

RECOVERY PLAN

for

Tuggeranong Lignum (*Muehlenbeckia tuggeranong*)

A Recovery Plan under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth), based on an Action Plan (Action Plan No. 24) prepared for the species under the *Nature Conservation Act 1980* (ACT).

In accordance with section 21 of the *Nature Conservation Act 1980* (ACT), the **Tuggeranong Lignum (*Muehlenbeckia tuggeranong*)** was declared an **endangered** species on 7 August 1998. Section 23 of the Act requires the Conservator of Flora and Fauna to prepare an Action Plan in response to each declaration (ACT Government 1999).

Muehlenbeckia tuggeranong is a declared **endangered** species under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) (Part 13, Division 1, Subdivision A). The Act requires the preparation of a Recovery Plan for a listed threatened species (Part 13, Division 5, Subdivision A).

Preamble

The *Nature Conservation Act 1980* (ACT) establishes the ACT Flora and Fauna Committee with responsibilities for assessing the conservation status of ACT flora and fauna and the ecological significance of potentially threatening processes. Flora and Fauna Committee assessments are made on nature conservation grounds only and are guided by specified criteria as set out in its publication *Threatened Species and Communities in the ACT*, July 1995.

In making its assessment of *Muehlenbeckia tuggeranong* the Committee concluded that it satisfied the following criteria:

Criteria Satisfied

- 1.2 The species is observed, estimated, inferred or suspected to be at risk of premature extinction in the ACT region in the medium-term future, as demonstrated by:
- 1.2.6 Extremely small population.

Species Description and Ecology

DESCRIPTION

The Tuggeranong Lignum *Muehlenbeckia tuggeranong* Mallinson (Figure 1) is a sprawling or procumbent shrub, eventually becoming a mounded loosely tangled mass to

approximately 1 m high and 1–2 m across. Stems are wiry, brownish, and weakly and irregularly longitudinally striate. Leaves are alternate, persistent, green, not glaucous, simple, petiolate, solitary and well spaced along the stems. Petioles are 0.5 to 3 mm long and leaf blades 5–13 mm long by 2–4 mm wide, showing considerable variation in form. Inflorescences are terminal (sometimes on short lateral branches) or very rarely axillary, simple or 2-branched; range from 12–20 mm from the subtending leaf to the apex; and bear 3–9 flowers in a lax spike. Flowers are unisexual or rarely hermaphrodite, and cream-green in colour. Plants are also mostly unisexual (Makinson and Mallinson 1997).

DISTRIBUTION and ABUNDANCE

M. tuggeranong was described from a single female plant and six male plants discovered in the Murrumbidgee River Corridor (MRC) near Tuggeranong in 1997. In May 1999, an additional male plant was discovered in the MRC a short distance from the other seven plants. Although extensive searches have been undertaken (R. Makinson pers. comm.), this population appears to be the only one in existence.

M. tuggeranong is similar in many respects to *M. axillaris* that occurs at higher altitudes (680 – 1200 m a.s.l.) in the ACT, NSW Southern Highlands, Victoria, Tasmania and New Zealand (Makinson and Mallinson 1997). The nearest known occurrences of *M. axillaris* to the *M. tuggeranong* site are about 25 km east-south-east in the Googong Reservoir area (altitude c. 680 m), and 35 km to the west-north-

west in the upper Cotter River valley (altitude c. 1010 m) (Makinson and Mallinson 1997).

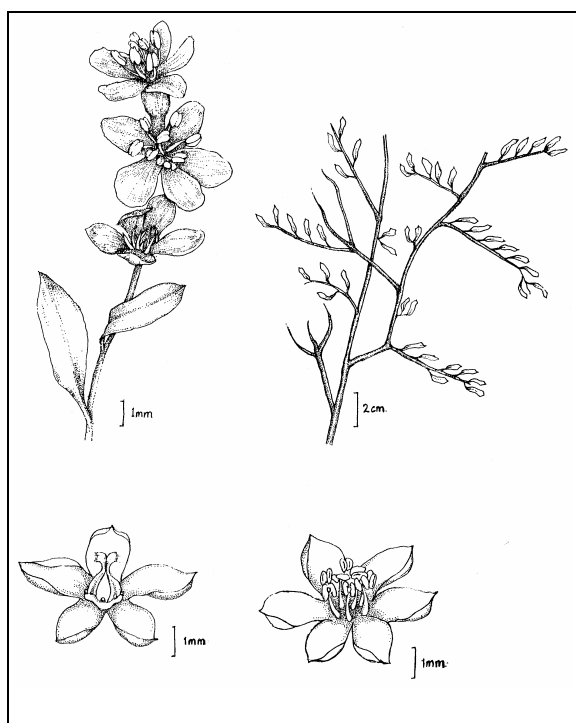


Figure 1: *Muehlenbeckia tuggeranong*. Top left - flowers and leaves; top right - stems and leaves; bottom left - detail of female flower; bottom right - detail of male flower.

HABITAT

The known habitat of the species is restricted to flood terraces, altitude c. 550 m, on the eastern bank of the Murrumbidgee River near Tuggeranong in the ACT, in areas of rocky outcrops with pockets of silty sandy soil (Makinson and Mallinson 1997).

M. tuggeranong is found in a highly disturbed riparian shrubby woodland association, heavily invaded by exotic weeds. The tree layer is largely remnant. The species is found on almost bare rock, or tangled amongst other vegetation (D. Mallinson pers. comm.).

Associated native species include River Oak *Casuarina cunninghamiana*; Burgan *Kunzea ericoides*; Silver Wattle *Acacia dealbata*; *Grevillea juniperina*; Purple Loosestrife *Lythrum salicaria*; Narrow-leaved Cumbungi *Typha domingensis*; a sedge *Isolepis* sp.; Tussock Grass *Poa labillardieri* and Common Reed *Phragmites australis*. There is also a range of introduced species including White Willow *Salix alba*; Sweetbriar *Rosa rubiginosa*; Great Mullein *Verbascum thapsus*; *Oenothera* sp.; Viper's Bugloss *Echium vulgare*; Fennel *Foeniculum vulgare*; Lamb's Tongue *Plantago lanceolata*; Curled Dock *Rumex crispus*; St

John's Wort *Hypericum perforatum*; Umbrella Sedge *Cyperus eragrostis*; Toowoomba Canary Grass *Phalaris aquatica*; African Lovegrass *Eragrostis curvula* and Yorkshire Fog *Holcus lanatus* (D. Mallinson pers. comm.).

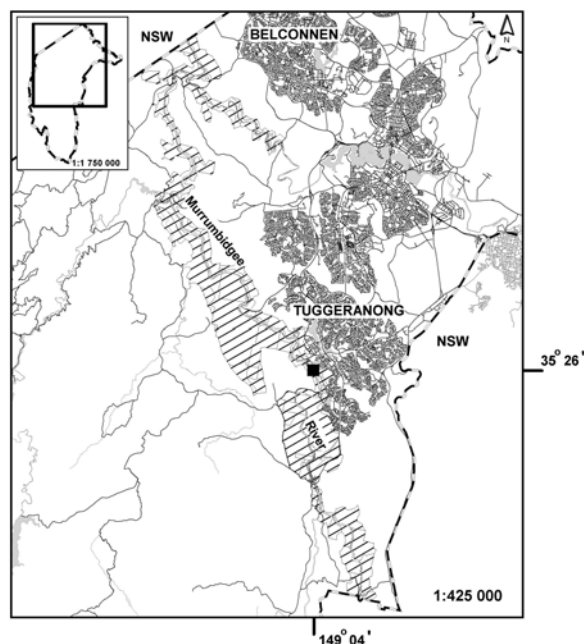


Figure 2: Map showing location (■) of *M. tuggeranong*. Hatched area represents the Murrumbidgee and Molonglo River corridors.

Conservation Status

Muehlenbeckia tuggeranong is recognised as a threatened species in the following jurisdictions:

Commonwealth

Endangered: *Environment Protection and Biodiversity Conservation Act 1999* (Part 13, Division 1, Subdivision A).

Australian Capital Territory

Endangered: Section 21 of the *Nature Conservation Act 1980*, Determination No. 192 of 1998.

Special Protection Status Species: Schedule 6 of the *Nature Conservation Act 1980*, Determination No. 197 of 1998.

Threats

The main threat to survival of this population and therefore the species is likely to be deliberate or unintended actions associated with visitor and/or land management activities

in the local area. It is not clear whether grazing animals such as kangaroos may also pose a threat to survival of remaining plants, or whether such grazing may benefit the species by keeping competing grass tussocks and other plant growth short and open.

Conservation Objectives

The objectives of the Recovery Plan are to:

1. Preserve the existing ACT population of *Muehlenbeckia tuggeranong* as it is the only known population of the species.
2. Conserve and manage the habitat of *Muehlenbeckia tuggeranong* so that natural ecological processes continue to operate.

Issues and options for the genetic conservation of *M. tuggeranong* have been examined by Young (2001). Given the small population and skewed sex ratio, the main genetic conservation issue for the species is the generation of new genetic variation. Young (p. 29) considers that 'this will be best achieved through controlled pollination among all possible combinations of male and female plants. Such a strategy will maximise the effective population size of the next generation. Seed produced can then be used to increase the size of the current population and equilibrate its sex ratios. They can also be used as a basis for an *ex-situ* breeding population as well as being outplanted to make new wild populations so as to spread the risk of extinction through habitat loss'.

The small number of plants known to exist does not support seed production. Only one female plant has been found, and this has not developed mature ovaries (D. Mallinson pers. comm.). Propagation work undertaken at the Australian National Botanic Gardens has shown that the species strikes extremely well from cuttings, with a success rate around 80%. This could form the basis for *ex-situ* conservation of the species. Using this clonal material for reintroductions is of little value to genetic conservation given the limited genetic sample, however, *ex-situ* clone collections can be used to spread the risk of genetic loss due to accidental site disturbance (Young 2001, p. 29).

Conservation and Management Actions

SURVEY/MONITORING/RESEARCH

1. As it is unlikely that the species exists anywhere else in the ACT, surveys beyond

its immediate location are not economically justified. However, awareness of the species by field workers and others is important for potentially locating other sites. Environment ACT (Wildlife Research and Monitoring) will monitor the existing population annually.

2. Environment ACT (Wildlife Research and Monitoring) will advise field workers, interested naturalists and conservation groups of the presence of the species to increase the potential that any other existing populations are identified.
3. Environment ACT (Wildlife Research and Monitoring) will liaise with the NSW National Parks and Wildlife Service to encourage surveys of potential habitat outside the ACT.

SPECIFIC MANAGEMENT ACTIONS

Due to the nature and small size of the site containing the species, management actions will be directed towards maintaining the existing conditions and ensuring that adjacent activities do not adversely affect the site. The management actions being undertaken are unlikely to have any adverse impact on other native species or ecological communities.

1. Research into the species will be encouraged. (Ongoing)
2. Facilities, such as walking tracks, will not be developed near the sites, with the aim of discouraging visitor access to the area. (Ongoing)
3. A 'low profile' will be maintained for the sites where the species is located, with no signs or fencing being erected. (Ongoing)
4. Statements of conservation objectives and intended management actions for the species will be placed in relevant management plans and strategies. (Ongoing)
5. Once plants have fully recovered from the January 2003 bushfires, Environment ACT will undertake controlled pollination among all possible combinations of male and female plants as a first step to increasing population size. Cuttings will also be taken for regeneration purposes. (Year three)

PERFORMANCE CRITERIA

1. The population of *Muehlenbeckia tuggeranong* is monitored annually and the population is maintained. (Annual)
2. Existing habitat conditions are maintained at the site by avoidance of potential threats (especially construction of visitor facilities). (Annual/ongoing)

3. Statements of conservation objectives and intended management actions for the species are placed in relevant management plans and strategies. (Ongoing)
4. Controlled pollination of plants has been undertaken and results evaluated (dependent upon recovery of plants from January 2003 bushfires). (Year 3)

EVALUATION OF PERFORMANCE

Environment ACT has primary responsibility for implementation of this Recovery Plan and will review progress of the Plan after three years, using the above performance criteria. The review will be reported to the ACT Flora and Fauna Committee providing the opportunity to assess progress and establish revised directions and priorities for future conservation action.

Protection

The main group of seven plants is located in the Pine Island Recreation Area of the Murrumbidgee River Corridor (MRC) (Public Land (Special Purpose Reserve) under the Territory Plan). The eighth plant is in the Bullen Range Nature Reserve of the MRC. Management responsibility rests with Environment ACT (ACT Parks and Conservation Service, Murrumbidgee River Corridor District).

Conservation efforts will be focussed on protecting the existing specimens in accordance with the specific management objective in the Murrumbidgee River Corridor Management Plan (p. 21) 'to protect the habitats of rare and threatened plant and animal species' (ACT Government 1998).

The response of the species to fire was not recorded until 2001 when a fire burnt one plant and this recovered from basal shoots. A fire of very high severity burnt the area in January 2003. A subsequent survey showed the recovery of all plants from basal shoots (Carey *et al.* 2003).

Socio-economic Issues

There are no foreseen activities or land uses that are likely to conflict with achievement of the conservation objective. Visitor access to the location will be discouraged. The two known locations of the species are within ACT reserves, and there are no potential adverse

social or economic impacts that may result from the implementation of the plan.

The conservation and management of *M. tuggeranong* is the responsibility of Environment ACT.

Legislative Provisions

The following legislation is relevant to conservation of flora and fauna in the ACT:

Nature Conservation Act 1980 (ACT)

Parts 4 and 5 of the Nature Conservation Act protect native plants and animals. Section 21 of the Act authorises the declaration of vulnerable or endangered species and a threatening process.

Native plants and animals may be declared as *protected* (s. 17) or *having special protection status* (s. 16) in recognition of a particular conservation concern that warrants additional protection.

Land (Planning and Environment) Act 1991 (ACT)

The Land (Planning and Environment) Act is the primary authority for land planning and administration in the ACT. It establishes the Territory Plan and several of its provisions are relevant to the protection of flora and fauna. These include the reservation of Public Land, the establishment of a Heritage Places Register, and the undertaking of environmental assessments and inquiries.

Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is the primary Commonwealth legislation for environment protection. Under the EPBC Act, an action will require approval from the (Commonwealth) Environment Minister if the action has, will have, or is likely to have a significant impact on a matter of national environmental significance. Nationally listed threatened species and ecological communities are matters of national environmental significance.

Consultation and Community Participation

The original Action Plan was released as a draft in March 1999 for public comment (minimum 21 days). Availability of the draft

was advertised in *The Canberra Times*. Following analysis of the comments, the final plan was released in October 1999.

Although the area supporting this species is within a high usage zone of the Murrumbidgee River Corridor, no specific community involvement in its management is planned. Advice on the location of the species will be issued to individuals on a 'need to know' basis only.

Role and Interests of Indigenous People

The interests of local Indigenous communities in this plan have not yet been identified. Implementation of recovery actions under this plan will include consideration of the role and interests of indigenous communities in the region.

Implementation

Environment ACT (Wildlife Research and Monitoring) will have responsibility for coordinating implementation of this Recovery Plan. In the Murrumbidgee River Corridor the conservation and management of the species is also the responsibility of Environment ACT (ACT Parks and Conservation Service).

Duration of Recovery Plan and Estimated Costs

The Recovery plan is for a period of three years. The estimated costs of implementing actions identified in the Plan are shown in Table 1.

Acknowledgments

Mr Bob Makinson, Curator of the Australian National Herbarium, who advised of the discovery of the eighth plant in the Murrumbidgee River Corridor.

Mr David Mallinson, of the Australian National Botanic Gardens, who provided advice to the Flora and Fauna Committee to assist in determining the status of the species.

The illustration of the species (Figure 1) was prepared for Environment ACT by John Pratt. A substantial component of this was adapted from the illustration used in Makinson and Mallinson (1997) that was prepared by Mr Frank Stadler, a postgraduate research student at the School of Biology, Macquarie University, Sydney.

References

- ACT Government 1998 *Murrumbidgee River Corridor. Management Plan*. Department of Urban Services, Canberra.
- ACT Government 1999 *Tuggeranong Lignum (Muehlenbeckia tuggeranong): an endangered species*, Action Plan No. 24. Environment ACT, Canberra.
- Carey, A., Evans, M., Hann, P., Lintermans, M., MacDonald, T., Ormay, P., Sharp, S., Shorthouse, D. and Webb, N. 2003 *Wildfires in the ACT 2003: Report on initial impacts on natural ecosystems*, Technical Report 17. Environment ACT, Canberra.
- Makinson, R.O. & Mallinson, D.J., 1997 *Muehlenbeckia tuggeranong* (Polygonaceae): A new species from the Canberra district, *Telopea* 7(3): 215–219.

Table1 Estimated costs of implementing actions identified in this Recovery Plan

ACTION	EXPENSES	COST	RESPONSIBILITY	TIME FRAME
Survey/monitoring/ research		(Total for three years)		
1. Annual monitoring	Salary (1 day p.a. for 3 yrs)	\$1050	Environment ACT (WRM, ACT P&CS)	Yr 1–3
2. Awareness of the species	Salary (1 day p.a. for 3 yrs)	\$1050	Environment ACT (WRM)	Yr 1–3
3. Liaison with NSW NPWS	Salary (1 day p.a. for 3 yrs)	\$1050	Environment ACT (WRM, ACT P&CS)	Yr 1–3
Specific Management Actions				
1. Encouragement of research	Salary (2 days p.a. for 3 yrs)	\$2100	Environment ACT (WRM)	Yr 1–3
2–3. Avoid development of facilities/maintain 'low profile' of site	Salary (1 day p.a. for 3 yrs)	\$1050	Environment ACT (ACT P&CS)	Yr 1–3
4. Additions to management plans/strategies	Salary (2 day p.a. for 3 yrs)	\$2100	Environment ACT (WRM)	Yr 1–3
5. Undertaking controlled pollination	Salary (2 days)/ Field staff (4 days)/Consultant (6 days)	\$6200	Environment ACT (WRM) and consultant	Yr 3
TOTAL		\$14 600		3 years

Salary based on ACT SOG 'C' (\$350 per day). Field staff cost based on GSO 5 (\$175 per day). Consultant fee based on \$800 per day.

WRM: Wildlife Research and Monitoring

ACT P&CS: ACT Parks and Conservation Service

MRC: Murrumbidgee River Corridor