



Persoonia pauciflora

P.H. Weston

Common name: North Rothbury Persoonia

Persoonia pauciflora was previously known as *Persoonia* sp “North Rothbury”.

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) and with the accompanying “Threatened Species Information” sheet.

Survey

There are no seasonal survey constraints for this plant as the mature plant is easily identifiable during both flowering and non-flowering periods of its lifecycle. Seedlings, however, may not be easily identifiable until they are 0.3-0.5m high. Care should be taken to distinguish *Persoonia pauciflora* from *P. isophylla*, which is a morphologically similar species.

If suitable habitat is or likely to be present (see attached profile for details), a targeted survey for the plant should be conducted. Targeted survey should be conducted over several days (2-3) depending on the floristics and size of the particular site, and should involve both quadrat and transect sampling strategies. Targeted survey for *P. pauciflora* should not be limited to areas within the existing distributional limits. Plant heights and approximate age of individuals should be inferred from previous fire and other disturbance histories. If a new sub-population is being surveyed, the surveyor should make an accurate population count, map the locations of the plants in a site sketch, and complete an Atlas of NSW Wildlife Flora Record Card with the NPWS. A voucher

specimen should also be lodged with National Herbarium of NSW, Sydney. More detailed mapping of the sub-population may be required depending on the nature and scale of the development.

Viable but dormant *P. pauciflora* seeds may be present in the soil seedbank, particularly where there are mature individuals within 1km. If *P. pauciflora* individuals occur within 1km, an investigation into the disturbance history (particularly fire history) of the site should be conducted to determine the likelihood of the existence of a soil seedbank for the species.

Life cycle of the species

The biology of *P. pauciflora* is poorly known, however, there is a range of previous and current research into the *Persoonia* genus from which various information may be inferred.

P. pauciflora is not likely to reproduce vegetatively; therefore the plant's persistence will depend on the production and germination of viable seeds that are stored in the seedbank. *Persoonia* seeds possess a dormancy mechanism that is poorly understood (see Wasley 1997). *P. pauciflora* seeds may germinate as a consequence of disturbance and/or the removal of threats such as grazing and frequent slashing. *Persoonias* have not generally been successfully grown from cuttings or seed, therefore, propagation and replanting is not a suitable ameliorative strategy.

The significance of a particular action which physically destroys individual plants will require (i) an examination of the number of plants to be destroyed in relation to the proportion of the relevant sub-population sizes¹; (ii) whether the removal of those plants potentially compromises the long term viability of the remaining sub-

¹ Details on the size and locations of sub-populations are presented in Patrick (1999).

populations (eg opportunities for external recruitment, fragmentation, cumulative impact); and (iii) a discussion of whether and how the potential seedbank will be affected. That is, whether the seedbank will also be destroyed permanently or whether seeds are likely to germinate following disturbance.

Fire disrupts obligate seeding plant species at the juvenile and adult plant stages of their lifecycle by killing individual plants and thereby halting the process of seed production and seedbank replenishment. Patrick (1999) notes that *P. pauciflora* appears to be absent from areas where there is evidence of recent or severe fires. Several smooth-barked *Persoonias* are obligate seeders, which do not survive fire, and therefore their persistence relies on seed germination from the seedbank. A minimum fire-free interval is required for obligate seeders to mature and produce sufficient viable seed to replace the seedbank. The age to reproductive maturity in *P. pauciflora* and therefore a specific recommendation in relation to an appropriate fire interval is unknown. Current estimates in one obligate seeding *Persoonia* (*P. mollis* ssp *maxima*) are that reproductive maturity is not reached until approximately eight years following germination, however, peak maturity is not likely to be reached until 12-15 years (NSW NPWS 1999). Caution should be exercised in transferring these estimates to a different species occupying a different habitat, however, a fire free interval of at least 10-12 years should be implemented for *Persoonia pauciflora* until there is more detailed information on the lifecycle of the species.

In relation to fire management of *Persoonias*, Wasley (1997) further notes the importance of maintaining for long periods of time unburnt "refuge" areas in *Persoonia* habitat which act as seed sources and facilitate re-invasion of seed by wallabies and birds.

Seedbank disturbance as a result of removal of leaf litter layer of the soil profile, may disrupt the lifecycle of *P. pauciflora* as *Persoonia* seeds are predominantly stored in the upper layers of the soil profile (Wasley 1997). An example of this kind of disturbance may include fuel reduction activities such as turbo-mowing, slashing, and the removal of understorey vegetation. Impacts of this type of disturbance on the *P. pauciflora* seedbank may be minimised by retaining a

proportion of the leaf litter occurring at a site.

Habitat modification affects the lifecycle of *P. pauciflora* by altering the ecological processes within suitable habitat. Habitat modification may include: weed invasion, reduced water quality, urban and agricultural runoff, and increased sedimentation. Since *Persoonia* species are pollinated by a relatively few genera of native bees, an activity which resulted in the loss or inhibited movement of native bees within *P. pauciflora* habitat has the potential to significantly affect the lifecycle of this plant.

Threatening processes

"High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition" is listed in the TSC Act as a key threatening process which may affect *P. pauciflora*. Other identified threats to *P. pauciflora* include: fire, inappropriate hazard reduction burning & associated activities (eg trail construction, turbo-mowing, slashing), habitat degradation (eg weed invasion & reduced water quality), and grazing (see Patrick 1999).

Viable local population

As the size of a viable local population is unknown, it should be assumed that a particular sub-population is viable regardless of its size, until further assessment indicates otherwise.

Significant area of habitat

Given the extremely restricted distribution of this species, all areas of habitat are considered to be significant.

Isolation/fragmentation

Three main sub-populations contain 90% of all *P. pauciflora* individuals (Patrick 1999), while the remaining 10% occurs as isolated individuals. Management of *P. pauciflora* habitat should aim to maintain the continuity of habitat between individuals within sub-populations, and avoid artificially creating new sub-populations.

Persoonia seeds are vertebrate dispersed (eg wallabies, currawongs) thereby allowing for relatively large dispersal distances provided there are opportunities for vertebrate movement (eg vegetation corridors). Fragmentation /isolation of *P. pauciflora* individuals is likely to result in

disruption to the plant's lifecycle by producing fewer opportunities for outbreeding and thereby reducing the likely reproductive success of the species.

Regional distribution of habitat

P. pauciflora habitat occurs in the Sydney Basin Bioregion. Patrick (1999) suggests that the species appears to be restricted to a single geology known as the "Farley Formation". This geology has a restricted occurrence in the North Rothbury - Branxton locality.

Limit of known distribution

P. pauciflora occurs over a restricted north-south range of approximately 4km. All sub-populations and individuals are located within 2.5km of the type locality

and the extent of occurrence is approximately 4.5km². The area of occupancy within this extent is much smaller at just approximately 0.4km². The loss of individuals from the limits of the plant's distribution may result in a range contraction, further isolation and potentially a loss of genetic diversity.

Adequacy of representation in conservation reserves

P. pauciflora has not been recorded from any conservation reserves. The species is therefore inadequately conserved.

Critical habitat

Critical habitat has not been declared for *P. pauciflora*.

For further information contact:

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References

Bernhardt, P. & Weston, P.H. (1996) The pollination ecology of *Persoonia* (Proteaceae) in eastern Australia. *Telopea* 6(4): 775-804.

NSW NPWS (2000) *Persoonia mollis* subspecies *maxima* Recovery Plan. NSW NPWS, Hurstville.

Patrick, G. (1999) Initial Flora Survey to Sample Potential Habitat: Abundance and Distribution of the New Plant Species *Persoonia* "North Rothbury". Report prepared for the NSW NPWS, Hurstville NSW.

Wasley, J. (1997) *Ecology of three obligate seeding Persoonia species in a fire prone habitat*. Undergraduate Honours Thesis prepared at the University of Wollongong.

Weston, P. H. (1999) *Persoonia pauciflora* (Proteaceae), a new species from the Hunter Valley, New South Wales. *Telopea* 8(2): 159-164.

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