

Appendix 6

Rehabilitation in the Resort Villages

A6.1 Introduction

Two examples of rehabilitation within Victorian alpine resort villages have been included in these Guidelines. These include:

- proposed additions to Hotham Chalet, at Mt Hotham (included as an example in Appendices 2 and 3); and
- rehabilitation associated with construction of new apartments at Ropers Apartments, in Pretty Valley (attached to this Appendix).

Although each project was a little different, several key stages of the works at both sites are relevant to similar projects within other resort areas. These are described below, followed by a summary of some of the typical characteristics of rehabilitation sites within resort villages.

Many resort areas, particularly the Perisher Range resorts, are located within valleys and in close proximity to areas of bog or wetland. Bogs are sensitive ecosystems that are easily damaged and very difficult to rehabilitate effectively. As a result, it is strongly recommended that development proposals avoid impacting on bogs. Large areas of bog within KNP have, however, already been disturbed. The results of disturbance generally include loss of vegetation diversity and altered hydrology. Typically disturbance leads to more rapid run-off and channelling of water, causing bogs to dry out and downstream flows to become more seasonal (refer to section A.3 for more information about the important role of bogs in acting as reservoirs for south-eastern Australia).

Because of the hydrological and biological significance of bogs and the frequent occurrence of disturbed bogs in the resort areas, there may be occasions when bog restoration can be included in rehabilitation proposals. The Ropers Apartments case study includes a plan for rehabilitation of an area of bog. Significant aspects of this have also been highlighted as a general guideline below. It is strongly recommended, however, that, if bog rehabilitation is proposed, specialist advice should be sought.

A6.2 Key aspects of work undertaken at Hotham Chalet and Ropers Apartments

Key aspects of rehabilitation work undertaken at Hotham Chalet and Ropers Apartments included:

- vi) Weed control: Resort areas are often weedy. Weed control at both sites was commenced prior to the construction works commencing and followed-up during and following rehabilitation. Important aspects of weed control included:
- Removal of the top 10 cm of soil in particularly weedy areas (refer below to comments regarding soil quality);
 - Not commencing weed control in areas where construction-related disturbance would not occur, until after construction was completed. This was to maintain some vegetation cover to protect the soil during construction. Care would, however, need to be taken with this technique, to ensure that potential for the weeds to disperse back onto the site or elsewhere, was minimised; and
 - Particular emphasis was placed on control of rhizomatous species such as *Achillea* (Yarrow) and *Agrostis* (Bent Grass), as these spread rapidly after disturbance.
- vii) Soils were protected during construction and rehabilitation, according to prescriptions detailed in SEMP's for each site. Important aspects of soil management included:

- Storage of soil stockpiles in weed-free, protected locations.
 - Mulching of all bare soil.
 - At both sites soils had been disturbed previously and were compact and lacking in structure and topsoil availability. Generally construction activity would result in ripping up and re-spreading of soil, however, in areas that were not ripped, cultivation would be necessary.
 - Where removal of topsoil was recommended, the addition of fertiliser and organic matter (e.g. Copra Peat) to the planting hole was recommended.
- viii) Installation of appropriate drainage was recommended.
- ix) Construction of formal pathways, was recommended, were required.
- x) With regard to planting, emphasis was placed on:
- Sourcing plants and quality control of tube-stock;
 - Use of indigenous species;
 - Preference for hardy, fast-growing species, where appropriate, to provide rapid cover;
 - Use of species that would give a pleasing visual effect (including mass planting of species to produce swathes of colour);
 - Inter-planting of flowering forbs and grasses, planted at a high density (5-7 plants per square metre) to achieve an immediate landscape effect); and
 - Planting at higher densities on slopes.
- xi) Ongoing post-rehabilitation maintenance of sites was recommended, including watering, weed control, re-mulching and protecting sites until rehabilitation was well established and self-supporting.

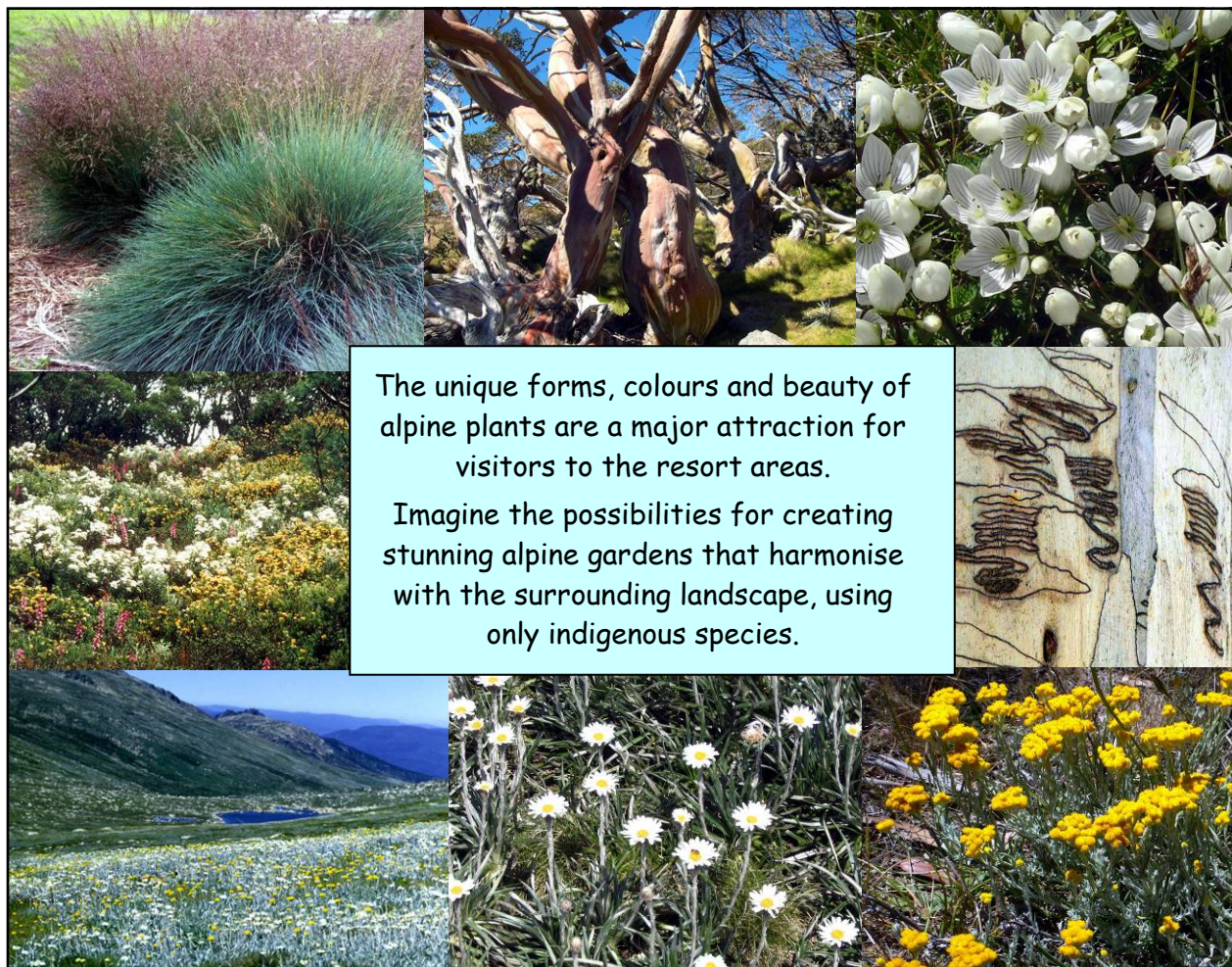
A6.3 Typical characteristics of rehabilitation sites within resort villages

As highlighted in the Ropers Apartments and Hotham Chalet case studies, a range of factors typical of resort areas need to be considered when planning rehabilitation in these areas. Some of the major factors that need to be considered are listed below:

- Areas requiring rehabilitation are typically very disturbed, with disturbance including poor soil (topsoil is often either absent or mixed with other soil layers), little indigenous vegetation and the presence of weeds.
- Many of the resort areas are adjacent to bogs or other sensitive areas that need to be protected.
- Areas adjacent to buildings are often subject to heavy use. Rehabilitation or landscape planning should attempt to identify routes that are likely to be used for access to the building or service points around the building and provide appropriate surfaces. For heavily used routes hardened surfaces would be required, while for occasional access to services grassed areas would be reasonably resilient and provide space for equipment to be laid down if necessary.
- Areas adjacent to hardened surfaces, below cuttings and adjacent to buildings are often poorly drained, while other areas may be very dry. Rehabilitation planning needs to take into consideration these areas and improve drainage, where possible, or ensure that species that can tolerate these areas are used.
- Bushfire protection is an important consideration in carrying out rehabilitation adjacent to lodges, public buildings and other important assets.
- Aesthetics are also an important consideration, therefore a landscaping approach may be more relevant than attempting to rehabilitate or restore the native character of the vegetation. Landscaping should, however, consider the use of locally indigenous

species that reflect an appropriate type of community (i.e. a community that will be able to survive on the site and, preferably, reflects the kind of community that would naturally occur at the site).

- Opportunities to create fauna habitat could be considered, e.g. use of rock and heath species near waterways or wet areas may create Broad-toothed Rat habitat.



A6.4 Special aspects of bog rehabilitation at Ropers Apartments

An important aspect of the Ropers Apartments case study was the inclusion of an adjacent area of bog in the rehabilitation plan. It should be noted that this area of bog was degraded prior to any works taking place, not degraded due to the works themselves. The bog restoration could, therefore, be seen as an offset for other impacts resulting from the works.

Specialist advice should be sought if bog rehabilitation is to be attempted, however, because opportunities for bog rehabilitation around the resort areas may arise, some of the key aspects of bog rehabilitation at Ropers Apartments are described below.

Key aspects of bog rehabilitation include:

- A long term commitment and on-going maintenance;
- Ensuring that hydrology is correct; flows need to be slow moving, steady and spread out over the area of the bog (not channelled);

- Bogs are vulnerable to weed infestation; weed species need to be filtered from water and managed continually during the entire period it will take for the bog to re-establish;
- Many bog plants are difficult to propagate and very slow growing, therefore preparation of stock has to commence well in advance. Specialist nursery assistance is likely to be required.

Note: It is generally recommended that any kind of impact on bogs is avoided due to the level of commitment and complexities involved in bog rehabilitation.

Attachment A6 Rehabilitation Plan for Ropers Apartments

Ropers Apartments at Pretty Valley Lodge

Site 39 Slalom Street
Falls Creek

Site Rehabilitation Plan - Spring 2004

This rehabilitation plan is comprehensive to the Pretty Valley lodge site and only includes the development of Buildings A and B. It is highly likely, however, that Buildings C, D, E and F will be constructed in the future. A separate rehabilitation plan will be done for the area that these buildings will affect when required.

Introduction

Ropers Apartments at Pretty Valley have been in conceptual form for some years. In 2001, environmental assessments were done on the site by various contractors, including a vegetation assessment by Ecology Australia, a landscape concept report by Mexted Rimmer Associates and a waterway management plan by Neil M Craigie Pty Ltd. All these documents will be presented with the rehabilitation plan as appendices.

The aim of this plan is to incorporate all of the above documents to produce a meaningful and prescriptive plan, which can be followed by the architect, the construction team and the landscape team.

Landscape Features

The area adjacent to the Pretty Valley Lodge is highly disturbed with about half remnant native vegetation present. The remaining vegetation is composed of a variety of mostly invasive, woody and herbaceous weeds. (See Vegetation Assessment for Pretty Valley Lodge Redevelopment – Ecology Australia 2001)

The most important feature associated with this site is the alpine moss-bed on the western side of the site. This type of ecological community is protected in the *Flora and Fauna Guarantee Act 1988* and must not be disturbed or built upon in the future. It is currently in a degraded state and this development is an excellent opportunity to improve its condition and eventually restore it to a functional moss-bed with Sphagnum moss hummocks present.

Another important feature of this site is the presence of mature Snow Gums (*Eucalyptus pauciflora ssp. hedraia*). This subspecies is listed as vulnerable and is localised to the Bogong High Plains. It has much to offer aesthetically in landscape quality with both form and attractive coloured bark. It is vital that as many of these trees are retained and protected from development as they are very slow to grow and seedlings of these plants do not provide the same effect as mature trees.

The single plant of Snow Speedwell (*Derwentia nivea*) is another important feature of this site. This is a declared rare plant nationally and must be protected. If this plant is to be disturbed during the development it must be relocated by a professional horticulturist and nurtured until re-established.

Site Condition 2004

The Pretty Valley site had a thorough vegetation assessment done in 2001 by Ecology Australia. (See attached documentation). The site in 2004 is in a very similar condition as this assessment, however some aspects are altered. Barry Jones, the leasee has planted in excess of 100 Snow Gum seedlings around the site in 2002/03. Some have been planted where the new buildings are to be constructed and need to be transplanted. In time these will add to the landscape features of the site.

Of particular note at this site is the presence of woody weeds, namely *Cytisus scoparius* (English Broom) and *Salix cinera* (Grey Willow). Both of these species have invaded the surrounding Alpine National Park and have the potential to become monocultural in the Park, particularly after the 2003 fires. A large amount of money and time is being spent by Parks Victoria to control these weeds. It is absolutely essential that any individuals of these species are completely removed from the site. *Juncus effusus* (Soft Rush) is a significant weed of alpine moss-beds, with the potential to invade and dominate wetlands. This weed must also be eradicated.

In general, this site does have a very large amount of weed seed present in the soil. The control of weeds will be an ongoing process well after the development and rehabilitation is complete. It is important that follow up weed control is done on this site for at least five years so that indigenous vegetation can re-establish.

Pre-Development Requirements

Before a single sod has been dug for this development a number of documents have to be approved by the relevant authorities and then followed by the contracted developers. There are a Site Environmental Management Plan (SEMP) which should have a project description, management and induction guidelines, monitoring requirements, site environmental values, construction impact management, including storm-water, surface treatments, native vegetation management and so on. Some of the information that is required for the completion in the SEMP is in this document and should be referred to where relevant.

The other important document is this one, the Site Rehabilitation Plan. This plan will divide the site into sections with species identified and a prescription for rehabilitation formulated for each section.

As the construction of the new buildings is proposed to begin in spring 2004, it would be sound practice to also begin the weed eradication program in spring 2004. All woody weeds need to be physically removed. Herbaceous weeds can

be sprayed with glyphosate and a surfactant. If herbaceous weeds are intermingled with indigenous species, an attempt should be made to remove the native plants and either replant them in an area that will not be further disturbed or alternatively potted up and stored under nursery conditions until required for replanting. Soft Rush (*Juncus effusus*) in the bog system can be sprayed with BioActive Roundup. All spraying must be done by a person trained in herbicide use, with good plant identification skills. Once weeds have senesced, mulching with a weed free material is recommended.

Alpine Bog Rehabilitation Requirements

The report by Ecology Australia 2001 deems that bog restoration is impossible. I dispute this statement. If the hydrology of the bog system is correct, that is, if water flows are maintained, weed seed filtered out of water flows and the water is slowed and spread to support indigenous vegetation, then restoration is feasible. Other important issues in restoring this moss-bed are the thorough removal of all the weed species and the replanting of a variety of indigenous moss bed species. Long term maintenance will be required as well as support from the FCRMB to ensure that this bog system will be restored.

Hydrological Aspects

Once the hydrology of an alpine moss-bed is altered and free running water is in the system it will continue to degrade until this aspect is altered. This is the basic hydrological problem with the Pretty Valley site bog system. The report by Neil M. Craigie, Waterway Management Consultants produced in 2001, lists the physical condition of the bog system and is still relevant in 2004. I will list the issues the report identifies and recommend solutions.

- **Problem(s)**

Significant erosion problems at the Slalom Street end due to high velocity water exiting and dropping from the road culvert causing incised channels. Extensive sediment deposition at the Slalom Street end and further downstream into the bog system.

- **Solution(s)**

The water discharge from the culvert has to be slowed and filtered to enter the Pretty Valley site. This is primarily the responsibility of the FCRMB. Where the culvert discharges from the road onto this site, a cleanable sediment basin with multiple dispersal pipes into the soil profile would be suitable. A series of gross pollutant traps should also be part of this system, which capture large amounts of sediment, rubbish and weed seed. The water can then be filtered through a series of rock pits. This is the best way to slow, disperse and clean culvert discharges.

Once the water being introduced into the site has been slowed and modified, the repair of the incised channels is relatively simple. The incised channels need to have weirs installed at the points where the water has the most erosive energy. This takes a trained person (such as myself) who understands the morphology of the landscape. The weirs need to be closer together where the ground is steep and the depth of the weirs will vary according to the entrenchment. Weirs can be made from local rock and silt mat or from rolled

hessian bags wrapped in silt matting and then pinned in. This effectively collects the fines that are dispersed from the drainage line, fills in the channelling and provides a substrate for indigenous wetland species to re-establish.

- Problem(s)

Erosion occurring at the end of the bog system due to earthworks and drainage construction immediately downstream in the carpark. Erosion is also occurring at an artificial drain cut as the outlet under the vehicle track at the rear of the Rubbish Collection building. This drain links into the drainage line above the carpark adding to the overall erosion problems on the lower part of the site.

- Solution(s)

Initially the site needs to be thoroughly inspected after the sediment basin has been installed below the Slalom Street culvert to see if the high water flows have diminished through the system. Concurrently the drainage construction of the carpark needs to be assessed to see whether any earthworks can be done to correct the effects of the lower drain. The placement of weirs above this drain should help in reducing the water flows and decrease erosive processes. The outflows from the drain near the Rubbish Collection building will either need one or two small sediment basins installed and large and small rocks spread at the outflow zone to disperse the water's energy. This should address the erosivity of the water and in time some native plants such as *Carex appressa* can re-establish.

- Problem

The easterly and westerly edge of the bog system have been artificially confined by earthworks and building construction. Spoil from the construction of the Pretty Valley Lodge is spread along the edges of the bog. These margins also have evidence of scouring from concentrated water flows.

- Solution

If the flows into this bog system are slowed and spread (see the first solution), then much of the scouring from high water flows will not occur. The placement of weirs in strategic positions throughout the bog system will also stop scouring. Water from the bog system is currently spreading into the Snow Gum woodland area and needs to be diverted back into the wetland system. The placement of weirs in appropriate places will address this problem.

The placement of building spoils along the edge of the bog system was very bad practice and must not occur again. Not only does it create a distinctive barrier to the flow of water in and around the bog, building spoils are commonly of a basic pH. Alpine bog systems are strongly acidic, with indigenous wetland species requiring a pH of around 4.5 to 5. If the pH is altered enough this will further encourage the growth of weedy exotic species. The edges of the bog system on this site must be less defined where the different types of plant communities merge into one another. Earthworks may be required, manually or with a small bob-cat to either remove these building spoils or ameliorate them into the landscape.

To ensure that the construction works on the site do not affect the bog system further, the area will be fenced off in October 2004 with a silt mat fence that is partially dug into the soil profile to protect it from further degradation.

Other hydrological impacts, such as to the existing lodge, for this development are tabled in the Neil M. Craigie 2001 report and should be included in the SEMP.

Plant Management – Alpine Bog System

This plan recommends that the removal of weeds from the bog system begins in the summer of 2004. Hopefully this will be concurrent with the installation of the sediment basin on Slalom Street so that weed seed infiltration is reduced. Once the weeds have been removed and or sprayed a more thorough assessment of the placement of weirs and the extent of planting required will be done. It is important that a weed management program is followed throughout the site, but particularly for the bog system if it is to be restored to a healthy state.

As stated by the Ecology Australia 2001 report, the bog predominantly needs the structural dominants re-introduced, such as *Baeckea gunnianna*, *Epacris paludosa* and *Callistemon pityoides*. Other species that may be useful as they have the ability to behave like natural weirs in time are *Carex appressa* and *Carex guadichaudiaina*. Shrubs will need to be intensively planted at about 3 per square metre. The *Carex* spp can be heavily planted behind artificial weirs at about 10 per square metre.

Adjacent to the bog directly up from the rubbish collection building, the planting of *Acacia obliquinervia* (Hickory Wattle) is recommended along that service road. This will hide the industrial look of the Oversnow and rubbish collection buildings.

The propagation of the woody species of the moss-bed has been initiated by Liz MacPhee of Alpine Flora. Due to the difficulties and slow growth rates associated with producing these species, they will not be available for planting until spring 2005. Other species required for the bog restoration work will be scheduled so that the planting can be done at the one time.

Once the hydrology, weeds, and sediment in-flows have been corrected, part of the management of this bog will be to re-introduce Sphagnum moss. This will only be possible once the woody dominants are established, to provide both support and shade for moss growth.

Ultimately, in time with comprehensive rehabilitation, and a thorough maintenance program the moss- bed will be effectively restored to a healthy ecological community.

Site Rehabilitation Prescription

Outside of the bog community, the rest of this site needs a prescriptive rehabilitation program that will identify sections of the site and what needs to be done to achieve successful rehabilitation.

Mexted Rimmer has generated a conceptual landscape plan (see Appendices) which this plan will generally follow in regard to species. However, this plan will also provide a process by which the rehabilitation and/or landscaping can be done.

As previously mentioned a person trained in herbicide application, with good knowledge of indigenous and weed species needs to do a thorough spray of weeds in the spring of 2004. This will by no means solve the weed problem of this site, but will enable the rehabilitation needs of the site to become clearer. Without suitable weed control, any disturbance of the soil which is inevitable when constructing buildings, will only further promote the spread of weeds. Weeds and the loss of topsoil are the greatest difficulties in achieving rehabilitation/landscaping outcomes using indigenous species. The removal of any existing exotic mature trees is also highly recommended. Two large Lodgepole Pines (*Pinus contorta*) grow adjacent to the existing lodge. Whilst these trees have some landscape quality, the fact that they are trees from a northern European landscape and detract from the aesthetic beauty of Snow Gums and the overall effect that this landscaping/rehabilitation plan would like to achieve. From an environmental point of view, Lodgepole Pines are an invasive woody weed that has been targeted by Parks Victoria for removal in the surrounding Alpine National Park.

Top soil that is dug up during construction must be stored in a suitable area either close to, or on the site. A reasonably flat area with weed free straw or weed mat covering the area to store the soil is recommended. Any obvious weed species should be removed from sods or soil manually if possible.

There is a small outlet pipe on the eastern side of the site, which emerges from the decking around the pool. The out flow is straight onto vegetation with no attempt to incorporate the water into the soil profile. There is also a lot of *Juncus effusus* (Soft Rush) established in the out flow area. This is probably a direct result of the high amount water in this area. The pipe either needs to be extended further down the slope and put underground, or this water redirected into a proper storm-water out flow system.

Another important factor in achieving successful rehabilitation is the designation of pathways for both vehicle and pedestrian access. The SEMP discusses this issue and needs to be followed. Auditing of the site by a relevant authority is recommended once the construction of Buildings A and B has commenced.

Planting Details

As this site has someone in residence most of the year and watering of tube-stock can be done over the summer, planting times are not so critical. Generally, though, planting of alpine areas is the most successful from the middle of October to the middle of December or from the middle of March until the end of April. Planting in May is not advisable as the ground can freeze at this time of the year and tube-stock will not establish.

Tube-stock to be planted will need to be hardened off at high altitude. This can be done on-site if the plants can be watered every two to three days.

The use of a small amount of pelletised chicken manure and slow release fertiliser mixed with the planting soil can help plants establish. It is important that the fertilisers are not placed directly upon the roots at planting and that weeds have been eradicated. The use of fertilisers to improve planting success is not recommended where large amounts of weeds occur as the weeds will preferentially take up the fertiliser over the native species.

The planting density varies according to the numbers of plants available, the types of plants to be planted and the site requirements. Generally though, trees can be planted at one per square metre, shrubs at two to three per square metre and grasses and herbs at five plants per square metre.

Section 1

Please refer to the site map to locate sections.

This section is at the front of the existing lodge and is not in the development footprint. Some native species are present and the leasee Barry Jones planted some Snow Gum seedlings in 2003/03 which are growing well. This part of the site is ideal for the planting of indigenous shrubs on the edge of the site which is against the wall that separates the lodge from the road. The planting of lower herbaceous flowering plants interspersed with indigenous grasses is recommended. This would create an attractive area that is looked out at from the dining area of the Pretty Valley Lodge and will add aesthetic value to the existing lodge. Attractive shrub species such as *Grevillea victoriae* (Royal Grevillea) and *Prostanthera cuneata* (Alpine Mint Bush) are recommended. Forbs that would do well in this section are *Helichrysum rutidolepis*, *Craspedia* spp., (Billy Buttons), *Bractenatha subundulata* (Orange Everlasting), *Leptorhynchus squamatus* (Scaly Buttons), *Rodanthe anthemoides* (White Everlasting) and *Brachyscome* species (Rock Daisies). These species interspersed with the blue form of *Poa fawcettiae* (Snow Grass) would create a very attractive representative alpine landscape and provide a good example to other lease holders of the potential for site improvement using native species.

Section 2

This section has a very deep trench running through it from the water that is dispersed from the road culvert. It would originally have been part of the bog system that is present adjacent to this site. The water flows and entrenchment will have to be fixed as part of the rehabilitation of the site (as for the alpine bog recovery section). This will be done in conjunction with the Falls Creek Resort Management Board. Water is currently flowing out of the trench and towards the dry land vegetation. This must be fixed as part of the bog recovery work. Apart from this problem, this area has a large Lodgepole Pine which is recommended for removal. The leasee has also planted a number of Blue

Gums which are about ten years old. Whilst this gum is not a species that occurs in sub-alpine landscapes, at this point they can be retained. However, in the future, when the planted Snow Gums have exceeded 2 metres in height, removal of these trees is desirable.

Once the bog system is repaired, the batter of this section can be planted heavily with indigenous shrub species. *Grevillea victoriae*, *Prostanthera cuneata*, *Olearia frostii*, *Olearia phloggopappa* var. *flavescens* and *Derwentia derwentia* are the species I recommend for this part of section 2. Aside from the stream/bog area in this section, lower growing herbaceous species and grasses as for section 1 are recommended on the flatter ground up to the existing building.

Section 3

See the Landscape Plan produced by Mexted Rimmer for the outline of Section 3. Basically Section 3 is the area surrounding Building B. It is the area in which new spa baths are to be installed, adjacent to the raised walkway, the alpine bog and in between the two new buildings. The abstract drawing of the planting design by Mexted Rimmer is suitable. The list of species as outlined on the landscape plan is appropriate. However, from past experience, the placement of properly constructed drip-lines must be clearly marked on the plan to avoid confusion at planting. Generally, leaving one to two metres away from the building is recommended. The steeper the site, the wider the drip line area needs to be. The planting of grasses and tough herbaceous species is also recommended between 500mm and 1000mm away from the drip line as these areas tend to get a lot of water flow and some pedestrian access. The grasses that I recommend are *Poa fawcettiae* (Snow grass) and *Poa hiemata* (Soft Snow grass). The herbaceous species recommended are: *Scleranthus biflorus* (Two-flowered Knawel), *Cotula alpinus* (Alpine Cotula) and *Helicrysum rutidolepis* (Pale Everlasting). Other herbaceous species recommended for planting, that would help further the biodiversity of this site are *Bracteantha subundulata* (Orange Everlasting), *Bracyscome* species (Rock Daisies) and *Podolepis robusta* (Mountain Lettuce).

Section 4

This section is the area surrounding Building B. This area will be under the most pressure from vehicles, building materials and foot traffic. Raised walkways would be ideal for protecting existing vegetation and soil. If this is not possible, then a protective material such as old carpet or silt matting would be acceptable. Any weed free native vegetation must be protected, especially mature shrubs and trees. Indigenous alpine plants are slow to grow and often difficult to produce. The more native species that can be saved through fencing or transplanting will reduce the cost of rehabilitation in the long run. Once the snow has melted, the new buildings marked out and high conservation vegetation has been identified, then the pathways can be marked

out. This will be done as soon as possible in the spring of 2004, prior to any earth being disturbed. Induction of the builders into the importance of this is highly recommended.

The planting guide as laid out by Mexted Rimmer is suitable and can be followed.

Section 5

This section is the rest of the site that should not be overly disturbed by the construction of Buildings A and B. In the future, these areas may be developed, but as far as this plan is concerned, the rest of the site will be managed as having vegetation only. This plan recommends that this section has a thorough weed control program carried out and a clean up of debris. The lower part of the site, which is most of Section 5 would benefit from more Snow Gums. This would hide the road and the sewerage farm below the road and add aesthetic value to the site. However, until Buildings C, D and E have been decided upon and what the FCRMB would like to do with this area, no planting is recommended.

Post Development Requirements

It is very important in successful rehabilitation of high altitude sites that follow up maintenance and planting is done. This is not just for one year after the development has been done, but five.

This is particularly pertinent for the bog system. This area has been severely altered hydrologically, ecologically and floristically. This development is a real opportunity to restore a listed, protected community and to provide a prototype for restoring alpine bog systems within a ski resort.

The other more general areas that need rehabilitating have had many years of weed seed deposited in the soil profile and large weed load. This will be the most difficult aspect to achieving successful rehabilitation. It is very important to do very thorough initial weed control, use weed free mulch and do follow up weed control and re-mulching. This will be most intensive the first year after planting, but can become phased out over 5 years. In this time, planted indigenous species should be large enough to out-compete weed species.

From a rehabilitation perspective, the survival of 50 % of planted tube-stock is acceptable. However, this site can be maintained with watering and weed control as required. A survival rate of up to 80 % would be more acceptable and will be aimed for. Barry Jones, the leasee, has already showed his commitment in caring for seedlings by keeping more than 80 % of the Snow Gun seedlings alive that were put in just before the 2003 fires. Replanting of any lost plants can be done in the spring of 2006.

Timeline – Rehabilitation Works

Oct/Nov 2004

- Site marked out.
- Access tracks designated.

Alpine bog system delineated and marked as a no-go area.
Endemic *Derwentia nivea* transplanted and/or protected.
Snow Gum seedlings in development area transplanted.
Weed eradication program commences.
Woody alpine species cuttings taken, cuttings to be ready by spring 2005.

Dec/Jan 2004/05

Follow up weed control (removal and spraying)
Mulching of areas that weed control has been successful.
In conjunction with FCRMB, a solution to the road culvert on Slalom Street to be formulated.
Access tracks monitored.
Areas for topsoil, building supplies etc to be clearly marked.

Jan/March 2005

Installation of a cleanable sediment basin at the culvert from Slalom Street (dependent upon cooperation with FCRMB).
Seed/cuttings collected from indigenous herbaceous plants on site.
Carpark end drainage problems addressed (see detail in this plan).
Sowing of herbaceous species for spring planting.
Propagation of herbaceous alpine bog species.

Feb/April 2005

Installation of weirs in alpine bog system (dependent on culvert works).
Re-spraying of any emerging weeds, in and out of bog system.

May/June 2005

Completion (or near completion) of Buildings A and B.
Removal of scaffolding, building materials etc for the winter
Mulching of pathways and any remaining bare ground.

Oct/Nov 2005

Assessment of the success of the culvert works.
Major landscaping and rehabilitation works, with planting and design plans followed. Re-mulching where required.

Feb/Mar 2006

Landscape assessment. Replanting of dead tube-stock, follow up weed control.
Planting of the alpine bog, both woody and herbaceous species.

Nov 2006

Auditing of site landscaping/rehabilitation. More planting if required.
Continued weed control and re-mulching.
Assessment of the restoration of the alpine bog system.

Nov 2007-2009

Follow up maintenance as required.

Conclusion

The Falls Creek Ski Resort is currently proposing a large modern development in Slalom Plaza, which is adjacent to the Pretty Valley/Ropers site. This development could be the catalyst for the re-emergence of Falls Creek as the ultimate family alpine destination. The completion of Buildings A and B for the Ropers/Pretty Valley development and the successful rehabilitation of the land around these buildings will be in keeping with the vision that the Falls Creek management team has for their resort. It is also very important that there is full cooperation between the Falls Creek management and the lease holder of the Pretty Valley site so that the culvert repair and bog restoration are achieved.

The rehabilitation of any high altitude site is difficult and it is important that the limitations of these projects are understood. There needs to be a strong commitment to protect and improve the vegetation quality of the site not only by the lease holder, but by the construction team, the landscape team and the resort management if this work is to be successful.

This rehabilitation plan is a guide on how to best manage the existing indigenous vegetation as well as the removal of introduced plants and their replacement with indigenous species. Should any on-site environmental issues occur before, during or after the development, Alpine Flora – Liz MacPhee will provide guidelines on how to best deal with the problems.

