

Crown Pastoral Land Tenure Review

Lease name : GLENCOE (North Otago)

Lease number : PO 366

Conservation Resources Report - Part 2

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.

December

10

4.4 NGOs Comments

Written submissions were received from

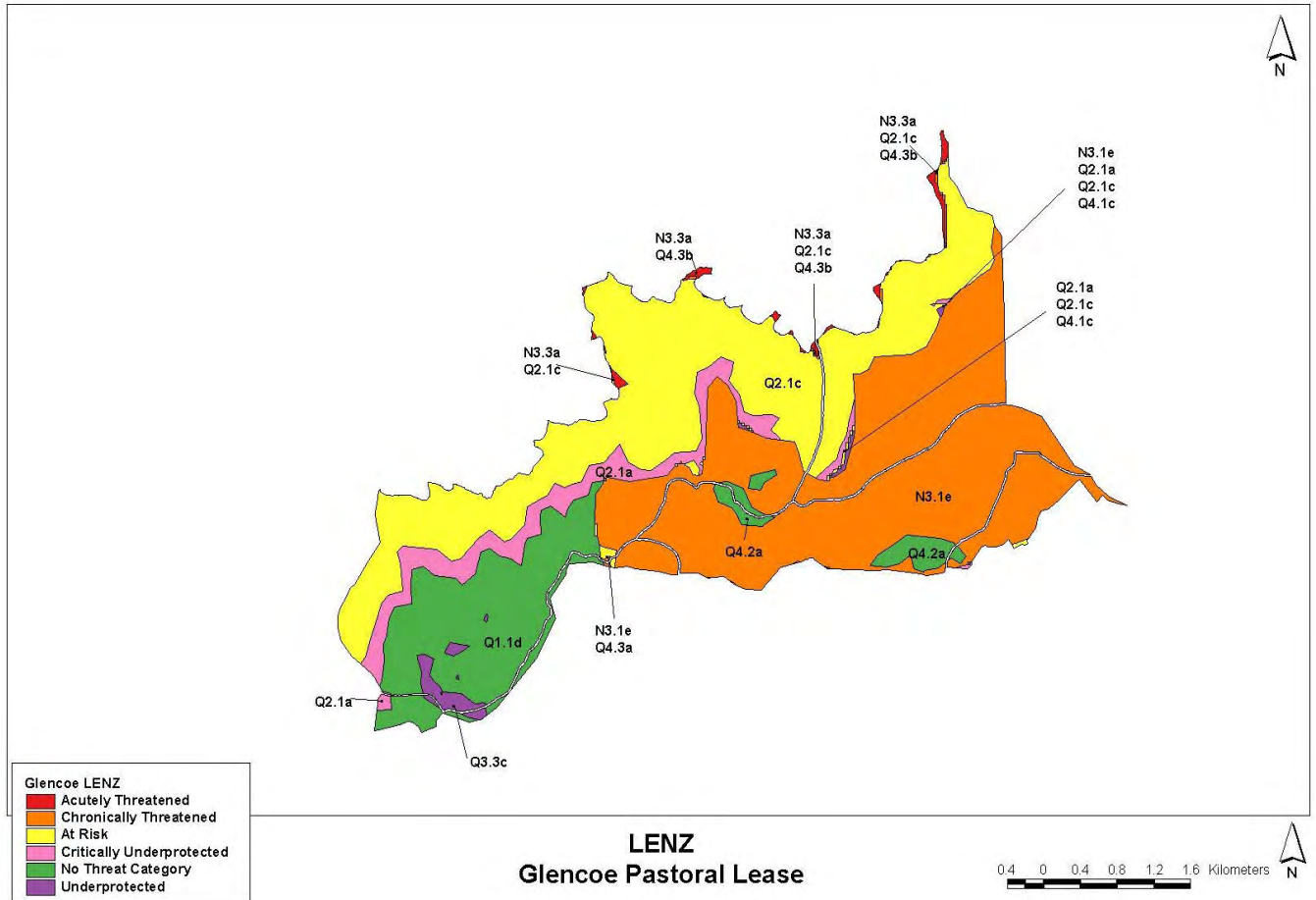
- Federated Mountain Clubs
- Dunedin Branch of Royal Forest and Bird Protection Society
- New Zealand Deerstalkers Association

4.5 Appendices

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APPENDIX 1

LENZ Level IV Map and Characteristics of LENZ Table



From: Leathwick, J., F. Morgan, G. Wilson, D. Routledge, M. McLeod and K. Johnstone.
2002: Land Environments of New Zealand. Technical Guide. Ministry for the Environment.

Environments	Characteristics	Level IV variations (if any)
N3.3a	Elevation 245 m. Located in the Lower Waitaki, Oamaru and coastal Otago south of Moeraki. Cool temperatures, low solar radiation, moderate vapour pressure deficits, moderate annual water deficits. Soils are well drained of moderate fertility from loess derived from schist and greywacke.	
N3.1e	Elevation 300 m. Located in Timaru and Oamaru, Otago. Cool temperatures, moderate solar radiation, moderate vapour pressure deficits, moderate annual water deficits. Imperfectly drained soils of moderate fertility from greywacke alluvium with some loess.	Much cooler temperatures, lower annual water deficits, undulating plains
Q4.3a Q4.3b	Elevation 330 m. Located in Eastern Otago including the Otago Peninsula. Cool temperatures, low solar radiation, moderate vapour pressure deficits, very low monthly water balance ratios, low annual water deficits. Imperfectly drained soils of moderate fertility from schist and quartz gravels.	a. Lower annual water deficits b. Much higher annual water deficits, strongly rolling hills.
Q2.1c	Elevation 640 m. Located in Eyre and Harris Mountains, ranges of inland Otago. Cool temperatures, moderate solar radiation, moderate vapour pressure deficits, very low monthly water balance ratios, low annual water deficits. Well drained soils of moderate fertility from greywacke.	Warmer temperatures, higher annual water deficits.
Q3.3c	Elevation 990 m. Located Garvie Mountains and the North Rough,	Much lower annual water deficits

	Knobby, Lammerlaw and Rock and Pillar Ranges. Cold temperatures, moderate solar radiation, moderate vapour pressure deficits, low monthly water balance ratios, low annual water deficits. Imperfectly drained soils of moderate natural fertility schist.	
Q4.1c	Elevation 265 m. Located in most of the Catlins, north of Te Waiwai Bay up to Te Anau. Cool temperatures, low solar radiation, moderate vapour pressure deficits, low monthly water balance ratios, slight annual water deficits. Well drained soils of moderate fertility from tuffaceous greywacke, Tertiary mudstones and gravels andesite,	Much cooler temperatures
Q1.1d	Elevation 1095 m. Located in Hawkdun Range, Grampian Mountains and Hunter Hills, South Canterbury, lower elevation slopes of the Eyre and Harris Mountains, range of inland Otago. Cold temperatures, moderate solar radiation, low vapour pressure deficits, low monthly water balance ratios, and slight annual water deficits. Well drained soils of moderate fertility from greywacke, schist.	Warmer temperatures
Q4.2a	Elevation 215 m. Located around Invercargill, east of Lake Te Anau and valleys in the Catlins. Cool temperatures, low solar radiation, moderate vapour pressure deficits, low monthly water balance ratios, slight annual water deficits.	Cooler temperatures, high fertility.

APPENDIX 2

Full List of Vascular Plant Species Recorded.

Current name	Family (Tribe)	Threat ranking (2009)	Common name
<i>Acaena anserinifolia</i>	Rosaceae	Not threatened	bidibid
<i>Acaena juvenca</i>	Rosaceae	Not threatened	bidibid
<i>Achillea millefolium</i>	Asteraceae	Exotic	yarrow
<i>Aciphylla aurea</i>	Apiaceae	Not threatened	spaniard
<i>Aciphylla scott-thomsonii</i>	Apiaceae	Not threatened	spaniard
<i>Agrostis capillaris</i>	Agrostidinae	Exotic	browntop
<i>Anaphalioides bellidioides</i>	Asteraceae	Not threatened	
<i>Anisotome aromatica</i>	Apiaceae	Not threatened	
<i>Anthoxanthum odoratum</i>	Phalaridinae	Exotic	sweet vernal
<i>Aphanes arvensis</i>	Rosaceae	Exotic	parsley piert
<i>Arenaria serpyllifolia</i>	Caryophyllaceae	Exotic	sandwort
<i>Aristotelia serrata</i>	Elaeocarpaceae	Not threatened	wineberry
<i>Asplenium appendiculatum</i> subsp. <i>appendiculatum</i>	Aspleniaceae	Not threatened	
<i>Asplenium flabellifolium</i> agg.	Aspleniaceae	Not threatened	necklace fern
<i>Asplenium hookerianum</i>	Aspleniaceae	Not threatened	Hooker's spleenwort
<i>Astelia fragrans</i>	Liliaceae	Not threatened	
<i>Astelia nervosa</i>	Liliaceae	Not threatened	
<i>Bellis perennis</i>	Asteraceae	Exotic	everlasting daisy
<i>Blechnum fluviatile</i> agg.	Blechnaceae	Not threatened	kiwikiwi
<i>Blechnum penna-marina</i> subsp. <i>alpina</i>	Blechnaceae	Not threatened	
<i>Brachyglottis bellidioides</i> var. <i>bellidioides</i>	Asteraceae	Not threatened	
<i>Brachyscome longiscapa</i>	Asteraceae	Not threatened	
<i>Cardamine corymbosa</i> agg.	Brassicaceae	Not threatened	
<i>Cardamine debilis</i> agg.	Brassicaceae	Not threatened	
<i>Carex breviculmis</i>	Cyperaceae	Not threatened	
<i>Carex coriacea</i>	Cyperaceae	Not threatened	
<i>Carex forsteri</i>	Cyperaceae	Not threatened	
<i>Carex gaudichaudiana</i>	Cyperaceae	Not threatened	
<i>Carex secta</i>	Cyperaceae	Not threatened	niggerhead
<i>Carmichaelia crassicaulis</i> subsp. <i>crassicaulis</i>	Fabaceae	Declining	coral broom
<i>Carmichaelia petriei</i>	Fabaceae	Not threatened	Desert broom
<i>Carpodetus serratus</i>	Carpodetaceae	Not threatened	putaputaweta
<i>Celmisia</i> (g) (CHR 274779; "rhizomatous")	Asteraceae	Not threatened	
<i>Celmisia gracilentata</i> agg.	Asteraceae	Not threatened	
<i>Celmisia hookeri</i>	Asteraceae	Naturally Uncommon	
<i>Cerastium fontanum</i> subsp. <i>vulgare</i>	Caryophyllaceae	Exotic	mouse-ear chickweed

<i>Chaerophyllum colensoi</i> agg.	Apiaceae	Not threatened	
<i>Chaerophyllum ramosum</i>	Apiaceae	Not threatened	
<i>Chionochloa rigida</i> subsp. <i>rigida</i>	Poaceaea (Danthonieae)	Not threatened	narrow-leaved snow-tussock
<i>Chionochloa rubra</i> subsp. <i>cuprea</i>	Poaceaea (Danthonieae)	Not threatened	copper tussock
<i>Chionochloa rubra</i> subsp. <i>cuprea</i> X <i>C. rigida</i> subsp. <i>rigida</i>	Danthoniinae	Not threatened	
<i>Cirsium arvense</i>	Asteraceae	Exotic	Californian thistle
<i>Cirsium vulgare</i>	Asteraceae	Exotic	Scotch thistle
<i>Clematis paniculata</i>	Ranunculaceae	Not threatened	native clematis
<i>Colobanthus buchananii</i>	Caryophyllaceae	Not threatened	
<i>Colobanthus</i> sp.	Caryophyllaceae	Not threatened	
<i>Coprosma cheesemanii</i>	Rubiaceae	Not threatened	
<i>Coprosma crassifolia</i>	Rubiaceae	Not threatened	
<i>Coprosma dumosa</i>	Rubiaceae	Not threatened	
<i>Coprosma elatirioides</i>	Rubiaceae	Not threatened	
<i>Coprosma linariifolia</i>	Rubiaceae	Not threatened	yellow wood
<i>Coprosma propinqua</i> var. <i>propinqua</i>	Rubiaceae	Not threatened	
<i>Coprosma rhamnoides</i>	Rubiaceae	Not threatened	
<i>Coprosma rotundifolia</i>	Rubiaceae	Not threatened	
<i>Coprosma rugosa</i>	Rubiaceae	Not threatened	
<i>Coprosma tayloriae</i>	Rubiaceae	Not threatened	
<i>Cordyline australis</i>	Laxmanniaceae	Not threatened	cabbage tree, ti
<i>Coriaria sarmentosa</i>	Coriariaceae	Not threatened	tutu
<i>Corokia cotoneaster</i>	Escalloniaceae	Not threatened	corokia
<i>Cortaderia richardii</i>	Poaceaea (Cortaderiinae)	Not threatened	South Island toetoe
<i>Crassula sieberiana</i>	Crassulaceae	Not threatened	coastal stonecrop
<i>Dichondra repens</i> agg.	Convolvulaceae	Not threatened	Mercury Bay weed
<i>Digitalis purpurea</i>	Scrophulariaceae	Exotic	foxglove
<i>Discaria toumatou</i>	Rhamnaceae	Not threatened	matagouri
<i>Dracophyllum rosmarinifolium</i>	Epacridaceae	Not threatened	turpentine scrub
<i>Eleocharis acuta</i>	Cyperaceae	Not threatened	sharp spike- sedge
<i>Epilobium pedunculare</i>	Onagraceae	Not threatened	
<i>Euchiton audax</i>	Asteraceae	Not threatened	
<i>Exocarpos bidwillii</i>	Santalaceae	Regionally Significant	
<i>Festuca novae-zelandiae</i>	Poaceaea (Poeae)	Not threatened	hard tussock
<i>Forstera tenella</i>	Stylidiaceae	Not Threatened	
<i>Fuchsia excorticata</i>	Onagraceae	Not threatened	tree fuchsia
<i>Galium aparine</i>	Rubiaceae	Exotic	cleavers
<i>Galium perpusillum</i>	Rubiaceae	Not threatened	
<i>Gaultheria macrostigma</i>	Ericaceae	Not threatened	prostrate snowberry

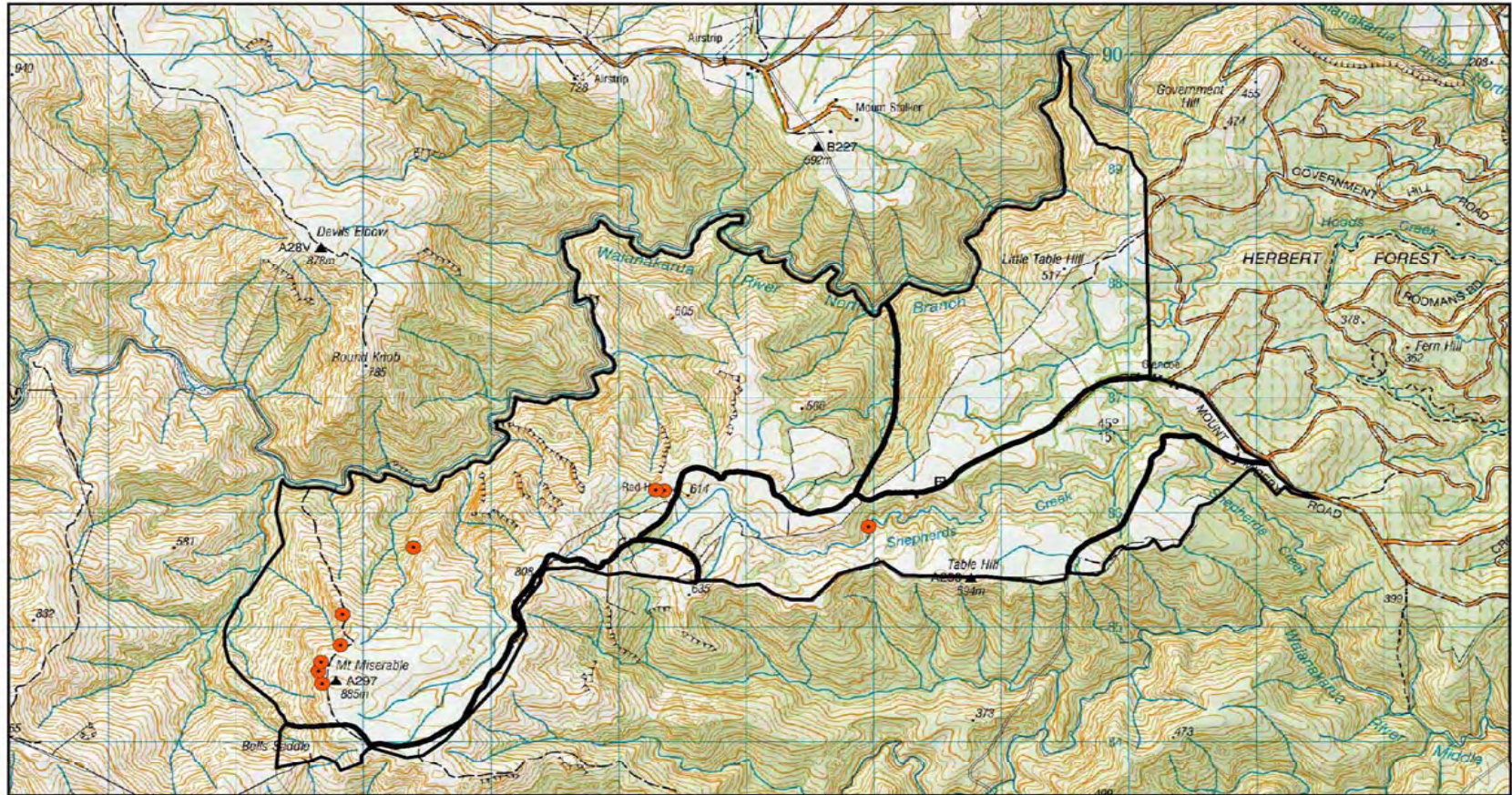
<i>Gentianella bellidifolia</i>	Gentianaceae	Not threatened	
<i>Geranium (d) (aff. G. microphyllum "mainland")</i>	Geraniaceae	Not threatened	
<i>Gingidia grisea</i>	Apiaceae	Naturally Uncommon	
<i>Glyceria fluitans</i>	Meliceae	Exotic	floating sweet grass
<i>Gonocarpus aggregatus</i>	Haloragaceae	Not threatened	
<i>Gonocarpus micranthus</i>	Haloragaceae	Not threatened	
<i>Griselinia littoralis</i>	Griselinaceae	Not threatened	broadleaf
<i>Hebe anomala</i>	Plantaginaceae	Not threatened	
<i>Hebe buchananii</i>	Plantaginaceae	Not threatened	
<i>Hebe salicifolia</i>	Plantaginaceae	Not threatened	koromiko
<i>Helichrysum filicaule</i>	Asteraceae	Not threatened	
<i>Helichrysum intermedium</i>	Asteraceae	Not threatened	
<i>Helichrysum lanceolatum</i>	Asteraceae	Not threatened	niniaio
<i>Hieracium lepidulum</i>	Asteraceae	Exotic	tussock hawkweed
<i>Hieracium pilosella</i> subsp.	Asteraceae	Exotic	mouse-eared hawkweed
<i>Hieracium praealtum</i>	Asteraceae	Exotic	king devil
<i>Hoheria angustifolia</i>	Malvaceae	Not threatened	small-leaved ribbonwood
<i>Hydrocotyle moschata</i>	Apiaceae	Not threatened	hydrocotyle
<i>Hydrocotyle novae-zeelandiae</i>	Apiaceae	Not threatened	
<i>Hypolepis millefolium</i>	Dennstaedtiaceae	Not threatened	thousand-leaved fern
<i>Juncus articulatus</i>	Juncaceae	Exotic	jointed rush
<i>Kelleria dieffenbachii</i>	Thymelaeaceae	Not threatened	
<i>Kunzea ericoides</i> s.l.	Myrtaceae	Not threatened	kanuka
<i>Lagenifera barkeri</i>	Asteraceae	Naturally Uncommon	
<i>Lagenifera cuneata</i>	Asteraceae	Not threatened	
<i>Lagenifera pinnatifida</i>	Asteraceae	Regionally Significant	
<i>Lepidosperma australe</i>	Cyperaceae	Not threatened	square sedge
<i>Leptecophylla juniperina</i> s.l.	Epacridaceae	Not threatened	prickly mingimingi
<i>Leptinella (b) (L. squalida subsp. mediana)</i>	Asteraceae	Not threatened	
<i>Leptinella pectinata</i> subsp. <i>pectinata</i>	Asteraceae	Not threatened	
<i>Leptinella pusilla</i>	Asteraceae	Not threatened	
<i>Leptospermum scoparium</i> agg.	Myrtaceae	Not threatened	manuka
<i>Leucopogon fraseri</i> complex (mountain ecotype)	Ericaceae	Not threatened	
<i>Leycesteria formosa</i>	Caprifoliaceae	Exotic	Himalayan honeysuckle
<i>Libertia ixioides</i>	Iridaceae	Not threatened	

<i>Lotus pedunculatus</i>	Fabaceae	Exotic	lotus
<i>Luzula rufa</i>	Juncaceae	Not threatened	woodrush
<i>Lycopodium fastigiatum</i>	Lycopodiaceae	Not threatened	mountain clubmoss
<i>Melicytus alpinus</i> agg.	Violaceae	Not threatened	porcupine shrub
<i>Melicytus flexuosus</i>	Violaceae	Declining	leafless mahoe
<i>Microsorium pustulatum</i>	Polypodiaceae	Not threatened	hound's tongue fern
<i>Mimulus guttatus</i>	Scrophulariaceae	Exotic	monkey musk
<i>Montia sessiliflora</i>	Portulacaceae	Not threatened	
<i>Muehlenbeckia complexa</i> agg.	Polygonaceae	Not threatened	small-leaved pohuehue
<i>Myrsine australis</i>	Myrsinaceae	Not threatened	red matipo
<i>Myrsine divaricata</i>	Myrsinaceae	Not threatened	weeping matipo
<i>Myrsine nummularia</i>	Myrsinaceae	Not threatened	
<i>Nematoceras macranthum</i>	Orchidaceae	Not threatened	silver-back spider orchid
<i>Nertera ciliata</i>	Rubiaceae	Not threatened	
<i>Olearia bullata</i>	Asteraceae	Not threatened	
<i>Oreobolus pectinatus</i>	Cyperaceae	Not threatened	comb sedge
<i>Oxalis exilis</i>	Oxalidaceae	Not threatened	creeping oxalis
<i>Oxalis magellanica</i>	Oxalidaceae	Not threatened	native oxalis
<i>Ozothamnus vauvilliersii</i>	Asteraceae	Not threatened	tauhinu
<i>Parsonsia heterophylla</i>	Apocynaceae	Not threatened	native jasmine
<i>Pentachondra pumila</i>	Epacridaceae	Not threatened	
<i>Phormium cookianum</i>	Hemerocallidaceae	Not threatened	mountain flax
<i>Pimelea oreophila</i>	Thymelaeaceae	Not threatened	alpine daphne
<i>Pimelea traversii</i>	Thymelaeaceae	Regionally Significant	
<i>Pinus</i> sp.	Pinaceae	Exotic	
<i>Pittosporum eugenioides</i>	Pittosporaceae	Not threatened	lemonwood
<i>Pittosporum tenuifolium</i>	Pittosporaceae	Not threatened	black matipo, kohuhu
<i>Plantago raoulii</i>	Plantaginaceae	Not threatened	
<i>Plantago triandra</i>	Plantaginaceae	Not threatened	
<i>Poa cita</i> agg.	Poeae	Not threatened	silver tussock
<i>Poa imbecilla</i>	Poaceaea (Poeae)	Not threatened	
<i>Polystichum neozelandicum</i> subsp. <i>zerophyllum</i>	Dryopteridaceae	Not threatened	
<i>Polystichum vestitum</i>	Dryopteridaceae	Not threatened	prickly shield fern
<i>Prasophyllum colensoi</i>	Orchidaceae	Not threatened	
<i>Prunella vulgaris</i>	Lamiaceae	Exotic	selfheal
<i>Pseudopanax</i> (c) (<i>P. colensoi</i> var. <i>ternatus</i>)	Araliaceae	Not threatened	threefinger
<i>Pseudopanax crassifolius</i>	Araliaceae	Not threatened	lancewood
<i>Pseudotsuga menziesii</i>	Pinaceae	Exotic	Douglas fir
<i>Pteridium esculentum</i>	Dennstaedtiaceae	Not threatened	bracken
<i>Ranunculus amphitrichus</i>	Ranunculaceae	Not threatened	waoriki
<i>Ranunculus foliosus</i>	Ranunculaceae	Not threatened	

<i>Ranunculus multiscapus</i>	Ranunculaceae	Not threatened	
<i>Ranunculus reflexus</i>	Ranunculaceae	Not threatened	hairy buttercup
<i>Ranunculus sceleratus</i>	Ranunculaceae	Exotic	celery-leaved buttercup
<i>Raoulia subsericea</i>	Asteraceae	Not threatened	
<i>Raukaua simplex</i>	Araliaceae	Not threatened	
<i>Rubus cissoides</i>	Rosaceae	Not threatened	bush lawyer
<i>Rumex acetosella</i>	Polygonaceae	Exotic	sheep's sorrel
<i>Sagina procumbens</i>	Caryophyllaceae	Exotic	procumbent pearlwort
<i>Sambucus nigra</i>	Caprifoliaceae	Exotic	elder
<i>Schizeilema trifoliolatum</i>	Apiaceae	Not threatened	
<i>Schoenus pauciflorus</i>	Cyperaceae	Not threatened	bog-rush
<i>Scleranthus brockiei</i>	Caryophyllaceae	Not threatened	
<i>Scleranthus uniflorus</i>	Caryophyllaceae	Not threatened	
<i>Sophora microphylla</i>	Fabaceae	Not Threatened	kowhai
<i>Stellaria parviflora</i>	Caryophyllaceae	Not threatened	New Zealand chickweed
<i>Taraxacum officinale</i>	Asteraceae	Exotic	dandelion
<i>Thelymitra longifolia</i> agg.	Orchidaceae	Not threatened	sun orchid
<i>Trifolium dubium</i>	Fabaceae	Exotic	suckling clover
<i>Trifolium pratense</i>	Fabaceae	Exotic	red clover
<i>Trifolium repens</i>	Fabaceae	Exotic	white clover
<i>Uncinia</i> sp.	Cyperaceae	Not threatened	
<i>Urtica ferox</i>	Urticaceae	Not threatened	stinging nettle, tree nettle
<i>Urtica incisa</i>	Urticaceae	Not threatened	
<i>Veronica serpyllifolia</i>	Scrophulariaceae	Exotic	turf speedwell
<i>Viola cunninghamii</i>	Violaceae	Not threatened	
<i>Viola filicaulis</i>	Violaceae	Not threatened	
<i>Wahlenbergia albomarginata</i> subsp. <i>albomarginata</i>	Campanulaceae	Not threatened	harebell
<i>Wahlenbergia rupestris</i>	Campanulaceae	Not threatened	

APPENDIX 3

Map 1 – Locations of ‘At Risk’ plants



Legend
● 'At Risk' Plants

Map 1
**Locations of 'At Risk' plants on
Glencoe Pastoral Lease**

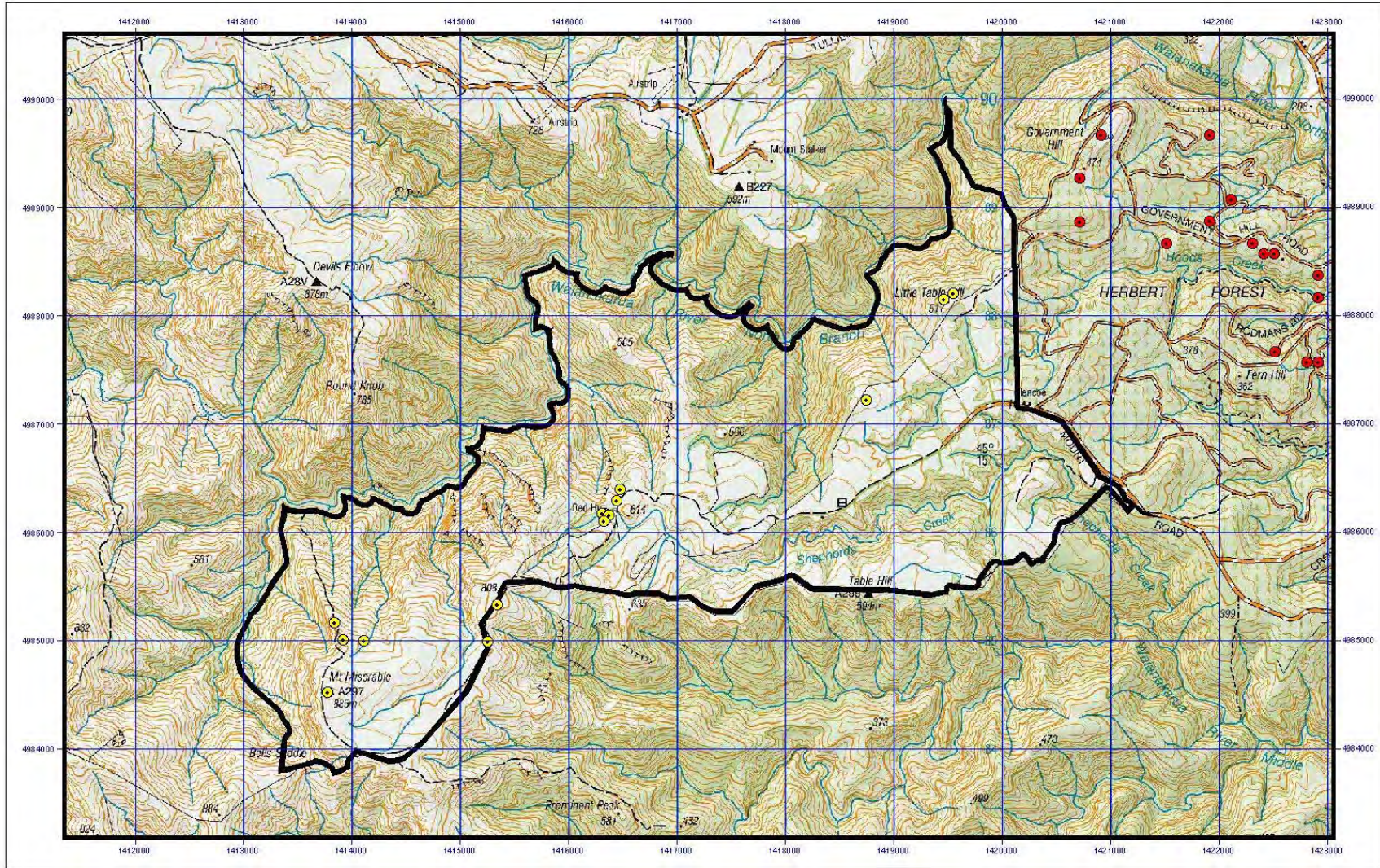
0 1.25 2.5 Kilometres

Department of Conservation
Te Papa Ataturu

New Zealand Government

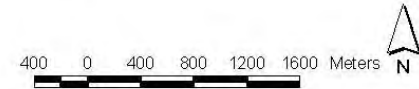
APPENDIX 4

Figure 1 - Historic Resources Map



- Historic NZAA sites
- Historic points

Figure 1
Historic resources on Glencoe Pastoral Lease



APPENDIX 5

Historic Photos – Plates 1-15



Plate1. Umu located on Little Table Hill at GPS 100. View south west to Brian Allingham within the umu.

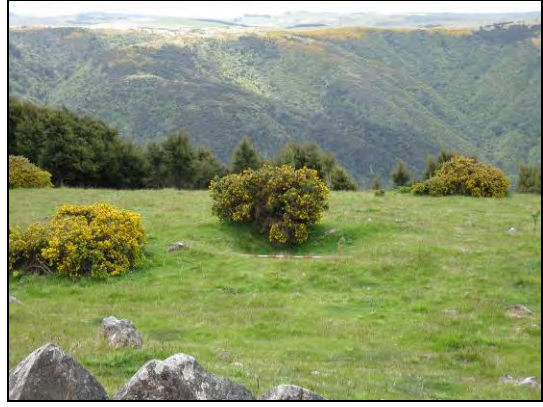


Plate 2. Umu located on Little Table Hill at GPS 100. View north.



Plate 3. Celimisia daisy's on north east facing slope of Mt. Miserable at GPS 095. View north. (Photo by Brian Allingham 2009).



Plate 4. Red Hut site at GPS 084. View south.



Plate 5. Back view of Red Hut. View north.



Plate 6. View of the concrete block chimney. View west.



Plate 7. Internal view of bedroom.



Plate 8. Internal view of fireplace.



Plate 9. Concrete lined trench marked by the ranging pole below Red Hut.



Plate 10. Concrete pad located below Red Hut.



Plate 12. 19th century post, wire, and flat standard

Plate 11. Metal chimney flue located above Red hut at fence line striking north at GPS 097. View north.
GPS 096. View south.



Plate 13. Remnant 19th century post, wire and flat standard fence line at GPS 101. View north east.



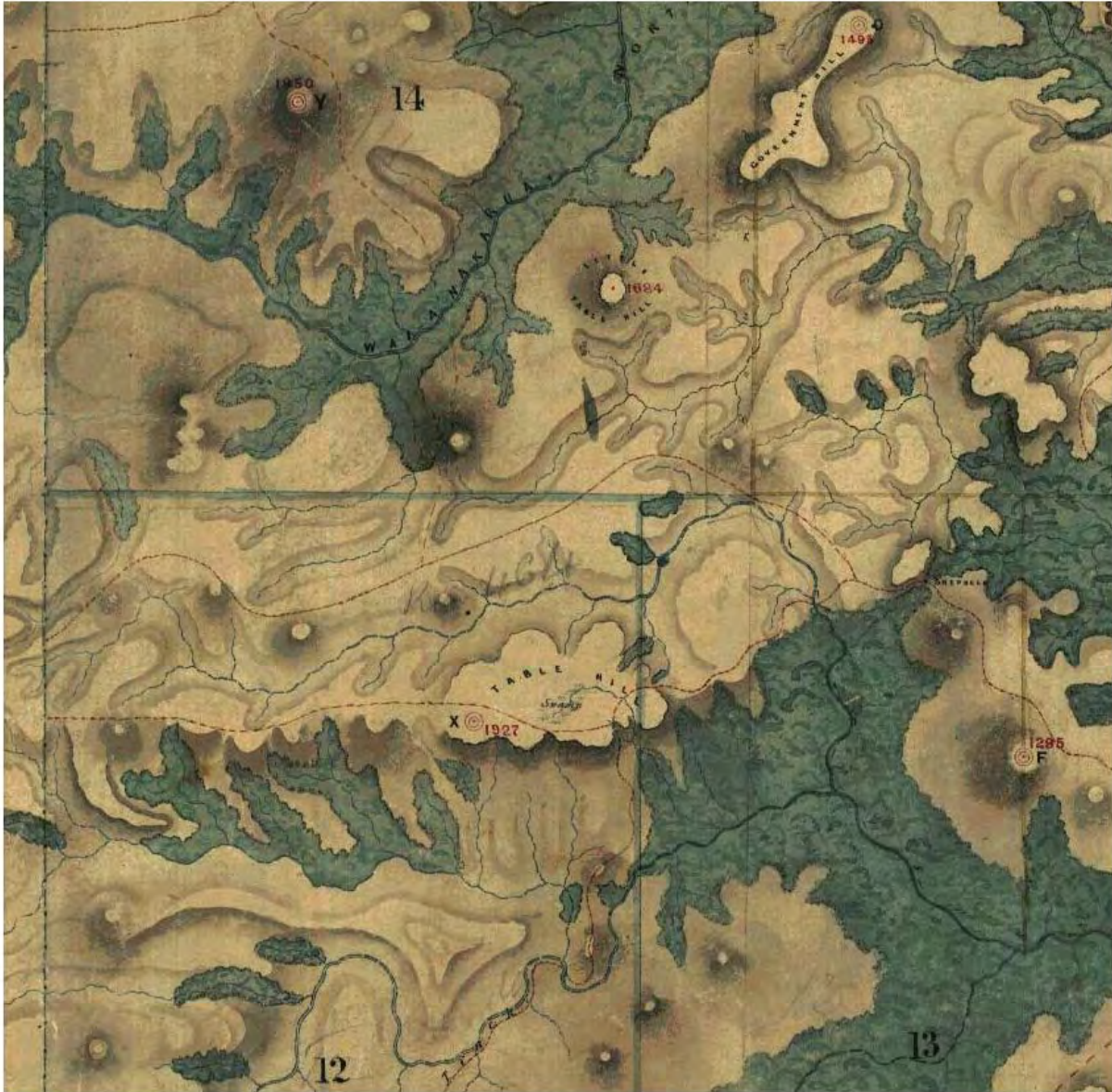
Plate 14. Trig station E on Mt. Miserable at GPS 091.



Plate 15. Trig station X on Table Hill at GPS 091 (photo by John Barkla).

APPENDIX 6

Survey Plan SO1349 Dated to December 1861



Close up of Survey Office Plan SO 1349 dated to December 1861 (QuickMap: Land Information New Zealand)