather than attributing several to the one individual.

Habitat

Soil: Sandy loam with a deep humus layer.

Substrate: Hawkesbury sandstone.

Topography: Gentle to moderate lower slope in gully below small broken cliff line.

Aspect: South to south-east.

Vegetation: *Eucalyptus gummifera - E piperita - Angophora costata* woodland with a moderately dense to sparse understorey including *Banksia ericifolia, B. oblongifolia, Callicoma serratifolia, Elaeocarpus reticulatus, Hakea teretifolia, Gleichenia dicarpa, G. silvestrus, Epacris microphylla, Leucopogon amplexicaulis, Schoenus melanostachys, Pteridium esculentum, Lepyrodia scariosa* and *Blechnum ambiguum*.

A dense patch of *H. lucasii* mixed with *Gleichenia* fern dominating the understorey below the cliff line at the eastern end of the site.

Survey Dates: 11/10/86 by J. Benson and 6/3/87 by J.D.B. and M. Richardson.

Voucher Specimen: Collected by M. Richardson (CBG).

28 GORDON 1km 29 330 10' 31

Hornsby 1:25,000
map sheet 9130-4-S