

Crown Pastoral Land Tenure Review

Lease name : LAUDER

Lease number : PO 376

Conservation Resources Report - Part 4

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.

September 06

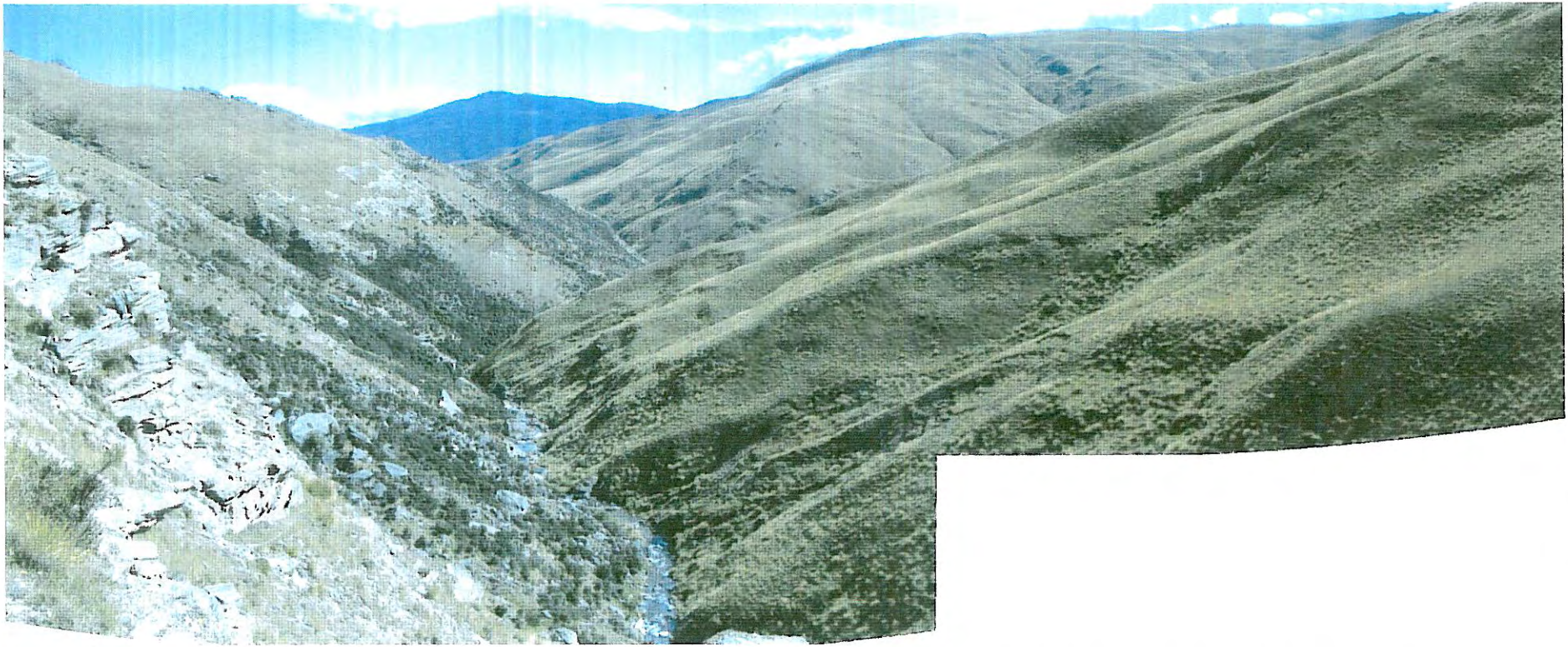


Figure 11 Looking south and west into Lauder Creek from approximately GR NZMS 260 G41 434 868. Extensive areas of shrubland are present in the lower reaches of Lauder Creek.



Figure 12 Lauder Basin area looking toward north boundary. Lauder Creek lies in the gully in the mid ground of the picture. A formed track on the ridge of the Dunstan Mountains traverses the ridge to the rear of the picture.



Figure 13 Looking east to south into a major upper tributary on the true right of Lauder Creek and towards the Lauder Basin Conservation Area from the Lauder/Cluden boundary at approximately GR NZMS 260 G40 433905. A track along this ridge extends beyond the lease in both directions, giving access to the wider Dunstan Mountains.



Figure 14 Close up of ground cover on Lauder/Cluden boundary at approximately GR NZMS 260 G41 399 863. Lower photo shows fence below the lease boundary.



Figure 15 Close up of ground cover on Lauder/Cluden boundary at approximately GR NZMS 260 G41 406 857



Figure 16 Gold workings east of Lauder Station Road at approximately GRNZMS 260 H41 923810.

4.4 Appendices

Appendix One	Land Environments of New Zealand Environment Descriptions
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APPENDIX ONE Land Environments of New Zealand Unit Descriptions

From: Leathwick J, Morgan F, Wilson G, Rutledge D, McLeod M, Johnston K. (2002) Land Environments of New Zealand : Technical Guide. Ministry for the Environment

Environment	Level III Descriptions	Level IV variations (if any)
N3.1d	Elevation 300 m Located in Otago, Timaru, Oamaru on undulating plains. 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.	
N3.2a	Elevation 535 m Located in inland Otago on undulating plains. Cool temperatures, moderate solar radiation, moderate vapour pressure deficits, moderate annual water deficits. Imperfectly drained soils of moderate fertility from Tertiary mudstones and sandstones with gravels.	
N4.1d	Elevation of 495m in Central Otago, Alexandra and Lake Waitaki on rolling lower hillslopes and basin floors. Cool temperatures, moderate solar radiation, moderate vapour pressure deficits, very low monthly water balance ratios, moderate annual water deficits. Well drained soils drained of moderate fertility from schist and greywacke.	d. warmer winter temperatures, steep hills
N5.1a N5.1b	Elevation 425m around Ranfurly and Wanaka. On very gently undulating plains. Cool temperatures, moderate solar radiation, high vapour pressure deficits, very high annual water deficits. Imperfectly drained soils of moderate fertility from a mixture of colluvium and loess from greywacke and schist.	b. Cooler winter temperatures, imperfect drainage.
Q1.1a Q1.1b Q1.1c	Elevation 1095 m Located in Hawkdun Range, Grampian Mountains and Hunter Hills, Eyre and Harris Mountains South Canterbury, ranges of inland Otago. Steep mountains. Cold temperatures, moderate solar radiation, low vapour pressure deficits, low monthly water balance ratios, slight annual water deficits. Soils are well drained and of moderate, fertility from greywacke, schist.	a. much cooler temperatures, lower vapour pressure deficits, strongly rolling mountainous terrain. b. As for Q1.1 c. very steep mountainous terrain.
Q1.2a	Elevation 1305 m Located in the Eyre and Harris Mountains , ranges of inland Otago, Takitimu Mountains. Very Steep mountains. Very cold temperatures, moderate solar radiation, low vapour pressure deficits, intermediate monthly water balance ratios, no annual water deficits. Soils are well drained and of moderate, fertility from greywacke, rock, colluvium and basalt.	
Q2.2a	Elevation 730 m Located in the Hawkdun Range, Grampian Mountains and Hunter Hills in South Canterbury, Takitimu mountains, southern end of the Two Thumb Range. Steep mountains. Cool temperatures, moderate solar radiation, moderate vapour pressure deficits, low monthly water balance ratios, low annual water deficits. Soils are imperfectly drained and of moderate fertility from schist	

Environment	Level III Descriptions	Level IV variations (if any)
<p>Q3.3a Q3.3b Q3.3c</p>	<p>Elevation 990 m Located in the Garvie Mountains and the North Rough, Knobby, Lammerlaw and Rock and Pillar Ranges. Undulating mountains. Cold temperatures, moderate solar radiation, moderate vapour pressure deficits, low monthly water balance ratios, low annual water deficits. Soils are imperfectly drained and of moderate fertility from schist</p>	<p>a. much cooler annual temperatures, lower vapour pressure deficits, higher monthly water balance ratios, much lower annual water deficits. b. warmer annual temperatures, cooler winter temperatures, higher vapour pressure deficits, lower monthly water balance ratios, much higher annual water deficits. c. much lower annual water deficits.</p>

APPENDIX TWO Lauder Pastoral Lease Botanical Species List January 2006

	Abundance at site	Notes	Threat ranking	Common name	Family
Gymnosperms					
<i>Podocarpus totara</i> var. <i>totara</i>	Rare	Spur above Woolshed Creek	Not threatened	totara	Podocarpaceae
<i>Podocarpus nivalis</i>	Local	Bluff shrublands	Locally Notable	snow totara	Podocarpaceae
Dicotyledonous trees, shrubs and vines					
<i>Acrothamnus colensoi</i> (ex. <i>Leucopogon colensoi</i> /L. <i>suaveolens</i>)	Occasional	Higher elevations	Not threatened		Ericaceae
<i>Aristotelia fruticosa</i>	Rare	Shrublands	Not threatened	small-leaved wineberry	Elaeocarpaceae
<i>Carmichaelia crassicaule</i>	Local	Several sites	Gradual Decline	coral broom	Fabaceae
<i>Carmichaelia petriei</i>	Occasional	Lower elevations	Not threatened		Fabaceae
<i>Carmichaelia vexillata</i>	Local	Saddle fellfield	Serious Decline		Fabaceae
<i>Clematis marata</i>	Local	Shrublands	Not threatened		Ranunculaceae
<i>Coprosma cheesemanii</i>	Local	Bluff shrublands	Not threatened		Rubiaceae
<i>Coprosma fowerakeri</i>	Rare	Bluff shrublands	Not threatened		Rubiaceae
<i>Coprosma propinqua</i> subsp. "propinqua"	Local	Shrublands	Not threatened		Rubiaceae
<i>Coprosma tayloriae</i> (ex <i>Coprosma "taylorae"</i> (<i>C. parviflora</i> var. <i>dumosa</i> , <i>C. sp. (t)</i> , <i>C. sp. 27</i>) in part)	Rare	Bluff shrublands	Not threatened		Rubiaceae
<i>Coriaria plumosa</i>	Rare	Lauder Creek	Not threatened	feathery tutu	Coriariaceae
<i>Coriaria sarmentosa</i>	Local	Lauder Creek	Not threatened	tutu	Coriariaceae
<i>Corokia cotoneaster</i> agg.	Rare	Bluff shrublands	Not threatened	corokia	Cornaceae
<i>Cytisus scoparius</i>	Local	Flats	Exotic	broom	Fabaceae
<i>Discaria toumatou</i>	Common	Lower elevations	Not threatened	matagouri	Rhamnaceae
<i>Dracophyllum muscoides</i>	Local	Fellfield	Not threatened	prostrate inaka	Epacridaceae
<i>Dracophyllum pronum</i>	Local	Rocky sites at higher elevations	Not threatened		Epacridaceae
<i>Dracophyllum uniflorum</i> var. <i>uniflorum</i>	Local	Lauder Creek	Not threatened	turpentine scrub	Epacridaceae
<i>Gaultheria crassa</i>	Local	Tors	Not threatened	snowberry	Ericaceae
<i>Gaultheria depressa</i> var. <i>depressa</i>	Occasional	Rocky sites at higher elevations	Not threatened	snowberry	Ericaceae
<i>Gaultheria depressa</i> var. <i>novae-zelandiae</i>	Rare	Tors	Not threatened	snowberry	Ericaceae

	Abundance at site	Notes	Threat ranking	Common name	Family
<i>Hebe buchananii</i>	Local	Rocky sites at higher elevations	Not threatened		Plantaginaceae (ex. Scrophulariaceae)
<i>Hebe lycopodioides</i> subsp. "lycopodioides"	Rare	Tussockland	Not Threatened		Plantaginaceae (ex. Scrophulariaceae)
<i>Hebe rakaiensis</i>	Rare	Streamsides	Not threatened		Plantaginaceae (ex. Scrophulariaceae)
<i>Hebe salicifolia</i>	Rare	Woolshed Creek	Not threatened	koromiko	Plantaginaceae (ex. Scrophulariaceae)
<i>Kunzea ericoides</i> s.l.	Common	Woolshed and Donald Stuarts Creeks. On dry spurs and faces	Locally Notable	kanuka	Myrtaceae
<i>Leycesteria formosa</i>	Rare	One plant on bluff in Lauder Creek	Exotic	Himalayan honeysuckle	Caprifoliaceae
<i>Melicytus</i> aff. <i>alpinus</i> (erect)	Occasional	Throughout	Not threatened	porcupine shrub	Violaceae
<i>Muehlenbeckia australis</i>	Local	Woolshed Creek	Not threatened	large-leaved pohuehue	Polygonaceae
<i>Muehlenbeckia axillaris</i>	Local	Streamsides, tailings	Not threatened		Polygonaceae
<i>Muehlenbeckia complexa</i> agg.	Occasional	Lower elevations	Not threatened	small-leaved pohuehue	Polygonaceae
<i>Myrsine nummularia</i>	Local	Bluff shrublands	Not threatened		Myrsinaceae
<i>Olearia bullata</i>	Local	Woolshed Creek	Not threatened		Asteraceae
<i>Olearia fimbriata</i>	Rare	One location	Serious Decline		Asteraceae
<i>Olearia fragrantissima</i>	Rare	One plant in Lauder Creek	Sparse	fragrant tree daisy	Asteraceae
<i>Olearia lineate</i>	Local	Woolshed Creek	Sparse		Asteraceae
<i>Olearia odorata</i>	Local	Shrublands	Not threatened		Asteraceae
<i>Ozothamnus leptophyllus</i> (<i>Cassinia fulvida</i>)	Occasional	Throughout	Not threatened	tauhinau	Asteraceae
<i>Parsonsia capsularis</i>	Rare	Woolshed Creek	Not threatened	native jasmine	Apocynaceae
<i>Pimelea oreophila</i> (green, bushy form = <i>P.</i> "eastern South Island"?)	Occasional	Higher elevations	Not threatened		Thymeleaceae
<i>Populus nigra</i>	Local	Woolshed Creek. Seedlings present	Exotic	Lombardy poplar	Salicaceae
<i>Rosa rubiginosa</i>	Common	Lower elevations	Exotic	sweet briar	Rosaceae
<i>Rubus schmidelioides</i> var. <i>subpauperatus</i>	Local	Shrublands	Not threatened	bush lawyer	Rosaceae
<i>Sambucus nigra</i>	Occasional	Lower elevations	Exotic	elder	Caprifoliaceae
<i>Solanum dulcamara</i>	Rare	Shrublands	Exotic	bittersweet	Solanaceae
<i>Ulex europaeus</i>	Local	Flats	Exotic	gorse	Fabaceae

	Abundance at site	Notes	Threat ranking	Common name	Family
Dicotyledonous herbs (including composites)					
<i>Epilobium macropus</i>	Local	Streamsides	Not Threatened		Onagraceae
<i>Epilobium melanocaulon</i>	Rare	Streamsides	Not threatened		Onagraceae
<i>Epilobium microphyllum</i>	Local	Streamsides	Not threatened		Onagraceae
<i>Epilobium pubens</i>	Local	Tors	Not threatened		Onagraceae
<i>Epilobium rotundifolium</i>	Local	Streamsides	Not threatened		Onagraceae
<i>Erodium cicutarium</i>	Local	Tailings	Exotic	storksbill	Geraniaceae
<i>Euchiton audax</i>	Rare	Tussockland	Not Threatened		Asteraceae
<i>Euchiton lateralis</i>	Local	Wetlands	Not threatened		Asteraceae
<i>Euphrasia zelandica</i> agg.	Occasional	Higher elevations	Not threatened		Orobanchaceae
<i>Galium aparine</i>	Rare	Woolshed Creek	Exotic	cleavers	Rubiaceae
<i>Galium propinquum</i>	Local	Tor bases	Not threatened	mawe	Rubiaceae
<i>Galium</i> sp. aff. <i>Perpusillum</i>	Local	Wetlands	Not threatened		Rubiaceae
<i>Gaultheria parvula</i>	Local	Wetlands	Not threatened		Ericaceae
<i>Gentianella grisebachii</i>	Rare	Wetlands	Not threatened		Gentianaceae
<i>Geranium microphyllum</i>	Occasional	Higher elevations	Not threatened		Geraniaceae
<i>Geranium sessiliflorum</i> subsp. <i>novaezelandiae</i> var. <i>novaezelandiae</i>	Occasional	Dry areas	Not threatened		Geraniaceae
<i>Geum leiospermum</i>	Local	Tor bases	Not threatened		Rosaceae
<i>Gratiola sexdentata</i>	Rare	Tarn	Locally Notable		Plantaginaceae (ex. Scrophulariaceae)
<i>Hectorella caespitosa</i>	Local	Fellfield	Not threatened		Portulacaceae
<i>Helichrysum filicaule</i>	Occasional	Lower elevations	Not threatened		Asteraceae
<i>Helichrysum intermedium</i>	Local	Bluffs	Not threatened		Asteraceae
<i>Hieracium aurantiacum</i>	Rare	One locality	Exotic	orange hawkweed	Asteraceae
<i>Hieracium lepidulum</i>	Occasional	Throughout	Exotic	tussock hawkweed	Asteraceae
<i>Hieracium pilosella</i> subsp. <i>Pilosella</i>	Common	Particularly at lower elevations	Exotic	mouse-eared hawkweed	Asteraceae
<i>Hieracium praealtum</i>	Local	Lauder Creek	Exotic	king devil	Asteraceae
<i>Hydrocotyle "montana"</i>	Occasional	Throughout	Not Threatened		Apiaceae
<i>Hypericum perforatum</i>	Occasional	Dry areas	Exotic	St John's wort	Clusiaceae
<i>Hypochoeris radicata</i>	Occasional	Throughout	Exotic	catsear	Asteraceae
<i>Hypsela rivalis</i>	Local	Montane wetlands	Not threatened		Campanulaceae
<i>Kelleria croizatii</i>	Local	Cushionfield	Not threatened		Thymeleaceae
<i>Kelleria dieffenbachii</i>	Occasional	Fellfield	Not threatened		Thymeleaceae
<i>Kirkianella novae-zelandiae</i> f. <i>novae-zelandiae</i>	Rare	Several sites	Sparse		Asteraceae

	Abundance at site	Notes	Threat ranking	Common name	Family
<i>Lagenifera barkeri</i>	Local	Streamsides	Not threatened		Asteraceae
<i>Lapsana communis</i>	Rare	Lower elevations	Exotic	nipplewort	Asteraceae
<i>Leptinella</i> "seep"	Local	Montane wetlands	Unknown		Asteraceae
<i>Leptinella pectinata</i> subsp. <i>Villosa</i>	Local	Tor bases	Not threatened		Asteraceae
<i>Leptinella pusilla</i> (<i>Cotula perpusilla</i>)	Local	Tor bases	Not threatened		Asteraceae
<i>Leptinella squalida</i> subsp. <i>Mediana</i>	Rare	Bluffs	Not threatened		Asteraceae
<i>Leptostigma setulosa</i> (ex. <i>Nertera setulosa</i>)	Local	wet areas	Not threatened		Rubiaceae
<i>Leucopogon fraseri</i> complex (mountain ecotype)	Occasional	Throughout	Not threatened		Ericaceae
<i>Linum catharticum</i>	Occasional	Lower elevations	Exotic	purging flax	Linaceae
<i>Lobelia linnaeoides</i>	Rare	Tussockland	Not Threatened		Lobeliaceae
<i>Malva neglecta</i>	Local	Tailings	Exotic	dwarf mallow	Malvaceae
<i>Mentha cunninghamii</i>	Rare	Streamsides	Not threatened	NZ mint	Lamiaceae
<i>Mimulus moschatus</i>	Local	wet areas	Exotic	musk	Scrophulariaceae
<i>Montia fontana</i> subsp. <i>Fontana</i>	Local	wet areas	Exotic	blinks	Portulacaceae
<i>Mycelis muralis</i>	Local	Shrublands	Exotic	wall lettuce	Asteraceae
<i>Myosotis</i> "drucei" (<i>M.</i> <i>pygmaea</i> var. <i>drucei</i>)	Rare	One locality	Regionally Significant	Druce's forget- me-not	Boraginaceae
<i>Myosotis</i> "glauca" (<i>M.</i> <i>pygmaea</i> var. <i>glauca</i>)	Local	Several sites	Endangered	Kaimanawa forget-me-not	Boraginaceae
<i>Myosotis</i> aff. <i>australis</i> (AK 231051; "small white")	Local	Shady cliff bases in Lauder Creek	Sparse		Boraginaceae
<i>Myosotis arvensis</i>	Rare	Tussockland	Exotic	field forget-me- not	Boraginaceae
<i>Myosotis elderi</i> s.s. agg.	Rare	Two sites in fellfield	Locally Notable		Boraginaceae
<i>Myosotis laxa</i>	Local	wet areas	Exotic	water forget- me-not	Boraginaceae
<i>Myosotis oreophila</i>	Local	Saddle fellfield	Range Restricted		Boraginaceae
<i>Myriophyllum</i> <i>propinquum</i>	Local	Tarn	Not threatened		Haloragaceae
<i>Navarretia squarrosa</i>	Local	Tailings	Exotic	Californian stinkweed	Polemoniaceae
<i>Neopaxia sessiliflora</i> (Garvie, Dunstan form)? Or <i>N.</i> <i>sessiliflora</i> s.s.	Local	Rocky sites at higher elevations and damp turfs	Not threatened		Portulacaceae
<i>Oreomyrrhis</i> "bog"	Local	Wetlands	Unknown		Umbelliferae
<i>Oreomyrrhis colensoi</i> var. <i>colensoi</i>	Occasional	Tussockland	Not threatened		Umbelliferae
<i>Oreomyrrhis ramosa</i> s.l.	Local	Tor bases	Not threatened		Umbelliferae
<i>Ourisia caespitosa</i> var. <i>gracilis</i>	Local	Streamsides	Not threatened		Scrophulariaceae

	Abundance at site	Notes	Threat ranking	Common name	Family
<i>Ourisia glandulosa</i>	Local	Higher elevations	Not threatened		Scrophulariaceae
<i>Oxalis exilis</i>	Occasional	Lower elevations	Not threatened	native yellow-flowered oxalis	Oxalidaceae
<i>Pachycladon cheesemanii</i>	Rare	Overhangs	Gradual Decline		Brassicaceae
<i>Pachycladon novae-zelandiae</i>	Local	Tors and fellfield	Not Threatened		Brassicaceae
<i>Pentachondra pumila</i>	Occasional	Higher elevations	Not threatened		Epacridaceae
<i>Phyllachne colensoi</i>	Local	Cushionfield	Not threatened		Stylidiaceae
<i>Phyllachne rubra</i>	Local	Cushionfield	Not threatened		Stylidiaceae
<i>Plantago lanigera</i>	Local	Snowbanks and wetland margins	Not threatened	hairy swamp plantain	Plantaginaceae
<i>Plantago triandra</i> subsp. <i>Triandra</i>	Local	Wetlands	Not threatened		Plantaginaceae
<i>Polygonum aviculare</i>	Local	Tailings	Exotic	wireweed	Polygonaceae
<i>Pratia angulata</i>	Local	Streamsides	Not threatened		Campanulaceae
<i>Pratia macrodon</i> s.s.	Rare	Higher elevations	Not threatened		Campanulaceae
<i>Prunella vulgaris</i>	Local	Damp sites	Exotic	selfheal	Lamiaceae
<i>Pseudognaphalium</i> "inland" (ex. <i>P. luteo-album</i> in part)	Local	Overhangs	Not threatened		Asteraceae
<i>Psychrophila obtusa</i> (<i>Caltha obtusifolia</i>)	Local	Wetlands	Not Threatened	White caltha	Ranunculaceae
<i>Ranunculus brevis</i>	Rare	Tarn. Southern extension of known range	Range Restricted		Ranunculaceae
<i>Ranunculus foliosus</i>	Local	Streamsides	Not threatened		Ranunculaceae
<i>Ranunculus gracilipes</i>	Local	Wetlands	Not threatened		Ranunculaceae
<i>Ranunculus maculatus</i>	Local	Wetlands	Sparse		Ranunculaceae
<i>Ranunculus multiscapus</i> (ex. <i>R. lappaceus</i>)	Local	Tor bases	Not threatened		Ranunculaceae
<i>Ranunculus trichophyllus</i>	Local	Coal pit	Exotic	water buttercup	Ranunculaceae
<i>Raoulia apice-nigra</i>	Occasional	Dry areas	Not threatened	scabweed	Asteraceae
<i>Raoulia australis</i> s.s.	Local	Dry areas	Not threatened	scabweed	Asteraceae
<i>Raoulia grandiflora</i>	Occasional	Higher elevations	Not threatened		Asteraceae
<i>Raoulia parkii</i>	Local	Dry areas	Not Threatened	Celadon mat daisy	Asteraceae
<i>Raoulia subsericea</i>	Occasional	Throughout	Not threatened		Asteraceae
<i>Raoulia tenericaulis</i>	Local	Streamsides	Not threatened	scabweed	Asteraceae
<i>Rorippa microphyllum</i>	Local	wet areas	Exotic	watercress	Brassicaceae
<i>Rumex acetosella</i>	Common	Throughout	Exotic	sheep's sorrel	Polygonaceae
<i>Rumex obtusifolius</i>	Rare	Woolshed Creek	Exotic	broad-leaved dock	Polygonaceae
<i>Sagina procumbens</i>	Occasional	Damp sites	Exotic	procumbent pearlwort	Caryophyllaceae
<i>Schizeilema exiguum</i>	Rare	Fellfield	Not threatened		Umbelliferae
<i>Schizeilema haastii</i> var. <i>cyanopetalum</i>	Local	Tor bases	Not Threatened		Umbelliferae
<i>Schizeilema hydrocotyloides</i>	Local	Fellfield	Not Threatened		Apiaceae

	Abundance at site	Notes	Threat ranking	Common name	Family
<i>Schizeilema trifoliatum</i>	Rare	Overhangs	Not threatened		Umbelliferae
<i>Scleranthus brockiei</i>	Occasional	Throughout	Not threatened		Caryophyllaceae
<i>Scleranthus uniflorus</i>	Occasional	Dry areas	Not threatened		Caryophyllaceae
<i>Senecio "discoideus"</i> (<i>S. glaucophyllus</i> subsp. <i>Discoideus</i>)	Rare	Bluffs	Locally Notable		Asteraceae
<i>Senecio jacobea</i>	Local	Woolshed Creek	Exotic	ragwort	Asteraceae
<i>Spergularia media</i>	Local	Dry areas	Not threatened		Caryophyllaceae
<i>Stellaria alsine</i>	Local	wet areas	Exotic	bog stitchwort	Caryophyllaceae
<i>Stellaria gracilentia</i>	Local	Tors	Not threatened		Caryophyllaceae
<i>Stellaria media</i>	Occasional	Lower elevations	Exotic	chickweed	Caryophyllaceae
<i>Stellaria parviflora</i>	Rare	Tor bases	Not threatened	New Zealand chickweed	Caryophyllaceae
<i>Taraxacum officinale</i>	Occasional	Throughout	Exotic	dandelion	Asteraceae
<i>Trifolium arvense</i>	Occasional	Lower elevations	Exotic	haresfoot trefoil	Fabaceae
<i>Trifolium dubium</i>	Occasional	Lower elevations	Exotic	suckling clover	Fabaceae
<i>Trifolium glomeratum</i>	Local	Tailings	Exotic	clustered clover	Fabaceae
<i>Trifolium repens</i>	Occasional	Throughout	Exotic	white clover	Fabaceae
<i>Urtica incise</i>	Local	Overhangs	Not threatened		Urticaceae
<i>Verbascum thapsus</i>	Occasional	Lower elevations	Exotic	woolly mullein	Scrophulariaceae
<i>Viola cunninghamii</i>	Occasional	Tussockland	Not threatened		Violaceae
<i>Viola lyallii</i>	Rare	Boulderfields	Not threatened		Violaceae
<i>Vittadinia australis</i> agg.	Local	Dry areas	Data Deficient	white fuzzweed	Asteraceae
<i>Wahlenbergia albomarginata</i> subsp. <i>Albomarginata</i>	Occasional	Throughout	Not threatened	harebell	Campanulaceae
Grasses					
<i>Agrostis capillaris</i>	Common	Lower elevations	Exotic	browntop	Agrostidinae
<i>Agrostis muelleriana</i>	Occasional	Higher elevations	Not threatened		Agrostidinae
<i>Agrostis muscosa</i>	Local	Snowbanks	Not threatened	pincushion grass	Agrostidinae
<i>Agrostis pallescens</i> (A. "Dunstan"?)	Local	Wetlands	Unknown		Agrostidinae
<i>Aira caryophyllea</i> subsp. <i>caryophyllea</i>	Local	Dry areas	Exotic	silvery hair grass	Aveninae
<i>Anthoxanthum odoratum</i>	Common	Lower elevations	Exotic	sweet vernal	Phalaridinae
<i>Bromus hordeaceus</i>	Local	Dry areas	Exotic	soft brome	Bromeae
<i>Chionochloa macra</i>	Common	Above c. 1200m	Not threatened	slim snow tussock	Danthoniinae
<i>Chionochloa rigida</i> subsp. <i>Rigida</i>	Abundant	Below c. 1200m	Not threatened	narrow-leaved snow-tussock	Danthoniinae
<i>Cortaderia richardii</i>	Local	Streamside	Not threatened	South Island toetoe	Cortaderiinae
<i>Critesion murinum</i> subsp.	Local	Dry areas	Exotic	barley grass	Hordeae
<i>Cynosurus cristatus</i>	Occasional	Lower elevations	Exotic	crested dogstail	Poeae
<i>Dactylis glomerata</i>	Local	Lower elevations	Exotic	cocksfoot	Poeae
<i>Elymus solandri</i>	Occasional	Throughout	Not threatened		Hordeae

	Abundance at site	Notes	Threat ranking	Common name	Family
<i>Festuca matthewsii</i> subsp. <i>pisamontis</i>	Local	Fellfield	Range Restricted		Poeae
<i>Festuca novae-zelandiae</i>	Common	Lower elevations	Not threatened	hard tussock	Poeae
<i>Festuca rubra</i> subsp. <i>Commutate</i>	Rare	Wetlands	Exotic	Chewings fescue	Poeae
<i>Glyceria fluitans</i>	Local	Tailing ponds	Exotic	floating sweet grass	Meliceae
<i>Hierochloe redolens</i>	Rare	Lauder Stream	Not threatened	scented holy grass	Phalaridinae
<i>Holcus lanatus</i>	Occasional	Lower elevations	Exotic	Yorkshire fog	Aveninae
<i>Koeleria cheesemanii</i>	Occasional	Higher elevations	Not threatened		Aveninae
<i>Koeleria novozelandica</i>	Rare	Rocky sites at higher elevations	Not threatened		Aveninae
<i>Lolium perenne</i>	Occasional	Lower elevations	Exotic	perennial ryegrass	Poeae
<i>Poa cita</i> agg.	Local	Lower elevations	Not threatened	silver tussock	Poeae
<i>Poa colensoi</i> s.l.	Common	Throughout	Not threatened	blue tussock	Poeae
<i>Poa imbecilla</i>	Local	Overhangs	Not threatened		Poeae
<i>Poa lindsayi</i>	Occasional	Higher elevations	Not threatened		Poeae
<i>Poa maniatoto</i>	Local	Dry areas	Not threatened	desert poa	Poeae
<i>Poa matthewsii</i>	Local	Overhangs	Not Threatened		Poeae
<i>Rytidosperma australe</i>	Local	Cushionfield and snowbanks	Not threatened		Danthoniinae
<i>Rytidosperma buchananii</i>	Occasional	Rocky sites at higher elevations	Not threatened		Danthoniinae
<i>Rytidosperma pumilum</i>	Local	Rocky sites at higher elevations	Not threatened		Danthoniinae
<i>Rytidosperma pumilum</i>	Occasional	Cushionfield	Not threatened		Danthoniinae
<i>Rytidosperma unarede</i>	Local	Tor bases	Not threatened	cliff fairy grass	Danthoniinae
<i>Trisetum lepidum</i>	Rare	Overhangs	Not threatened		Aveninae
Rushes and Sedges					
<i>Carex berggrenii</i>	Rare	Wetlands	Sparse		Cyperaceae
<i>Carex breviculmis</i>	Occasional	Dry sites	Not threatened		Cyperaceae
<i>Carex buchananii</i>	Rare	Streamsides	Not threatened		Cyperaceae
<i>Carex comans</i>	Rare	Woolshed Creek	Not Threatened		Cyperaceae
<i>Carex coriacea</i>	Local	Wetlands	Not threatened		Cyperaceae
<i>Carex guadichaudiana</i>	Local	Wetlands	Not threatened		Cyperaceae
<i>Carex hectorii</i> (small; dry cushion field)	Rare	Fellfield	Unknown		Cyperaceae
<i>Carex kaloides</i>	Rare	Two sites in Woolshed Creek	Not threatened		Cyperaceae
<i>Carex lachenalii</i> subsp. <i>Parkeri</i>	Local	Wetlands	Not threatened		Cyperaceae
<i>Carex ovalis</i>	Rare	Wetlands	Exotic	oval sedge	Cyperaceae
<i>Carex petriei</i>	Local	Woolshed Creek	Not threatened		Cyperaceae
<i>Carex wakatipu</i> agg.	Occasional	Higher elevations	Not threatened		Cyperaceae
<i>Eleocharis acuta</i>	Local	Coal pit and Tarn	Not threatened	sharp spike-sedge	Cyperaceae

	Abundance at site	Notes	Threat ranking	Common name	Family
<i>Eleocharis gracilis</i>	Local	Wet sites	Not threatened	slender spike-sedge	Cyperaceae
<i>Isolepis aucklandicus</i>	Rare	Wetlands	Not threatened		Cyperaceae
<i>Juncus articulatus</i>	Local	Wet sites	Exotic	jointed rush	Juncaceae
<i>Juncus effuses</i>	Local	Wet sites	Exotic	soft rush	Juncaceae
<i>Juncus pusillus</i>	Local	Wetlands	Not Threatened		Juncaceae
<i>Luzula banksiana</i> var. <i>rhadina</i>	Local	Tors	Not threatened		Juncaceae
<i>Luzula leptophylla</i>	Occasional	Rocky sites	Not threatened	woodrush	Juncaceae
<i>Luzula picta</i> var.	Local	Tor bases	Not threatened	woodrush	Juncaceae
<i>Luzula pumila</i>	Local	Wetlands	Not threatened	woodrush	Juncaceae
<i>Luzula rufa</i> var. <i>rufa</i>	Occasional	Throughout	Not threatened	woodrush	Juncaceae
<i>Oreobolus pectinatus</i>	Local	Wetlands	Not threatened	comb sedge	Cyperaceae
<i>Schoenus pauciflorus</i> "short"	Local	Wetlands	Not threatened	bog-rush	Cyperaceae
<i>Uncinia fuscovaginata</i>	Occasional	Higher elevations	Not threatened		Cyperaceae
<i>Uncinia viridis</i>	Rare	Overhangs	Sparse		Cyperaceae
Monocotyledons (other)					
<i>Bulbinella angustifolia</i>	Common	Throughout	Not threatened	maori onion	Liliaceae
"Lemna minor"	Local	Wet sites	Not threatened	duckweed	Lemnaceae
<i>Microtis</i> aff. <i>unifolia</i> (smaller, flws more spaced)	Rare	Lauder Stream	Not threatened		Orchidaceae
<i>Phormium cookianum</i> subsp. <i>Cookianum</i>	Local	Tors	Not threatened	mountain flax	Agavaceae
<i>Potamogeton cheesemanii</i>	Local	Coal pit	Not threatened	pondweed	Potamogetonaceae
<i>Potamogeton crispus</i>	Local	Coal pit	Exotic	curled pondweed	Potamogetonaceae
<i>Prasophyllum colensoi</i> s.s.	Occasional	Throughout	Not threatened		Orchidaceae
Ferns and Allies					
<i>Asplenium flaccidum</i> subsp. <i>Flaccidum</i>	Rare	Shrublands	Not threatened	hanging spleenwort	Aspleniaceae
<i>Asplenium hookerianum</i>	Rare	Lower elevations	Not threatened	Hooker's spleenwort	Aspleniaceae
<i>Asplenium richardii</i>	Occasional	Tors	Not threatened		Aspleniaceae
<i>Asplenium trichomanes</i>	Rare	Overhangs	Not threatened	maidenhair spleenwort	Aspleniaceae
<i>Blechnum penna-marina</i>	Occasional	Higher elevations	Not threatened		Blechnaceae
<i>Blechnum vulcanicum</i>	Rare	Bluffs	Not threatened		Blechnaceae
<i>Cystopteris tasmanica</i>	Rare	Tors	Not threatened	bladder fern	Dryopteridaceae
<i>Grammitis patagonica</i>	Local	Overhangs	Not threatened		Grammitidaceae
<i>Grammitis poepiggiana</i>	Local	Tors	Not threatened		Grammitidaceae

	Abundance at site	Notes	Threat ranking	Common name	Family
<i>Hymenophyllum multifidum</i>	Local	Overhangs	Not threatened		Hymenophyllaceae
<i>Hypolepis millefolium</i>	Local	Tor bases	Not threatened	thousand-leaved fern	Dennstaedtiaceae
<i>Lycopodium fastigiatum</i>	Occasional	Higher elevations	Not threatened	mountain clubmoss	Lycopodiaceae
<i>Ophioglossum coriaceum</i> agg.	Local	Higher elevations	Not threatened	adder's tongue	Ophioglossaceae
<i>Pellaea calidrupium</i>	Rare	Outcrops	Not threatened		Pteridaceae
<i>Polystichum cytotegia</i>	Rare	Higher elevations	Not threatened	alpine shield fern	Dryopteridaceae
<i>Polystichum vestitum</i>	Local	Tor bases	Not threatened	prickly shield fern	Dryopteridaceae
<i>Pteridium esculentum</i>	Local	Bluffs	Not threatened	bracken	Dennstaedtiaceae

APPENDIX THREE Lauder Pastoral Lease Invertebrate Species List January 2006

Class	Order	Family	Genus species	Collection site	Taxonomic and Conservation status*	
Arachnida	Araneae	Agelenidae	<i>Neoramia childi</i> Forster and Wilton	14	Endemic species, not threatened.	
		Araneidae	<i>Coloranea viriditas</i> Urq.	15	Common and widespread orb web spider. Not threatened.	
		Clubionidae	<i>Clubiona</i> sp.	13,27	Native hunting spiders. Widespread and common.	
		Cycloctenidae	<i>Cycloctenus westlandicus</i> Forster	10	Endemic southern 'scuttling' spider. Not threatened.	
		Gnaphosidae	<i>Matua valida</i> Forster & Blest	10,14	Threatened (data deficient) endemic species restricted to Otago and Canterbury.	
		Lycosidae	<i>Anoteropsis flavescens</i> L. Koch	5	Wolf spider. Endemic species restricted to Otago. Ex. pitfall trap, tall tussock habitat.	
		Lycosidae	<i>Anoteropsis hilaris</i> L. Koch	24,26	Common and widespread endemic wolf spider.	
		Miturgidae	<i>Miturga</i> species A	10	Endemic prowling spiders. Not threatened.	
		Miturgidae	<i>Miturga</i> species B	25	Endemic prowling spiders. Not threatened.	
		Pisuridae	<i>Dolomedes aquaticus</i> Goyen	16	Endemic water spider, threatened (data deficient).	
		Pisuridae	<i>Dolomedes minor</i> L. Koch	9	Native nursery web spider. Not threatened.	
		Salticidae	<i>Holoplatys</i> sp.	11	Native jumping spiders. Lacking information.	
		Tetragnathidae	<i>Tetragnatha</i> sp.	15	Endemic 'big jawed' spiders. Ex. sweep netting wetland grasses.	
		Opiliones	Trianenonychidae:	<i>Nuncia</i> sp.	10	Endemic genus of harvestmen. Common and widespread.
			Laniatores			
	Phalangiidae	<i>Pantopsalis</i> sp.	10,19	Native harvestman. Not threatened.		
Chilopoda (Centipedes)	Geophilomorpha	Geophilidae	<i>Zelanophilus provocator</i> Pocock	Throughout	Widespread and common soil centipede.	
	Geophilomorpha	Henicopidae	<i>Paralamyctes</i> sp.	28	Relatively large native soil centipede. Conservation status unknown.	
Diplopoda	Polydesmoidea	Sphaerotrachopidae	<i>Icosidesmus olivaceus</i> Carl	10,27	Endemic millipede. Not threatened	
Crustacea	Amphipoda	Talitridae	<i>Talorchestia</i> sp.	10	Terrestrial amphipods. Native, not threatened.	
Insecta	Blattodea	Blattidae	<i>Celatoblatta quinquemaculata</i> Johns	1,2,4,5,6	Common Otago endemic cockroach. Not threatened.	

Class	Order	Family	Genus species	Collection site	Taxonomic and Conservation status*
		Blattidae	<i>Parellipsidion inaculeatum</i> Johns	2	Endemic cockroach, not commonly seen. Feeds on rotting <i>Celmisia</i> and <i>Astelia</i> vegetation. Not threatened.
	Coleoptera	Byrrhidae	<i>Epichorius</i> sp.	26	Endemic moss beetles, widespread and common.
		Byrrhidae	<i>Liochoria</i> sp.	1,4,6	Endemic moss beetles. Not threatened.
		Carabidae	<i>Holcaspis implica</i> Butcher	9,16	Endemic eastern South Island species (Canterbury to Southland). Not threatened.
		Carabidae	<i>Mecodema impressum</i> Laporte de Castelnau	11,27	A moderately widespread and common Central Otago species. Similar to <i>M. lucidum</i> .
		Carabidae	<i>Mecodema lucidum</i> Larporte de Castelnau	2,4,10,11,16,2 2,25,28	An endemic southern South Island species. Not threatened.
		Carabidae	<i>Neoferonia edax</i> Chaudoir	27	Endemic Otago species. Not threatened but restricted distribution.
		Carabidae	<i>Oregus aereus</i> White	20	Endemic species. Found from Wellington south but not on islands. Not threatened.
Insecta		Coleoptera	Carabidae: Zolini	<i>Zolus</i> sp.	13
	Cicindelidae		<i>Cicindela latecincta</i> White	13	Endemic tiger beetles. Common South Island species.
	Cicindelidae		<i>Cicindela parryi</i> White	13	Common and widespread. Not threatened.
	Coccinelidae		<i>Adalia bipuncta</i> L.	22	Introduced two spotted ladybird.
	Coccinelidae		<i>Coccinella leonina</i> F.	10	Native orange spotted ladybird.
	Coccinelidae		<i>Coccinella undecimpunctata</i> L.	6	Eleven spotted ladybird. Introduced.
	Curculionidae		<i>Inophloeus sulcifer</i> Broun	1,2,28	Endemic speargrass weevil. Not threatened but susceptible to predation by rates and mice.
	Curculionidae: Eugnomini		Species A	2,9	Small speargrass weevils.
	Curculionidae: Eugnomini		Species B	16	Small speargrass weevils.
	Melyridae		<i>Dasytes</i> sp.	8,27	Native flower beetles. Ex. <i>Celmisia spectabilis</i> . Not threatened.
	Scarabaeidae		<i>Costelytra zealandica</i> White	6	Common and widespread grass grub beetle.
	Scarabaeidae		<i>Odontria ? striata</i> Broun	15	Common chafer beetle.
	Scarabaeidae		<i>Pyronota festiva</i> L.	9,10,15,16,17,	Common manuka beetle. Native, not threatened.

Class	Order	Family	Genus species	Collection site	Taxonomic and Conservation status*	
Insecta	Diptera	Tenebrionidae	<i>Artystona vicina</i> Sharp	19 13,19,20,21,26 ,27,28,29	Endemic Otago darkling beetle.	
		Dermaptera	<i>Forficula auricularia</i> L.	6	Introduced European earwig.	
		Acroceridae	<i>Ogcodes brunneus</i> Hutton	27	Endemic small-headed fly. Parasites of young spiders.	
		Asilidae	<i>Neoitamus</i> sp.	27	Native robber fly.	
		Calliphoridae	<i>Lucilia sericata</i> Meigen	16	Introduced blowfly. Ex. <i>Olearia odorata</i> .	
		Stratiomyidae	<i>Beris</i> sp.	1,16	Native soldier fly. Pollen feeders, ex. <i>Olearia odorata</i>	
		Syrphidae	<i>Melanostoma fasciatum</i> Macquart	22	Native hover fly. Widespread and common..	
		Syrphidae	<i>Melangyna novaezelandiae</i> Macquart	16,22,25	Native large hover fly. Widespread and common..	
		Syrphidae	<i>Syrphus</i> sp.	22	Native genus.	
		Therevidae	<i>Anarbrhyncus</i> sp.	9	Genus of native stiletto flies. One of 70 NZ species, 12 of which are threatened.	
		Tipulidae	<i>Austrotipula</i> sp.	22	Native giant crane fly. Ex. stream bank.	
		Tipulidae	<i>Leptotarsus montanus</i> Hutton	22	Endemic mountain crane fly. Maggots feed on tussock roots.	
		Tipulidae	<i>Leptotarsus</i> sp.	6,22	Native crane fly. Not threatened.	
		Hemiptera	Acanthostomatidae	<i>Oncacontias vittatus</i> F.	17	Native stinkbug, widespread and common.
			Acanthostomatidae	<i>Rhopalimorpha lineolaris</i> Pendergrast	15	Common and widespread associated with native monocotyledons.
Cercopidae:	<i>Arawa</i> sp.		11	Leaf hopper. Native species, genus occurs in Australia.		
Auchenorrhyncha				Sweep netting Poa grass.		
Cixiidae	<i>Cixius</i> sp.		18	Native planthopper, ex. <i>Coprosma propinqua</i> .		
Corixidae	<i>Sigara arguta</i> White		25	Common native water bug. Ex. tarn, not threatened.		
Lygaeidae	<i>Rhypodes</i> sp. Cf. <i>R. brachypterus</i>		1	Native genus, specimen beneath <i>Dracophyllum pronum</i> .		
Insecta	Hemiptera		Miridae	<i>Bipuncticoris</i> sp.	1,2	Native Mirid bug, ex. Sweep netting
	Homoptera		Cicadidae	<i>Kikihia angusta</i> Walker	6,9,25	Native South Island tussock cicada. Common and widespread.
	Homoptera		Cicadidae	<i>Maoricicada otagoensis</i> Dugdale and Fleming	1,10, 11,13,27,30	Endemic Otago mountain cicada, found between 1000-1650m.
Insecta	Hymenoptera	Formicidae	<i>Monomorium antarticum</i> Smith	26	Common endemic ants. Not threatened.	
		Sphecidae	<i>Species A</i>	13	Native hunting wasp.	
	Lepidoptera	Crambidae	<i>Eudonia</i> sp.	18	Genus of native tussock moths.	

Class	Order	Family	Genus species	Collection site	Taxonomic and Conservation status*
Insecta	Lepidoptera	Crambidae	<i>Orocrambus flexuosellus</i> Doubleday	1	Widespread and common.
		Geometridae	<i>Aponotoreas insignis</i> Butler (was Notoreas)	30	Alpine tussock orange. Day-flying moth, common in snowgrass 900-1500m. Not threatened.
		Geometridae	<i>Asaphodes declarata</i> Prout	10,27,30	Native 'striped carpet' moth. Day flying, caterpillars feed on Ranunculus. Type specimen ex. Ben Lomond, Otago. Not threatened.
		Geometridae	<i>Dasyuris anceps</i> Butler	30	Greater orange underwing. Caterpillars feed on Aciphylla and Gingidia. Not threatened.
		Geometridae	<i>Notoreas chioneres</i> Prout	27,30	Endemic, type specimen ex. Old Man Range, CO. Caterpillars may feed on Pimelea. Not threatened.
		Geometridae	<i>Paranotoreas brephosata</i> Walker	26,30	Striped orange underwing. Eastern South Island endemic. Not threatened.
	Lepidoptera	Lycaenidae	<i>Lycaena salustius</i> F.	5,9,11,15,18,	Widespread and common.
		Lycaenidae	<i>Zizina otis oxleyi</i> Felder	8,9,13,20,21	Widespread and common.
		Noctuidae	<i>Graphania rubescens</i> Butler	25	Common cutworm moth. Not threatened.
		Nymphalidae	<i>Argyrophenaga antipodum</i> Doubleday	3,9,10,5,27,30	Common and widespread. Endemic tussock butterflies Not threatened.
		Odonata	Coenagrionidae	<i>Xanthocnemis zealandica</i> McLachlan	15,22
Insecta	Odonata	Petaluridae	<i>Uropetala chiltoni</i> Tillyard	7,10,27	Giant mountain dragonfly. Endemic, not threatened.
		Orthoptera	Acrididae	<i>Phaulacridium marginale</i> Walker	12,13,15,20,21,22
	Orthoptera	Acrididae	<i>Sigaus australis</i> Hutton	1,7,8,13,25,26,30	Common South Island alpine grasshopper. Not threatened.
		Anostostomatidae	<i>Hemideina maori</i> Pictet & Saussure	6	Endemic mountain stone weta. Not threatened, however these weta require undisturbed sub-alpine, stone-pavement habitats.
		Gryllidae	<i>Bobilla</i> sp.	Throughout lower elevations	Common and widespread field crickets.
	Plecoptera	Tettigonidae	<i>Conocephalus bilineatus</i> Erichson	17,19	Katydid/field grasshoppers. Native (also occur in Australia).
		Austroperlidae	<i>Austroperla cyrene</i> Newman	10	Native black stone fly. Not threatened.

APPENDIX FOUR Lauder Pastoral Lease Lizard Sightings January 2006.

Records include actual sightings only, not other signs of presence such as sloughs or scats.

“Site” locations of rare and endangered herpetofauna are recorded in the original report. Herpetofauna of this nature is at risk of illegal activities including damage and removal through unlawful interference and disturbance. Accordingly, information regarding the locations of any such herpetofauna has been deleted from this version of the report. The Department of Conservation has put in place mechanisms to ensure that such information can be released for genuine scientific and research purposes. Please contact the Department of Conservation directly to determine whether the information can be released.