BIOSIS
RESEARCH

Review of flora, fauna and net gain assessment of the Heavenly Valley Development Plan and New Hotham Village Redevelopment Plan, Mount Hotham Alpine Resort

August 2006

Natural & Cultural Heritage Consultants 38 Bertie Street (PO Box 489) Port Melbourne Victoria 3207

BIOSIS
RESEARCH

Report to Mount Hotham Alpine Resort Management Board

Review of flora, fauna and net gain assessment of the Heavenly Valley Development Plan and New Hotham Village Redevelopment Plan, Mount Hotham Alpine Resort

August 2006

Aaron Harvey

Draft Report

Project no. 5820

Melbourne:
38 Bertie Street, Port Melbourne VIC 3207
Ph: (03) 9646 9499 Fax: (03) 9646 9242
email: melbourne@biosisresearch.com.au

Sydney:
15-17 Henrietta Street, Chippendale NSW 2008
Ph: (02) 9690 2777 Fax: (02) 9690 2577
email: sydney@biosisresearch.com.au

Ballarat:
449 Doveton Street North, Ballarat VIC 3354
Ph: (03) 5331 7000 Fax: (03) 5331 7033
email: ballarat@biosisresearch.com.au

Queanbeyan
55 Lorne Road (PO Box 1963),
Queanbeyan NSW 2620
Ph: (02) 6284 4633 Fax: (02) 6284 4699
email: queanbeyan@biosisresearch.com.au

***BIOSIS** RESEARCH Pty. Ltd. A.B.N. 65 006 175 097*
Natural & Cultural Heritage Consultants

ACKNOWLEDGEMENTS

I wish to acknowledge the contribution of the following people and organisations in undertaking this review:

Mount Hotham Alpine Resort Management Board

- Jim Atteridge
- Tom Pelly
- Bev Lawrence

Biosis Research Pty. Ltd.

- Charles Meredith
- Ian Smales
- Nicola Barnes
- Bretan Clifford

CONTENTS

1.0 AUTHORS STATEMENT

This review has been prepared by Aaron Harvey, Senior Consultant, Biosis Research Pty. Ltd., of 38 Bertie Street, Port Melbourne.

Aaron holds a Bachelor of Applied Science (Environmental Management), an Honours degree in Bachelor of Science (Conservation Ecology) and a Diploma in Natural Resource Management.

Aaron has worked extensively in alpine and sub-alpine environments, conducting numerous flora and fauna surveys and environmental impact assessments, preparing environmental management plans and rehabilitation and revegetation plans and providing general ecological advice to land managers in south-eastern Australia. He has particular experience in flora and fauna management and environmental impact assessments within high altitude environments and ski resorts.

Aaron is a member of the Environment Institute of Australian and New Zealand where he is Chair of the Professional Development Standing Committee. He is also a member of the Ecological Society of Australia and the Australian Institute of Alpine Studies.

Aaron has conducted flora and fauna assessments throughout the Australian Alps. He has worked on a broad range of projects relating to impact assessment in relation to flora and fauna within alpine and sub-alpine environments in the following areas:

Victoria –

- Alpine National Park
- Mount Buffalo National Park
- Mount Buller Alpine Resort
- Mount Hotham Alpine Resort

New South Wales –

- Perisher Blue Ski Resort

2.0 PROJECT BACKGROUND & OBJECTIVES

I was commissioned by the Mount Hotham Alpine Resort Management Board (MHARMB) to peer review the flora, fauna and net gain assessments by Ecology Australia Pty. Ltd. of the Heavenly Valley Development Plan (Ecology Australia 2006a) and the New Hotham Village Redevelopment Plan (Ecology Australia 2006b) within the Mount Hotham Alpine Resort.

A planning permit application (2005/0337) has been lodged with the Alpine Planning Unit (DSE) for the proposed Heavenly Valley Development Plan which includes two areas, the Mount Hotham Ski Company (MHSC) ski field operations facility and the Heavenly Valley skier facility.

Deleted:

The New Hotham Village Redevelopment Plan (Amendment C17) includes nine stages of development including the relocation of the Great Alpine Road and construction of numerous buildings (Ecology Australia 2006b).

The Heavenly Valley Development Plan and Amendment C17 are being heard by Planning Panels Victoria.

The objectives of this investigation are:

- to undertake an independent review of the flora and fauna information, net gain assessment and any potential impacts and recommended mitigation measures in the reports of Ecology Australia (2006a, b).

2.1 Study Areas

The general study area is shown in Figure 1, the Heavenly Valley Development Plan study area in Figure 2 and the New Hotham Village Redevelopment Plan study area in Figure 3.

2.2 Basis of Review

I have based this review on the relevant legislation and policies that deal with flora and fauna matters:

- Victorian Native Vegetation Management Framework – A Framework for Action (hereafter the Framework) (NRE 2002);
- *Flora and Fauna Guarantee Act 1988* (FFG Act); and
- *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

What about the Conservation, Forests and Lands Act 1987, over 1,220 metres for public authorities?

I have read and reviewed the following documents:

Ecology Australia. 2006a. Heavenly Valley Development Plan – Flora and Fauna section. Heavenly Valley Development Plan: Planning permit application. Supporting documentation prepared by Arup Environmental and Planning, Albert Park.

Ecology Australia. 2006b. New Hotham Village Redevelopment Plan: Flora, Fauna and Net Gain Assessment. Ecology Australia Pty Ltd, Fairfield.

I have also read the following to assist with this review:

Arup Environmental and Planning. 2006. Hotham Village Redevelopment Plan – Hotham Village Environmental Management Plan: Stage One. Arup Environmental and Planning, Albert Park.

Craigie, N.M. 2006. Mount Hotham Village Redevelopment – Surface Water Management. Neil M Craigie Pty Ltd, Croydon.

Ecology Australia. 1997. Mount Hotham Snowmaking Environmental Report and Management Plan – Flora and Fauna section. Arup Environmental and Planning, Melbourne.

MFS Living and Leisure Limited. 2006. EPBC Act Referral Form (2006/2915).

This assessment is based on a review of state and federal biological databases, experience of Biosis Research staff that have worked on sites around and including the study areas, information gathered from previous natural heritage work and reports held by Biosis Research Pty Ltd at this time, including extensive field assessments completed during summer 2005/06 within the Mount Hotham Alpine Resort (Harvey 2005; Harvey and Barnes 2006; Harvey and Nicholson 2006; Harvey et al. 2006; Harvey et al. in prep.; Schnittler and Harvey 2006; Schnittler et al. 2006).

3.0 REVIEW OF METHODS

Classification of native vegetation in Victoria follows a typology in which ecological vegetation classes (EVCs) are the primary level of classification. An EVC contains one or more plant (floristic) communities, and represents a grouping of broadly similar environments. Vegetation community names follow the typology of vegetation in Victoria developed by DSE (http://www.dse.vic.gov.au/dse/nrence.nsf/).

Ecology Australia (2006a, b) utilise draft EVCs which were superseded in March 2006. Synonymous and current EVC names from DSE, and those subsequently used in this review are provided in Table 1.

Table 1. EVC names from Ecology Australia (2006a, b) and synonymous EVC names and Conservation Status from DSE (March 2006).

Ecology Australia (2006a, b)	DSE (March 2006)	Conservation Status
(Sub) alpine Open Heath	Alpine Grassy Heathland	Vulnerable
Kunzea Heath	Alpine Rocky Outcrop Heathland	Vulnerable
Tall Alpine Heath	Alpine Grassy Heathland	Vulnerable
Subalpine Woodland	Sub-alpine Woodland	Least Concern

With one exception Ecology Australia (2006a) have followed standard practice in undertaking searches of public databases to generate lists of flora and fauna that have been previously recorded as occurring in the local area, or whose broad distributional ranges include the study areas. Databases accessed are DSE Victoria's FIS and AVW databases and the Commonwealth DEH online EPBC Act Protected Matters Search Tool.

They do not appear to have searched the FIS for the Heavenly Valley Development Plan study area.

In their assessment of the Heavenly Valley Development Plan, Ecology Australia (2006a) also cite a 1997 assessment which they completed as part of the Mount Hotham Snowmaking Project.

It is assumed that where dates are not stated, the most current version of the database was accessed. This is not considered to be a significant limitation of the Ecology Australia reports.

3.1 Field Survey

3.1.1 Flora and fauna assessment

Heavenly Valley Development Plan

Ecology Australia (2006a) collected flora quadrat data and species lists over two days in early November 2005. They also completed a habitat assessment for threatened fauna.

The flora and fauna survey by Ecology Australia (2006a) was conducted in November, which is not an optimal time for survey in alpine environments. Some plant species are dormant and/or lack flowering or fruiting material, making detection and/or identification difficult. Some fauna species, particularly reptiles and frogs, are less consistently active at this time than they generally are in mid to late summer. However, altitudinal migratory birds are more likely to be present during the season in which they surveyed than in winter.

Given the previous study by Ecology Australia (1997) and the small size of the Heavenly Valley Development Plan study area, the methods used and duration of investigations are considered to be appropriate and adequate for general assessment of the site.

Ecology Australia did not undertake surveys for fauna species. However, on the basis of habitat assessment they recommend that a targeted investigation of the MHSC ski field operations facility site aimed at determining the presence of the Alpine She-oak Skink should be undertaken. I agree that this is an appropriate and valid recommendation for the site.

New Hotham Village Redevelopment Plan

Ecology Australia (2006b) collected vascular flora lists, non-vascular flora data, quadrat data and completed net gain assessments over three days during February 2006. They also completed a three day field survey and habitat assessment of fauna including compilation of species lists, diurnal searches for reptiles and other signs of fauna.

The flora and fauna survey by Ecology Australia was conducted in February, which is the optimal time for survey in alpine environments.

Given the size of the New Hotham Village Redevelopment Plan study area, the methods used and duration of investigations, are considered to be appropriate and adequate for general assessment of the site.

4.0 REVIEW OF RESULTS

4.1 Flora Species & Communities

Heavenly Valley Development Plan

Ecology Australia (2006a) recorded 41 vascular plant species within the MHSC ski field operations facility study area, of which 38 were indigenous and three are introduced. In the Heavenly Valley skier facility study area, Ecology Australia recorded 27 vascular plant species, of which 24 were indigenous and 3 are introduced.

Ecology Australia (2006a) identified (Sub) alpine Open Heath within the MHSC ski field operations facility and Kunzea Heath within the Heavenly Valley skier facility study area. These draft EVCs have been replaced respectively by the synonymous Alpine Grassy Heathland EVC 1004 and Alpine Rocky Outcrop Heathland EVC 1013.

Results of the Ecology Australia surveys provide the information required for the purpose of assessing the development proposal. They are consistent with my own assessments (Harvey and Barnes 2006; Harvey and Nicholson 2006; Harvey et al. in prep.) in the surrounding area where similar indigenous and introduced vascular plant numbers have been recorded.

Ecology Australia (2006a, p. 3-26) state that the vegetation within the MHSC ski field operations facility "…is in good condition and is regenerating post-fire."

My own observations (Harvey and Barnes 2006; Harvey and Nicholson 2006; Harvey et al. in prep.) in the surrounding area concur with the above statement. Moreover post-fire regeneration throughout the resort has been consistent with that expected from alpine and sub-alpine environments.

Ecology Australia (2006a) do not comment on the condition of the vegetation within the Heavenly Valley skier facility, however it could be inferred from their very high habitat scores that they consider the vegetation to be in good condition. I concur with this assessment.

New Hotham Village Redevelopment Plan

Ecology Australia (2006b) recorded 111 vascular plant species within the New Hotham Village Redevelopment Plan study area, of which 93 species were indigenous and 26 are introduced.

Ecology Australia (2006a) identified three EVCs within the study area:

- Sub- alpine Woodland EVC 43;
- Tall Alpine Heath which has been replaced by the synonymous Alpine Grassy Heathland EVC 1004; and
- Kunzea Heath which has been replaced by the synonymous Alpine Rocky Outcrop Heathland EVC 1013.

Results of the Ecology Australia survey provide the information required for the purpose of assessing the development proposal. These results are consistent with my own assessments (Harvey et al 2006; Harvey et al. in prep; Schnittler and Harvey 2006) in the surrounding area where similar indigenous and introduced vascular plant numbers have been recorded. The high number of weeds can be attributed to the high degree of disturbance associated with village infrastructure and development.

Ecology Australia (2006b) provide comments on the quality of vegetation for individual facilities under the site descriptions. They rate the vegetation from predominantly exotic dominated vegetation through to good quality native vegetation.

My observations within the surrounding area concur with the assessments by Ecology Australia.

4.2 Vegetation quality assessment for Net Gain

Heavenly Valley Development Plan

Ecology Australia (2006a) assigned an adjusted habitat score of 0.95 to the MHSC ski field operations facility and estimated the habitat zone to be 0.086 ha, resulting in an estimated habitat hectare value of **0.08 habitat hectares.** Subsequent to receiving an objection from DSE the proposed footprint was amended by the proponent (Workshop – drawing no. 4267-17-B-DA-10-01 rev D) to be 0.03 ha resulting in a revised habitat hectare value of **0.03 habitat hectares.**

The Ecology Australia habitat score is very high and in my opinion results in an over-estimation of vegetation condition for the study area. The Landscape Values assigned by Ecology Australia do not reflect the 'significantly disturbed' environment of the Loch Car Park and Dam, and the presence of what I consider high threat weeds (e.g. English Broom *Cytisus scoparius* and Red Fescue *Festuca rubra*) have contributed (?? Weeds contribute to a higher score??) to this unusually high habitat score. However, any reduction in the habitat score would not significantly alter the conservation significance of the site given the vulnerable conservation status of Alpine Grassy Heathland.

Ecology Australia (2006a) assigned an adjusted habitat score of 0.97 to the Heavenly Valley skier facility and estimated the habitat zone to be 0.19 ha resulting in an estimated habitat hectare value of **0.18 habitat hectares.** Subsequent to receiving an objection from DSE the proposed footprint was amended by the proponent (Site Plan – drawing no. A-DA-01-04 rev B) to be 0.04 ha resulting in a revised habitat hectare value of **0.04 habitat hectares.**

The Ecology Australia habitat score is very high and in my opinion results in an over-estimation of vegetation condition for the study area. The Landscape Values assigned by Ecology Australia do not reflect the 'significantly disturbed' environment of the Heavenly Valley Chairlift unload area and Loch Car Park and Dam, and have contributed to this unusually high habitat score. However, any reduction in the habitat score would not significantly alter the final habitat hectare value of the site given the vulnerable conservation status of Alpine Rocky Outcrop Heathland.

Ecology Australia (2006a) assigned Very High conservation significance to the vegetation for the MHSC ski field operations facility and the Heavenly Valley skier facility by combining the habitat condition score and the conservation status (vulnerable).

The presence of threatened species or habitat for such species as well as other site attributes should also be considered when assigning conservation significance, but Ecology Australia (2006a) do not comment on this.

Notwithstanding this oversight and the unusually high habitat scores it is my opinion that the vegetation proposed for clearing is appropriately classified as very high conservation significance for both sites within the Heavenly Valley Development Plan by Ecology Australia (2006a).

New Hotham Village Redevelopment Plan

Ecology Australia (2006b) completed vegetation quality assessment for all stages of the New Hotham Village Redevelopment Plan that contained assessable native vegetation.

The habitat condition scores assigned by Ecology Australia ranged from 0.24 to 0.87 which is generally in accordance with similar assessments completed by Biosis Research (Harvey et al 2006; Harvey et al. in prep; Schnittler and Harvey 2006).

Ecology Australia estimated that the combined total footprint impact on native vegetation, including a 20% allowance for construction disturbance outside the building envelopes, of the New Hotham Redevelopment Plan would be **0.36 hab ha.**

Ecology Australia assigned conservation significance ranging from Medium up to Very High for various stages of the New Hotham Village Redevelopment Plan by combining habitat condition scores and conservation status.

The presence of threatened species or habitat for such species as well as other site attributes should also be considered when assigning conservation significance, but Ecology Australia (2006b) do not comment on this. For example the presence of the endangered *Podolepis* sp. aff. *robusta* High Plains Podolepis should elevate the conservation significance for Sub-alpine Woodland within the proposed GAR re-alignment from Medium to High.

Notwithstanding this oversight it is my opinion that Ecology Australia (2006b) have accurately assessed vegetation under the Framework.

4.3 Vertebrate Fauna

Heavenly Valley Development Plan

Ecology Australia (2006a) used assessment of habitats rather than fauna survey to determine potential values of the sites to threatened fauna species within the Heavenly Valley Development Plan study area. They also refer to a previous assessment undertaken in 1997. Since the habitat assessment method does not provide data about fauna of the sites it is not feasible to fully evaluate their assessment of likely fauna composition of the sites or of potential impacts of the proposed developments.

An evaluation is provided of the potential values of the study site for seven listed species of threatened fauna against key habitats they are known to utilise. On the basis of current knowledge, the key habitat requirements for these species are accurate and based on information provided about the study area, the appraisals are appropriate.

Ecology Australia suggest that a targeted survey aimed at maximising the potential to determine the presence of the Alpine She-oak Skink *Cyclodomorphus praealtus* should be undertaken for the MHSC ski field operations facility study area. I agree that this is an appropriate and valid recommendation for the site.

New Hotham Village Redevelopment Plan

Ecology Australia (2006b) carried out field surveys and habitat assessment for fauna within the overall development footprint over three days in February 2006. The species recorded during the survey are representative of the fauna that would be expected for a survey there at that time of year.

Results of the Ecology Australia surveys provide the information required for the purpose of assessing the development proposal.

An evaluation is provided of the potential values of the study site for seven listed species of threatened fauna against key habitats they are known to utilise. On the basis of current knowledge, the key habitat requirements for these species are correct and, on the basis of information provided about the study area, the appraisals seem appropriate. However, Ecology Australia (2006b) do (you've been giving them a plural) not provide a clear indication of the extent of any surveys they undertook for fauna off-site where potential impacts of the New Hotham Village Redevelopment Plan might occur. Some areas downslope of the development envelopes, particularly along drainage lines and associated gullies, are known to support habitats for fauna that are more intact than those within the development zone and they would appear to be susceptible to a number of possible impacts (see also Potential Impacts and Mitigation).

Deleted: es

5.0 REVIEW OF CONSERVATION SIGNIFICANCE

5.1 Significant Flora & Fauna Species

5.1.1 National significance

Heavenly Valley Development Plan

Ecology Australia (2006a) do not list any flora species of national significance from the study areas. However, in my opinion and following Biosis Research internal guidelines for significance, it is considered that two species recorded by Ecology Australia, *Ranunculus eichlerianus* Eichler's Buttercup and *Olearia frostii* Bogong Daisy-bush, are of national significance.

Ecology Australia (2006a) note that the DEH database predicts the occurrence of, or suitable habitat for, one listed flora species, *Euchtion nitidulus* Shining Cudweed, within 1 km of the study area. They state that it was not detected during the survey. This is consistent with FIS (DSE 2005) data with no records of this species know from the Mount Hotham Alpine Resort.

No fauna species of national significance were recorded by Ecology Australia (2006a) for either the MHSC ski field operations facility or the Heavenly Valley skier facility. Two nationally significant species, the Alpine Tree Frog *Litoria verreauxii alpina* and the Mountain Pygmy-possum *Burramys parvus* are considered by Ecology Australia for their potential to occur within the study area.

I consider that the Ecology Australia assessment of nationally significant fauna is accurate.

New Hotham Redevelopment Plan

Ecology Australia (2006b) do not list any flora species of national significance from the study areas. However, in my opinion and following Biosis Research internal guidelines for significance, it is considered that two species recorded by Ecology Australia (2006a), *R. eichlerianus* and *O. frostii*, are of national significance.

Ecology Australia (2006b) note that the DEH database predicts the occurrence of, or suitable habitat for, one listed flora species, *Euchtion nitidulus* Shining Cudweed, within 1 km of the study area. They state that it was not detected during the survey. This is consistent with FIS (DSE 2005) data with no records of this species know from the Mount Hotham Alpine Resort.

No fauna species of national significance were recorded by Ecology Australia (2006b) for the New Hotham Village Redevelopment Plan study area. Two species, the Mountain Pygmy-possum and the Alpine Tree Frog, occur within close proximity but neither is considered likely to occur within the development footprint.

I consider that this assessment is accurate; however I do have some concern about the potential for off-site impacts of the New Hotham Village Redevelopment on the Alpine Tree Frog (see Potential Impacts and Mitigation).

5.1.2 State significance

Heavenly Valley Development Plan

Ecology Australia (2006a) state that four species classified as rare in Victoria were recorded from the MHSC ski field operations facility study area including *Craspedia crocata* Crimson Billy-buttons, *Celmisia costiniana* Carpet Snow-daisy, *Luzula acutifolia* ssp. *acutifolia* Sharp-leaf Woodrush and *O. frostii*. This is inconsistent with the quadrat data for the MHSC ski field operations facility provided in Appendix E (Ecology Australia 2006a) which also lists *Celmisia tomentella* Carpet Snow-daisy, *Ozothamnus alpinus* Alpine Everlasting, *Pimelea axiflora* ssp. *alpina* Alpine Bootlace Bush and *Ranunculus eichlerianus* Eichler's Buttercup. It is not clear in the Ecology Australia report why these species were omitted from the main body of the report.

Ecology Australia (2006a) recorded five rare species including *C. crocata*, *C. costiniana*, *L. acutifolia* ssp. *acutifolia*, *O. frostii* and *Prasophyllum tadgellianum* Small Alpine Leek-orchid from the Heavenly Valley skiers facility study area. The quadrat data listed in Appendix E does not list *P. tadgellianum*; rather it lists *Prasophyllum* sp. This anomaly is not explained by Ecology Australia, however, it may be that this species was identified to species level at a later date and the quadrat data was not subsequently up-dated to reflect this.

Notwithstanding the inconsistencies between the quadrat data contained within Appendix E and the species listed in the main body of the Ecology Australia report, the overall assessment and numbers of state significant species is consistent with similar studies conducted by Biosis Research in the surrounding area.

No fauna species of state significance were recorded by Ecology Australia (2006a) for either the MHSC ski field operations facility or the Heavenly Valley skier facility. Five state significant species, the Broad-toothed Rat *Mastacomys fuscus*, Alpine She-oak Skink, Alpine Egernia *Egernia guthega*, Alpine Bog Skink *Pseudemoia cryodroma* and Alpine Water Skink *Eulamprus kosciuskoi* are

considered by Ecology Australia's assessment for their potential to occur within the study area. They consider that there is a possibility for the Alpine She-oak Skink to occur, particularly within the MHSC ski field operations facility and recommend further investigation of that possibility. None of the other species are considered likely to occur within the study area.

No records of either the Alpine Egernia or Alpine Water Skink are known from the Mount Hotham Alpine Resort (AVW 2005). I consider that the assessment of state significant fauna made by Ecology Australia for the development footprints is appropriate.

New Hotham Village Redevelopment Plan

Ecology Australia (2006b) recorded fourteen state significant flora species, 12 rare, one vulnerable and one endangered, within the New Hotham Village Redevelopment Plan study area.

As for the Heavenly Valley Development Plan study area the Ecology Australia assessment of state significant species is consistent with similar studies conducted by Biosis Research in the surrounding area.

No fauna species of state significance were recorded by Ecology Australia (2006b) for the New Hotham Village Redevelopment Plan study area. Five state significant species, the Broad-toothed Rat, Alpine She-oak Skink, Alpine Egernia, Alpine Bog Skink and Alpine Water Skink are considered by Ecology Australia's assessment for their potential to occur within the study area. No records of either the Alpine Egernia or Alpine Water Skink are known from the Mount Hotham Alpine Resort (AVW 2005).

I consider that the assessment of state significant fauna made by Ecology Australia for the development footprints is appropriate. However I do have some concern about the potential for off-site impacts of the New Hotham Village Redevelopment Plan on the Broad-toothed Rat and Alpine Bog Skink (see Potential Impacts and Mitigation).

6.0 REVIEW OF ASSESSMENT AGAINST RELEVENT POLICIES AND STRATEGIES

Following is an assessment of the Ecology Australia (2006a, b) reports and their consideration of relevant government legislation and policies affecting the species and environments identified within the study areas.

6.1 Commonwealth

6.1.1 Environment Protection and Biodiversity Conservation Act 1999

Heavenly Valley Development Plan

Ecology Australia (2006a) assessed the MHSC ski field operations facility and the Heavenly Valley skier facility against the EPBC Act and state that referral is not considered necessary as no 'matters of national environmental significance' were recorded for the site.

I concur with this assessment.

New Hotham Village Redevelopment Plan

Ecology Australia (2006b) assessed the New Hotham Village Redevelopment Plan against the EPBC Act and state that referral is not considered necessary as no 'matters of national environmental significance' were recorded for the study area, nor are likely to be impacted by the development.

Ecology Australia note that two EPBC Act listed fauna species occur within the 'vicinity' of the study area, the Alpine Tree Frog and Mountain Pygmy-possum.

Ecology Australia state that referral under the EPBC Act is not considered necessary. However, contrary to this recommendation the New Hotham Village Redevelopment Plan was referred to DEH (2006/2915). DEH have considered the referral and determined on 31 July 2006 that they do not consider the proposed action to be a controlled action, provided it is undertaken in a 'particular manner'.

6.2 State

6.2.1 Flora and Fauna Guarantee Act 1988

Heavenly Valley Development Plan

Ecology Australia (2006a) assessed the MHSC ski field operations facility against the FFG Act by noting that the listed *Euphrasia crassiuscula* ssp. *glandulifera* Thick Eyebright has been recorded in similar habitat at Mount Loch. They state that neither this species, nor any other *Euphrasia* sp. was recorded from the study area.

Ecology Australia also note that the FFG Act listed Alpine She-oak Skink has been recorded from the surrounding area. They state that a permit would be required under the FFG Act to remove or translocate individuals.

Ecology Australia (2006a, p. 3-37) assessed the Heavenly Valley skier facility against the FFG Act and state that no listed plant species or plant communities were recorded for the site, but that the surrounding area provides '….very marginal' habitat for the Alpine She-oak Skink.

I concur with the above conclusions and note that the recommendation by Ecology Australia to undertake additional survey for the Alpine She-oak Skink in the MHSC ski field operations facility site is consistent with the first Intended Management Action in the Action Statement (No. 113) prepared under the FFG Act, and thus should be completed prior to any development taking place.

New Hotham Redevelopment Plan

Ecology Australia (2006b) assessed the New Hotham Village Redevelopment Plan against the FFG Act and noted that the Alpine Tree Frog and the Mountain Pygmy-possum are listed under the FFG Act. They also note that no listed threatened plant species, plant communities or fauna species have been recorded from, or are likely to occur at any of the development sites.

I concur with this assessment, however I consider that the Action Statement (No. 2) prepared under the FFG Act for the Mountain Pygmy-possum should have been explicitly considered.

6.2.2 Wildlife Act 1975

Heavenly Valley Development Plan

Ecology Australia (2006a) note that a permit would be required under the Wildlife Act to remove or translocate Alpine She-oak Skinks if they are present on the site.

Biosis Research experience elsewhere is that removal of habitat may be covered by a permit to remove native vegetation; therefore a separate permit under the Wildlife Act would not be required.

New Hotham Village Redevelopment Plan

Ecology Australia (2006b) does not consider the Wildlife Act with regard to the New Hotham Village Redevelopment.

6.2.3 Native Vegetation Management Framework

Heavenly Valley Development Plan

Ecology Australia (2006a) determined that the native vegetation within the footprint of the MHSC ski field operations facility and Heavenly Valley skier facility meet the definition of very high conservation significance under the Framework.

New Hotham Village Redevelopment Plan

Ecology Australia (2006b) determined that the native vegetation within the footprint of the New Hotham Village Redevelopment Plan meet the definition of medium through to very high conservation significance under the Framework.

7.0 POTENTIAL IMPACTS AND MITIGATION

Heavenly Valley Development Plan

Ecology Australia (2006a) discuss potential impacts of the MHSC ski field operations facility under the heading "Development Implications". I agree that potential impacts they have identified should be addressed and support measures they suggest to do so. These include translocation of any Alpine She-oak Skinks that can be found on the site, implementation of Net Gain requirements as assessed for the site, and the potential for four threatened plant species to be used in a revegetation program. I also strongly support the development and implementation of a comprehensive Site Environmental Management Plan (SEMP) which could minimise direct and indirect impacts.

Potential impacts of the Heavenly Valley skier facility are covered by Ecology Australia (2006a) under a heading "Development Implications". For this site I also agree that potential impacts they have identified should be addressed and support measures they suggest to do so. These include implementation of Net Gain requirements as assessed for the site, and the potential for salvage and revegetation of specific plant species.

I also strongly support the development and implementation of a comprehensive Site Environmental Management Plan (SEMP) for both facilities which could minimise direct and indirect impacts.

In my view some additional potential indirect impacts that should be considered for the Heavenly Valley development Plan, include the following:

- Loss of any vegetation that survives the construction process as a result of changed environmental conditions, particularly through weed invasion.
- Accidental loss of or damage to retained vegetation during the construction phase.
- Potential introduction and/or spread of introduced flora species to the site via machinery.

New Hotham Redevelopment Plan

Ecology Australia (2006b) discuss potential impacts under "Development Implications" and I concur with this assessment. In particular the development of a management plan for threatened plant species should be completed. In addition to this the environmental management principles outlined in the Hotham Village Environmental Management Plan (HVEMP) (Arup 2006) should be applied to the site. The implementation of the HVEMP could minimise direct and indirect impacts.

Based on the Ecology Australia assessment and my review, I believe that the flora and fauna values of the New Hotham Village Redevelopment Plan are low to medium. Given that the footprint for most facilities is small and/or will occur on land that is already alienated, it is unlikely to have major ecological impacts. The areas of greatest ecological value are the patches of Alpine Rocky Outcrop Heathland, Alpine Grassy Heathland and Sub-alpine Woodland vegetation within stages 1 and 2.

Indirect impacts are the modification and degradation of adjacent vegetation and habitat not removed by the development. They include the following:

- Loss of any vegetation that survives the construction process as a result of changed environmental conditions, particularly through weed invasion.
- Accidental loss of or damage to retained vegetation during the construction phase.
- Possible introduction and/or spread of introduced flora species to the site via machinery.

In summary it is my opinion that appropriate management will be important to ensure that the development does not cause impacts off-site. This is principally because the proposed development is along the top of a ridgeline and deleterious effects could be experienced downslope, particularly in watercourses and gullies and there is a possibility for these environments to include significant flora species such as *Celmisia sericophylla* Silky Daisy and significant fauna species such as Broad-toothed Rat and Alpine Tree Frog. In this situation effects could occur from routine development practices and from unexpected contingencies such as accidents.

Ecology Australia have recommended some precautionary measures to minimise some direct and indirect potential impacts. I have also taken account of the Expert Witness Statement of Mr A. McMahon (July 2006), in which a number of indirect and/or off-site effects, such as infrastructure upgrades required to service the development, have been addressed. I consider that the mitigation measures proposed by McMahon, by the HVEMP (Arup 2006) and the management intervention options and recommendations of Craigie (2006) are crucial and must be implemented.

Deleted: s

7.1 Recommendations for mitigation

There may be opportunities to reduce (mitigate) potential impacts through alterations to the design or management following consideration of this review. Impacts on vegetation and habitats should be avoided and minimised, in accordance with Net Gain policy.

7.1.1 Net Gain

The primary mechanism for mitigating ecological impacts is through adherence to Net Gain policy.

The 3-step process to achieving Net Gain should be followed; (1) to first attempt to avoid any native vegetation loss, (2) minimise any unavoidable loss of native vegetation, and (3) offset any native vegetation losses.

Heavenly Valley Development Plan

Ecology Australia (2006a) consider and discuss the 3-step process for the MHSC ski field operations facility and the Heavenly Valley skier facility. The revision of the proposed footprint for both facilities has significantly reduced their impact on native vegetation. However, any native vegetation losses will still need to be offset in line with the requirements of the Framework (NRE 2002). As such, I have used Ecology Australia's (2006a) habitat score, the revised footprint and the conservation significance to estimate the Net Gain offset requirements for the MHSC ski field operations facility as **0.06 habitat hectares,** and the Heavenly Valley skier facility as **0.08 habitat hectares. T**ese results concur with those results presented in McMahon's witness statement.

Deleted: th

Ecology Australia note that the offset requirements arising from the Heavenly Valley Development Plan could be met through management of remnant vegetation and up to 10% through revegetation. However, they do not nominate an area or sites for these works.

New Hotham Village Redevelopment Plan

Ecology Australia (2006b) consider and assess the 3-step process against each proposed facility of the New Hotham Village Redevelopment Plan. They state that overall there is a reasonable level of compliance with steps one and two of the Framework and I agree with this conclusion.

Any native vegetation losses will need to be offset in line with the requirements of the Framework (NRE 2002). As such, I have used Ecology Australia's habitat scores for the proposed area of disturbance and the conservation significance to estimate the Net Gain offset requirements for the New Hotham Redevelopment Plan as **0.63 habitat hectares**. This is 0.13 habitat hectares more than Ecology Australia's final figure due to my allocation of high conservation significance for the Sub-alpine Woodland within the Great Alpine Road relocation.

Ecology Australia (2006b) have designed an offset strategy, which, whilst not meeting the Framework's requirements for offsets (as per Appendix 4 Table 6 NRE 2002) would provide a valuable contribution to native vegetation management within the Mount Hotham Alpine Resort and create a Net Gain. I am supportive of this approach. However, it is worth noting that the MHARMB

is in the process of preparing a resort wide strategy (Harvey et al in prep.) that identifies, maps and broadly assesses areas for their suitability as offset sites. In this context I have identified some additional sites that are suitable for offset works and could contribute to the achievement of a Net Gain (Figure 4 and 5) more consistent with requirements of the Framework.

REFERENCES

Arup Environmental and Planning. 2006. Hotham Village Redevelopment Plan – Hotham Village Environmental Management Plan: Stage One. Arup Environmental and Planning, Albert Park.

Craigie, N.M. 2006. Mount Hotham Village Redevelopment – Surface Water Management. Neil M Craigie Pty Ltd, Croydon.

DSE 2003. *Advisory List of the Threatened Vertebrate Fauna in Victoria - 2003*, Department of Sustainability and Environment, Melbourne.

Ecology Australia. 1997. Mount Hotham Snowmaking Environmental Report and Management Plan – Flora and Fauna section. Arup Environmental and Planning, Melbourne.

Ecology Australia. 2006a. Heavenly Valley Development Plan – Flora and Fauna section. Heavenly Valley Development Plan: Planning permit application. Supporting documentation prepared by Arup Environmental and Planning, Albert Park.

Ecology Australia. 2006b. New Hotham Village Redevelopment Plan: Flora, Fauna and Net Gain Assessment. Ecology Australia Pty Ltd, Fairfield.

Harvey, A. 2005. *Vegetation Management Plan for the new Police Station, Mt Hotham, Victoria.* Report prepared for FMSA Architects (Victoria Police). Biosis Research Pty Ltd, Port Melbourne.

Harvey, A. and Barnes, N. 2006. *Flora, fauna and Net Gain assessment of the proposed Great Alpine Road re-alignment at 'The Cross', Mt Hotham, Victoria.* Report prepared for VicRoads. Biosis Research Pty Ltd, Port Melbourne.

Harvey, A. and Nicholson, R. 2006. *Flora and Net Gain assessment of the proposed Utility Services installation, Mt Hotham, Victoria.* Report prepared for Mount Hotham Alpine Resort Management Board. Biosis Research Pty Ltd, Port Melbourne.

Harvey, A., Nicholson, R. and Clarke, R. 2006. *Flora, fauna and Net Gain assessment of the proposed Great Alpine Road re-alignment, Mt Hotham, Victoria.* Report prepared for Mount Hotham Alpine Resort Management Board. Biosis Research Pty Ltd, Port Melbourne.

Harvey, A., Barnes, N. and Nye, E. in prep. *Net Gain Strategy for the Mount Hotham Alpine Resort.* Report prepared for Mount Hotham Alpine Resort Management Board. Biosis Research Pty Ltd, Port Melbourne.

NRE 2002. *Victoria's Native Vegetation Management: A Framework for Action.* Department of Natural Resources & Environment, Victoria.

Schnittler, N. and Harvey, A. 2006. *Net Gain assessment and Vegetation Management Plan for Lot 7 of the Ultima site.* Report prepared for BCR Asset Management. Biosis Research Pty Ltd, Port Melbourne.

Schnittler, N., Harvey, A. and Smales, I. 2006. *Flora, fauna and Net Gain assessment of the proposed Wire Plain Car Park, Mt Hotham, Victoria.* Report prepared for Mount Hotham Alpine Resort Management Board. Biosis Research Pty Ltd, Port Melbourne.

FIGURES

Figure 1. Location of the study area, Mount Hotham Alpine Resort.

Figure 2. Heavenly Valley Development Plan study area.

Figure 3. New Hotham Village Redevelopment Plan study area.

Figure 4. Ecology Australia (2006b) offset sites and additional potential offset sites.

Figure 5. Additional potential offset sites.