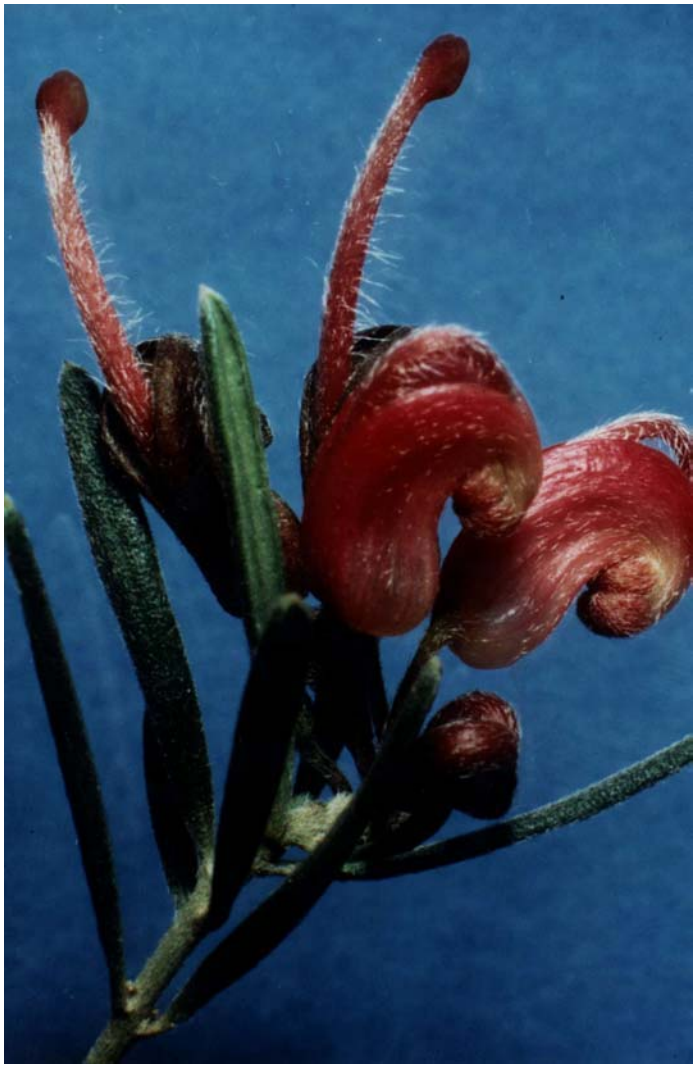
Approved Recovery Plan

Grevillea obtusiflora subsp. *obtusiflora* and subsp. *fecunda*

Recovery Plan



September 2001

Natural Heritage Trust
Helping Communities Helping Australia

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Recovery Planning Program

Grevillea obtusiflora subsp. *obtusiflora* and subsp. *fecunda*

Recovery Plan

Prepared in accordance with the New South Wales *Threatened Species Conservation Act 1995* and the Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999

September 2001

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Foreword

The conservation of threatened species, populations and ecological communities is crucial for the maintenance of this State's unique biodiversity. In NSW, the *Threatened Species Conservation Act* 1995 (TSC Act) provides the framework to conserve and recover threatened species, populations and ecological communities through the preparation and implementation of recovery plans.

The preparation and implementation of recovery plans is identified by both the National Strategy for the Conservation of Australia's Biological Diversity and the NSW Biodiversity Strategy as a key strategy for the conservation of threatened flora, fauna and invertebrates. The object of a recovery plan is to document the management actions required to promote the recovery of a threatened species, population or ecological community and to ensure its ongoing viability in nature.

This plan describes our current understanding of *Grevillea obtusiflora* subsp. *obtusiflora* and subsp. *fecunda*, documents the research and management actions undertaken to date, and identifies the actions required and parties responsible to ensure the ongoing management of the taxon in nature.

The *Grevillea obtusiflora* subsp. *obtusiflora* and subsp. *fecunda* Recovery Plan was prepared with the assistance of a recovery team comprising relevant land management and research interests, and was placed on public exhibition during September and October 2000. I thank these people for their efforts to date and I look forward to their continued involvement in the implementation of recovery actions identified in this plan.

BOB DEBUS MP

Minister for the Environment

Executive Summary

Introduction

Grevillea obtusiflora subsp. *obtusiflora* and subsp. *fecunda* are two attractive red-flowering Grevilleas with similar morphology but different ecological strategies, one of which reproduces primarily by vegetative means and the other by both vegetative and sexual means. The taxa are found in the Cudgegong and Capertee valleys north of Lithgow.

The main threats to *Grevillea obtusiflora* (the collective term for both subspecies) are vehicular access, inappropriate fire regimes and roadside management activities.

Legislative context

The *Threatened Species Conservation Act* 1995 is NSW's legislative framework to protect and encourage the recovery of threatened species, populations and communities. Under the TSC Act, the Director-General of National Parks and Wildlife has certain responsibilities including the preparation of recovery plans for threatened species, populations and ecological communities. This Recovery Plan considers the requirements of *Grevillea obtusiflora* and outlines management actions to be taken for the conservation of the taxon. *Grevillea obtusiflora* is also listed nationally as an endangered species pursuant to the *Environment Protection and Biodiversity Conservation Act* 1999 (EPBC Act).

Preparation of plan

This Recovery Plan has been prepared with the assistance of a recovery team, a non-statutory group of interested parties with relevant expertise, established to discuss and resolve issues relating to the plan. Components within the plan do not necessarily represent the views nor the official positions of all the individuals or agencies represented on the recovery team.

The plan will be reviewed and updated five years from the date of publication.

Implementation of plan

The TSC Act requires that a government agency must not undertake actions inconsistent with a recovery plan. The government agencies relevant to this plan are the NPWS and State Forests of NSW. Consequently, the NPWS and State Forests of NSW must, as the government agencies responsible for *Grevillea obtusiflora*, manage the taxon and it's habitat in accordance with this recovery plan.

Recovery objectives

Overall objective

The overall objective of this recovery plan is to stabilise *G. obtusiflora's* status as an endangered taxon pursuant to the provisions of the TSC Act. Recovery relates specifically to the prevention of the decline in the number of sub-populations and individuals of *G. obtusiflora* extant in the wild, by protecting sub-populations from threats.

Overall Performance Criteria

The overall performance criteria of the recovery plan is that the number of sub-populations and individuals of *G. obtusiflora* subsp. *obtusiflora* and subsp. *fecunda* extant in the wild does not decrease over the five years of plan operation.

Estimated cost of recovery

NPWS: National Parks and Wildlife Service
SF: State Forests of NSW
RSC: Rylstone Shire Council

Action	Description	NPWS	SF	RSC	unfunded
10.2	Habitat Management	$14500	$1000	$1000	
11.2	Survey and Monitoring	$9250			
12.2	Research				$7500
13.2	Community Education	$2500			
	TOTAL	**$24250**	**$1000**	**$1000**	**$7500**

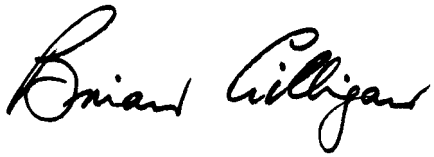
Biodiversity benefits

Conservation of *G. obtusiflora* also conserves the habitat of the rare plant *Persoonia marginata* and the plant communities and habitats associated with these rare taxa.

Through awareness of *G. obtusiflora* the profile of all threatened taxa is raised in the general community. This in turn leads to greater opportunities for the conservation of threatened taxa and increased protection of biodiversity.

G. obtusiflora subsp. *obtusiflora* is a clonal plant that is not known to produce seed. Research into this plant will assist in accumulating knowledge of the ecology of clonal plants and their mechanisms for reproduction. The conservation and study of *G. obtusiflora* subsp. *obtusiflora* will also benefit other species that share the same habitat.

Grevillea obtusiflora subsp. *fecunda* is an attractive plant that produces a profuse number of flowers. Research into these taxa provides a very useful comparison to assist our understanding of reproduction in Grevillea.



BRIAN GILLIGAN
Director-General

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1 Introduction

The initial collection of *Grevillea obtusiflora* was by Alan Cunningham in 1822 in the "Brushy hills N. of Bathurst". Robert Brown first described the taxon in 1830 in his supplement to the 'Flora of New Holland'. *G. obtusiflora* was not recorded again until 1977, when Bob Coveny of the Royal Botanic Gardens, Sydney collected a specimen in Clandulla State Forest (SF) near Kandos in NSW. Makinson (1997) considers that Clandulla State Forest is possibly not its type locality following examination of Cunningham's journal entries and maps.

McGillivray (1993) recognised *G. obtusiflora* as consisting of three subspecies, two of which were new. The new taxa were subspecies *kedumbensis* and *granulifera*, with the Clandulla taxon retaining the subspecies name *obtusiflora.* These three subspecies are allopatric, that is, their distributions do not overlap. This, and floristic differences, were used by Olde and Marriott (1994) to justify the elevation of the subspecies to species (*G. obtusiflora, G. kedumbensis* and *G. granulifera*).

Makinson (1997) described a new subspecies of *G. obtusiflora*; subsp. *fecunda*. This subspecies was discovered 15 km away from the Clandulla sub-population of *Grevillea obtusiflora* subsp. *obtusiflora* in 1995 by Johnson and Miller. *G. obtusiflora* subsp. *fecunda* is distinguished principally by possessing narrower and more revolute leaves, narrower flowers, shorter pistils, and by differences in distribution. The subspecies name, *fecunda*, refers to the copious quantities of seed observed on the plants. In contrast, *G. obtusiflora* subsp. *obtusiflora* is apparently sterile. Despite regular flowering, no fruit or seed has been found.

G. obtusiflora subsp. *obtusiflora* (Figure 1) is a low, root suckering shrub found in and adjacent to Clandulla State Forest. It is located at approximately 720 metres altitude in the Sydney Basin bioregion.

Grevillea obtusiflora subsp. *fecunda* (Figure 2) is a low, root suckering shrub found near Capertee in NSW. It is located at approximately 570 metres altitude in the Sydney Basin bioregion.

Based on the present distribution and the differences in fruit production, Makinson (1997) considers that the two subspecies may be reproductively isolated. Surveys of potential habitat did not locate further sites; however, it is probable that the range of both taxons is more extensive than currently known.

In this recovery plan the term *Grevillea obtusiflora* is used to describe the subspecies collectively.

2 Legislative context

2.1 Legal status

Grevillea obtusiflora R. Br. is listed as an endangered species on Schedule 1 of the *TSC Act* and the Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999 (EPBC Act). Both acts define the term species as inclusive of the taxon's subspecies.

As Makinson (1997) divided *Grevillea obtusiflora* into *Grevillea obtusiflora* subsp. *fecunda* and *Grevillea obtusiflora* subsp. *obtusiflora*, the listing of *G. obtusiflora* encompasses both the subspecies.

2.2 Recovery Plan preparation

The TSC Act requires that the Director-General of National Parks and Wildlife prepare recovery plans for all species, populations and ecological communities listed as endangered or vulnerable on the TSC Act schedules. The TSC Act includes specific requirements for both the matters to be addressed by recovery plans and the process for preparing recovery plans. This plan satisfies these provisions.

This Recovery Plan has been prepared with the assistance of a recovery team, a non-statutory group of interested parties with relevant expertise, established to discuss and resolve issues relating to the plan. Components within the plan do not necessarily represent the views nor the official positions of all the individuals or agencies represented on the recovery team. The information in this Recovery Plan was accurate to the best of the NPWS' knowledge on the date that it was approved.

2.3 Recovery Plan implementation

The TSC Act requires that a government agency must not undertake actions inconsistent with a recovery plan. The four government agencies relevant to this plan are the NPWS, Rylstone Shire Council, and State Forests of NSW. Consequently, the NPWS, Rylstone Shire Council and State Forests of NSW must, as the relevant land managers, manage the *Grevillea obtusiflora* sites within their areas, in accordance with this plan. Relevant land management issues include vehicular access, inappropriate fire regimes and roadside management activities, such as grading and weed control.

2.4 Relationship to other legislation

The lands on which *Grevillea obtusiflora* occur are either Rylstone Shire Council roads, State Forests of NSW or NPWS managed lands, or Freehold. Accordingly, legislation that may affect the management of the population includes the: *Forestry Act* 1916, *National Parks and Wildlife Act* 1975, *Local Government Act* 1993, *Noxious Weeds Act* 1993, *Rural Fires Act* 1997, Native Vegetation Conservation Act 1997, and *Environmental Planning and Assessment Act* 1979.

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.

Critical habitat has not been declared for these taxa under the TSC Act. The identification of critical habitat is not considered to be a priority for *Grevillea obtusiflora* as no demonstrable conservation outcome would accompany its identification and declaration.

2.6 Environmental assessment

The TSC Act amendments to the environmental assessment provisions of the *Environmental Planning and Assessment Act* 1979 (EP&A Act) require that consent and determining authorities consider relevant recovery plans when exercising a decision making function under Parts 4 & 5 of the EP&A Act. As the area occupied by *Grevillea obtusiflora* includes land under a range of tenures, there are several relevant approval authorities. These determining and consent authorities must consider the conservation strategy outlined in this plan when considering any activity which may affect *Grevillea obtusiflora*.

Environmental Assessment Guidelines are included as Appendix 4.

3 Conservation Status

Grevillea obtusiflora is listed as an endangered species on Schedule 1 of the TSC Act. This listing of *Grevillea obtusiflora* is the result of the combination of the following factors that affect the taxon: occupies a restricted area, has a low number of individuals, there are threats to the taxon operating, and the taxon's ecology makes it susceptible to threats and subsequent decline.

G. obtusiflora subsp. *obtusiflora* is not represented in conservation reserves (National Park or Nature Reserve). Sub-populations within State Forest are conserved to the extent that forest management activities are conducted in accordance with the TSC Act. Sub-populations also occur on Council-managed roadsides. *Grevillea obtusiflora* subsp. *fecunda* is poorly represented in conservation reserves, with only one of the three subpopulations occurring within Gardens of Stone National Park, the remainder occurring on freehold land and roads.

Briggs and Leigh (1996) assign a conservation code of 2E to *Grevillea obtusiflora*, indicating that it is an endangered taxon with a geographic range of less than 100 kilometres. Makinson (1997) recommends (pending full survey) a conservation coding of 2Vi for *Grevillea obtusiflora* subsp. *fecunda* indicating a vulnerable taxon, with a range of less than 100 kilometres, and that is inadequately reserved.

4 Description

Grevillea obtusiflora* subsp. *obtusiflora

G. obtusiflora subsp. *obtusiflora* is a red-flowering shrub that grows in open low understorey of eucalypt forest and regenerates from root suckers. Fruits, seeds and seedlings have not been recorded. *G. obtusiflora* subsp. *obtusiflora* flowers within the period of July to October.

G. obtusiflora subsp. *obtusiflora* is described by Makinson (1997) as:

A low, multi-stemmed shrub, 0.2-0.4 m in height; leaves narrowly obtuse-elliptic to oblong, 2-5 cm long, 1.5-5 mm wide; margin shortly recurved or revolute; upper surface openly and moderately granulate; lower surface exposed on most leaves, densely subsericeous (ground tissue completely obscured) or sometimes open-villous; flowers have a pink to pinkish red perianth with cream limb. The style is red with biramous hairs and sometimes also minute erect simple hairs ventrally. The perianth is 2.5-3.0 mm across from dorsal edge to ventral edge. The pistil is 18-23 mm in length. It is not known to set fruit or seed. (Figure 1)

Grevillea obtusiflora* subsp. *fecunda

Grevillea obtusiflora subsp. *fecunda* is a low, spreading to erect shrub growing up to one metre in height. It flowers profusely with red to pink flowers in spring.

Grevillea obtusiflora subsp. *fecunda* is described by Makinson (1997) as:

Low spreading to erect dense shrub 0.5-0.8 m in height. Leaves linear to very narrowly obovate, 15-40 mm long, 1.0-1.2 mm wide; margin smoothly revolute; upper surface densely granulose; lower surface usually enclosed, including midvein, sometimes narrowly exposed and then with an open appressed indumentum (ground-tissue visible between hairs). Flower colour: perianth deep pink to crimson, paling to pink or cream along dorsal side and with a cream limb, or occasionally cream with a weak red along dorsal side, or rarely yellow; style deep pink to red (rarely yellow) with white hairs; style end sometimes yellowish. The perianth is 1.5-2 mm across. The pistil is 14-18 mm in length; style with biramous hairs and sometimes also minute erect simple hairs ventrally (Figure 2). Follicles setting freely.

Figure 1 *Grevillea obtusiflora* subsp. *obtusiflora*

Figure 2 *Grevillea obtusiflora* subsp. *fecunda*

5 Distribution and habitat

5.1 Distribution

Grevillea obtusiflora* subsp. *obtusiflora

G. obtusiflora subsp. *obtusiflora* occurs in and adjacent to Clandulla State Forest near Rylstone in the Central Tablelands, NSW (Figure 3). Preliminary surveys show that the plant is limited to a small area of the forest. The forest is bisected by Carwell Creek, which flows north to the Cudgegong River. *G. obtusiflora* subsp. *obtusiflora* is found on the plateau east of the Carwell Creek.

Site O1 (Figure 4) is located within Clandulla State Forest and comprises a total of nine groups of plants within an area of 400 square metres. Each stand comprises from 50 to several hundred plants. Site O2 is located on the boundary of State Forest and Rylstone Shire Council roads, occupies ten square metres, and consists of approximately 100 plants. Detailed information on each site for *Grevillea obtusiflora* subsp. *obtusiflora* is included as Appendix 1.

Cunningham found the type specimen in 1882 in 'Brushy hills N. of Bathurst'. It is not known whether the known sites include the collection site of the syntypic series.

Grevillea obtusiflora* subsp. *fecunda

Grevillea obtusiflora subsp. fecunda occurs in the Capertee Valley, west of Lithgow. Three sites are known. Site F1 (Figure 5) is located primarily on the raised roadside verges on Home Hills Road. Site F1 extends for approximately 50 metres and contains approximately 60 individual plants. Site F2 is located in Port Macquarie Rd and extends for 600 metres; and has greater than 500 plants. Site F3 (Figure 6) is located on the slopes of Pantoneys Crown within Gardens of Stone National Park where 350 plants occupy an area of approximately 300 square metres.

Detailed information on each site for *Grevillea obtusiflora* subsp. *fecunda* is included as Appendix 1.

Figure 3 shows the distribution of both subspecies.

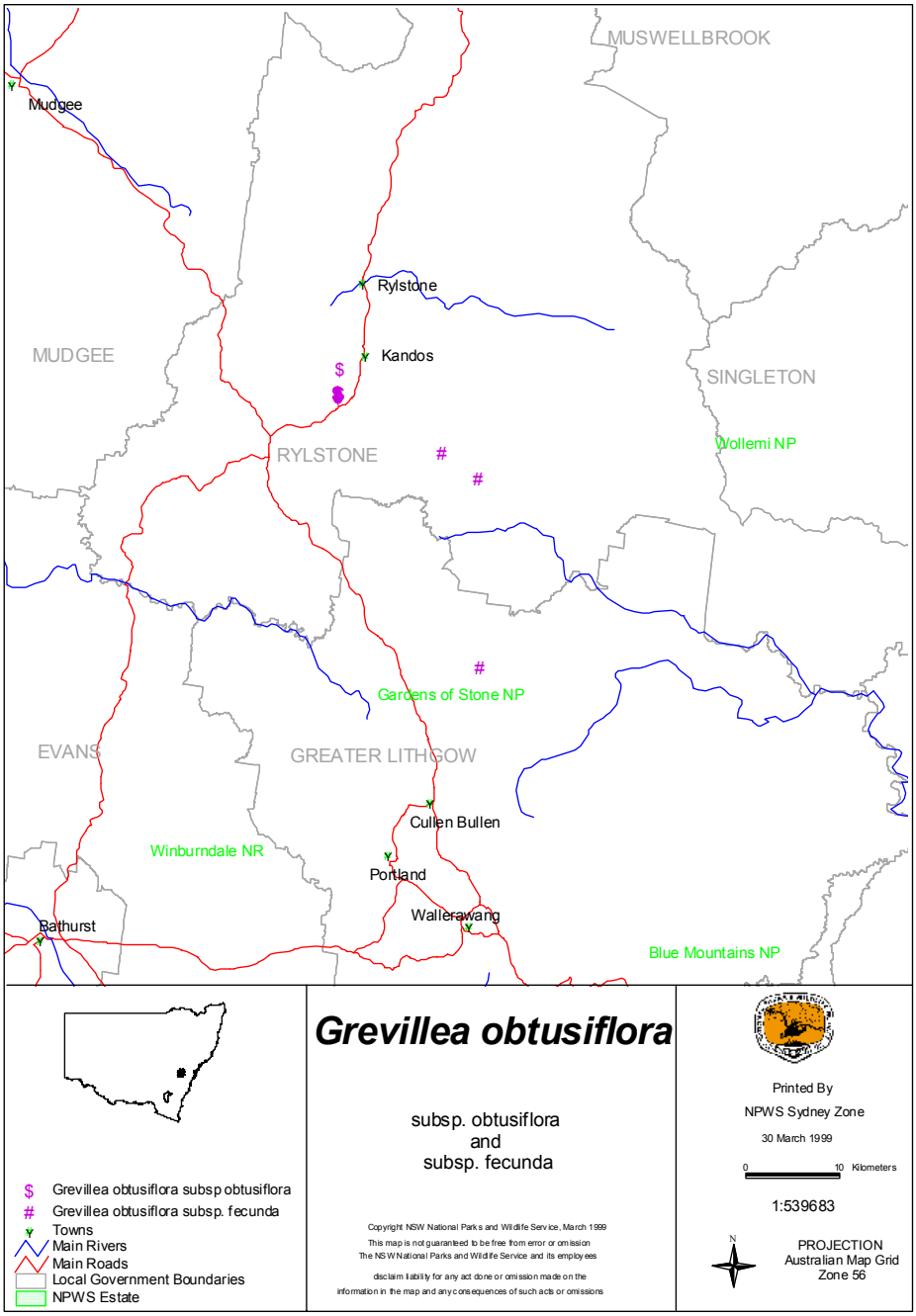

Figure 3 – Distribution of *G. obtusiflora* subsp. *fecunda* and subsp. *obtusiflora*

Figure 4 - Site O1 – Clandulla State Forest

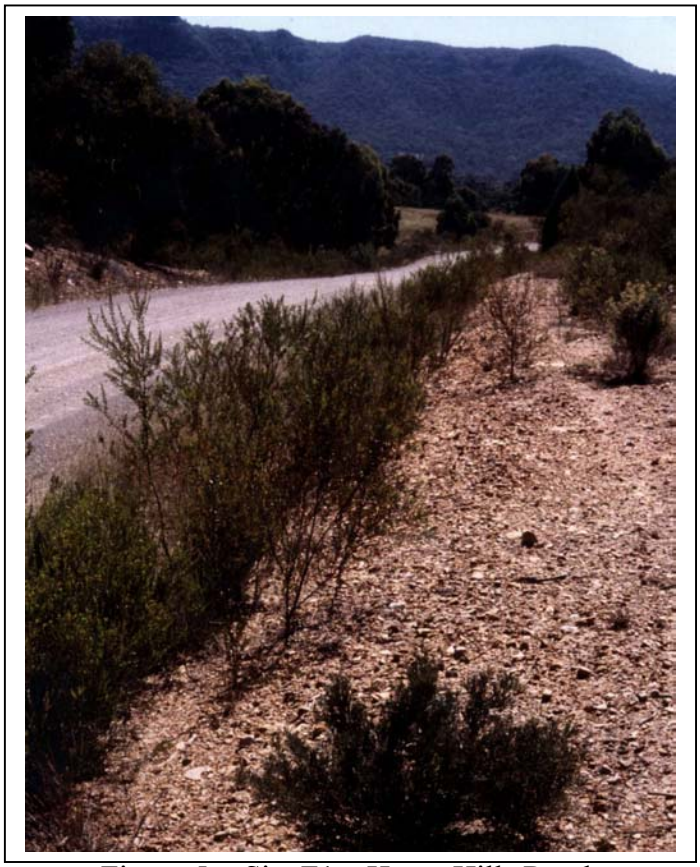

Figure 5 - Site F1 – Home Hills Road

Figure 6- Site F3 – Pantoneys Crown

5.2 Habitat

5.2.1 Climate

The area experiences hot, dry summers and moist to wet winters, with an average rainfall of 750-850 mm.

5.2.2 Vegetation

Grevillea obtusiflora* subsp. *obtusiflora

G. obtusiflora subsp. *obtusiflora* occurs in open forest dominated by the following species.

Sites O1 and O2

Canopy : *Eucalyptus crebra*; *E. dealbata*; *E. tenella*.
Middle stratum : *Callistemon linearis*, *Acacia buxifolia*, *Acacia elongata*,
Understorey : *Leucopogon* sp., *Caustis flexuosa*, *Dianella* sp, *Patersonia* sp.

A list of the species associated with *G. obtusiflora* subsp. *obtusiflora* is provided in Appendix 2.

Grevillea obtusiflora* subsp. *fecunda.

G. obtusiflora subsp. *fecunda* occurs in open forest dominated by the following species.

Sites F1 and F2.

Canopy :	*Eucalyptus tenella, E. fibrosa, E. macrorhyncha, E. punctata, Callitris endlicheri*
Middle stratum :	*Acacia buxifolia, Leptospermum continentale, Monotoca elliptica.*
Ground stratum :	*Persoonia linearis, Indigofera* sp., *Pomax umbellata.*

Site F3

Canopy :	*Eucalyptus crebra, E. beyeriana.*
Middle Stratum :	*Acacia buxifolia, Acacia ixiophylla, Isopogon aneminifolius*.
Ground Stratum :	*Lomandra glauca, Styphelia triflora, Goodenia sp.*

A list of the species associated with *Grevillea obtusiflora* subsp. *fecunda* is provided in Appendix 2.

In regard to *G. obtusiflora* subsp. *fecunda,* Makinson (1997) has suggested that the presence of *Eucalyptus tenella* may prove to be a good indicator for the taxon.

5.2.3 Soil Characteristics

In eastern Australia, most Grevillea species grow in sandstone-derived soils which are usually shallow, and both hard to wet and slow to drain (Olde and Marriott 1994). Where Grevilleas occur, the sandy-loam soils are highly acidic (pH3 to pH4) and usually contain considerable humus (Olde and Marriott 1994).

G. obtusiflora subsp. *obtusiflora* occurs on sandy loam soil (Olde and Marriott, 1995) derived from shale, siltstone, conglomerate and sandstone associated with the geology of the Permian, Shoalhaven Group.

G. obtusiflora subsp. *fecunda* occurs on structured loam soil derived from the shale, conglomerate and sandstone associated with the geology of the Permian, Shoalhaven Group.

Makinson (1997) refers to the distinctive orange loamy soil with sandstone boulders on which *G. obtusiflora* subsp. *fecunda* occurs. Makinson (1997) further suggests it is likely that *G. obtusiflora* subsp. *fecunda* is substrate specific, and that this soil type may prove to be a good indicator for this taxon.

5.2.4 Tenure

Grevillea obtusiflora* subsp. *obtusiflora

The known sites of *G. obtusiflora* subsp. *obtusiflora* occur on State Forest, freehold land (as an inholding within State Forest), and on roads managed by the Rylstone Shire Council. The sites are within the Parish of Clandulla and the Rylstone local government area.

No voluntary conservation agreements have been entered into for the freehold land containing *G. obtusiflora* subsp. *obtusiflora*.

Clandulla State Forest is classified under the Preferred Management Priority system. The area is classified as either multiple use natural forest, Special Emphasis, or Undeveloped Natural Forest.

Clandulla State Forest was dedicated on 8 June 1917. The forest has a history of low intensity harvesting operations producing mining props, charcoal, fencing timber and firewood. The immediate area in which *G. obtusiflora* subsp. *obtusiflora* occurs contains trees that are of low timber value and has not been logged for approximately 40 years, although the area has been available for the harvesting of minor forest products. The first Occupational Permit for grazing Clandulla State Forest was issued on 15 December 1948. Although grazing is recorded in the Capertee and Rylstone areas since the middle 1800s, there is little information about its duration, intensity and extent. Grazing has the ability to alter species composition, soils crusts, and vegetation structure, however the effect of grazing in this area is not known.

Site No.	Tenure	Manager
O1	Clandulla State Forest Freehold	State Forests of NSW Private Landholder
O2	Clandulla State Forest Council road	State Forests of NSW Rylstone Shire Council

Table 1: Tenure of *G. obtusiflora* subsp. *obtusiflora* sites.

Grevillea obtusiflora* subsp. *fecunda

The greatest numbers of *Grevillea obtusiflora* subsp. *fecunda* occur at sites along two unsealed Rylstone Shire Council roads and adjoining freehold land, within the Parish of Capertee (sites F1 & F2). Site F3 occurs within the Gardens of Stone National Park. No voluntary conservation agreements have been entered into for the freehold land containing *G. obtusiflora* subsp. *fecunda.*

The area in which the largest numbers are found has been used for cattle grazing in excess of 120 years, accordingly the taxon and its habitat is likely to have been subjected to grazing for part of this period.

Despite the variation in tenure between the different sites of both subspecies, it is likely that all the sites have been subjected to comparable levels of grazing by sheep and cattle, and to the harvesting of timber.

Site No.	Tenure	Manager
F1	Council road Freehold	Rylstone Shire Council Private Landholder
F2	Council road Freehold	Rylstone Shire Council Private Landholder
F3	Gardens of Stone National Park	National Parks and Wildlife Service

Table 2: Tenure of *Grevillea obtusiflora* subsp. *fecunda* sites.