



**CARABOST FLORA RESERVE No.180**  
**WORKING PLAN**  
**Carabost State Forest**  
**Hume Region**



Mountain Gum *Eucalyptus dalrympleana* in Carabost Flora Reserve

## **CONTENTS**

- 1. INTRODUCTION**
- 2. KEY VALUES OF THE RESERVE**
- 3. DESCRIPTION OF THE RESERVE**
  - 3.1 LOCATION
  - 3.2 EXCLUSIONS
  - 3.3 GEOGRAPHY
  - 3.4 GEOLOGY AND SOILS
  - 3.5 CLIMATE
  - 3.6 VEGETATION
  - 3.7 FAUNA
- 4. HISTORY**
  - 4.1 INDIGENOUS CULTURAL HERITAGE
  - 4.2 NON-INDIGENOUS HERITAGE
  - 4.3 FOREST MANAGEMENT
  - 4.4 FIRE
- 5. CURRENT USAGE**
- 6. MANAGEMENT**
  - 6.1 OBJECTIVES OF MANAGEMENT
  - 6.2 MANAGEMENT ISSUES
    - 6.2.1 AVAILABLE ARCHAEOLOGICAL AND SCIENTIFIC DATA
    - 6.2.2 HUMAN IMPACT
    - 6.2.3 ROAD ACCESS AND ADJACENT LAND MANAGEMENT
    - 6.2.4 WEEDS
    - 6.2.5 FERAL ANIMALS
    - 6.2.6 FIRE
  - 6.3 FUTURE MANAGEMENT
    - 6.3.1 ACTIVITIES NOT PERMITTED
    - 6.3.2 ACTIVITIES PERMITTED STANDARD CONDITIONS
    - 6.3.3 ACTIVITIES PERMITTED WITH SPECIAL CONDITIONS
- 7. MONITORING, REPORTING AND REVIEW**
- 8. REFERENCES**
- 9. ACKNOWLEDGEMENTS**
- 10. APPENDICES**
  - APPENDIX 1: LOCALITY MAP
  - APPENDIX 2: FLORA RESERVE AND TOPOGRAPHIC MAP
  - APPENDIX 3: FLORA SPECIES LIST
  - APPENDIX 4: FAUNA SPECIES LIST

## 1. INTRODUCTION

This plan has been prepared in accordance with the terms of section 25A (5) of the Forestry Act 1916 with the objective of providing for the future management of that part of the Carabost State Forest No. 647, set aside as Carabost Flora Reserve No. 180.

Carabost Flora Reserve forms part of the dedicated reserve system for the Southern Region Forest Agreement.

## 2. KEY VALUES OF THE RESERVE

Carabost Flora Reserve has the following identified values requiring protection:

- **Remnant vegetation.** Much of the surrounding Tumbarumba – South West Slopes Region has been cleared for agricultural purposes and pine plantation. The Reserve contains a significant area of native vegetation, and is sufficient in size to sustain ecological communities.
- **Representative communities of terrestrial orchids** (family Orchidaceae) that are likely to have been removed from surrounding areas, with considerable reduction in occurrence and distribution. A rare natural hybrid *Chiloglottis x pescottiana* occurs within the Reserve.
- **Habitat for threatened and vulnerable fauna species.** Several bird species identified as Vulnerable in the NSW Threatened Species Conservation Act 1995 have been recorded within the Reserve, including *Pyrrolaemus sagittatus* (Speckled Warbler), *Neophema pulchella* (Turquoise parrot) and *Ninox connivens* (Barking Owl). Carabost Flora Reserve is also probable habitat for *Petaurus norfolcensis* (Squirrel Glider) – a species listed as Vulnerable that has been located in nearby Murraguldrie State Forest.

## 3. DESCRIPTION OF THE RESERVE

Refer to Appendices 1 and 2 for locality and topographic maps of the Reserve.

### 3.1 Location

Carabost Flora Reserve is within Carabost State Forest No. 647, managed by Hume Region, Forests NSW. It is located north-east of Holbrook and directly west of Rosewood. Primary access is via Carabost, along the Carabost - Coppabella Road, then Short Cut Road onto Western Access Road.

### **3.2 Exclusions**

Jocks Mountain has a small exclusion zone on the pinnacle (Carabost Trig Station).

Within State forest, the distance from the road or track in use to the Reserve boundary is 20m or 40 metres from the centreline of the road, depending on the particular location. Diagram F 1387 from Schedule 3, National Park Estate (Southern Region Reservations) Act 2000 No. 103 specifies the distance for each location.

### **3.3 Geography**

Carabost Flora Reserve includes an area of approximately 2800 ha, with elevation ranging from 400 - 800m ASL.

Jocks Mountain is a predominant feature of the local landscape, being clearly visible from the Tumbarumba-Wagga Road and sites along the Hume Highway. The topography is undulating to dissected, with some steep slopes.

The Reserve is predominantly northerly and easterly in aspect. The upper reaches of the Carabost Creek and several of its tributaries including Dead Dog Creek, Branch Creek and Horse Creek are located on the north eastern side of the Reserve, and all water flow within the Reserve is northerly and easterly in fall. Carabost Creek is a major creek draining into Umbango Creek, which flows into Tarcutta Creek and then the Murrumbidgee River.

*Pinus radiata* plantations managed by Forests NSW occur on the northern and eastern boundaries of the Reserve.

### **3.4 Geology and Soils**

The geology of the area is predominantly Ordovician quartzite metasediments, which were deposited in the warm shallow sea of the Wagga Marginal Basin (Wagga Wagga 1:250 000 Geological Series Sheet S1 55–15, 1966). Metamorphism occurred due to heat, folding and intrusion of igneous material during the middle to late Silurian period. A belt of Kyeamba (granitic) adamellite extends south from the Kyeamba Range into the Reserve.

The shale parent material produces primarily shallow lithosols. There are small areas of relatively stable Red Earths, and extremely erodible Yellow Solods. Red Earths are usually found on the lower hill slopes but not right into the gullies, which is where the Yellow Solods are found. The erodibility of the Yellow Solods is evidenced by some deep erosion gullies in Carabost State Forest (FCNSW 1984).

Kyeamba Adamellite weathers to form Earthy Sands. These soils are only weakly coherent, and highly porous, and therefore prone to erosion. High porosity of the B horizon, combined with a relatively impermeable C horizon, means that in wet

weather, soil moisture contents are extremely high and soil strength is extremely low. In areas of poor drainage, Kyeamba Adamellite weathers to form Red Solods, similar to Yellow Solods (FCNSW).

A soil profile (No. 29022) taken within the Reserve on an eastern facing granite ridge gave the following results:

Surface condition	hard set, well drained profile, very high erosion hazard
Layer 1	A2 horizon: pale sandy loam with massive structure (earthy), pH 5.5
Layer 2	B2 horizon: brown with moderate pedality, pH 5.0
Soil Type	Brown Kurosol (ASC), Brown Podzolic Soil (GSG)

A soil profile (No. 29023) taken within the Reserve on a north-easterly facing steep hillslope gave the following results :

Surface condition	hard set, imperfectly drained profile, high erosion hazard
Layer 1	A2 horizon: pale loamy sand with massive structure (earthy), pH 6.0
Layer 2	B2 horizon: yellow clayey sand with moderate pedality, pH 5.5
Soil Type	Yellow Dermosol (ASC), Yellow Earth ( GSG)

(NSW Dept. of Land & Water Conservation 1999 – 2002)

The combination of landscape significance, rocky outcrops and very erodible soils are the major features contributing to the area not being developed as plantation forest in the past.

### 3.5 Climate

The climate of the area has predominantly cool, wet winters with warm and drier summers. Figures provided are averages for Carabost State Forest from readings taken for the period 1938 – 1979. Data is from the Commonwealth Bureau of Meteorology website

[www.bom.gov.au/climate/averages/tables/cw\\_072014.shtml](http://www.bom.gov.au/climate/averages/tables/cw_072014.shtml).

Median annual rainfall	1009.8mm
Mean daily minimum temperature	0.7° Celcius
Mean daily maximum temperature	28.9° Celcius

The highest monthly rainfall occurs during winter and spring (May - October), although reasonable rainfall is experienced in the other months. The minimum

daily temperature recorded between 1938 and 1979 was  $-3.3^{\circ}$  C and the maximum  $38.9^{\circ}$  C.

### 3.6 Vegetation

Appendix 5 lists flora species identified in Carabost Flora Reserve.

*Eucalyptus macrorhyncha*, *E. dives*, *E. radiata* and *E. mannifera* are the dominant tree species within the Reserve. On the drier and skeletal upper slopes and ridges, the Red Stringybark Forest Type (FT 124) is dominant. Forest Types Peppermint (FT 111), Red Stringybark, Scribbly Gum/Brittle Gum (FT 125) and Peppermint – Mountain/Manna Gum (FT 131) are distributed over a wide range of sites, depending on aspect, soil fertility and water availability.

The flora and ecosystems within Carabost Flora Reserve provide an excellent reference point in a region that has experienced significant disturbance and removal of native vegetation. Areas within the Reserve are noted for the representative communities of terrestrial orchids (family ORCHIDACEAE) that have been reduced in population and distribution elsewhere.

The rare, naturally occurring hybrid terrestrial orchid *Chiloglottis x pescottiana* is found here. Logan (1984) states the hybrid does not persist in any one position, and dies out after approximately 3 to 4 years. However other plants appear elsewhere, indicating a constant crossing of the two parent species *C. gunnii* and *C. trapeziformis* is required to maintain a population in the wild.

### 3.7 Fauna

Appendix 5 lists recorded fauna species in the Reserve.

The Booroolong frog, *Litoria booroolongensis*, is recorded in the NPWS Atlas for Carabost Creek, Carabost. This species is listed as Endangered under the NSW Threatened Species Conservation Act 1995.

Three bird species listed as Vulnerable (Threatened Species Conservation Act 1995 schedule 2) have been recorded within Carabost Flora Reserve - the Turquoise Parrot, the Speckled Warbler and the Barking Owl.

The Turquoise Parrot, *Neophema pulchella*, occurs in eucalyptus woodlands and open forests, with a ground cover of grasses and low understorey of shrubs. Loss of habitat of this species has been associated with clearing, intensive logging, burning and grazing. Inappropriate fire regimes may remove nesting and feeding resources (NPWS 2004).

The Barking Owl, *Ninox connivens*, is at the top of the food chain, although the exact requirements of the species are not well known in terms of prey, habitat floristics and habitat structure. Woodland is the primary habitat of the Barking

Owl, which has declined dramatically due to clearing for agriculture and other human development (NPWS 2004).

The Speckled Warbler, *Pyrrolaemus sagittatus*, inhabits woodlands with a grassy understorey. The preferred foraging habitat of Speckled Warbler is areas with a combination of open grassy patches, leaf litter and shrub cover. This species is threatened by land clearing and fragmentation of habitat, including removal of dead timber. Nesting on the ground also makes them vulnerable to predation from foxes and cats (NPWS 2004).

A recent study into Squirrel Glider, *Petaurus norfolcensis*, populations in the Wagga Wagga local government area by van der Ree (unpubl.) found populations nearby at Murraguldrrie State Forest. This species is listed as Vulnerable under the Threatened Species Conservation Act 1995 and occurs in a wide variety of forest and woodland vegetation types, usually below 300m ASL. Their occurrence is dependent typically on the presence of large, hollow-bearing eucalypt trees, mixed-age stands and an understorey of flowering shrubs, particularly Acacia's. It is likely that populations of the Squirrel Glider occur within Carabost Flora Reserve.

## **4. HISTORY**

### **4.1 Indigenous Cultural Heritage**

Carabost Flora Reserve encompasses an area traditionally occupied and used by Wiradjuri clans at the Murrumbidgee and Murray Rivers.

These clan groups used the area as a semi-permanent home whilst journeying to the Bogong Ranges and the area is on the Brungle - Wiradjuri Line.

Traditional and contemporary cultural values are being re-established in the area through employment opportunities developed between local Wiradjuri Aboriginal groups and Forests NSW.

***This section of Carabost Flora Reserve Working Plan was prepared by Paul Williams and Heather Wighton, Community Development Employment Program, Wagga Wagga, in consultation with Alice Williams, Forests NSW Aboriginal Co-Ordinator, Tumut.***

### **4.2 Non-Indigenous Heritage**

Carabost Pastoral Run No.198 Map contains the general area of what is now Carabost Flora Reserve. The map indicates the area to be part of Carabost Forest Reserve, dedicated 30<sup>th</sup> March 1878 and marked as "Specially exempt from operations of ordinary timber licences" ([www.lpi.nsw.gov.au/maps/pmap](http://www.lpi.nsw.gov.au/maps/pmap)).

The northern section of what is now Carabost Flora Reserve is shown on the 1897 Carabost Parish, County Wynyard Map as Crown Lease Area 3683. This

map also shows Carabost Trig (now known as Jocks Mountain) as being notified on 13<sup>th</sup> May 1899 and marks the “Main Carabost Road” – the access track from Holbrook. That track is now part of Western Access Road, and another track marked forms part of the Western Fire Road.

### 4.3 Forest Management

Carabost State Forest was initially dedicated in 1918, and the southern part of the Reserve is within this area. The northern section of the Reserve was dedicated as State Forest in 1952. Other extensions to Carabost State Forest occurred in 1925, 1952, 1962, 1968 and 1990.

The area around Carabost Trig Station was cleared (probably pre-1950's) but has since revegetated.

Foliage from some areas of the Reserve was periodically cut for eucalyptus oil production up until the 1980's. Logging was conducted by Langheims Sawmill, Holbrook in the late 1970's – early 1980's.

Within what is now Carabost Flora Reserve were two pre-existing Flora Preserves, both created in 1992.

Jocks Mountain Flora Preserve No. 285 was approximately 490 ha of dry sclerophyll forest, containing mainly Red Stringybark (Forest type 124). The area was identified for its stands of *E.mannifera* on white granite boulder country. The forest was observed to have 'escaped the ravages of the 1952 fires and have good aesthetic and conservation values' (FCNSW). The presence of *Dipodium hamiltonianum* was also noted.

Pescottiana Forest Preserve No. 284 was approximately 87 ha of high site quality mountain gum and narrow-leaved peppermint (Type 131). Reservation was primarily for the protection of hybrid orchid *Chiloglottis x pescottiana*.

The two Forest Preserves were absorbed into Carabost Flora Reserve when it was established on 1<sup>st</sup> January 2001 through enactment of the National Park Estate (Southern Region Reservations) Act of 2000, Schedule 3.

### 4.4 Fire History

Since clearing for agriculture and the establishment of pine plantation on adjacent land, the natural fire regime at Carabost has been considerably modified. In a landscape that naturally experiences seasons of numerous dry storms and lightning strikes, the wildfire occurrence in the past 30 – 40 years has been reduced to virtually nil. This is a deliberate consequence of rapid detection and response to any fire outbreak by government and community agencies. The last wildfire reaching a significant size was in 1952, which was an extensive and severe wildfire in the region.

A firebreak has been constructed on the edges of the reserve separating native forest from pine plantation.

Many areas within the Flora Reserve were burnt regularly (every 4 to 5 years) during the 1980's and 1990's to reduce fuel loads. It is likely that these burns were predominantly 'edge burns' along controlled access lines. The total area burnt as well as fire intensity would have been highly variable. Records indicate whilst ridges and slopes had effective fuel reduction, the gullies were generally too wet to burn.

## **5. CURRENT USAGE**

Public usage of this area is low. There are no recreational facilities. The Reserve contains two research sites used for monitoring bird species.

## **6. MANAGEMENT**

### **6.1 Objectives of Management**

- To preserve native flora and fauna species in the Reserve.
- To protect examples of forest ecosystems in the area.
- To protect aboriginal cultural and archaeological values of the Reserve.
- To meet the expectations of the local community with respect to the management of the Reserve, consistent with State Forests legal and policy requirements.
- To protect the Reserve and neighbouring areas from wildfire.
- To maintain reference stands within the natural forest to provide for scientific study, and for assessing the effects of alternative land use in surrounding areas, consistent with the protection of the Reserve.

### **6.2 Management Issues**

The following issues will influence future management priorities. Over time these issues will change and require review. Many of the works program priorities identified in Appendix 6 are in response to these issues.

#### **6.2.1 Available archaeological and scientific data**

There is a limited amount of data available on flora and fauna species occurring within the Reserve, however work by orchid enthusiast Alan Logan in the 1970's and 1980's indicated the area to be important for the occurrence of many orchid

species. Further survey work would assist in assessment of values and development of appropriate management practices.

#### 6.2.2 Human impact on the site

Most of the Flora Reserve is reasonably intact native forest. There is a limited amount of illegal firewood collection.

#### 6.2.3 Road access and adjacent land management

The roads and tracks bounding and within the Reserve are of reasonably good condition. There is no identified need to develop further access tracks, however the condition of existing roads should be improved. Access is important for quick fire suppression, and improved drainage along some tracks will reduce the potential for erosion. Satisfactory access for harvesting vehicles to other areas of the forest is also required.

Management of the adjacent pine plantation by Hume Region must recognise the Forest Management Zone 1 values of the Reserve. Operations in adjacent areas will be performed in a manner not to cause damage or disturbance to the Reserve. Logs must not be stockpiled or loading sites constructed within Reserve boundaries, and if possible placed on the opposite side of the boundary roads.

#### 6.2.4 Weeds

Weeds such as Blackberry and St Johns Wort occur within the Reserve. The distribution and rate of spread of noxious weeds and other environmental weeds requires ongoing monitoring and if necessary, control.

There is also some limited infestation by pine wildlings (*Pinus radiata*). Removal of pine wildlings will required a range of techniques, determined by size of tree, safety and potential impact on surrounding vegetation.

#### 6.2.5 Feral animals

Predation by the European Red Fox (*Vulpes vulpes*) and feral cat (*Felis catus*) are Key Threatening Processes under the Threatened Species Conservation Act. Fox and cat populations should be monitored and baiting or trapping programs conducted, if necessary. To be effective, fox and cat baiting programs need to be done in association with neighbouring landholders.

Competition and grazing by the feral European rabbit is also an identified Key Threatening process. Rabbits may be present on some areas within the Flora Reserve.

### 6.2.6 Fire

The impact of uncontrolled wildfire on the wildlife in the Flora Reserve is likely to be severe, with alternative habitat sources either low in availability or non-existent. Exposure to invasion by weeds and feral animals is also likely to be high. There is responsibility for preventing wildlife from escaping from the Reserve and spreading to adjacent assets, including private property and pine plantation. Consequently, suppression of any wildfire would be a priority.

The impact of fire regimes on threatened or endangered species within the Reserve must be considered. The Department of Environment and Heritage recommends maintaining a “fire regime that establishes a mosaic of fire ages” for protection of the Turquoise Parrot (DEH, website 2005).

Prescribed burning is an activity permitted under standard conditions.

## **6.3 Future Management**

Carabost Flora Reserve will be managed by Hume Region, Forests NSW.

The following management priorities have been adopted:

- Maintenance of healthy forest condition in the Reserve to protect key values, consistent with the dynamic nature of forest ecosystems.
- Maintenance of existing roads and trails as required, consistent with the objectives of the Reserve. Boundary roads to be graded and gravelled as required to maintain access for firefighting, other management purposes and visitor use.
- Fuel management within the Reserve will be undertaken as part of the District Bush Fire Committee considerations and consistent with the Rural Fires Act 1997.
- Occupation and Special Purposes permits will only be issued for activities consistent with the objectives for the reserve. Hunting is permitted within the Reserve by holders of a Game Licence issued under the *Game and Feral Control Act 2002*.
- The boundary of the reserve must be checked and if necessary its location confirmed prior to commencement of any forestry operations in the vicinity of the Reserve. Operations in adjacent areas will be performed in a manner not to cause damage or disturbance to the Reserve.

Under the Forest Management Zoning (FMZ) system Carabost Flora Reserve is zoned FMZ 1 and therefore contributes to the dedicated (formal) Comprehensive Adequate and Representative reserve system in the Southern Region (Tumut Sub-Region). Management is to meet the requirements of JANIS dedicated

(formal) reserves. Refer to the Southern Region Forest Agreement 2002 for further details and definitions.

- Minister for Forestry approval by notice in the Gazette is required for new declarations, revocations or boundary amendment.

#### 6.3.1 Activities Not Permitted

The following activities are not permitted:

- Timber harvesting
- Removal of forest products and materials
- Grazing by domestic stock
- Gravel or hard rock quarrying
- Mineral and petroleum exploration and mining

#### 6.3.2 Activities permitted with Standard Conditions

The following activities will be permitted subject to standard conditions approved by the Regional Manager and consistent with the Integrated Forestry Operation Approval, Codes of Practice, Operational Circulars, protocols, Licenses and Management/Recovery Plans:

- Scientific studies (e.g., fauna surveys including trapping)
- Maintenance of existing roads and fire trails
- Limited tree removal for safety reasons or weed control only.
- Feral animal and noxious weed control
- General access for activities such as bush walking and photography
- Suppression of wildfire
- Prescribed burning

#### 6.3.3 Activities Permitted with Special Conditions

The following activities will be permitted subject to special conditions approved by the Regional Manager and consistent with Codes of Practice, Operational Circulars, protocols, licenses and Management/Recovery Plans:

#### **Construction of New Roads and Trails**

The construction of new roads and fire trails will be permitted with special conditions. (It is very unlikely that new construction in the Reserve will be

required, as existing roads adequately access the area). Construction will only be permitted in exceptional instances and consistent with the following principles:

- No practical alternative is available;
- The values of the Reserve will not be significantly affected by the road or fire trail;
- Opportunity is provided for public comment on the proposal; and
- Ministerial approval is given for the proposal.

## **7. MONITORING, REPORTING AND REVIEW**

Forests NSW will monitor:

- The output of scientific research and incorporate the results, where relevant into future management of the Reserve.
- The condition of the roads and fire trails and fuel accumulation in the Reserve.

The provisions of this Working Plan will be amended if necessary in light of the results of the monitoring program.

## **8. ACKNOWLEDGEMENTS**

This Working Plan was prepared by Gabriel Wilks, Forests NSW. The following people have contributed data, knowledge and expertise in the development of this document.

David Leslie, Ecologist, Riverina Region Forests NSW (fauna)  
Doug Binns, Ecologist, Forests NSW (flora)  
Duncan Watt, Planning Manager Hume Region, Forests NSW  
Alice Williams, Forests NSW Aboriginal Co-ordinator, Tumut (Indigenous culture)  
Janet Wild, Regional Soil Surveyor Murrumbidgee Region, Dept. of Natural Resources (geology and soils).

## **9. REFERENCES**

1. NSW Government (2002) *“Southern Region Forest Agreement”*
2. NSW Government (1995) *“Threatened Species Conservation Act – Schedule 2”*
3. NSW Dept. of Land & Water Conservation (1999 – 2002) *“Soil Profile Attribute Data Environment”* [www.canri.nsw.gov.au/spade.center.extent](http://www.canri.nsw.gov.au/spade.center.extent)
4. Commonwealth Bureau of Meteorology (2003) website  
[www.bom.gov.au/climate/averages/tables/cw\\_072035.shtml](http://www.bom.gov.au/climate/averages/tables/cw_072035.shtml)

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[www.deh.gov.au/biodiversity/threatened/action/birds2000/pubs/turquoise\\_parrot.pdf](http://www.deh.gov.au/biodiversity/threatened/action/birds2000/pubs/turquoise_parrot.pdf)
7. Logan, A.E. (1984) *“Orchids of the Carabost State Forest (West)”* pages 27 – 31 in *The Orchadian*, December 1984 issue.
8. Van der Ree (unpubl.): *Squirrel Glider populations in the Wagga Wagga Local Government area*. Results of a trapping survey for the National Parks and Wildlife Service of NSW. Australian Research Centre for Urban Ecology c/ - School of Botany, University of Melbourne 3010.
9. FCNSW (1984) *“Management Plan for Tumut Management Area”* January 1984
10. FCNSW (unpubl.) Native Forest preservation Program – Tumbarumba District File Notes 1991
11. NPWS (2004): ‘Threatened species profile for the Turquoise Parrot’  
[www.nationalparks.nsw.gov.au/PDFs/tsprofile\\_turquoise\\_parrot.pdf](http://www.nationalparks.nsw.gov.au/PDFs/tsprofile_turquoise_parrot.pdf)
12. NPWS (2004) *“Speckled warbler - vulnerable species listing: NSW Scientific Committee - final determination”*  
[www.nationalparks.nsw.gov.au/npws.nsf/Content/Speckled+warbler](http://www.nationalparks.nsw.gov.au/npws.nsf/Content/Speckled+warbler)
13. NPWS (2004) *“Barking Owl - vulnerable species listing: NSW Scientific Committee - final determination”*  
[www.nationalparks.nsw.gov.au/npws.nsf/Content/Barking+Owl](http://www.nationalparks.nsw.gov.au/npws.nsf/Content/Barking+Owl)

## 10. APPENDICES

Appendix 1 Locality Map

Appendix 2 Carabost Flora Reserve Topographic Map

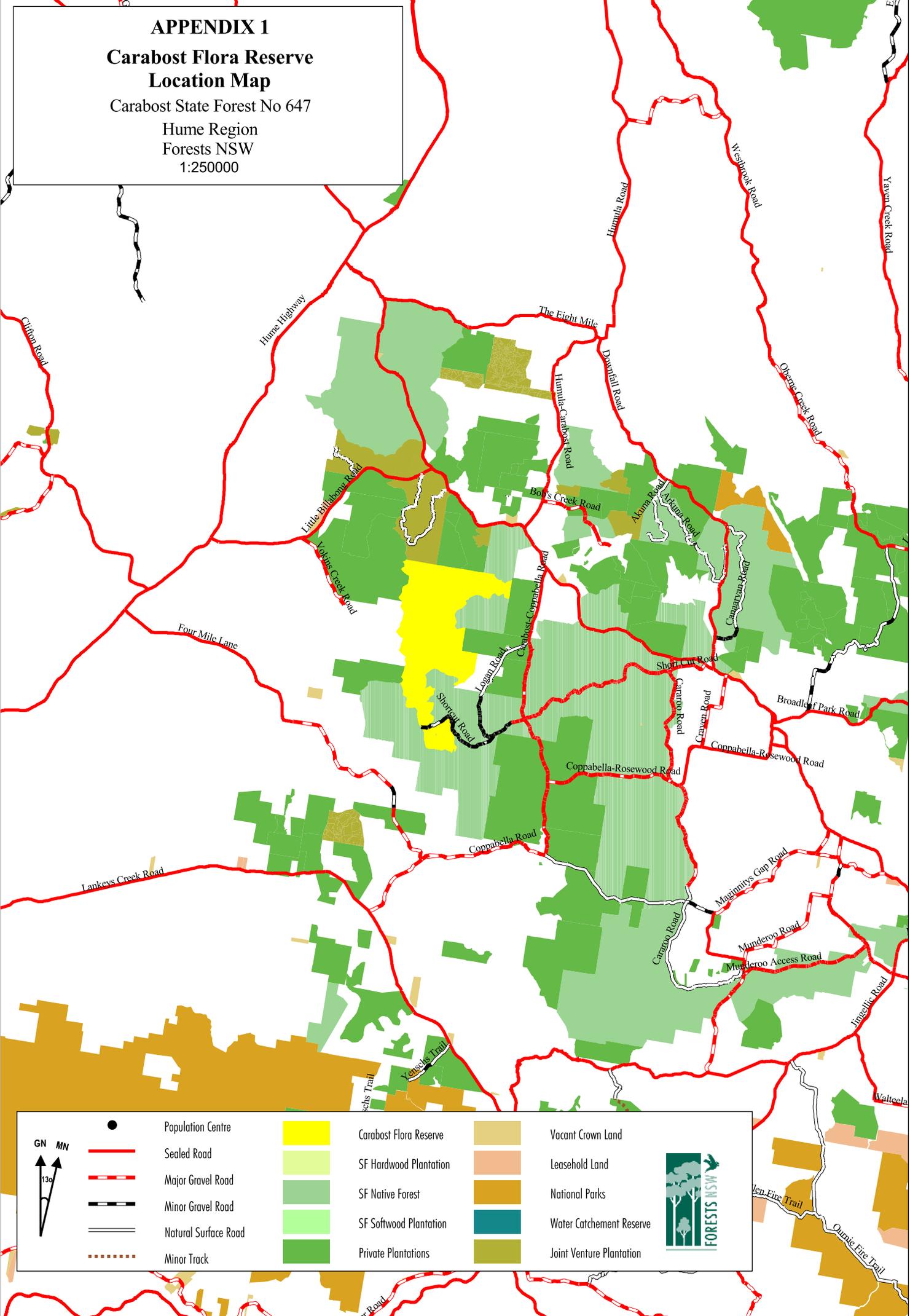
Appendix 3 Carabost FR Flora Species List

Appendix 4 Carabost FR Fauna Species List

# APPENDIX 1

## Carabost Flora Reserve Location Map

Carabost State Forest No 647  
Hume Region  
Forests NSW  
1:250000



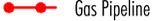
	Population Centre		Carabost Flora Reserve		Vacant Crown Land
	Sealed Road		SF Hardwood Plantation		Leasehold Land
	Major Gravel Road		SF Native Forest		National Parks
	Minor Gravel Road		SF Softwood Plantation		Water Catchment Reserve
	Natural Surface Road		Private Plantations		Joint Venture Plantation
	Minor Track				



# APPENDIX 2

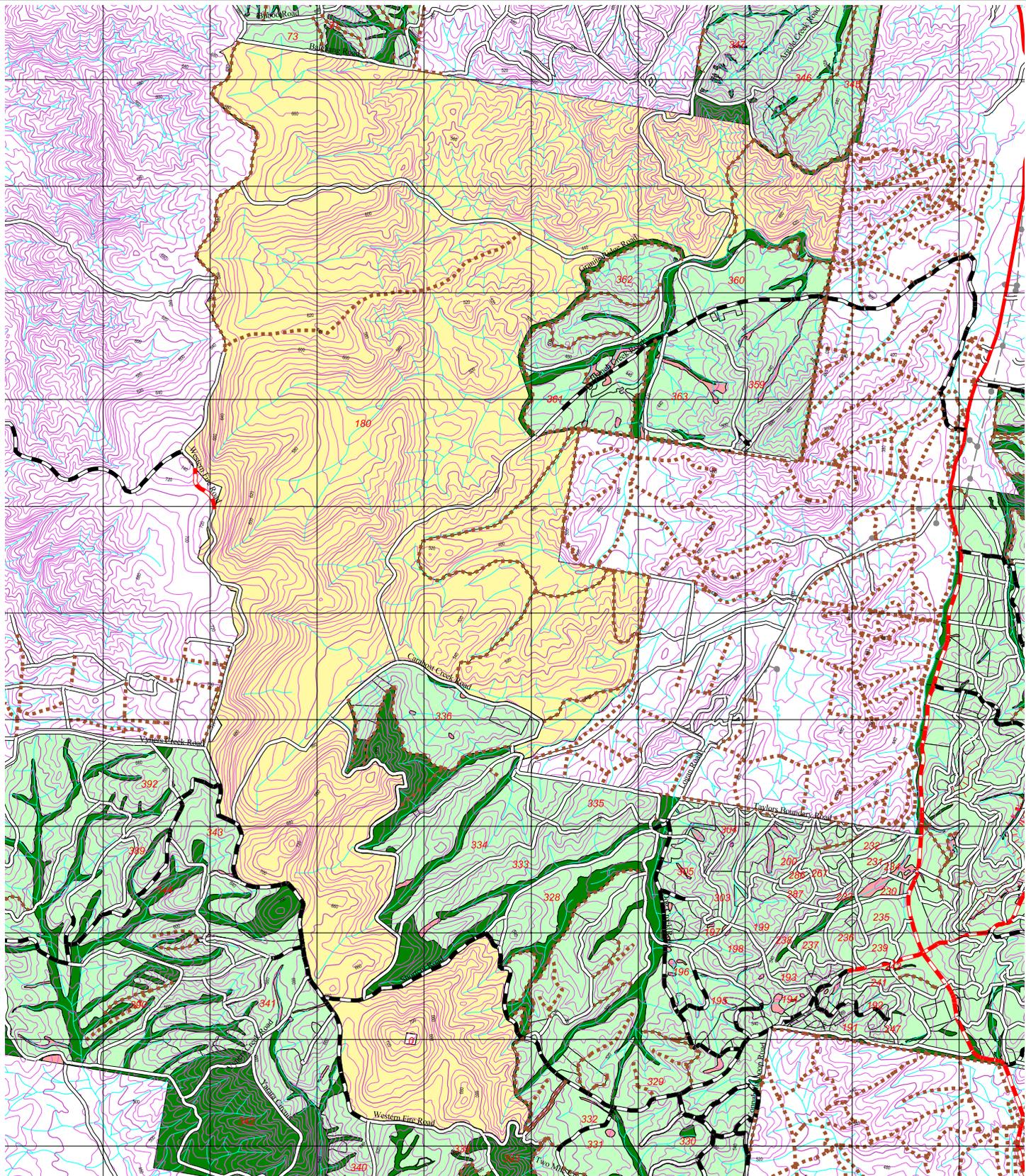
## Carabost Flora Reserve Topographical Map

Carabost State Forest No 647  
Hume Region  
Forests NSW

	Flora Reserve		Other Non-Plantation Area
	FNSW Plantation		Environmental Exclusion
	Powerline - 11-33kv; 66-132kv; 330-500kv		Major Contour
	Gas Pipeline		Minor Contour
	Closed Road		Drainage Line
	Sealed Road		
	Major Gravel Road		
	Minor Gravel Road		
	Natural Surface Road		
	Minor Track		



GN MN  
130  
1:50000



### Appendix 3 CARABOST FLORA RESERVE FLORA SPECIES LIST

#### References:

1. Forests NSW Flora Survey, Doug Binns & David Leslie, October 2003 and previous CRA surveys
2. A.E. Logan, "Wodara" Carabost: Correspondence to State Forests dated 23.5.1990.
3. A.E. Logan (1984): Orchid species recorded for Carabost S.F. (West)

\* indicates introduced species

FAMILY	SPECIES	REF.	NOTES
Adiantaceae	<i>Adiantum aethiopicum</i>	1,2	
Adiantaceae	<i>Cheilanthes austrotenuifolia</i>	1,2	
Anthericaceae	<i>Arthropodium milleflorum</i>	1	
Anthericaceae	<i>Arthropodium minus</i>	1	
Anthericaceae	<i>Dichopogon strictus</i>	1	
Anthericaceae	<i>Thysanotus patersonii</i>	1,2	
Anthericaceae	<i>Thysanotus tuberosus ssp tuberosus</i>	1,2	
Anthericaceae	<i>Tricoryne elatior</i>	1	
Apiaceae	<i>Daucus glochidiatus</i>	1	
Apiaceae	<i>Hydrocotyle laxiflora</i>	1	
Aspidiaceae	<i>Polystichum proliferum</i>	2	
Aspleniaceae	<i>Asplenium flabellifolium</i>	2	
Asteraceae	<i>Brachyscome aculeata</i>	1,2	
Asphodelaceae	<i>Bulbine bulbosa</i>	1	
Asteraceae	<i>Carduus pycnocephalus</i>	1	*
Asteraceae	<i>Carduus tenuiflorus</i>	1	*
Asteraceae	<i>Cassinia sp.</i>	1,2	
Asteraceae	<i>Chrysocephalum apiculatum</i>	1,2	
Asteraceae	<i>Chrysocephalum semipapposum</i>	2	
Asteraceae	<i>Cirsium vulgare</i>	1	*
Asteraceae	<i>Conyza bonariensis</i>	1	
Asteraceae	<i>Craspedia variabilis</i>	1,2	
Asteraceae	<i>Cymbonotus lawsonianus</i>	1	
Asteraceae	<i>Cymbonotus preissianus</i>	1	
Asteraceae	<i>Euchiton gymnocephalus</i>	1	
Asteraceae	<i>Euchiton sphaericus</i>	1	

Asteraceae	<i>Helichrysum scorpioides</i>	1,2	
Asteraceae	<i>Hypochaeris glabra</i>	1	*
Asteraceae	<i>Hypochaeris radicata</i>	1	*
Asteraceae	<i>Isoetopsis graminifolia</i>	1	
Asteraceae	<i>Lactuca serriola</i>	1	
Asteraceae	<i>Lagenifera stipitata</i>	1	
Asteraceae	<i>Microseris lanceolata</i>	1	
Asteraceae	<i>Senecio hispidulus</i> var <i>hispidulus</i>	1	
Asteraceae	<i>Senecio quadridentatus</i>	1	
Asteraceae	<i>Senecio tenuiflorus</i>	1	
Asteraceae	<i>Sonchus oleraceus</i>	1	*
Asteraceae	<i>Taraxacum officinale</i>	1	*
Asteraceae	<i>Triptilodiscus pygmaeus</i>	1	
Asteraceae	<i>Vittadinia dissecta</i>	2	
Boraginaceae	<i>Cynoglossum suaveolens</i>	1	
Boraginaceae	<i>Myosotis discolor</i>	1	
Campanulaceae	<i>Wahlenbergia gracilentia</i>	1	
Campanulaceae	<i>Wahlenbergia stricta</i> ssp <i>stricta</i>	1	
Casuarinaceae	<i>Allocasuarina verticillata</i>	2	
Caryophyllaceae	<i>Cerastium glomeratum</i>	1	
Caryophyllaceae	<i>Petrorhagia nanteuillii</i>	1	*
Clusiaceae	<i>Hypericum gramineum</i>	1	
Clusiaceae	<i>Hypericum perforatum</i>	1	*
Colchicaceae	<i>Burchardia umbellata</i>	1	
Colchicaceae	<i>Wurmbea dioica</i> ssp <i>dioica</i>	1	
Convolvulaceae	<i>Convolvulus erubescens</i>	1, 2	
Convolvulaceae	<i>Dichondra repens</i>	1	
Cyperaceae	<i>Carex appressa</i>	1	
Cyperaceae	<i>Carex inversa</i>	1	
Cyperaceae	<i>Eleocharis acuta</i>	1	
Cyperaceae	<i>Schoenus apogon</i>	1	
Dennstaeditaceae	<i>Calochlaena dubia</i>	2	
Dennstaeditaceae	<i>Pteridium esculentum</i>	1,2	
Dicksoniaceae	<i>Dicksonia antarctica</i>	1,2	
Dilleniaceae	<i>Hibbertia calycina</i>	1	
Dilleniaceae	<i>Hibbertia obtusifolia</i>	1, 2	
Dilleniaceae	<i>Hibbertia riparia</i>	1	
Dilleniaceae	<i>Hibbertia virgata</i>	2	Needs confirmation, possible rare species
Droseraceae	<i>Drosera auriculata</i>	1	
Epacridaceae	<i>Acrotriche serrulata</i>	1,2	

Epacridaceae	<i>Brachyloma daphnoides</i>	1,2	
Epacridaceae	<i>Leucopogon virgatus</i>	2	
Epacridaceae	<i>Melichrus urceolatus</i>	1,2	
Epacridaceae	<i>Monotoca scoparia</i>	1,2	
Euphorbiaceae	<i>Poranthera microphylla</i>	1,2	
Fabaceae	<i>Bossiaea sp.</i>	2	
Fabaceae (Faboideae)	<i>Daviesia latifolia</i>	1, 2	
Fabaceae (Faboideae)	<i>Daviesia leptophylla</i>	2	
Fabaceae (Faboideae)	<i>Desmodium varians</i>	1	
Fabaceae (Faboideae)	<i>Dillwynia phyllicoides</i>	1,2	
Fabaceae (Faboideae)	<i>Dillwynia sp.</i>	2	
Fabaceae (Faboideae)	<i>Glycine clandestina</i>	1,2	
Fabaceae (Faboideae)	<i>Glycine tabacina</i>	1	
Fabaceae (Faboideae)	<i>Hardenbergia violacea</i>	1,2	
Fabaceae (Faboideae)	<i>Hovea heterophylla</i>	2	
Fabaceae (Faboideae)	<i>Hovea linearis</i>	1	
Fabaceae (Faboideae)	<i>Indigofera australis var australis</i>	2	
Fabaceae (Faboideae)	<i>Oxylobium procumbens</i>	1,2	
Fabaceae (Faboideae)	<i>Platylobium formosum</i>	1,2	
Fabaceae (Faboideae)	<i>Trifolium arvense</i>	1	*
Fabaceae (Faboideae)	<i>Trifolium campestre</i>	1	*
Fabaceae (Faboideae)	<i>Trifolium dubium</i>	1	*
Fabaceae (Faboideae)	<i>Trifolium glomeratum</i>	1	*
Fabaceae (Mimosoideae)	<i>Acacia dealbata</i>	1	
Fabaceae (Mimosoideae)	<i>Acacia deanei ssp deanei</i>	1	
Fabaceae	<i>Acacia buxifolia</i>	2	

(Mimosoideae)			
Fabaceae (Mimosoideae)	<i>Acacia lanigera</i>	2	
Fabaceae (Mimosoideae)	<i>Acacia implexa</i>	2	
Fabaceae (Mimosoideae)	<i>Acacia melanoxylon</i>	2	
Fabaceae (Mimosoideae)	<i>Acacia paradoxa</i>	1,2	
Fabaceae (Mimosoideae)	<i>Acacia rubida</i>	2	
Fabaceae (Mimosoideae)	<i>Acacia vomeriformis</i>	2	
Gentianaceae	<i>Centaurium erythraea</i>	1	*
Gentianaceae	<i>Centaurium spicatum</i>	1	
Gentianeae	<i>Sebaea ovata</i>	2	
Geraniaceae	<i>Geranium solanderi</i> var <i>solanderi</i>	1	
Goodeniaceae	<i>Brunonia australis</i>	2	
Goodeniaceae	<i>Goodenia hederacea</i>	2	
Haloragaceae	<i>Gonocarpus tetragynus</i>	1	
Haloragaceae	<i>Haloragis heterophylla</i>	1	
Hypericaceae	<i>Hypericum gramineum</i>	2	
Hypoxidaceae	<i>Hypoxis hygrometrica</i> var. <i>hygrometrica</i>	1, 2	
Juncaceae	<i>Juncus bufonius</i>	1	*
Juncaceae	<i>Juncus filicaulis</i>	1	
Juncaceae	<i>Luzula flaccida</i>	1	
Lamiaceae	<i>Ajuga australis</i>	1,2	
Lamiaceae	<i>Lamium amplexicaule</i>	1	
Lamiaceae	<i>Scutellaria humilis</i>	1	
Lauraceae	<i>Cassythia melantha</i>	2	
Lentibulariaceae	<i>Utricularia dichotoma</i>	2	
Liliaceae	<i>Wurmbea dioica</i>	2	
Liliaceae	<i>Arthropodium milleflorum</i>	2	
Liliaceae	<i>Arthropodium minus</i>	2	
Liliaceae	<i>Bulbine bulbosa</i>	1,2	
Liliaceae	<i>Burchardia umbellata</i>	2	
Liliaceae	<i>Caesia parviflora</i>	2	
Liliaceae	<i>Dianella revoluta</i>	1,2	
Liliaceae	<i>Dichopogon strictus</i>	2	
Liliaceae	<i>Lomandra filiformis</i>	2	
Liliaceae	<i>Lomandra longifolia</i>	2	
Liliaceae	<i>Lomandra multiflora</i>	1,2	
Liliaceae	<i>Stypandra glauca</i>	1,2	

Lobeliaceae	<i>Istoma axillaris</i>	2	
Lobeliaceae	<i>Istoma fluviatilis</i>	2	
Lobeliaceae	<i>Lobelia gibbosa</i>	1,2	
Lobeliaceae	<i>Pratia pedunculata</i>	1	
Lomandraceae	<i>Lomandra bracteata</i>	1	
Lomandraceae	<i>Lomandra filiformis</i> ssp <i>coriacea</i>	1	
Lomandraceae	<i>Lomandra filiformis</i> ssp <i>filiformis</i>	1	
Lomandraceae	<i>Lomandra longifolia</i>	1	
Loranthaceae	<i>Amyema pendulum</i> ssp <i>pendulum</i>	1	
Myrtaceae	<i>Calytrix tetragona</i>	2	
Myrtaceae	<i>Eucalyptus blakeyi</i>	1,2	
Myrtaceae	<i>Eucalyptus bridgesiana</i>	1,2	
Myrtaceae	<i>Eucalyptus dives</i>	1,2	
Myrtaceae	<i>Eucalyptus macrorhyncha</i>	1,2	
Myrtaceae	<i>Eucalyptus melliodora</i>	1,2	
Myrtaceae	<i>Eucalyptus camphora</i>	1	
Myrtaceae	<i>Eucalyptus polyanthemos</i>	1,2	
Myrtaceae	<i>Eucalyptus robertsonii</i>	1,2	
Myrtaceae	<i>Eucalyptus mannifera</i>	1,2	
Myrtaceae	<i>Eucalyptus dalrympleana</i>	1,2	
Myrtaceae	<i>Leptospermum continentale</i>	1,2	
Myrtaceae	<i>Leptospermum multicaule</i>	2	
Ophioglossaceae	<i>Ophioglossum lusitanicum</i> subsp. <i>coriaceum</i>	1,2	
Orchidaceae	<i>Acianthus exsertus</i>	2,3	
Orchidaceae	<i>Caladenia carnea</i> var <i>carnea</i>	1	
Orchidaceae	<i>Caladenia gracilis</i>	1	
Orchidaceae	<i>Caladenia phaeoclavia</i>	1	
Orchidaceae	<i>Calochilus paludosus</i>	1,2,3	
Orchidaceae	<i>Calochilus robertsonii</i>	2,3	
Orchidaceae	<i>Chiloglottis valida</i>	1,2,3	
Orchidaceae	<i>Chiloglottis x pescottiana</i>	1,2,3	
Orchidaceae	<i>Chiloglottis</i> aff. <i>reflexa</i>	2,3	
Orchidaceae	<i>Chiloglottis trapeziformis</i>	2,3	
Orchidaceae	<i>Corybas diemenicus</i>	2,3	
Orchidaceae	<i>Corybas dilatatus</i>	2,3	
Orchidaceae	<i>Corybas hispidus</i>	2,3	
Orchidaceae	<i>Cyrtostylis reniformis</i>	2,3	Same as <i>gracilis</i>
Orchidaceae	<i>Cyrtostylis caerulea</i>	1,2,3	
Orchidaceae	<i>Cyrtostylis carnea</i>	2,3	
Orchidaceae	<i>Cyrtostylis congesta</i>	2,3	

Orchidaceae	<i>Cyrtostylis phaeoclavia</i>	2,3	
Orchidaceae	<i>Cyrtostylis gracilis</i>	3	
Orchidaceae	<i>Cyrtostylis aff. patersonii</i>	1,2,3	
Orchidaceae	<i>Cyrtostylis praecox</i>	2,3	Needs confirmation
Orchidaceae	<i>Cyrtostylis pusilla</i>	3	
Orchidaceae	<i>Cyrtostylis reniformis</i>	1	
Orchidaceae	<i>Dipodium hamiltonianum</i>	1,2,3	regionally rare
Orchidaceae	<i>Dipodium punctatum</i>	1,2,3	
Orchidaceae	<i>Diuris maculata</i>	2,3	
Orchidaceae	<i>Diuris lanceolata</i>	2,3	
Orchidaceae	<i>Diuris sulphurea</i>	1,2,3	
Orchidaceae	<i>Diuris sulphurea (peloral form)</i>	3	
Orchidaceae	<i>Eriochilus cucullatus</i>	1,2,3	
Orchidaceae	<i>Gastrodia sesamoides</i>	2,3	
Orchidaceae	<i>Genoplesium sp.</i>	2,3	
Orchidaceae	<i>Glossodia major</i>	1,3	
Orchidaceae	<i>Microtis rara</i>	1,3	
Orchidaceae	<i>Microtis unifolia</i>	1,2,3	
Orchidaceae	<i>Prasophyllum patens</i>	2,3	
Orchidaceae	<i>Pterostylis alata</i>	3	regionally rare
Orchidaceae	<i>Pterostylis bicolor</i>	1	
Orchidaceae	<i>Pterostylis curta</i>	2,3	
Orchidaceae	<i>Pterostylis decurva</i>	2,3	Probably same as <i>furcata</i>
Orchidaceae	<i>Pterostylis foliata</i>	2,3	
Orchidaceae	<i>Pterostylis furcata</i>	1,3	
Orchidaceae	<i>Pterostylis laxa</i>	2,3	
Orchidaceae	<i>Pterostylis longifolia</i>	2,3	
Orchidaceae	<i>Pterostylis mutica</i>	3	
Orchidaceae	<i>Pterostylis nana</i>	2,3	
Orchidaceae	<i>Pterostylis nutans</i>	1,2,3	
Orchidaceae	<i>Pterostylis parviflora</i>	2,3	
Orchidaceae	<i>Pterostylis pedunculata</i>	1,2,3	
Orchidaceae	<i>Pterostylis plumosa</i>	2	Rare in NSW, possible threatened species
Orchidaceae	<i>Pterostylis aff. revoluta</i>	2,3	
Orchidaceae	<i>Pterostylis x ingens</i>	2,3	
Orchidaceae	<i>Spiranthes sinensis subsp. australis</i>	3	
Orchidaceae	<i>Thelymitra aristata</i>	3	
Orchidaceae	<i>Thelymitra ixioides</i>	3	

Orchidaceae	<i>Thelymitra nuda</i>	3	
Orchidaceae	<i>Thelymitra pauciflora</i>	1,3	
Orchidaceae	<i>Thelymitra rubra</i>	3	
Onagraceae	<i>Epilobium billardierianum</i> ssp <i>cinereum</i>	1	
Oxalidaceae	<i>Oxalis perennans</i>	1,2	
Phormiaceae	<i>Dianella caerulea</i> var <i>caerulea</i>	1	
Phormiaceae	<i>Dianella revoluta</i> var <i>revoluta</i>	1	
Phormiaceae	<i>Stypandra glauca</i>	1	
Pittosporaceae	<i>Billardiera scandens</i>	2	
Pittosporaceae	<i>Cheiranthra cyanea</i> var. <i>cyanea</i>	1,2	
Pittosporaceae	<i>Rhytidosporum procumbens</i>	1,2	
Polygalaceae	<i>Comesperma ericinum</i>	2	
Plantaginaceae	<i>Plantago varia</i>	1	
Poaceae	<i>Aira caryophyllea</i>	1	*
Poaceae	<i>Aira elegantissima</i>	1	*
Poaceae	<i>Briza maxima</i>	1	*
Poaceae	<i>Briza minor</i>	1	*
Poaceae	<i>Bromus diandrus</i>	1	*
Poaceae	<i>Bromus hordeaceus</i>	1	*
Poaceae	<i>Danthonia pilosa</i> var <i>pilosa</i>	1	
Poaceae	<i>Dichelachne sieberiana</i>	1	
Poaceae	<i>Echinopogon ovatus</i>	1	
Poaceae	<i>Elymus scaber</i> var <i>scaber</i>	1	
Poaceae	<i>Joycea pallida</i>	1	
Poaceae	<i>Microlaena stipoides</i> var <i>stipoides</i>	1	
Poaceae	<i>Pentaschistis airoides</i>	1	*
Poaceae	<i>Poa sieberiana</i> var <i>hirtella</i>	1	
Poaceae	<i>Poa sieberiana</i> var <i>sieberiana</i>	1	
Poaceae	<i>Vulpia bromoides</i>	1	*
Poaceae	<i>Vulpia myuros</i>	1	*
Polygonaceae	<i>Rumex brownii</i>	1	
Primulaceae	<i>Anagallis arvensis</i>	1	*
Proteaceae	<i>Banksia marginata</i>	2	
Proteaceae	<i>Grevillea lanigera</i>	2	
Proteaceae	<i>Grevillea polybractea</i>	2	
Proteaceae	<i>Persoonia rigida</i>	2	
Ranunculaceae	<i>Clematis aristata</i>	2	
Ranunculaceae	<i>Ranunculus lappaceus</i>	1,2	
Ranunculaceae	<i>Ranunculus pachycarpus</i>	1	
Ranunculaceae	<i>Ranunculus pumilio</i> var <i>pumilio</i>	1	

Ranunculaceae	<i>Ranunculus sessiliflorus</i> var <i>sessiliflorus</i>	1	
Rhamnaceae	<i>Cryptandra amara</i>	2	
Rosaceae	<i>Acaena novae-zelandiae</i>	1,2	
Rosaceae	<i>Rubus parvifolius</i>	2	*
Rubiaceae	<i>Asperula scoparia</i>	2	
Rubiaceae	<i>Asperula conferta</i>	1	
Rubiaceae	<i>Galium murale</i>	1	
Rubiaceae	<i>Sherardia arvensis</i>	1	
Rutaceae	<i>Boronia nana</i>	2	
Santalaceae	<i>Exocarpus cupressiformis</i>	1,2	
Sapindaceae	<i>Dodonea viscosa</i> subsp. <i>cuneata</i>	1,2	
Scrophulariaceae	<i>Gratiola peruviana</i>	1,2	
Scrophulariaceae	<i>Derwentia perfoliata</i>	2	
Scrophulariaceae	<i>Linaria pelisseriana</i>	1	
Scrophulariaceae	<i>Orobanche minor</i>	1	*
Scrophulariaceae	<i>Veronica plebeia</i>	1	
Sinopteridaceae	<i>Cheilanthes sieberi</i> ssp <i>sieberi</i>	1	
Stackhousiaceae	<i>Stackhousia monogyna</i>	1,2	
Stylidiaceae	<i>Levenhookia dubia</i>	1	
Stylidiaceae	<i>Stylidium graminifolium</i>	1,2	
Thymelaeaceae	<i>Pimelia linifolia</i>	1,2	
Tremandraceae	<i>Tetratheca ciliata</i>	2	
Violaceae	<i>Viola betonicifolia</i> ssp <i>betonicifolia</i>	1, 2	
Violaceae	<i>Viola hederacea</i>	1,2	
Xanthorrhoeaceae	<i>Xanthorrhoea glauca</i> subsp. <i>angustifolia</i>	1,2	

## Appendix 4 Fauna Species List for Carabost Flora Reserve

### Status:

### Source:

1. Forests NSW Sightings, western Carabost S.F.

Status Key:	I	Introduced
	P	Protected
	V	Vulnerable (as per Threatened species Conservation Act 1995 schedule 2)
	E	Endangered (as per Threatened species Conservation Act 1995 schedule 2)

(This list is not comprehensive and additions are likely with further survey work)

### MAMMALS

FAMILY	SPECIES	COMMON NAME	STATUS	SOURCE
<b>MONOTREMATA</b>				
TACHGLOSSIDAE	<i>Tachyglossus aculeatus</i>	Echidna	P	1
<b>MARSUPIALIA</b>				
PHALANGERIDAE	<i>Trichosurus vulpecula</i>	Brushtail Possum	P	1
PETAURIDAE	<i>Pseudocheirus peregrinus</i>	Common Ringtail Possum	P	1
	<i>Petaurus breviceps</i>	Sugar Glider	P	1
MACROPODIDAE	<i>Wallabia bicolor</i>	Swamp Wallaby	P	1
	<i>Macropus giganteus</i>	Eastern Grey Kangaroo	P	1
	<i>Macropus rufogriseus</i>	Red-necked Wallaby	P	1
DASYURIDAE	<i>Antechinus stuartii</i>	Brown Antechinus	P	1
VOMBATIDAE	<i>Vombatus ursinus</i>	Common Wombat	P	1
<b>LAGOMORPHA</b>				
LEPORIDAE	<i>Lepus capensis</i>	European Hare	I	1
	<i>Oryctolagus cuniculus</i>	Rabbit	I	1
<b>CARNIVORA</b>				
CANIDAE	<i>Vulpes vulpes</i>	Fox	I	1
<b>ARTIODACTYLA</b>				
SUIDAE	<i>Sus scrofa</i>	Pig	I	1