PLANT COMMUNITIES OF MT BARROW & MT BARROW FALLS

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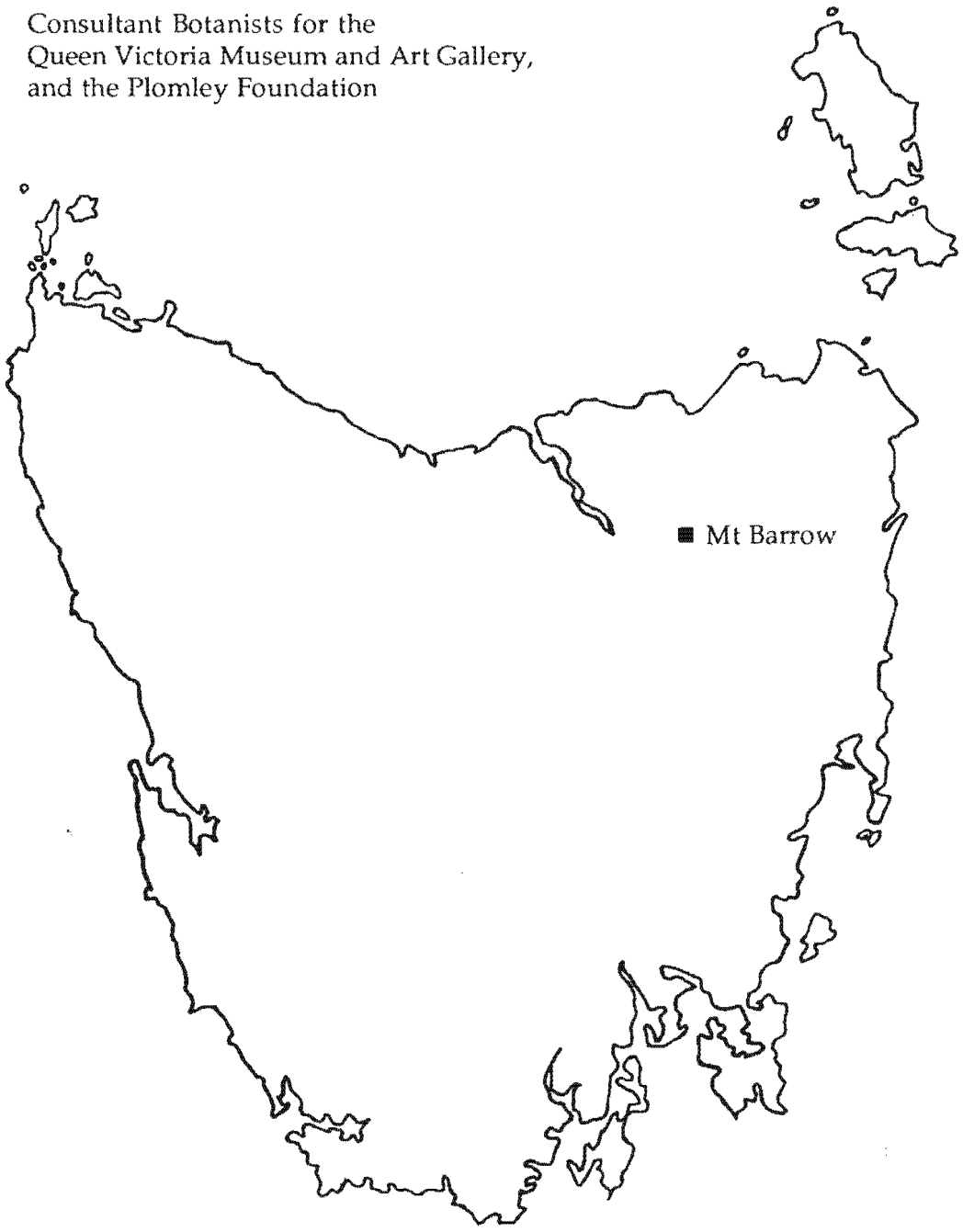

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BACKGROUND

OBJECTIVES OF THE STUDY

The authors received a brief from the Queen Victoria Museum and Art Gallery and the Plomley Foundation to conduct a botanical survey of the upper slopes and plateau of Mt. Barrow, (including all of the State Reserve as well as areas of surrounding State Forest) and the Mt. Barrow Falls State Reserve. The survey was to list the plant communities and vascular species and note the conservation significance of the area.
The major objectives of the study were to:-

(1) document the flora.
(2) describe and map the plant communities.
and (3) identify and describe the major patterns of variation in the vegetation.

LOCATION AND TOPOGRAPHY

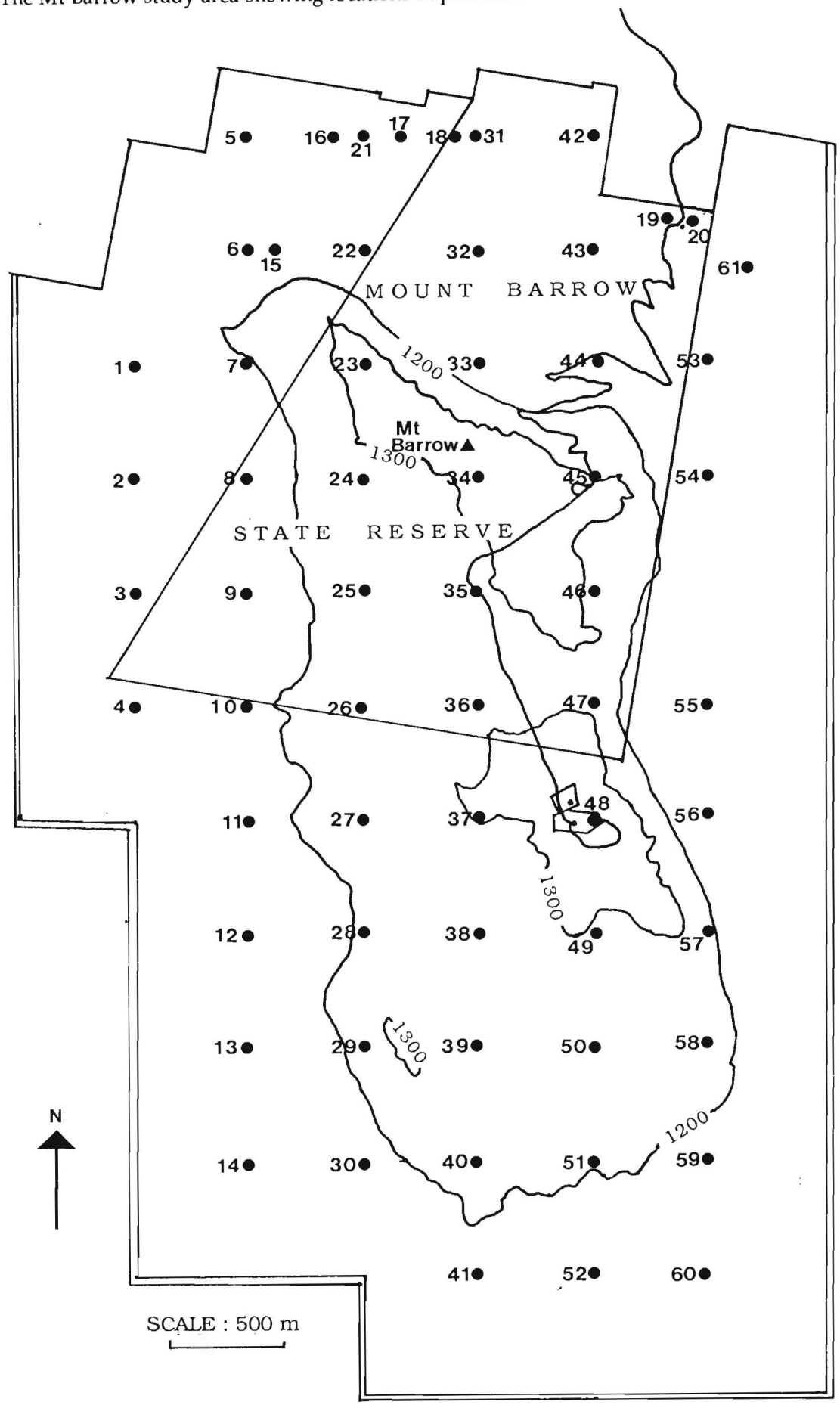
Mt. Barrow is situated in north-eastern Tasmania, at latitude 41° 24'S, longitude 147° 25'E, about 25km east of Launceston. It is part of the north-eastern massif, which is bounded to the north-west by Mt. Arthur, in the north-east by Mt. Victoria and by Ben Lomond in the south. Mt Barrow Falls State Reserve is located just below the north-western edge of the plateau.

The plateau is a roughly rectangular area of approximately 600 hectares, ranging in altitude from 1250m to over 1400m. Mt. Barrow at 1406m is the highest point on the northern part of the plateau, with South Barrow the dominant feature of the southern plateau. The eastern side of the plateau is slightly more elevated resulting in a predominantly westerly to north-westerly drainage pattern, but there are no major lakes or streams on the plateau as on Ben Lomond.

PHOTO 1: General view of the Mt Barrow plateau from the north, looking towards South Barrow.

MAP 1

The Mt Barrow study area showing locations of plot sites.



GEOLOGY AND GEOMORPHOLOGY

Davies (1965) described the mountains of Tasmania as belonging to two broad types. In the centre, east and south-east, they tend to be plateau-like in character, whereas in the west they tend to be ridge-like. This difference is caused by the underlying rocks - folded pre-Carboniferous rocks in the west, and post-Carboniferous more or less horizontal sediments intruded by granite and dolerite in the east.

The basement rocks of the north-eastern massif are slates, siltstones, greywackes and quartzite of the Mathinna Beds (Fish & Yaxley 1966). These were folded intensely during the Devonian Period, and subsequently intruded by granite. Peneplanation followed and later Permian and Triassic sediments known as the Parmeener Supergroup were deposited. During the Jurassic Period these were intruded by dolerite with sills up to 300m thick. The igneous rocks conform to and mimic the sedimentary structure and although there has been extensive faulting and uplifting, the general horizontal structure has been maintained (Caine 1983). The resulting mountains have the tabular form of the Fault-Structure Province typical of the north eastern mountains.

Geologically the Mt.Barrow Plateau is Jurassic dolerite. Sedimentary rocks of the Parmeener Supergroup are exposed at the surface at only two sites within the study area, but in other areas are concealed beneath a mantle of talus and slope deposits derived from the overlying dolerite. A wide variety of surficial materials due to weathering, mass wasting and erosion exist at Mt. Barrow, varying from saprolitic products of deep weathering to the coarse diamictons of talus and blockfields (Caine 1983). A highly localised area of granite occurs near the shelter shed within the State Reserve boundary.

Although there is ample evidence of glacial and periglacial activity on the highlands of Tasmania during the Pleistocene epoch, Mt. Barrow was not glaciated. The only plateau in the north-east to be glaciated was Ben Lomond (Caine 1983).

SOILS

The soils in the study area vary in response to topography, drainage and geology. Large areas are devoid of soils and characterised by exposures of dolerite bedrock and boulderfields.

Organic soils (peats) develop in areas of poor drainage subject to waterlogging on the alpine plateau. Nicolls and Dimmock (1971) refer to highland soils on dolerite as alpine humus soils with small areas of moor peats. These peats are mainly shallow (<10cm) in depth but are occasionally deep (>60cm). They are usually black to dark brown and often consist of a fibrous surface layer over a muck peat.

Mineral soils may be found in the better drained sites, and are mainly stony, shallow, uniform-textured clay loams, yellow-brown to yellow-red in colour and <30cm deep. Stony, deep (i.e. > 50cm) uniform-textured soils derived from dolerite tend to be restricted to the well drained slopes around the plateau. These soils tend to be yellow-brown to yellow-red in colour and a clay loam in texture.

Granitic soils are restricted to the park entrance and have been cleared for agriculture in the past. These now support old fields of regenerating native shrubs and grasses, with some introduced species (see Community 15). Soils derived from Mathinna Beds are also highly localised and restricted to the immediate vicinity of the entrance to the reserve and support rainforest.
All the soils in the study area are acidic and moderately to strongly leached. Chemical analyses of alpine soils from Ben Lomond have been conducted by Noble (1981). Pinkard (1980) described soils in the "Barrow Land System" with depths ranging from 0.1 to 0.8m .

CLIMATE

General

Tasmania has a temperate maritime climate with the prevailing weather dominated by a westerly airstream (the 'Roaring Forties') and a subtropical high pressure system.

In summer the belt of high pressure strengthens and is centred around 40° South. This weather brings mild to warm conditions especially to the north-eastern part of the State (Faulkner 1986).
During the winter months, the high pressure system weakens and moves northwards, allowing a more frequent penetration of temperate depressions and polar maritime air, bringing cooler, more moist conditions to the State.

Air temperature and precipitation records for Mt Barrow over the period 1961 to 1974 show the present climate to be a maritime periglacial one, in which freeze-thaw cycles and high soil and atmospheric humidities are common, but freezing does not penetrate far into the soil. (Caine 1983).

Rainfall

Rainfall is primarily frontal or orographic, and is heaviest during the winter months. The north-eastern massif forces the westerly air-stream up to over 1400m from the Midlands Valley and Tamar Basin. The winter rainfall is mainly a result of a series of cold fronts constantly sweeping across the State, but occasionally depressions in Bass Strait produce heavy rainfall and snow in the north-east (Faulkner 1986).

Rainfall records for Mt. Barrow are shown in Figure 1. The mean annual total rainfall is 1445mm, with an expected winter maximum.

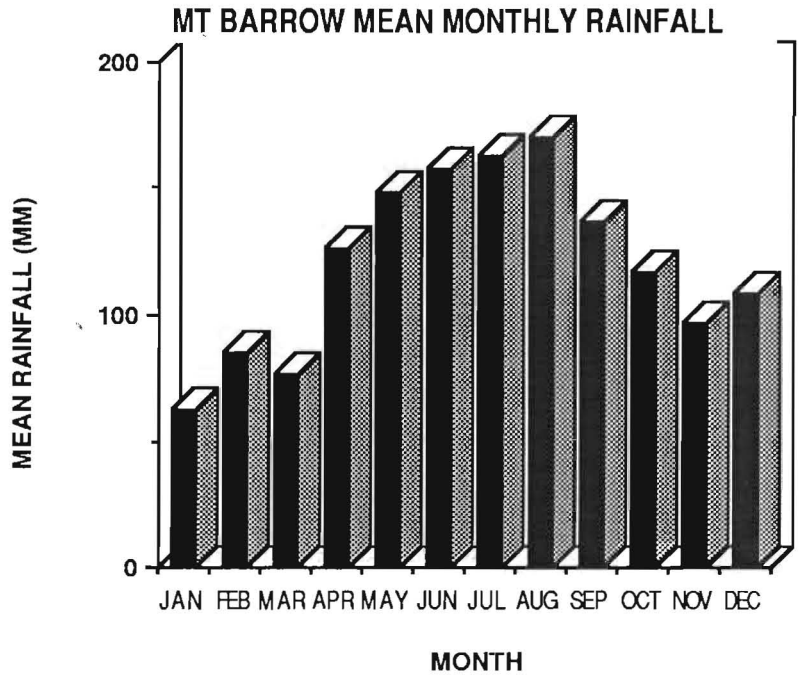


Figure 1; Mean monthly rainfall, Mt. Barrow, based on all available data from 1961-1974. (Commonwealth Bureau of Meteorology, Hobart.)

Temperature

Mean daily maximum and minimum temperatures were recorded at Mt. Barrow from 1965 to 1974. (Figures 2a and 2b).

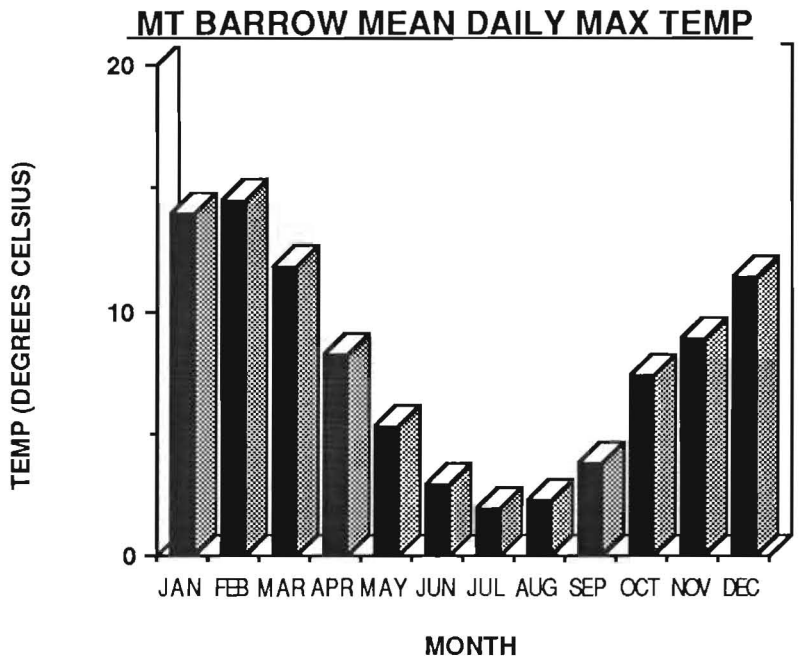


Figure 2a Mean maximum temp.(1965-1974)

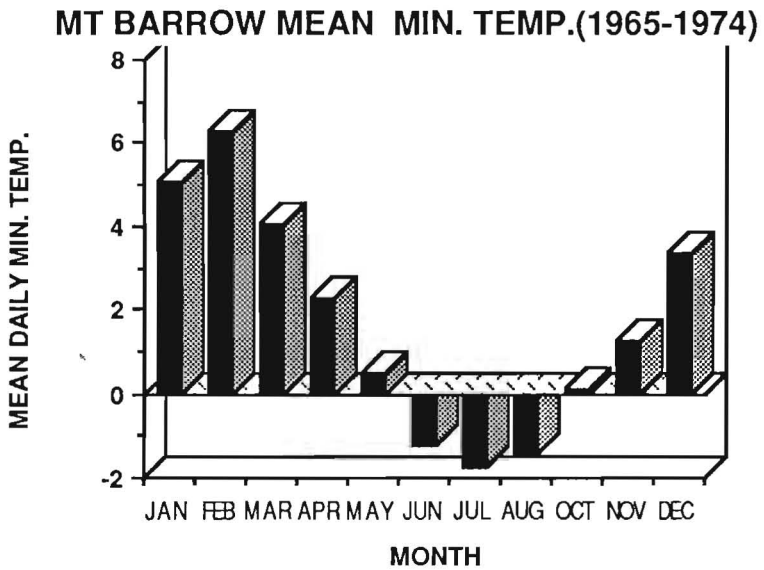


Figure 2b Mean daily minimum temps (1965-1974)

Frosts

As can be seen from the graph (Figure 3), frosts are most common from May to November with the greatest frequency being in July, but they may occur at any time of the year.

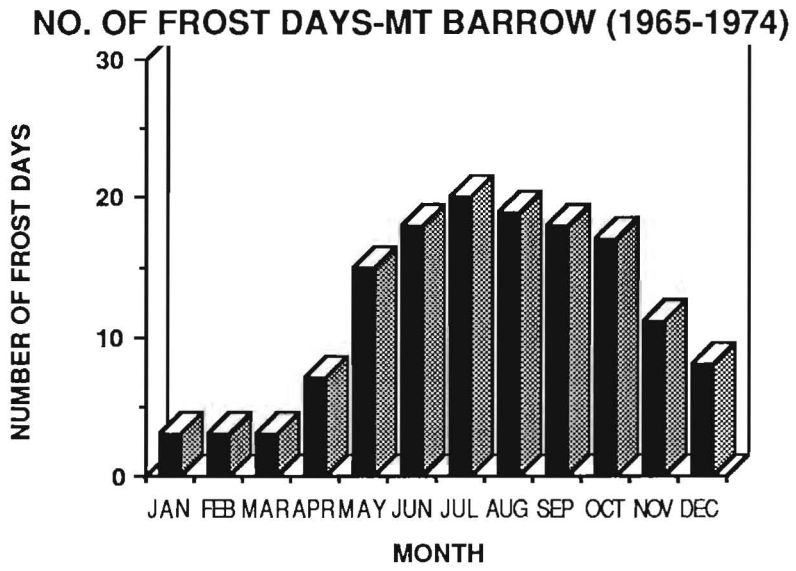


Figure 3; Number of Frost Days recorded at Mt. Barrow (1965-1974)

Snow

All areas in Tasmania experience snowfall from time to time. Snowfall is common in winter above 800m, but of the north-eastern mountains, only Ben Lomond has a regularly sustained snow cover (figure 4.).

Records of snow days from 1965 to 1974 show that snow may occur at any time of the year at Mt. Barrow, however it does not persist as on Ben Lomond, where snow may lie for up to four months on the slopes of Legges Tor (Caine 1983).

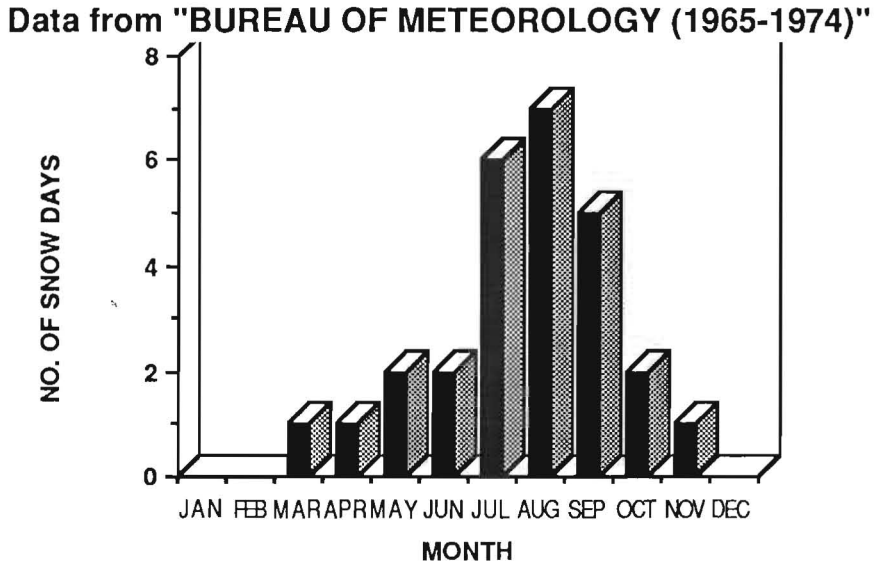


Figure 4; Number of Snow Days recorded at Mt. Barrow (1965-1974)

Wind

Strong buffetting winds are common in highland environments.
The month with the highest frequency of strong winds is May, whilst February has the lowest frequency (Figure 5)

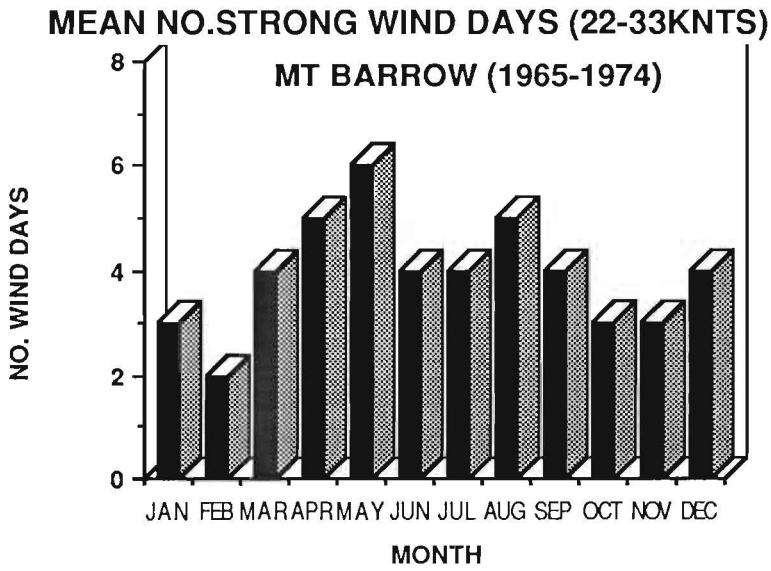


Figure 5 Mean Number of Strong Wind Days

DISTURBANCE

General

The most conspicuous disturbance to the vegetation on Mt. Barrow has resulted from road and carpark construction, and development associated with the Transmission Towers on Mt Barrow and South Barrow. Clearing of native vegetation occurs periodically under the power lines on the northern slopes of the Plateau. A number of old exotic conifers are present in the wet forest behind the picnic hut at the park entrance. One lone shrub of *Salix cinerea*, an exotic, was found in the reserve on the alpine plateau.

Fire

The Mt Barrow area has been subjected to fire and periodic drought over a long period of time. Signs of previous fire about 11 years ago are evident on the northern slopes of Mt Barrow (see mapping unit "Burnt" on Vegetation Map), on the western end of Mt Barrow itself, and on the plateau immediately south of the transmission towers on South Barrow. However there are also localised areas associated with fire protection afforded by boulderfields and topography which have been free of fire for long periods of time.

PREVIOUS VEGETATION STUDIES

Lists of plant communities found in the Mt Barrow State Reserve were documented by Jackson (1974) and based on community structure and floristics of the dominant stratum.

The area was also included in a statewide survey of tree-less high altitude areas of the State by Kirkpatrick (1982,1983). Botanical surveys of the Mt Victoria and Mt Maurice Forest Reserves in north-east Tasmania have been described in Davies (1988a) and (1988b).

Mt Barrow has strong botanical affinities with the Ben Lomond plateau which has been described by Davies and Davies (1989).

No detailed botanical survey of the Mt Barrow plateau or of the State Forest on the slopes around the plateau had been conducted before the present survey.

BOTANICAL SURVEY OF MT BARROW

SUMMARY

A botanical survey was conducted in an area of State Forest and State Reserve around Mt Barrow.

Species

A total of 187 native plant species was recorded in the Mt Barrow study area, representing 130 dicotyledons, 38 monocotyledons, and 19 fern and fern allies. A species list is at Appendix 3 which records their occurrence in State Reserve (SR) and State Forest (SF) respectively. The seven most common families Asteraceae, Poaceae, Epacridaceae, Cyperaceae, Rubiaceae, Proteaceae and Myrtaceae, account for about half the total native species recorded. One particular shrub, *Lissanthe montana* , was not recorded from Mt Barrow but was common at Ben Lomond. The most common species recorded in the study area were the herbs *Poa gunnii* and *Gentianella diemensis*, followed by the shrubs *Richea scoparia, Pentachondra pumila, Orites acicularis, Baeckea gunniana* and *Epacris serpyllifolia*. A list of the species present in the samples and their respective abundance is shown in Appendix 6.

Three species were of particular note. Firstly the endemic wattle species *Acacia axillaris* was recorded from Site 3 (G.R. 53350-41850) on the western side of the study area at an altitude of 1135m. A specimen has been lodged with the Tasmanian Herbarium. This species was found growing under "Subalpine *Leptospermum lanigerum* Scrub" (Community 2) and about a dozen plants were observed in the immediate vicinity through to a point about 1km southeast from the previously mentioned site. This species is presently not known to be reserved anywhere in the State. All the individuals observed in the area were located in State Forest and were outside the State Reserve, but it is possible that the species may be present in the south-western extremity of the Reserve. It normally grows in lowland riverine scrub on the St Pauls River, so this population at an altitude of 1120m is of particular interest. At this altitude the species is buffetted by strong winds rather than the periodic floods to which the riverine habitat is subjected.

Future studies are recommended to investigate this small population and consider whether an extension to the Mt Barrow reserve or the creation of a special Forest Reserve is appropriate.

The second species of interest was *Spyridium ulicinum* which was locally common in the subalpine and alpine heath on the south-western extremity of the plateau. It was recorded at Site 40 at an altitude of 1245m which is extremely high for this species. This particular form is notably hairy and requires further taxonomic studies.

A few individuals of the endemic shrub *Tetracarpaea tasmanica* were recorded on the western slopes of the Mt Barrow plateau growing under *Leptospermum lanigerum* scrub. Voucher specimens have been lodged in the Tasmanian Herbarium and the Queen Victoria Museum herbarium.

One plant community (Community 15) was of high conservation value and was associated with a small area of granitic soils near the park entrance. This community (Shrubby granitic grassland) occurs in an area that has been cleared in the past and contains some of the best soils in the park. The area which has been invaded by native and exotic plant species was the only site where the native *Luzula modesta* and the rare sedge *Carex raleighii* were recorded.

It is recommended that this granitic region be investigated as a possible northern extension to the Mt Barrow Reserve.It would also provide potential for development of a camping area, nature trails, and for general interpretation of the park for tourists as at present nothing is available. This could include a walking track up to the plateau following the existing power-line so that people had the option of walking down to the picnic hut from the plateau.

An unusual character of the study area was the absence of *Bauera rubioides* which is normally abundant in subalpine *Leptospermum lanigerum* communities.

PLANT COMMUNITIES

A total of 25 plant communities were identified. These were:-

(1) BOULDERFIELD COMMUNITY
(2) SUBALPINE LEPTOSPERMUM LANIGERUM SCRUB.
(3) EUCALYPTUS GUNNII SCRUB
(4) RICHEA SCOPARIA-EMPODISMA MINUS-POA GUNNII GRASSY SHRUBLAND
(5) SUBALPINE SHRUBBY EUCALYPTUS DELEGATENSIS -LEPTOSPERMUM LANIGERUM DAMP FOREST
(6) SUBALPINE THAMNIC RAINFOREST SCRUB
(7) MONOTOCA EMPETRIFOLIA DRY ROCK HEATH
(8) RICHEA SPRENGELIOIDES-ORITES REVOLUTA ROCKY SHRUBLAND
(9) RICHEA SCOPARIA-OLEARIA LEDIFOLIA ROCKY SHRUBLAND
(10) ORITES REVOLUTA DRY HEATH
(11) SHRUBBY/GRASSY EUCALYPTUS DELEGATENSIS DRY SCLEROPHYLL FOREST
(12) EUCALYPTUS DELEGATENSIS-NOTHOFAGUS CUNNINGHAMII SCRUB
(13) FERNY EUCALYPTUS DELEGATENSIS-TASMANNIA LANCEOLATA DAMP SCLEROPHYLL FOREST
(14) SHRUBBY EUCALYPTUS DELEGATENSIS-OLEARIA PHLOGOPAPPA - HELICHRYSUM ANTENNARIUM DRY SCLEROPHYLL FOREST
(15) SHRUBBY GRANITIC GRASSLAND
(16) EUCALYPTUS DELEGATENSIS-CORREA LAWRENCIANA DAMP SCLEROPHYLL FOREST
(17) BOULDERY EUCALYPTUS DELEGATENSIS -CYATHODES GLAUCA-BEDFORDIA SALICINA DAMP SCLEROPHYLL FOREST
(18) EUCALYPTUS DELEGATENSIS-POMADERRIS APETALA-BEDFORDIA SALICINA WET SCLEROPHYLL FOREST
(19) CALLIDENDROUS RAINFOREST SCRUB
(20) CALLIDENDROUS EUCALYPTUS DELEGATENSIS-NOTHOFAGUS CUNNINGHAMII-BEDFORDIA SALICINA MIXED FOREST
(21) TALL LEPTOSPERMUM LANIGERUM SCRUB
(22) EUCALYPTUS DELEGATENSIS-POMADERRIS APETALA-OLEARIA ARGOPHYLLA-BEDFORDIA SALICINA WET SCLEROPHYLL FOREST
(23) ACACIA DEALBATA WET FOREST
(24) CALLIDENDROUS RAINFOREST
(25) EUCALYPTUS DELEGATENSIS-LEPTOSPERMUM LANIGERUM-OLEARIA ARGOPHYLLA WET SCLEROPHYLL FOREST

Altitude appears to be the major factor influencing the distribution of the communities, with drainage and aspect also important. The forested north-facing slopes were particularly diverse and supported a complex mosaic of wet, damp, dry, mixed forest and rainforest communities. This contrasted with the protected less diverse south-facing slopes, which supported mainly dry and damp sclerophyll forest, with localised patches of rainforest scrub. The tree-line was predominantly formed by *Eucalyptus archeri* except on the north and south-facing slopes where it was formed by *Eucalyptus delegatensis*.

Conservation Status

One of the long-term objectives in conservation is to preserve the greatest diversity of ecosystems, a wide range of plant and animal species, and a wide variety of heterogeneous habitats in which evolution may occur. The montane and sub-alpine communities represented at Mt. Barrow are all considered adequately protected in State Reserves and National Parks in Tasmania except for Community 15 (Shrubby Granitic Grassland) and possibly Community 24 (*Acacia dealbata* Wet Forest). Further studies are recommended for both these communities to document their floristics and assess their present conservation status.

The alpine communities found at Mt. Barrow are also adequately reserved, with such communities having the most satisfactory conservation status of the vegetation types in Tasmania (Duncan & Brown 1985).

It is recommended that a review be made of the present State Reserve/State Forest boundaries in the region. The present boundary on the alpine plateau dissects the area into State Forest in the south and mainly State Reserve in the north. This boundary consists of lines drawn on a map which ignore natural landforms. It is suggested that the State Reserve boundary be extended to the south to follow the natural landform boundary along the edge of the alpine plateau. This would extend the Reserve to include the interesting floristic zone on the southwestern corner which contains the only known population of *Spyridium ulicinum* on the plateau. It is also suggested that the boundary be extended to include the extreme northwestern area of alpine plateau which includes the rare endemic wattle species *Acacia axillaris*, which is not known to be reserved anywhere in the State.

DESCRIPTION OF THE MT BARROW PLANT COMMUNITIES AND THEIR RESERVATION STATUS

COMMUNITY 1

BOULDERFIELD COMMUNITY

Community 1 consists of lichen-dominated areas on boulderfields and is characterised by the conspicuous absence of both higher plant species and soil development. It was found at Sites 2, 8, 25, 33, 51, 55, 56 and 57. Approximately 13% of the study area was occupied by this community which is most extensively developed on the north to north-western slopes of Mt Barrow, and immediately off the plateau at the south to south-eastern extremity of the study region. (See Mapping unit "Bare Rock Scree" on Vegetation Map). The Mt Barrow access road crosses this community on the steep northern slopes as the road climbs up to the plateau surface. The community is extremely well drained and drought prone, but also provides fire protection for patches of Rainforest Scrub (See Community No. 19). Extremely rare occurrences of higher plants occur. These are mainly grasses such as *Deyeuxia monticola* and *Danthonia diemenica*, which can grow on a rocky substrate or species such as *Hierochloe fraseri* and *Poa labillardieri* which grow between the rocks. In the dampest and most protected sites the hook-sedge *(Uncinia compacta)* forms small clumps with mats of the filmy fern, *Hymenophyllum peltatum*. Woody shrubs are extremely rare but individuals of snowberry, *Gaultheria hispida* may be found.

PHOTO 2: Community 1 (Boulderfield) on the southern end of the Mt Barrow plateau.

RESERVATION STATUS

The community is well represented around the State in reserves that contain highland dolerite country, in particular the Cradle Mt-Lake St Clair, Mt Field and Hartz Mt National Parks, and Mt Barrow and Ben Lomond State Reserves.

COMMUNITY 2

SUBALPINE LEPTOSPERMUM LANIGERUM SCRUB.

This subalpine scrub community was found at altitudes of 1110m to 1168m just below the tree-line, on the western edge of the study area (Sites 3, 4, 9, 10 and 30). The dominant species are *Leptospermum lanigerum* <5.0m in height, with *Eucalyptus archeri* also present. Other woody shrubs include *Baeckea gunniana, Bellendena montana,* and in the drier sites, *Pultenaea juniperina* and *Cryptandra alpina* . Groundcover species include *Poa gunnii, Empodisma minus* and *Lycopodium fastigiatum.* In steeper sites, more shrubs such as *Richea scoparia* and *Olearia phlogopappa* are found, and groundcover species are fewer. (See "Subalpine *Leptospermum lanigerum* Scrub" on vegetation map).

One site (Site 3) in this community contained the endemic species *Acacia axillaris* which is not known to be reserved in Tasmania. The species is usually found in scrub in lowland areas near the Elizabeth and St. Pauls Rivers.

With the increased topographic protection which is common on the eastern upper slopes the community merges into *Nothofagus* Scrub (communities 6 and 19)

RESERVATION STATUS

One species in this community is of particular note. *Acacia axillaris* is an endemic which is not protected in any State Reserve in Tasmania. It grows under tea-tree scrub, particularly in areas with a rocky substrate. The species was first observed in site 3, at an altitude of 1130 m A.S.L. About 15 other shrubs of *Acacia axillaris* were also seen in the vicinity, but all were just outside (south) of the State Reserve boundary in subalpine scrub designated as State Forest. One individual was seen beside the creek-line at G.R. 53350-41810 in an area burnt before 1980. This location is only about 25 m south of the reserve.

COMMUNITY 3

EUCALYPTUS GUNNII SCRUB

This community is found on the edge of a moor below the western edge of the plateau (Site 14). It is the only site in the study area where *Eucalyptus gunnii* was sampled. The site is poorly drained and dominated by *Baeckea gunniana* and *Callistemon viridiflorus* shrubs to a height of about 1 metre, with *Eucalyptus gunnii* emerging from this shrub layer to a height of about 8m. Other shrubs present include *Cyathodes parvifolia, Epacris gunnii,* and *Leptospermum rupestre.* Ground cover species include *Oreobolus distichus, Hydrocotyle sibthorpioides, Rubus gunniana, Velleia montana* and *Gonocarpus micranthus* .

This community is found at an altitude of 1025m. At higher altitudes *Eucalyptus gunnii* is replaced by *E. archeri,* which forms the tree-line on the north-eastern mountains, except on the north- and south-facing slopes where the tree-line is formed by *Eucalyptus delegatensis.* The community is found on the edges of mapping unit "Subalpine Moorland"on the vegetation map (Appendix 2).

RESERVATION STATUS

The community is reserved in a number of reserves around the State. It has been described on the Overland track in the Cradle Mt-Lake St Clair National Park between Windy Ridge and Narcissus by Davies (1990). It has also been described in the Broad River Valley (Mt Field National Park) by Davies (1978).

Photo 3: The subalpine moorland to the west of Mt Barrow which contains *Eucalyptus gunnii* scrub. Access to the region is via the Weavers Creek track.

COMMUNITY 4

RICHEA SCOPARIA-EMPODISMA MINUS-POA GUNNII GRASSY SHRUBLAND

This community is one of the most widespread in the study area and was found in about 10% of sites (Sites 27, 35, 36, 38, 39 and 50). It occurs typically on flat areas of alpine plateau and is characterised by the presence of the woody shrub *Richea scoparia* (<1.0m in height) over a ground cover dominated by *Empodisma minus*. It is found within mapping unit "Richea scoparia Moorland" on the vegetation map (Appendix 2).

The community is found in well to poorly drained sites at altitudes from 1270-1290m. Other woody shrubs present include *Epacris serpyllifolia, Baeckea gunniana,* and *Orites acicularis* while *Empodisma minus* and *Poa gunnii* are common groundcover species. In better drained sites (e.g. Site 36) *Richea acerosa* and *Phebalium montanum* are found, and *Lycopodium fastigiatum, Astelia alpina* and *Carpha alpina* grow in the poorer drained sites (e.g. Sites 38, 39, 50).

Other species typically present include *Orites revoluta, Bellendena montana, Grevillea australis, Tasmannia lanceolata, Oreobolus pumilio, Exocarpos humifusus, Pentachondra pumila, Oreobolus distichus* and *Gentianella diemensis*. In the very poorly drained sites, *Myriophyllum pedunculatum, Restio australis* and *Carex gaudichaudiana* can be found. *Coprosma moorei* was found at one site (Site 50) in this community.

RESERVATION STATUS

This community is well represented in other State Reserves and National Parks around the State including the Mt Field, Cradle Mt-Lake St Clair, Ben Lomond and Walls of Jerusalem National Parks.

COMMUNITY 5

SUBALPINE SHRUBBY EUCALYPTUS DELEGATENSIS -LEPTOSPERMUM LANIGERUM DAMP FOREST

This community was sampled at one site (Site 11) on the western edge of the Mt. Barrow plateau, at an altitude of 1120m. It is mostly found in mapping unit "Damp Eucalypt Forest" on the vegetation map (Appendix 2).
The community is dominated by *Eucalyptus delegatensis* to a height of up to 27m, over a tall understorey of woolly tea-tree, *Leptospermum lanigerum*. Other species present include the shrubs *Orites revoluta, Coprosma nitida, Tasmannia lanceolata,* (native pepper) and *Telopea truncata* (Waratah).
The ground cover is dominated by the clubmoss *Lycopodium fastigiatum,* with the common buzzy *Acaena novae-zelandiae* and *Geranium potentilloides* also present.
This community is similar to community DEL0011 described by Kirkpatrick et. al. (1988) but differs due to the presence of a second stratum of *Leptospermum lanigerum* and the shrubby ground cover of *Orites revoluta.*

RESERVATION STATUS

The community is widespread in the higher altitude areas of the Cradle Mt -Lake St Clair National Park. It has been described along the overland track by Davies (1990) and is also probably present in the Mt Field and Ben Lomond National Parks.

COMMUNITY 6

SUBALPINE THAMNIC RAINFOREST SCRUB

This community was sampled at Site 28, is present at an altitude of 1215m, on a sloping, well drained site below the western edge of the plateau. It is commonly found in mapping unit "Subalpine Rainforest Scrub" and "Subalpine *Leptospermum lanigerum* Scrub" on the vegetation map (Appendix 2).

It is dominated by myrtle, *Nothofagus cunninghamii,* growing to <5m over a shrubby understorey which includes *Tasmannia lanceolata, Telopea truncata, Coprosma nitida, Cyathodes parvifolia, Bellendena montana* and *Orites revoluta* .

Groundcover species include *Poa gunnii* and *Coprosma nitida. Richea scoparia* is present in the vicinity and as the community typically occurs near the tree-line old stags of *Eucalyptus archeri* are also present. The community contrasts with another subalpine rainforest scrub community (Community 19) in that it had a shrubby rather than open ground cover.

This community does not fit into any of the rainforest communities described by Jarman et al (1974). Here it differs in being present at a higher altitude, and is not as tall.

RESERVATION STATUS

The community is probably also present in the Ben Lomond and Cradle Mt -Lake St Clair National Parks.

COMMUNITY 7

MONOTOCA EMPETRIFOLIA DRY ROCK HEATH

This community was found on an extremely well-drained site (Site 7) with a warm northerly aspect, at an altitude of 1180m. The community is found in mapping unit "Rocky Alpine Shrubland" on the vegetation map (Appendix 2).

The community is low in height (<1m) with a large proportion of exposed rock and shallow soils over which the dominant species *Monotoca empetrifolia* spreads. Other species present include *Richea sprengelioides, Pultenaea juniperina, Pentachondra pumila, Helichrysum hookeri, Leptospermum lanigerum* and *Westringia rubiaefolia.* The large area of rock exposure acts as a heat bank and provides protection from extreme cold. The woody shrubs *Richea scoparia* and *Hakea lissosperma* were in the vicinity.

The community is most closely related to the "Dry Rock Heath" community described on the Ben Lomond Plateau by Davies & Davies (1989). The Mt Barrow community differs by the constant presence of *Helichrysum hookeri.*

RESERVATION STATUS

It is probable that this community is well represented in other State Reserves and National Parks including Mt Field, Cradle Mt -Lake St Clair, and Walls of Jerusalem.

COMMUNITY 8

RICHEA SPRENGELIOIDES-ORITES REVOLUTA ROCKY SHRUBLAND

This alpine community is common on the plateau between altitudes of 1230m and 1250m and typically exploits intermediate to well drained sites. It was sampled at Sites 24, 26, 29 and 40 and is typically found in mapping unit "Rocky Alpine Shrubland" on the vegetation map (Appendix 2).

It is characterised by the presence of woody shrubs below 2.0m in height with *Orites revoluta, Richea sprengelioides, Tasmannia lanceolata* and *Helichrysum hookeri* common species. Other shrubs present include *Richea scoparia, Oxylobium ellipticum* and *Baeckea gunniana.* Groundcover species include *Lycopodium fastigiatum, Poa gunnii, Monotoca empetrifolia, Cyathodes parvifolia* and *Westringia rubiaefolia.*

The community is similar to that described as "*Richea sprengelioides -Richea scoparia* Scree Shrubland" by Davies & Davies (1989) for the Ben Lomond Plateau and "Community 6" at Mt Victoria as described by Davies (1988a).

RESERVATION STATUS

The community is commonly found on high dolerite mountains around the State and is present in the Mt Field, Cradle Mt.-Lake St Clair, Ben Lomond and South West National Parks.

Photo 4: Typical habitat for Community 8 (*Richea sprengelioides- Orites revoluta* Rocky shrubland) on the warmer north-facing slopes of Mt Barrow. (Note the hang-glider).

COMMUNITY 9

RICHEA SCOPARIA-OLEARIA LEDIFOLIA ROCKY SHRUBLAND

This widespread community was found at Sites 23, 34, 37, 46, 49 and 58 at altitudes above 1260m, and includes the highest (1400m) altitude site (23) sampled at Mt. Barrow. The sites were well to excessively drained and typically occurred on protected, cold, rocky, south to southeast facing slopes within mapping unit "Rocky Alpine Shrubland" (see Appendix 2).

The community is generally less than 1.0m in height, and dominated by the woody shrubs *Richea scoparia* and *Olearia ledifolia*. Other shrubs commonly present are *Tasmannia lanceolata, Bellendena montana, Helichrysum backhousii var. kingii, Orites revoluta* and *Richea sprengelioides*. The rocky groundcover includes the grass *Poa gunnii*, the clubmoss *Lycopodium fastigiatum* and the daisy Celmisia *asteliifolia* .

RESERVATION STATUS

This alpine community is found on dolerite mountains around the State. It is probably also present in the Mt Field, Ben Lomond, Hartz Mt., Walls of Jerusalem and Cradle Mt-Lake St Clair National Parks.

COMMUNITY 10

ORITES REVOLUTA DRY HEATH

This community was sampled at a height of 1270m on the eastern edge of the Mt. Barrow plateau. The site (Site 47) is well-drained, with a warm north-easterly aspect and the community is generally found in the warmer sites of mapping unit "Rocky Alpine Shrubland" (Appendix 2).

The heath is dominated by *Orites revoluta*, with the shrubs *Tasmannia lanceolata, Cyathodes parvifolia, Olearia phlogopappa, Richea sprengelioides, Westringia rubiaefolia, Bellendena montana* and *Leptospermum rupestre* also commonly present. Groundcover species include seedlings of *Tasmannia lanceolata*, the grasses *Poa gunnii*, and *Deyeuxia monticola* and the fern *Polystichum proliferum.*

The community is characterised by a low species diversity with very few groundcover herbs and often develops on the edges of boulderfields. It is closely related to the "*Eucalyptus archeri-Orites revoluta* Dry Scrub Community" described on the Ben Lomond Plateau by Davies &Davies (1989), but differs in not having *Eucalyptus archeri* present.

RESERVATION STATUS

The community is commonly found on dolerite mountains around the State.

It is present in the Mt Field, Hartz Mt., Cradle Mt.-Lake St Clair and South West National Parks.

COMMUNITY 11

SHRUBBY/GRASSY EUCALYPTUS DELEGATENSIS DRY SCLEROPHYLL FOREST

This community was found in State Forest at the southern end of the study area on flat to gently sloping well-drained sites between 987 and 1050m altitude. It is generally found in mapping unit "Dry Sclerophyll Forest" (see Appendix 2). The sites (41, 52 and 60) were in the upper catchment of Musselboro Creek. The dominant species is *Eucalyptus delegatensis*, (over 27m in height in some sites) with the understorey varying from shrubby in the rockiest most well-drained sites, to grassy in the least rocky areas. The open shrubby understorey is dominated by *Cyathodes parvifolia*, with *Cyathodes glauca* and *Tasmannia lanceolata* commonly present. Other shrub species include *Oxylobium ellipticum, Hakea lissosperma, Coprosma nitida* and *Pultenaea juniperina.* Areas with the grassy ground cover contain *Poa labillardieri* and *Deyeuxia monticola*, with *Acaena novae-zelandiae, Geranium potentilloides, Epilobium sarmentaceum* and *Wahlenbergia sp* also present. In one protected site (Site 60) the shrubby understorey tended towards damp sclerophyll forest and contained *Bedfordia salicina, Lomatia tinctoria* and *Persoonia muelleri.*

RESERVATION STATUS

Shrubby *Eucalyptus delegatensis* forest is common on upland landforms throughout Tasmania. Duncan & Brown (1985) consider its conservation status as fair and list its presence in a number of the larger reserves in the State including Maria Island, Ben Lomond, Mt Field, and St Marys Pass National Parks, and The Steppes State Reserve on the Central Plateau. It is also probably present in the Cradle Mt-Lake St Clair, Walls of Jerusalem, and Franklin-Lower Gordon Wild Rivers National Parks.

COMMUNITY 12

EUCALYPTUS DELEGATENSIS-NOTHOFAGUS CUNNINGHAMII SCRUB

This community was recorded at Site 44 at an altitude of 1100m, on a well-drained north-facing slope near the access road. It is generally found in mapping unit "Subalpine Rainforest Scrub" (see Appendix 2). The community is dominated by *Eucalyptus delegatensis* 5-8m in height, over a dense understorey of *Nothofagus cunninghamii* (<5m) and *Tasmannia lanceolata*, with occasional shrubs of *Coprosma nitida, Pimelea drupacea, Phebalium squameum var. retusum*, and *Aristotelia peduncularis*. Groundcover species include *Acaena novae-zelandiae, Lycopodium fastigiatum* and *Polystichum proliferum*.

Due to this sites warm aspect, it represents the upper altitudinal limit of *E. delegatensis* which forms the eucalypt tree-line on the northern and southern slopes of the plateau. On the western and eastern slopes the tree-line is formed by *Eucalyptus archeri*.

RESERVATION STATUS

This community is probably found only in north-eastern and eastern of Tasmania where the subalpine scrub near the tree-line includes *Eucalyptus delegatensis* rather than the snow-gum *Eucalyptus coccifera*. The community is also reserved in the Ben Lomond National Park, and is probably also present in the Maria Island National Park.

COMMUNITY 13

FERNY EUCALYPTUS DELEGATENSIS OVER TASMANNIA LANCEOLATA DAMP SCLEROPHYLL FOREST

This community grows on well-drained, west to south-east facing slopes between 1060 and 1120m (see Sites 12, 13 and 59) and is typically found in the forest mapping units "Damp Eucalypt Forest", "Wet Eucalypt Forest (Old Growth)" and "Dry Sclerophyll Forest" on the vegetation map (Appendix 2).

It is dominated by *Eucalyptus delegatensis* up to 41m in height, over a dense understorey of shrubs of *Tasmannia lanceolata* greater than 1.0m in height. Other common understorey shrub species are *Coprosma nitida* and *Cyathodes parvifolia*, with *Eucalyptus archeri* present in the higher altitude sites near the tree-line. The ground cover is dominated by the ferns *Blechnum penna-marina* and *Polystichum proliferum* but in the rockier sites *Cardamine gunnii* becomes common between the rocks. The woody shrubs *Pultenaea juniperina* and *Orites revoluta* are more common in the drier sites.

The community is close to that described by Kirkpatrick et al (1988) as *"E. delegatensis-Telopea truncata* subalpine wet sclerophyll forest (DEL0011)" but differs because the broad-leafed shrub *Bedfordia salicina* and the silver wattle *Acacia dealbata* are absent, the community being well above the normal altitudinal limit (>1150m) for both these species. It is also close to the dry sclerophyll community described by Duncan and Brown (1985) as "Shrubby subalpine E. delegatensis Forest" but differs in having an understorey dominated by the shrub *Tasmannia lanceolata*. The community is therefore not a classic wet or dry sclerophyll community and therefore has been described as damp sclerophyll.

RESERVATION STATUS

The reservation status of this community is difficult to discuss because the community does not fit easily into descriptions in the literature. It is probably present in the Mt Field, Cradle Mt-Lake St Clair, Ben Lomond, and Franklin-Lower Gordon Wild Rivers National Parks.

COMMUNITY 14

SHRUBBY EUCALYPTUS DELEGATENSIS OVER OLEARIA PHLOGOPAPPA-HELICHRYSUM ANTENNARIUM DRY SCLEROPHYLL FOREST

This community was found on warm, northern, well-drained slopes at altitudes between 1098 and 1120m, (Sites 1,15, 22) and is typically found in mapping unit "Dry Sclerophyll Forest". The dominant species is *Eucalyptus delegatensis* between 8 and 15m in height, over an understorey containing *Olearia phlogopappa* and sometimes *Leptospermum lanigerum.* Other shrubs such as *Helichrysum antennarium, Telopea truncata, Pultenaea juniperina, Cyathodes parvifolia* and *Westringia rubiaefolia* may also be present. The ground cover is typically species depauperate with only a few species such as *Hydrocotyle sibthorpioides* and *Galium australe* present below a fern layer of *Polystichum proliferum.*

The community is closely related to the community described by Kirkpatrick et al (1988) as "*E. delegatensis-Olearia phlogopappa-Olearia viscosa* subalpine wet sclerophyll forest (DEL0010)" however it differs in not having the broad leaved shrub understorey of that community. It also broadly fits into the dry sclerophyll forest type described as "shrubby subalpine *E. delegatensis* forest" by Duncan and Brown (1985).

RESERVATION STATUS

The community is probably reserved in the Ben Lomond, Cradle Mt-Lake St Clair, Walls of Jerusalem, Mt Field, South West and Hartz Mt National Parks.

COMMUNITY 15

SHRUBBY GRANITIC GRASSLAND

A small area of this community was recorded inside the State Reserve associated with granitic soils near the public shelter hut near the park entrance (Site 20). It occurs in mapping unit "Granitic Shrubby Grassland" on the vegetation map (Appendix 2).

The site is at an altitude of 895m and is well-drained. The area has been cleared in the past, but has since been invaded by various native plant species including the silver wattle, *Acacia dealbata,* native pepper,*Tasmannia lanceolata* and the daisy shrub,*Olearia phlogopappa.* The groundcover includes a number of weed species but is dominated by the grasses *Poa labillardieri* and *Australopyrum pectinatum.* Numerous herbaceous species are also present including *Hydrocotyle hirta, Geranium sessiliflorum, Galium australe,* and *Cotula sp.,* with sporadic occurrences of the prickly shrub *Cyathodes parvifolia.*

This was the only site where *Luzula modesta* and the rare sedge *Carex raleighii* were recorded.

The community closely fits the community described by Kirkpatrick et al (1988) as "*Eucalyptus delegatensis -Australopyrum pectinatum* grassy woodland (Ed)" but differs structurally in being more a grassland and not containing *Eucalyptus delegatensis,* although the species is present in the vicinity.

Photo 5: Community 15 (Shrubby Granitic Grassland) near the park entrance, with Mt Barrow behind.

RESERVATION STATUS

Although this community is highly localised and limited in extent within the Mt Barrow State Reserve it is of high conservation value. Very few highland grassland communities are reserved in State Reserves in Tasmania due to their grazing potential.

Kirkpatrick et al (op. cit) describe community as "Ed "which occurs on well-drained sites with moderate to deep non-rocky soils on granite and basalt and state that the structural community is unreserved, although similar forests are mentioned that occur in the Cradle Mt - Lake St Clair National Park.

It is recommended that a study be undertaken to assess the possibility of extending the northern boundary of the Mt Barrow Reserve to include more of this granite country. This would entail looking at the feasibility of acquiring part or all of the private block 0789 or changing the tenure of the State Forest block number 0183 to State Reserve or alternatively making it a Forest Reserve. The combination of spectacular views of Mt Barrow, rainforest to grassland vegetation and picturesque granite creek-lines makes the area a possibility for development as a camping and general interpretation area.

COMMUNITY 16

EUCALYPTUS DELEGATENSIS-CORREA LAWRENCIANA DAMP SCLEROPHYLL FOREST

This community was sampled at an altitude of 1050m on the forested slopes below the north-eastern end of the plateau (Site 54). It typically occurs in mapping unit "Wet Eucalypt Forest (regrowth)" on the vegetation map (Appendix 2).

The site was well-drained, with an easterly aspect. The community is dominated by *Eucalyptus delegatensis* (8-15m high) with some shorter *E. archeri* mixed with tall shrubs of *Notelaea ligustrina* and *Telopea truncata* (<8m), over a dense understorey (<2.5m) dominated by *Correa lawrenciana*. Other shrubs species present in this stratum include *Olearia phlogopappa* and *Nothofagus cunninghamii*, whilst the fern *Polystichum proliferum* is common at heights below about 1m. The groundcover species (<0.1m) include *Tasmannia lanceolata, Drymophila cyanocarpa, Geranium potentilloides, Acaena novae-zelandiae* and *Pimelea drupacea* .

The community does not fit easily into any of the *Eucalyptus delegatensis* wet forest groups described by Kirkpatrick et al (1988) but broadly fits into the "Shrubby *Eucalyptus delegatensis* forest" described by Duncan & Brown (1985).

RESERVATION STATUS

Most of this community is located outside the Mt Barrow State Reserve on the northeast to east facing upper slopes in State Forest. The community is probably more extensively reserved in the Ben Lomond National Park and may also be present in the Mt Field, Cradle Mt-Lake St Clair, Maria Island, Franklin-Lower Gordon Wild Rivers and Walls of Jerusalem National Parks.

COMMUNITY 17

BOULDERY EUCALYPTUS DELEGATENSIS-CYATHODES GLAUCA-BEDFORDIA SALICINA DAMP SCLEROPHYLL FOREST

This community was sampled in State Forest at the relatively low altitude of 880m on a well-drained, gently sloping site (Site 17) with a northerly aspect. It typically occurs in the mapping unit "Wet Eucalypt Forest (Old Growth)" on the vegetation map (Appendix 2).

The dominant species is old-growth *Eucalyptus delegatensis* (27-41m tall) over a low (1-2.5m) open shrub cover of the broad-leaved species *Bedfordia salicina*, with *Cyathodes glauca* also present. The understorey also contains the creeper *Billardiera longiflora* and the shrubs *Notelaea ligustrina, Helichrysum antennarium, Cassinia aculeata, Coprosma hirtella, Olearia argophylla* and *E. delegatensis* seedlings(<2.5m). These young seedlings reflect the relatively high light levels associated with the openness of the bouldery ground, and the low shrub height (<2.5m) of this community. The groundcover includes the fern *Microsorum diversifolium* growing between rocks which contrasts markedly with its usual epiphytic growth habit on the mossy trunks of trees in wet rainforest. *Acacia verniciflua* was observed immediately downslope and becomes an important component of the forest understorey at lower altitudes.

The community was only sampled in State Forest. It closely fits the community described by Kirkpatrick et al (1988) as *"Eucalyptus delegatensis-Acacia melanoxylon-Bedfordia salicina* Wet Sclerophyll Forest (DEL0001)" but differs in not containing *Acacia melanoxylon*.

RESERVATION STATUS

This community is listed as unreserved by Kirkpatrick et al (1988) but is well represented at least in the Mt Field National Park on the east facing slopes below Davis Look-out. It is also probably present in the Maria Island, Ben Lomond and Walls of Jerusalem National Parks.

COMMUNITY 18

EUCALYPTUS DELEGATENSIS-POMADERRIS APETALA-BEDFORDIA SALICINA WET SCLEROPHYLL FOREST

This community was sampled on well drained north-facing slopes within State Forest at an altitude of 920m (Site 16) and typically occurred in mapping unit "Wet Eucalypt Forest (Old Growth)" on the vegetation map (Appendix 2).

It is characterised by tall (41-55m) *Eucalyptus delegatensis* over a dense, low understorey (<5m) of the broad leaved shrubs *Bedfordia salicina* and *Pomaderris apetala.* Other species occasionally present include low shrubs (<1m) of *Olearia argophylla, Telopea truncata* and *Pultenaea juniperina.* The ground cover (<0.1m) was notably bare and typically lacked ferns and shrubs and consisted of an extensive cover of moss and litter.

The community is similar to that described by Kirkpatrick et al (1988) as "*Eucalyptus delegatensis-Atherosperma moschatum-Olearia argophylla* wet sclerophyll/mixed forest (DEL0110)", but tends to be drier with a notable absence of *Atherosperma moschatum, Acacia dealbata* and ferns in the understorey.

RESERVATION STATUS

Kirkpatrick et al (1988) list community "DEL0110" as present in the Croesus Caves, Mt Field and Mt Barrow State Reserves. It is also present in the Barrow Falls State Reserve and is probably also present in the Ben Lomond National Park.

COMMUNITY 19

CALLIDENDROUS RAINFOREST SCRUB

This picturesque rainforest scrub community was found in State Forest at an altitude of 1025m growing in a topographically protected flat site on extremely well-drained scree (Site 6). The community occurs in mapping unit "Subalpine Rainforest Scrub" on the vegetation map (Appendix 2) and is characterised by its low species diversity. Only three higher plant species were recorded at this site. The dominant species is *Nothofagus cunninghamii,* which forms a dense canopy at a height between 5-8m, with moss cover extending from the ground up the trunks of *Nothofagus cunninghamii* to a height of about 5m. The only shrub present in the sparse understorey (other than seedlings of *Nothofagus*) is *Telopea truncata* which is present between 1-2.5m. The bouldery ground is covered by extensive mats of the filmy fern *Hymenophyllum peltatum* and *Nothofagus* litter. The community is topographically protected from fire.

This community fits into the broad description by Jarman et al (1984) for "High altitude callidendrous rainforest C2(a)".

RESERVATION STATUS

Jarman et al list "High altitude callidendrous rainforest C2(a)" as reserved in the Cradle Mt-Lake St Clair National Park and Mt Barrow State Reserve. It is also known to be reserved in the Ben Lomond National Park along the Ford River near Jacobs Ladder, and in the Mt Victoria and Mt Maurice Forest Reserves (Davies 1988a,b).

Photo 6: Community 19 (Callidendrous Rainforest Scrub) exploiting the fire protection afforded by Community 1 (Boulderfield) on the northern slopes of Mt Barrow.

COMMUNITY 20

CALLIDENDROUS EUCALYPTUS DELEGATENSIS-NOTHOFAGUS CUNNINGHAMII-BEDFORDIA SALICINA MIXED FOREST

This community was recorded within the State Reserve at an altitude of 980m. It occurred in the mapping unit "Wet Eucalypt Forest (Old Growth)" on the vegetation map (Appendix 2) on well drained north-east slopes near the Mt Barrow access road (Site 43/32). It is dominated by *Eucalyptus delegatensis* (27-41m) over a tall (<15m) dense second stratum dominated by *Nothofagus cunninghamii* and *Bedfordia salicina*. The open understorey includes scattered tall (<8m) shrubs of Tasmannia *lanceolata, Telopea truncata, Pittosporum bicolor* and *Notelaea ligustrina*. The ground cover (<1m) is notably open and includes sporadic occurrences of the ferns *Polystichum proliferum, Blechnum wattsii* and *Hymenophyllum peltatum,* with the shrubs *Pimelea drupacea, Cyathodes glauca* and *Aristotelia peduncularis* also occasionally present. Mosses and litter cover the forest floor whilst the filmy fern *Hymenophyllum peltatum* forms mats over exposed rock surfaces.

It broadly fits the description of the community described by Kirkpatrick et al (1988) as "*Eucalyptus delegatensis-Telopea truncata* subalpine wet sclerophyll forest (DEL0011)" but differs in not containing *Acacia dealbata* and a number of other herbs and grasses.

RESERVATION STATUS

Discussion of the reservation status of this community is difficult due to the fact that it does not fit easily into any wet forest communities described in the literature. It is probably also reserved in the Ben Lomond National Park as well as the Mt. Barrow State Reserve.

COMMUNITY 21

TALL LEPTOSPERMUM LANIGERUM SCRUB

This community was recorded immediately east of the shelter hut at the entrance to the park (altitude 870m) on a poorly drained bench associated with Mathinna Beds with some dolerite material derived from downslope movement (Site 61). It occurs in the mapping unit "Tall *Leptospermum lanigerum* Scrub" on the vegetation map (Appendix 2).

The community is dominated by tall, dense tea-tree, *Leptospermum lanigerum*, growing to a height of 8-15m with the occasional tree of *Acacia dealbata* . The understorey is particularly open in structure with the sporadic occurrence of low (<2.5m) shrubs of *Tasmannia lanceolata, Pimelea drupacea,* the fern *Polystichum proliferum* and invading rainforest species such as *Nothofagus cunninghamii.* The groundcover (<0.1m) is dominated by *Uncinia tenella* intermingling with mosses and lichens. Other groundcover species present include *Oxalis corniculata* and *Clematis aristata.* In the drier sites scattered individuals of *Pteridium esculentum, Drymophila cyanocarpa,* and *Viola hederacea* are found.

RESERVATION STATUS

The community is probably represented in a number of reserves around the State, particularly the Cradle Mt-Lake St Clair and Ben Lomond National Parks. It has been described in the Mt Victoria Forest Reserve by Davies (1988a) where it has developed on Mathinna Beds, and in the Mt Maurice Forest Reserve where it has been recorded on granite (Davies 1988b).

COMMUNITY 22

EUCALYPTUS DELEGATENSIS-POMADERRIS APETALA-OLEARIA ARGOPHYLLA-BEDFORDIA SALICINA WET SCLEROPHYLL FOREST

This community was found on well-drained north to north-east facing slopes of State Forest and State Reserve between an altitude of 855 to 945m (Sites 5,18, 21, 31). See mapping unit "Wet Eucalypt Forest (Old Growth)" on the vegetation map (Appendix 2). The community is dominated by *Eucalyptus delegatensis* commonly between 27-41m in height over a tall, dense understorey (<15m) dominated by the broad-leaved species *Pomaderris apetala, Bedfordia salicina* and *Olearia argophylla.* Other shrubs occasionally present are *Tasmannia lanceolata, Nothofagus cunninghamii* and *Olearia lirata.* The sparse groundcover includes the fern *Polystichum proliferum* (<1m) and the occasional *Pteridium esculentum, Blechnum wattsii, Dicksonia antarctica* and *Histiopteris incisa.* Moss and litter cover the forest floor.

This community is similar to that described by Kirkpatrick et al (1988) as "*Eucalyptus delegatensis -Atherosperma moschatum -Olearia argophylla* wet sclerophyll/mixed forest (DEL0110)". It differs in not containing *Acacia dealbata* or *Atherosperma moschatum.*

RESERVATION STATUS

The community is listed by Kirkpatrick et al (1988) as reserved in the Croesus Caves and Mt Barrow State Reserves, and in the Maria Island National Park. It is also probably reserved in the Ben Lomond National Park.

COMMUNITY 23

ACACIA DEALBATA WET FOREST

This community was sampled at an altitude of 855m on the north-eastern well-drained dolerite slopes (Site 42) of the State Reserve. It occurs in the mapping unit "Wet Wattle Forest" on the vegetation map (Appendix 2).

This wet wattle forest community is characterised by the absence of eucalypts and by the dominance of tall *Acacia dealbata* up to 30m in height. The dense canopy cover also includes *Nothofagus cunninghamii* whilst the second stratum is dominated by the broad-leaved, wet sclerophyll, small-tree (<15m) species *Olearia argophylla, Bedfordia salicina* and *Pomaderris apetala*. The shady understorey is notably open in structure but includes sporadic occurrences of the ferns *Dicksonia antarctica, Histiopteris incisa,* and *Hypolepis rugosula* , and the shrub *Pittosporum bicolor*. Mosses and litter dominate the forest floor.

This community is very similar to the previous wet forest type described (Community 22) but differs in that it is dominated by *Acacia dealbata* rather than *Eucalyptus delegatensis*. The community seems to develop when eucalypt regeneration fails following a major disturbance such as fire, severe frost, drought or perhaps due to biological influences such as insect browsing and/or damping-off due to fungal infection.

RESERVATION STATUS

Wet wattle communities are widespread in north-east Tasmania particularly on granitic substrates, and have been described in the Mt Victoria Forest Reserve by Davies (1988a). Their reservation status is difficult to discuss due to the fact that the community tends to be lumped in with wet eucalypt forest and not recognised as a distinct community. From a forestry perspective, the community tends to be viewed as a problem area of eucalypt regeneration failure occupying sites with high potential eucalypt production. Further studies are necessary to document the wet wattle forests types in Tasmania and their present reservation status. They have a high aesthetic value due to the tallness of the wattles, and their relatively short life-span means that special management is required.

COMMUNITY 24

CALLIDENDROUS RAINFOREST

This localised community was sampled near the shelter hut at the entrance to the park on a well-drained slightly sloping site, at an altitude of 900m (Site 19). It was developed on a mixture of Mathinna Beds and dolerite and occurs in the mapping unit "Rainforest" on the vegetation map (Appendix 2).

The dominant species are tall, oldgrowth *Nothofagus cunninghamii* and *Atherosperma moschatum* which form the canopy at a height of 15-27m. The understorey is exceptionally open but includes the occasional tall, old, shrub (<5m) of *Olearia argophylla* and *Tasmannia lanceolata,* with both species showing signs of senescence. The open ground cover (<1m) includes a variable cover of the fern *Polystichum proliferum,* which is absent in some areas and locally dense in other spots.

The community fits that described by Jarman et al (1984) as "High altitude callidendrous rainforest-C2 (a)", but is also similar to "Callidendrous myrtle-musk rainforest-C1(b)" although the musk *(Olearia argophylla)* was obviously dying out.

The community is also similar to Community 19 (Callidendrous Rainforest Scrub) described in this study, but is much taller and lacks *Telopea truncata.*

RESERVATION STATUS

Jarman et al (1984) list "High altitude callidendrous rainforest " as reserved in the Cradle Mt - Lake St Clair National Park and the Mt Barrow State Reserve .

COMMUNITY 25

EUCALYPTUS DELEGATENSIS-LEPTOSPERMUM LANIGERUM-OLEARIA ARGOPHYLLA WET SCLEROPHYLL FOREST

This community was found on a well-drained, north-east facing slope of State Forest at an altitude of 980m (Site 53) and occurred in the mapping unit "Wet Eucalypt Forest (regrowth)"on the vegetation map (Appendix 2).

The dominant species is *Eucalyptus delegatensis* (15-27m tall) over a tall open second stratum (<15m) dominated by *Leptospermum lanigerum* but also containing *Acacia dealbata*. A third open stratum (<8m) is dominated by the broad-leaved shrub *Olearia argophylla*, but occasional shrubs of *Prostanthera lasianthos* are also present. The understorey is notably open and contains sporadic occurrences of the shrub *Pimelea drupacea* and the ferns *Polystichum proliferum, Histiopteris incisa* and *Dicksonia antarctica*. The ground cover is mostly dominated by litter but also includes mosses and a number of small ground hugging herbs such as *Oxalis corniculata, Viola hederacea, Uncinia tenella* and *Hydrocotyle sibthorpioides*.

The community does not fit easily into any of the wet forest types described by Kirkpatrick et al (1988).

RESERVATION STATUS

The reservation status of this community is difficult to discuss as it does not fit easily into any of the wet forest types described by Kirkpatrick et al (1988). It is probably present in the Mt Field and Hartz Mt National Parks but future survey work is necessary to confirm this.

COMPARISON OF THE VEGETATION AT MT BARROW AND BEN LOMOND

There are some obvious differences between the vegetation on Mt Barrow and on Ben Lomond and at the same time some striking similarities. A number of species and plant communities are present only at Ben Lomond. The cushion plant species and communities described by Davies & Davies (1989) were not recorded at Mt Barrow, nor were "*Ewartia catipes-Gentianella diemensis* Skeletal Rock Herbfield", "*Isoetes gunnii* Aquatic Herbfield" and "*Poa costiniana-Poa gunnii* Alpine Grassland". The absence of these communities probably results from a number of influences.

Firstly, the Ben Lomond plateau includes larger areas of subdued topography (moorland) with an intermediate to poor drainage status and a much greater alpine catchment. This tends to be exploited by a greater range and extent of aquatic, bog, cushion-plant, grassland and grassy shrubland communities than at Mt Barrow.

The absence of cushion plants is difficult to explain as the localised areas of alpine moorland on Mt Barrow and on the major moor to the west would appear to be the perfect habitat. Other species commonly associated with cushion plants such as *Empodisma minus, Richea scoparia, Myriophyllum pedunculatum* and *Astelia alpina* are all present on Mt. Barrow. It may be that geographical isolation has prevented the species from colonising the relatively small areas of suitable moorland on Mt. Barrow.

The poor representation at Mt. Barrow of bog communities, large tarns and lakes, and their associated aquatic communities correlates well with the absence of such glacial features as U-shaped valleys. The absence of large exposures of rounded bed-rock at Mt Barrow also reflects the absence of glacial activity in the past.

The community that develops on "sorted polygons" (*Montia australasica* Stony Herbfield) at Ben Lomond was also absent from Mt Barrow, suggesting that present-day freeze/thaw cycles on Mt. Barrow are far less severe than at Ben Lomond.

The most common species recorded at Mt. Barrow were also the most common species recorded on the Ben Lomond Plateau, except for *Lissanthe montana* (present in 30% of sites at Ben Lomond), which was not recorded at Mt. Barrow.

BOTANICAL SURVEY OF MT BARROW FALLS STATE RESERVE

SUMMARY

A brief botanical survey was conducted in Mt Barrow Falls State Reserve which is located beside the Mt Barrow Rd on the northwestern slopes immediately down-slope from the Mt Barrow State Reserve. The method is outlined in Appendix 1.

A total of 81 vascular plant species was recorded in the reserve comprising 17 fern and fern allies, 51 dicots and 13 monocots.

Six plant communities were identified and described, with wet eucalypt forest being most widespread. An interesting grassy *Callistemon pallidus* cliff-face shrubland was present on north facing rocky slope formed from exposures of Mathinna Beds which is the predominant geology of the reserve. Also present was a highly localised scree-colonising community dominated by *Muehlenbeckia gunnii*.

Photo 7: Barrow Falls formed from bedrock of Mathinna Beds.

VEGETATION BARROW FALLS S.R.

Species

A total of 81 vascular plant species was recorded in the reserve comprising 17 fern and fern allies, 51 dicots and 13 monocots. Seven Tasmanian endemic species were recorded.

A species list is presented in Appendix 4.

Plant Communities

Six plant communities were identified including one wet eucalypt forest, one damp sclerophyll forest, one rainforest, one dry eucalypt forest, one grassy cliff-face shrubland community and one unusual scree-colonising community .

These communities were:-

(1) EUCALYPTUS DELEGATENSIS-POMADERRIS APETALA-OLEARIA ARGOPHYLLA-BEDFORDIA SALICINA WET SCLEROPHYLL FOREST
(2) CALLIDENDROUS FERN RAINFOREST
(3) EUCALYPTUS DELEGATENSIS-ACACIA VERNICIFLUA DAMP SCLEROPHYLL FOREST
(4) SHRUBBY EUCALYPTUS DELEGATENSIS DRY SCLEROPHYLL FOREST
(5) CALLISTEMON PALLIDUS-POA LABILLARDIERI GRASSY CLIFF-FACE SHRUBLAND
(6) MUEHLENBAECKIA GUNNII SCREE COMMUNITY

DESCRIPTIONS OF THE PLANT COMMUNITIES OF MT. BARROW FALLS STATE RESERVE AND THEIR RESERVATION STATUS

COMMUNITY 1

EUCALYPTUS DELEGATENSIS-POMADERRIS APETALA-OLEARIA ARGOPHYLLA-BEDFORDIA SALICINA WET SCLEROPHYLL FOREST

This community was found on well-drained north-west to west facing slopes and gullies of the State Reserve. It is dominated by *Eucalyptus delegatensis* over a dense understorey dominated by *Pomaderris apetala*. Other broad-leaved species commonly present include *Bedfordia salicina, Olearia argophylla, Olearia lirata* and *Zieria arborescens*. The ground cover is sparse in the driest sites but as moisture availability increases there is an increase in fern ground cover of *Polystichum proliferum* (<1m) and the occasional *Blechnum wattsii, Dicksonia antarctica* and *Histiopteris incisa*. Moss and litter cover the forest floor.

This community is similar to that described by Kirkpatrick et al (1988) as "*Eucalyptus delegatensis-Atherosperma moschatum-Olearia argophylla* wet sclerophyll/mixed forest (DEL0110)". It differs in not containing *Acacia dealbata* or *Atherosperma moschatum*.

RESERVATION STATUS

The community is listed by Kirkpatrick et al (1988) as reserved in the Croesus Caves and Mt Barrow State Reserves, and in the Maria Island National Park. It is also probably reserved in the Ben Lomond National Park.

COMMUNITY 2

CALLIDENDROUS FERN RAINFOREST

This localised community was recorded along topographically protected creek-lines. The dominant species is tall, oldgrowth *Nothofagus cunninghamii* and *Atherosperma moschatum* which form the canopy at a height of 15-27m. Moss is present on the trunks of the trees and along the branches high into the canopy, as is the epiphytic fern *Microsorum diversifolium*. The ferny understorey is open but includes the occasional tall *Dicksonia antarctica* (<5m) whilst the ground cover (<1m) includes a variable cover of the fern *Polystichum proliferum*, which is absent in some areas and locally dense in other spots. Epiphytic ferns are abundant, particularly *Grammitis billardieri, Polyphlebium venosum*, and *Asplenium flabellifolium*.

The community fits the community described by Jarman et al (1984) as "Callidendrous fern rainforest-C1(a)".

RESERVATION STATUS

Jarman et al (1984) lists "Callidendrous fern rainforest C1(a)" as reserved in the Franklin-Lower Gordon Wild Rivers National Park, and reserved as mixed forest in Mt Field National Park.

COMMUNITY 3

EUCALYPTUS DELEGATENSIS-ACACIA VERNICIFLUA DAMP SCLEROPHYLL FOREST

This community was recorded on ridge slopes between the wet forest and the dry forest. The community is dominated by *Eucalyptus delegatensis* (<41m) with the occasional presence of *E. dalrympleana*. The understorey is dominated by *Acacia verniciflua* (<8m) with the sporadic occurrence of the broad leaved shrub, *Olearia argophylla*. The ground cover is notably open and dominated by litter, with the occasional presence of bracken *Pteridium esculentum* (<0.3m).

RESERVATION STATUS

The community does not fit easily into any of the wet forest communities described by Kirkpatrick et al (1988). Its conservation status is therefore difficult to discuss.

COMMUNITY 4

SHRUBBY EUCALYPTUS DELEGATENSIS DRY SCLEROPHYLL FOREST

This community was recorded on a dry north-west facing ridge-line at an altitude of 680m, immediately up-slope from the damp forest described in community (3). The community is dominated by *Eucalyptus delegatensis* but *E. viminalis* is also present as a subdominant. The bare stony understorey is dominated by the prickly low (<0.3m) shrub *Pultenaea juniperina*, but *Cyathodes glauca* is also present with tussocks of the grass *Poa labillardieri*. Other shrubs in the vicinity are *Exocarpos cupressiformis, Lomatia tinctoria, Pteridium esculentum* and the lily *Dianella tasmanica*.

The community fits the broad description of "shrubby *Eucalyptus delegatensis* forest" given by Duncan & Brown (1985).

RESERVATION STATUS

The community is listed by Duncan &Brown (1985) as reserved in the Maria Island and Mt Field National Parks, and the St Marys Pass and Mt Barrow State Reserves.

COMMUNITY 5

CALLISTEMON PALLIDUS-POA LABILLARDIERI GRASSY CLIFF-FACE SHRUBLAND

This Grassy shrubland community was developed on the north to north-west facing cliff-faces and steepest slopes of Mathinna Bed rocks where the shallowest soils were found. This community is dominated by shrubs of *Callistemon pallidus* with an open grassy ground cover of *Poa labillardieri*. The ground cover also includes *Deyeuxia monticola* and the sporadic occurrence of the shrubs *Olearia phlogopappa, Hakea lissosperma* and *Olearia stellulata*. It is the same community as described around Ralphs Falls in the Mt Victoria Forest Reserve by Davies (1988a).

RESERVATION STATUS

No statewide survey has been conducted to date to assess the conservation status of similar cliff-shrubland communities. As mentioned, this community is found in the Mt. Victoria Forest Reserve, and it may also be present in the St Columba Falls State Reserve.

COMMUNITY 6

MUEHLENBECKIA GUNNII SCREE COMMUNITY

This community was highly localised and restricted to an area of steep scree deposits near the Mt. Barrow Falls. The community is dominated by the vine *Muehlenbeckia gunnii* which is actively and exclusively colonising the unstable scree deposits.

Photo 8: Community 6 (*Muehlenbeckia gunnii* Scree Community) colonising unstable scree deposits with Community 2 (Callidendrous Fern Rainforest) in the gully immediately below Barrow Falls. Note Muehlenbeckia in right foreground.

RESERVATION STATUS

It is difficult to assess the conservation status of this community due to a lack of information in the literature on this type of scree community. It is probably the most important plant community in the reserve from a conservation perspective, but further studies are necessary to confirm this.

APPENDIX 1

Survey Method and Analysis of Data

SAMPLING AND DESCRIPTION
MT. BARROW

The quantitative sampling of the vegetation of Mt. Barrow was limited to the area shown in Map 1, and covered an area of approximately 1200 ha. The study area included the forested slopes surrounding the Mt. Barrow plateau, as well as the plateau surface itself. The altitudinal range of the sampling sites was from 855m to 1400m A.S.L.

The objective in sampling the vegetation was to obtain quantitative data representative of the full range of floristic and structural composition of the vegetation. A randomly sited systematic design was employed using sites located at 500m intervals along traverse lines forming a grid system within the study area (see Map 1). The sites were marked on aerial photographs, and their location identified in the field by using a 100m tape and compass bearings from major topographic features. Seven sites were subjectively chosen during field work to include vegetation types not sampled by the grid. The sampling unit adopted was a 20m diameter circular area. A day-pack was placed at the centre of the sample area and the 10m radius paced out. Attempts were made to ensure the sampling area did not cross any apparent or topographic discontinuities and that the vegetation within the area was homogeneous. The structure of the vegetation was described following Specht (1970).

All vascular plant species within the plot were recorded with relevant structural information (height, cover) using "TASFORHAB" (Peters 1984). Species which could not be identified at the time of sampling were collected for later identification using the herbarium collection of the Queen Victoria Museum and Art Gallery, and the Tasmanian Herbarium.

In addition to the vegetation data, notes were made on relevant site characteristics including drainage, soil type, soil depth, topographic position and the proportion of site covered by boulders or bedrock. The altitude for each site was determined from 1:25,000 topographic maps, as was the grid reference.

MT. BARROW FALLS

The author visited the reserve during two day trips from its eastern and western boundaries on the 9/2/1990 and the 11/5/1990. The vegetation was described using" TASFORHAB " profiles (Peters 1984) at subjectively chosen sites, as well as in field notes.

The flat agricultural country is generally associated with sediments of the Parmeener Super-group. These occur on the upper slopes, whilst the steeper country in the reserve and the bedrock of the waterfall itself consist of the older rocks of the Mathinna Beds complex, which form the basement rock.

Soils are mostly derived from Mathinna Beds rocks, and typically consist of an organic surface loam over a stony, yellow-brown clay subsoil. Areas associated with cliffs and ridge crests support the shallowest soils (or are completely devoid of soils), whilst the deepest soils are found on the lower slopes and valley bottoms.

The reserve covers an area of about 81 ha and has a rather obscure boundary. No official signs are present to inform people travelling along the Mount Barrow Road that they are passing through the State Reserve, so ground location is an immediate problem. The best landmark to locate the reserve is to find the rough track that branches off to the west from the Mount Barrow Road at Grid Reference 53278-42131. The reserve is immediately east from this point although a small area of the reserve does extend over to the western side of the road about 200m down the road from this intersection. This triangular shaped area of reserve has been used for firewood cutting whilst the eastern side of the road has been used for dumping

rubbish. The reserve covers an altitudinal range between 510-730m A.S.L. and mainly includes steep northwest to west facing slopes and associated gullies in the upper catchment of Bennies Creek.

NOMENCLATURE

Taxonomic nomenclature follows Buchanan et al (1989). Appendix 4 lists the species and authorities for the species encountered during sampling of the vegetation. Voucher specimens collected during the survey have been deposited in the Herbarium of the Queen Victoria Museum and Art Gallery in Launceston.

DATA ANALYSIS

Data from Mt. Barrow were coded and entered by the authors on to "ECOPAK" (Ecological Data Base Package) (Minchin 1986), at the University of Tasmania for analysis.
The data were initially ordinated using "DCA" (Detrended Correspondence Analysis) (Hill & Gauch 1980) and classified using the polythetic divisive computer program "Twinspan" (Hill 1979). The initial Twinspan groups were then studied in detail. Some sites were re-allocated where obvious mis-classification had occurred, and in some cases further divisions were created so the final groups were consistent with field observation and not purely numerically generated. As a result of the analysis, 25 plant communities were identified for the Mt. Barrow area.

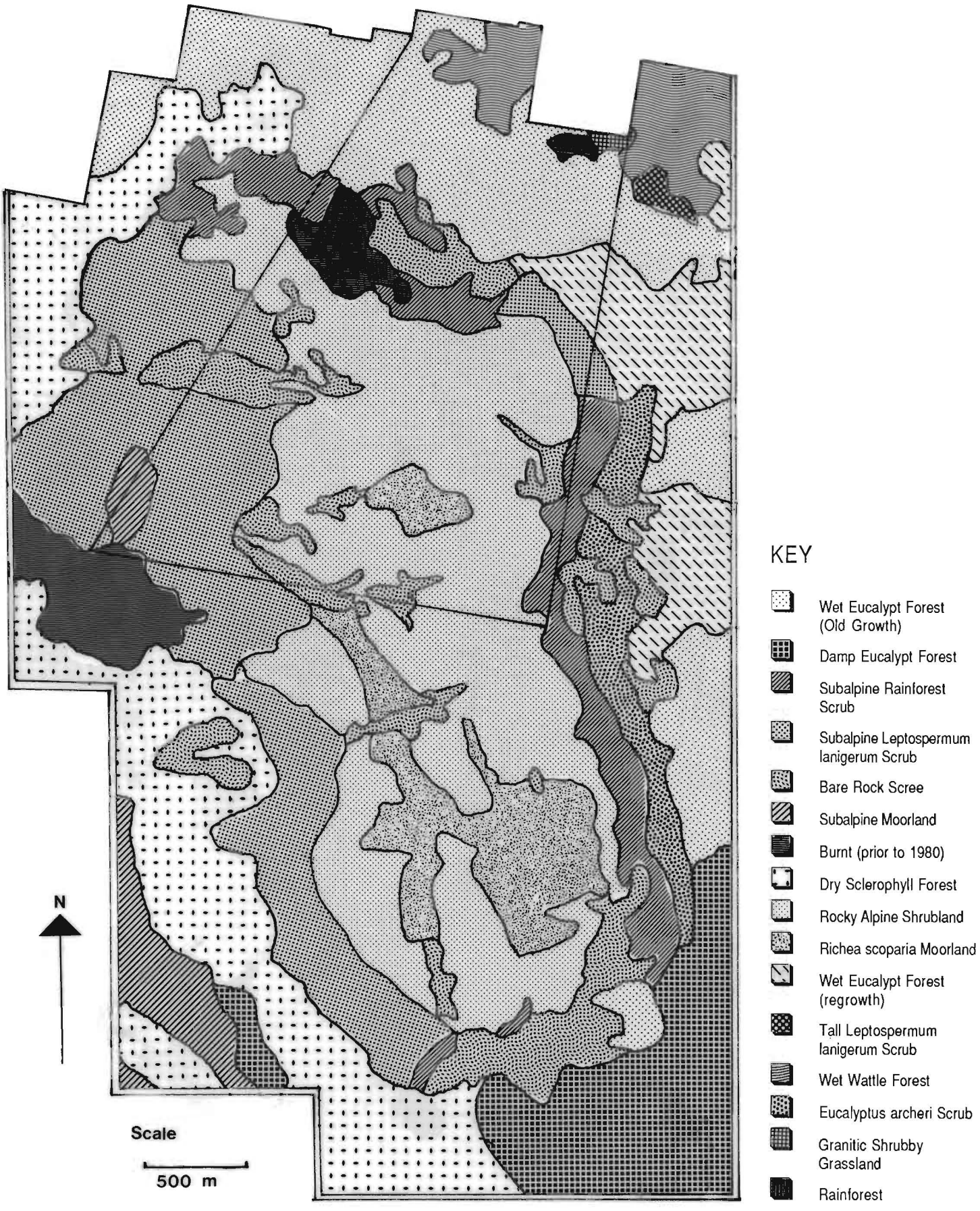
The vegetation of the Mt. Barrow Falls State Reserve was described from field notes and no quantitative sampling was undertaken.

VEGETATION MAPPING

A vegetation map for Mt. Barrow (see Appendix 2) was constructed from field observations and interpretation of colour aerial photographs (Wesley Vale 1:20,000, 24/12/1980) using a mirror stereoscope, in conjunction with Forestry Commission 1:20,000 P.I. (photographic interpretation) maps. Sixteen mapping units were identified.

APPENDIX 2

VEGETATION MAP OF MT. BARROW



APPENDIX 3

SPECIES LIST FOR MT BARROW STATE RESERVE (SR) AND ASSOCIATED STATE FOREST (SF)

(e=endemic i=introduced v=voucher specimen lodged in Herbarium at Queen Victoria Museum, Launceston)

DICOTYLEDONS

		SR	SF
	APIACEAE (UMBELLIFERAE)		
	Hydrocotyle hirta R.Br. ex A.Rich.	+	+
	Hydrocotyle sibthorpioides Lamk.	+	+
v	Oreomyrrhis ciliata Hook.f.	+	
	ASTERACEAE (COMPOSITAE)		
ev	Bedfordia linearis (Labill.) DC	+	+
e	Bedfordia salicina (Labill.) DC.	+	+
ev	Brachyscome spathulata Gaud. ssp. glabra (DC.) Stace	+	+
v	Cassinia aculeata (Labill.) R.Br	+	+
	Celmisia asteliifolia Hook.f.	+	+
v	Cotula alpina (Hook.f.) Hook.f.	+	+
v	Cotula filicula (Hook.f.) Benth	+	+
	Erigeron pappocromus Labill.	+	+
ev	Ewartia catipes (DC.) P.Beauv.	+	+
ev	Ewartia planchonii (Hook.f.) P.Beauv.	+	+
v	Gnaphalium argentifolium Wakef.	+	
	Gnaphalium sp.	+	
	Gnaphalium supinum L.		+
v	Gnaphalium umbricola J.H.Willis	+	+
e	Helichrysum antennarium (DC.) F.Muell. ex Benth.	+	+
	Helichrysum backhousii (Hook.f.) F.Muell. ex Benth. var. kingii W.M.Curtis	+	+
v	Helichrysum hookeri (Sonder) Druce	+	+
v	Helichrysum scorpioides Labill.	+	+
	Lagenifera stipitata (Labill.) Druce	+	+
vi	Leontodon taraxacoides (Vill.) Merat	+	+
v	Leptorhynchos squamatus (Labill.) Less.	+	+
	Olearia argophylla (Labill.) Benth.	+	+
e	Olearia ledifolia (DC.) Benth.	+	+
	Olearia lirata (Sims.) Hutch.	+	+
ev	Olearia obcordata (Hook.f.) Benth.	+	+
	Olearia phlogopappa (Labill.) DC.	+	+
ev	Olearia pinifolia (Hook.f.) Benth.	+	+
ev	Olearia tasmanica (Hook.f.) W.M.Curtis	+	+
	Olearia viscosa (Labill.) Benth.	+	+
v	Senecio gunnii (Hook.f.) Belcher	+	+
	Senecio lautus Forst.f. ex Willd.	+	
	Senecio leptocarpus DC.	+	+
v	Senecio pectinatus DC. var. pectinatus	+	+
	BRASSICACEAE (CRUCIFERAE)		
	Cardamine gunnii Hewson	+	+
	CAMPANULACEAE		
ev	Wahlenbergia saxicola A.DC.	+	+
v	Wahlenbergia sp.	+	+

		SR	SF
CARYOPHYLLACEAE			
vi	Sagina apetala Ard.	+	+
	Stellaria pungens Brongn.	+	+
CRASSULACEAE			
	Crassula sieberana (Schult. & Schult.f.) Druce	+	+
DROSERACEAE			
	Drosera arcturi Hook.	+	+
v	Drosera peltata Thunb. ssp. auriculata (Backh. ex Planchon) Conn	+	+
ELAEOCARPACEAE			
ev	Aristotelia peduncularis (Labill.) Hook.f.	+	+
EPACRIDACEAE			
ev	Cyathodes dealbata R.Br.	+	+
ev	Cyathodes glauca Labill.	+	+
ev	Cyathodes parvifolia R.Br.	+	+
ev	Epacris gunnii Hook.f.	+	+
	Epacris lanuginosa Labill.	+	+
v	Epacris serpyllifolia R.Br.	+	+
e	Monotoca empetrifolia R.Br.	+	+
v	Pentachondra pumila (Forst. & Forst.f.) R.Br.	+	+
e	Richea acerosa (Lindley) F.Muell.	+	
ev	Richea gunnii Hook.f.	+	+
e	Richea scoparia Hook.f.	+	+
e	Richea sprengelioides (R.Br.) F.Muell.	+	+
ERICACEAE			
e	Gaultheria hispida R.Br.	+	+
ev	Pernettya tasmanica Hook.f.	+	+
ESCALLONIACEAE			
ev	Tetracarpaea tasmanica Hook.f.	+	
EUPHORBIACEAE			
	Poranthera microphylla Brongn.	+	+
FABACEAE (LEGUMINOSAE)			
ev	Acacia axillaris Benth.		+
	Acacia dealbata Link	+	+
v	Oxylobium ellipticum (Labill.) R.Br.	+	+
	Pultenaea juniperina Labill.	+	+
v	Pultenaea subumbellata Hook.	+	+
FAGACEAE			
v	Nothofagus cunninghamii (Hook.) Oersted	+	+
GENTIANACEAE			
	Gentianella diemensis (Griseb.) J.H.Willis	+	+
GERANIACEAE			
v	Geranium potentilloides L'Herit. ex DC.	+	+
	Geranium sessiliflorum Cav.	+	
GOODENIACEAE			
v	Scaevola hookeri (Vriese) F.Muell. ex Hook.f.	+	+
v	Velleia montana Hook.f.	+	+

		SR	SF
HALORAGACEAE			
	Gonocarpus micranthus Thunb.		+
v	Gonocarpus montanus (Hook.f.) Orch.	+	+
v	Myriophyllum pedunculatum Hook.f.	+	+
LAMIACEAE (LABIATAE)			
	Prostanthera lasianthos Labill.	+	+
e v	Westringia rubiaefolia R.Br.	+	+
MONIMIACEAE			
	Atherosperma moschatum Labill.	+	+
MYRTACEAE			
	Baeckea gunniana Schauer	+	+
e v	Callistemon viridiflorus (Sims) Sweet	+	
e v	Eucalyptus archeri Maiden & Blakely	+	+
e	Eucalyptus delegatensis R.Baker ssp. tasmaniensis Boland	+	+
e	Eucalyptus gunnii Hook.f.	+	
	Leptospermum lanigerum (Aiton) Smith	+	+
e	Leptospermum rupestre Hook.f.	+	+
OLEACEAE			
	Notelaea ligustrina Vent.	+	+
ONAGRACEAE			
v	Epilobium sarmentaceum Hausskn.	+	+
OXALIDACEAE			
	Oxalis corniculata L.	+	+
PITTOSPORACEAE			
v	Billardiera longiflora Labill. var. longiflora	+	+
	Pittosporum bicolor Hook.	+	+
PLANTAGINACEAE			
v	Plantago tasmanica Hook.f. var. tasmanica	+	+
POLYGALACEAE			
v	Comesperma retusum Labill.		+
POLYGONACEAE			
i	Rumex acetosella L.	+	+
PROTEACEAE			
e v	Bellendena montana R.Br.	+	+
	Grevillea australis R.Br.	+	+
	Hakea lissosperma R.Br.	+	+
e	Lomatia tinctoria R.Br.	+	+
e v	Orites acicularis R.Br.	+	+
e v	Orites revoluta R.Br.	+	+
e v	Persoonia muelleri (P.Parm.) Orch.		+
e	Telopea truncata (Labill.) R.Br.	+	+
RANUNCULACEAE			
	Clematis aristata R.Br. ex DC.	+	+
v	Ranunculus lappaceus Smith		+

		SR	SF
RHAMNACEAE			
ev	Cryptandra alpina Hook.f.	+	+
	Pomaderris apetala Labill.	+	+
ev	Spyridium ulicinum (Hook.) Benth.		+
ROSACEAE			
	Acaena novae-zelandiae Kirk	+	+
ev	Rubus gunnianus Hook.	+	
RUBIACEAE			
v	Asperula pusilla Hook.f.	+	+
	Coprosma hirtella Labill.	+	+
v	Coprosma moorei F.Muell. ex Rodway		+
	Coprosma nitida Hook.f.	+	+
v	Coprosma perpusilla Colenso	+	+
v	Coprosma pumila Hook.f.		+
	Coprosma quadrifida (Labill.) Robinson	+	+
	Galium australe DC.	+	+
RUTACEAE			
	Boronia citriodora Gunn ex Hook.f.	+	+
v	Correa lawrenciana Hook. var. lawrenciana	+	+
ev	Phebalium montanum Hook.	+	+
ev	Phebalium squameum (Labill.) Engl. ssp. retusum (Hook.) Paul G.Wilson	+	+
SALICACEAE			
i	Salix cinerea L.		+
i	Populus deltoides Marshall	+	
SANTALACEAE			
e	Exocarpos humifusus R.Br.	+	+
SCROPHULARIACEAE			
e	Euphrasia collina R.Br. ssp. diemenica (Sprengel) W.R.Barker	+	+
ev	Ourisia integrifolia R.Br.	+	+
vi	Verbascum virgatum Stokes	+	
v	Veronica calycina R.Br.		+
STYLIDIACEAE			
v	Stylidium graminifolium Swartz	+	+
THYMELAEACEAE			
v	Pimelea drupacea Labill.	+	+
	Pimelea ligustrina Labill. ssp. ligustrina	+	+
ev	Pimelea sericea R.Br.	+	+
TREMANDRACEAE			
ev	Tetratheca procumbens Gunn ex Hook.f.	+	+
URTICACEAE			
	Australina pusilla (Desf. ex Poiret) Gaudich	+	
	Urtica incisa Poiret	+	+
VIOLACEAE			
	Viola hederacea Labill.	+	+

ADDENDA - APPENDIX 3

SPECIES LIST MT BARROW STATE RESERVE AND ASSOCIATED STATE FOREST

continuing from page 42

		SR	SF
WINTERACEAE			
	Tasmannia lanceolata (Poiret) A.C.Smith	+	+
MONOCOTYLEDONS			
CYPERACEAE			
	Carex gaudichaudiana Kunth	+	+
v	Carex raleighii Nelmes	+	
v	Carpha alpina R.Br.	+	+
	Gahnia grandis (Labill.) S.T. Blake	+	
v	Isolepis crassiuscula Hook.f.	+	+
v	Isolepis subtilissima Boeck.	+	+
v	Lepidosperma filiforme Labill.	+	+
	Oreobolus distichus F.Muell.	+	+
	Oreobolus pumilio R.Br.	+	+
v	Uncinia compacta R.Br.	+	+
v	Uncinia tenella R.Br.	+	+
JUNCACEAE			
v	Juncus sandwithii Lourteig	+	+
v	Luzula densiflora (Nordensk.) Edgar	+	+
	Luzula modesta Buchenau	+	
	Luzula sp	+	+
LILIACEAE			
	Astelia alpina R.Br.	+	+
	Drymophila cyanocarpa R.Br.	+	+
ORCHIDACEAE			
v	Chiloglottis cornuta Hook.f.	+	+
v	Prasophyllum alpinum R.Br.	+	+
POACEAE (GRAMINEAE)			
v i	Agrostis capillaris L.	+	
	Agrostis sp	+	
v	Agrostis venusta Trin.	+	+
v	Australopyrum pectinatum (Labill.) A.Löve	+	+
e v	Danthonia diemenica Morris	+	+
e v	Danthonia pauciflora R.Br.	+	+
v	Danthonia penicillata (Labill.) P.Beauv.	+	+
v	Deschampsia caespitosa (L.) P.Beauv.	+	+
	Deyeuxia carinata Vick.	+	+
v	Deyeuxia monticola (Roemer & Schultes) Vick.	+	+
e	Ehrharta tasmanica (Hook.f.) Willemse	+	
v	Hierochloe fraseri Hook.f. ex Rodway	+	+
v	Poa costiniana Vick.	+	+
v	Poa fawcettiae Vick.	+	+
e v	Poa gunnii Vick.	+	+
v	Poa labillardieri Steudel	+	+
v	Poa sieberiana Sprengel	+	+
v	Trisetum spicatum (L.) Richter	+	+
v i	Vulpia bromoides (L.) Gray	+	
RESTIONACEAE			
	Empodisma minus (Hook.f.) L.Johnson & Cutler	+	+
v	Restio australis R.Br.	+	+

		SR	SF
GYMNOSPERMS			
PINACEAE			
i	Pseudotsuga menziesii (Mirb) Franco	+	
TAXODIACEAE			
i	Sequoia sempervirens (D. Don) Endlicher	+	
i	Sequoiadendron giganteum (Lindl.) Buchh	+	
PTERIDOPHYTES			
ASPIDIACEAE			
	Polystichum proliferum (R.Br.) C.Presl	+	+
ASPLENIACEAE			
	Asplenium flabellifolium Cav.	+	+
BLECHNACEAE			
v	Blechnum fluviatile (R.Br.) E.J.Löwe ex Salom	+	+
	Blechnum nudum (Labill.) Mett. ex Luerss.		+
	Blechnum penna-marina (Poiret.) Kuhn	+	+
	Blechnum wattsii Tind.	+	+
DENNSTAEDTIACEAE			
	Histiopteris incisa (Thunb.) J.Smith.	+	+
	Hypolepis rugosula (Labill.) J.Smith	+	+
	Pteridium esculentum (Forst.f.) Cockayne	+	+
DICKSONIACEAE			
	Dicksonia antarctica Labill.	+	+
GLEICHENIACEAE			
	Gleichenia alpina R.Br.	+	+
	Gleichenia microphylla R.Br.	+	
GRAMMITIDACEAE			
v	Grammitis poeppigiana (Mett.) Pichi-Serm.	+	+
HYMENOPHYLLACEAE			
	Hymenophyllum cupressiforme Labill.	+	+
v	Hymenophyllum peltatum (Poiret.) Desv.	+	+
LYCOPODIACEAE			
v	Lycopodium australianum Herter	+	+
	Lycopodium fastigiatum R.Br.	+	+
	Lycopodium scariosum Forst.f.	+	+
POLYPODIACEAE			
	Microsorum diversifolium (Willd.) Copel.	+	+

APPENDIX 4

SPECIES LIST FOR THE MT BARROW FALLS STATE RESERVE

DICOTYLEDONS

APIACEAE (UMBELLIFERAE)
- Hydrocotyle hirta R.Br. ex A.Rich.

ASTERACEAE (COMPOSITAE)
- e Bedfordia salicina (Labill.) DC.
- Cassinia aculeata (Labill.) R.Br.
- Celmisia asteliifolia Hook.f.
- Gnaphalium involucratum Forst.f.
- v Gnaphalium umbricola J.H.Willis
- Olearia argophylla (Labill.) Benth.
- Olearia lirata (Sims.) Hutch.
- Olearia phlogopappa (Labill.) DC.
- Olearia stellulata (Labill.) DC.
- Senecio linearifolius A.Rich.

CAMPANULACEAE
- Wahlenbergia sp

CARYOPHYLLACEAE
- i Sagina apetala Ard.
- Stellaria pungens Brongn.

ELAEOCARPACEAE
- e Aristotelia peduncularis (Labill.) Hook.f.

EPACRIDACEAE
- e Cyathodes glauca Labill.

FABACEAE (LEGUMINOSAE
- Acacia dealbata Link
- Acacia melanoxylon R.Br.
- Acacia verniciflua A.Cunn.
- Pultenaea juniperina Labill.

FAGACEAE
- Nothofagus cunninghamii (Hook.) Oersted

GERANIACEAE
- Geranium potentilloides L'Herit. ex DC.

HALORAGACEAE
- Gonocarpus teucrioides DC.

LAMIACEAE (LABIATAE)
- Prostanthera lasianthos Labill.

MONIMIACEAE
- Atherosperma moschatum Labill.

MYRTACEAE
- Callistemon pallidus (Bonpl.) DC.
- e Eucalyptus amygdalina Labill.
- Eucalyptus brookerana A.M.Gray
- Eucalyptus dalrympleana Maiden ssp. dalrympleana

MYRTACEAE cont.
e Eucalyptus delegatensis R.Baker
ssp. tasmaniensis Boland
Eucalyptus obliqua L'Herit.
Eucalyptus viminalis Labill.
ssp. viminalis
Leptospermum lanigerum (Aiton) Smith

OLEACEAE
Notelaea ligustrina Vent.

OXALIDACEAE
Oxalis corniculata L.
ssp. corniculata

PITTOSPORACEAE
Billardiera longiflora Labill.
var. longiflora
Bursaria spinosa Cav.
Pittosporum bicolor Hook.

POLYGONACEAE
v Muehlenbeckia gunnii (Hook.f.) Walp.

PROTEACEAE
Hakea lissosperma R.Br.
e Lomatia tinctoria R.Br.

RANUNCULACEAE
Clematis aristata R.Br. ex DC.

RHAMNACEAE
Pomaderris apetala Labill.

RUBIACEAE
Coprosma hirtella Labill.
Coprosma quadrifida (Labill.) Robinson

RUTACEAE
Zieria arborescens Sims

SANTALACEAE
Exocarpos cupressiformis Labill.

THYMELAEACEAE
Pimelea drupacea Labill.

URTICACEAE
Urtica incisa Poiret

VIOLACEAE
Viola hederacea Labill.

WINTERACEAE
Tasmannia lanceolata (Poiret) A.C.Smith

MONOCOTYLEDONS

CYPERACEAE
Carex appressa R.Br.
Isolepis limbata W.M.Curtis
Uncinia flaccida S.T.Blake

JUNCACEAE
Juncus sp

LILIACEAE
Dianella tasmanica Hook.f.

ORCHIDACEAE
Chiloglottis cornuta Hook.f.
Prasophyllum sp.
Pterostylis sp

POACEAE (GRAMINEAE)
Australopyrum pectinatum (Labill.) A.Löve
Deyeuxia monticola (Roemer & Schultes) Vick.
e.v Deyeuxia rodwayi Vick.
Ehrharta stipoides Labill.
Poa labillardieri Steudel

PTERIDOPHYTES

ASPIDIACEAE
Polystichum proliferum (R.Br.) C.Presl

ASPLENIACEAE
v Asplenium bulbiferum Forst.f.
v Asplenium flabellifolium Cav.

BLECHNACEAE
v Blechnum fluviatile (R.Br.) E.J.Löwe ex Salom
Blechnum minus (R.Br.) Effingsh.
v Blechnum penna-marina (Poiret.) Kuhn
Histiopteris incisa (Thunb.) J.Smith.
Hypolepis rugosula (Labill.) J.Smith
Pteridium esculentum (Forst.f.) Cockayne

DICKSONIACEAE
Dicksonia antarctica Labill.

GRAMMITIDACEAE
Ctenopteris heterophylla (Labill.) Tind.
Grammitis billardieri Willd.

HYMENOPHYLLACEAE
Hymenophyllum australe Willd.
Hymęnophyllum cupressiforme Labill.
Hymenophyllum flabellatum Labill.
Polyphlebium venosum (R.Br.) Copel.

POLYPODIACEAE
Microsorum diversifolium (Willd.) Copel.

APPENDIX 5

LIST OF SITES, GRID REFERENCES, ALTITUDES AND DRAINAGE CLASSES FOR MT. BARROW

Notes: 1. The grid references are given in accordance with the Australian Grid Reference System.

2. Drainage classification ranges from standing water (1) to free drainage as in boulder fields (5).

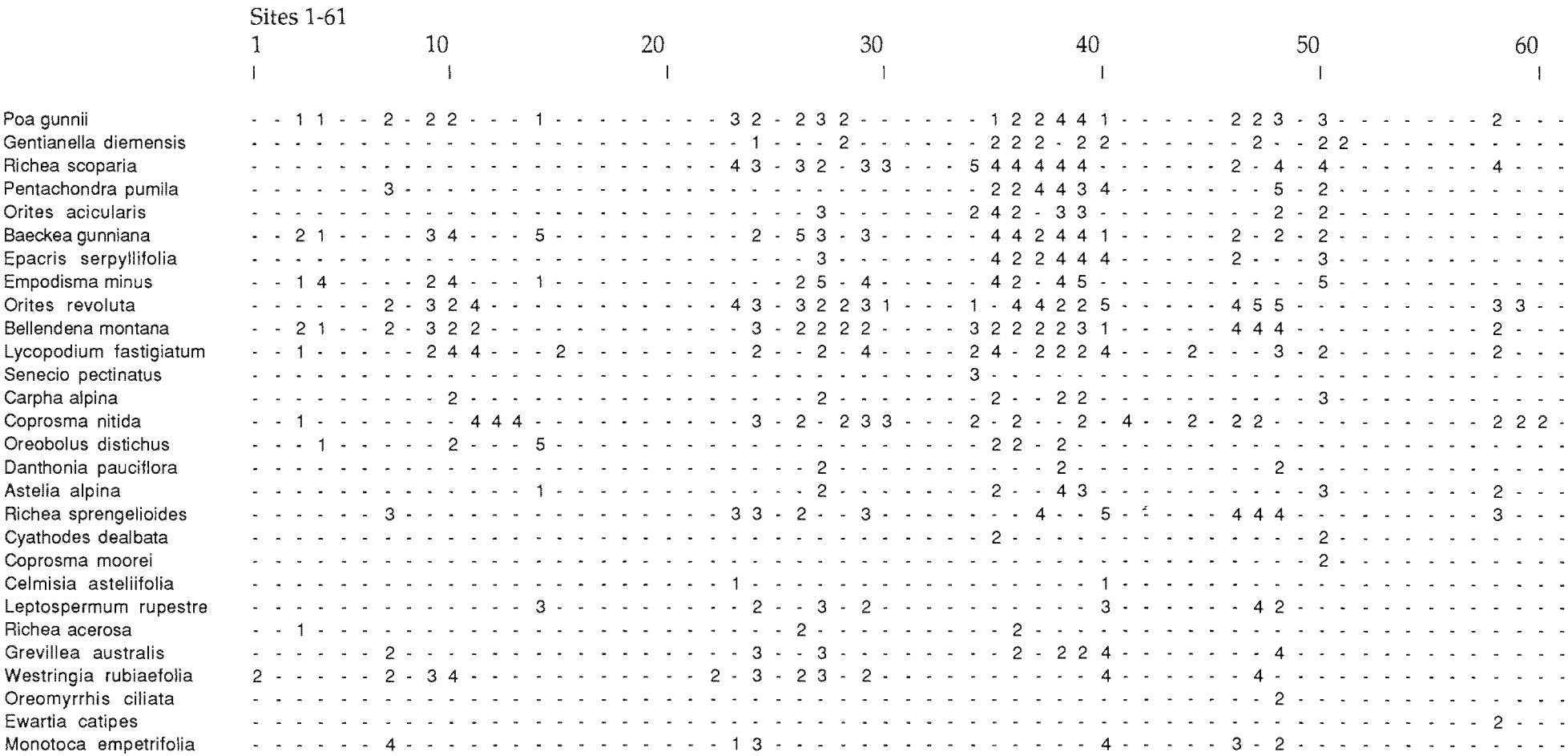
SITE NO.	EASTING	NORTHING	ALTITUDE (m)	DRAINAGE CLASS
1	53350	41950	1098	4
2	53350	41900	109	5
3	53350	41850	1135	3
4	53350	41800	1110	2
5	53400	42050	945	4
6	53400	2000	1025	5
7	53400	41950	1180	5
8	53400	41900	1160	5
9	53400	41850	1165	3
10	53400	41800	1168	3
11	53400	41750	1120	3
12	53400	41700	1080	5
13	53400	41650	1060	5
14	53400	41600	1025	1
15	53410	42000	1120	4
16	53440	42050	920	4
17	53470	42050	880	4
18	53490	42050	860	4
19	53583	42012	900	4
20	53594	42015	895	4
21	53450	42050	900	4
22	53450	42000	1100	4
23	53450	41900	1250	4
25	53450	41850	1270	5
26	53450	41800	1230	4
27	53450	41750	1270	3
28	53450	41700	1215	4
29	53450	41650	1250	3
30	53450	41600	1120	3
31	53500	42050	870	4
32	53500	42000	1025	4
33	53500	41950	1150	5
34	53500	41900	1320	5
35	53500	41850	1290	3
36	53500	41800	1280	4
37	53500	41750	1300	5
38	53500	41700	1275	2
39	53500	41650	1270	2
40	53500	41600	1245	4
41	53500	41550	1050	4
42	53550	42050	855	4
43	53550	42000	980	4
44	53550	41950	1100	4
45	53550	41900	1300	3
46	53550	41850	1290	5
47	53550	41800	1270	4

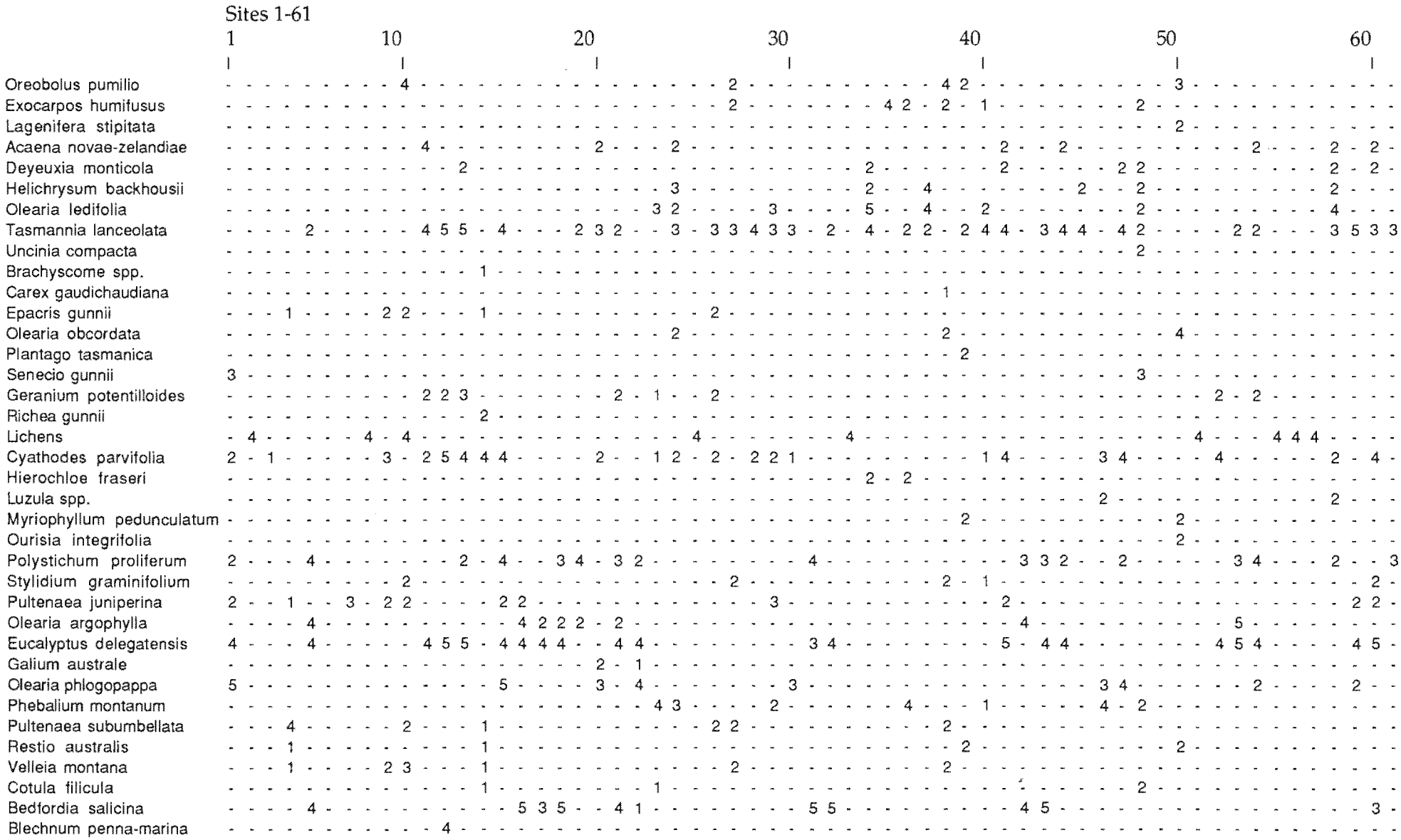
SITE NO.	EASTING	NORTHING	ALTITUDE (m)	DRAINAGE CLASS
48	53550	41750	1310	4
49	53550	41700	1295	4
50	53550	41650	1280	2
51	53550	41600	1220	5
52	53550	41550	990	5
53	53600	41950	980	4
54	53600	41900	1050	4
55	53600	41800	1080	5
56	53600	41750	1120	5
57	53600	41700	1210	5
58	53600	41650	1260	4
59	53600	41600	1120	4
60	53600	41550	987	4
61	53620	41990	870	2

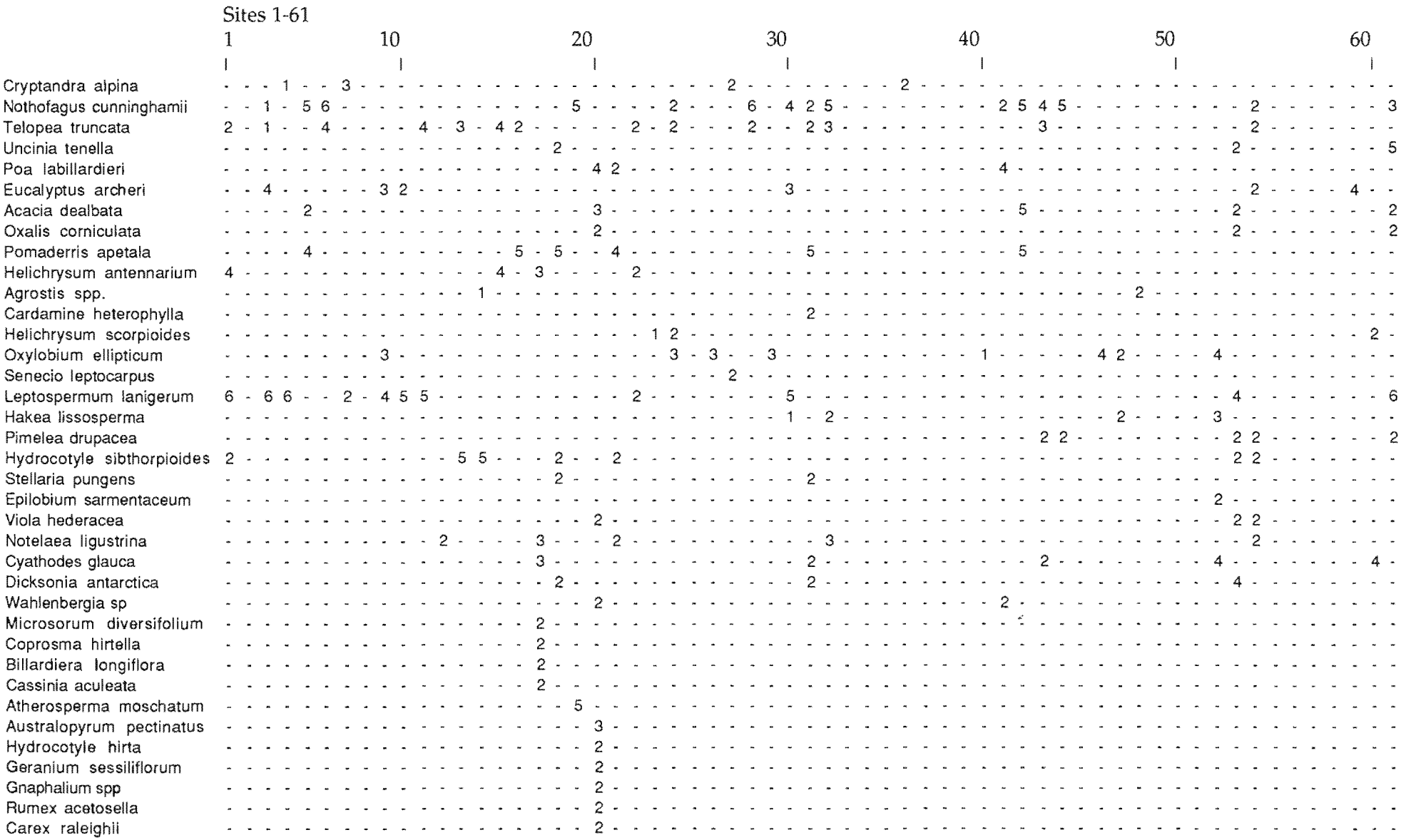
APPENDIX 6

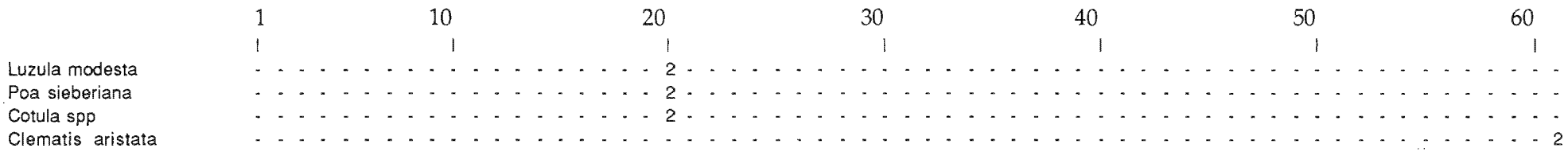
Table of species by site and cover density %.

Explanation 1=<0.1%, 2=0.1-1.0%, 3=1.0-10%, 4=10-30%, 5=30-70%, 6=70-100%.
No density is given for the disturbed sites 45 and 48.




Sites 1-61
1
10
20
30
40
50
60
Oreobolus pumilio
Exocarpos humifusus
Lagenifera stipitata
Acaena novae-zelandiae
Deyeuxia monticola
Helichrysum backhousii
Olearia ledifolia
Tasmannia lanceolata
Uncinia compacta
Brachyscome spp.
Carex gaudichaudiana
Epacris gunnii
Olearia obcordata
Plantago tasmanica
Senecio gunnii
Geranium potentilloides
Richea gunnii
Lichens
Cyathodes parvifolia
Hierochloe fraseri
Luzula spp.
Myriophyllum pedunculatum
Ourisia integrifolia
Polystichum proliferum
Stylidium graminifolium
Pultenaea juniperina
Olearia argophylla
Eucalyptus delegatensis
Galium australe
Olearia phlogopappa
Phebalium montanum
Pultenaea subumbellata
Restio australis
Velleia montana
Cotula filicula
Bedfordia salicina
Blechnum penna-marina


Sites 1-61
1
10
20
30
40
50
60
Cryptandra alpina
Nothofagus cunninghamii
Telopea truncata
Uncinia tenella
Poa labillardieri
Eucalyptus archeri
Acacia dealbata
Oxalis corniculata
Pomaderris apetala
Helichrysum antennarium
Agrostis spp.
Cardamine heterophylla
Helichrysum scorpioides
Oxylobium ellipticum
Senecio leptocarpus
Leptospermum lanigerum
Hakea lissosperma
Pimelea drupacea
Hydrocotyle sibthorpioides
Stellaria pungens
Epilobium sarmentaceum
Viola hederacea
Notelaea ligustrina
Cyathodes glauca
Dicksonia antarctica
Wahlenbergia sp
Microsorum diversifolium
Coprosma hirtella
Billardiera longiflora
Cassinia aculeata
Atherosperma moschatum
Australopyrum pectinatus
Hydrocotyle hirta
Geranium sessiliflorum
Gnaphalium spp
Rumex acetosella
Carex raleighii


Sites 1-61
1
10
20
30
40
50
60
Luzula modesta
Poa sieberiana
Cotula spp
Clematis aristata
2
2
2
2

REFERENCES

Buchanan,A.M., McGeary-Brown,A.,Orchard, A.E.,(1989). A Census of the Vascular Plants Of Tasmania. Tasmanian Herbarium Occasional Publication No.2., Hobart, Tasmania.

Caine, N., (1983). The Mountains of Northeastern Tasmania. A Study of Alpine Geomorphology. A.A. Balkema, Rotterdam.

Davies,J.L.,(1965). Landforms. In: Davies, J.L. (ed).,Atlas Of Tasmania. Lands and Survey Department. Government Printer. Hobart.

Davies, J.B. (1978) Alpine and Subalpine Plant Communities of the Mt Field National Park and Mt Rufus. Unpublished Honours Degree Thesis. Botany Dept. University of Tasmania.

Davies, J.B. (1988a) Botanical Survey Report No. 6. Mt Victoria Forest Reserve -N.E. Tasmania. Unpublished Manuscript. Forestry Commission. Tasmania.

Davies, J.B.(1988b) Botanical Survey Report No. 7. Mt Maurice Forest Reserve -N.E. Tasmania. Unpublished Manuscript. Forestry Commission,Tasmania.

Davies, J.B.& Davies, M.J. (1989) Plant Communities of the Ben Lomond Plateau. Occasional Paper No. 1, Queen Victoria Museum and Art Gallery, Launceston, Tasmania.

Davies, J.B. (1990) Ecology Notes for the Overland Track. Unpublished script. Interpretation Section. Department of Lands, Parks and Heritage.

Duncan, F.& Brown, M.J.(1985) Dry Sclerophyll Vegetation in Tasmania. Extent and Conservation Status of the Communities. Wildlife Technical Report 85/1. National Parks and Wildlife Service,Tasmania.

Faulkner, P. S., (1986) The Winter Climate of Ben Lomond .Private Report.

Fish, G.J. & Yaxley , M.L. (1966), Behind the Scenery. The Geological Background to Tasmanian Landforms. Teaching Aids Centre Publication No. 62. Education Department. Tasmania.

Hill, M.O., (1979). Twinspan-A Fortran Program for arranging Multivariate Data in an Ordered Two-way Table by Classification of the Individuals and Attributes. Ecology and Systematics. Cornell University. Ithaca. New York.

Hill, M.O. & Gauch, H.G., (1980). Detrended Correspondence Analysis, An Improved Ordination Technique. Vegetatio. 42. 47-58.

Jackson,W.D.(1974). Conservation in Tasmania. In: R. L. Specht et al (eds). Conservation of Major Plant Communities in Australia and Papua New Guinea. Australian Journal of Botany Supplementary Series No.7, C.S.I.R.O.,Melbourne.

Jarman,S.J.,Brown,M.J.,&Kantvilas,G. (1984) Rainforest in Tasmania. National Parks &Wildlife Service ,Tasmania.

Kirkpatrick,J.B.,(1982) Phytogeographical Analysis of Tasmanian Alpine Floras. Journal of Biogeography. 9, 255-271.

Kirkpatrick,J.B.,(1983) Treeless plant communities of the Tasmanian High Country. Proc.Ecol. Soc. Aust. 12, 61-77.

Kirkpatrick, J.B., Peacock R.J., Cullen,P.J. and Neyland, M.G. (1988) The Wet Eucalypt Forests of Tasmania. Tasmanian Conservation Trust.

Kirkpatrick, J., Gilfedder, L. & Fensham, R. (1988) City Parks and Cemeteries,Tasmanian remnant grasslands and grassy woodlands. Tasmanian Conservation Trust Inc. Hobart.

Minchin, P.R. (1986) How to use ECOPAK: An Ecological Database System. Technical Memorandum 86/6. C.S.I.R.O. Institute of Biological Resources, Division of Water and Land Resources, Canberra.

Nicolls, K.D. & Dimmock, G.M.(1971) Soils. Tasmanian Year Book.5: 45-50.

Noble, M.G. (1981) Vegetation Organisation along Altitudinal Gradients in Tasmania. Ph.D. Thesis. Australian National University.

Peters, D.G., (1984) TASFORHAB In :"Proceedings of Workshop on Survey Methods for Nature Conservation." Editors: K.Myers, I. Musto, pp179-192. CSIRO. Canberra.

Pinkard, G.J. (1980) Land Systems of Tasmania Region 4 . Tasmanian Department of Agriculture.

Specht, R.L., (1970), Vegetation. In: G. W. Leeper (ed) The Australian Environment. (4th Edn.), CSIRO, Melbourne.