

## Recovery Plan for the Tumut Grevillea (*Grevillea wilkinsonii*)





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NSW National Parks and Wildlife Service, 43 Bridge Street, (PO Box 1967) Hurstville NSW 2220 Tel: 02 95856444 www.npws.nsw.gov.au

Requests for information or comments regarding the recovery program for the Tumut Grevillea are best directed to the Recovery Team coordinators at either:

Threatened Species Unit, NPWS Southern Directorate, PO Box 2115, **Queanbeyan NSW 2620** Ph: (02) 6298 9700 Reserve Conservation Unit, NPWS Southern Directorate, PO Box 2228, **Jindabyne NSW 2627** Ph: (02) 6450 5555

NPWS South West Slopes Region, PO Box 472, **Tumut NSW 2720** Ph: (02) 6947 7000

#### Or

The Director, Regional Wildlife Programs, Wildlife Australia, Environment Australia, PO Box 636, **Canberra ACT 2601** 

**Cover illustration:** The Tumut Grevillea - flowering branchlet. **Illustrator:** Faye Davies

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## **Recovery Plan for the Tumut Grevillea** (*Grevillea wilkinsonii*)

#### **Executive Summary**

This document constitutes the formal New South Wales State Recovery Plan for the Tumut Grevillea (*Grevillea wilkinsonii*), and as such considers the conservation requirements of the species across its known range. It identifies actions to be undertaken to ensure the long-term viability of the species in nature and the parties who will carry these out.

The Tumut Grevillea is listed as Endangered (Schedule 1, Part 1) on the Commonwealth's *Environment Protection and Biodiversity Conservation Act 1999* and Endangered (Schedule 1, Part 1) on the NSW *Threatened Species Conservation Act 1995*. It is a straggly to dense shrub, usually up to 2 m tall and wide. The species is endemic to NSW, being confined to a 4.5 km stretch of the Goobarragandra River approximately 14-18 km south-east of the township of Tumut. Seven sites of the Tumut Grevillea, supporting 80% of the population, occur on private freehold land while the remaining two sites are on Crown land.

The first actions to recover this species were carried out in 1991. Since then, a large number of other Recovery Actions have been carried out, many with the financial assistance of the Commonwealth under its Endangered Species Program. These previous actions are described in this Plan.

The future Recovery Actions detailed in this Recovery Plan include; (i) periodic evaluation of population size, trends and threats at each site, (ii) consultation with landowners and implementation of agreed cooperative management at each site, (iii) preparation and implementation of Joint Management Agreements for Crown land sites, (iv) determination of the need for reintroduction, enrichment planting and/or cultivation, (v) incorporation of mechanisms to protect the Tumut Grevillea into planning documents such as Local Environmental Plans, (vi) the provision of information to the community, and (vii) active encouragement of community participation in the recovery program.

It is intended that this Recovery Plan will be implemented over a five-year period. Actions will be largely implemented using existing resources of various NSW Government agencies and community- based groups. An additional \$40,600 will be required to implement some currently unfunded actions.

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Brian Gilligan Director-General

**Bob Debus Minister for the Environment** 

#### Acknowledgments

Environment Australia is thanked for a substantial grant to NPWS under the Commonwealth's Endangered Species Program to assist with the initial recovery planning work for the species.

The work of the initial Recovery Team (established in 1992) in preparing the first two editions of the Recovery Plan for the Tumut Grevillea and its efforts to protect the species and inform and involve the local community in its protection has provided an excellent basis from which to progress the recovery of this Grevillea.

The Australian National Botanic Gardens is thanked for its 'in kind' support through the involvement of two staff who assisted in preparing the earlier versions of the Recovery Plan, upon which the current Plan is substantially based. The efforts and enthusiasm of the Society for Growing Australian Plants (Canberra Region) in assisting with establishing new populations and involving the local community in the Recovery Process is gratefully acknowledged.

The successful implementation of Recovery Actions for this species will be largely dependent on the ongoing cooperation of those landholders with populations of the Tumut Grevillea growing on their land. The cooperation of these landowners to date, in particular for allowing field surveys on their properties, has made an invaluable contribution to the recovery process. The support of other neighbouring landowners in allowing populations to be established on their land is also appreciated.

The following current members of the Recovery Team, and where applicable their respective agencies, are thanked for their assistance with the preparation of this third edition of the Recovery Plan and with the implementation of Recovery Actions to date: John Briggs (NSW National Parks & Wildlife Service (NPWS), Southern Directorate), Geoff Butler (Society for Growing Australian Plants, Canberra), Adrian Johnstone (NPWS, Tumut Area, South West Slopes Region), Warwick Hull (Department of Land and Water Conservation, Wagga Wagga), Bob Makinson (Australian National Herbarium, Canberra), Dion Manning (Tumut Shire Council and Tumut Ecology Reserve Trust), James Smith (Gundagai Rural Lands Protection Board), Nicki Taws (Botanical consultant, Canberra), and Genevieve Wright (NPWS, Southern Directorate).

The following previous members of the Recovery Team and others are thanked for their contribution to early drafts of the Recovery Plan and implementation of Recovery Actions; Susie Edwards (NPWS), Paul Hardey (NPWS), Ann Jelinek (Environment Australia), Paul Nugent (Tumut Shire Council), Peta McGee (NPWS), Lyn Meredith (Environment Australia), Pam O'Brien (NPWS), Ian Pulsford (NPWS), Mark Richardson (ex. Australian National Botanic Gardens), Kevin Swann (ex. Tumut Ecology Reserve Trust), Susan Swann (ex. Tumut Ecology Reserve Trust) and Geoff Winnett (NPWS).

#### 1 Introduction

The Tumut Grevillea (*Grevillea wilkinsonii*) occurs only in New South Wales, where it is confined to a 4.5 km stretch of the Goobarragandra River approximately 18 km south-east of the township of Tumut.

The species was discovered in 1982 by a local naturalist, Mr Tom Wilkinson, and was brought to scientific attention in 1991. It was formally named and described in 1993.

The first significant efforts to conserve the Tumut Grevillea commenced in 1991, when members of the Australian National Botanic Gardens (ANBG), the local community and the NSW National Parks and Wildlife Service (NPWS) successfully negotiated with Tumut Shire Council (TSC) to prevent proposed roadworks destroying a portion of one of the larger colonies. In 1992 a formal Recovery Team was established by the NPWS and the ANBG to coordinate conservation actions for the species. This group was one of the first Recovery Teams in Australia to receive financial support from the then newly established Commonwealth Endangered Species Program (ESP). This funding, which extended over several years, greatly assisted with the implementation of several important conservation actions for the species.

This document constitutes the formal National and New South Wales State Recovery Plan for the Tumut Grevillea, and as such considers the conservation requirements of the species across its known range. It identifies the actions to be taken to ensure the long-term viability of the Tumut Grevillea in nature and the parties who will carry these out. The attainment of this Recovery Plan's objectives is subject to budgetary and other constraints affecting the parties involved. It may also be necessary to amend this plan in the event of new information or following recommended changes to the Recovery Program by the Recovery Team. The information in this Recovery Plan is accurate to February 2001.

#### 2 Legislative Context

#### 2.1 Legal Status

The Tumut Grevillea is listed as Endangered (Schedule 1, Part 1) on the Commonwealth's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and Endangered (Schedule 1, Part 1) on the NSW *Threatened Species Conservation Act 1995* (TSC Act). It is also listed as Endangered (Code 2E) in *Rare or Threatened Australian Plants* (Briggs & Leigh, 1996). The species meets the IUCN (1994) Red

List criteria for the category Critically Endangered (CR), based on criterion B {1 & 2 (b,c,d,e)}.

Among the consequences of listing a threatened species on the TSC Act are:

- a Recovery Plan must be prepared for the species;
- consideration must be given to the species when assessing the impacts of developments and activities, with the aim of minimising adverse impacts; and
- other actions that are likely to result in the harming or picking of that species or damage its habitat are licensed.

#### 2.2 Recovery Plan Preparation

The TSC Act establishes a legislative framework to protect and encourage the recovery of threatened species, populations and communities in NSW. Under this legislation the Director-General of National Parks and Wildlife (NPW) has a responsibility to prepare Recovery Plans for all species, populations and ecological communities listed as endangered or vulnerable on the TSC Act schedules. Similarly, the EPBC Act requires the Commonwealth Minister for the Environment

to ensure the preparation of a Recovery Plan for nationally listed species and communities or adopt plans prepared by others including those developed by State agencies. Both Acts include specific requirements for the matters to be addressed by Recovery Plans and the administrative process for preparing Recovery Plans.

This Recovery Plan has been prepared to satisfy both the requirements of the TSC Act and the EPBC Act and therefore will be the only Recovery Plan for the species. It is the intention of the Director-General of NPW to forward this Recovery Plan to the Commonwealth Minister for the Environment for adoption.

#### 2.3 Recovery Plan Implementation

The TSC Act requires that a public authority must take any appropriate measures available to implement actions included in a Recovery Plan for which it has agreed to be responsible. Public authorities and councils identified as responsible for the implementation of Recovery Plan actions are required by the TSC Act to report on measures taken to implement those actions. In addition, the Act specifies that public authorities must not make decisions that are inconsistent with the implementation of measures included in a Recovery Plan. The government agencies relevant to this Plan are the NPWS, TSC, the Department of Land and Water Conservation (DLWC), and the Gundagai Rural Lands Protection Board (GRLPB). Consequently, the actions outlined for each of these agencies must be implemented as described in the Plan.

The EPBC Act specifies that a Commonwealth agency must not take any action that contravenes a Recovery Plan.

#### 2.4 Relationship to Other Legislation

The lands on which the Tumut Grevillea occur include those that are owned and/or managed by private landholders, DLWC and GRLPB. Relevant legislation includes:

• NSW National Parks and Wildlife Act 1974

- NSW Local Government Act 1993
- NSW Rural Fires Act 1997
- NSW Native Vegetation Conservation Act 1997
- NSW Rivers and Foreshores Improvement Act 1948
- NSW Rural Lands Protection Act 1998
- Commonwealth's Environment Protection and Biodiversity Conservation Act 1999

The interaction of these Acts with the TSC Act legislation is varied. The most significant implications are described below and in Section 2.6.

In accordance with the *Rural Land Protection Act 1998* the Travelling Stock Reserve will need to be managed in a manner that is compatible with the conservation of the Tumut Grevillea.

The clearing of native vegetation in NSW is subject to consent from the DLWC in accordance with the NSW Native Vegetation Conservation Act 1997 (NVC Act). The NVC Act is integrated with the Environmental Planning and Assessment Act 1979 (EP&A Act), and requires that threatened species are taken into account when considering clearing applications under Part 4 of the EP&A Act. There are however a series of exemptions and the NVC Act does not apply to certain types of land including land zoned as 'residential', 'township', 'village', 'industrial', or 'business'. All Tumut Grevillea sites are on land zoned Rural 1a on the Tumut Local Environment Plan and thus the NVC Act applies.

Further, most of the distribution of the Tumut Grevillea occurs within an area on either side of the Goobarragandra River, which is subject to specific clearing constraints under the NVC Act. Any proposed clearing within 20 m of a prescribed stream requires the approval of the DLWC (the 2 ha exemption does not apply).

In addition any works (eg. excavation) within 40 metres of a stream must be assessed as a

requirement under the *Rivers and Foreshores Improvement Act 1948*.

*The Rural Fires Act 1997* requires that all parties involved in fire suppression and prevention must have regard to the principles of Ecologically Sustainable Development (ESD) when exercising their functions and when preparing Operational Plans and Bush Fire Risk Management Plans. Consideration of the principles of ESD must include the conservation of biological diversity and ecological integrity. Within this, consideration must be given to the impact on threatened species and their habitats.

#### 2.5 Critical Habitat

The TSC Act makes provision for the identification and declaration of Critical Habitat for species, populations and ecological communities listed as endangered. Once declared, it becomes an offence to damage Critical Habitat (unless the TSC Act specifically exempts the action) and a Species Impact Statement is mandatory for all developments and activities proposed within Critical Habitat.

To date, Critical Habitat has not been declared for this species under the TSC Act. However, see Action 5.3.

Under the EPBC Act, Critical Habitat may be registered for any nationally listed threatened species or ecological community. When adopting a Recovery Plan the Federal Minister for the Environment must consider whether to list habitat identified in the Recovery Plan as being critical to the survival of the species or ecological community. It is an offence under the EPBC Act for a person to knowingly take an action that will significantly damage Critical Habitat (unless the EPBC Act specifically exempts the action). Although this offence only applies to a Commonwealth area, any action that is likely to have a significant impact on a listed species occurring within registered Critical Habitat on other areas is still subject to referral and approval under the EPBC Act.

Proposed actions within registered Critical Habitat on non-Commonwealth areas are likely to receive additional scrutiny by the Commonwealth Minister.

This Recovery Plan identifies those habitat features and the location (sections 3.2 - 3.4) currently known to be critical to the survival of the Tumut Grevillea, as required by the EPBC Act.

#### 2.6 Environmental Assessment

The New South Wales *Environmental Planning and Assessment Act 1979* (EP&A Act) requires that consent and determining authorities, and the Director-General of NPW, as a concurrence authority, consider relevant Recovery Plans when exercising a decision-making function under Parts 4 and 5 of the EP&A Act. Decision-makers must consider known and potential habitat, biological and ecological factors and the regional significance of individual populations.

The following public authorities currently have a decision making function in relation to the Tumut Grevillea:

- TSC;
- DLWC in relation to Crown land, subject to the provisions of the *Crown Lands Act 1989*, and in relation to private land under the requirements of the NVC Act and the *Rivers and Foreshores Improvement Act 1948;*
- GRLPB; and
- the NPWS where a concurrence or consultation role under the EP&A Act is required, or where a Section 91 Licence (under the TSC Act) or a Section 132 Licence (under the NPW Act) is required.

Additional public authorities may have a decision making function if the species is located in other areas in the future.

Any other action not requiring development consent under the EP&A Act, and which is likely to have a significant impact on the Tumut Grevillea, requires a Section 91 licence from the NPWS under the provisions

of the TSC Act. Such a licence can be issued with or without conditions, or can be refused. Routine agricultural activities however, are exempt from the provisions of the TSC Act. This means, for example, that those populations of the Tumut Grevillea on private land can, in some circumstances, legally be subject to grazing by domestic stock under the provisions of the TSC Act.

Any owner or occupier of private land is required to obtain a Section 132 licence from the Director-General of NPW if they wish to grow a TSC Act-listed threatened native plant species for the purposes of sale.

The EPBC Act regulates actions that may result in a significant impact on nationally listed threatened species and ecological communities. It is an offence to undertake any such actions in areas under State or Territory jurisdiction, as well as on Commonwealth-owned areas, without obtaining prior approval from the Commonwealth Environment Minister. As the Tumut Grevillea is listed nationally under the EPBC Act, any person proposing to undertake actions likely to have a significant impact on this species should refer the action to the Commonwealth Minister for the Environment for consideration. The Minister will then decide whether the action requires EPBC Act approval.

Administrative guidelines are available from Environment Australia to assist proponents in determining whether their action is likely to have a significant impact.

The Environment Minister can also delegate the role of assessment and approval to other Commonwealth Ministers under a Ministerial Declaration, and to the States and Territories under bilateral agreements. At the time of writing the bilateral agreement between NSW and the Commonwealth has not been completed, but when in place the agreement will avoid the need for duplication of environmental assessment.

#### **3** Species Information

#### 3.1 Description and Taxonomy

The Tumut Grevillea (Grevillea wilkinsonii R. Makinson) is a straggly to dense shrub, usually up to 2 m tall and wide. The habit varies with site, and very old plants may have main trunks up to 4 m long, but the plant has by this time usually partly collapsed. The leaves are more or less oblong, 5-15 cm long by 1-2 cm wide, with 5-17 small spinose teeth spaced more or less regularly around the edges. The leaves are green (sometimes bronze on young foliage) and almost hairless on the upper surface; the lower surface has a silky covering of grey-silver hairs. The individual flowers are small, with pinkish to purple petals that are hairy outside and hairless inside; and a single projecting pistil 14-15 mm long, that is lilac-pink with a green to yellow tip. The flowers are aggregated in toothbrush-like clusters usually 3-5 cm long. The fruits are ellipsoid dry follicles (capsules) about 8-9 mm long, with a covering of hairs; the hairs are mostly pale but some are reddish purple and form striped or blotchy patterns; the fruit splits longways to release one (rarely two) seeds. The seeds are elliptic, 5-6 mm long and 2.5-3 mm thick; one face is covered with a waxy substance that projects slightly at the apex.

The most distinctive features of the Tumut Grevillea, as compared with its close southeast Australian relatives, are the oblong leaves with regular small teeth, and the small lilac-pink flowers in toothbrush-like heads. It is not easily confused with other species, although the distantly related *G. sericea*, a native of the Hawksberry sandstnes around Sydney, has similar-coloured flowers.

The Tumut Grevillea is a member of a group of 64 species commonly known as the "toothbrush inflorescence" Grevilleas, most members having inflorescences of this form; in addition they all have a hairless inner surface to the petals, and a hairy ovary and fruit (usually with distinct stripes or blotches). Some 26 species of this group

occur in south-eastern Australia. Most members of the group have red, orange or vellow pistils, and these are often more than 2 cm long; together with the presence of a floral tube and a lack of obvious floral scent, these features indicate a primary syndrome of bird pollination. A few members have shorter styles, different (white or pinkish) flower colour, and tend to be scented, all indicating a reversion to insect pollination; these species include G. ramosissima Meisn., G. triternata R. Br., G. raybrownii Olde & Marriott, G. willisii R.V. Smith & McGill., and G. pachlostyla (McGill.) Olde & Marriott. The flower of the Tumut Grevillea is also reduced and appears to be pollinated by insects.

On comparative morphological grounds, the closest relatives of the Tumut Grevillea are likely to be bird-pollinated species, specifically *G. longifolia* and *G. barklyana*; with less close relationships to *G. acanthifolia* and perhaps *G. willisii*.

#### 3.2 Distribution

The Tumut Grevillea is endemic to NSW. and is confined to a 4.5 km stretch of the Goobarragandra River approximately 18 km south-east of the township of Tumut (Figure 1). This site lies in Tumut Shire Local Government Area and the South West Slopes Region of NPWS. It is not known with certainty whether the species formerly had a wider distribution along the Goobarragandra River, or elsewhere, but there are no historic records of the species from other localities. It appears that within the known distribution the original population has suffered some fragmentation, primarily due to land clearing and grazing by domestic stock. Currently nine small sections of riparian habitat along the Goobarragandra River support Tumut Grevillea (see Figure 1).

Note: In this document the term 'colony' refers to discrete patches of Tumut Grevillea plants. Each colony is not necessarily genetically distinct from others in the population and has been given an individual site number in this Plan.

#### 3.3 Land Tenure

Seven sites of Tumut Grevillea supporting 80% of the population occur on private freehold land (five landholders) and the remaining two sites are on Crown land owned by DLWC.



**Figure 1. Distribution of** *Grevillea wilkinsonii.* Note: Site numbers differ from those given in Taws (1994) and the previous two editions of the Tumut Grevillea Recovery Plan.

The private land close to the populations on the riverbank has been extensively cleared and is still often used for stock grazing. The Crown land sites are largely uncleared but have also been accessible to domestic stock in the past. Site nine was dedicated as a Water and Camping Reserve, but has now been re-gazetted as a reserve for Environmental Protection and has recently been fenced by DLWC to exclude domestic stock. The second Crown land site (Site 1) is

on a Travelling Stock Reserve (TSR) managed by the GRLPB. The area of the TSR supporting the natural occurrence of Tumut Grevillea was fenced to exclude travelling stock in 1991.

#### 3.4 Habitat

The Tumut Grevillea occurs in alluvial pockets and crevices on granodiorite and serpentinite rock at Sites 1 and 2, and on coarse grained granitic rock, alluvial soil and sands at Site 8. All other sites are on ultrabasic rock types, which occur along the middle reaches of the river between Lacmalac and Goobarragandra. These rocks are exposed at the surface at various places, but may be the underlying rock strata where not exposed. The altitude of the sites is between 310 m and 340 m a.s.l.

Most plants are growing close to the edge of the river, well within the flood zone, a few extend up to 40 m from the river, well outside the flood zone. At all sites the native vegetation includes remnant riverine shrub communities adjacent to open-forest. The most common tree species are Blakely's Red Gum (*Eucalyptus blakelyi*), Apple Box (*E. bridgesiana*), Yellow Box (*E. melliodora*), and Red Stringybark (*E. macrorhyncha*). Kurrajongs (*Brachychiton populneus*) grow in nearby paddocks.

Taller shrubs of the lower slopes and riverbanks include River Lomatia (Lomatia myricoides), Small-fruited Hakea (Hakea microcarpa), Tea Trees (Leptospermum brevipes and L. obovatum), Burgan (Kunzea ericoides), Blackwood Wattle (Acacia melanoxylon), Wedge-leaved Wattle (A. pravissima), Blackthorn (Bursaria lasiophylla), River Bottlebrush (Callistemon sieberi), Narrow-leaved Pomaderris (Pomaderris angustifolia), Sticky Dodonaea (Dodonaea viscosa subsp. spatulata) and Grass Tree (Xanthorrhoea glauca subsp. angustifolia). Smaller shrubs include the Woolly Grevillea (Grevillea lanigera), Fringe Myrtle (Calytrix tetragona), Common Correa (Correa reflexa), and Common Crowea (Crowea exalata).

#### 3.5 Ecology

The rate of fruit set is high, though there also appears to be a fairly high predation of the ripening fruits and fallen seed. Ants may have a role in seed dispersal, as in one instance numerous seedlings were found emerging from an ant's nest (Butler & Makinson, 1993).

All sites contain individuals of varying ages. Numerous seedlings have been observed at some sites in the wild and seedlings have also been observed to establish under planted individuals. Most healthy adult plants occur in open areas. The species thus seems to prefer full sun to partial shade and is rarely found under the canopy of adjacent dense vegetation. The observed establishment of seedlings under cultivated, genetically isolated plants indicates the species is reproductively self compatible. These field observations are consistent with genetic research findings of Gleeson (1994). It is to be noted that Gleeson also found the species capable of outbreeding.

#### Life Cycle

The Tumut Grevillea flowers from September to November and individual flower clusters can last for some weeks. Flowering is probably consistent every year, though a weak second flush of flowers was noted in autumn of 1992. Most species in the toothbrush-flowered group are adapted to bird pollination, but this species has small flowers and they are believed to be insect pollinated. Native bees and ants have been collected from flowering plants, and a variety of flies, beetles and introduced honey bees have been noted as visitors. The flower has a strong and rather unpleasant perfume, not unlike the smell of mice.

The fruit matures during December and early January and dehisces to release one (rarely two) seed.

Individuals have not been monitored in the field, but in cultivation, growth rates have

been moderate and some individuals have been known to survive for at least 15 years. It is thought that individuals probably live up to 30 years in the field.

#### **Population Structure**

A survey conducted by the Society for Growing Australian Native Plants (SGAP) in 1993 determined that of the total population of 620 plants, 150 were reproductively mature and 470 were seedlings or juveniles (Butler, 1995). The nine colonies are numbered on Figure 1. The population structure and distribution by land tenure as recorded by a survey conducted by Taws (1999) is presented in Table 1. This data set has been obtained following the initial implementation of Recovery Action 1 of this Plan. Populations are characterised by the presence of a wide range of size classes, indicating that recruitment is reasonably frequent.

#### Disturbance Regimes

Much of the Tumut Grevillea habitat is subject to periodic natural flooding by the Goobarragandra River, however this does not appear to impede recruitment and most adult plants appear to be able to withstand normal flood events. Severe flood events have the potential to have an adverse impact, as several mature plants were destroyed at two sites during a flood event in winter 1993.

The response of Tumut Grevillea to burning is not fully known. Observations on an exsitu

population at the Tumut Ecological Reserve Trust (TERT) Reserve after a grass fire in early December 1998 noted adult death and seedling recruitment after a low intensity wildfire. Closely related Grevillea species are known to be fire sensitive and function as obligate seeders. Such species can be threatened by burning at too frequent intervals. In addition, field observations of the Tumut Grevillea have found only limited resprouting from stem bases, and no signs of resprouting from lignotubers or root suckers after physical damage, which suggests this species is likely to be fire sensitive. Numerous Tumut Grevillea seedlings have established in the absence of fire, both in natural populations and near cultivated plants, indicating that recruitment is not fire dependent.

The species is probably well buffered from the effects of drought as most of the population occurs in a riparian zone where the root systems of the Grevilleas are likely to readily access the water table.

#### 3.6 **Ability of Species to Recover**

Numerous seedlings have been observed at some sites in the wild. Of the total population of 620 plants recorded in survey conducted by SGAP in 1993, 150 were reproductively mature and 470 were seedlings and juveniles. Healthy regeneration has been observed in the DLWC reserve since it was fenced to exclude cattle in May 1996. This establishment of seedlings in the field indicates the species has

Site Number		Plant size class	Total population	Land Tenure			
	0.1 - 0.2 m	0.2 - 1 m	> 1m	-			
1	4	2	33	39	Crown		
2	0	4	9	13	Private		
3	11	44	65	120	Private		
4	41	48	33	122	Private Private		
5	4	32	24	60			
6	9	7	10	26	Private		
7	0	0	7	7	Private Private		
8	7	19	93	119			
9	45	69	24	138	Crown		
Total (%)	121 (19%)	225 (35%)	297 (46%)	644			
Source: Taws (19	(000)						

#### Table 1: Population structure and distribution of the Tumut Grevillea by land tenure.

Source: Taws (1999).

the capacity to regenerate providing various threats, particularly stock grazing, are controlled.

The success of several plantings of the Tumut Grevillea in the field indicates that populations can be readily established at new sites. Whether such populations can become naturalised is yet to be established.

#### 4 Management Issues

#### 4.1 Population Size and Distribution

Due to the extremely limited distribution of the species and its small population size, the Recovery Team considers all remaining sites to be of high conservation significance.

#### 4.2 Domestic Stock Grazing

Seven of the natural populations of Tumut Grevillea occur on private land and most are currently subject to varying degrees of browsing damage and associated habitat degradation by domestic stock, particularly cattle. This browsing is impacting on all size classes of the plants, including seedlings and juveniles and is almost certainly inhibiting regeneration. The vigorous growth of juvenile plants in the DLWC Reserve following fencing suggests browsing by cattle was having a substantial impact on regeneration of the species at this site. A future monitoring program will assist in determining the extent of the impact of this threat on the species.

#### 4.3 Weed Infestation

There are two very vigorous invasive introduced weed species, Blackberry (Rubus fruticosus complex) and Willow (Salix sp.), at several sites. Blackberry posses the most immediate threat and large patches have colonised the river bank within parts of the habitat of Tumut Grevillea. Uncontrolled Blackberries will smother and kill adult Tumut Grevillea plants and prevent seedling establishment. Willows, if uncontrolled, can be expected to increase in density along the river banks and create high levels of shading believed to be unfavourable for the survival of Tumut Grevillea. Other weed species that are present at some sites and may need future management include Paspalum (Paspalum dilatatum), Phalaris (Phalaris aquatica), Briar Rose (Rosa rubiginosa), Purple Top (Verbena sp.) and wildling fruit trees (Malus and Prunus).

#### 4.4 Competition from Other Native Species

At some sites dense stands of Slender Tea Tree (*Leptospermum brevipes*) and Bluntleaved Tea Tree (*L. obovatum*) pose a threat through direct competition and shading. The invasion of *Leptospermum* into habitat should be monitored to determine if there is a need to control the spread of these species.

#### 4.5 Clearing

Much of the land surrounding the Goobarragandra River has been extensively cleared for grazing and in some areas this clearing has extended virtually to the edge of the river. Clearing close to the river's edge in the past has almost certainly destroyed Tumut Grevillea plants and habitat. Clearing controls defined in the NVC Act should ensure that no further Tumut Grevillea or its habitat is cleared. Monitoring should be undertaken to ensure that no unapproved clearing takes place.

#### 4.6 Fire

Until the fire response of the Tumut Grevillea is known a precautionary approach should be taken and fire excluded from known sites.

If any of the known sites are accidentally burnt and it is demonstrated that the Tumut Grevillea is fire sensitive, then particular fire exclusion strategies may need to be developed. The need for such strategies will depend on the extent of successful seedling regeneration following a fire event, and an assessment of potential frequency of fire events. At this stage, because of the low numbers of mature plants, it is not considered appropriate to experimentally burn natural occurrences of the Tumut Grevillea.

#### 4.7 Flooding

Because of clearing of some of the upper catchment of the Goobarragandra River, flooding intensities may have increased since European settlement. Six large adult and 10 medium sized plants of Tumut Grevillea were observed to have been destroyed during a flood event in winter 1993. Flooding may also now have a more significant impact on the overall population because a larger percentage of the surviving plants are within the flood zone. However, the positive ecological role that flooding may have by creating new sites for recruitment of Tumut Grevillea through the removal of competing vegetation remains unassessed.

#### 5 Previous Recovery Actions

(Listed in chronological order)

Many of the following Recovery Actions were implemented with the assistance of a \$27,500 grant made in 1993 to the NPWS from the former Australian Nature Conservation Agency (now Environment Australia) under the Commonwealth's Endangered Species Program. Approximately \$8,000 of that grant remains to assist with implementing some of the required additional actions identified in this document.

- The section of the TSR supporting Tumut Grevillea at Site 1 was fenced in 1991.
- A Recovery Team was established in 1992. Initial membership included representatives from NPWS, Environment Australia, ANBG, TERT, SGAP, GRLPB and TSC. More recent members of the Team include DLWC and the CSIRO Centre for Plant Biodiversity Research.
- A draft Recovery Plan (Butler & Makinson, 1993) was prepared and published on behalf of the Recovery Team and subsequently updated by Butler in 1995.
- Weeding, primarily of Blackberry, was completed at Site 1 during 1992-94. Volunteers from SGAP and ANBG undertook this work.
- In 1992-1993 three media statements on the Tumut Grevillea were released. This received attention from various newspapers and radio stations.
- In November 1993 cuttings were taken from Sites 1 and 4 and plants propagated for trial plantings at the TSR (Site 1) and for planting on local properties.
- In 1993 volunteers from SGAP and ANBG staff established the Tumut Grevillea at two new sites on the TSR. One is adjacent to Site 1, the second is at the picnic area where the Hume and Hovell track crosses the Goobarragandra River. Propagated material for these two sites was sourced from Site 1.
- A public meeting of about 30 local residents and members of the Recovery Team was held in November 1993 at

Lacmalac. At this meeting 13 interested residents volunteered to have plantings of the Tumut Grevillea of their land.

- In November 1993 a film segment on the Tumut Grevillea was screened on the ABC television program 'Cross Country'.
- In 1994 a detailed field survey was conducted for several kilometres along the Goobarragandra River, both up and downstream from the first known population of the Tumut Grevillea. A report documenting the results of this survey was produced by Taws (1994). This work included on-site liaison with all resident landholders.
- An honours thesis on the genetic variation and breeding system of the Tumut Grevillea was undertaken and completed in June in 1994 by Tom Gleeson, a student at the Australian National University.
- Over the last eight years the occurrence

Grevillea has been widely publicised in the local community. Interpretive signs have been placed at the Tumut Library and at the crossing of the Hume and Hovell Track with the Goobarragandra River where plantings have been established.

- A shed and shadehouse was established at the TERT Reserve specifically for the propagation of Tumut Grevillea plants.
- In 1995, the species received formal legal protection following its inclusion on the TSC Act as Endangered (Schedule 1, Part 1).
- In March 1995 plants were propagated by SGAP and ANBG from cuttings taken from naturally occurring plants at Sites 1 and 4. At that time each source plant was numbered and tagged to provide a future reference for the origin of the propagated plants. As of October, 2000 the original tags were still marking the source plants. The propagated plants were distributed to 12 landholders in the Goobarragandra Valley, including the owners of four private properties fronting the

Location	Clone numbers of plantings
<u> </u>	56, 6, 4, 13, 511, 515, 512, 513, 17, 16, 9, 518.
2	8, 56, 502, 6, 13, 17, 516, 515, 9, 514, 511, 513.
3	514, 56, 502, 512, 515, 6, 501, 53, 520, 519, 511, 13
4	14, 56, 6, 3, 8, 17, 5, 15, 519, 518, 511, 512.
5	14, 56, 514, 6, 4, 519, 8, 516, 43, 17, 13, 5.
6	56, 13, 6, 17, 9, 516, 519, 512, 502, 4, 513, 518.
7	512, 56, 6, 501, 54, 518, 510, 509, 16, 17, 9, 516.
8	6, 519, 16, 15, 55, 18, 512, 516, 515, 4, 518, 56.
9	14, 55, 56, 6, 4, 512, 516, 519, 501, 13, 17, 9.
10	515, 56, 10, 6, 4, 511, 14, 9, 519, 17, 516, 518.
11	4, 6, 17, 56, 514, 501, 13, 519, 516, 2, 518, 9.
12	1, 4, 5, 6, 9, 13

**Table 2:** Summary of plantings of Tumut Grevillea in 1995 on 12Goobarragandra Valley private properties.

and threatened status of the Tumut

Goobarragandra River. These were planted by

volunteers from SGAP, staff from the ANBG and local landholders. Three of these plantings (Locations 4, 11 & 12) are close to the Goobarragandra River and within the known natural range of the Tumut Grevillea. Table 2 summarises these plantings and lists the clone number of each individual planted out. Twelve plants, all different clones, were planted at locations 1-11 and six plants, each of different clones, were planted at location 12. The names of the property owners for each location and other details are held by NPWS and SGAP. The fate of these plantings has not been fully assessed, but several are known to have flourished, e.g. on the TSR near Site 1, and seedlings have established under mature plants.

- The Crown reserve managed by DLWC (Site 9) was fenced in May 1996.
- An information brochure on the Tumut Grevillea was produced in 1996.
- DLWC staff spent three person days spraying blackberry infestations at Site 9 in February 1997.
- The Crown Reserve managed by DLWC was regazetted as a reserve for Environmental Protection in September 1997.
- propagation Commercial of the species commenced in 1997 and it is now available from a number of nurseries, including those that specialise in native plant production. Plants are also available from the SGAP through their State bodies and the Grevillea Study Group. As far as is known, the source of all material being sold was from Site 1 (the first site discovered). There are no legal mechanisms to effectively control the planting of commercially available Tumut Grevillea by individuals on private land, however, given the self-pollination characteristics of this species, the risk of genetic contamination of the wild populations of the Tumut Grevillea, and for that matter of other Grevillea species, from such plantings is low.
- The Tumut Region Visitor Centre was opened on December 13, 1997. At that event the community information board displayed information about the Tumut Grevillea and this information remained on display for a month.
- The Tumut Region Visitor Centre conducted a tour as part of the Festival of the Falling Leaf on April 24, 1998. The tour included visiting the Hume and Hovell Picnic area to look at the Tumut Grevillea plantings. Each of the participants received a copy of the information pamphlet on the Tumut Grevillea.

- A detailed population count and mapping of all the populations was undertaken in late October and early November 1998, and the results of this survey are presented in Taws (1999). At the same time an assessment of the current threats at each site was made and photo points were established. These tasks were the initial implementation of Action 1 of this Plan and will be repeated in 2003.
- Between autumn 1999 and winter 2000 suitable habitat adjacent to Site 2 (private property) was cleared of extensive blackberry infestations and was replanted with Tumut Grevillea. This action was carried out in a manner consistent with the ANPC translocation guidelines. The source of the planting material was from the natural population at Site 1 located on the opposite riverbank. Fifty plants, representing nine clones were used and each re-introduced plant has been labeled according to its source parent plant. The plantings have also been mapped.

#### 6 Proposed Recovery Objectives, Actions and Performance Criteria for 1999-2004

The overall objective of this Recovery Plan is to ensure that all, or most natural populations of the Tumut Grevillea are stable or increasing in size.

#### **Specific Objective 1: Periodic evaluation of population size, trends and threats**

It is necessary to periodically ascertain the size of known colonies, monitor population trends and identify and monitor major current threats for each site.

## Action 1.1 Re-survey all known colonies every five years.

Habitat condition, the number of individuals and size-class of Tumut Grevillea plants at each site, and the current threats to each colony will be recorded.

#### Performance Criterion 1.1

In 2003 all known Tumut Grevillea colonies are re-surveyed. This is to include the documentation of the number of individuals and size class at each site, and the identification of the current major threats.

#### Action 1.2 Establish a monitoring program.

Photo-points for annual monitoring were set up in 1998 and initial photographs were taken (this was undertaken concurrently with the 1998 re-survey and mapping task).

Photo-points are a useful indicator of vegetation change and condition over time. The native *Leptospermum* species growing in some of the Tumut Grevillea sites has the potential to suppress adult Tumut Grevillea plants and prevent seedling establishment. Photo-points would give an indication of the rate of colonisation, major changes in vegetation density and show major weed infestations at *Grevillea* sites.

Performance Criterion 1.2

Within three years from the establishment of the photo points an ongoing monitoring program is established.

## Specific Objective 2: Active management of colonies on private land

In order to address the various threats identified in this plan it is necessary to continue consultation with private landholders and implement agreed cooperative management at each site.

### Action 2.1 Undertake consultation with private landholders.

The NPWS and the Recovery Team will consult with each private landholder with Tumut Grevillea on their property to agree on site specific management actions and timescales for implementation and prepare estimate of costs for agreed actions. In the longer term formal protection of the sites on private land through the negotiation of Voluntary Conservation Agreements or other mechanisms will be sought. Particular effort will be made to achieve protection of Tumut Grevillea sites from browsing by domestic stock.

#### Performance Criterion 2.1

Within two years, each landholder with Tumut Grevillea on their properties is consulted, and agreement is reached on cooperative management actions, time for implementation and costs to protect and manage each site.

## Action 2.2 Undertake agreed management actions on private land.

Once agreement has been reached with private landholders it may be necessary to undertake weed control and fence off areas to protect colonies from cattle grazing. This action will be guided by the outcomes of Action 1.1.

Performance Criterion 2.2

Within three years, weed control and fencing will be undertaken on identified lands.

#### Specific Objective 3: Secure long term protection and management of Crown land sites

Currently there are no formal agreements for the management of Crown lands that support Tumut Grevillea. The following actions aim to formalise existing and future management approaches for these lands.

Action 3.1 Prepare and implement Joint Management Agreements

NPWS to liaise with both DLWC and the GRLPB to prepare Joint Management Agreements (JMAs) for the sites owned/managed by those agencies and implement agreed management actions at each site, including weed control and fencing.

#### Performance Criterion 3.1

Within three years, JMAs between the NPWS and both DLWC and the GRLPB are finalised.

Action 3.2 Implementation of agreed management actions, including weed control and fencing.

The agreed actions to be implemented will be negotiated in the process of developing JMAs between NPWS and both DLWC and the GRLPB. Weed control and appropriate fencing are likely to be high priority management actions.

#### Performance Criterion 3.2

Within three years, agreed high priority management actions are completed.

## Specific Objective 4: Determine the need for re-introduction, enrichment planting and/or cultivation

The need for further enrichment planting/reintroduction is uncertain and will be determined by considering the following factors: how well natural recruitment occurs at existing sites; whether currently unoccupied suitable habitat within the known range of the species is colonised naturally within the next few years; and whether current population sizes are maintained or increase with appropriate management.

Action 4.1 Identification of sites for reintroduction and determination of need for enrichment planting.

Potential sites in the Goobarragandra Valley where re-introduction could be undertaken (if necessary) will be identified. This task could be undertaken concurrently with the resurvey task. The need for enrichment planting of any existing colonies will be determined.

Factors which are important to consider in determining whether sites could be suitable for re-introduction include: whether the site is within the known range of the species; whether the habitat free of major weeds or can it be satisfactory weeded; whether the landowner is agreeable to allow the species to be established there and is likely to be afforded long term protection; whether the site can be satisfactorily protected from stock browsing.

Most of the current plantings of Tumut Grevillea in the Goobarragandra Valley (see section 5) were undertaken in 1995. The locations of these plantings and the parentage of each plant have been recorded and planted material was sourced from Sites 1 and 4. Any future re-introductions into the wild undertaken as part of the Recovery Program will follow the ANPC translocation guidelines. Recent enrichment plantings at Site 1 were made into suitable habitat cleared of dense and extensive blackberry infestations and were consistent with the translocation guidelines.

Performance Criterion 4.1

Within five years other potential sites in the Goobarragandra Valley where reintroduction or enrichment planting could be undertaken, if necessary, are identified.

#### Action 4.2 Undertake cultivation.

If required, cultivation of plants, selected such that the genetic range of the total population is represented, will be undertaken.

#### Performance Criterion 4.2

Within three years establish plants in cultivation which are representative of the genetic range of the population.

# Specific Objective 5: Incorporate the protection of habitat for Tumut Grevillea into planning documents

Planning documents provide a long term and strategic mechanism to protect the habitat of the species over its entire range.

#### Action 5.1 Use planning instruments to assist in the protection of the Tumut Grevillea

Negotiate with Tumut Shire Council to have the habitat of the Tumut Grevillea identified by an Affectation layer on the Tumut Shire Local Environment Plan (LEP). Seek the support of the Riverina Highlands Regional Vegetation Committee for the habitat of the Tumut Grevillea to be specifically protected in the Regional Vegetation Management Plan being prepared under the NVC Act.

#### Performance Criterion 5.1

Within three years the habitat of the Tumut Grevillea is identified by an Affectation layer on the Tumut Shire LEP and such habitat is specifically protected in any Regional Vegetation Management Plan prepared under the NVC Act.

Action 5.2 Include appropriate fire protection requirements in the Tumut Shire Bush Fire Risk Management Plan and other relevant planning and vegetation management documents. Given the preliminary indications that the Tumut Grevillea is likely to be fire sensitive, it is recommended that efforts be made to exclude fire from Tumut Grevillea populations. This advice should be recorded in appropriate planning and vegetation management documents. It is also appropriate that the sites of the Tumut Grevillea and their conservation importance are recorded in Bush Fire Risk Management Plans so that damage to these sites can be avoided during any fire suppression operations.

#### Performance Criterion 5.2

Within three years any necessary fire protection requirements are included in the Tumut Shire Bush Fire Risk Management Plan and other relevant planning and vegetation management documents.

#### Action 5.3: Identification and nomination of Critical Habitat

The NPWS will consider the benefits of nominating Critical Habitat and, if appropriate, make a recommendation to the Minister regarding what area should be listed.

#### Performance Criterion 5.3

Within five years NPWS will have made a decision as to whether to recommend to the NSW Minister for the Environment the listing of areas of Critical Habitat for the Tumut Grevillea.

## Specific Objective 6: Community information and participation

The objective of the following set of actions is to increase the understanding of the community (particularly the local community) of the conservation of Tumut Grevillea and encourage their participation in the recovery program.

#### The Tumut Grevillea

Action 6.1 Prepare and install interpretative signs and other information where appropriate.

Interpretive signs were prepared and installed in the early 1990s at two locations where the Tumut Grevillea had been planted (the Hume & Hovell track crossing of the Goobarragandra River and at the Tumut Library). These signs have deteriorated and the text needs updating. It is proposed to replace these two existing signs and to install a new sign at the site of the 1993 plantings on the TSR near Site 1.

#### Performance Criterion 6.1

Within two years interpretive signs are prepared and installed at three selected locations.

Action 6.2 Distribute an information brochure (already prepared) on the Tumut Grevillea to all interested persons (particularly landholders with known or likely habitat).

An information brochure was prepared in 1996. This brochure needs updating to reflect the progress with the Recovery Program since then and to include advice on the management requirements of the species. The brochure will target landholders with known and potential habitat.

#### Performance Criterion 6.2

Within one year an information brochure is distributed to all landholders with known or likely habitat.

Action 6.3 Obtain media coverage for major conservation actions achieved, particularly for those where private landowners have assisted.

Publicity of conservation actions undertaken with the cooperation of landholders is desirable to publicly acknowledge the contribution landholders are making to the Recovery of the Tumut Grevillea.

Performance Criterion 6.3

Timely media coverage for major conservation actions achieved, particularly for those where private landowners have assisted will be obtained on an ongoing basis.

Action 6.4 Investigate the possibilities of local groups, such as Landcare, assisting with the management (weeding for example) of Tumut Grevillea habitat.

Regular weed control is an important management action for this species. The involvement of local community groups in this activity, particularly on public land sites, could reduce the cost to government in undertaking this action and might assist in achieving careful and often tedious weeding to be undertaken on a regular basis.

#### Performance Criterion 6.4

Within two years the possibilities of local groups, such as Landcare, assisting with the management (weeding, for example) of Tumut Grevillea habitat is investigated.

Action 6.5 Coordinate education and information programs for community groups such as schools and other utility providing agencies.

The Tumut Grevillea and the Recovery Program for it provide a useful case study for interested local schools and other local community groups. The Recovery Team will assist local schools or community groups who are interested in obtaining information on the species or the Recovery Program. It is also important that service-providers such as Transgrid and Telstra are aware of the occurrences of the Tumut Grevillea which are close to utility easements so as to avoid inadvertent damage to the species during any works these providers may be undertaking.

#### Performance Criterion 6.5

Within one year the feasibility of an extension and education program for the community is investigated and utilityproviding agencies are notified about the distribution of the Tumut Grevillea.

#### 7 Implementation

Table 3 outlines the implementation of recovery actions specified in this Plan for the period of five years from publication.

#### 8 Social and Economic Consequences

The Tumut Grevillea is mostly confined to 5-10 m wide belts of rocky and often steep terrain along the Goobarragandra River. This land supports vegetation of little fodder value for domestic stock and has little other agricultural value. Therefore, the protection of these areas for Tumut Grevillea is unlikely to have a significant economic impact on the landholders. It is recognised that landholders may require river access for watering stock and other purposes and consideration of such needs will be incorporated into negotiated management/fencing actions of each site.

The Tumut Grevillea habitat is largely included within a 20 m streamside protection zone, which requires a permit from DLWC for the clearing of native vegetation under the NVC Act. In addition, any works (eg. excavation) within 40 metres of a stream must be assessed and approved by DLWC as a requirement under the Rivers and Foreshores Improvement Act 1948. It is thus currently illegal for landholders to clear within most Tumut Grevillea habitat without a permit. Specific Recovery Actions, including fencing, will thus not impose significant new constraints on landowner activities within the habitat of Tumut Grevillea.

#### 9 Biodiversity Benefits

The Recovery Program aims to significantly reduce the level of infestations of some vigorous invasive exotic weeds, particularly Blackberries and Willows, within known habitat of the Tumut Grevillea, thus increasing the ecological and aesthetic values of the sites. Exclusion of feral and domestic animals from some sections of the river, subject to agreement with the landowners, would lead to improved river bank stability and reduced levels of nutrient input to the river. Retention of the habitat of the Tumut Grevillea will assist in maintaining the riparian wildlife corridor of remnant native vegetation. Preservation of native riparian vegetation is consistent with the National Biodiversity Strategy objectives for the maintenance of wildlife corridors.

Part of a small population of the nationally Vulnerable plant species, *Ammobium craspedioides* (Yass Daisy), is within the habitat of the Tumut Grevillea to be protected in the TSR at Site 1. Opportunity exists for more of the *A. craspedioides* population to be protected, together with the established planting of the Tumut Grevillea adjacent to Site 1. A separate Draft Recovery Plan has been prepared for *A. craspedioides* by NPWS Southern Directorate.

#### **10** Preparation Details

This Recovery Plan was prepared by John Briggs, Senior Threatened Species Officer and Genevieve Wright, Flora Conservation Officer, NPWS Southern Directorate.

It has been formulated with the advice and assistance of a Recovery Team. The Recovery Team is a non-statutory group of expert biologists, landowners/managers and other stakeholders and has been established by NPWS to discuss and resolve issues relating to the conservation and management of the species.

### 11 Review Date

Any major changes to this Recovery Plan will require the revised Plan to be placed on public exhibition in NSW and re-approval by the NSW Minister for the Environment. The NPWS, Environment Australia or other Recovery Team members should be contacted if it is believed any change to the Recovery Plan or to the Recovery Program should be considered. This Recovery Plan is to be formally reviewed by the NPWS in

conjunction with the Recovery Team within five years from the date of its publication.

#### **12 References**

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- Taws, N. (1999). Re-survey of the Tumut Grevillea, *Grevillea wilkinsonii*. Unpublished report prepared for the NSW National Parks and Wildlife Service and the *Grevillea wilkinsonii* Recovery Team. (Taws Botanical Research: Canberra).

#### 13 Acronyms Used in this Document

ANBG	Australian National Botanic				
Gardens					
ANPC	Australian Network for Plant				
	Conservation				
DLWC	NSW Department of Land and				
	Water Conservation				
EP&A A	ct NSW Environmental Planning				
	and Assessment Act 1979				
ESD	Ecologically Sustainable				
Developm	nent				
EPBC Ac	ct Commonwealth				
	Environmental Protection and				
	Biodiversity Conservation Act				
	1999				

- GRLPB Gundagai Rural Lands Protection Board
- NPWS NSW National Parks and Wildlife Service
- NPW Act NSW National Parks and Wildlife Act 1974
- NVC Act NSW Native Vegetation Conservation Act 1997
- RVC Regional Vegetation Committee
- SGAP Society for Growing Australian
- Plants TERT Tumut Ecological Reserve Trust
- TSC Tumut Shire Council
- TSC Act NSW Threatened Species Conservation Act 1995
- TSR Travelling Stock Reserve

Table 3: Estimated costs, funding source and responsible parties for implementing the actions identified in the Tumut Grevillea Recovery Plan.

Action	Action Description	*Priority	^Feasibility	Responsible	Fund	Cost Estimate (\$'s/year)				Total Cost	
No.	-	-		Party	source	99-00	00-01	01-02	02-03	03-04	(\$ <b>'</b> s)
1.1	Re-survey and map	3	100%	Consultant	additional	8,000	0	0	0	10,000	118,000
				SGAP & ANBG	'in kind'	500	0	0	0	1,000	1,1,500
1.2.1	Set up photopoints and take	3	80%	Consultant	additional	0	0	0	0	0	0
	Photographs			Recovery Team/	additional	500	0	0	0	500	1,000
				NPWS	'in kind'	720	0	0	0	720	1,440
1.2.2	Annual monitoring program	2	100%	Recovery Team/	additional	0	200	200	200	0	600
				NPWS	'in kind'	0	2,400	2,400	2,400	0	7,200
2.1	Consultation with private landholders on management	1	80%	NPWS/Recovery	'in kind'	4,800	1,200	1,200	1,200	1200	9,600
	actions			Team							
2.2	Fencing and weed control on private land	1	80%	NPWS/ Contractor	additional	5,500	5,500	5,500	0	0	16,500
3.1	Develop Joint Management Agreement	2	80%	NPWS	'in kind'	0	2,400	1,200	1,200	0	4,800
	with the GRLPB & DLWC			DLWC	'in kind'	0	2,400	1,200	1,200	0	4,800
				GRLPB	'in kind'	0	2,400	1,200	1,200	0	4,800
3.2	Implementation of agreed management	1	80%	DLWC	'in kind'	720	720	720	720	720	3600
	actions, including weed control & fencing			GRLPB	'in kind'	720	720	720	720	720	3600
				NPWS & GRLPB	additional	5000	0	0	0	0	5,000
4.1	Identify potential sites for Tumut Grevillea	3	70%	Recovery Team/	additional	0	0	0	0	0	0
	re-introduction. Determine the need for enrichment planting			Consultant	'in kind'	1,000	1,000	0	0	0	2,000
4.2	Establish population in cultivation	3	100%	Recovery Team (TERT, SGAP)	ʻin kind'	1,500	2,700	2,700	0	0	6,900
5.1	Use planning instruments to assist in the protection of the Tumut Grevillea	3	80%	NPWS/ TSC/ RVC	ʻin kind'	0	2,400	2,400	0	0	4,800
5.2	Include agreed fire management actions in	2	90%	NPWS	additional	0	0	0	0	0	0
	relevant planning and management				'in kind'	0	480	1,200	0	0	1,680
	Documents			Tumut Bushfire	additional	0	0	0	0	0	0
				Management Committee	ʻin kind'	0	480	1,200	0	0	1,680
5.3	Identification and nomination of Critical Habitat	3	100%	NPWS	'in kind'	0	0	0	0	900	900
6.1	Prepare and install interpretive signs	3	100%	NPWS	additional	500	500	0	0	0	1000,000
					'in kind'	500	500	0	0	0	1000,000
6.2-5	Community education and involvement	2	70%	NPWS/ Recovery Team	additional	500	2,000	2,000	2,000	0	6,500
					'in kind'	2,400	2,400	2,400	2,400	0	9,600
Total					additional	20,000	8200	7700	2200	0	48,600
Total					'in kind'	12,860	22,200	18,540	11,040	3,540	69,900
Total					additional + 'in kind'	32,860	30,400	26,240	13,240	3,540	118,500

Note: \$8,000 remains from previous Commonwealth funding for the recovery of this species. Therefore \$40,600 of additional funds are required to implement this Plan.

#### **14** Costing Explanations

Costing is based on 2000 dollars rates.

In the *fund source* column 'additional' refers to currently unsecured funding which will have to be obtained in order to implement Recovery Actions, and 'in kind' indicates the value of contributions offered in various forms by government agencies and community groups to implement Recovery Actions.

\* Priority ratings as defined by Commonwealth Recovery Plan guidelines: 1 - action critical to prevent extinction, 2 - action prevents negative impact short of extinction,

^Feasibility assessment reflects estimated chance of success of the action on a scale of 0-100%.

(1.1) 2 weeks field work, 2 weeks for report at a consultancy rate of @ \$2,000 per week. 'In kind' contributions of SGAP & ANBG 1 day each @ \$250 / day.

(1.2.1) Salary Costs of Consultant incorporated in Action 1.1. 'In kind' costs of 3 days supervision by NPWS staff of consultant @ \$240 per day. (1.2.2) 'In kind' costs of 1 week field work and 1 week for report preparation by NPWS. Staff time costed @ \$1,200 per week. Additional funds required for photographic and other materials.

(2.1) 4 weeks of NPWS staff time in the first year and one week in each of the following years costed @ \$1,200 per week. Additional uncosted assistance from the Recovery Team.

(2.2) Until management actions have been agreed, broad cost estimates only can be forecast at this stage. The above costings are based on contracting for the supply and erection of a total of 0.5 km of fencing and two weeks of weed control per year on private land.

(3.1) For the 'in kind' contribution, each Agency to contribute two weeks each in year 1 and one week each in the following 2 years, costed @ \$1,200 per week. (3.2) It is anticipated that DLWC may undertake 3 days per year weed control on the Crown land site, costed @ \$240 per day. It is anticipated that GRLPB may undertake management actions at the TSR, costed @ \$240 per day. The additional funding is sought to allow for further fencing at the TSR.

(4.1) Funding for this survey will be covered under 1.1. (4.2) TERT, Recovery Team and SGAP combined total time of one week for 2 consecutive years commencing in 1999, costed @ \$1,200 per week. Tumut Shire Council 'in kind' contributions, 2 weeks per year, for 3 consecutive years, spread

between two staff and scheduled to minimise disruption to normal council duties - costed @ \$1,200 per year, plus use of associated propagation facilities costed @ \$300 per year.

(5.1) 'In kind' costs, 1 week each for NPWS and TSC staff for amendments to LEP costed @ \$1,200 per week. Contribution of RVC uncosted. (5.2) 'In kind' contribution calculated for a total of 7 person days each for NPWS and Bushfire Management Committee costed @ \$240 per day.

(6.1) Additional funds sought for material and erection costs for interpretive signs.

(6.2, 6.3, 6.4 & 6.5) Details of ongoing community education and involvement program are yet to be formulated. Costings are therefore only broad estimates.



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43 Bridge Street Hurstville 2220 (02) 9585 6444