

Crown Pastoral Land Tenure Review

Lease name : DUNSTAN BURN

Lease number : PO 064

Conservation Resources Report

As part of the process of Tenure Review, advice on significant inherent values within the pastoral lease is provided by Department of Conservation officials in the form of a Conservation Resources Report. This report is the result of outdoor survey and inspection. It is a key piece of information for the development of a preliminary consultation document.

Note: Plans which form part of the Conservation Resources Report are published separately.

These documents are all released under the Official information Act 1982.

February

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**DOC CONSERVATION RESOURCES REPORT ON
TENURE REVIEW OF DUNSTAN BURN PASTORAL
LEASE AND ASSOCIATED FREEHOLD LAND.**

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DUNSTAN BURN PASTORAL LEASE AND ASSOCIATED FREEHOLD LAND.**

PART 1: INTRODUCTION

1.1

The lessee of Dunstan Bum Pastoral Lease has applied to the Commissioner of Crown Lands for a review of the property's pastoral lease tenure.

The 5067 hectare property is situated on the southern extremity of the 8t Bathans Range and extends from the Manuherikia Valley floor (bounded by Hawkdun Runs Road) westwards to the lower reaches of Dunstan Creek. The homestead lies on freehold land adjacent to 8t Bathans Loop Road. A separate parcel of the pastoral lease comprising some 15 hectares lies between the lower reaches of Dunstan Creek and Fish Pond Road.

Altitude ranges between 518m and 1621m on the northern boundary.

The pastoral lease comprises developed river flats, moderately steep faces which have been AOSTD up to -700m, a series of steep sided gullies and undeveloped high basins and ridges.

478.33 hectares of freehold land adjoining the pastoral lease is recommended for inclusion in the review (see Other Matters).

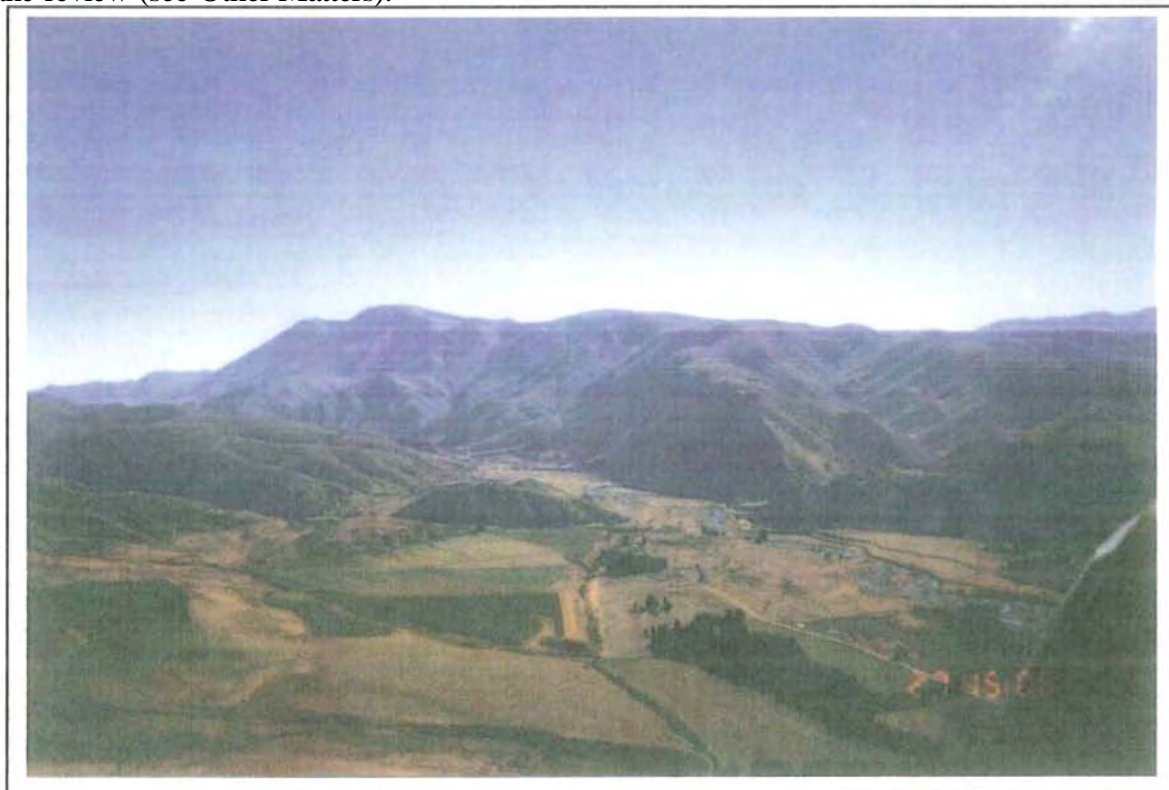


Photo 1. Dunstan Burn Pastoral Lease straddles the St Bathans Range (background). Dunstan Creek in the middle of the photo forms the western boundary.

Ecological Setting

Dunstan Bum pastoral lease is mostly situated within the St Bathans Ecological District (ED); however the lower flanks of the Dunstan Creek Valley lie within the Dunstan ED and a small area adjacent to the Hawkdun Runs Road is situated within the western margin of the Mamototo ED. No Protected Natural Area Program survey (PNAP) has been conducted for the St Bathans ED. PNAP survey reports have been compiled for the Dunstan and Maniototo ED's. No Recommended Areas for Protection (RAP's) have been identified on the property.

1000 hectares of high altitude country located in the headwaters of Mata Creek and along the upper Dunstan Creek faces has been retired from grazing for 99 years from 1981 under Otago Catchment Board Soil and Water Conservation Plan No.241. This agreement has been registered on the pastoral lease title. Some sheep grazing is occurring within this area as fences between this area and Mount St Bathans pastoral lease are in poor condition.

The Tenure Review inspection of the property and freehold land recommended for inclusion was undertaken between 18-22nd March 2002. This inspection was undertaken by a multi-disciplinary team of nine people.

PART 2: INHERENT VALUES: DESCRIPTION OF CONSERVATION RESOURCES AND ASSESSMENT OF SIGNIFICANCE

2.1 Landscape

Methodology

For this assessment, the Dunstan Bum PL has been divided into four landscape units with the boundaries being defined principally by aspect and land cover. After defining the landscape units (*LV's*) (see Map 4.2(c)) the following assessment criteria were applied to each unit:

Landscape Character Description

This assessment describes the overall appearance of the LU using common descriptive terms to help create a "mental picture" of the primary elements, which include:

- Landform - reflects the topography and natural processes such as erosion and weathering.
- Land cover - covers vegetation and water bodies.
- Land use - reflects cultural and social processes such as fanning.

Assessment of Landscape Values

The criteria used to assess and evaluate each of the landscape units are based on the following attributes.

- Naturalness - is an expression of the degree of indigenous content of the vegetative cover, and the extent of human intervention.

- Legibility - is an expression of the clarity of the formative processes and how striking these physical processes are.
- Aesthetic values - includes the concepts of memorability and naturahless. Aesthetic factors which can make a particular landscape vivid include simplicity in landform, muted colours and fine textured ground cover.

Values That Will Be Assessed When Appropriate

Other values that may be assessed when relevant include:

- Transient values - ephemeral events such as the occasional presence of wild life.
- Landscapes commonly valued - quintessential landscapes reflected in public through photographs, art work, tourism and recreation.
- Historical values - areas containing high heritage importance.

Visual Values

Visual values are a subset of landscape values and relate to the visibility of a particular landscape/or natural feature as seen from key viewing locations such as regional highway systems, viewing points within a township, tourist routes and recreational areas.

A term frequently used is "visual amenity". Visual amenity is the value of a particular view in relation to what is seen and how people respond to it.

Potential Vulnerability to Change

This is a measure of a landscape unit's susceptibility to modification. In general terms the less modified an area is, the more vulnerable to further change resulting from human activities.

Landscape Unit 1 (LUI)

This unit incorporates the headwaters of the Mata Creek catchment at the northern end of the pastoral lease. The unit's boundaries are defined by lateral spurs that project eastwards from the main axis of the St Bathans Range. The highest point on the property (1,621m.) is at the head of this catchment.

The unit comprises an elongated valley which forks in its mid reaches into two separate valleys. The lower section of the main valley has a deep and narrow cross profile with relatively steep parallel side slopes. Protruding from these slopes are intermittent outcroppings of semi-schist and stable talus fans. The stream channel winds across the valley floor, frequently cutting down into its gravel bed.

The mid section of the valley opens out into an upland basin, the hummocky nature of which forces the stream to wind around large gravel mounds. The two major tributaries are separated by a large hillock, which extends out from the main mountain axis. The side two tributary catchments are markedly different in character. The smaller tributary which drains the northern slopes has a rounded appearance owing to a deep mantle of coluvium, while the larger valley which drains the western slopes is a more typical v-shape with long constant slopes descending to a confined valley floor.

The vegetative cover conforms to a pattern determined by altitude, aspect and stock grazing patterns. Within the lower enclosed valley, the floor is relatively modified. Here the ground tier comprises a sward of introduced grasses with the occasional tuft of fescue tussock. Discontinuous matagouli thickets frequently extend along existing and abandoned

watercourses. The side slopes are clad in grey shrublands with some sweet briar and the occasional elderberry.

Where the valley opens out, aspect is the major influence over distribution and composition of the plant communities. The lower flanks of sunny north-west facing slopes support grey shrublands which merge into depleted narrow leaved snow tussock close to the ridgelines. On the corresponding darker faces the slopes are clad in snow tussock interspersed with golden speargrass and mountain flax. Some grey scrub regeneration is occurring along the base of the darker slopes and stable talus fans. The valley floor is still relatively modified, being covered in exotic grasses with random thickets of matagouri.

Close to where the main valley forks, there is a distinctive change in the ground cover with snow tussock becoming dominant over woody species. The northern sub-catchment has a relatively uniform covering of snow tussock, while the southern tributary exhibits a marked difference in cover with aspect. Here the darker faces are clad in strong snow tussock, while the opposite drier slopes support a mix of tall and fescue tussock. Tussock cover generally improves above the existing retirement fence, however, close to the crest of the St Bathans Range cover becomes sparse. Here patches of tussock are separated by large expanses of stable scree that frequently takes on a wind-stripping appearance.

Significance of Landscape: LUI

This entire landscape unit makes a significant contribution to the natural character of the Saint Bathans Ecological District. This unit's landscape values are attributable to the valley having a well-defined entity and supporting a diverse vegetative cover over a variety of landforms. This LU conveys an overall impression of naturalness, which increases with altitude where pastoral activities such as burning and grazing have been less frequent/intense. This LU also provides the landscape with a linkage through an uninterrupted sequence of vegetation types; although this connectivity is broken on the more modified plains (LU 4).

Attributes that make this unit significant include:

- The mixture of plant communities at different altitudes and aspects.
- The strong sense of containment, especially within the lower main valley.
- The sense of "discovering" the upper side valleys.
- The overall impression of being in the backcountry owing to the lack of "built" elements, low key tracking, and large grazing blocks.

Visual Values

This unit has only a limited visual resource value, being well contained by the surrounding ridgelines, which consequently help to reinforce this unit's sense of remoteness and backcountry character.

Potential Vulnerability To Change

This unit could be adversely affected by some land use activities/occurrences, for example;

- Loss of the natural ecological sequences through intensification and further subdivision of grazing blocks.

- Fire lines that could unnaturally fragment existing plant communities, especially where sl'ublands are expanding.
- Spread of exotic trees.
- Loss of remoteness qualities through upgrading of tracks and construction offences down conspicuous slopes.

Landscape Unit Two (LU2)

This unit encompasses the western facing slopes above Dunstan Creek and Wheelers Gully.

The northern limit of both the unit and the property is a long lateral spur that descends from the crest of the St Bathans Range to the valley floor. The southern boundary is an arbitrary boundary line that separates the lease with a parcel of freehold land that forms the backdrop to the goldfields town of St Bathans. The eastern boundary follows the crest of the St Bathans Range, while Dunstan Creek forms a natural boundary in the west.

The western faces of this unit form a major component of the Dunstan Creek valley, which tapers into a gorge in the vicinity of the first major bend in the stream. This area is locally known as Little Bend. The side slopes are a combination of sharp spurs separated by dissected gullies, the heads of which contain large expanses of scree, with some outcropping of semi-schist. Where Dunstan Creek bounds the lease the channel is relatively straight, following the edge of a series of river terraces.

Ground cover is dictated by altitude, aspect and previous burning history. Nowhere is this more apparent than the lower-mid sections of Wheelers Gully, where the dominant ground cover is hawkweed. The upper section of Wheelers Gully, which has a darker aspect, is clad in narrow leaved snow tussock with an abundance of golden speargrass.

In general, the vegetation of the western slopes can be divided into two components. The area shown in yellow on Map 4.2(c) has a high indigenous component including snow tussock, *Celmisia*, speargrass and a variety of stunted woody species that tend to occupy the sheltered sites around the rocky outcrops. The mid slopes are covered in a mixture of tall and fescue tussock. In many places the base of the slopes are being re-colonised by matagouri shrublands. At the northern end of the unit the prominent gully contains an uninterrupted sequence of shrublands extends to about 1,000m. Neighbouring gullies also retain sizeable shrublands in areas protected from fire.

Over the lower country vegetation composition becomes more uniform, being generally a modified mixture of snow tussock, fescue tussock and introduced grasses with the large patches of bare ground.

The valley floor and adjoining river terraces have a ground tier of introduced grasses and patches of *Coprosma matagouri* shrublands. A point of interest is the almost continuous strip of native shrublands along the bank of Dunstan Creek.

The side slopes have been divided into several large grazing blocks.

Significance of Landscape: LU2

The northern section of this landscape unit makes a significant contribution to the natural character of the Saint Bathans Ecological District. Landscape values in this area are

attributable to its high indigenous natural character, i.e. natural ground cover and patterns being dominant over fanning influences. These attributes are reversed in the lower country where modifications to the natural ground cover are apparent. Where Dunstan Creek borders this pastoral lease the stream has scenic and semi remote qualities, which are appreciated by backcountry anglers and other valley users. The intrinsic values along Dunstan Creek are a part of a wider river system and landscape continuum.

Visual Values

This unit has a moderately high visual resource value as it is an integral component of the front rangelands which are visible both locally and from the broader Maniototo Basin, and due to its juxtaposition with the Dunstan Creek valley that contains few physical features which disrupt distant views.

Potential Vulnerability To Change

This unit could be adversely affected by some land use activities/occurrences, for example;

- The spread of wilding pines.
- The interruption of ecological sequences, especially to shrublands.
- Fence lines construction and other earth works over these highly visible slopes.
- The siting of communication installations on prominent points.

Landscape Unit Three (LU3)

Description

This unit comprises a large triangular area of high rolling hill country that stems out towards the east from the main crest the St Bathans Range.

The boundaries to the unit tend to follow changes in landform. The upper limit of the unit is the crest of the rangeland, while the lower boundary is where the hill country folds into the outwash plains of the Manuherikia River.

The landform is dominated by a series of undulating ridgelines separated by v-shaped valleys that tend to become foreshortened in the south. The side slopes of the ridgelines are lightly indented a series of watercourses which feed into Mata Creek.

In comparison with the adjacent western facing slopes (LU2), these slopes have a more rounded, imiform appearance which is attributable to a deep mantle of colluvium that cloaks them.

Ground cover is influenced by aspect and altitude. Darker slopes are covered in good stature snow tussock and associated native species. Smillier faces have a sparser covering of mixed snow and fescue tussock with patches of bare ground that are frequently covered with mats of hawkweed. These drier slopes lack the homogeneity and evenness of the tussock cover, which is a feature of the corresponding dark faces. Grey shrublands occupying the valley are starting to spread upwards onto the lower slopes.

Significance of Landscape: LU3

The upper most reaches of this landscape unit makes a significant contribution to the natural character of the Saint Bathans Ecological District. Overall this unit has moderate landscape values principally due to its overall impression of uniform grasslands being overlaid on rounded hills. This uniformity in ground cover is accentuated by the shrublands being principally located within depressions. Future management of this type of hill country in the Maniototo Basin needs to be assessed, not as singular landscape units, but as a collective whole.

Visual Values

This unit has a moderately high visual resource value, forming a part of the front country that overlooks the Manuherikia River valley. Similarly to its physical significance, this unit's visual importance should not be assessed in isolation but seen as a part of the visual suite of hill country that abuts the rangelands that encircle the Maniototo Basin.

Potential Vulnerability to Change

This unit could be adversely affected by some land use activities/occurrences, for example:

- Introduction of a single land use such as a monoculture of forestry.
- Further subdivision would fragment the existing simple vegetative cover overlaid on rolling hill country.
- Insensitive tracking where rehabilitation is difficult to achieve.

Landscape Unit Four (LU4)

Description

This unit comprises all of the outwash plain located between the eastern rolling hill country (LU3) and the Hawkdun Runs Road. At the southern end there is a sequence of small terraces that step out towards the abutting hill country.

The drainage pattern is superimposed on the land surface. Many of the multi-channelled streams which originate in the adjoining hill country follow the edge of small escarpments that lead towards the well-defined Mata Creek. Areas of hummocky ground provide other variations in the relatively subdued topography.

The vegetation reflects the strong cultural overlay with modified grasslands being the dominant ground cover. The recent planting of farm shelter trees has broken the uniformity of the grasslands. Discontinuous thickets of grey shrublands line existing watercourses and abandoned channels.

Significance of Landscape: LU4

The legibility of the natural processes that have formed the outwashed plains, with the simplicity of the grassland communities, provides this unit with a distinctive character. This trait is emphasized by the strong horizontal lines that contrast markedly with the more

angulated fonnns of the hill country. While there is a high component of introduced species within the grasslands, the overall impression remains memorable.

Visual Values

This unit fonnns the "front yard" of the pastoral lease and has a moderately high visual resource value attributable to the fact that the gentle terrain allows for uninterrupted vistas of the eastern flanks of the St Bathans Range. The combination of the expansive views, short even vegetation and minimal tonal range in the landscape are fundamental components in making this one of the South Island high country's most recognizable images.

Potential Vulnerability to Change

Owing to this unit's simplicity in landfonn and ground cover, it is vulnerable to the following activities:

- Major changes in land use, such as geometric blocks of forestry.
- Further loss and decline of residual fescue tussock areas.
- Insensitive siting of buildings and farming structures close to Hawkdun Runs Road.
- Shelter planting close to Hawkdun Runs Road that will obscure scenic vistas.

Landscape Values on Freehold Land at Grey Lakes Recommended for Inclusion in the Tenure Review.

In most respects this unit is described under LU4. However at the local scale the historic overlay makes this area a special landscape which is vulnerable to the following activities:

- A major change in land use, such as forestry.
- Tracking.
Erection of buildings and other farming structures.
- Medium or large scale mining using modern techniques.
- Continued spread of weeds (primarily broom and wilding pines).

2.2 Landforms & Geology

The geology is generally of sedimentary origin and can be divided into three different land forms.

- (a) The eastern side of the main ridge is predominantly greywacke in the steepland area.
- (b) The western side is chlorite sub-zone two, made up of non-foliated quartzo/feldspathic schist.
- (c) The foothills and flood plains are fonnned on changing geologic formations of remnant hills and outwash fans of schist and greywacke, quartz conglomerate and sandstone and siltstone and mudstone on glauconitic sandstones.

Varying proportions of loess lie over lower areas of the property.

2.3 Climate

Rainfall ranges from 500mm per annum in the lower reaches of the pastoral lease near St Bathans township, to approximately 1400mm at high altitude. Snow lies well into the spring/early summer in the highest basins. Wind is predominantly from the north west while cold southerlies are also common. Severe and frequent frosts occur from May to late September.

2.4 Vegetation

Three land units based on catchment groupings, are identified for the purpose of describing the vegetation.

Vegetation Description

Mata Creek Headwaters

The upper extent of the Mata Creek catchment is formed by the broad encircling crest of the St Bathans Range and subsidiary ridges. In the highest altitude zone (1550 - 1621 m) are rocky pavements with about 40% vegetation cover comprised of patchy and heavily browsed slim snow tussock (*Chionochloa macra*) and prostrate fellfield communities. These have high species diversity and are dominated by *Phyllachne colensoi*, *Celmisia sessiliflora*, *Dracophyllum muscoides*, *Raoulia subsericea*, *R. hectorii*, *Scleranthus uniflorus*, blue tussock (*Poa colensoi*), *Chionohebe thomsonii* and *Gaultheria depressa*. Other common species include *Kelleria dieffenbachii*, *Lycopodium fastigiatum*, *Anaphalioides bellidioides*, *Celmisia lyallii*, golden speargrass (*Aciphylla aurea*), *A. dobsonii*, *A. hectorii*, *Anisotome aromatica*, coral broom (*Carmichaelia crassicaule*), *Neopaxia sessiliflora*, *Rytidospermum pumilum*, *Hebe buechananii*, porcupine shrub (*Melicytus alpinus*), *Leucopogon suaveolens* and *Blechnum penna-marina*. Weed species are restricted to occasional king devil hawkweed (*Hieracium praealtum*) and sheep's sorrel (*Rumex acetosella*).



Photo.2. Slim Snowtussocklands Near Point 1621m.

Dracophyllum pronum and slim snow tussock becomes dominant off the ridge crest, although many of the above species are still present, before grading into narrow-leaved snow tussocklands (*Chionochloa rigida*). These extend to the valley floor as medium stature and density grasslands, often on quite rubbly slopes with considerable litter. Taller shrubs become more common at lower elevations and include *Pimelea traversii*, matagouri (*Discaria toumatou*), and coral broom. Native inter-tussock species include blue tussock, golden speargrass, *Gaultheria depressa*, *Leucopogon fraseri*, *L. suaveolens*, *Raoulia subsericea*, *Pimelea pseudolyallii*, *Celmisia gracilentata*, *Pentachondra pumila*, *Wahlenbergia albomarginata*, *Viola cunninghamii*, *Coprosma cheesemanii*, *Myrsine nummularia*, *Anisotome flexuosa* and *Microtis oligantha*. Introduced species are mostly represented by catsear (*Hypochoeris radicata*), sweet vernal (*Anthoxanthum odoratum*), tussock hawkweed (*Hieracium lepidulum*) and sheep's sorrel.

Shallow rubbly gullies amongst the tussockland have thousand-leaved fern (*Hypolepis millefolium*) and prickly shield fern (*Polystichum vestitum*), along with matagouri, Scotch thistle (*Cirsium vulgare*), golden speargrass, woolly mullein (*Verbascum thapsus*) and Maori onion (*Bulbinella angustifolia*). Some lower valley slopes are dominated by blue tussock with *Dracophyllum pronum* and cottonwood (*Ozothamnus vauvilliersi*).

A large intact shrubland occupies north-facing talus slopes on the lower true right of the valley, and on both valley sides just before the creek flows out of the hills onto the flats. Dominant shrub species include matagouri, *Olearia odorata*, *Coprosma propinqua*, *C. ciliata*, mountain wineberry (*Aristotelia fruticosa*), desert broom (*Carmichaelia petriei*), *Comkia cotoneaster*, porcupine shrub (*Melicactus alpinus*), and *Pimelea traversii*. These are

well draped in the climbers scrub pohuehue (*Muehlenbeckia complexa*), lawyer (*Rubus schmidelioides*) and *Clematis marata*. One site at 900m on the true right has at least two shrubs of the threatened shrub, *Hebe cupressoides*.

Rocky outcrops on these talus faces have a shrub and herb flora comprising *Asplenium richardii*, *Brachyglottis haastii*, *Scleranthus uniflorus*, *Anisotome flexuosa*, *Crassula sieberiana*, *Leptinella pectinata* subsp. *villosa*, *Deyeuxia avenoides*, *Rytidosperma setifolia*, *Helichrysum filicaule* and *Poa maniototo*. Where outcrops merge into spur crests several shrubs occupy the shallow soils including the threatened dwarf broom (*Carmichaelia vexillata*), desert broom and matagouri along with the herbs mouse-ear hawkweed (*Hieracium pilosella*) and *Geranium sessiliflorum*.

Damp riparian margins along the valley floor have *Olearia bullata*, *Hebe rakaiensis* and mountain flax (*Phormium cookianum*). Dry terraces above the creek support a sub-shrub and herb groundcover which includes hard tussock (*Festuca novae-zelandiae*), *Muehlenbeckia axillaris*, *Raoulia subsericea*, *Coprosma petriei*, *Acaena inermis*, *Leucopogon fraseri*, *Gaultheria macrostigma*, *Geranium sessiliflorum* and abundant mouse-ear hawkweed.

Small areas of impeded drainage on the valley floor have been affected by domestic stock and variously include *Sphagnum* moss dominated bog and sedge dominated swamp. Common species are *Carex coriacea*, *C. petriei*, *Eleocharis acuta*, *Juncus* spp and musk (*Mimulus moschatus*). Flats out near Hawkdun Runs Road are dominated by browntop (*Agrostis capillaris*) and white clover (*Trifolium repens*), although there are many native herbs amongst the grassland. Wetter areas retain small remnants of copper tussock (*Chionochloa rubra* subsp. *cuprea*).



Photo 3. Narrow leaved snow tussocklands in headwaters of Mata Creek.

Mid-Lower Mata Creek Catchment

This catchment is in two parts; a small valley system south of the Mata Creek headwaters, and a series of small gullies and larger flats above and below the Mountain and Enterprise Water Race. The valley catchment extends to 1450 m and lacks the high-alpine fellfield communities of the adjoining catchment to the north. High encircling ridge crests do however have stony pavement areas with cushion vegetation. Upper catchment areas are dominated by *Dracopyllum pronum* and narrow-leaved tussock with a scattering of tall shrubs such as cottonwood and coral broom. Common inter-tussock species in well drained sites include *Ranunculus crithmifolius*, *Euphrasia zelandica*, *Gaultheria depressa*, golden speargrass, *Leucopogon fraseri*, *Lycopodium fastigiatum*, *Anisotome aromatica*, *Luzula pumila*, *Celmisia lyallii*, *C. sessiliflora*, dwarf broom, *Pentachondra pumila* and *Kelleria dieffenbachii*.

Wet seepages in the upper basin have been heavily grazed and trampled by sheep, and have a margin of sweet vernal. Bryophytes are the dominant cover but there are a wide range of sedges, rushes and herbs. Common species include *Plantago triandra*, *Pratia angulata*, *Galium perpusillum*, *Hydrocotyle microphylla*, *Oreobolus pectinatus*, *Euchiton delicatus*, *Juncus effusus*, *Schoenus pauciflorus*, Maori onion, *Psychrophila obtusa* and *Celmisia gracilentia*.

Snow tussocklands below are of similar condition and composition as those described in the Mata Creek headwaters. These grade into a belt of more modified depleted tussocklands above a large shrubland which extends down valley on the true right until the stream issues from the hills. Tall snow tussocklands extend to the valley floor on the true left where toetoe (*Cortaderia richardii*) is also occasionally present. The shrublands are very similar to those described in the Mata Creek headwaters. Several woody weeds occur in the shrubland including rowan (*Sorbus aucuparia*), gooseberry (*Ribes uva-crispa*) and elderberry (*Sambucus nigra*). A further similar shrubland, albeit smaller, occurs in the gully south of spot height 1245m.

Snow tussocklands on the gullied face west of the Mountain and Enterprise Water Race deteriorate with decreasing altitude. A generally dense narrow-leaved snow tussockland in the upper portion becomes a sparse tussockland with abundant sweet vernal and mouse-ear hawkweed groundcover. A lone large *Olearia cymbifolia* hints at what the pre-pastoral cover may have been. Small thickets of 0.5 m tall matagouri are recent and probably fertiliser enhanced.

Flats below the water race have mostly been cultivated and oversown. Native flora is generally restricted to riparian sites and comprises matagouri and scattered copper tussock.



Photo 4. Shrublands and Tussocklands in Mid-Lower Mata Creek Catchment.

Dunstan Creek Faces

These faces rise to over 1500 m on the southern end of the St Bathans Range. The exposed range crest has a sparse vegetation cover of fellfield plants, many of which are in common with those already mentioned above. Particularly abundant are *Raoulia petriensis* and dwarf broom. Rock outcrops in this high zone commonly have coral broom, *Hebe buchananii*, *Leucopogon suaveolens*, *Celmisia densiflora*, edelweiss (*Leucogenes grandiceps*), *Blechnum penna-marina*, *Polystichum richardii* and *Anisotome flexuosa*

The uppermost slopes are predominantly screes with a very sparse vegetation cover. Typical scree species present include *Hebe epacridea*, *Epilobium* spp., *Ranunculus haastii* and *Leptinella pectinata* subsp. *villosa*. Snow tussocklands down to about 1000m are in good condition with a composition similar to that already described for equivalent tussocklands on the property.

The northern-most two creeks flowing west off the face contain excellent riparian shrublands which extend from their confluence with Dunstan Creek, to high up on the face. Common species include *Olearia odorata*, *Coprosma propinqua*, *C. intertexta*, matagouri, desert broom, *Muehlenbeckia complexa*, and, higher up the creeks, *Hebe rakaiensis*. They are surrounded by mixed short/tall tussocklands with *Pimelea traversii* and mountain flax, with gradually improving snow tussock upslope. The odd elderberry is dotted amongst the shrublands.

Further south along the face, below the retirement face, the condition of indigenous vegetation deteriorates with progressive replacement by introduced grasses and weeds. Relicts of shrubland and snow tussock are mostly confined to gullies and upper slopes. The catchment of Wheelers Gully is very depleted with intact indigenous communities confined to the upper-most boundaries of the catchment.

Vegetation on Freehold Land at Grey Lakes Recommended for Inclusion in the Tenure Review.

Vegetative cover at the Grey Lakes area recommended for inclusion in the tenure review is highly modified consisting of a desert mining pavement, exotic grasses and herbs and weedy species described in the following section.

Problem Plants

Apart from ubiquitous *Hieracium* there are few weeds of conservation concern. At least three species of *Hieracium* are present (*Hieracium pilosella*, *H. lepidulum* and *H. praealtum*), although the latter two species are quite localised. With the notable exceptions of elevated dry stream terraces, and occasional spur crests, mouse-ear hawkweed does not reach densities where it significantly competes with or excludes indigenous species. Exotic conifer sources in the district are a potential source of wildings requiring ongoing vigilance to prevent their establishment. Sweet briar is a minor component of most montane shrublands and does not appear to significantly compromise their integrity. Rowan, gooseberry and elderberry are also present at low density in some shrublands and should be controlled.

Problem Plants on Freehold Land at Grey Lakes Recommended for Inclusion in the Tenure Review.

This area recommended for inclusion in the review has a serious wilding pine and broom problem. Both species stand to compromise the historical and recreation integrity of the area.

Significance of Vegetation

This property is notable for the overall good condition of the major indigenous vegetation communities present and the high degree of natural character they impart at a landscape scale. Its position on the southeastern flanks of the St Bathans Range from range crest to valley floor, encapsulating a variety of landforms and aspects, suggest it is likely to be highly representative of all but the high alpine zone of the St Bathans Ecological District. While the lack of a definitive protected natural areas survey of the St Bathans District constrains such an assessment, recent botanical surveys carried out in the upper Manuherikia Valley have given considerable basis to this assertion.

At least nine species are listed as threatened in the most recent threat classification system (Hitchmough in prep.), see Table 1 below. Of particular note is the occurrence of the shrub *Hebe cupressoides* (ranking of 'Nationally Vulnerable') in the Mata Creek headwaters. Taxa in this category are facing a very high risk of extinction in the wild. This plant is the subject of a national recovery plan (Norton 2000) which promotes the formal protection of its habitat.

Low alpine and subalpine communities are well represented and show little evidence of recent disturbance from pastoral activities, with the exception of slim snow tussocklands on

the highest range crests, which have been heavily grazed. Highly palatable slim snow tussocklands, which in Otago occupy a generally narrow altitudinal zone between the upper extent of narrow-leaved tussocklands and alpine communities, are vulnerable to overgrazing. Such slim snow tussock communities once covered the crests of the main Central Otago block mountains but have undergone substantial retreat following pastoralism.

Narrow-leaved tussocklands are the dominant vegetation of the montane bioclimatic zone and show increasing degradation down the altitudinal gradient. The overall condition of these tussocklands, taking into account stature, density and composition, is better than most at a comparable altitude and aspect in the district and beyond. This community is also a significant habitat for several threatened plants including coral broom, dwarf broom and *Pimelea pseudolyallii*.

Two categories of montane shrublands are present. Those dominated by short-statured matagouri are the first stage in the transition back to a woody cover following early fires. Their spread and vigour has probably been enhanced by the application of fertiliser and their conservation significance is moderate. More diverse shrublands on rubbly talus slopes in stream gorges are highly significant as remnants of woody cover with a species mix that reflects the likely pre-human extensive burning state. They include several shrub and liane species now recognised as threatened. Future restoration and rehabilitation of the woody shrub cover in this part of the landscape will require nucleus seed sources such as these. The importance of shrubland remnants has recently been given prominence by Walker et al. (2002) who highlight the conservation importance of low altitude woody vegetation and associated fauna.

Table 1. Threatened Plants Present on Dunstan Burn Pastoral Lease

Threat of extinction category (Hitchmough, 2002)	Species
Gradual Decline	<i>Carmichaelia crassicaule</i>
Gradual decline	<i>Carmichaelia rexillata</i>
Sparse	<i>Clematis marata</i>
Sparse	<i>Coprosma intertexta</i>
Nationally Vulnerable	<i>Hebe cupressoides</i>
Sparse	<i>Olearia bullata</i>
Sparse	<i>Pimelea pseudolyallii</i>
Range restricted	<i>Raoulia petriensis</i>
Range Restricted	<i>Hebe buechananii</i>

2.5 Fauna

2.5.1 Invertebrate Fauna

An entomological survey of the property was completed as part of the tenure review inspection. Little is known about the invertebrates occupying this area of Otago or their conservation value. The Lepidopteran fauna of the neighbouring Hawkdun Range was surveyed by Brian Patrick in the early 1990's. Results from that survey suggest that the invertebrate fauna occupying this region contains elements of both the South Canterbury and North Otago regions with a relatively high proportion of the fauna is near its distributional limit.

A limited survey of invertebrate habitats was conducted as part of the tenure review inspection. Invertebrates were collected from a number of terrestrial and aquatic habitats and from a range of altitudes. The primary collection sites are outlined in Appendix 3. A range of collection techniques were used, including yellow pan-traps, hand searching, surber sampling for aquatic invertebrates and foliage beating. With the exception of hand searching not all methods were used at each collection site.

Identification of invertebrates was carried out by Alison Evans, John Marris and Cor Vink (Lincoln University), Peter Johns and John Ward (Canterbury Museum).

A total of 53 invertebrate families were collected, a majority of which are native. (Appendix 3).

Description of fauna associated with habitats encountered at collection sites.

Site 1. Mata Creek: GR NZMS 260 H40 22613E 5s957N. Site consists of a valley with small remnants of native vegetation including: *Olearia*, *Muehlenbeckia*, matagouri, degraded *Chionochloa*, *Aciphylla*, *Carmichaelia*. These plants are known to be important host plants for a number of invertebrates including, native aphids (Homoptera: Aphididae), Chafer beetles (Coleoptera: Scarabidae), native bees and wasps (Hymenoptera), moths (Lepidoptera) and flies (Diptera). Also observed at this site were cicadas (Hemiptera: Cicadidae) grasshoppers (Orthoptera: Acrididae) ground beetles (Coleoptera: Carabidae), a diverse richness of spiders (Arachnida: Araneae), mayflies (Ephemeroptera: Leptophlebiidae), caddisflies (Trichoptera) and the large toe-biter (Megaloptera).

Site 2. Modified faces adjacent to Hawkdun Runs Road: GR NZMS 260 H40 22607E 55934N. Site consists of a flat terrace where the primary vegetation comprises brown top, clover and tussock. Although this area has undergone considerable modification due to over-sowing with exotic grasses, some elements of native herb vegetation remain intact, particularly amongst the sub-shrub layer. Invertebrates occupying this site include the tussock ringlet butterfly (Lepidoptera: Nymphalidae) whose larvae feed on native tussocks, grasshoppers (Orthoptera: Acrididae) and grassland spiders (Arachnida: Theridiidae).

Site 3. GR NZMS 260 H40 22566E 55978N, (near Pt 1641m). This site is located in the north-west corner of the property and reaches an altitude of approximately 1600m at the highest point. Invertebrates were collected from along the ridge and on both the west and eastern facing slopes. Invertebrates collected and observed in these areas are typical for subalpine and alpine altitudes. The mountain stone weta (*Hemideina maori*) was collected from this site as

were alpine cockroaches (*Celatoblatta* sp.) and alpine byrrid beetles (Coleoptera: Byrrhidae). A diverse cover of low mat forming alpine plants at this site host a number of alpine invertebrates, particularly Hemiptera and Diptera. Centipedes (Chilopoda: Cryptopidae) and grasshoppers (Orthoptera: Acrididae) were also collected as well as several spider species. Most of the spiders collected were juvenile and those that were able to be identified are thought to be widespread in New Zealand. The trapdoor spider *Misgolaspilama* (Arachnida: Idiopidae) was also collected at this site. This find is of conservation interest as it was previously only known from one other specimen collected in Balclutha in 1914.



Photo. 6. Mountain Stone Weta (*Hemideina maori*)

Site 4. Mid altitude on St Bathans Range Ridge: GR NZMS 260 H40 22577E 55938N. This site is characterised by a rocky outcrop which is home to a number of subalpine invertebrates, including native wasps (Hymenoptera), flies (Diptera) and the tussock ringlet butterfly (Lepidoptera: Nymphalidae). A large *Sargon* sp. weevil (Coleoptera: Curculionidae) was observed on a flower stem of an *Aciphylla* plant.

Site 5. Dunstan Creek - north west corner of property: GR NZMS 260 H40 22547E 55948N). Most sampling at this site was for aquatic invertebrates; however a number of mature *Olearia* and matagouri trees located on the true river bank may be important habitat for invertebrates. Invertebrate samples taken from these plants included true bugs belonging to the families: Cicadellidae, Lygaeidae, Miridae and Saldidae. A diverse range of aquatic invertebrates were collected from Dunstan Creek including a number mayfly and caddisfly species as well as the common Toe Biter (Megaloptera).

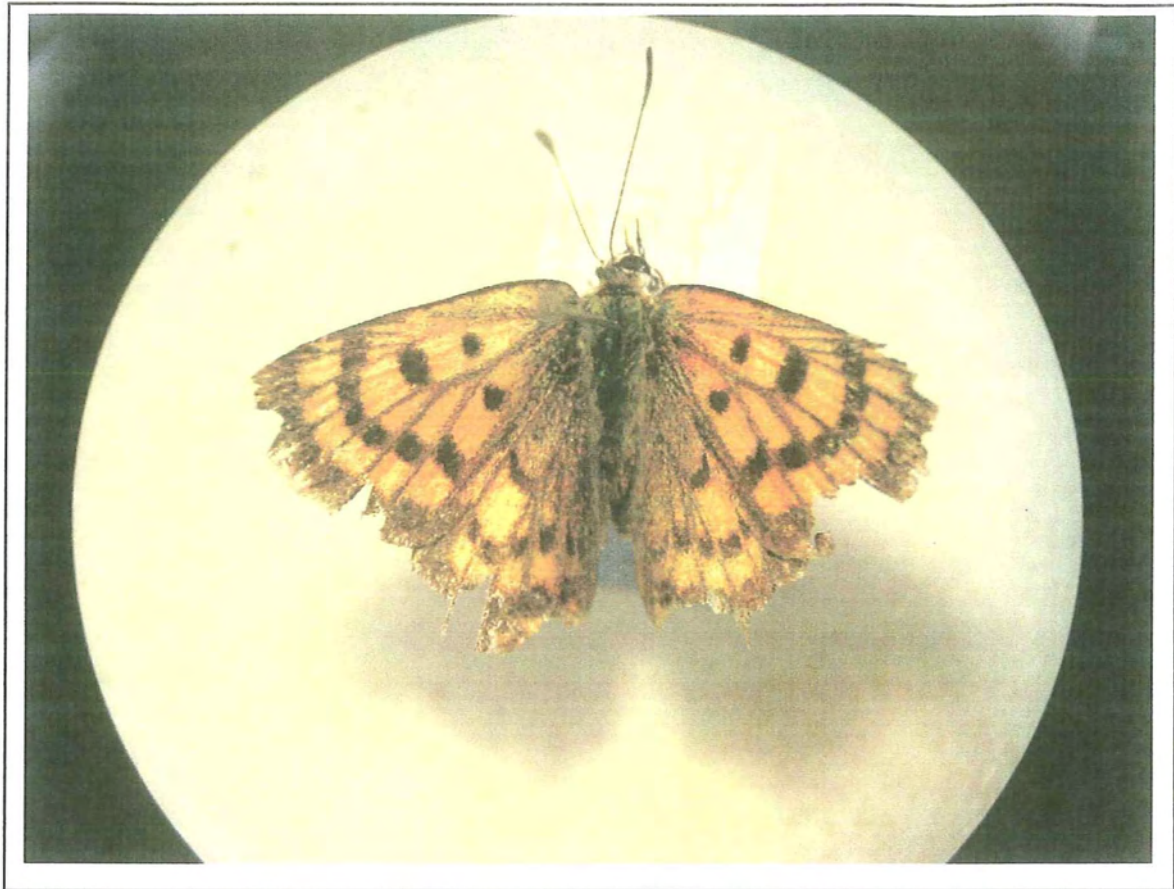


Photo 7. Boulder copper butterfly (Lepidoptera: Lycaenidae).

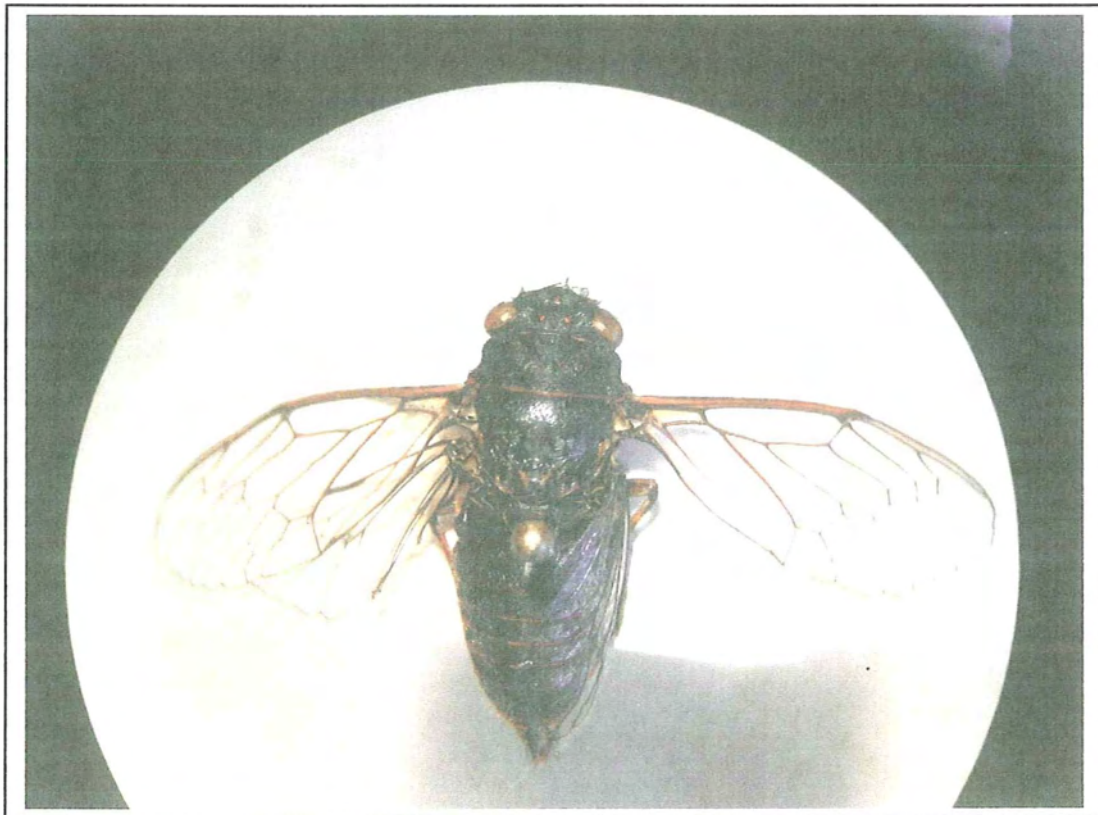


Photo 8. Alpine cicada *Maorkicada* sp. (Hemiptera: Cicadidae)

Significance of Invertebrate Fauna.

Due to a general lack of knowledge on most of the invertebrates occupying this region, many of the specimens collected are identified to a level that does not allow for a definitive interpretation of their conservation value. The assessment of significance is based on currently available information and on an appraisal of the intactness of potential habitats which are likely to be of high value to invertebrates.

None of the invertebrates collected during this survey are known to be rare or threatened, however, some forms are of conservation interest (e.g. the Trapdoor spider *Misgolas pilama*). A large portion of the New Zealand invertebrate fauna has not been formally identified, for this reason the majority of species are considered to be "data deficient" (Hitchough *in prep.*). The number of species listed as threatened is only a small proportion of the total invertebrate fauna. The new classification structure (Molloy, *et al.*, unpublished) for determining whether a species is threatened by extinction is therefore based on the extent of knowledge associated with each species.

Although no invertebrates of known high conservation value were collected, the property does contain areas of significant invertebrate habitat associated with the high country landscape. For example, alpine and subalpine habitat is available for invertebrates such as the mountain stone weta and alpine cockroaches. Shrublands and streams associated with valley systems also play an important role in maintaining the integrity of the invertebrate fauna.

2.5.2 Herpetofauna

A survey of lizards carried out in 1989 included the Mt St Bathans Range (Whitaker and Loh 1990, Amphibian and Reptile Distribution Survey (ARDS) database 2002). Two threatened lizard species were found on Dunstan Burn, scree skink (*Oligosoma waimatense*) and green skink (*O. chloronoton*). These species were also found in the Rocks Creek catchment, adjacent to Dunstan Burn. Scree skinks were found in active greywacke screes surrounded by tussocklands and shrublands, within an altitudinal range of 900 - 1200 m. Green skinks were found in semi-stable talus slopes close to Dunstan Creek and in screes supporting scree skinks. The altitudinal range was from 600 -- 1130m.

McCann's skink (*O. maccanni*) and *O. nigriplantare polychroma* were found to be widespread throughout the survey area and the gecko *Hoplodactylus* 'Southern Alps' (Hitchmough 1997) was commonly found in rock outcrops, boulder banks and screes.

A further search for lizards and suitable habitat occurred as part of the tenure review inspection in 2002. Details of survey sites and search effort are contained in Appendix 2.

Results of the 2002 and 1989 surveys are summarized in Table 2 below:

Table 2. (Grid references are from NZMS 260 H40)

Location	Habitat Description	Suitable Habitat For:	Species Recorded
Headwaters of Mata Creek GR 2261400 5595500 to 2259400 5596400	Small valley containing small screes and rocky areas amongst shrublands with some exotic grass	Green skink, <i>H. 'Southern Alps'</i> , McCann's skink, cryptic skink, (<i>O. inconspicuum</i>) and <i>O. n. polychrome</i> .	<i>H. 'Southern Alps'</i> , McCann's skink and <i>O. n. polychroma</i> (2002).
Headwaters of Mata Creek centered at GR 225800 559700.	Lobes of running scree between tussocklands	Scree skink, green skink, cryptic skink, <i>O. n. polychroma</i> and McCann's skink	Scree and green skinks (Whitaker and Loh 1990).
Slopes on east side of Dunstan Creek above 800m.	Lobes of running scree between tussocklands	Scree skink, green skink, cryptic skink, <i>O. n. polychroma</i> and McCann's skink	Not searched.
Upper catchment of Wheelers Gully below GR 2257700 5593800.	Lobes of running scree between tussocklands	Scree skink, green skink, cryptic skink, <i>O. n. polychroma</i> and McCann's skink	Not searched
Section of ridge dividing Dunstan Creek and Mata Creek catchments at GR's NZMS 260 H40 2256500 5596500, 2257700 5593800 and 2256600 5594800	Mixed tall tussock, short tussock and scree.	Cryptic skink, <i>O. n. polychroma</i> and McCann's skink.	McCann's skinks: GR's 2256500 5596500, 2257700 5593800 and 2256600 5594800 (2002). Cryptic skink was seen at GR 2257700 5593500 (2002).
Edge of Dustan Creek above Wheelans Gully	A mosaic of shrublands and rock slides/screes represent good green skink habitat	Good green and McCann's skink habitat. <i>H. 'Southern Alps'</i> .	Green skink: GR 2256600 5594300 (Whitaker and Loh 1990). McCann's skink and <i>H. 'Southern Alps'</i> were observed at GR 2254500 5594800 (2002).
The lower altitude country comprising the eastern part of the property.	Mostly converted to exotic pasture, appears to provide unsuitable habitat for threatened lizard species.	A gully at 2259800 5594500 supports an extensive shrubland which provides likely provide habitat for green skinks.	Not searched.

Significance of Herpetofauna

Although the scree and green skinks were not recorded during the tenure review survey, they have been found at several locations on the property and in nearby in Rocks Creek catchment (Whitaker and Loh 1990). Their continued presence remains probable. Scree skink have a threat status of gradual decline (Hitchmough *in prep.*). This species occur only in Marlborough, Canterbury and Otago. Furthermore, genetic studies to date suggest that Otago scree skinks may be distinct from those in Canterbury (Daucherty in Kappers and Tocher 2001, Whitaker *et al.* 2002). For this reason it is prudent to manage the Otago scree skinks as a separate group. Otago scree skink populations are at the southern range limit for the species. Those present on the St Bathans Range are at the south-western limit for the species in Otago. Distribution is likely to be restricted to areas with greywacke rather than schist.

Green skinks are an endemic species found only in Southland and Otago (although taxonomic resolution is uncertain). Although they are locally abundant at some sites, habitat is generally not well protected and is at risk from human activities. Green skinks have a status of gradual decline (Hitchmough, RA in prep.). Green skink populations have declined significantly as a result of human influence (i.e. through introduction of mammalian predators and habitat destruction). The patchy distribution is an on-going result of pastoral farming activities and other developments.

The areas of "suitable" green skink habitat identified are important as they may contain skinks or could be used for translocations. Endangered lizards with uncertain taxonomy (Otago is known as an area of high endemism) and patchy distribution means that good quality habitat should be protected.

Areas of outstanding habitat for scree skinks include screes above 800m along the northern section of the Dunstan Creek faces (true left of Dunstan Creek) and most of the upper catchment of the two major Creeks comprising the headwaters of Mata Creek.

Areas of important green skink habitat include the outstanding scree skink habitat, as these species are known to occupy the same sites on the St Bathans Range. Other areas of high ranking for green skinks are the toe slopes of the Dunstan Creek faces above Wheelans Gully and two small valleys which feed into the Mountain and Enterprise Water Race.



Photo 5. Bouldery Areas Amongst Tall Tussock are a Known Location of Scree Skinks on Upper Dunstan Faces.

2.5.3 Avifauna

Bird species observed on the property and their conservation significance are summarized in Table 3 below.

Table 3. Bird Species on Dunstan Burn Pastoral Lease.

SPECIES	LOCATION	STATUS	SIGNIFICANCE
NZ falcon	Mid altitude hillslopes	Protected rare threatened endemic	New Zealand Falcon have a "Gradual Decline" Status (Hitchmough in prep.)
Harrier hawk	Throughout montane and lower altitude country	Native, Protected	Not a priority
Blackbird	Lower country	Introduced, Unprotected	Not a priority
Paradise Shellduck	Valley floors	Partially Protected Endemic	Not a priority
New Zealand pipit	Montane and lower country	Native, Protected	Not a priority
Silvereye	Low altitude shrublands	Native Partially Protected	Not a priority
Grey warbler	Low altitude shrublands	Native, Protected	Not a priority
Greenfinch	Low altitude	Introduced, Unprotected	Not a priority
Spur-winged plover	River flats	Protected common selfintroduced native	Not a priority
Redpoll	Low altitude	Introduced, Unprotected	Not a priority
Chaffinch	Low altitude	Introduced, Unprotected	Not a priority
Yellow hammer	Low altitude	Introduced, Unprotected	Not a priority

2.5.4 Aquatic Fauna

The property was surveyed on 19 March 2002 for freshwater fish using a backpack electric fishing machine. Six sites were fished. Two existing data sets also were searched for records of freshwater fauna: DOC's Biodiversity Central Otago Fish Survey database and the NIWA National Freshwater Fish Database (NIWA FWFD) (Appendix 1). ANIWA FWF Data form was completed at each site fished. All fish collected were readily identified on site and returned to the stream.

The streams on this property are typically small, steep gradient streams draining the slopes of the St Bathans Range from 1500 m. Some are seasonally dry.

Of the six sites fished, five had fish present and one had no fish. Only the introduced Brown trout (*Salmo trutta*) was found.

Significance of Aquatic Fauna.

Known freshwater fish on Dunstan Bum PL are limited to two introduced species: brown trout and brook char. Brown trout which is the most common and widely distributed exotic fish and is abundant and widely distributed in the waterways on this property.

Streams on the property probably once supported populations of native, non-migratory galaxiids which are thought to be widespread in Otago. These species are not able to co-exist with trout or char and are now not present on the property (Allibone 1997). Many of these galaxiids are now ranked as endangered or have restricted distributions.

The streams on this property are typical of those above 700m in Central Otago, being shallow, relatively low volume, experiencing large seasonal variation in flows and unconstrained flooding. The water quality in all the streams on the property was high, with good riparian vegetation along most stream margins. Common invertebrates present were mayfly (*Coloburiscus*, *Deleatidium*), caddis (*Olinga*, *Pycnocentroides*) and stonefly (*Zealandobius*, *Zealandoperla*.) species all common.

Streams of this quality are not uncommon locally but are declining as land development continues. The invertebrate communities that these waterways support would benefit from the maintenance and enhancement of the native riparian and catchment vegetation.

2.5.5 Problem Animals

Rabbits have historically reached high numbers on low lying and sunny country. Hares are present at a moderate density throughout much of the property. Possums are present in low numbers. Pigs historically inhabited the area, but in recent years have probably been eliminated. Stoats, ferrets and cats are present and represent a serious threat to lizard populations. A low and mobile population of red deer inhabit the St Bathans Range and surrounding country.

2.6 Historic

Maori sites: There are no recorded Maori sites on the pastoral lease.

European sites: (Including freehold land in vicinity of the Grey Lakes).

Freehold land run in conjunction with Dunstan Burn pastoral lease contains what can be considered the other half of the St. Bathans Gold Field. The area of sluicings known locally as the Grey Lakes is separated from the Blue Lake at St. Bathans by a short 250 m high ridge. Historically both areas were part of the St Bathans diggings. Like the Blue Lake area it was originally mined in the early 1860s. However, by the early 1870s mining had essentially ceased because the natural water course (Muddy Creek) had become choked with tailings.

Work was begun by a company on excavating a tail race to enable the gold sluicing to continue deeper into the hill slope. It eventually took 11 years to complete and opened in 1886 at a cost of £12000. The original company collapsed and the project was taken over by the Muddy Creek Channel Co. which was formed by the Scandinavian Co. and the United Mountain and Enterprise Co. Both these companies were major players in the St. Bathans Gold Fields and held the two largest areas of claims to be serviced by the tail race. When completed, the tail race was four miles long, 12 - 18 feet wide at the bottom and 45 feet deep where it commenced at the claims.

In 1887, in addition to the Scandinavian and United Co.s, the Otago Co., and 12 small parties of miners were sluicing into the tail race. Perhaps the most interesting facet of the mining was the small number of men actually employed in the mine - both the Scandinavian and United Co.s only employed 2 - 3 men each. It was this small number of employees that allowed the companies to be financially successful because the gold bearing deposit being worked contained less than 1 grain of gold per cubic yard of gravel. Within 10 years most of the better ground had been mined out and by 1896 only the 3 large companies were still working at Muddy Creek. Ten years later only the Scandinavian Co. was still working in Muddy Creek. They were using an elevating plant to follow the gold lead deeper into the ground. The Scandinavian Co. was the last company to mine the area with the site being abandoned by the 1920s.

What remains?: Within the pastoral lease itself there are the remains of the main water races that supplied water to St. Bathans and Muddy Creek (including the Scandinavian, United Mountain and Enterprise and the Otago water races). Lower down Muddy Creek are small scale ground sluicings and occasional habitation sites. However it is difficult to assess the number of sites in this area as there is a thick cover of wilding pine trees.

The main area of gold sluicing including the so called Grey Lakes is located within the free hold area of Dunstan Bum. The area comprises a shallow lake and impressive "cliffs" of pipe clay that have been sluiced into the original ground surface. The site is similar to the Blue Lake at St. Bathans but the area is visually more spectacular. The area surrounding the Blue Lake is obscured by broom and gorse which masks the associated water races and other workings. At the Grey Lakes the races etc. are still clearly visible giving a clear impression of how the area was worked, however, wilding pines and broom are beginning to establish themselves in the sluicings.



Photos 9 &10. Grey Lakes Historic Mining Area Located on Freehold Land Run with Dunstan Burn Pastoral Lease.



Significance of Historic Sites

The water races and gold workings on the pastoral lease are older than 1900 and are therefore protected under the 1993 Historic Places Act under which it is an offence to damage or destroy an archaeological site (which these are) without an authority from the Historic Places Trust. The historical integrity of this area is somewhat compromised by a heavy pine cover.

Of greater historical significance are the "Grey Lakes" which lie on freehold land fanned in conjunction with the pastoral lease. This site is the other half of the St. Bathans workings and historically part of the St Bathans diggings complex which are currently managed by the Department of Conservation as historic and recreation reserves. It is also visually more significant than the Blue Lake because of the ability to demonstrate the mining techniques used in the area. Because mining continued in this area long after 1900 it is questionable whether any protection for the area exists under the Historic Places Act.

2.7 Public Recreation

2.7.1 Physical Characteristics

The property's remote location provides a setting for a range of recreational opportunities.

In 1992, DOC compiled a Recreation Opportunity Spectrum for the Otago Conservancy whereby all areas regardless of land tenure, were classified and mapped according to setting, activity and recreational experience characteristics.

The Upper Manuherikia River/Dunstan Creek area was zoned "Backcountry 4WD Drive-In" which is characterised by a feeling of relative remoteness from populated areas". "The highly natural setting is a valued part of the experience and may be associated with motivations of "escape from town", education and nature appreciation". "Four wheel drive vehicles are desirable to give access to high country tussock grasslands and block mountains and more rugged remote areas."

2.7.2 Legal Access

A number of legal roads bound and dissect the pastoral lease. Hawkdun Runs Road forms the eastern boundary. Loop Road forms part of south-western boundary and dissects the southern tip of the lease. St Bathans Downs Road forms the western boundary of land contained within the lease to the west of Loop Road.

Dunstan Creek which forms much of the western boundary is subject to an existing marginal strip. Parts of the formed four wheel drive track on the southern banks of Dunstan Creek lie within this strip. A short section of this track lies within Dunstan Bum pastoral lease at the north-western extremity of the property.

Mata Creek appears to qualify for a marginal strip from the point where it exits the property well into its headwaters. No marginal strip has been registered to date.

Legal Access in Vicinity of Freehold Land at Grey Lake Recommended for Inclusion in Tenure Review.

A legal Road links St Bathans township with freehold land lying to the south of Grey Lake; however it does not extend northwards as far as Grey Lake and associated gold workings.

2.7.3 Activities

Numerous four wheel drivers, fishermen, mountain bikers, walkers and horse trekkers utilise the track up Dunstan Creek. Many continue on into the headwaters and exit via the Chain Hills into the Lindis or over **Old Man Peak** into the Mackenzie Basin.

The balance of the property has historically received a low level of use by trampers and hunters. The track along the main ridge crest provides a logical access route onto the St Bathans Range.

Freehold Land in Vicinity of the Grey Lakes.

The Grey Lakes are frequently visited by walkers from St Bathans. The area has become well known to the public as it is the location for the popular Ghost to Ghost triathlon event which has now been running for over a decade.

PART 3: OTHER RELEVANT MATTERS & PLANS

3.1 Consultation

Conservation resources on Dunstan Bum were discussed at a meeting with "umbrella" recreation and conservation groups (NGO's) in Alexandra on Monday October 8th 2001.

Key points raised at the meeting were:

- Restore approximately 1800 ha at northern high altitude part of property to full Crown ownership under DOC management.
- Access along main ridge is desirable from Blue Lakes via Grey Lake (freehold).
- Attempt to include Grey Lake freehold area in tenure review (significant historic and recreational values in this area).
- Noted that that part of the Dunstan Creek track is within Dunstan Bum pastoral lease - suggested that an access easement is required over this stretch of track.
- Noted possibility of a round trip (4WD/mountain, bike/horse) via northern end of the property.
- A series of small catchments which flow into Dunstan Creek in the north west corner of the property containing shrublands and tall tussocklands should be protected.
- The south eastern flanks of the property above the Mountain and Enterprise Water Race should be protected as the area supports rhanuka growing close to its temperature and moisture gradient.

3.2 Regional Policy Statements & Plans

There are two community water supply takes for 8t. Bathans within the property which are listed in schedule 1B of the Otago Regional Plan: Water.

3.3 District Plans

The property is located within the Rural Resource zone of the Central Otago District Plan. The western edge of the small block of land on Fish Pond Road, 8t. Bathans is marked as being flood prone.

In general, the proposed Central Otago District Plan (amended to incorporate Council decisions) does not act as a trigger for the protection of tussock grasslands and smaller wetlands and forest areas. Resource consent is required for excavations or tree planting within specified distances of a water race or irrigation pipeline, and for development work within 10m of any water body. Resource consent is also required for tree planting of evergreen species with wilding spread capabilities. The property is not in the area of Outstanding Landscape. There are no registered historic sites, or areas of significant

indigenous vegetation and habitats of significant indigenous fauna and wetlands as set out in the schedules of the plan. Protection is limited to the controls set out above.

3.4 Conservation Management Strategies & Plans

The Otago Conservancy of DOC has prepared a Conservation Management Strategy (CMS) which was approved by the New Zealand Conservation Authority in August 1998.

The CMS identifies 41 special places of conservation interest in Otago Conservancy. Dunstan Bum lies within the St Bathans-Hawkdun-Ida Special Place.

The CMS objective for the St Bathans-Hawkdun-Ida Special Place is:

To protect, on an extensive scale, the high altitude landscape, nature conservation and historic resources of the area, principally by acquiring adjoining lands of high natural, historic and recreational value, through pastoral lease or occupation licence tenure reviews, to link existing areas of land administered by the department thus providing for more recreational opportunities, better protection of values and efficient integrated management of those values.

The key implementation methods relevant to Dunstan Bum are:

(a) To protect, on an extensive scale, the high altitude landscape, nature conservation and historic resources of the area, principally by acquiring adjoining lands of high natural, historic and recreational value, through pastoral lease or occupation licence tenure reviews, to link existing areas of land administered by the department thus providing for more recreational opportunities, better protection of values and efficient integrated management of those values.

(b) Tourism and recreation concessions may be allowed where the proposed activities can be shown to have no adverse effect on identified values, including the remoteness of the range crests in winter, or where conditions can be attached to a concession to adequately or reasonably avoid, remedy or mitigate any potential adverse effects.

(c) The development of additional prominent access roads or mountain top facilities are likely to have an adverse effect on natural and landscape values and is considered inappropriate. Potential developers of facilities will be encouraged to better utilise existing facilities by co-siting.

(d) Pastoral lease and occupation licence tenure review on adjacent properties will provide opportunities to negotiate the acquisition of areas of similar or complementary natural and historic values and significant recreational opportunities. Overall management of these new areas, together with existing conservation areas, will confer net conservation and management benefits.

(e) Signs will be erected at key access points once cohesive units of estate and access have been acquired/negotiated.

(g) Appropriate wild animal control work will be carried out, including feral sheep.

Priorities for St Bathans - Hawkdun - Ida Ranges

Pastoral lease and pastoral occupation licence tenure review negotiations will be the priority method for implementation of the objective, along with continued vigilance with regard to the spread of wilding trees.

Also of relevance is the general CMS statement (Chapter 14 - page 469) that "the vision for Otago sees all kinds of natural indigenous communities thriving, and this being done, in the main, by ensuring the retention of representative samples of all classes of natural ecosystems."

Dunstan Burn contains the following broad ecosystem classes identified in the CMS as being present in the Otago Zone:

- Dry
- Rivers
- Tussock Grasslands
- Shrub Remnants

Freehold Land Recommended For Inclusion

This area is recommended for inclusion solely on its historic and recreational values. For this reason the Otago Gold Fields Park Special Place is applicable. Key objectives for this Special Place relevant to the Grey Lakes area:

General Objectives for Otago Goldfields Park

Protection:

To protect in perpetuity a representative range of goldfields remains and their original and visually sympathetic settings:

- *to fulfil our cultural and individual needs for tangible links with the past;*
- *for academic study.*

Use:

To optimise the potential for public or commercial recreation and tourism access to and use of sites as:

- *a recreational and cultural resource,'*
- *a resource of significance to tourism;*
- *to an extent compatible with maintenance of the integrity of the sites.*

Implementation

(a) The general objectives will be implemented through the following specific objectives and their associated implementation points.

(b) A conservation management plan will specify management regimes for individual sites.

Objective for addition of new sites to the Otago Goldfields Park, and deletion of present sites

To consider additions of other Otago Goldfields sites to the park once existing sites are being managed satisfactorily, or have been identified for deletion.

Implementation

(a) There is no numerical limit on the number of OGP sites, but constraints exist in the ability of the department to satisfactorily manage a large number of sites and present them together.

(b) The selection of new sites will be according to their historic significance, which will be determined by the following criteria:

- *association with significant persons, events and processes, intactness,*
- *degree of threat to site,*
- *compatibility with other sites,*
- *visitors experience,*
- *representativeness,*
- *accessibility and location,*
- *condition of site,*
- *cost of acquisition and maintenance.*

(c) Sites may be deleted if they rank poorly in terms of the above criteria relative to existing sites and those available for addition eg, Lonely Graves.

(d) Negotiation for the protection of adjoining areas to existing site so as to preserve intact system, eg, Golden Point.

(e) Addition of sites considered to meet the above criteria, eg, Bullendale, Serpentine and Potters No.2 and negotiation for the protection of other such areas, eg, Doctors Point.

Objective for legal protection for Otago Goldfields sites

To seek the highest level of legal protection for each site within the park and those which are not part of the park.

Implementation

(a) Otago Goldfields Park sites on land held or managed by the department for that purpose only or principally for that purpose will be classified as historic reserves. Park sites classified as recreation reserves will be managed so that recreation and historic values can both be accommodated at the site. If this is not possible, the reserves will be reclassified as historic reserves.

(b) Protected private land agreements for sites in private ownership will be maintained but to seek reserve status for these sites as opportunities arise.

(c) Landowners and neighbours may be appointed as honorary rangers to help enforce the provisions under the Reserves Act which protect sites from fossicking, theft and vandalism.

(d) To advocate protection and recognition of sites in the park and goldfields sites generally in regional and district plans under the Resource Management Act 1991.

(e) Opportunities arising out of pastoral lease tenure reviews will be taken to negotiate for the protection (including the allocation of the land to the department) of significant goldfields sites. Each such site will be evaluated in terms of the policy above, for addition to the park.

3.5 Freshwater Fisheries Plans

Under Preparation.

PART 4: MAPS ETC.

4.1 Additional information

4.1.1 References

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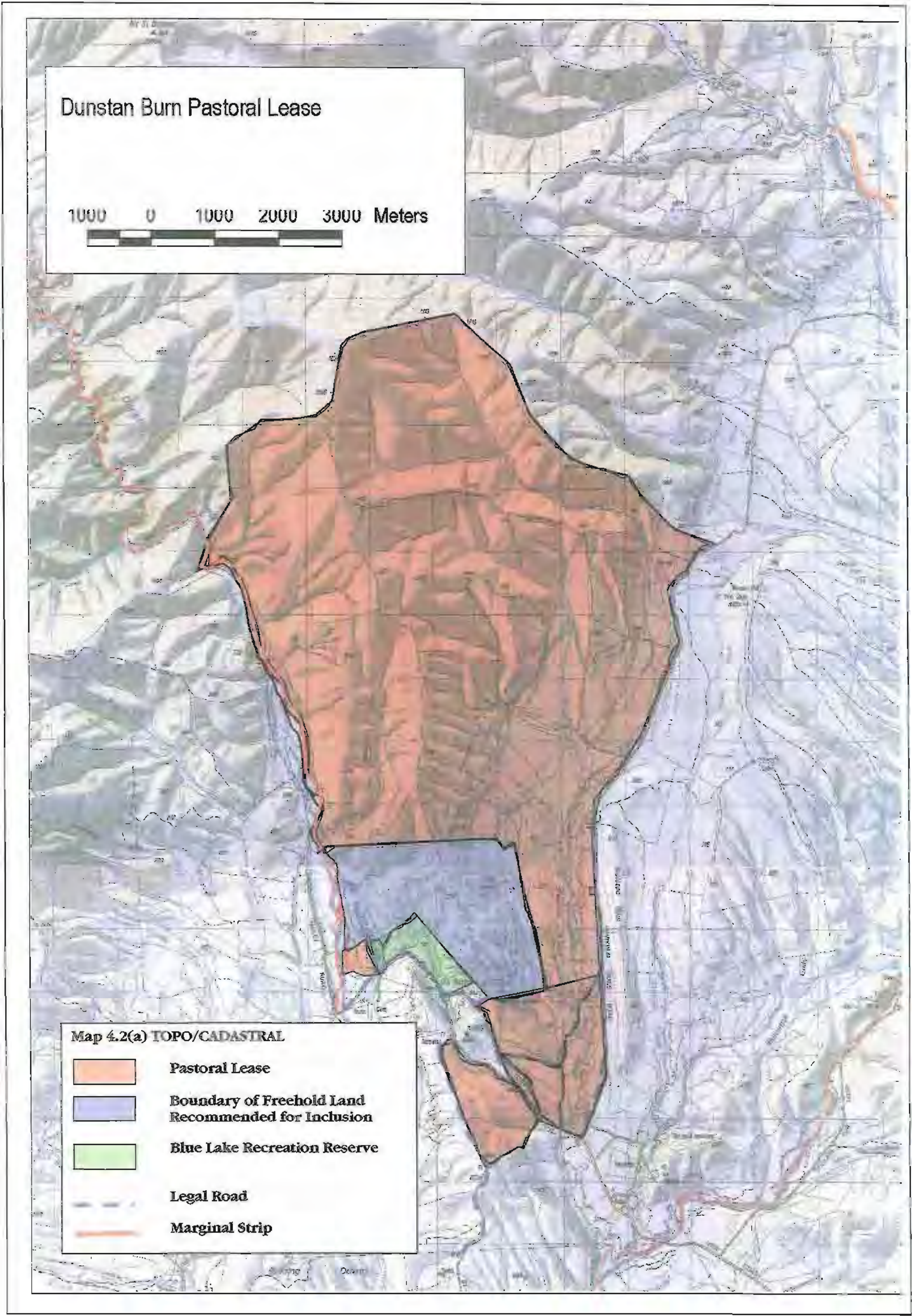
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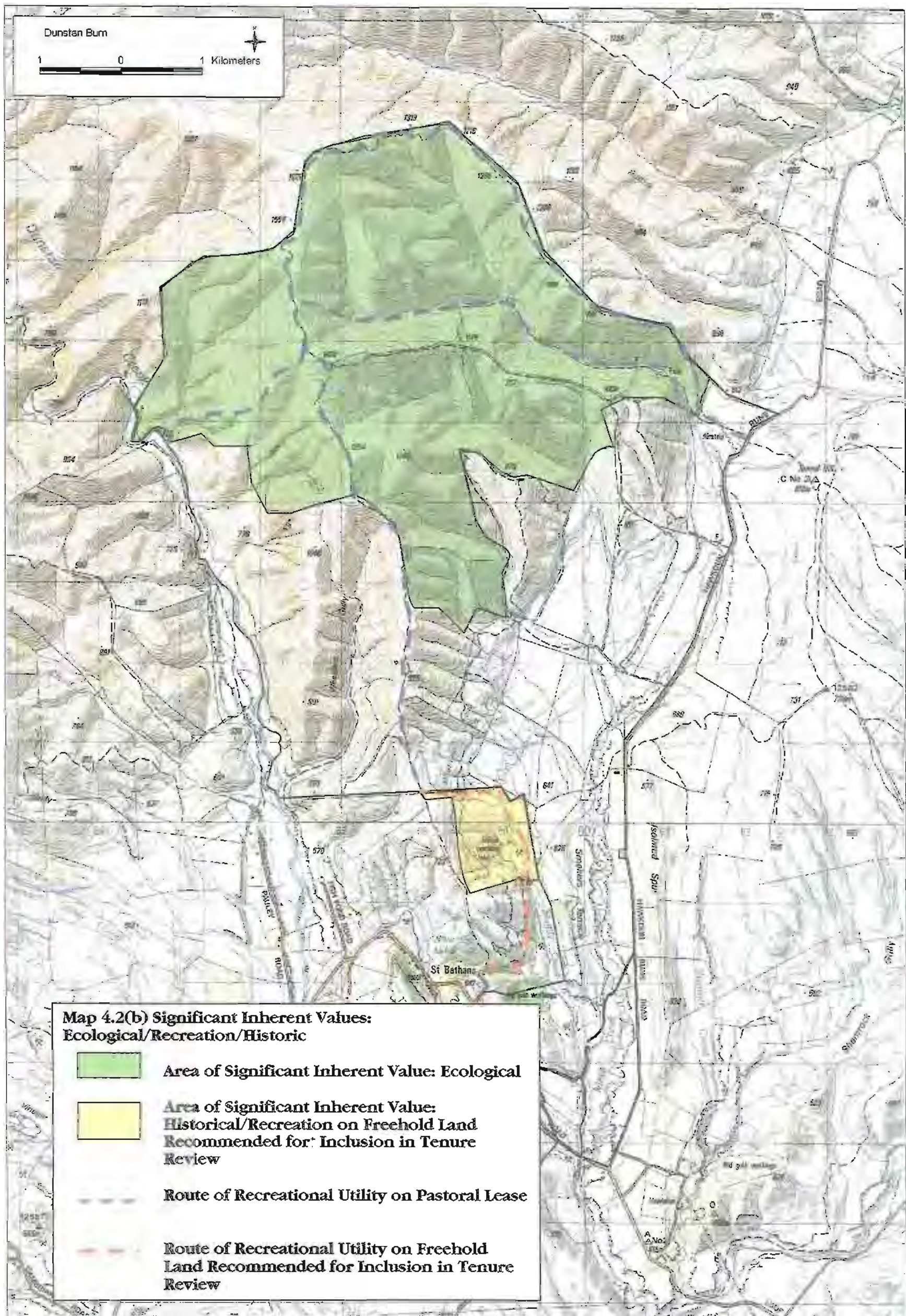
4.2 Illustrative Maps

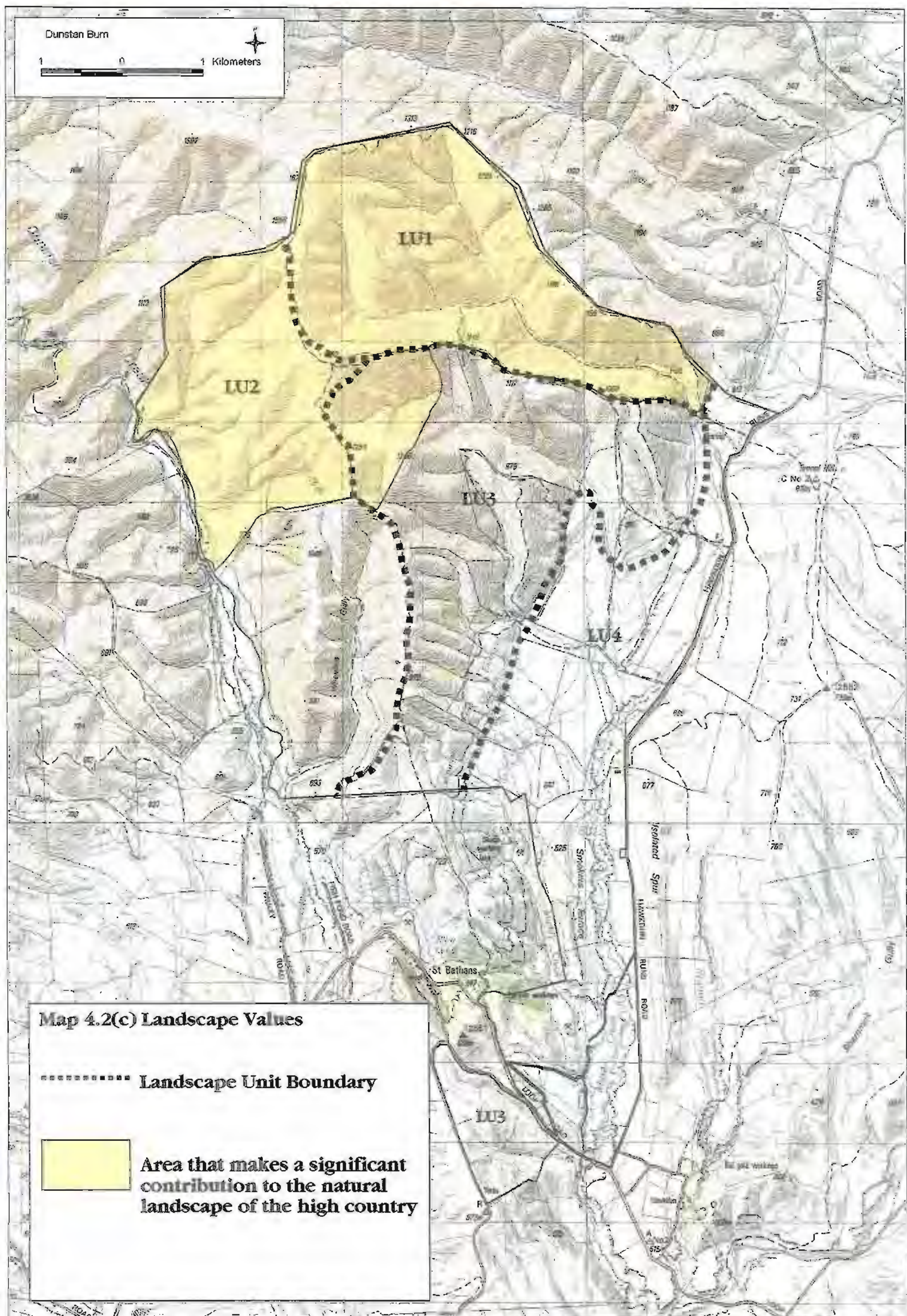
4.2.(a) Top/Cadastral

4.2(b) Significant Inherent Values: Ecological Recreation/Historic

4.2(c) Landscape Values







4.3 Appendices

Appendix 1. Combined Freshwater Fish Records for Dunstan Burn PL.

<i>Location</i>	<i>NZMS 260 Grid Ref.</i>	<i>Date</i>	<i>Fish Species</i>	<i>Data Source</i>
Dunstan Creek	H4022553 55933	1984	salfon	NIWAFF DB
Dunstan Creek	H4022553 55933	1984	saltru	NIWAFF DB
MataCreek	H40 22613 949	19.03.2002	saltru	DOC
MataCreek	H4022602 55957	19.03.2002	saltru	DOC
Unnamed trib. Mata Creek	H4022600 55922	19.03.2002	saltru	DOC
Unnamed trib. Mata Creek	H4022588 55939	19.03.2002	saltru	DOC
Unnamed trib. Mata Creek	H4022593 55925	19.03.2002	saltru	DOC
Muddy Creek	H4122593 55893	19.03.2002	Nospec	DOC

Saltru = Brown Trout, *Salmo trutta*. **Salfon** = Brook Char, *Salvelinus fontinalis*.
Nospec=No species recorded.

Appendix 2: Lizard Searching Notes.

18/2/02 A small valley upstream from 22614005595500 to 2259400 5596400: search time two people for four hours. Weather calm, warm, overcast.

20/2/02 search time two people for four hours from the vehicle track onto the upper slopes of Mt St Bathans (running approx. N-S), and two hours from the track up Dunstan Creek. Weather was fine and warm, although the wind was cold on the upper slopes of Mt St Bathans.

21/2/02 The gully at 22595005595000: search time one person for two hours. Weather cool and showery, but calm.

Appendix 3. Invertebrate Collection List

Common name	Family	Genus and species	Conservation status
Land snail	Punctidae	<i>Undetermined sp.</i>	Unknown distribution
Slater	Styloniscidae	<i>Undetermined sp.</i>	Widespread & Common
Cockroach	Blattidae	<i>Celatoblatta anisoptera</i>	Widespread & Common
Tussock ringlet	Nymphalidae	<i>Argyrophenaxanitia</i>	Widespread in tussock habitat.
Cricket	Gryllidae	<i>Bobilla sp.</i>	Widespread & Common
Grasshopper	Tettigoniidae	<i>Conocephalus sp.</i>	Widespread & Common
Grasshopper	Acrididae	<i>Sigaus australis</i>	Widespread & Common
Grasshopper	Acrididae	<i>Phaulacridium marginale</i>	Widespread & Common
Ladybird beetle	Coccinellidae	<i>Undetermined sp.</i>	Widespread & Common
Weevil	Curculionidae	<i>Sargosp.</i>	Unknown distribution
Weevil	Curculionidae	<i>Undetermined sp.</i>	Unknown distribution
Ground beetle	Carabidae	<i>Megadromus bullatus</i>	Widespread & Common
Ground beetle	Carabidae	<i>Gregus aerius</i>	Common but restricted to Otago
Chafer beetle	Scarabaeidae	<i>Pyronota sp.</i>	Unknown distribution
Darkling beetle	Tenebrionidae	<i>Zeodelium sp.</i>	Common but restricted to Otago
Hover fly	Syrphidae	<i>Melanostoma fasciatum</i>	Widespread & Common
Hover fly	Syrphidae	<i>Melangyna novaezelandiae</i>	Widespread & Common
Fly	Schizophora	<i>Acalypterate sp.</i>	Unknown distribution
Fly	Tephritidae	<i>Undetermined sp.</i>	Unknown distribution
Tipulid fly	Tipulidae	<i>Limonia sperata</i>	Widespread & Common
Tipulid fly	Tipulidae	<i>Leptotarsus tapleyi ?</i>	Widespread & Common
Centipede	Geophilidae	<i>Zelation sp.</i>	Widespread & Common
Centipede	Henicopidae	<i>Henicops maculatus</i>	Widespread & Common
Millipede	Schedotrigonidae	<i>Schedotrigona sp.</i>	Widespread & Common
Weta	Anostomatidae	<i>Hemideina maori</i>	Restricted to South Island Mountains
Ant	Formicidae	<i>Amblypone saundersi</i>	Widespread & Common
Aphids	Aphididae	<i>Carrot aphid</i>	Widespread & Common
Spittlebug	Cercopidae	<i>Philaenus spumarius</i>	Widespread & Common
True bug	Cicadellidae	<i>Undetermined sp.</i>	Widespread & Common
True bug	Miridae	<i>Chaetodus sp.</i>	Unknown distribution
True bug	Lygaeidae	<i>Undetermined sp.</i>	Unknown distribution
True bug	Saldidae	<i>Undetermined sp.</i>	Unknown distribution
Centipede	Henicopidae	<i>Cryptops sp.</i>	Unknown distribution
Centipede	Henicopidae	<i>Craterostigmus sp.</i>	Unknown distribution
Brown soldier bug	Pentatomidae	<i>Cermatulus nasalis</i>	Rare and restricted
Flatworm	Undetermined	<i>Undetermined sp.</i>	Distribution unknown
Native bee	Halticidae	<i>Lasioglossum sp.</i>	Widespread & Common
Bumble bee	Apidae	<i>Bombus terrestris</i>	Widespread & Common
Butterfly	Pyrillidae	<i>Argyrophenax antipodum</i>	Widespread & Common

Tiger Moth	Arctiidae	<i>Metacrias huttoni</i>	Widespread & Common
Moth	Geometridae	<i>Notoreas sp.</i>	Widespread & Rare
Moth	Lycaenidae	<i>Boldenaria boldenarum</i>	Widespread & Common
Nurseryweb spider	Pisauridae	<i>Dolomedes minor</i>	Widespread & Common
Spider	Cycloctenidae	<i>Cycloctenus fugax ?</i>	Widespread & Common
Trapdoor spider	Idiopidae	<i>Misgolas vilama</i>	Distribution UnlOIOwn
Wolfspider	Lycosidae	<i>Anoterovsis adumbrata</i>	Widespread & Common
Orbweb spider	Araneidae	<i>Coloranea verutum</i>	Widespread & Common
Orbweb spider	Araneidae	<i>Novakia trituberculata</i>	Widespread & Common
Orbweb spider	Araneidae	<i>Eriophora pustulosa</i>	Widespread & Common
Cobweb spider	Theridiidae	<i>Undetermined sv.</i>	Widespread & Common
Wasp	Proctotrupidae	<i>Undetermined sp.</i>	Distribution unknown
Wasp	Pteromalidae	<i>Undetermined sp.</i>	Distribution unknown
Wasp	Pteromalidae	<i>Undetermined sp.</i>	Distribution unknown
Spider wasp	Pompilidae	<i>Undetermined sp.</i>	Widespread & Common
Cicada	Tibicinidae	<i>Maoricicada sv.</i>	Widespread & Common
Cicada	Tibicinidae	<i>Kikihia angusta</i>	Widespread & Common
Caddis fly	Hydrobiosidae	<i>Psilochorema leptoharpax</i>	Widespread & Common
Caddis fly	Hydrobiosidae	<i>Costachorema xanthopterum</i>	Widespread & Common
Caddis fly	Hydrobiosidae	<i>Hydrobiosis clavigera</i>	Widespread & Common
Caddis fly	Hydrobiosidae	<i>Hydrobiosis parumbripennis</i>	Widespread & Common
Caddis fly	Hydrobiosidae	<i>Hydrobiosis umbripennis</i>	Widespread & Common
Caddis fly	Conoesucidae	<i>Olingaferedayi</i>	Widespread & Common
Caddis fly	Hydropsychidae	<i>Aoteapsyche colonica ?</i>	Widespread & Common
Caddis fly	Polycentropodidae	<i>Plectrocnemia maclachlani</i>	Widespread & Common
Caddis fly	Conoesucidae	<i>Pycnocentria evecta</i>	Widespread & Common
Toebiter	Corydalidae	<i>Archichauliodes diversus</i>	Widespread & Common
Mayflies	LeptopWebiidae	<i>Austroclima jollyae</i>	Widespread & Common
Mayflies	Coloburiscidae	<i>Coloburiscus humeralis</i>	Widespread & Common
Freshwater snail	Hydrobiidae	<i>Potamopyrgus antipodarum</i>	Widespread & Common
Spider	Pisauridae	<i>Dolomedes aquaticus</i>	Widespread & Common