

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



RESEARCH REPORT  
to the  
Australian Heritage Commission

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**Zieria sp. 6 (sp. "G"; Mt. Dromedary)**

Family: Rutaceae

**Conservation Status:** Vulnerable (Code 2VC-/N/57x 58C)

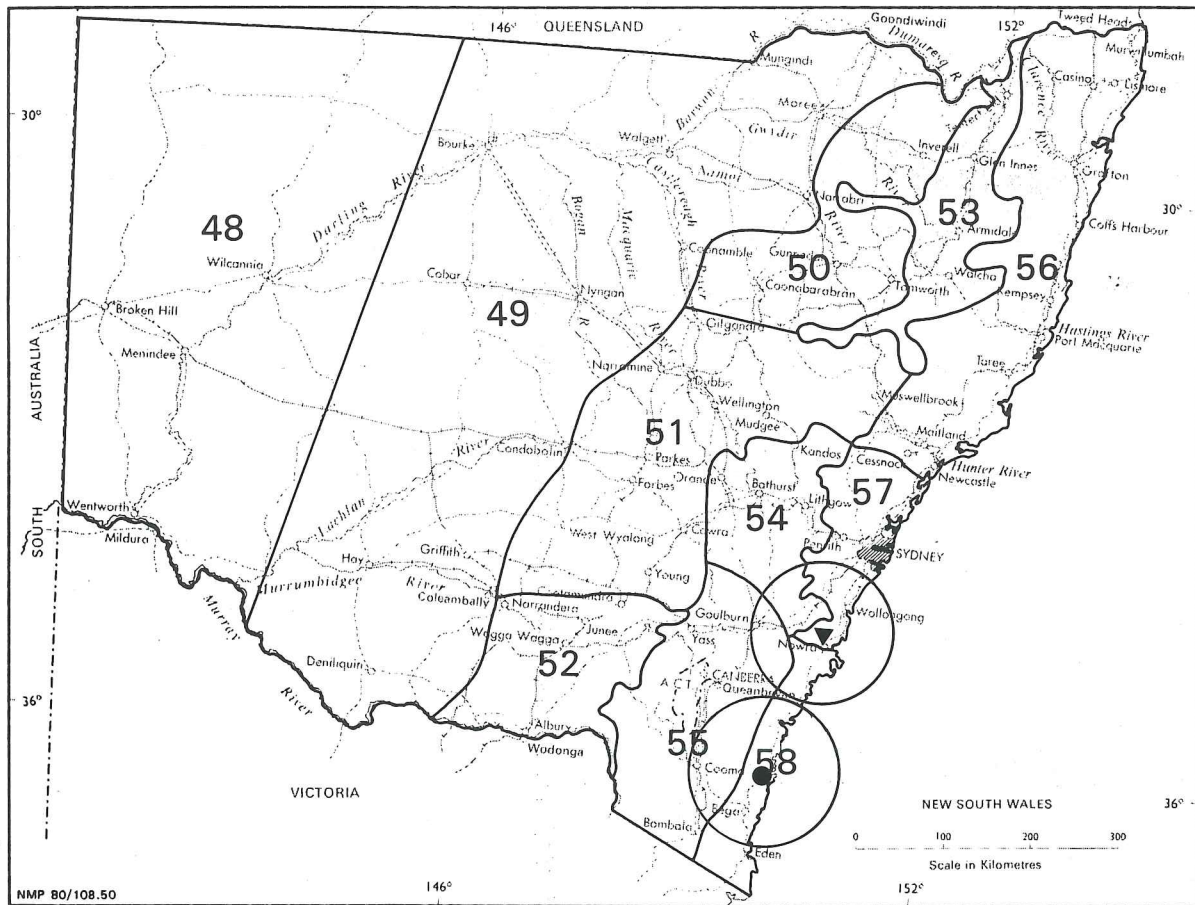
(Conservation Code prior to survey: 2RC-/N/57x 58C)



Flowering branchlet.

**Description:** Rounded, open to moderately dense shrub to 2 m high, with the young stems covered with numerous small warts (tubercles) and a moderately dense layer of short stellate hairs. Leaves opposite and comprised of three leaflets (trifoliolate) and aromatic when crushed. The central leaflet is linear with strongly recurved margins, 25-40 mm long and 2-3 mm wide, sparsely hairy on the upper surface and with a moderately dense layer of short stellate hairs on the under surface. The secondary leaflets are similar but usually only about two thirds the size. Flowers white, arranged in dense clusters of up to 30 or more flowers borne on a common stalk 5-10 mm long arising singly from the leaf axils. There are numerous, conspicuous, linear, brown bracts 3-4 mm long within each flower cluster. Each flower is about 8 mm across with 4 ovate-elliptic petals. Fruits are capsules about 5 mm across which are deeply divided into 4 chambers, with each chamber containing one

# Distribution of Zieria sp.6(sp."G")



= previously recorded locality where species is now Presumed Extinct.



or rarely two elliptical seeds about 2 mm long. Often only 2 or 3 of the fruit chambers develop.

**Flowering:** August-September.



A flowering shrub of *Z. sp. 6* growing in a drainage line on extensive rock outcropping. (This photo was taken near the Central Tilba Reservoir (Site 3)).

### **Distribution**

Known only from Little Dromedary Mountain and the lower eastern slopes of Mount Dromedary 10-15 km south of Narooma on the New South Wales South Coast. The geographic range of the known populations is 6 km. There is one old specimen collected from Good Dog Mountain, Cambewarra Range (north of Nowra) in 1931 which appears to match this species (J. Armstrong, pers. comm.) but several searches by Armstrong and one by J.D.B. have failed to re-locate the species in that area. It is believed that Good Dog Mountain is an old name for the peak now known as Cambewarra Mountain. Although now heavily vegetated, the summit and slopes of Cambewarra Mountain were cleared and grazed earlier this century and it seems probable that *Z. sp. 6* has been eliminated from this site.

Prior to this survey, apart from the above record, *Z. sp. 6* had been recorded only from Little Dromedary Mountain and in the vicinity of the Central Tilba Reservoir (J. Armstrong, pers. comm.). During this survey six additional populations were discovered on suitable rock outcrops along the eastern side of Mount Dromedary. A total of about 900 plants from 8 populations are now known. It is likely that other small populations occur on a few rock outcrops on the lower eastern slopes of the mountain which could not be accessed during this survey due to impenetrable barriers of lantana.

#### **Habitat Summary**

Shrub communities on monzonite outcrops fringed by temperate rainforest or eucalypt open-forest. Occasionally *Z. sp. 6* extends into eucalypt open-forest understorey.

#### **Threats Summary**

Several, if not all, of the populations may eventually be overrun with Lantana and in some places also by Ivy. These are aggressive weeds which have established in the area and are spreading. Apart from the Little Dromedary Mountain population all sites are on private property which has been cleared where possible and sown to pasture. Although some of the best remaining sites are too rocky to be cleared others, such as Sites 3 to 6 have been partly cleared many years ago and these sites could be eliminated if these regrowth areas on farmland are re-developed.

#### **Reservation**

A total of about 60 plants from 3 of the smallest populations occur within Mount Dromedary Flora Reserve which is managed by the Forestry Commission of New South Wales.

#### **Cultivation**

The species does not have great horticultural appeal despite its numerous small flowers. It can be readily propagated from cuttings and a total of 6 plants originating from 2 individuals are in cultivation at the Australian National Botanic Gardens, Canberra (M. Richardson, pers. comm.). A total of 6 plants from 3 individuals have also been established in permanent pots at the CSIRO Division of Plant Industry, Canberra.

#### **Recommendations Summary**

Two populations (Sites 1 and 2) have been nominated for inclusion on the Register of the National Estate. It is desirable that both sites be formally reserved for the protection of *Zieria sp. 6*. The New South Wales National



Parks and Wildlife Service should advise landholders and the Forestry Commission of New South Wales of the other occurrences and seek their co-operation in protecting the species. For example, the regrowth areas on private property should not be re-cleared.

### **SITE DETAILS**

#### **Site 1 - Little Dromedary Mountain**

**Latitude and Longitude:** 36° 19' 36", 150° 04' 30".

**Altitude:** 150-180 m.

**Location:** The summit and upper slopes of Little Dromedary Mountain, located 1.3 km direct east of Tilba Tilba. The nominated site is that part of the mountain above the 140 m contour interval. The summit corresponds with the Central Tilba 1:25,000 map sheet 8925-111-N grid reference point 37557570. (A second population of 10 plants was found amongst rocks in a grazed paddock 400 m east-north-east of the summit of Little Dromedary Mountain but is not detailed here because it is considered to have little conservation value). (See map page 284).



Looking south to Little Dromedary Mountain. *Zieria* sp. 6 occurs in the open shrub community growing in the crevices and depressions on the exposed rock outcrop.

**Land Status:** Vacant Crown land.

**Area:** 4 ha.

**Population:** An estimated 300 mature plants.

**Habitat**

**Soil:** Skeletal humus-rich black sandy loam.

**Substrate:** Monzonite, extensively exposed.

**Topography:** Summit and precipitous upper slopes of isolated peak rising from undulating terrain.

**Aspect:** Found on all aspects but predominantly northerly and westerly.

**Vegetation:** Open shrub community including *Melaleuca armillaris*, *Kunzea ambigua*, *Beyeria lasiocarpa*, *Prostanthera incana*, *P. nivea*, *Dodonaea viscosa*, *Bursaria spinosa*, *Notelaea venosa*, *Plectranthus parviflorus*, *Dendrobium speciosum* and *Platycerium bifurcatum*.

**Threat:** No immediate threats were identified and this appears to be the most secure of the sites surveyed.

**Recommendation:** Little Dromedary Mountain should be dedicated as a flora reserve for the protection of *Z. sp. 6*. This site has been nominated for inclusion on the Register of the National Estate.

**Survey Date:** 19/8/88.

**Voucher Specimen:** J.D.B. No. 2342.

**Site 2 - Portion 321**

**Latitude and Longitude:** 36° 18' 30", 150° 04' 00".

**Altitude:** 120-190 m.

**Location:** Extensive rock outcrop 900 m directly north-west of Central Tilba. The nominated site is a circular area of radius 150 m centred on the Central Tilba 1:25,000 map sheet 8925-111-N grid reference point 36607775. (See map page 284).





Looking south-west to the rock outcrop comprising Site 2. This outcrop lies at the base of a long spur running east down from the summit of Mount Dromedary.

**Land Status:** Private freehold.

**Area:** 7 ha.

**Population:** An estimated 300 mature plants. No seedlings seen.

**Habitat**

**Soil:** Skeletal humus rich sandy loam.

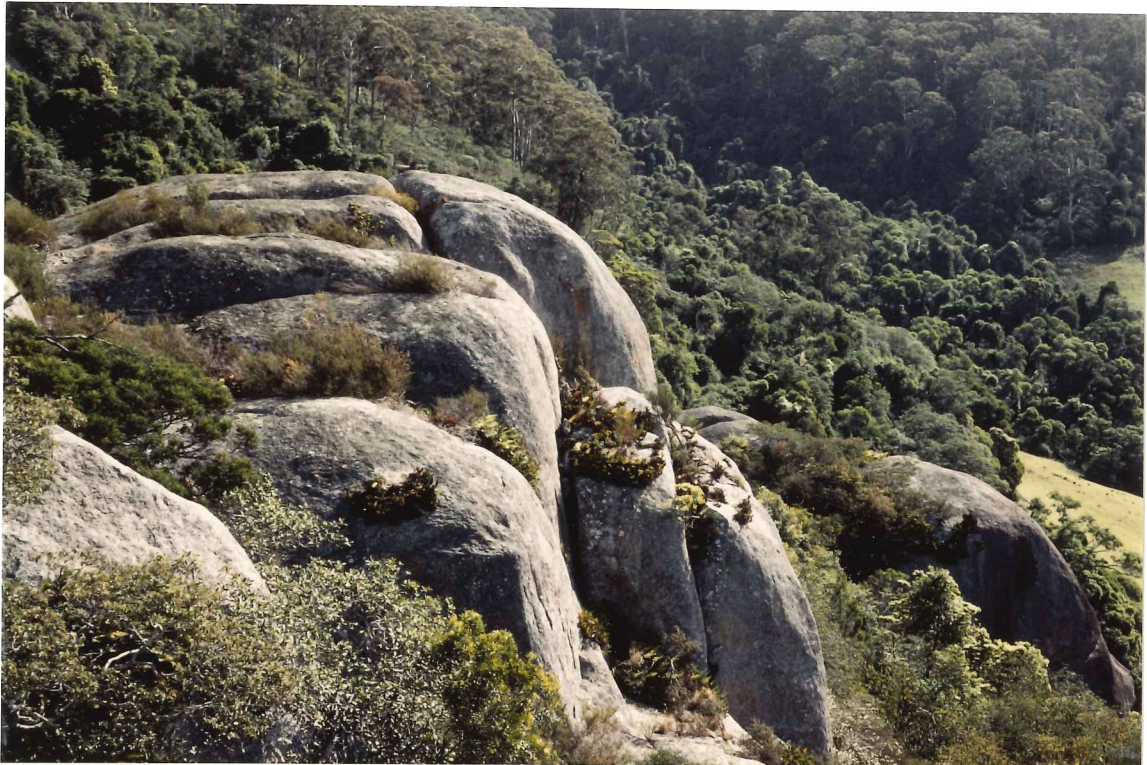
**Substrate:** Extensive monzonite outcropping.

**Topography:** Extensive domes of rock outcrop at the base of a spur which rises steeply to the mountain summit to the west.

**Aspect:** On most aspects, but predominantly northerly and easterly, and not westerly.

**Vegetation:** Shrub community including *Kunzea ambigua*, *Prostanthera nivea*, *Beyeria lasiocarpa*, *Ficus rubiginosa*, *Acacia mearnsii*, *Pomaderris cinerea*, *Plectranthus parviflorus* and *Dendrobium speciosum*.





A north-facing section of the granite outcrop at Site 2. *Zieria* sp. 6 grows with other shrub species in the crevices and drainage lines on the massive rock domes.

**Threat:** Not immediately threatened but much of the site is at risk from possible invasion from aggressive weed species such as Lantana and Ivy which are prevalent in the area.

**Recommendation:** This site should be added to the adjacent Mount Dromedary Flora Reserve. It has been nominated for inclusion on the Register of the National Estate.

**Survey Date:** 18/8/88.

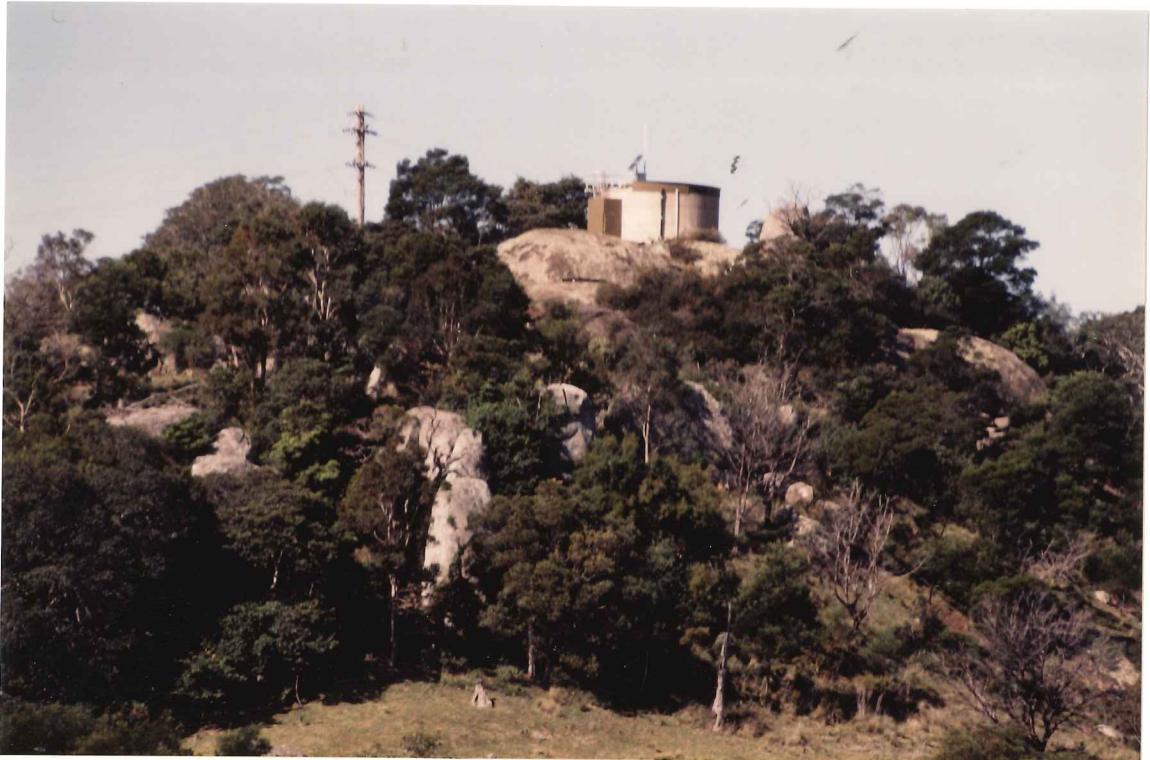
**Voucher Specimen:** J.D.B. No. 2340.

### **Site 3 - Central Tilba Reservoir Site**

**Latitude and Longitude:** 36° 18' 40", 150° 04' 26".

**Altitude:** 80-110 m.

**Location:** Summit and eastern slopes of hill 200 m west of Central Tilba. The nominated site is a circular area of radius 100 m centred on the Central Tilba 1:25,000 map sheet 8925-111-N grid reference point 37137735. (See map page 284).



Looking south to the rocky outcrop comprising Site 3. *Zieria* sp. 6 grows in the drainage lines between the large granite boulders around the top of the outcrop in the vicinity of the reservoir which is visible in this photo.

**Land Status:** Private freehold.

**Area:** 3 ha.

**Population:** About 60 mature plants. No seedlings seen.

**Habitat**

**Soil:** Skeletal grey loam.

**Substrate:** Extensively exposed monzonite.

**Topography:** Rock outcrop forming low hill near base of mountain.

**Aspect:** All aspects except south.

**Vegetation:** Open shrub community including *Ficus rubiginosa*, *Acacia mearnsii*, *Prostanthera nivea*, *Hymenanthera dentata*, *Plectranthus parviflorus*, *Cheilanthes* sp., *Pelargonium* sp. and *Isotoma axillaris*.

**Threats:** Much of the eastern part of this site has been cleared or partly cleared and converted to pasture and the area is grazed by cattle. Although this species does not appear to be particularly palatable to domestic stock many *Zieria* plants have nevertheless been trampled and badly damaged by



the stock. Parts of this site are now heavily infested with weed species and regeneration of *Zieria* in such areas or where pasture has established is unlikely.

**Recommendations:** Removal of cattle grazing would assist the survival of the species at the site and allow recovery of many previously damaged plants. Although the longer term survival of the species on the more fertile parts of the site is doubtful, due to competition from exotic species, the species is likely to survive on the more rocky summit areas, given adequate protection.

**Survey Dates:** 19/8/88 and 10/11/88.

**Voucher Specimens:** J.D.B. Nos 2444 and 2445.

#### **Site 4 - Portions 321/295**

**Latitude and Longitude:** 36° 18' 27", 150° 04' 15".

**Altitude:** 130 m.

**Location:** Rocky outcrop 700 m north-north-west of Central Tilba. The site is centred on the Central Tilba 1:25,000 map sheet 8925-111-N grid reference point 36957780. (See map page 284).



Looking east to the rock outcrop comprising Site 4.

**Land Status:** Private freehold.

**Area:** 0.75 ha.

**Population:** 45 mature plants. No seedlings seen.

**Habitat:** Very similar to Site 3.

**Threat:** Similar to Site 3.

**Recommendation:** Similar to Site 3.

**Survey Date:** 18/8/88.

**Voucher Specimen:** Not collected.

#### Site 5 - Portion 22

**Latitude and Longitude:** 36° 17' 43", 150° 03' 26".

**Altitude:** 130-150 m.

**Location:** Spur 1 km direct south-west of 'Ben Braggie' homestead. The nominated site is a circular area of radius 60 m centred on the Central Tilba 1:25,000 map sheet 8925-111-N grid reference point 35647913. (See map page 284).



Looking south-west to Site 5 which is on the spur to the right side of the photo. This area had previously been cleared but is now regenerating, particularly with shrubs of *Acacia mearnsii* and *A. melanoxylon*. It was not possible to survey the rock outcrop to the left of Site 5 due to an impenetrable barrier of *Lantana* surrounding the site, but it is likely that *Zieria* sp. 6 would also occur there.



**Land Status:** Private freehold with possibly a small portion of the site extending into Mount Dromedary Flora Reserve.

**Area:** ca. 1 ha.

**Population:** 80 mature plants. No seedlings seen.

**Habitat**

**Soil:** Brown sandy loam.

**Substrate:** Monzonite, exposed as low domes in places.

**Topography:** Lower slope of spur rising to the south-west to the summit of high mountain.

**Aspect:** North-east.

**Vegetation:** On margins of eucalypt open-forest and previously cleared grazing land in an open shrub community including *Acacia mearnsii*, *A. melanoxylon*, *Pittosporum undulatum*, *Beyeria lasiocarpa*, *Hakea eriantha*, *Notelaea venosa*, *Cheilanthes distans*, *Plectranthus parviflorus* and *Coprosma* sp.

**Threats:** This site has previously been cleared but a shrub component of the original flora is now regenerating. The area is grazed by cattle and although the *Zieria* plants are not particularly palatable many have been trampled and badly damaged by the stock. Large patches of Lantana have established on the site and adjacent areas and its continued spread threatens the entire *Zieria* population.

**Recommendations:** Unless the spread of the Lantana can be controlled the long term survival of *Zieria* sp. 6 at this site is doubtful. Removal of cattle grazing in this case may be counter-productive in that cattle browsing is probably assisting in retarding the rate of spread of the Lantana.

**Survey Date:** 19/8/88.

**Voucher Specimen:** J.D.B. No. 2344.

**Site 6 - Portion 326**

**Latitude and Longitude:** 36° 17' 40", 150° 03' 42".

**Altitude:** 130 m.

**Location:** Rock outcrop on low hill 700 m direct south-west of 'Ben Braggie' homestead. The site is centred on the Central Tilba 1:25,000 map sheet 8925-111-N grid reference point 35957920. (See map page 284).

**Land Status:** Private freehold.

**Area:** ca. 0.3 ha.

**Population:** 55 mature plants.

**Habitat**

**Soil:** Shallow brown loam.

**Substrate:** Monzonite, exposed in many places.

**Topography:** Rock outcrop on low hill.

**Aspect:** South-west and south.

**Vegetation:** Remnant shrub community on previously cleared and grazed land. Only scattered plants of *Acacia mearnsii*, *Coprosma* sp., *Plectranthus parviflorus* and *Cheilanthes distans* remain.

**Threat:** Similar to Site 5 but little regeneration is occurring.

**Recommendation:** As for Site 5.

**Survey Date:** 19/8/88.

**Voucher Specimen:** Not collected.

**Site 7 - Dromedary Flora Reserve/Portion 461**

**Latitude and Longitude:** 36° 17' 30", 150° 03' 24".

**Altitude:** 200-230 m.

**Location:** Rocky knoll 850 m direct south-west of 'Ben Braggie' homestead. The site is centred on the Central Tilba 1:25,000 map sheet 8925-111-N grid reference point 35567957. (A second population of 5 plants was found 150 m south of this site). (See map page 284).



Looking north-west to the rocky knoll on the summit of which is located Site 7.



**Land Status:** Mount Dromedary Flora Reserve under the control of the New South Wales Forestry Commission.

**Area:** ca. 0.6 ha.

**Population:** 10 mature plants. No seedlings seen.

**Habitat**

**Soil:** Skeletal dark-brown sandy loam.

**Substrate:** Extensively exposed monzonite boulders and domes.

**Topography:** Rocky knoll on the lower part of a spur rising to the south-west to the summit of the mountain.

**Aspect:** North-west.

**Vegetation:** Shrub community including *Acacia mearnsii*, *Beyeria lasiocarpa*, *Dodonaea viscosa*, *Acacia* sp., *Plectranthus parviflorus*, *Dendrobium speciosum* and *Brachychiton populneus*. The shrub community is surrounded by *Eucalyptus maidenii* open-forest.

**Threat:** The eucalypt open-forest surrounding the site is heavily infested with Lantana which is spreading into the shrub community. It appears that within a few years Lantana will have taken over this site and the *Zieria* is likely to be eliminated.

**Recommendation:** Apart from general control of Lantana no action is warranted.

**Survey Date:** 19/8/88.

**Voucher Specimen:** J.D.B. No. 2343.

**Site 8 - Mount Dromedary Fire Trail**

**Latitude and Longitude:** 36° 17' 20", 150° 02' 15".

**Altitude:** 260 m.

**Location:** Lower north slope of Mount Dromedary, 350 m on the summit track south from the northern boundary of the flora reserve. The site is centred on the Central Tilba 1:25,000 map sheet 8925-11-N grid reference point 339799. (See map page 284).

**Land Status:** Mount Dromedary Flora Reserve managed by the New South Wales Forestry Commission.

**Area:** ca. 600 m<sup>2</sup>.

**Population:** 10 mature plants.

**Habitat**

**Soil:** Brown gravelly loam.

**Substrate:** Monzonite, with numerous exposed boulders.

**Topography:** Moderately steep slope near the base of the mountain.

**Aspect:** North.

**Vegetation:** *Eucalyptus smithii* - *E. bosistoana* - *E. maidenii* open-forest with a moderately dense understorey including *Goodia lotifolia*, *Commersonia fraseri*, *Polyscias sambucifolia*, *Coprosma* sp., *Zieria smithii*, *Indigofera australis*, *Pimelea axiflora*, *Cassinia* sp. and *Plectranthus parviflorus*.

**Threat:** This site is bisected by the fire trail and would thus be at risk from roadworks associated with any upgrading of the track. The site otherwise appears secure.

**Recommendation:** The Forestry Commission should be advised of this occurrence of the species to ensure that possible roadworks associated with the fire trail do not damage the site.

**Survey Date:** 18/8/88.

**Voucher Specimen:** J.D.B. No. 2341.



