



Tasmania

Tasmanian Geological Survey Record 1997/04

Interim Management Plan for the Mt Read RAP

*A Co-operatively Formulated Plan by Government Agencies, Statutory Bodies
and Relevant Land Users for the Mt Read RAP*

SUMMARY

The formulation of this plan by a co-operative committee, comprising representatives from Government Agencies, statutory bodies and relevant land users, is a 'first' for Tasmania. The effort by these various parties with an interest in the Mt Read area demonstrates the commitment to protect the area in the absence of any formal reserve.

The Mt Read RAP is almost entirely covered by two current mining leases, ML7M/91 over the Henty gold deposit and ML28M/93 associated with the Rosebery silver-lead-zinc mine, and exploration licence EL5/96 held by Renison Limited.

The RAP is within the Mt Read Strategic Prospectivity Zone, which means that if the status of the land is changed and this effectively prevents activities on the current mining tenements, then compensation may be payable.

The vegetation around Lake Johnston is acknowledged as having exceptionally high conservation and scientific values, which is why a management plan for the area was written in 1992 and adopted by the lessee. There is a need to expand the scope of the previous plan so that all users of the Mt Read area are aware of the need to abide by measures to protect the vegetation.

In addition, media reports have generated much interest in the ancient stands of Huon pine growing in one part of the Mt Read RAP. Studies indicate that the existing Huon pine on the site comprises one or a few individuals which may have vegetatively reproduced on the site since the last glaciation. Demands for visitor/tourist access to view this ancient organism are increasing, and damage is being caused by unauthorised visits.

This report recommends that the area around Lake Johnston be made a Nature Reserve (under the *National Parks and Wildlife Act 1970*). The area could remain within the mining lease or the area could be excised from the lease with the consent of the lessee. The area which could be made a Nature Reserve is shown in Figure 1. A management plan and regulations could be made to assist with management of the Nature Reserve. Such a plan would have statutory effect; this plan does not.

The area covered by the remainder of the RAP needs to remain within the existing mining leases and exploration licence. Conditions are already in place to ensure the two lessees take steps to protect the vegetation values.

Additional land users should abide by the provisions of this plan, so all those needing to access the Mt Read area abide by the same vegetation protection and hygiene measures.

The report recommends that all land users adopt this Interim Management Plan for the time being, and that the Interim Management Committee (i.e. signatories to this plan) continue to meet as required until a formal change of status for the proposed Lake Johnston Nature Reserve has been made.

When the area around Lake Johnston is a Nature Reserve, an Advisory Committee can be established under the provisions of the *National Parks and Wildlife Act 1970* to advise on the management of the area.

Until that time the Interim Management Committee should administer the Interim Management Plan by agreement between the parties involved.

RECOMMENDATIONS

1. That the area around Lake Johnston be made a Nature Reserve.

The area can remain within Mining Lease 28M/93 or can be excised by agreement with Pasminco Mining.

2. That a management plan be written to guide the management of the Lake Johnston Nature Reserve, and that this plan contain detailed prescriptions governing visitor access.

The Management Plan should:

- (i) contain recommendations for the development of appropriate infrastructure and regulatory controls to allow sustainable scientific research; and
- (ii) identify the level and type of educational and recreational visits that are commercially and environmentally sustainable.

3. That an Advisory Committee be established to advise the Minister administering the *National Parks and Wildlife Act 1970* on management matters affecting the Lake Johnston Nature Reserve.

The Advisory Committee should comprise of representatives of all groups who have a reason to access the Mt Read area.

NB: Stringent conditions already exist covering operations by the two lessees on the remainder of the RAP. No additional controls are necessary.

4. That the final determination of visitor frequency and numbers should be made by the Parks and Wildlife Service.

5. That a photographic archive of both stills and video footage be established and such material be made freely available to news crews, etc., in preference to such crews taking more (near identical) footage.

This will reduce visitor impact and reduce needless duplicate visits.

6. That until a formal change in tenure (i.e. to Nature Reserve) is made, the Interim Management Plan be accepted and used by all parties needing to access the Mt Read RAP; and

7. That the Interim Management Committee continue until a formal Advisory Committee is established.

8. That no access for tourism be granted until such time as a formal Management Plan has been developed for the proposed Lake Johnston Nature Reserve.

**SIGNATORIES TO THE MT READ RAP
INTERIM MANAGEMENT PLAN**

Mineral Resources Tasmania

Parks and Wildlife Service

Environment Tasmania

Forest Scientists

Tourism Tasmania

Goldfields Tasmania Limited

Pasminco Mining Rosebery

Pasminco Exploration

Telstra

Hydro-Electric Corporation

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ACKNOWLEDGEMENTS

This plan has been formulated by an ad-hoc committee consisting of:

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Mr Bill Bourke, Environment Tasmania
Mr John Johnston, Environment Tasmania
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INTRODUCTION

The Mt Read area is acknowledged as being of great botanical and scientific importance due to the occurrence of particularly unusual and interesting vegetation communities, some of which may have been on the site since the last glaciation. In recognition of the values of the vegetation, the area has been chosen by the Working Group for Forest Conservation (WGFC) as a Recommended Area for Protection (RAP). Of all the 170 or so RAPs identified, the Mt Read RAP is considered by the WGFC to be botanically one of the most important.

Since the late 1800s the Mt Read area has also been widely recognised as a place of geological importance. Early mineral exploration resulted in numerous mines being developed in the region. This exploration continues today with the discovery of additional prospective mineralised zones. Harvesting of the native rainforest timbers which cover the region has also been a traditional activity.

Most of the Mt Read area is covered by existing mining leases: ML7M/91 covers the Goldfields (Tasmania) Limited Henty gold mine, while ML28M/93 is associated with the Pasmaenco Mining – Rosebery silver-lead-zinc mine.

In September 1990 the RAP process was incorporated within the Forests and Forest Industry Strategy. A report completed by the group in 1991 classified the Mt Read RAP as ‘unresolved’ in terms of its location, boundary and general future management intent. In recognition of the conservation significance of the vegetation in the area, Mineral Resources Tasmania drew up a Management Plan in 1992 (*Management of the Flora of the Mt Read RAP*; Bacon, 1992).

Recently, a stand of ancient Huon pine (*Lagarostrobos franklinii*) near Lake Johnston within the RAP area has been featured in the media. This stand of Huon pine is believed to be one of the world’s oldest organisms.

In 1995 a co-operative committee comprising the land users of Mt Read and relevant Government Departments was formed to determine a suitable management strategy for Mt Read. Given the collaborative nature of this committee, the Public Land Use Commission (PLUC) at that time indicated that it would consider the deliberations of this committee in recommending any change in tenure for the Mt Read RAP.

MANAGEMENT PLAN OBJECTIVE

The overall objective of the Mt Read Interim Management Plan is to ensure an understanding of, and adequate planning for, the management and protection of the Mt Read RAP by all land users.

There is a need to acknowledge the importance of the flora and fauna of the area and have in place some means of ensuring protection for the rare communities. However at the same time, the existence of the current Mining Leases, the existing contractual rights of the lessees, and the rights of other users of Mt Read such as Telstra and the HEC must be acknowledged.

This Plan has been co-operatively formulated by Government Agencies, Statutory Bodies and relevant land users including Mineral Resources

Tasmania, Parks and Wildlife Service, Forestry Scientists, Hydro-Electric Corporation, Telstra, Goldfields Tasmania Limited, Pasmaenco Rosebery and Pasmaenco Exploration, Tourism Tasmania and Environment Tasmania.

The Plan used information from previously completed studies to provide a description of the existing physical environment. Land use and socio-economic considerations were then applied to this information. Environmental management requirements for specific land users were then formulated to provide a collaborative Interim Management Plan which can be used as a management guide for the Mt Read RAP.

MANAGEMENT PLAN IMPLEMENTATION

Once agreed, this Plan will be adopted by relevant regulatory authorities and Mt Read RAP area land users, ensuring the sustainable use of Mt Read’s natural resources as an interim measure until a suitable statutory process can be found which will provide a long-term solution. Recommendations relating to the long-term management of the area are made in this Plan (pages 19–23).

The Mt Read RAP Interim Management Plan should be updated at regular intervals to take account of major land issues which may occur in the area, until such time as a decision is made on the future status of the RAP area.

DESCRIPTION OF THE MT READ RAP

Location

The Mt Read RAP area comprises approximately 500 ha of land located some 8 km south of Rosebery in central western Tasmania (fig. 1). This area extends to the south of Mt Read from 1125 m to about 825 m in elevation.

Climate

The climate of the Mt Read RAP area is characterised by cool temperatures (ranging from averages of 0°C during winter to approximately 18°C during summer) and high rainfall (average approximately 3300 mm per annum). Rainfall distribution is generally all year round, with higher levels during winter. Snow and frost may be experienced throughout the year. The mean relative humidity varies between 75 and 100% during winter and 61 to 78% during summer.

The driest period of the year is from January to March, when stable, fine weather can be accompanied by hot, dry northerly winds. This is the period of greatest fire danger. The exposed nature of the Mt Read RAP area also results in it being under the influence of westerly winds, known as the 'Roaring Forties', during winter.

Although rainfall is the principal means of precipitation, significant amounts of snow occur above the 600 m level. This occurs mainly in winter but may fall during any month. There is no permanent snow line within the RAP area, however snow may persist above 1000 m well into summer.

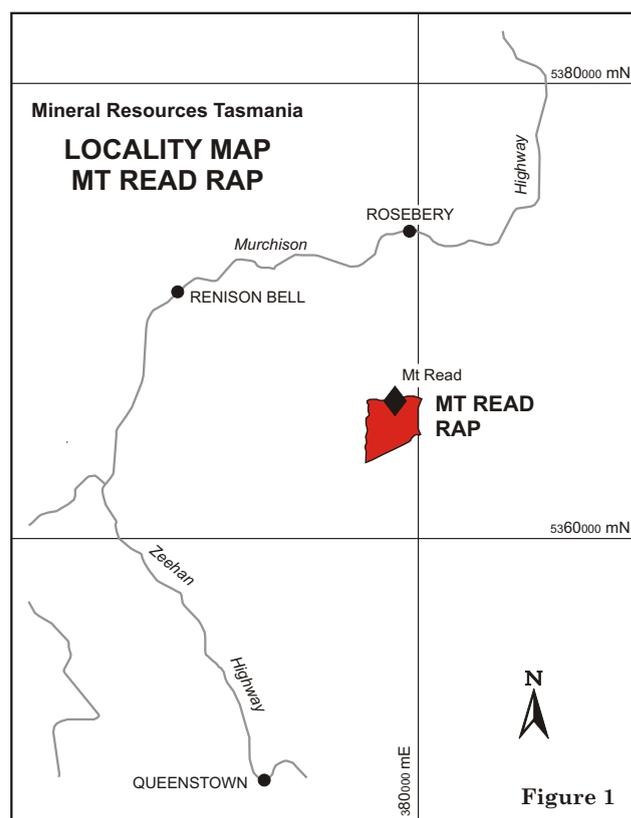
Physiography/topography

Landforms in the Mt Read area are typical of the western ranges' physiographic region; Precambrian and folded Palaeozoic rocks form the ranges in which the topography is largely controlled by major structural trends. More resistant quartzite and conglomerate units form the dissected mountain ranges which almost parallel the west coast. The steep sides of the ridges were formed by large valley glaciers.

Geology

Many of the ore deposits of western Tasmania occur in an elongate zone called the Dundas Element. This element contains sedimentary rocks and volcanic and related rocks of Cambrian age, wrapped in an arcuate fashion around the western and northern edge of Precambrian rocks (the 'Tyennan Region').

The eastern side of the Dundas Element comprises a 10–15 km wide belt of Cambrian volcanic and similar rocks known as the Mt Read Volcanics.



Several major volcanic and volcano-sedimentary sequences or rock associations of regional extent occur within the volcanic belt. The geological relationships between these units are complicated, and are further dislocated by faulting. The most significant fault is a NNE-trending structure — the Henty Fault Zone — which obliquely bisects the volcanic belt from south of Mt Read to near Hellyer. There are major differences in rock types across the fault zone.

The main geological associations in the Mt Read Volcanics belt are:

- the Dundas Group, consisting of volcanic and associated volcano-sedimentary rocks to the northwest of the Henty Fault, and which hosts the Hellyer and Que River ore deposits;
- the Central Volcanic Complex (CVC), mainly consisting of volcanic rocks, on both sides of the Henty Fault, and which hosts the Rosebery, Hercules and Mt Lyell deposits; and
- the Tyndall Group, also mainly volcanic rocks and associated sediments, to the east of the Henty Fault.

This volcanic belt is one of the most intensively mineralised provinces of its type in the world. It hosts numerous small ore deposits, two or three medium-sized deposits, and three large deposits: Mt Lyell, with more than two million tonnes of copper; and Rosebery and Hellyer, each with about four

million tonnes of zinc, two million tonnes of lead, 100 000 tonnes of copper, 60 tonnes of gold and 3000 tonnes of silver.

These orebodies, technically described as volcanic-hosted massive and disseminated sulphide deposits, are thought to have been formed on or just below the sea bed during volcanic activity. The metals they contain were carried in hot aqueous solutions from below the sea floor, and the sulphide ores formed when the solutions mixed with cold seawater.

The orebodies within the Mt Read Volcanics usually comprise massive lenses or pods of sulphide minerals interbedded with, or enclosed within, shale or volcanic-derived sedimentary rocks formed at the same time. The main ore minerals are pyrite, sphalerite and galena (sulphides of iron, zinc and lead respectively), and chalcopyrite (copper-iron sulphide). Trace metals within the sulphides include gold and silver. A common mineral present is barite (barium sulphate).

Soils

A description of the soils found within the Mt Read RAP is given in Johnston (1988) from which the following information was obtained.

The area is bisected by a major structure, the Rosebery Fault. The sedimentary rocks comprise dolomitic siltstone, conglomerate and quartzite of the Dundas Group.

The Cambrian Mt Read Volcanics, comprising lava flows, tuffs, volcanoclastic sandstone and occasional areas of shale including black shale and ashy siltstone, give rise to siliceous clay soils. There are also dykes of basalt which weather to orange clayey soils.

Glacial deposits, mainly till, also occur. As with the Dundas Group sediments, these deposits are highly erodible once disturbed.

The characteristic feature of all soils found within the area is their high organic content. A peat mantle of fairly uniform characteristics is capable of developing over a variety of rock types as a result of the cool temperatures and high rainfall. The cover is rarely more than 500 mm deep and usually has a sharp basal boundary. Peat can rapidly absorb and retain large quantities of water, thus making it resistant to erosion. Once the peat layer is lost through disturbance or fire it is not readily replaced and the underlying substrate is frequently eroded once exposed.

The volcanic rocks give rise to gravelly brownish yellow gradational soils, while dark grey gradational soils develop on mudstone and slate. These soils are generally limited in depth (up to about 500 mm) and are highly siliceous and infertile. Volcanic soils predominate in the area. These soils

are subject to compaction, surface puddling, are poorly drained and may be extensively sheet eroded on slopes. This is evident at the Hercules mine on Mt Read, where extensive sheet erosion has taken place with the removal of the organic soil mantle and vegetation cover.

As well as being shallow and organic, the soils are highly acidic and low in nutrients, particularly nitrogen and phosphorus.

Hydrology

Surface hydrology

Moxon Saddle, between Mt Read and the southwestern end of Mt Murchison, forms the watershed for the Stitt River which flows north into the HEC's Lake Pieman just below the Rosebery township.

The western side of the Mt Read massif is drained by the Ring River and several smaller creeks (Natone and Salisbury), which run into the Pieman River. The Pieman River is the ultimate receptacle of the whole drainage system from Mt Read area, excluding the extreme southern area which is drained by the Henty River.

The tributaries of the Stitt River comprise Koonya, Talune, Dalmeny and Saddle Creeks which drain the northern flanks of Mt Read.

The Stitt River supplies potable water to Rosebery, while the Pieman River supplies water for mining and milling operations, and has been modified for hydro power generation.

The Pieman River is the major receiving river system in the area and has one of the highest flow rates of any Tasmanian river, with an average discharge of 190 cumecs at Pieman Head and 150 cumecs at the Reece Dam. The total catchment area is approximately 3800 km².

Groundwater

Specific groundwater studies have not been undertaken in the Mt Read RAP area. However, a consideration of the general topography, geology and rainfall of the district, and the application of basic hydrogeological principles, indicate that groundwater is likely to be a major component of the hydrological cycle.

Most, if not all, of the Cambrian rock types can be considered, in the groundwater sense, as fractured, hard-rock aquifers, which permit the infiltration of rain through, and its storage in, joints and other related defects in the rock mass. The relatively high annual rainfall of around 3300 mm suggests that significant quantities of water are likely to move to the subsurface. The rugged topography implies relatively steep water table gradients, so that large volumes of groundwater will flow through rock defects to receiving streams.

The water table (the level below which all rock fractures are water filled) is almost certainly a subdued replica of the land surface, being close to the surface in low-lying areas, and deeper under hills. Groundwater movement will, in all cases, be towards creeks and rivers, at rates determined by the bulk permeability of the rock through which it moves, and the water table gradient.

Groundwater quality is determined by the quality of the infiltrating rain, the chemical characteristics of the aquifers, and the length of time the groundwater is in contact with the host rocks.

There are no users drawing groundwater from this area for commercial or residential use.

Vegetation

The Mt Read RAP contains a number of rainforest communities currently either unreserved or poorly represented in the existing reserve system, and which are considered to be of biogeographic significance in terms of their species composition, biodiversity and structural forms. The area is part of a major stronghold of the rare restricted endemic *Orites milliganii*, and also contains a significant population of the endemic conifer Cheshunt pine (*Diselma archeri*) in its rare arboreal form, including the largest and possibly oldest specimens recorded. Of the State's 320 endemic species, 90 have been recorded in the RAP. Only one other site in the State (Mt Field) has an equivalent number of native conifers. The RAP (approximately 500 ha in area) is within a 21 km² patch of deciduous beech (*Nothofagus gunnii*), which is the biggest single patch in the State.

The RAP also contains two disjunct subalpine patches of Huon pine (*Lagarostrobos franklinii*). Anecdotal sources have reported Huon pine from a number of other high altitude sites in western Tasmania, and an occurrence at 850 m altitude on Frenchmans Cap has been described. However, at this point in time, the Mt Read occurrences are undisputedly the highest recorded altitude of live Huon pine.

Vegetation and scientific studies

The vegetation on the Mt Read/Mt Dundas massif has attracted many studies. The revelation of the unique vegetation attributes is due, in part, to the intensity of the studies conducted to date, and the ease of access provided by mining and mineral exploration tracks. Nevertheless, the importance of the vegetation cannot be denied, particularly that near Lake Johnston.

Studies which have been done, or are in progress, include:

- Dendro-chronological studies of the live and fire-killed Huon pine, which have produced an important 1100 year climatic record (Cook *et al.*,

1991, 1992). This record has now been extended back nearly 5000 years, the longest record of its type in the southern hemisphere and on a global basis is considered to be one of the most significant. Dendro-chronological studies, producing records of 2000 years or more, have also been produced from Huon pine stands in the Teepookana, Frenchmans Cap, Harman River and Stanley River areas.

- Analysis of pollen in sediment cores taken from Lake Johnston and genetic studies (Shapcott, 1991) indicate that the Huon pine stand near the lake may consist of, or is derived from, one or a few single individuals which may have been present on the site for over 10,500 years.
- Pollen records from Lake Johnston have been used to interpret vegetation and climate profiles following the waning of the last glaciation (approximately 11,000 years ago). The sediment cores were also used for palaeomagnetic interpretation, part of an Australia-wide research project by the Australian Geological Survey Organisation.
- The inferred long-undisturbed nature of rainforest communities on Mt Read is of great interest to ecologists and palaeobotanists. A comparative study of these communities with recently disturbed areas is providing new insights into vegetation succession and the effects of fire.

Vegetation surveys

A vegetation survey of the part of ML7M/91 which overlaps the Mt Read RAP was commissioned by the lessee in response to a request from the Mineral Exploration Working Group (MEWG). A vegetation study over the part of the Pasminco lease area (part of ML28M/93) which overlaps the Mt Read RAP was commissioned by Mineral Resources Tasmania. Both surveys were undertaken by Mr M. J. Peterson.

The aim of both these studies was to produce a vegetation map, together with notes on the various vegetation communities, which would allow exploration works to be designed in such a way as to minimise impact on the flora and avoid, wherever possible, the vegetation communities of highest conservation significance.

The main findings of these studies are presented in Appendices 1, 2 and 3.

Introduced flora

Whilst no detailed surveys have been conducted, some evidence exists of flora being inadvertently introduced to the area along roadsides leading to the Mt Read RAP. These include varieties of thistles, burrs and pampas.

Phytophthora cinnamomi

The spread of *Phytophthora cinnamomi* into areas surrounding the Mt Read RAP area has occurred.

This is particularly evident in areas where roads and other land disturbance have been made during construction of the Anthony and Pieman River hydro-electric schemes.

The spread of this disease is being routinely mapped on the Goldfields Tasmania Limited lease.

To prevent the spread of *Phytophthora*, the following precautionary measures have been introduced:

- a boot wash has been installed near the summit of Mt Read for use by personnel walking into the area. All foot traffic in this area is expected to use the boot wash;
- mobile equipment is routinely washed down and disinfected. A vehicle washing facility will shortly be available for use (courtesy of Pasminco Rosebery) at the Rosebery mine.

Only persons having a valid reason to visit the area should be admitted for the time being, until measures to cope with visitor numbers (i.e. boardwalk, etc.) have been installed.

Fauna

No faunal study or research programme has been specifically undertaken in the Mt Read RAP area. Further investigation, determination and quantification is required before any definitive measures can be proposed.

The vegetation communities found in the area (excluding Zone 1 described in Appendix 3) are generally typical of the vegetation communities found throughout the West Coast region. From these observations it can be assumed that the fauna found within the RAP is represented elsewhere in similar environments on the west coast. A fauna survey was conducted on behalf of the HEC for the Anthony Power Development in 1984.

Terrestrial fauna

A faunal study of mammals, reptiles and amphibians was completed in the adjacent Anthony–Henty area by the Hydro-Electric Commission as part of the Anthony Power Development Environmental Plan.

The survey found one introduced species of mammal and 16 native mammals in the general region, representing more than half the indigenous species in Tasmania. The species diversity found is comparable to other areas in Tasmania having similar habitats. All species recorded in the survey are widely distributed within Tasmania, and were found within the expected range of habitats.

The 14 species of reptiles and 10 species of amphibians collected during the survey are all relatively common and are widely distributed throughout Tasmania.

No rare or endangered bird species were found in the survey area. Of the 44 species expected to be present, all use two or more of the habitat types described in the botanical surveys (rainforest, mixed forest and scrub, sedgeland and heath and alpine). A survey carried out on the Pieman River area (*Pieman River State Reserve and Conservation Area Management Plan 1992* — Parks and Wildlife Service) encountered several pairs of wedge-tailed eagles (*Aquila audax*) which are known to nest in the region. Although widespread in Tasmania, there are only 70 to 80 breeding pairs and the species is fully protected.

Aquatic fauna

Limited information is available on the aquatic fauna present in the streams flowing through the area. Some information is available on the Pieman River which is the major river in the region. All streams ultimately flow into the Pieman River system.

Eleven native fish species are known to occur within the Pieman River State Reserve and Conservation Area below the Reece Dam. Two of these, Tasmanian whitebait (*Lovettia sealii*) and Tasmanian smelt (*Retropinna tasmanica*) are endemic to Tasmania. An examination of the genetic structure of whitebait in the Pieman River has shown it to be a separate stock to that found elsewhere.

The Australian grayling (*Prototroctes maraena*) has a wide distribution in Tasmania and southeast Asia, although numbers are declining due to habitat alteration and water quality deterioration. The Pieman River system is thought to hold a good population of this species.

Short-finned eels (*Anguilla australis*), Brown trout (*Salmo trutta*) and Rainbow trout (*Onchorynchus mykiss*) also occur, while the Australian salmon (*Arripis trutta*) is known to occasionally enter the river.

Most freshwater fish species in the Pieman River system are migratory, with some marine phase in their life cycle. The Reece Dam will most certainly have had some influence on their movements, both from changes to the past flow regime of the river and from the physical barrier the dam presents.

Invertebrates

There is evidence to suggest that the Tasmanian invertebrate fauna is large and of scientific interest, containing a number of relict and endemic species. It is possible that some of these species may be found within the RAP.

Greenslade (1985) described the aquatic invertebrate fauna of western Tasmanian rivers as highly endemic and diverse.

Invertebrates tend to have very specialised environmental requirements, often resulting in

patchy localised distributions. While the environmental conditions found within the area are very similar to conditions elsewhere within the region, there is insufficient information available to predict whether the small RAP area is, or is not, likely to contain invertebrates which may have a high conservation status.

Introduced fauna

Whilst records exist of feral cat and stray dog sightings in the general area of the Mt Read RAP, no specific surveys have been conducted.

Goldfields Tasmania Limited have introduced a formal cat sighting system together with a cat trapping scheme for mining lease ML7M/91.

Archaeological, Conservation and Heritage Aspects

Tasmanian Aboriginal archaeology

The Tasmanian Aboriginal Sites Index (TASI) of the Department of Environment and Land Management lists only three sites within approximately five kilometres of the Mt Read RAP boundary. Two scattered artefact sites have been recorded 3.5 km and 4 km south of the area (a scattered artefact site is a location where two or more Aboriginal artefacts have been located). A rock shelter has also been recorded approximately 5.5 km to the east of the area. The TASI is current up to July 1991.

All Aboriginal sites are protected by the *Aboriginal Relics Act 1975*. Any site found must be reported to the Parks and Wildlife Service. A permit from the Minister is required to disturb, damage or destroy an Aboriginal site.

Areas of historical significance

Whilst no detailed survey or archaeological study has been carried out on the Mt Read RAP area, except from scientific work on vegetation, the history of the area and location of mining and sawmilling activities in adjoining areas is well known to mining companies and local historians.

The first mineral discovery reported from the area was by Thomas Bather Moore, who observed small quantities of copper pyrites and carbonate of copper on the eastern slopes of Mt Read in March 1877.

Moore had named the mountain after the Read family of historic 'Redlands', near New Norfolk, who were one of the sponsors of the expedition. The first deposit of commercial value was discovered in early 1891, when prospector A. E. Conliffe located a gold-bearing gossan on the western side of Mt Read. The Mt Read Mining Company was established to work the deposit which turned out to be an extensive lead-zinc sulphide orebody.

A more significant event occurred in December 1894, when Joseph Will found a rich seam of silver, gold and lead in an area below the Mt Read mine. This discovery led to the development of the successful Hercules mine. By 1900, the mine had reached full production and continued to operate until the closure of the Zeehan Smelters in 1913. Meanwhile, a small settlement was established on Mt Read near the Hercules mine at an altitude of 900 m above sea level.

By 1897, the Mt Read township was home to 100 miners, and with an average annual rainfall of 3300 mm (130 inches), it was the wettest mining community on the West Coast. With the opening of the 1600 metre self-acting haulage in 1899, the settlement slowly began to fade away. Williamsford, located at the base of the haulage and at the terminus of the North East Dundas Tramway, became the preferred place of residence.

After three years of closure, the Hercules mine was acquired by the Mount Lyell Mining and Railway Company Ltd in 1916, and a development and exploration campaign was conducted. Another change of ownership occurred four years later when the mine was purchased by the Electrolytic Zinc Company of Australasia Limited. The Hercules mine returned to full production during 1922 and was to remain with the company until the mine's closure in 1986. During its 86 year existence, ore production exceeded 2.5 million tonnes with an estimated metal value of \$1 billion.

The Hercules mine was re-opened by Mancala Pty Ltd in late 1996.

Historically significant sites on the RAP area could include:

- Pack tracks into the area dating from the 1880s;
- Early prospecting and mining operations (at least ten mines are known to have been operating within 2 km of the Mt Read summit);
- Timber gathering and sawmilling activities in and close to the RAP area.

The remoteness of the area and the prevailing harsh climatic conditions have resulted in most sites being left as they stand when operations ceased.

Lease conditions now contain provisions for the protection of items of cultural heritage significance. For example, the Pasminco lease 28M/93 includes:

14. *The lessee will take such steps as directed by the Inspector of Mines to avoid or protect mining features or artefacts deemed to be of cultural heritage significance, and prior to mine closure the lessee shall undertake an audit of the heritage values of the site in accordance with direction issued by the Director of Mines.*

Fire Management

Impact of bushfires

Some 30% of the Mt Read RAP area has been damaged by bushfires since white settlement. Major fires occurred during the 1890s and in February 1960.

During the last event a major fire started in the Rosebery area and moved up the Natone and Ring River valleys onto Mt Hamilton and Mt Read. Areas of significant vegetation were destroyed, including populations of King Billy and Huon pine. Over most of the alpine areas almost no regrowth of these species has occurred. All rainforest and alpine communities are extremely sensitive to fire and research suggests it will be many millennia before fire-disturbed areas reach climax species composition and structure. Further firing of disturbed sites may lead to local extinction of species and community types.

Lease conditions

Lease conditions on mining leases include provisions for the lighting and suppression of fires. Please note that the following are extracts from the exact wording of the lease conditions, and in some cases land tenure details and names of Government departments have since changed.

As the mining lease document constitutes a contract between the Crown and the lessee, changes to the wording cannot be made without the agreement of both parties.

■ **ML7M/91 — Henty gold mine**

7. *No fires to be lit on or adjacent to the lease area without the prior written approval of the District Forester, Queenstown, and then only in accordance with the provisions of the Fire Service Act 1979.*
8. *The lessee shall be responsible for the immediate suppression of any fires which may occur on the lease area due to mining or exploration activities to the satisfaction of the District Forester, Queenstown.*

The Licence to Operate Scheduled Premises for the Henty gold mine, issued by the Department of Environment and Land Management, also includes clauses relating to fire.

Conditions G8 of the licence ensures the licensee shall:

- (a) *ensure that there is no open burning of vegetation, rubbish, or other matter on the premises; and*
- (b) *clear firebreaks around areas and machinery from which there is a risk of fire escaping; and*

- (c) *instruct employees on the fire sensitive nature of the surrounding vegetation communities, and the fire control provisions of this licence; and*
- (d) *from the commencement of pre-production mining (as described in the EMP), station a fire-fighting vehicle and equipment on the premises, train personnel in fire-fighting techniques, and maintain an 'at-call' trained crew to man the vehicle and equipment in the case of a fire; and*
- (e) *ensure that peat stockpiles are located at least 10 m from road edges; and*
- (f) *liaise with the Tasmania Fire Service, Department of Parks, Wildlife and Heritage, Hydro-Electric Commission and Forestry Commission with respect to fire management, planning and control. The licensee shall provide to the Director of Environmental Control a report on the outcome of these discussions and the agreed role of the licensee in a co-operative fire management plan within 6 months of the date of issue of these conditions.*

■ **ML28M/93 — Rosebery mine**

Lease conditions for the Pasminco Mining Lease 28M/93, revised in March 1996, include:

17. *The Lessee shall:*

- (a) *Ensure no open burning of vegetation, rubbish or other matter occurs within the lease area, other than control burns required as part of a Fire Management Plan.*
- (b) *Instruct employees on the sensitive nature of the surrounding vegetation communities and the fire control provisions of this lease.*
- (c) *Liaise with the Tasmania Fire Service and other relevant authorities with respect to fire management planning and control.*
- (d) *Provide to the Director of Environmental Management and to the Director of Mines, evidence of a co-operatively developed Fire Management Plan for the lease within 6 months of the issue thereof.*

Exploration Licence Conditions

Standard fire suppression conditions form part of every exploration licence issued. The following are excerpts from standard schedules A and B:

■ **SCHEDULE A**

The licensee shall not light any fires without the approval of the State Fire Commission or the relevant District Forester when on State Forest. When on land reserved under the National

Parks and Wildlife Act 1970 or the Crown Lands Act 1976, the approval of the Secretary of the Department of Parks, Wildlife and Heritage is required. Precautions are to be taken with fuel storage to minimise the risk of fire. The licensee, agent and/or employees during exploration activities shall be responsible for the immediate suppression of non-permit fires arising from those activities.

Chainsaws and other mechanical equipment may not be used on days of total fire ban, and during fire permit periods all work sites must be stocked with relevant fire fighting equipment.

■ SCHEDULE B

Exploration managers will ensure that **during a fire permit period**, persons occupying permanent and semi-permanent camp sites, drilling sites, or work sites using, servicing or refuelling earth-moving equipment shall have the sites equipped with the following fire-fighting tools:

- a serviceable knapsack pump filled with not less than 10 litres of water, or a powder type extinguisher of not less than 1 kg capacity;
- a slash hook;
- a fire rake or grubbing hoe;
- a receptacle containing not less than 180 litres of water.

Track cutting teams using chainsaws, and persons on work sites where chainsaws, power

augers, generators or other petrol engines are frequently used, will maintain within sensible reach a serviceable knapsack pump filled with not less than 10 litres of water, or a powder type extinguisher of not less than 1 kg capacity.

All premises used as kitchens or as sites for storing fuel or storing, servicing or refuelling engines will be:

- cleared to bare earth;
- surrounded by a firebreak sufficient to isolate the premises from the surrounding vegetation.

Reporting of fires

All fires in the vicinity of the Mt Read/Mt Dundas massif should be reported immediately to the lessees:

- Henty gold mine (03) 6473 2444;
- Pasminco Rosebery mine (03) 6473 2222;

or to the:

- Tasmanian Fire Service control centre at Burnie (03) 6431 1155; or
- Parks and Wildlife Service at Strahan (03) 6471 7122.

A fire management plan for the Henty area is currently being prepared by the Parks and Wildlife Service.

CURRENT LAND USE

Land use within and around the Mt Read RAP area is presently subject to a complex system of Legislative requirements, guidelines and lease conditions.

Legislative Framework

The land on which the Mt Read RAP is located currently has the status of unallocated Crown Land. Legislation applicable to the area includes:

- Aboriginal Relics Act 1975* if any artefacts are found in the area;
- Crown Lands Act 1976*;
- Hydro-Electric Commission Act 1944*;
- Mining (Strategic Prospectivity Zones) Act 1993*;
- Mount Read and Rosebery Mines Limited Leases Act 1916*;
- Mineral Resources Development Act 1995*;
- Environmental Management and Pollution Control Act 1994*;
- Fire Services Act 1979*;
- Commonwealth Telecommunication Act 1991*.

Land Use Classifications

The land within the Mt Read RAP:

- is covered almost entirely with mining leases granted in accordance with the *Mount Read and Rosebery Mines Limited Leases Act 1916* and the *Mineral Resources Development Act 1995*;
- is within a Strategic Prospectivity Zone; and
- is classed as unallocated Crown Land (albeit held under mining leases and an exploration licence).

Tasmania/Commonwealth Regional Forests Agreement

In January 1996, a reference was issued by the Tasmanian Government to the Tasmanian Public Land Use Commission (PLUC) requiring it to inquire into areas to be reserves under the Tasmania – Commonwealth Regional Forest Agreement, i.e.

The Public Land Use Commission is to conduct an inquiry into the determination of the appropriate land use classifications for the areas of public land which will be identified by the comprehensive, adequate and representative (CAR) reserve system assessment process that is expected to be part of a Regional Forest Agreement (RFA) for Tasmania under the National Forest Policy Statement. The Inquiry is also to determine appropriate land

use classifications for the public land areas known as unresolved Recommended Areas for Protection (RAPs). In addition, the Inquiry is to determine the management options for the private forest lands that are expected to be part of the Regional Forest Agreement CAR reserve system.

Final recommendations are to be submitted to the Minister by 30 June 1997.

If the Mt Read RAP is included in the CAR reserve recommendations arising from the RFA, then the PLUC may be asked to recommend an appropriate land classification. If not, a land classification may be agreed between all relevant parties without the matter having to be referred to the PLUC.

Land Tenure

The Mt Read RAP is almost entirely covered by mining leases ML28M/93, held by Pasmaenco Australia Ltd, and ML7M/91 held by Goldfields Tasmania Ltd. A small portion of the RAP remains as unallocated Crown Land, part of which is held under exploration licence EL5/96 by Renison Ltd. Current land tenure is shown in [Figure 2](#), and the coverage of mining tenements is shown in [Figure 3](#).

Road Access

The Mt Read RAP is largely covered by mining leases and road access is via private roads built to varying standards.

- The Telstra road, built to service communications equipment on Mt Read, provides a two-wheel drive vehicle connection to the Williamsford road through the Pasmaenco mining lease.
- The Hercules road, built to access the Hercules mine on Mt Hamilton, provides a four-wheel drive vehicle connection to Williamsford through the Pasmaenco mining lease.
- The Lake Johnston road, built as a four-wheel drive vehicle mining exploration track, provides a connection to Howards Road via the Pasmaenco and Goldfields Tasmania Ltd mining leases.

As none of these roads are public roads, both Telstra and the mining lease holders are entitled to restrict the use of the roads, and all have gates which are normally locked.

Existing Controls — Mining and Exploration

Note that the following are exact extracts from the conditions of the mining lease documents; the names of Government departments have changed since the documents were issued.

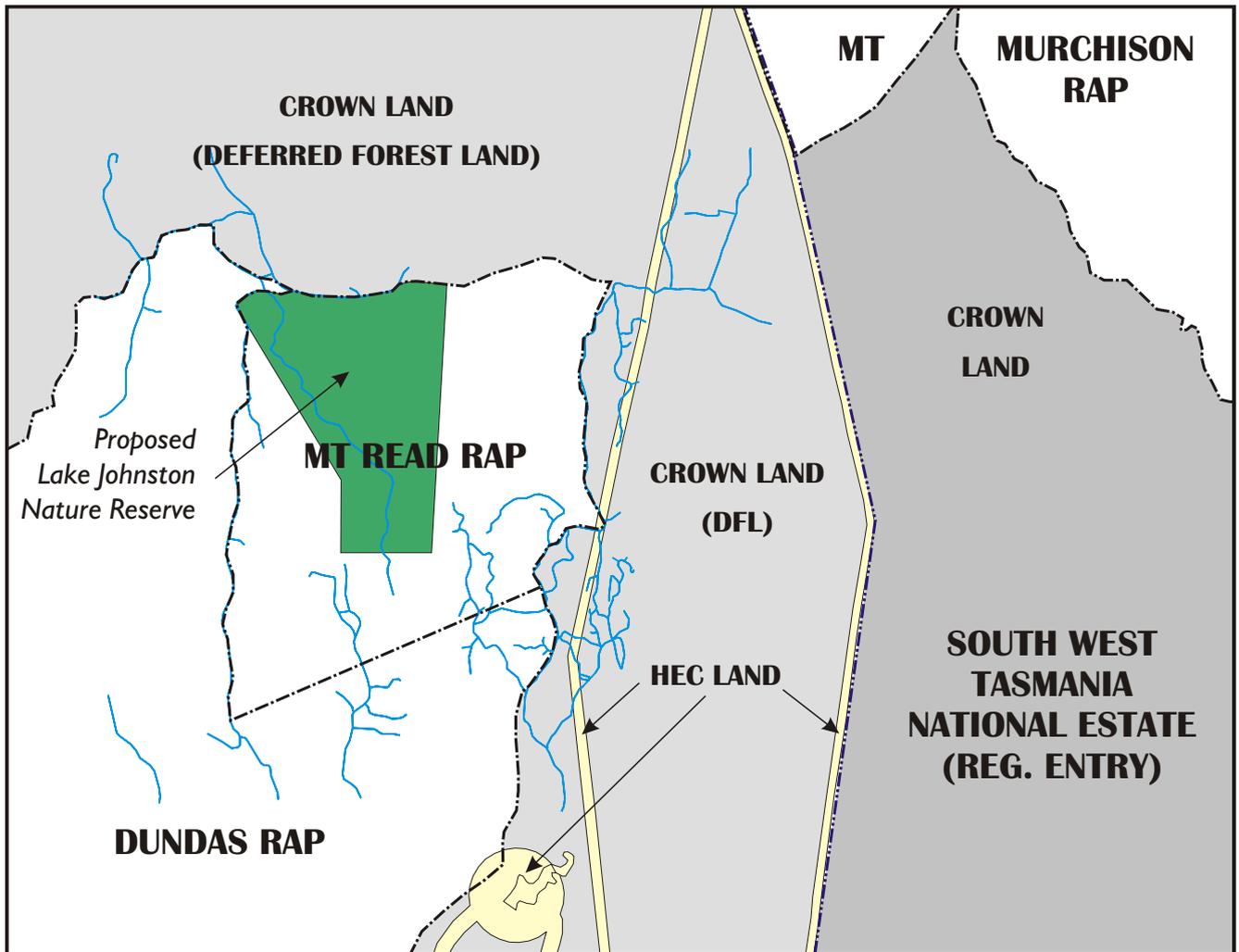


Figure 2

Land tenure in the Mt Read area

■ **ML7M/91 — Goldfields Tasmania Ltd — Henty gold mine**

This lease is held over the Henty gold mine. Conditions in both the Mining Lease (issued by Mineral Resources Tasmania) and Licence to Operate Scheduled Premises (issued by the Department of Environment and Land Management) require approval to be sought before exploration activities are undertaken in the Mt Read RAP.

Clause 10 of Schedule 2 of the Mining Lease document reads:

Any exploration activities causing ground disturbance in the area classified as Recommended Areas for Protection (RAPs) are to be referred to the Mineral Exploration Working Group, and will be subject to prior written approval before being undertaken.

Condition G4 of the Licence to Operate Scheduled Premises (issued by the Department of Environment and Land Management) reads:

New exploration activities involving earthworks, drill pads or vehicular tracks within the Mt Read Recommended Area for

Protection, as defined by the Working Group for Forest Conservation in 'Recommended Areas for Protection of Rainforest, Wet Eucalypt and Dry Sclerophyll Forest in Tasmania' (see Map 1 attached to this licence), must be referred to and approved by the Tasmanian Government's Mineral Exploration Working Group. This does not include works associated with the exploration program currently being undertaken with the approval of the Department of Resources and Energy.

Note that at the time these two conditions were drafted, the 'Mt Read RAP' covered much of the Dundas area; subsequently this large RAP was divided into a much smaller 'Mt Read RAP', with the remainder being known as the 'Dundas RAP'. The aim of both these sets of conditions was to cover work in the large RAP (i.e. current Mt Read and Dundas RAPs combined).

■ **ML28M/93 — Pasmenco Mining, Rosebery — Rosebery mine**

Lease conditions were updated and revised in 1996 and now include:

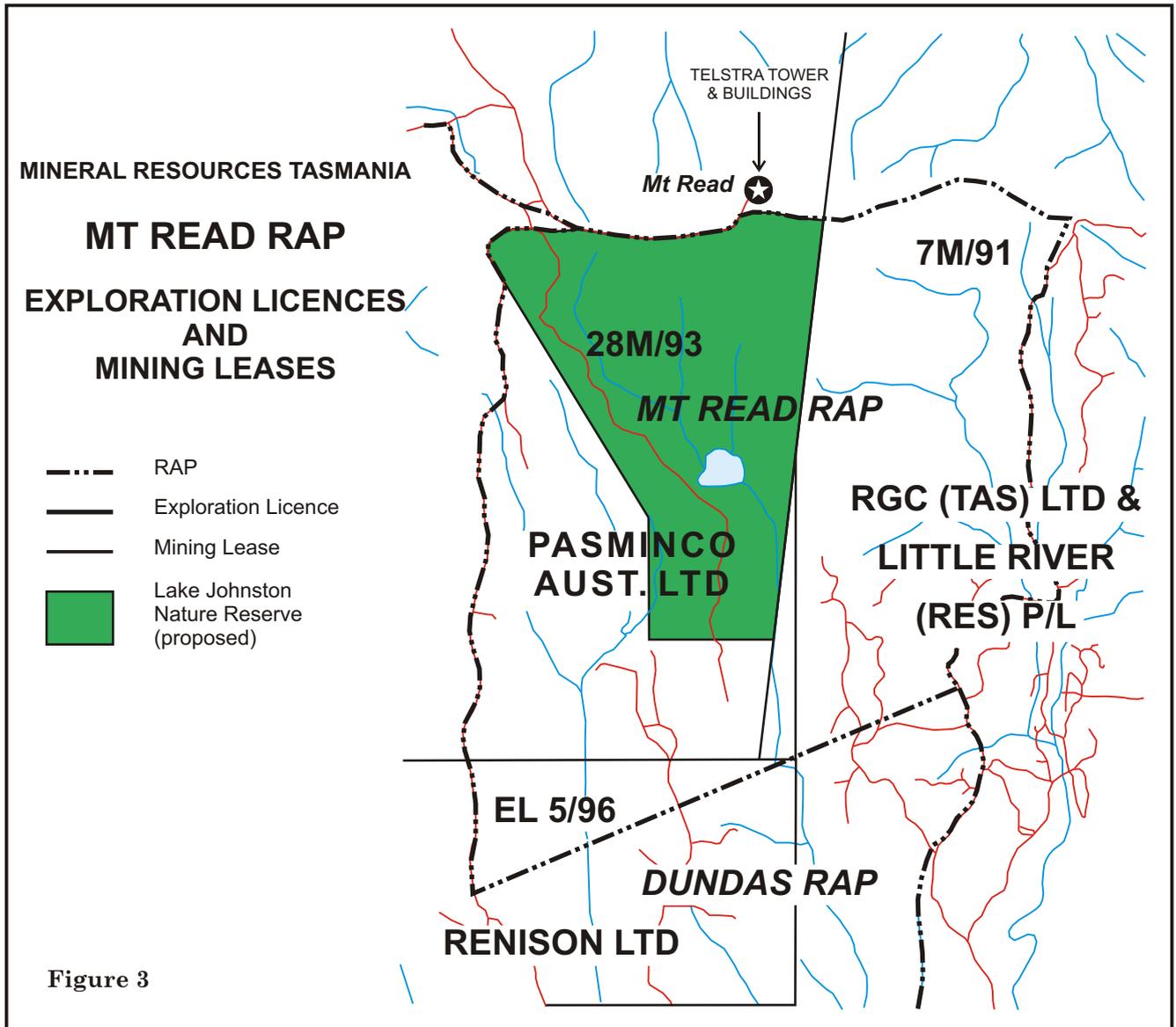


Figure 3

- Mineral Resources Tasmania is to be notified of proposed exploration works on the lease.
- Any exploration works will be planned so as to minimise environmental disturbance. Works will be in accordance with the Mineral Exploration Code of Practice as amended from time to time.
- In the Mt Read RAP area, exploration works will be planned giving due regard to the vegetation map of this area provided by Mineral Resources Tasmania and all activities will be undertaken in such a way as to minimise impact on the important vegetation communities insofar as is prudent and feasible to do so.

Whilst there are no current mining activities within the Mt Read RAP area on existing mining leases, any proposed activity would be carried out under relevant sections of Legislation including:

- Mineral Resources Development Act 1995;
- Mount Read and Rosebery Mines Limited Leases Act 1916;

- Environmental Management and Pollution Control Act 1994.

Pasmenco Mining released a media statement on 2 February 1995 about activities within the Mt Read RAP area and stated:

Pasmenco has agreed to minimise the impact of any activities on the important vegetation communities including the rare Huon pine. Pasmenco has not undertaken any field activities in the area since 1992 and there are no current plans for further work and access to the site is carefully controlled to ensure ongoing protection.

■ EL5/96 — Renison Ltd

All exploration programmes must be approved in writing by Mineral Resources Tasmania before work commences. If any ground disturbance is planned within the Mt Read RAP, the programme will be referred to the Mineral Exploration Working Group for assessment. The vegetation zoning (Bacon, 1992) must be taken into account in planning any disturbance in this area.

Existing Rights — Mining Leases

A mining lease is a contract entered into between the lessee and the Crown. The lessee gains a number of rights in return for a set of obligations. In simplified terms, the lessee is entitled to extract a mineral ore from the earth, in accordance with various environmental and safety conditions, in return for paying rent and royalties to the Crown for this privilege.

A mining lease may be revoked by the Crown (using the *Mineral Resources Development Act 1995* or other legislation which provides for land to be resumed for a public purpose) but the lessee is entitled to claim compensation for this action, as the Crown, has in effect, broken the contract.

In addition, the Mt Read area is within a Strategic Prospectivity Zone, which means that if Government changes the status of land, having the effect of preventing mining or exploration activity on an existing tenement, then compensation may be payable.

Access to Mining Leases

Lessees are entitled to restrict access to their leases and may prohibit entry to persons who do not have a right of entry under the *Mineral Resources Development Act 1995* or some other Act. Trespassers on leases can be prosecuted. Persons with a right of entry under the *Mineral Resources Development Act 1995* include the Mines Inspectors and any officer authorised by the Director of Mines, together with such assistants as are considered necessary. Officers from the Department of Environment and Land Management also have a right of entry.

Visitor Responsibilities

Lessees are, in general terms, responsible for the safety of visitors on a lease. Lessees may incur liability in respect of injuries to visitors on their leases when such injuries are sustained in circumstances which constitute a breach of a 'duty of care' owed to those visitors. A lessee has a duty to take reasonable care to prevent accidents to persons in a proximate relationship to him. In particular, a lessee has a duty to protect visitors to his lease from dangers of which he is aware or ought to be aware.

An exact definition of 'duty of care' is difficult to ascertain, as each case will be different.

It should also be noted that lessees are not automatically liable for any injury sustained by any visitor. Liability will only arise where the injury results from a breach of a duty of care.

It would be reasonable for any tourism operator who is granted approval to use the private Mt Read road to indemnify both Pasminco Rosebery and Telstra

against any damages which may be claimed from tourist ventures using the road.

Permission to visit Mining Leases

Permission for entry (even on foot) to either lease must be sought from the relevant Mine Manager. Visitors intending to enter ML7M/91 must contact Goldfields Tasmania Limited (telephone 03-6473 2444); visitors intending to enter ML28M/93 must contact Pasminco Mining – Rosebery (telephone 03-6473 2222). Visitors may be authorised to visit leases by the Mine Manager, or by a person designated by the Manager to give that authority.

Visitors to the Mt Read RAP Area

A set of interim visitor guidelines were agreed by the parties to this Mt Read RAP Interim Management Plan in March 1995 and these included:

- All enquiries from personnel wishing to visit Mt Read and/or the Mt Read RAP area are to be directed to Pasminco Mining – Rosebery.
- The Mt Read road gate to be fitted with a new lock, and keys issued only to those who have a genuine reason for holding a key, e.g. HEC, Telstra, Pasminco, etc.
- New signs to be erected at the gate.
- Visitors to be limited primarily for scientific purposes.
- Request for access for tours and general public to be declined.
- The situation to be reviewed after the Management Plan was completed.
- Media requests to be jointly managed by the Forest Scientists (Mike Peterson) and Pasminco.
- Other access roadways should be blocked off, e.g. Lake Johnston and Mt Hamilton roads.

Whilst this protocol has been, in the main, successful, some unauthorised access by vehicle and by walkers has occurred.

Many requests have been made to all parties and to Ministers for access for either individuals or parties to view the ancient Huon pine. The tree is seen by tourism operators to be a potentially valuable drawcard for the area and a means of boosting revenue from tourists.

Scientific Study

A number of scientific studies are ongoing including:

- Long-term climate changes;
- Modelling long-term changes in vegetation;
- Floristic and ecological patterns and processes;
- Determination of growth patterns;

- Determination of the age and origin of the living organisms;
- Determination of any association with other stands of Huon pine;
- Collection of data for education programmes.

All work done on the stands of Huon pine has been in accordance with a Code of Practice, and has been authorised by research permits issued by the Parks and Wildlife Service.

Visitor Impacts

Concern has been expressed relating to the damage being done by persons visiting the area and by the collecting of samples for scientific work. Some of these impacts include:

- Damage to alpine heathland by foot traffic;
- Damage to mosses and undergrowth and delicate root systems by persons walking within the stand of Huon pine;
- Removal of samples of wood;
- Drilling cores within living tree trunks;
- Digging around roots of trees.

The removal of pieces of wood etc., except for scientific purposes in accordance with permits issued by the Parks and Wildlife Service, is to be discouraged.

Forestry

Quantities of specialist timbers, principally King Billy pine, were taken from Mt Read and the Mt Read RAP area early this century and also during the 1970s.

Communications

The Telstra Corporation holds a lease, from the Crown, over the roadway called the Mt Read Road to the summit of Mt Read to provide access to a second lease on the summit on which telecommunication facilities are installed. This narrow, steep roadway, which traverses the Pasminco mining lease, is a private road accessed via a normally locked gate on the Williamsford Road and was not constructed to the highway code.

The National Transmission Authority (NTA) lease an adjoining site at the summit, on which television and radio broadcasting facilities are installed.

The leases held by Telstra and the NTA are outside the boundary of the Mt Read RAP, but adjoin its northern boundary. A section of the roadway also forms part of the boundary.

Telstra

Mt Read is the prime site for the provision of all telecommunications to Rosebery, and areas

surrounding Mt Read on the west coast of Tasmania. This site consists of high capacity radio links between Burnie and Hobart, and small capacity radio links from Mt Read to Rosebery, Zeehan, Strahan, Tullah, and the Que River, Renison Bell, and Henty mine sites. The Mt Read site is also used for the provision of the digital mobile phone service, and base stations for Police, Roads and Transport, and Telstra vehicle-based radios. A number of single channel radios operate from this site for the provision of remote telephone services for the HEC, mining requirements and some remote residents. In addition to the provision of local facilities, the site carries a portion of the telecommunication and data transmission between Hobart and Melbourne. The route provides an essential back-up for the optical fibre route between Melbourne and Hobart. Telstra has a 40 m high heavy-duty mast and an equipment building at this site.

The telecommunication facilities provided by Telstra, for the West Coast communities, via the installation on Mount Read, are of vital importance to all residents, industry and business on the West Coast.

NTA

The NTA building houses equipment which facilitates the broadcast of two commercial television channels, ABC Television and ABC FM radio to the Rosebery area. The Mt Read site also provides repeater facilities for these services to the remainder of the West Coast translators. The NTA has two metal tower structures at this site.

The television and radio broadcast services provided by the NTA from Mt Read are of very high importance to the West Coast communities.

Staff facilities provided by Telstra on Mt Read are sufficient to allow staff to spend several days at the site in an extreme emergency. Basic cooking facilities and a septic toilet are installed. The associated absorption trenches are within the boundaries of the Telstra lease. These facilities are only occasionally used.

To service and maintain the communications systems, access to the area is required via the Mt Read road by a range of personnel including:

- Telstra;
- NTA;
- HEC;
- Communications firms;
- Civil and building contract firms.

Keys to the locked gate on the Mt Read road have been issued by Telstra to a number of essential organisations with permit conditions as shown in Appendix 4.

INTERIM MANAGEMENT PLAN — MT READ RAP

Management Framework

This document records the agreed findings of the Interim Management Committee in the management of the Mt Read RAP area and will be submitted to the Parks and Wildlife Service with a recommendation to finalising the unresolved status of the Lake Johnston area. In the meantime, representatives of all interest groups currently having a need to access the Mt Read area will be asked to abide by this plan.

Possible Land Use Classification

The whole of the RAP is of botanical significance, but the area around the ancient Huon pine is the most important in terms of scientific and conservation values.

Different land classifications could be made for:

1. an area around the ancient Huon pines; and
2. the remainder of the RAP.

Proposed Lake Johnston Nature Reserve

The area incorporating the Huon pine stands and other vegetation communities of high conservation value, which could be made a Nature Reserve (under the *National Parks and Wildlife Act 1970*), is shown in [Figure 1](#).

A Nature Reserve is a designated or prescribed title for an area proclaimed as a State Reserve. The Working Group for Forest Conservation recommended that the Mt Read RAP become a State Reserve. The *National Parks and Wildlife Act 1970* provides for the continuation of private rights so that the area could remain within the mining lease if required.

A management plan should be drawn up to guide the management of the area; the managers would be the Parks and Wildlife Service.

An advisory committee should be set up to assist the Parks and Wildlife Service in the management of the Nature Reserve.

Nature Reserves are primarily managed for the protection of scientific and conservation values, and whilst some visitation can be permitted, such areas are too fragile to allow for general recreation activities.

The Nature Reserve would extend from the surface of the earth to a depth of 50 metres, and could either co-exist with the mining lease, or Pasminco could elect to excise this area from the lease, which would continue at depth, below the 50 metres. It is unlikely

that any underground access (i.e. workings) would be needed within 50 m of the surface in this area.

Remainder of the RAP

There are already substantial controls on activities on the two mining leases. Proposed activity on ML7M/91 is reviewed by the Mineral Exploration Working Group, and there are conditions for vegetation management on ML28M/89. Most of the RAP on ML28M/89 is within the proposed Nature Reserve.

The remainder of the RAP could possibly be added to the Dundas RAP and the whole area considered as a unit. However, the botanical significance of the remainder of the Mt Read RAP is greater than that of the Dundas RAP; a recommendation on land classification is beyond the scope of this Interim Management Plan.

Recommendations

Recommendation 1: The area around Lake Johnston be made a Nature Reserve.

- The Nature Reserve extend from the Earth's surface to 50 metres in depth.

Recommendation 2: That a management plan be written to guide the management of the Lake Johnston Nature Reserve and that this plan contain detailed prescriptions governing visitor access.

Recommendation 3: A committee be established to advise the Minister administering the *Parks and Wildlife Service Act 1970* or an ad-hoc advisory committee constituted by administrative arrangement to assist with determining the management objectives of the proposed Lake Johnston Nature Reserve.

Such a committee should include representatives from:

- Parks and Wildlife Service;
- Mineral Resources Tasmania (if the mining lease is included in the Reserve);
- Environment Tasmania;
- Forestry Scientists;
- Pasminco Mining Rosebery;
- Tourism Tasmania;
- Telstra;

- Others as appropriate.

The functions of the committee would be to implement the management objectives of the Interim Management Plan or subsequent management plans devised for the area encompassing the rare Huon pine.

Land Tenure

All existing Crown Leases for mining, exploration, road access and communication facilities and existing rights must be continued.

Relevant aspects of this Interim Management Plan are applicable to all users of the Mt Read RAP area.

Proposed Lake Johnston Nature Reserve — Constraints on Visitation

The vegetation in this area is of high scientific and conservation value. Any plan to increase visitor/tourism access to this area should consider the following constraints:

- Fire — severe wildfires over the past century have burnt a significant proportion of the fire-sensitive endemic-rich vegetation communities of high conservation value on the Mt Read/Mt Dundas massif, including part of the Huon pine stand. It can be shown that all the fires have been started by humans and are also associated with the level of human access. Control of access has reduced fire incidence significantly. As the vegetation has evolved over many thousands of years any probability of increasing the risk must be avoided.
- Disease — as the impact of imported diseases, such as root fungus (*Phytophthora spp.*), is unknown but likely to be detrimental, the area must in essence be quarantined and access restricted to those who will responsibly adopt implemented control measures.
- Scientific Studies — scientists from universities and other research institutes are currently undertaking number of studies on Mt Read and specifically on the Huon pine stand. Visitation may influence data collection and is likely to result in disturbance of sensitive and expensive monitoring equipment. Many hundreds of thousands of dollars of science funds are being expended and this valuable work should not be jeopardised by uncontrolled visitation.

Any proposal for increased visitor/tourist access should only be considered following the most intensive evaluation of potential impacts. In particular the key components would be:

- an environmental impact study (EIS);
- determination of levels of acceptable impact (if any);

- assessment of carrying capacity (likely to be very low given the nature of the soils and vegetation cover);
- determination of which body will be responsible for day-to-day management and monitoring of visitation;
- question of licensing of operators, access/road maintenance; and
- cost of infrastructure (boardwalks, disease control, parking, etc.), likely to be hundreds of thousands of dollars.

Possible Visitation Guidelines

Recommendation 4: The final determination of visitor frequency and numbers should be made by the Parks and Wildlife Service.

Some possible options could include:

- Construction of a boardwalk of a sympathetic design to an agreed viewing point(s). Construction personnel and all timber used would need to be subject to very strict *Phytophthora* hygiene controls.
- Visitation could possibly be allowed with strict controls;
 - No visitation during periods of high fire danger;
 - No visitation during unsuitable weather i.e. snow conditions, when *Phytophthora* hygiene would be difficult to enforce;
 - No smoking in area of pines; no fires and no camping either;
 - All visitors to be closely supervised;
 - No private vehicular access;
 - Strict *Phytophthora* hygiene — including visitors shoes and tripods (if allowed at all);
 - The Parks and Wildlife Service should review access periodically and access may be allowed when appropriate infrastructure is in place, so that the vegetation is not damaged;
 - Limit on numbers per trip;
 - Limit on number of trips per year;
 - Liaison with Pasminco Mining for access through the mine lease;
 - Liaison with Telstra relating to the use of the Mt Read road.
- That a photographic archive be established of both still and video footage of the Huon pines to prevent unnecessary visits by film crews to duplicate existing footage. Film crews and photographers should be required to donate material to this collection in return for the privilege of photographic access.

Interim Management Requirements

Flora management

■ *General*

- The cutting and use or removal of any indigenous flora will be restricted to a specifically authorised management purpose.
- Within the proposed Lake Johnston Nature Reserve no vegetation or land is to be disturbed without the prior approval of the Parks and Wildlife Service.
- Work on the mining leases covering the remainder of the RAP is adequately covered by existing lease and licence conditions.

■ *Access*

- Roads and tracks which are no longer required within the proposed Lake Johnston Nature Reserve should be closed and rehabilitated.
- In the remainder of the RAP, strict controls are already in place. Proposed earthworks on ML7M/91 are referred to the Mineral Exploration Working Group for assessment prior to the work being done. On ML28M/93, the lessee is to abide by the 1992 Flora Management Plan.

Introduced plant species

- The introduction of non-local plant species will be avoided for any rehabilitation works in the proposed Lake Johnston Nature Reserve and on the remainder of the RAP which is within current mining leases.
- The occurrence of weeds should be regularly monitored. Steps will be taken to eradicate or control weeds considered to have the potential to invade the natural vegetation.
- Only local plant species should be permitted to be used for revegetation or other purposes within the proposed Lake Johnston Nature Reserve. Strict conditions already apply to the revegetation on adjoining mining leases as specified in lease and licence conditions.
- All areas disturbed on the mining leases must be rehabilitated to the satisfaction of the Director of Mines.
- In the proposed Lake Johnston Nature Reserve, any rehabilitation by land users should be done to the satisfaction of the Interim Management Committee.
- On the Telstra road verges and around the Telstra towers, any rehabilitation required should be done to the satisfaction of the Interim Management Committee.

Flora Management Zones

The vegetation communities in the Mt Read area have been mapped by M. J. Peterson and zoned according to sensitivity to disturbance (see Appendix 3).

■ *Zone 1*

Contains the ancient Huon pines. As these stands of Huon pine are of immense scientific interest, the aim is total preservation of this flora, without additional cutting of the vegetation or mechanical disturbance in these areas.

■ *Zones 2-5*

In Zones 2 to 5 the aim is to avoid any further grid cutting. The area is well served by existing grids, which do not grow over quickly due to the slow growing nature of the flora.

The existing grid network should be sufficient to allow access for the immediate future, and every effort should be made to tailor work programmes around these existing tracks.

Vehicular track construction in these zones should be avoided unless the need for such access is essential. Alternatives, such as drilling angled holes from alternative locations or helicopter-assisted drilling programmes, should be thoroughly investigated. Vegetation disturbance in Zones 2 to 5 should be kept to a minimum.

■ *Zone 6*

Gridding and low impact works will not unduly affect the vegetation values of Zone 6. Construction of vehicular access should only be contemplated if essential.

The terrain in Zone 6 is steep; existing tracks are prone to erosion and future earthworks are to be avoided wherever possible. Any future works should be designed, constructed and rehabilitated in a manner which takes into account the steep nature of the ground.

■ *Zone 7*

The vegetation values in Zone 7 will not be greatly affected by more intensive activities, such as costeaning and track construction, but again erosion is seen as a major hazard and every effort should be made to use existing access.

Phytophthora cinnamomi

- Disturbance to vegetation associated with road and track development and maintenance in or near to the RAP will be kept to a minimum.
- Light and heavy vehicles, including mobile off-road equipment (such as excavators, small backhoes, bobcats or transport vehicles), must be washed down before travelling to the Mt Read RAP to remove any soil and reduce the risk of

spreading *Phytophthora cinnamomi* (commonly called dieback or rootrot) and noxious weeds (gorse, broom, blackberries or pampas, etc.).

- All personnel must clean all items which will have been in contact with the soil before entering the area; boots, shoes, tent pegs, spades, camera tripods, and so on. Washing items in water will suffice. Ensure that the item is washed free of soil.
- Large items and all earth-moving equipment should, after washing down, be sprayed with a dilute solution of ABF-42 (mixed up to 400 parts water to 1 part ABF-42).

Note that ABF-42 is toxic to fish and water organisms. Treated effluent (i.e. mixed solution) should not be discharged where it will drain into lakes, streams, ponds or public water. Do not contaminate water by cleaning of equipment or disposal of wastes. Only use ABF-42 where waste water will accumulate in a sump.

- The extent of *Phytophthora* distribution should be periodically monitored.

Rehabilitation

Only local province plant species will be permitted to be used for revegetation or other purposes within the RAP.

- No vegetation or land area is to be disturbed without prior approval in the proposed Lake Johnston Nature Reserve.
- On the surrounding mining leases, such work must be in accordance with the current lease and licence conditions. Full consideration will be given to the need for the disturbance, and if and how long other areas might be used.

Fire management

Existing requirements for fire management are to be maintained on the mining leases in accordance with lease conditions. All visitors and persons undertaking work in this area should consider themselves personally responsible for taking all practicable measures for fire prevention.

- To minimise the risk of fire, all users of the Mt Read area will observe the following:
 - no open fires are lit on site;
 - all vehicles and large equipment are fitted with a fire extinguisher;
 - vegetation is not burned for any reason;
 - all visitors are to be made aware of the fire-sensitive nature of the environment;
 - no machinery which is capable of producing sparks (such as chainsaws) shall be operated when the relative humidity is less than 40% and the fire danger rating for the relevant fuel type is 20. Operators may only employ such machinery when the METFAX forecast

indicates a High Fire Danger if they can show that the relative humidity at the proposed work site is more than 40% and the fire rating for the relevant fuel type is <20. Fire management is the responsibility of the operator.

- Access to the RAP will be closed during periods of declared High Fire Danger.

Note: In periods of High Fire Danger, access to State Forest is limited and some activities (such as use of chainsaws) is not permitted. Similar conditions apply to exploration programmes.

- No matches or fire lighting devices are to be taken into the RAP.

Water management

- All steps must be taken to minimise the unnecessary contamination of water from any activity.
- Any water running onto a works area, or generated by any process, is to be treated in accordance with the Mineral Exploration Code of Practice.
- Only transportable chemical toilets or the existing ablution facilities are to be used within the RAP area.
- No materials (with the exception of materials and devices required for scientific monitoring and research) shall be placed in or near any waterway or body of water.

Terrestrial and aquatic fauna management

- Wildlife is not to be disturbed. Trapping or killing of native fauna is not permitted in the RAP.
- No firearms are to be taken onto any mine lease or into the proposed Lake Johnston Nature Reserve.

Introduced fauna

- No introduced plant or animal species are to be taken into the RAP (including domestic pets).
- Feral animal sightings are to be recorded and reported to the Parks and Wildlife Service office at Strahan.

Waste management

- Waste generated by the lessees of the area must be transported off site by the user or an appropriately licensed carrier, in accordance with existing lease and licence conditions. Other users of the area should do likewise.
- Material will be stored, handled and transported in accordance with the statutory requirements.
- All dangerous or hazardous wastes generated and materials contaminated by dangerous or hazardous goods are to be treated and disposed of using appropriately licensed contractors to a licensed disposal facility.

Recreation

- The area covered by the mining leases is not available for recreation. Visitors requiring access to mine leases must obtain the permission of the lessee prior to entry.
- Visitation/recreation requirements and constraints for the proposed Lake Johnston Nature Reserve should be determined by the Parks and Wildlife Service.

Cultural resources

- Any site which is suspected to contain archaeological or historical artefacts is to be reported before further works proceed. Where appropriate, these matters should be referred to the Department of Environment and Land Management or to Mineral Resources Tasmania.
- Where there is a reasonable possibility of an archaeological site, development works should be preceded by a survey so that damage can be avoided (except where a permit from the Parks and Wildlife Service has authorised its disturbance).
- All identified cultural sites will be provided with protection appropriate to their significance.

Research

- More detailed surveys on the extent of flora, fauna and cultural sites will be encouraged.

- As further information on the presence of rare or endangered fauna or flora becomes available, action will be taken to protect or manage the site in accordance with the management objectives.
- Permission should be sought from the relevant land manager to conduct research or collect fauna or flora specimens anywhere in the RAP. This will be granted for valid research purposes provided that there will be no adverse impact. A written report should be submitted to the relevant land manager upon completion.

Environmental education

Information, education and interpretation

- A simple brochure should be produced. This brochure should outline access, activities available and relevant management issues, as well as give a general description of the RAP.
- Use of designated sections of the RAP for environmental education should be permitted.

Signs

Simple interpretative signs should be erected where appropriate, to highlight points of cultural, ecological, geological, and geomorphological interest.

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[4 February 1997]

APPENDIX 1
Native Species Observed in the Mt Read RAP
(reproduced from Bacon, 1992)

	Endemic	Western Section*	Eastern Section†
ANGIOSPERMAE (DICOTYLEDONAE)			
APIACEAE (UMBELLIFEREAE)			
<i>Actinotus moorei</i>	<i>e</i>	*	*
<i>Xanthosia dissecta</i>		*	
ARALIACEAE			
<i>Pseudopanax gunnii</i>	<i>e</i>		*
ASTERACEAE			
<i>Abrotonella scapigera</i>		*	
<i>Celmisia asteliifolia</i>		*	
<i>Celmisia longifolia</i>			*
<i>C. saxifraga</i>	<i>e</i>	*	*
<i>Cotula filicula</i>		*	
<i>Erigeron sp.</i>			*
<i>Erigeron stellatus</i>	<i>e</i>	*	
<i>Ewartia catipes</i>	<i>e</i>	*	*
<i>E. meredithae</i>	<i>e</i>	*	*
<i>E. planchonii</i>	<i>e</i>	*	
<i>Helichrysum backhousii</i>	<i>e</i>	*	*
<i>H. milliganii</i>	<i>e</i>	*	
<i>H. pumilum</i>	<i>e</i>	*	*
<i>Olearia ledifolia</i>	<i>e</i>	*	*
<i>O. persoonioides</i>	<i>e</i>	*	*
<i>O. pinifolia</i>	<i>e</i>	*	*
<i>Pterygonpappus lawrencii</i>	<i>e</i>	*	
<i>Senecio leptocarpus</i>	<i>e</i>	*	
CUNONIACEAE			
<i>Anodopetalum biglandulosum</i>	<i>e</i>	*	*
<i>Baeura rubioides</i>		*	*
DONATIACEAE			
<i>Donatia novae-zelandiae</i>		*	*
DROSERACEAE			
<i>Drosera arcturi</i>		*	*
<i>D. pygmaea</i>		*	
ELAEOCARPACEAE			
<i>Aristotelia peduncularis</i>	<i>e</i>	*	*
EPACRIDACEAE			
<i>Archeria comberi</i>	<i>e</i>	*	
<i>A. eriocarpa</i>	<i>e</i>	*	*
<i>A. hirtella</i>	<i>e</i>	*	*
<i>A. serpyllifolia</i>	<i>e</i>	*	*
<i>Cyathodes dealbata</i>	<i>e</i>	*	*
<i>C. glauca</i>	<i>e</i>	*	*
<i>C. juniperina</i>		*	*
<i>C. parvifolia</i>	<i>e</i>	*	*
<i>C. petiolaris</i>	<i>e</i>	*	*
<i>Drachophyllum milliganii</i>	<i>e</i>	*	*
<i>D. minimum</i>	<i>e</i>	*	
<i>Epacris corymbiflora</i>	<i>e</i>	*	*

	Endemic	Western Section*	Eastern Section†
EPACRIDACEAE			
<i>E. gunnii</i>	<i>e</i>	*	
<i>E. serpyllifolia</i>		*	*
<i>Leucopogon hookeri</i>		*	*
<i>Monotoca glauca</i>	<i>e</i>	*	*
<i>M. submutica</i>	<i>e</i>	*	*
<i>Pentachondra pumila</i>		*	*
<i>Prionotes cerinthoides</i>	<i>e</i>	*	*
<i>Richea augustifolia</i>	<i>e</i>	*	
<i>R. milliganii</i>	<i>e</i>	*	
<i>R. pandanifolia</i>	<i>e</i>	*	*
<i>R. scoparia</i>	<i>e</i>	*	*
<i>R. sprengelioides</i>	<i>e</i>	*	*
<i>Sprengelia incarnata</i>		*	*
<i>Trochocarpa cunninghamii</i>	<i>e</i>	*	*
<i>T. gunnii</i>	<i>e</i>	*	*
ERICACEAE			
<i>Gaultheria hispida</i>	<i>e</i>	*	*
ESCALLONIACEAE			
<i>Anopterus glandulosus</i>	<i>e</i>	*	*
<i>Tetracapaea tasmanica</i>	<i>e</i>	*	*
EUCRYPHIACEAE			
<i>Eucryphia lucida</i>	<i>e</i>	*	*
<i>E. milliganii</i>	<i>e</i>	*	*
FAGACEAE			
<i>Nothofagus cunninghamii</i>		*	*
<i>N. gunnii</i>	<i>e</i>	*	*
GENTIANACEAE			
<i>Gentianella diemensis</i>		*	
HALORAGACEAE			
<i>Myriophyllum pedunculatum</i>		*	
MENYANTHACEAE			
<i>Nymphoides exigua</i>	<i>e</i>	*	
MONIMIACEAE			
<i>Atherosperma moschatum</i>		*	*
MYRTACEAE			
<i>Leptospermum nitidum</i>		*	*
OXALIDACEAE			
<i>Oxalis magellanica</i>		*	
PITTOSPORACEAE			
<i>Pittosporum bicolor</i>		*	*
PROTEACEAE			
<i>Agastachys odorata</i>	<i>e</i>	*	*
<i>Bellenden montana</i>	<i>e</i>	*	*
<i>Cenarrhenes nitida</i>	<i>e</i>	*	*
<i>Lomatia polymorpha</i>	<i>e</i>	*	*
<i>Orites acicularis</i>	<i>e</i>	*	*
<i>O. diversifolia</i>	<i>e</i>	*	*
<i>O. milliganii</i>	<i>e</i>	*	*
<i>O. revoluta</i>	<i>e</i>	*	*
<i>Persoonia gunnii</i>	<i>e</i>	*	*
<i>Telopea truncata</i>	<i>e</i>	*	*

	Endemic	Western Section*	Eastern Section†
RUNUNCULACEAE			
<i>Anemone crassifolia</i>	<i>e</i>	*	*
ROSACEAE			
<i>Acaena montana</i>	<i>e</i>	*	*
<i>A. novae-zelandiae</i>		*	
<i>Rubus gunnianus</i>	<i>e</i>	*	*
RUBIACEAE			
<i>Coprosma moorei</i>		*	
<i>C. nitida</i>		*	*
SANTALACEAE			
<i>Exocarpos humifusus</i>	<i>e</i>	*	*
SCROPHULARIACEAE			
<i>Euphrasia gibbsiae</i>	<i>e</i>	*	*
<i>E. hookeri</i>	<i>e</i>	*	
<i>E. striata</i>	<i>e</i>	*	*
THYMELAEACEAE			
<i>Pimelia cineria</i>	<i>e</i>	*	*
<i>P. lindleyana</i>	<i>e</i>	*	*
<i>P. sericea</i>	<i>e</i>	*	*
WINTERACEAE			
<i>Tasmania lanceoolata</i>		*	*
ANGIOSPERMAE (MONOCOTYLEDONAE)			
CENTROLEPIDACEAE			
<i>Centrolepis monogyna</i>	<i>e</i>	*	
<i>Gaimardia fitzgeraldii</i>	<i>e</i>	*	
CYPERACEAE			
<i>Carpha alpina</i>		*	*
<i>C. Curvata</i>	<i>e</i>	*	*
<i>Eleocharis sphacelata</i>		*	
<i>Gahnia grandis</i>		*	*
<i>Isolepis sp.</i>		*	*
<i>Lepidosperma filiforme</i>		*	
<i>Oreobolus acutifolius</i>	<i>e</i>	*	*
<i>O. pumilio</i>		*	*
<i>Tetraria capillaris</i>	<i>e</i>	*	*
<i>Unicinia compacta</i>		*	
<i>U. tenella</i>		*	*
IRIDACEAE			
<i>Diplarrena latifolia</i>	<i>e</i>	*	*
<i>Isophysis tasmanica</i>	<i>e</i>	*	*
<i>Libertia pulchella</i>		*	*
JUNCACEAE			
<i>Juncus sp.</i>		*	
LILIACEAE			
<i>Astelia alpina</i>		*	*
<i>Blandfordia punicea</i>	<i>e</i>	*	*
<i>Campynema lineare</i>	<i>e</i>	*	
<i>Milligania densiflora</i>	<i>e</i>	*	*
POACEAE			
<i>Danthonia sp.</i>		*	*
<i>Ehrharta sp.</i>		*	
<i>Poa gunnii</i>	<i>e</i>	*	
<i>Poa sp.</i>		*	*

	Endemic	Western Section*	Eastern Section†
RESTIONACEAE			
<i>Calorophus elongatus</i>	<i>e</i>	*	*
<i>Empodisma minus</i>		*	*
<i>Restio sp.</i>		*	
XYRIDACEAE			
<i>Xyris gracilis</i>			*
<i>X. marginata</i>	<i>e</i>	*	*
<i>X. operculata</i>			*
GYMNOSPERMAE			
CUPRESSACEAE			
<i>Diselma archeri</i>	<i>e</i>	*	*
PHYLLOCLADACEAE			
<i>Phyllocladus aspleniifolius</i>	<i>e</i>	*	*
PODOCARPACEAE			
<i>Lagarostrobos franklinii</i>	<i>e</i>	*	
<i>Microcachrys tetragona</i>	<i>e</i>	*	*
<i>Podocarpus lawrencii</i>		*	*
TAXODIACEAE			
<i>Athrotaxis cupressoides</i>	<i>e</i>	*	
<i>Athrotaxis laxifolia</i>	<i>e</i>	*	*
<i>A. selaginoides</i>	<i>e</i>	*	*
PTERIDOPHYTA			
ASPIDIACEAE			
<i>Polystichum proliferum</i>		*	*
BLECHNACEAE			
<i>Blechnum nudum</i>		*	*
<i>B. wattsii</i>		*	*
DENNSTAEDTIACEAE			
<i>Histiopteris incisa</i>		*	*
<i>Pteridium esculentum</i>		*	*
DICKSONIACEAE			
<i>Dicksonia antarctica</i>			*
GLEICHENIACEAE			
<i>Gleichenia alpina</i>		*	*
<i>Gleichenia dicarpa</i>		*	*
<i>Sticherus tener</i>		*	*
GRAMMITIDACEAE			
<i>Grammitis billardieri</i>		*	*
HYMENOPHYLLACEAE			
<i>Apteropteris applanata</i>	<i>e</i>	*	*
<i>Hymenophyllum australe</i>		*	*
<i>H. marginatum</i>		*	*
<i>H. peltatum</i>		*	*
<i>H. rarum</i>		*	*
IOSETACEAE			
<i>Isoetes gunnii</i>	<i>e</i>	*	
LYCOPODIACEAE			
<i>Lycopodium fastigiatum</i>		*	*
<i>L. laterale</i>		*	*
<i>L. myrtifolium</i>		*	*
<i>L. scariosum</i>		*	*

e = endemic, * denotes Rosebery Mine Lease ML28M/93, EL11/85 and unallocated Crown Land, † denotes ML7M/91.

APPENDIX 2
Areal extent (ha) of vegetation communities
(reproduced from Bacon, 1992)

Community	Western Area (ha)	Eastern Area (ha)
Callidendrous r/f		
CF C1.1		5
Call/Tham <i>N. cunninghamii</i> r/f		
CT 2.1/T1.1	21	
Thamnic <i>A. selaginoides</i> r/f		
T1.1		21
T1.3*	12	18
T4.3	29	17
Implicate <i>N. gunnii</i> r/f		
I 1.3*		10
I 2.1*	54	29
I 2.2*	27	32
I 2.3*		3
I 2.4*	14	27
I 2.5*		5
I 2.6*	1	
I 2.7*	5	
I 2.8*	0.4	
Subalpine Heaths/Shrub		
H1.1	9	3
H2.1	13	5
H2.2	66	3
SH1.1	3	
Alpine complexes		
A1.1	40	4
A1.2	3	
A2.1	9	
Bare Ground/rock	2	
Lake Johnston	2	
Total	310.4	182

* not reserved or poorly represented in current reserve system

APPENDIX 3

Vegetation Studies of the Mt Read RAP

(reproduced from Bacon, 1992)

VEGETATION STUDIES

The RAP covers approximately 500 ha, 269 ha of this being covered by ML33M/89* held by Pasminco-EZ and 182 ha being covered by ML7M/91, held by RGC (Tasmania) Ltd and Little River Resources.

A vegetation survey of that part of ML7M/91 which overlaps with the Mt Read RAP was commissioned by the lessee in response to a request from the Mineral Exploration Working Group (MEWG). The vegetation study over that part of the Pasminco-EZ lease area (part of ML33M/89) which overlaps the Mt Read RAP was commissioned by the Department of Mines.

The aim of both these studies was to produce a vegetation map, together with notes on the various vegetation communities, to allow exploration works to be designed in such a way as to minimise impact on the flora and avoid, wherever possible, the vegetation communities of highest conservation significance. Both studies were undertaken by M. J. Peterson; the results of these studies are presented below. The vegetation is shown in Figure 5.

Sampling Limits

Examination of aerial photography suggested that this area contains a range of sub-alpine and montane rainforest types, with small patches of alpine heaths/herbfields at higher elevations. The impenetrable nature of much of the vegetation and the extreme variation in topography — altitude rises from 620 m near the Henty River to approximately 1127 m at the summit of Mt Read — restricts field sampling to established exploration gridlines or to areas in close proximity to old logging/mineral exploration tracks.

Initial photo-interpretation of colour aerial photography, flown in 1984 at a scale of 1:20 000 and 1991 at 1:10 000, suggested the presence of a number of distinct vegetation assemblages; eleven in the ML7M/91 part of the RAP and twelve on the ML33M/89 part.

Each of these assemblages were systematically sampled to cover the broad altitudinal range and geological variation shown on the *Geology of the Henty River–Mt Read Area* (Corbett, 1986). Quadrats were subjectively located within areas of apparently homogeneous vegetation; the sampling intensity was sufficient to support a descriptive community classification and to also permit distributional mapping from interpretation of

available aerial photography, correlated with field observations.

A total of 137 plots were located throughout the RAP area during these two studies; 97 plots were on ML7M/91 and 40 plots on ML33M/89.

This data was supplemented by records from 81 quadrats established in the study area during 1989/90 (Peterson and Podger, unpublished data). Quadrat data from sites outside the study area, but within assemblages contiguous with or apparently similar to those within the study area, were also included to improve confidence in community classification and description.

A species list is given in Appendix 1.

The mining/exploration tenements and established exploration grids, tracks and vegetation sample points within the study area and immediate environs are shown in Figures 3 and 4.

Data Collection and Floristic Classification

Examination of the vegetation was based on 5 × 5 and 10 × 10 metre quadrats. A species list was compiled for each quadrat, noting the cover of each vascular plant according to a six-point Braun Blanquet scale and relative abundance on a four-point scale. Community structure in terms of height, floristic composition and cover of each stratum was recorded according to the system of Specht (1970). Elevation, slope, aspect, soil type and parent material (if apparent) were also recorded at each site.

Community types were assessed from 218 sample sites, 107 on ML33M/89 and 111 on ML7M/91. Altogether forty-one quadrats were located on disturbed areas (33 on ML33M/89 and 8 on ML7M/91) to assess the resilience of vegetation communities and species to disturbance.

The terminology used by Peterson is based on that of Jarman *et al.* (1991, 1984) and Kirkpatrick (1977). Species nomenclature follows Buchanan *et al.* (1989).

Plant Communities

Fifteen plant communities were identified on ML7M/91 and 17 on ML33M/89. Most of these communities are common to both lease areas; in total some 21 communities were identified over the whole Mt Read RAP.

* Mining Lease 33M/1989 is now part of the consolidated lease 28M/1993 held by Pasminco Australia Limited.

Several communities may be interpreted as intermediates of others, but at this level of discrimination they are described as separate communities. A general description of these communities and their principal indicator species is outlined below.

Callidendrous/Thamnic *Nothofagus cunninghamii* Rainforest

- C 1.1 *Nothofagus cunninghamii*–*Atherosperma moschatum* over *Polystichum proliferum* and/or *Blechnum watsii*
ML7M/91

This community closely resembles that described by Jarman *et al.* (1984), however *Dicksonia antarctica* is absent. Tall (25–35 m), widely-spaced *N. cunninghamii* and the subdominant *A. moschatum* produced a dense canopy above an open understorey dominated by patches of *P. proliferum* and *B. watsii*, with epiphytic ferns common on trunks of trees and logs. Vascular species diversity is generally low (<10 species) and none are endemic.

- CT2.1 *Nothofagus cunninghamii*–*Atherosperma moschatum* over *Anodopetalum biglandulosum* (C1.1 X T1.1)
ML7M/91
ML33M/89

This intermediate community has the same general structure as that of C1.1, with the inclusion of *A. biglandulosum* in the understorey.

- T1.1 *Nothofagus cunninghamii*–*Atherosperma moschatum*–*Eucryphia lucida* (–*Phyllocladus aspleniifolius*) over *Anodopetalum biglandulosum*
ML33M/89
ML7M/91

This forest type is also dominated by tall (25–35 m) *N. cunninghamii* and appears to be associated with similar but less well-drained sites to those on which the above community (CT2.1) was observed. *Atherosperma moschatum*, and to a lesser extent *E. lucida* and *P. aspleniifolius*, are found as subdominants. Gaps in the canopy have permitted the development of thickets of *A. biglandulosum*, often accompanied by *Cenarrhenes nitida*, *Anopterus glandulosus*, *Archeria eriocarpa* and occasionally *Trochocarpa gunnii*. *Blechnum watsii* is the prominent ground fern. *Hymenophyllum* spp. and *Grammitis billardieri* are common epiphytics. Ground cover is composed of dense patches of moss and lichens or litter.

Thamnic *Athrotaxis selaginoides* Rainforest

- T1.3 *Athrotaxis selaginoides* over *Anodopetalum biglandulosum*–*Richea pandanifolia*
ML7M/91
ML33M/89

This community is similar to T1.1 in most aspects, but tall (20–30 m) *A. selaginoides* is present as a

co-dominant. The climbing heath, *Prionotes cerinthoides*, is common on *Athrotaxis* stems, and *Richea pandanifolia*, *Tasmannia lanceolata* and *Coprosma nitida* occur sparsely where there are gaps in the canopy.

- T4.3 *Athrotaxis selaginoides*–*Nothofagus cunninghamii*–*Eucryphia* sp. over *Archeria eriocarpa* / *A. hirtella*–*Richea pandanifolia*
ML7M/91
ML33M/89

Scattered *A. selaginoides* to 25 metres dominate a closed layer of *N. cunninghamii* and *E. lucida* and/or *E. milliganii*. Understorey shrubs, such as *Archeria* spp., *Anopterus glandulosus*, *Olearia persoonioides*, *Anodopetalum biglandulosum* and *Cenarrhenes nitida* may be present. Smaller shrubs include *Tasmannia lanceolata*, *Coprosma nitida* and *Orites diversifolia*.

Implicate Conifer Rainforest

- I1.3 *Athrotaxis selaginoides* over a mixed *Agastachys odorata* tangle with *Richea pandanifolia*
ML7M/91

Athrotaxis selaginoides (18–25 m) is scattered and dominates mid–high *N. cunninghamii* and *E. milliganii*. *Eucryphia lucida* and *Phyllocladus aspleniifolius* are often present as small stems. In the study area the understorey shrub layer was densely tangled, displaying typical implicate traits. Prominent shrubs include *A. odorata*, *Anodopetalum biglandulosum*, *Anopterus glandulosus*, *A. eriocarpa*, *A. hirtella*, *Cenarrhenes nitida*, *Olearia persoonioides* and *R. pandanifolia*. *Prionotes cerinthoides* is common on many stems, logs and the dense matt of moss which forms the ground cover. Ferns include *Blechnum watsii*, *Grammitis billardieri*, *Hymenophyllum* spp., and sometimes *Apteropteris applanata*.

All the implicate communities listed below may be broadly grouped in the I2.1 type described by Jarman *et al.* (1984). There is, in M. J. Peterson's opinion, sufficient variation in structure and component species to discriminate each and therefore accord each community status. These communities are unusual in that the level of species diversity and the degree of endemism far exceeds all other forest communities in the study area.

- I2.1 *Athrotaxis selaginoides*–*Diselma archeri* over *Nothofagus gunnii* tangle
ML7M/91
ML33M/89

Athrotaxis selaginoides and *N. gunnii* are the most conspicuous trees in this mid–high (8–15 m) forest type, the *N. gunnii* forming an often dense tangle below the dominant conifer. *Diselma archeri* is present in tree-form, attaining heights of up to twelve metres and diameters of 40 centimetres. *Phyllocladus aspleniifolius*, *Nothofagus cunninghamii*, *Eucryphia milliganii* and *Richea*

pandanifolia are frequently present in the tallest layer. A prominent indicator in this community is the shrub *Orites milliganii*. *Agastachys odorata*, *Archeria eriocarpa*, *A. hirtella*, *Anodopetalum biglandulosum*, *Cenarrhenes nitida*, *Olearia persoonioides*, *Telopea truncata* and *Trochocarpa gunnii* are also common woody shrubs. *Prionotes cerinthoides* often forms dense mats on stems and the extensive cover of moss. *Gahnia grandis* tussocks are common. Other monocots are present but do not feature in high abundance. A variety of ferns are encountered, with *Blechnum watsii* the most abundant.

- I2.2 *Athrotaxis selaginoides*–*Phyllocladus aspleniifolius* over *Nothofagus gunnii* tangle
ML7M/91
ML33M/89

This variant is similar to I2.1, described above, but *Diselma archeri* and *Orites milliganii* are absent. *Phyllocladus aspleniifolius* is also co-dominant. *Eucryphia milliganii* and *Archeria* spp. feature more prominently in this community.

- I2.3 *Athrotaxis selaginoides*–*Leptospermum nitidum* over *Nothofagus gunnii* tangle
ML7M/91

This community is a variant of I2.2 (above) but *L. nitidum* is a prominent co-dominant tree. *Anodopetalum biglandulosum*, *Anopterus glandulosus* and *Cenarrhenes nitida* are also found in greater abundance.

- I2.4 Dwarf *Athrotaxis selaginoides*–*Diselma archeri*–*Leptospermum nitidum* over *Nothofagus gunnii* tangle
ML7M/91
ML33M/89

Although this community has component attributes of rainforest it is better described as a low rainforest scrub or dwarf implicate deciduous beech rainforest. Generally the dominants are between three and eight metres in height. Floristically it can be interpreted as an intermediate of I2.1 and I2.3. Species common to alpine areas were also observed, perhaps due to the more open nature of this community.

- I2.5 Dwarf *Athrotaxis selaginoides*– *Phyllocladus aspleniifolius*–*Eucryphia milliganii* over *Nothofagus gunnii* tangle
ML7M/91

This community is also low in stature (3–8 m). Floristically it is similar to I2.2, however *A. selaginoides*, *P. aspleniifolius* and *E. milliganii* are present as co-dominants over a diverse tangle of *N. gunnii* and *Agastachys odorata*. Of note is the absence of *Diselma archeri* and *Orites milliganii*.

- I2.6 *Lagarostrobos franklinii* over *Nothofagus gunnii* tangle
ML33M/89

In this previously undescribed community the endemic conifer, Huon pine (*L. franklinii*), forms a dense cover in association with *N. gunnii* over an open cover of mosses and lichens. There is a general paucity of understorey shrubs, the most prominent being the shrubs *Trochocarpa cunninghamii*, *Tasmannia lanceolata* and *Archeria eriocarpa*. Part of the stand was burnt by a wildfire in 1960.

- I2.7 *Athrotaxis laxifolia*–*Diselma archeri* over *Nothofagus gunnii* tangle
ML33M/89

In this community, which is structurally and floristically similar to I2.1, a putative *Athrotaxis* hybrid, *A. laxifolia*, replaces *A. selaginoides* as the dominant conifer. Of note is the presence of a number of large (1.4–1.9 m) diameter specimens of *A. laxifolia* near Lake Johnston.

- I2.8 *Athrotaxis cupressoides*–*Diselma archeri* over *Nothofagus gunnii* tangle
ML33M/89

Pencil pine, *A. cupressoides*, is the dominant tree in this community which has a deciduous scrub understorey component similar to that of I2.1. Stems of *D. archeri* and *N. gunnii* commonly exceed 40 cm diameter in this mid–high (8–15 m) forest type.

Sub-alpine Heaths/Scrubs

- H1.1 *Nothofagus gunnii*–*Diselma archeri*–*Microcachrys tetragona* heath
ML7M/91
ML33M/89

This community was found at high windswept altitudes above 900 m elevation. *Nothofagus gunnii* dominates a closed heath which includes *Richea scoparia*, *Orites milliganii*, and the conifers *D. archeri* and *M. tetragona*. Numerous small endemic shrubs and herbs are present in varying abundance.

- H2.1 Very tall *Leptospermum nitidum*–*Gahnia grandis*–*Baeura rubioides* closed heath
ML7M/91
ML33M/89

Found on the ridgelines near the western boundary of ML7M/91 and in the southeastern corner of ML33M/89. This community appears to be a sere of the ‘climax’ implicate deciduous beech rainforest types. The diameter of the sclerophyllous *Leptospermum* indicates a fire event probably occurred several hundred years ago — similar sized stems near Lake Johnston were measured to be 185 to 220 years old.

This community is dominated by 3–8 m high, well-spaced *Leptospermum nitidum*. There is a dense ground cover of *G. grandis*, *B. rubioides* and *Empodisma minus*. Occasional clumps of the fire

sprout *Anodopetalum biglandulosum* and *Agastachys odorata* were observed. Of note was the presence of seedling *Nothofagus gunnii*, *Athrotaxis selaginoides*, *Diselma archeri* and *Orites milliganii*.

H2.2 Tall (1–3 m) *Gahnia grandis*–*Leptospermum nitidum* open clumpwood heath

ML33M/89
ML7M/91

This community is essentially an assemblage of recently burnt (c.1960) facies of the deciduous implicate types (I2.1 and variants) and the tall conifer/deciduous heath (H1.1). The community is structurally variable and is generally composed of thickets of *Gahnia grandis* and *Leptospermum nitidum* or extensive mats of *Baeura rubioides*. Fire sprout *Agastachys odorata*, *Cenarrhenes nitida* and *Anodopetalum biglandulosum* are found in and around the thickets. Seedlings of rainforest and alpine species are frequently encountered.

SH1.1 Very tall (3–6 m) *Leptospermum nitidum*–*Gahnia grandis* closed scrub heath

ML33M/89

Patches of recently burnt tall *Athrotaxis selaginoides* thamnic rainforest (T1.3 and T4.3) have regenerated to a dense thicket of *L. nitidum* and *G. grandis*. Fire sprout *Nothofagus cunninghamii*, *Anodopetalum biglandulosum*, *Cenarrhenes nitida* and seedling *A. selaginoides* are commonly found.

Alpine Complexes

A1.1 Alpine gramminoid herbfield/heath

ML33M/89
ML7M/91

This community is an assemblage of recently fired alpine communities (described below). The area is generally dominated by hard leaved gramminoids and/or Cyperaceae species. *Astelia alpina* or *Carpha alpina* is found in dense mats. *Baeura rubioides*, *Diplarrena latifolia*, *Gahnia grandis* and *Milligania densiflora* may be locally abundant. Regenerating alpine species of the Epacridaceae and Proteaceae are frequently found but their importance is presently low. *Athrotaxis selaginoides* is sparsely present as small seedlings. All other conifers were absent.

A1.2 Low (<0.5 m) coniferous bolster heath

ML33M/89

Diselma archeri and/or *Microcachrys tetragona* form dense low mats in which bolsters of *Donatia novae-zelandiae*, *Centrolepis monogyna*, *Gaimardia fitzgeraldii* and *Oreobolus* spp. are common. Numerous other endemic and cosmopolitan alpine species were observed in this type, which appears to be extremely fire sensitive.

A2.1 Krummholz conifer–*Nothofagus gunnii* shrubs

ML33M/89

On exposed southerly aspects above the timber-line (approximately 1000 m) there are extensive patches of low (1–3 m) conifer–deciduous beech scrub. Pruned by wind and ice particles, the dominant plants have assumed a krummholz form (def. — dwarf and deformed trees, often prostrate; resulting from strong winds). The community is particularly rich in endemic species, with component species from both the implicate conifer rainforests and alpine communities. The principal species are *N. gunnii*, *Athrotaxis selaginoides*, *Diselma archeri*, *Podocarpus lawrencii*, *Orites milliganii*, *Astelia alpina*, *Richea scoparia*, *Olearia pinifolia* and *Epacris serpyllifolia*.

The most unusual krummholz association is a small patch which includes Huon pine (*Lagarostrobos franklinii*) as the dominant conifer. Unfortunately 95% of this stand has been destroyed by fire and only three live stems remain. These three individuals (?) are the highest recorded for the species. A ring count of a 23 cm diameter sample taken from a fire-killed specimen indicated an age of 976 years before death.

COMMUNITY CONSERVATION STATUS

Of the fourteen rainforest community types recorded from the whole RAP, ten are not known from any State Reserve (although a fragmented variant of the implicate conifer–deciduous beech communities has been recorded from a locality now reserved on Mt Bobs in the south of the State). The remaining rainforest communities are adequately represented in the existing reserve system.

The areal distribution of the unreserved rainforest types are shown in Figure 6. These are:

T1.3: The thamnic horizontal rainforest with King Billy pine is composed almost entirely of endemics and covers an area of 30 ha in the Mt Read RAP (12 ha on ML33M/89 and 18 ha on ML7M/91). The community has been recorded at Red Hills in the West Coast Range (Jarman *et al.* 1984, 1991); Grant (1989) also recorded this community frequently in a botanical survey of King Billy pine forest at Howards Road, suggesting the largest patches of this type probably exist within or in close proximity to the Mt Read RAP.

I1.3: The implicate *Agastachys* rainforest with King Billy pine and pandani (I1.3) is also unreserved and has been recorded along Anthony Road, where it has been disturbed by logging. The undisturbed 10 ha in the Mt Read RAP area enhances the significance of this community.

I2.1 and Variants (I2.2–I2.8):

The distinctive and essentially unreserved conifer–deciduous beech communities (I2.1 and variants) achieve their most developed state, where *Diselma archeri* and *Orites milliganii* assume an arboreal form, on the south and southeastern slopes of Mt Read. Some 55 ha were found on ML7M/91 and 73 ha on ML33M/89.

The communities are relatively undisturbed, with the exception of a small area (1–2 ha) near the southern boundary of the RAP [AMG 379100, 364650] where there has been the intrusion of several vehicular tracks and the cutting of a number of exploration gridlines in the last 20 years. The known areas of these communities form a contiguous band from Moxon Saddle to Jones Creek, west of Lake Johnston.

The limited extent of these communities and the degree of endemism exhibited by component species implies they have a very high conservation value. In addition, increment cores taken from a number of conifers in these communities indicate that many specimens are over 1000 years old and that several *Athrotaxis laxifolia* may be in the order of 2000 to 2500 years old.

The implicate high altitude Huon pine community (I2.6) has not previously been described. Given the present known distribution of the species there is only a remote possibility that a similar stand exists elsewhere in the state. As a consequence the 0.7 ha mapped on the slopes of Mt Read, above Lake Johnston, is considered to be a unique disjunct stand with very high conservation and scientific values.

SPECIES CONSERVATION STATUS

One endemic vascular species recorded from the survey area was noted to have national and statewide conservation significance by Briggs and Leigh (1988) and Kirkpatrick *et al.* (1991).

Orites milliganii — Conservation status code Rr2

R = taxa that have limited distributions nationally (following Briggs and Leigh, 1988).

r2 = taxa that occur in 20 or less 10 × 10 km National Mapping grid squares in Tasmania.

Orites milliganii was commonly observed as a large shrub or small tree throughout the Implicate I2.1, I2.4 and I2.7, Alpine 2.1 and Heath H1.1 communities. Its presence was also noted as sparse in the Implicate I2.6 and I2.8, and Heath H2.1 communities.

GIS analysis suggests that the total areal extent of communities containing this species within the Mt

Read RAP is approximately 167 ha (105 ha in ML33M/89 and 62 ha in ML7M/91). It should be noted that *Orites milliganii* has been observed in *Nothofagus gunnii* communities outside the Mt Read RAP; for example, in the low sub-alpine scrub and implicate types on the eastern flanks of Mt Dundas. On the Mt Read/Mt Dundas massif the total area of communities in which *Orites milliganii* is a component is estimated to be 270–300 ha.

MANAGEMENT PRIORITY ZONES

During the course of the two vegetation surveys the consultant was asked to identify or “zone” the vegetation into areas according to similarities in respect of community and species conservation significance and perceived hazards. The reason for this was to allow mineral exploration activities, access routes and gridlines to be planned to minimise impact on all communities and to avoid disturbance in the zones deemed to be of the highest conservation and scientific value.

These zones are shown on in [Figure 7](#).

Zone 1

Two rectangular blocks in [Figure 7](#) contain the valuable Huon pine (*Lagarostrobos franklinii*) communities. A buffer of 50–80 m is incorporated around the known extent of these communities. One stand is close to Lake Johnston and the other some metres above the lake on the slopes of Mt Read.

Principal Community: I2.6 on ML33M/89 only

Zone 2

This zone principally contains the rare association of *Nothofagus gunnii*, *Diselma archeri* (often in tree form) and the restricted endemic *Orites milliganii*. The component communities have the highest species diversity amongst the rainforest communities, with endemics often representing in excess of 75% of total species present at any one site. This zone also includes the small areas of Coniferous Bolster Heath (A2.1) which have escaped past firing of the alpine areas, and the unreserved implicate deciduous beech associations dominated by Pencil pine, *Athrotaxis cupressoides* and *Athrotaxis laxifolia*.

Communities:

I2.1, I2.4, I2.7, I2.8, H1.1, H2.1, A1.2, A2.1 on ML7M/91

I2.1, I2.4, H1.1, H2.1 on ML33M/89

Zone 3

This zone contains the other unreserved implicate deciduous beech (*Nothofagus gunnii*) community with levels of endemism almost equivalent to those in Zone 2.

Communities:

I2.2 on ML33M/89

I2.1, I2.2, I2.3, I2.5 on ML7M/91

Zone 4

The unreserved and undisturbed implicate *Agastachys* rainforest with King Billy pine and pandani defines this zone. The uncommon species, *Pseudopanax gunnii*, was recorded twice in this community.

Communities:

I1.3 on ML7M/91 only

Zone 5

This zone comprises the tall thamnic King Billy pine (*Athrotaxis selaginoides*) rainforest communities, one of which is unreserved, and a burnt facie of these communities; the closed *Leptospermum* scrub heath.

Communities:

T1.3, T4.3, H2.3 on ML33M/89

T1.3, T4.3 on ML7M/91

Zone 6

This zone consists of the burnt Alpine herbfield and heaths. Numerous endemics are present.

Communities:

A1.1, H2.2 on ML33M/89

A1.1, H2.2 on ML7M/91

Zone 7

Nothofagus cunninghamii dominates this zone. Species diversity is low and generally few endemics are present. These communities have the lowest conservation significance in the study area. Revegetation on the fertile clay-loam/basaltic soils in this zone is likely to be rapid in comparison to other areas.

Communities:

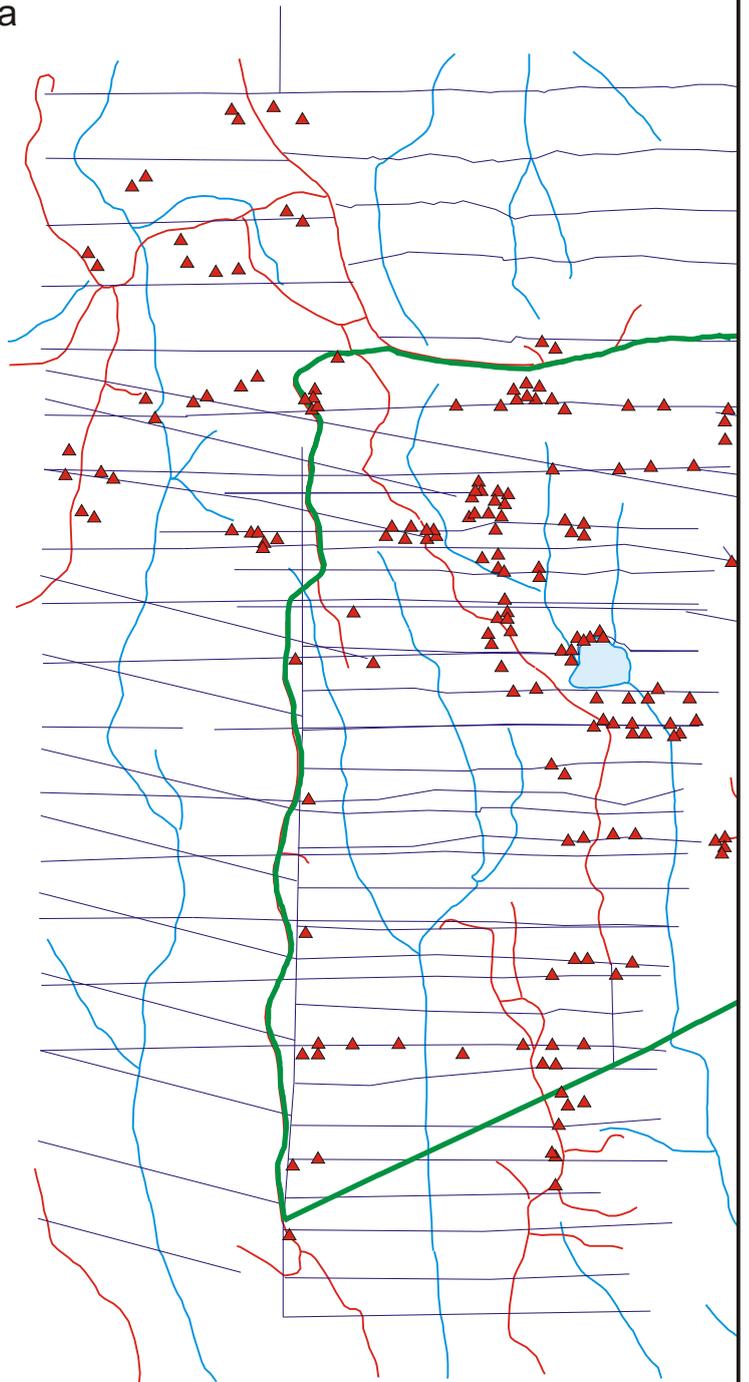
CT2.1, T1.1 on ML33M/89

C1.1, CT2.1, T1.1 on ML7M/91

Department of Mines — Tasmania

MT READ RAP

**Exploration gridlines &
vegetation sample points**



Exploration guidelines and vegetation survey points M. J. Peterson 1992

Figure 4

Department of Mines — Tasmania

MT READ RAP

Vegetation communities

-  A1.1 Alpine herbfield / heath
-  A1.2 Alpine conifer / bolster heath
-  A2.1 Krummholz conifer / *N. gunnii*
-  C1.1 Callidendrous *N. cunninghami* / *A. moschatum*
-  CT2.1/T1.1 Callidendrous–thamnic *N. cunninghami*
-  H1.1 *N. gunnii* / *D. archeri* low heath
-  H2.1 *L. nitidum* / *G. grandis* closed heath
-  H2.2 *G. grandis* open clump heath
-  H2.3 *L. nitidum* / *G. grandis* scrub heath
-  I1.3 Implicate *A. selaginoides* / *N. cunninghami*
-  I2.1 Implicate *A. selaginoides* / *D. archeri* / *N. gunnii*
-  I2.2 Implicate *A. selaginoides* / *P. aspleniifolius* / *N. gunnii*
-  I2.3 Implicate *A. selaginoides* / *L. nitidum* / *N. gunnii*
-  I2.4 Dwarf *A. selaginoides* / *D. archeri* / *L. nitidum*
-  I2.5 Dwarf *A. selaginoides* / *N. gunnii*
-  I2.6 Implicate *L. franklinii*
-  I2.7 Implicate *A. laxifolia*
-  I2.8 Implicate/thamnic *A. cupressoides*
-  T1.3 Thamnic *A. selaginoides* / *A. biglandulosum*
-  T4.3 Thamnic *A. selaginoides* / *N. cunninghami*
-  Wr Bare ground/rock

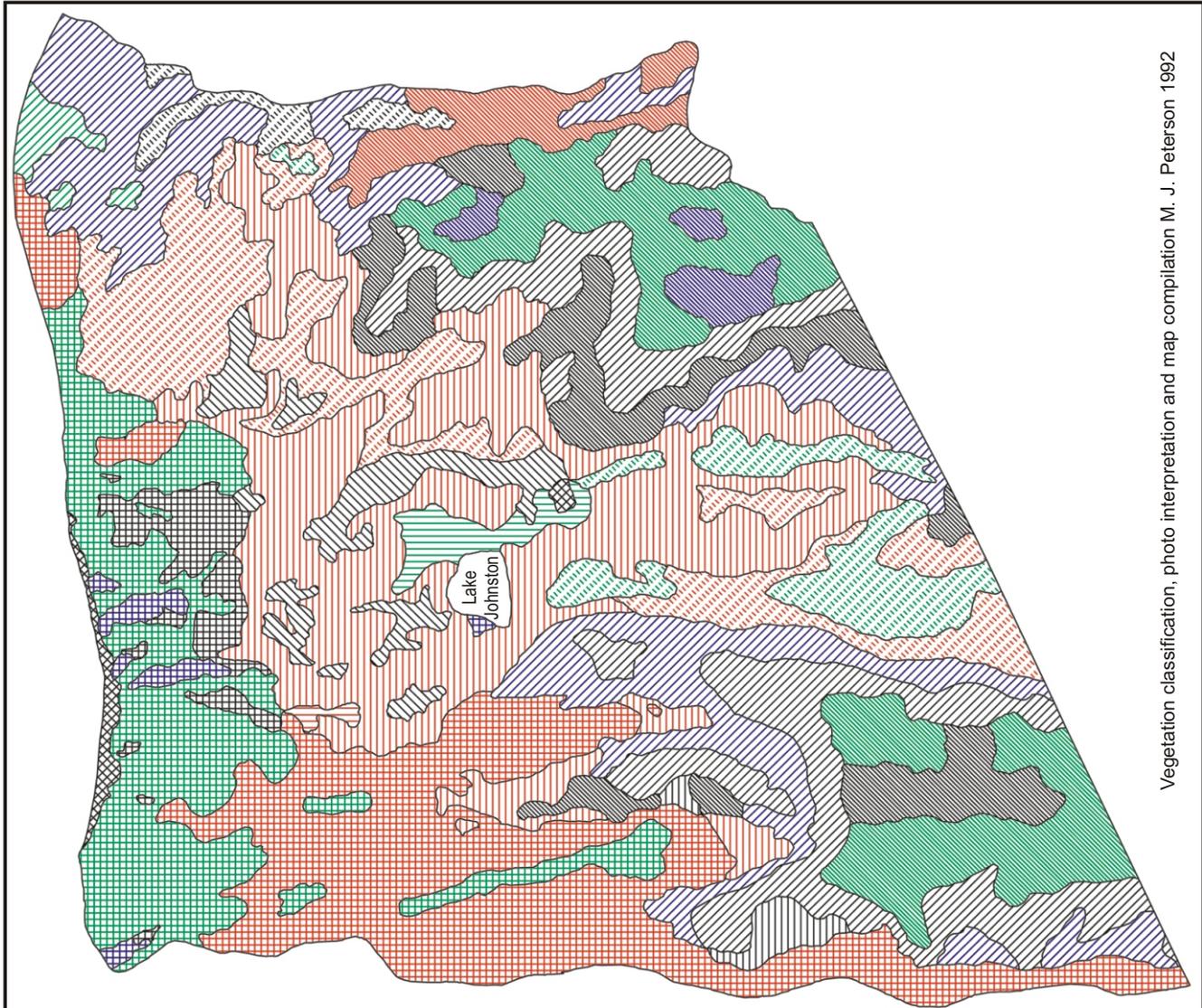


Figure 5

Vegetation classification, photo interpretation and map compilation M. J. Peterson 1992

MT READ RAP
Unreserved vegetation communities

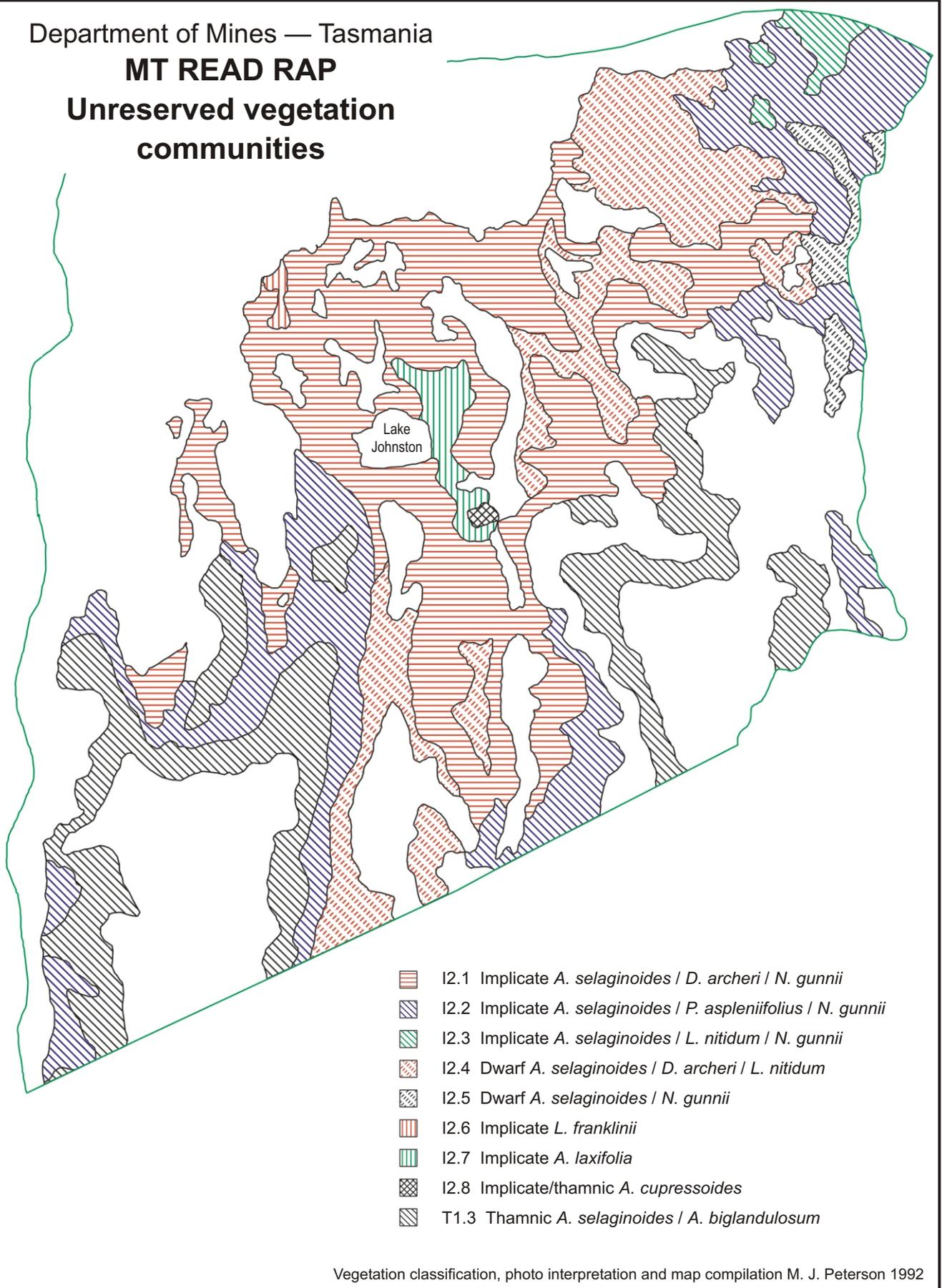
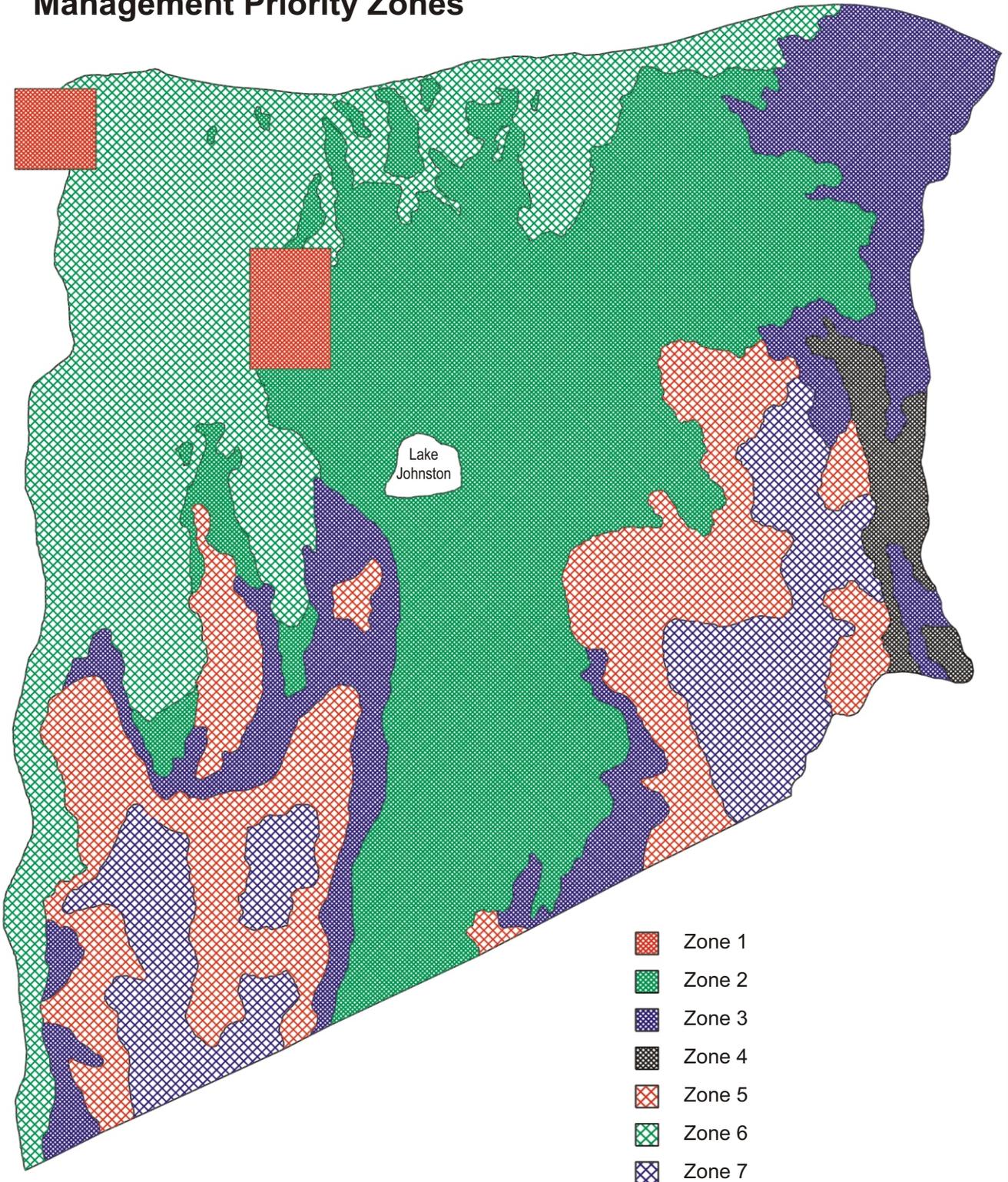


Figure 6

Department of Mines — Tasmania
MT READ RAP
Management Priority Zones



Vegetation classification, photo interpretation and map compilation M. J. Peterson 1992

Figure 7

APPENDIX 4
Authority to access Mt Read via Telstra Road

AUTHORITY TO ACCESS MT READ - VIA TELSTRA ROAD

Key No. _____ is issued to Mr/Mrs/Ms _____

Of _____ (organisation) for the agreed purpose of

Authorisation is granted from ___ / ___ / 199 ___ to ___ / ___ / 199 ___ under the following conditions:

It is acknowledged that the area surrounding the road is on the Mining Lease granted to Pasminco Mining –Rosebery and is subject to special conditions under the *Mineral Resources Development Act 1995* and those required by Mineral Resources Tasmania.

Entry to the Mining Lease surrounding the road can only be authorised by Pasminco Mining–Rosebery, inquiries may be made by phoning (03) 6473 2228 or (03) 6473 2220 during normal working hours. Written inquiries should be directed to:

The General Manager
Pasminco Mining
PO Box 21
Rosebery Tas 7470

All rubbish generated by authorised activities to be removed to the Municipal Tip.

Removal of any other materials and vegetation from the roadway or Mining Lease is prohibited.

Fires of any nature are not permitted to be lit under any circumstances on Mt Read.

Visitors to the area can only be authorised by Pasminco Mining–Rosebery.

Unauthorised visitors will be considered as trespassers and will be prosecuted.

Gate to be locked shut after passing through in either direction.

Any breach of these conditions will result in withdrawal of authority and keys.

Authorised by _____ Organisation _____

Signed (Authorising officer) Date ___ / ___ / 199 ___

I _____ (key holder) accept the terms and conditions above.

Signed (key holder) Date ___ / ___ / 199 ___

APPENDIX 5

Visitor Potential

Irrespective of the status of the site, the amount of infrastructure and the level and quantity of interpretation, it would appear unlikely that visitors (of a commercial nature) will be allowed to visit the site unaccompanied.

Visitors need to be accompanied:

- to ensure the site visitation is controlled;
- to ensure that the natural history and other activities are interpreted correctly;
- to ensure security for the land managers; and
- to minimise environmental impact.

To ascertain the real potential of the site, as a guided commercial tourist venture, it would be necessary to undertake some level of market research. However, experience with other touring operations on natural sites would indicate that there are two potential markets.

The Free and Independent Traveller makes up the largest part of Tasmania's 480,000 visitors. Many bring their own car (10%), while 45% hire motor vehicles. Of the total visitors to the State, 27.2%, or 130,600, spend at least one night on the West Coast.

We know that 29.2% of visitors undertake a short bush walk and it is fair to assume that this percentage would be somewhat greater amongst the West Coast segment. A conservative estimate of the potential existing market that have an interest in nature-based tourism would be 40,000 people.

Short 2 to 4 hour tours are, as a rule, not pre-booked, with most clients preferring to check out the weather and other options before committing themselves. This type of product would not obtain a 10% reach on the target market. As a product that is being offered to a transitory market (who have their own cars), it would be expected that a well designed and marketed product could attract around 1500 passengers per annum.

This particular market is relatively cost sensitive and the concession fee would need to have consideration to what the market is prepared to pay. A fee in the vicinity of \$5 would probably be 10% of the fare charged.

The product for this market is primarily visual, supported by some level of interpretation. The opportunity to purchase souvenirs of their visit will add value to the experience.