

**INVENTORY of
NEW ZEALAND SOIL SITES
of INTERNATIONAL, NATIONAL and REGIONAL
IMPORTANCE**

**PART ONE - SOUTH ISLAND AND SOUTHERN
OFFSHORE ISLANDS (1st edition)**

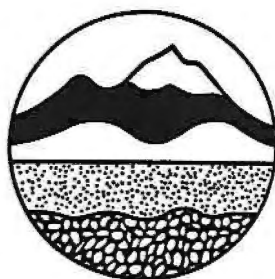
by

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for the

Joint Earth Sciences Societies Working Group on Geopreservation

Bruce Hayward (convenor)



NEW ZEALAND SOCIETY OF SOIL SCIENCE OCCASIONAL PUBLICATION 1

*Ka u ki Matanuku
Ka u ki Matarangi;
Ka u ki tenei whenua,
Hei whenua*

I arrive where unknown earth is under my feet,
I arrive where a new sky is above me;
I arrive at this land, a resting-place for me

(Grace 1959)

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FOREWORD

In 1987 the New Zealand Society of Soil Science began compiling an inventory of sites in New Zealand with special soil significance as part of the New Zealand Geopreservation Inventory (NZGI). The main purpose of the inventory of soil sites is to identify and describe the least-disturbed sites that represent the full range of soils in New Zealand.

This publication is the first listing of all significant soil sites in southern New Zealand (South Island, Stewart Island, Chatham Islands and subantarctic islands). It mainly comprises sites which have formal protection for scenic, biotic or scientific reasons (*e.g.* scenic reserves, scientific reserves, ecological areas, covenants) or have been proposed for protection, but also includes a smaller number of sites that have no formal protection. The latter category will expand in later editions of this inventory as sites are drawn to the attention of the New Zealand Society of Soil Science.

Information for the inventory has been gathered mainly from published sources, particularly the "General survey of the soils of South Island, New Zealand" (New Zealand Soil Bureau 1968) and protected natural area descriptions (especially *Biological survey of reserves series* reports and survey reports of the Protected Natural Areas Programme), as well as interviewing experts about sites with which they are personally familiar. Only a few of the sites listed have been adequately characterised from a soils perspective. For the remainder, there has been no verification that the soils preserved match the soil group or mapping unit that they have been selected to represent. Furthermore, at most sites the range of soils will certainly be greater than indicated.

Readers are invited to correct our information and to send in additions to the inventory. In particular, sites representing soils that do not occur at any of the sites in this inventory are needed for inclusion in the next edition. A record form for describing a soil site is printed at the end of this report. Many of these new records will probably also be high priority sites for which formal protection may be advocated by the New Zealand Society of Soil Science.

The information contained in the Soil Sites Inventory will be particularly useful for regional councils in the assessment of soil status prior to land development, and for the Department of Conservation as a guide to priority areas for protection. Information in the inventory will also be of research use and educational use - for soil scientists looking for unmodified sites to use as control sites to compare with modified soils, for earth science graduates wanting thesis topics and for schoolteachers looking for field trip sites.

Data on all soil sites catalogued is recorded on a VISOR database held on the Department of Scientific and Industrial Research, Christchurch VAX computer system.

This project has been supported by grants to the New Zealand Geopreservation Inventory from the New Zealand Lottery Board and the Department of Conservation, the provision of facilities by the Department of Scientific and Industrial Research (Christchurch and Dunedin), and by two generous grants from Dr Raisaku Kiyoura, Research Institute for Environmental Science, Tokyo.

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Table 1 Soil group representation in the inventory

| SOIL GROUP | SOIL SETS ¹ | | | | |
|--|------------------------|--------------------|---------------|------------------------|-------------------|
| | Total | Number represented | % represented | Number not represented | % not represented |
| Brown-Grey Earths | 19 | 9 | 47 | 10 | 53 |
| Yellow-Grey Earths | 84 | 26 | 31 | 58 | 69 |
| Yellow-Grey to Yellow-Brown Earths Intergrade | 40 | 20 | 50 | 20 | 50 |
| Lowland Yellow-Brown Earths | 77 | 56 | 73 | 21 | 27 |
| Upland Yellow-Brown Earths | 49 | 38 | 78 | 11 | 22 |
| Lowland Podzolised Yellow-Brown Earths and Podzols | 23 | 19 | 83 | 4 | 17 |
| Upland Podzolised Yellow-Brown Earths and Podzols | 25 | 22 | 88 | 3 | 12 |
| Yellow-Brown Sands | 9 | 7 | 78 | 2 | 22 |
| Rendzina and Related Soils | 15 | 11 | 73 | 4 | 27 |
| Brown Granular Loams and Clays | 21 | 16 | 76 | 5 | 24 |
| Brown Granular Loams and Clays to Yellow-Brown Earths Intergrade | 14 | 10 | 71 | 4 | 29 |
| Yellow-Brown Loams | 3 | 2 | 67 | 1 | 33 |
| Organic Soils | 7 | 5 | 71 | 2 | 29 |
| Gley Soils | 8 | 2 | 25 | 6 | 75 |
| Gley Recent Soils | 9 | 6 | 67 | 3 | 33 |
| Saline Gley Recent Soils | 1 | 1 | 100 | 0 | - |
| Recent Soils | 29 | 18 | 62 | 11 | 38 |
| Alpine Steepland Soils, etc. | 1 | 1 | 100 | 0 | - |

¹ Soil groups and soil sets are described in New Zealand Soil Bureau (1968)

1. INTRODUCTION

1.1 The New Zealand Geopreservation Inventory

New Zealand has a unique and extremely varied soil, geology and geomorphological heritage, yet protection of it has been rather random, fortuitous and opportunistic. Almost all areas preserved in New Zealand have been for aesthetic and biotic values (Whitehouse *et al.* 1990). While this has resulted in the preservation of a large number of sites of soil significance it has also resulted in considerable bias in what has been preserved. The aim of the New Zealand Geopreservation Inventory (NZGI) is to identify and document all landforms, geological sites and soil sites of international, national and regional scientific and educational significance. The ultimate goal is to ensure the survival, through protection, of the best examples of the broad range of physical features and processes which best characterise each part of New Zealand, including the commonplace as well as the unique and spectacular.

The NZGI is co-ordinated by the Joint Earth Science Societies Working Group on Geopreservation which consists of representatives of the Geological Society of New Zealand, New Zealand Society of Soil Science, New Zealand Geographical Society, Australia and New Zealand Geomorphological Group, New Zealand Speleological Society and the New Zealand Institute of Landscape Architects. The group convenor is Dr Bruce Hayward, Auckland Museum, Private Bag, Auckland.

Nine other geopreservation reports have been published: active earth deformation features (Stirling 1988), caves and karst (Worthy 1990), fossil localities (Hayward and Ward 1989), geologically-related historic sites (Black *et al.* 1991), geothermal fields and features (Houghton *et al.* 1989), igneous geological sites and features (Weaver *et al.* 1990), landforms (Priestley *et al.* 1990), mineral sites (Priestley *et al.* 1991) and Quaternary volcanoes-Taupo Volcanic Zone (Houghton *et al.* 1991). Three reports are in press (metamorphic sites; Quaternary volcanoes-Northland, Auckland and South Auckland; and structural sites). Two categories remain to be completed (sedimentary geological sites and soils-North Island).

To date over 3500 sites are documented.

1.2 Soil sites - a case for preservation

In the half-century from 1860-1910, New Zealand underwent possibly the most rapid landscape transformation of any nation; over 6.5 million hectares of lowland indigenous forest were cleared (nearly 25% of the total land area) - as much as destroyed in the previous 1000 years of the Polynesian era (Molloy 1988). Natural shrublands, tussocklands, wetlands and dunelands were also developed for agricultural, horticultural, forestry and settlement purposes.

The soils and landscapes represented in New Zealand's system of protected natural areas are biased towards forested steep mountains and other non-productive land. As a consequence, most of the soils of the dunelands, lowlands, foothills and "high country" are not represented in reserves. Many soil types no longer occur under their original (*i.e.* pre-human) vegetation, or occur only as small remnants under quite modified vegetation.

The fundamental reason for protecting unmodified soils is so that we, and future generations of New Zealanders, will be able to look back with pride and interest at representative remnants of the old landscape of Aotearoa (Molloy 1988). Unmodified soil sites are also a genetic resource that ensure the survival of certain soil-specific plants and soil macro- and micro-organisms, many of which are poorly known or understood. There is practical value too in protecting unmodified soils for they provide benchmarks against which the effect of natural processes and human management practices on similar soils outside the reserve can be measured².

1.3 Summary of unmodified soil reserves in New Zealand

The representation of soil groups in this inventory is summarised on Table 1. The results reflect the representation of soil groups in reserved natural landscapes in the southern islands of New Zealand. The following soil groups are well represented: alpine steepland soils; upland yellow-brown earths; upland and lowland podzolised yellow-brown earths and podzols; and recent soils (although these are very biased towards mountainlands).

Priority soil groups for protection that contain a diverse number of soil sets include brown-grey earths; yellow-grey earths; and yellow-grey to yellow-brown earth intergrades. On an areal basis, other priority soil groups for protection include yellow-brown loams; brown granular loams and clays; rendzina and related soils; gley soils; recent soils (on lowland floodplains) and organic soils (lowlands). Soil sets that are not represented on this inventory are listed on Table 2.

2. EXPLANATION OF INFORMATION FIELDS USED IN THIS INVENTORY

Name

Many significant soil sites are well-known areas and have names in common use, *e.g.* Fiordland National Park. Most of the sites covered by a QEII National Trust covenant are given the surname of the landowner. Other sites have usually been named after the local area.

Regional/city council

Local authorities are described to the regional council or city council level.

² The subject of soil and soil-vegetation reserves has been aired in Atkinson (1961), Webb and Espie (1988), *New Zealand Soil News* 33(1), 33(3), 33(4) and 35(5), in the *International Society of Soil Science Bulletin* 69(1), at the 13th International Congress of Soil Science in Hamburg, and in the *Annual Report of the International Soil Reference and Information Centre* (ISRIC) in Wageningen, The Netherlands.

Table 2 Soil sets not represented in the South Island Inventory

| Brown-Grey Earths | Yellow-Grey Earths | Yellow-Grey to Yellow-Brown Earths Intergrade | Lowland Yellow-Brown Earths | Upland Yellow-Brown Earths | Lowland Podzolised Yellow-Brown Earths and Podzols | Upland Podzolised Yellow-Brown Earths and Podzols | Yellow-Brown Sands | Rendzina and Related Soils | Brown Granular Loams and Clays | Brown Granular Loams and Clays to Yellow-Brown Earths Intergrade | Yellow-Brown Loams | Organic Soils | Gley Soils | Gley Recent Soils | Recent Soils |
|---|---|---|---|--|--|---|----------------------|---|--|--|--------------------|-------------------------|--|-------------------------|---|
| Becks Clare Clyde Conroy Drybread Lowburn Otematata Ripponvale Waenga Wetherburn | Amberley Ashley Balfour Chertsey Cheviot Cluden Clydevdale Culverden Dashwood Donett Glasnevin Glendhu Glenmark Gower Hakataramea Hatfield Highbank Hokonui Kaweku Kononi Kurov Leader Lyndhurst Mairaki Makerikeri Middlemarch Motunau Naseby Ngapara Otiake Oturehua Phoebe Pukeawa Pukeuri Renwick Rotherham Seaview Seddon Sedgemere Sherwood Shotover Struan Steward Te Houka Taiko Takahe Tengawai Tima Tipapa Tiroiti Waihopai Waipara Wakanui Wakanu Wanaka Weld Wharetoa Wither | Abbotsford Abbotsford-Warepa Ashwick Dipton Glenroy Hau Jordan Kahutara Mapua Mossum Mt Somers Nokomai Okuku Oreti Otapiri Ranzau Skipton Tapanui Waimumu Wakatu | Breaksea Buccleugh Charwell Gorge Greenburn Hope Kikiwa Korere Manaroa Orawia Orepuki Orinoco Purakino Puramahoi Raurekau Runanga Spoonier Stanley Tutahi Tuturau Wairaki | Avoca Clarence Hightop Lynwood Maud Molesworth Moonlight Mt Misery Nevis Paradise Queenstown | Kongahu Kotinga Matauiria Omanu | Glenhope Leith-Cargill Princess | Halkett Tahunanui | Huihui Oamaru Waikakahi Wantwood | Atawhai Camphill Camphill-Becks Highcliff Waiareka | Ligar Portobello-Warepa Purakanui Rameka | Dunton | Waitepeka Windermere | Braeburn Coopers Creek Manapouri Richmond Temuka Waterton | Koau Oporo Oswald | Action Barrhill Clutha Eweburn Fraser Gladbrook Riwaka Waimangarara Waitati Willowbridge Wingatui |

Ecological district

The ecological district codes and names used in this field follow McEwen (1987)³, except where altered boundaries have been described in protected natural areas programme survey reports. Ecological districts are a useful framework for ensuring that soil reserves represent the full range of New Zealand ecosystems.

Locality

This field gives a brief description of the location of the site and/or a description of the direct distance and direction from the nearest settlement or other landmark.

Topography

Landforms of the site and their slope angle are described in this field.

Vegetation

Vegetation names are listed in descending order of cover. A more detailed description is held on the computer database for most of the sites listed. Unless otherwise noted the names describe native communities.

Soil group and mapping unit names

Most of the soil group and mapping unit names follow the soil group and soil set names in *Soil Bureau Bulletin 27* (New Zealand Soil Bureau 1968) - *i.e.* "General survey of the soils of South Island, New Zealand." Different soil group names used in other soil survey reports have generally been modified to equivalent names in New Zealand Soil Bureau (1968) so that the number of soil group names is kept to an easily-followed minimum. Soil series names have usually been used where available. It is emphasised that at most sites the range of soils preserved will be greater than indicated. Soil groups and mapping units are listed in descending order of extent within the site.

In time the inventory will be amended to include the revised New Zealand Soil Classification (Hewitt 1991).

³ Readers who consult the *Register of Protected Natural Areas in New Zealand* (Department of Lands and Survey 1984) for further details about the sites on the soil sites inventory should note that the ecological region and district codes and names used in the *Register* for parts of Southland are different to those in McEwen (1987).

Significance

This is an explanation of the features of the site that make it worthy of inclusion on the inventory.

Importance

Importance of the site is ranked in three categories:

1 = International

- * contains the best example of a soil (generally a soil group) or soil-vegetation or soil-landform association that is unique to New Zealand (or these latitudes)
- * contains a soil that is naturally uncommon or greatly reduced in extent in other parts of the world
- * contains a wide range of extensive soils with a relatively unmodified vegetation cover
- * has been studied in detail and is known internationally

2 = National

- * contains the best or a "classic" example of a soil (either a soil group or a mapping unit) or a soil-vegetation or soil-landform association in New Zealand
- * contains a soil or soil-vegetation or soil-landform association that is nationally uncommon or reduced in extent
- * contains a moderate range of extensive soils with a relatively unmodified vegetation cover
- * has been studied in detail and is known nationally.

3 = Regional

- * contains the best regional examples of a soil (generally a mapping unit) or a soil-vegetation or soil-landform association
- * contains or a limited range of soils under vegetation that is relatively unmodified.

Vulnerability

- 1 = site has no formal protection of soil, vegetation or other scientific or scenic values; soil and/or vegetation threatened by modification
- 2 = formal protection of the site has been proposed or is being negotiated; soil and/or vegetation threatened by modification; most parts formally protected
- 3 = site is formally protected; no foreseeable threat to soil and/or vegetation

In general, sites with legal protection (*e.g.* national park, scenic reserve, covenanted) and Department of Conservation stewardship land are rated "3"; areas that have been formally recommended for protection are rated "2"; and most other sites are rated "1".

Modifications/Threats

This field briefly describes human processes and features that have modified the site, as well as threats.

Tenure

The legal status of the site is described in this field. Sometimes the site is covered by more than one type of tenure. The term "recommended area for protection" (from Protected Natural Area Programme survey reports) is also used in this field.

Owner/Manager

The owner, pastoral run and/or the land manager of the site is catalogued in this field.

Contacts

For each site, one person who has personal knowledge about the soils of the site or of similar sites in the region is listed in this field.

Date of information

This is the date when the site was catalogued.

Notes

Comments about the soils at the site or brief details about the site's other special features are recorded in this field.

References

References are given to works which include site information that is more extensive than the information contained in the inventory. A list of references is included at the end of this report.

3. LIST OF CONTACTS

| | |
|-----------------|--|
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| Mew, Geoff | DSIR Land Resources, Private Bag, Lower Hutt |
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| Patrick, Brian | Department of Conservation, PO Box 5244, Dunedin |
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| Tonkin, Phil | Department of Soil Science, PO Box 84, Lincoln University, Canterbury |
| Trangmar, Bruce | DSIR Land Resources, Private Bag, Christchurch |
| Webb, Trevor | DSIR Land Resources, Private Bag, Christchurch |
| Wilson, Hugh | Long Bay Rd, RD 3, Akaroa |

4. INVENTORY OF SIGNIFICANT SOIL SITES

The inventory of sites in New Zealand with special soil significance is sorted on the basis of ascending ecological district number (*i.e.* from Marlborough to the subantarctic islands) and alphabetical order of site names in each ecological district.

Data on all soil sites catalogued is recorded on a VISOR database held on the DSIR, Christchurch VAX system.

(1) Chetwode Island Nature Reserve

REGIONAL/CITY COUNCIL(S): Nelson/Marlborough **ECOLOGICAL DISTRICTS(S):** 39-02 Cook Strait

LOCALITY and GRID REFERENCE: entrance to Pelorus Sound P26 013338

AREA(ha): 280 **ALTITUDE(m):** 0-240 **RAINFALL(mm):** 1200

TOPOGRAPHY: two main islands, many small rock stacks, inlets; steep shores rising to cliffs; moderately steep colluvial hill slopes **PARENT MATERIAL:** deeply weathered greywacke **VEGETATION:** broadleaved scrub and forest

SOILS: lowland yellow-brown earths (Ketu)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) although much modified by humans in the past, vigorous regeneration has resulted in vegetation of great diversity and naturalness, indicative of the Marlborough lowlands a thousand years ago.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** Maori settlement and burning

TENURE: nature reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Iain Campbell **DATE OF INFORMATION:** May 1990

REFERENCES: Department of Lands and Survey (1984) Walls (1984) McCaskill (1981)

(2) Stephens Island Wildlife Sanctuary

REGIONAL/CITY COUNCIL(S): Nelson/Marlborough **ECOLOGICAL DISTRICTS(S):** 39-02 Cook Strait

LOCALITY and GRID REFERENCE: 3 km N of D'Urville Island, 93 km NW of Wellington P25 943590

AREA(ha): 150 **ALTITUDE(m):** 0-280 **RAINFALL(mm):** 1200

TOPOGRAPHY: island with extremely steep coastal cliffs **PARENT MATERIAL:** well weathered greywacke **VEGETATION:** introduced grassland; broadleaved forest; coastal cliff vegetation

SOILS: lowland yellow-brown earths (Ketu)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) contains lowland soils with original forest cover – an association that is regionally and nationally uncommon. (ii) nationally, soils that have been modified by burrowing actions of seabirds are uncommon.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** large part of the island has been burned and grazed; lighthouse station

TENURE: wildlife sanctuary **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Iain Campbell **DATE OF INFORMATION:** May 1990

REFERENCES: Department of Lands and Survey (1984)

(3) Deep Bay Scenic Reserves

REGIONAL/CITY COUNCIL(S): Nelson/Marlborough **ECOLOGICAL DISTRICTS(S):** 39-03 Sounds

LOCALITY and GRID REFERENCE: Tennyson Inlet and western side of Nydia Bay, Pelorus Sound P26 750140

AREA(ha): 9795 **ALTITUDE(m):** 0-1020 **RAINFALL(mm):** 2000-2500

TOPOGRAPHY: colluvial hill slopes and tops; beaches; headlands **PARENT MATERIAL:** greywacke and argillite and derived colluvium; metavolcanic rocks; minor alluvium, ultramafic serpentinite and loess **VEGETATION:** beech forest; broadleaved forest; manuka and kanuka scrub

SOILS: lowland yellow-brown earths (Opouri Rai), upland yellow-brown earths (Patriach), brown granular loams and clays (Dun)

IMPORTANCE: 1 **SIGNIFICANCE:** (i) probably the most original or intact landscape in the Sounds. (ii) encompasses: shore to high peaks altitudinal soil sequences and soil-vegetation associations; pronounced vegetation changes related to soils; and nationally uncommon estuarine and ultramafic soil-vegetation associations.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** possums, pigs and goats present; some stock damage around edges; widespread evidence of habitation by Maori

TENURE: scenic reserves **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Iain Campbell **DATE OF INFORMATION:** May 1990

NOTES: Comprises the following scenic reserves: Deep Bay, Tuna Bay, Tennyson Inlet, Jacobs Bay, Nydia Bay, Chance, Penguin and Fairy Bay.

REFERENCES: Department of Lands and Survey (1984) Walls (1984)

(4) Garne and Savill Bays Scenic Reserve

REGIONAL/CITY COUNCIL(S): Nelson/Marlborough **ECOLOGICAL DISTRICTS(S):** 39-03 Sounds

LOCALITY and GRID REFERENCE: Pelorus Sound P26 750210

AREA(ha): 814 **ALTITUDE(m):** 0-608 **RAINFALL(mm):** 1400

TOPOGRAPHY: steep colluvial hillslopes; solifluction features **PARENT MATERIAL:** argillite and some volcanic sediment and derived solifluction debris and colluvium **VEGETATION:** beech-kamahia forest; broadleaved forest; manuka and kanuka shrubland; broadleaved scrub

SOILS: lowland yellow-brown earths (Opouri)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) contains a wide range of woody vegetation types on lowland yellow-brown

earths.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** has been burned; possum, pig, cattle, sheep and deer damage
TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Iain Campbell **DATE OF INFORMATION:** May 1990
REFERENCES: Department of Lands and Survey (1984) McCaskill (1975a) McCaskill (1981)

(5) Howdens Bush Scenic Reserve

REGIONAL/CITY COUNCIL(S): Nelson/Marlborough **ECOLOGICAL DISTRICTS(S):** 39-03 Sounds
LOCALITY and GRID REFERENCE: head of Endeavour Inlet, west of Mt Furneaux Q26 108123
AREA(ha): 405 **ALTITUDE(m):** 0-820 **RAINFALL(mm):** 2000
TOPOGRAPHY: colluvial hill slopes and tops; valley floor **PARENT MATERIAL:** deeply weathered schist and greywacke **VEGETATION:** podocarp-broadleaved forest; silver beech forest; kanuka and manuka scrub
SOILS: lowland yellow-brown earths (Kenepuru), upland yellow-brown earths (Patriach)
IMPORTANCE: 2 **SIGNIFICANCE:** (i) contains the best example of lowland soils under tall podocarp/broadleaved forest in the Sounds, (ii) contains a moderate range of soil-vegetation associations.
VULNERABILITY: 3 **MODIFICATIONS/THREATS:** browsing damage caused by feral mammals
TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Iain Campbell **DATE OF INFORMATION:** May 1990
REFERENCES: Department of Lands and Survey (1984) Walls (1984) McCaskill (1981)

(6) Mt Stokes

REGIONAL/CITY COUNCIL(S): Nelson/Marlborough **ECOLOGICAL DISTRICTS(S):** 39-03 Sounds
LOCALITY and GRID REFERENCE: 27 km NNW of Picton P26 045127
AREA(ha): 7183 **ALTITUDE(m):** 300-1203 **RAINFALL(mm):** 2000
TOPOGRAPHY: steep gullied colluvial mountain slopes with gently-sloping ridges **PARENT MATERIAL:** deeply weathered greywacke and schist and derived colluvium **VEGETATION:** beech forest; broadleaved scrub; podocarp-beech-broadleaved forest; broadleaved forest
SOILS: lowland yellow-brown earths (Kenepuru Anahoka), upland yellow-brown earths (Patriach)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) a large and little-modified area representing all the main mid-to-high soil-vegetation associations of this part of the Marlborough Sounds.
VULNERABILITY: 3 **MODIFICATIONS/THREATS:** depleted by feral goats and pigs
TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Iain Campbell **DATE OF INFORMATION:** July 1991
NOTES: Includes Mt Stokes, Puzzle Peak, Tahuaki and Grants Lookout scenic reserves.
REFERENCES: Walls (1984) McCaskill (1981)

(7) Roberston Range

REGIONAL/CITY COUNCIL(S): Nelson/Marlborough **ECOLOGICAL DISTRICTS(S):** 39-03 Sounds
LOCALITY and GRID REFERENCE: east side of Roberston Range, 30 km NW of Blenheim P27 980855
AREA(ha): 4387 **ALTITUDE(m):** 0-970 **RAINFALL(mm):** 1400
TOPOGRAPHY: steep gullied colluvial hillslopes; minor stream/river flats; rocky and precipitous coastline except for sandy beach at Whites Bay **PARENT MATERIAL:** deeply weathered greywacke, argillite and schist and derived colluvium **VEGETATION:** beech forest; broadleaved-podocarp-fern forest; broadleaved scrub
SOILS: lowland yellow-brown earths (Kenepuru Arapawa Kaituna), upland yellow-brown earths (Patriach), yellow-grey - yellow-brown earths intergrade (Tuamarina)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) a large, very diverse and relatively unmodified area encompassing a shore-to-tops altitudinal sequence of soil-vegetation associations.
VULNERABILITY: 3 **MODIFICATIONS/THREATS:** goats, pigs and red deer present; self-sown exotic pines; wind damage; camping areas and roads
TENURE: scenic reserve, recreation reserve **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Iain Campbell **DATE OF INFORMATION:** July 1991
NOTES: Includes Roberston Range Scenic Reserve and Whites Bay Recreation Reserve.
REFERENCES: Walls (1984)

(8) D'Urville Island Scenic Reserve

REGIONAL/CITY COUNCIL(S): Nelson/Marlborough **ECOLOGICAL DISTRICTS(S):** 39-04 D'Urville Island
LOCALITY and GRID REFERENCE: three areas of D'Urville island, outer Marlborough Sounds P25 840410
AREA(ha): 4072 **ALTITUDE(m):** 0-730 **RAINFALL(mm):** 1500
TOPOGRAPHY: steep colluvial mountain slopes and tops; gullies; coastal bays and rock stacks **PARENT MATERIAL:** mostly greywacke/argillite, some red and green volcanic sediment and mineral belt of serpentinite and derived colluvium

VEGETATION: podocarp–broadleaved forest; broadleaved coastal forest; beech–kamahi forest; mixed shrubland
SOILS: lowland yellow–brown earths (Opouri), brown granular loams and clays (Dun)
IMPORTANCE: 2 **SIGNIFICANCE:** (i) large area comprising relatively unmodified soil – vegetation associations.(ii) Dun soils are only represented elsewhere in the inventory in North West Nelson and Mt Richmond Conservation Parks.
VULNERABILITY: 3 **MODIFICATIONS/THREATS:** road bisects reserve; many historical fires; deer grazing
TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Iain Campbell **DATE OF INFORMATION:** May 1990
NOTES: Reserve in in two parts – second part GR: P26 827360.
REFERENCES: Department of Lands and Survey (1984) McCaskill (1981)

(9) Brown River Scenic Reserve

REGIONAL/CITY COUNCIL(S): Nelson/Marlborough **ECOLOGICAL DISTRICTS(S):** 40–01 Pelorus
LOCALITY and GRID REFERENCE: adjacent SH 60, 2 km N of Rai Valley settlement O27 588997
AREA(ha): 91 **ALTITUDE(m):** 50–300 **RAINFALL(mm):** 2000
TOPOGRAPHY: colluvial hillslopes and tops; terraces; gullies **PARENT MATERIAL:** greywacke and derived alluvium and colluvium **VEGETATION:** beech forest; broadleaved forest; podocarp–beech forest; beech–broadleaved forest
SOILS: upland podzolised yellow–brown earths and podzols (Pelorus), lowland yellow–brown earths (Rai)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) valley floor lowland yellow–brown earths under original podocarp forest are virtually extinct in Marlborough.(ii) contains lowland soils complemented by hillslope soils under relatively unmodified forest.
VULNERABILITY: 3 **MODIFICATIONS/THREATS:** pigs and possums are common
TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Iain Campbell **DATE OF INFORMATION:** May 1990
REFERENCES: Department of Lands and Survey (1984) Walls (1984) McCaskill (1981)

(10) Pelorus Bridge Scenic Reserve

REGIONAL/CITY COUNCIL(S): Nelson/Marlborough **ECOLOGICAL DISTRICTS(S):** 40–01 Pelorus
LOCALITY and GRID REFERENCE: junction of Pelorus and Rai Rivers O27 563880
AREA(ha): 1010 **ALTITUDE(m):** 30–565 **RAINFALL(mm):** 2000
TOPOGRAPHY: colluvial hillslopes and flat terraces **PARENT MATERIAL:** semi–schistose greywacke and derived colluvium and alluvium **VEGETATION:** beech forest; tawa forest; podocarp forest; podocarp–beech forest
SOILS: lowland yellow–brown earths (Opouri Rai), upland yellow–brown earths (Patriach), upland podzolised yellow–brown earths and podzols (Pelorus), recent soils (Ronga)
IMPORTANCE: 2 **SIGNIFICANCE:** (i) contains a wide range of soils under relatively unmodified native vegetation.(ii) Rai and Ronga soils under tall podocarp–dominated forest on alluvial terraces and colluvial footslopes and Opouri soils under tawa forests on low slopes were formerly abundant in Marlborough, but are now very uncommon associations. The reserve contains the best example of tall podocarp–dominated forest in Marlborough (Walls 1984).
VULNERABILITY: 3 **MODIFICATIONS/THREATS:** some historical milling of podocarps; traversed by SH 6; motor camp facilities and road; shop
TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Iain Campbell **DATE OF INFORMATION:** May 1990
REFERENCES: Department of Lands and Survey (1984) Walls (1984) McCaskill (1981)

(11) Mt Richmond Conservation Park

REGIONAL/CITY COUNCIL(S): Nelson/Marlborough **ECOLOGICAL DISTRICTS(S):** 40–01 Pelorus, 40–03 Fishtail, 40–02 Para, 47–04 Red Hills and 47–03 Bryant
LOCALITY and GRID REFERENCE: Richmond, Bryant and Gordan Ranges, between Wairau River and Tasman Bay O28 440730
AREA(ha): 180 271 **ALTITUDE(m):** 0–1790 **RAINFALL(mm):** 2300
TOPOGRAPHY: steep colluvial mountain slopes and tops **PARENT MATERIAL:** sandstone, limestone, serpentinite, dunite, sandstone, greywacke and argillite and derived colluvium and alluvium **VEGETATION:** beech forest; subalpine shrubland; red tussock grassland
SOILS: upland yellow–brown earths (Patriach Spenser), upland podzolised yellow–brown earths and podzols (Pelorus), lowland yellow–brown earths (Onamalutu Opouri Ketu Whangamoa), brown granular loams and clays (Dun)
IMPORTANCE: 1 **SIGNIFICANCE:** (i) extensive area of relatively unmodified soil–vegetation associations.(ii) outstanding range of soil types, including soils on ultramafics.
VULNERABILITY: 3 **MODIFICATIONS/THREATS:** gold, copper and chrome ore minng until early 1920s; parts have been logged, burned and grazed; red and fallow deer, goats, possums, pigs and chamois still present; exotic forest development nearby

TENURE: conservation park **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Iain Campbell **DATE OF INFORMATION:** May 1990

REFERENCES: Department of Lands and Survey (1984) NZMS 274/6 Mt Richmond Forest Park New Zealand Forest Service (1982)

(12) Onamalutu Recreation Reserve

REGIONAL/CITY COUNCIL(S): Nelson/Marlborough **ECOLOGICAL DISTRICTS(S):** 40-02 Para

LOCALITY and GRID REFERENCE: both sides of Onamalutu Rivr, 20 km NW of Blenheim O28 687717

AREA(ha): 26.4 **ALTITUDE(m):** 80-120 **RAINFALL(mm):** 1500

TOPOGRAPHY: flat alluvial terrace and gently-sloping colluvial hill footslopes **PARENT MATERIAL:** alluvium derived mainly from schist **VEGETATION:** podocarp-beech forest; introduced grassland; bracken-beech-broadleaved scrub and low forest; beech forest; introduced pine forest

SOILS: lowland yellow-brown earths (Koromiko Onamalutu)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) relatively undisturbed forest on lowland alluvial terrace soils are nationally uncommon.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** many exotic weeds (*Clematis vitalba*, elderberry, blackberry and willows); also plantings of exotic and native (but not local) species

TENURE: recreation reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Iain Campbell **DATE OF INFORMATION:** July 1991

REFERENCES: Walls (1984)

(13) Tuamarina Government Purpose Reserve

REGIONAL/CITY COUNCIL(S): Nelson/Marlborough **ECOLOGICAL DISTRICTS(S):** 40-02 Para

LOCALITY and GRID REFERENCE: 11 km N of Blenheim P28 905770

AREA(ha): 39 **ALTITUDE(m):** 24-26 **RAINFALL(mm):** 1200

TOPOGRAPHY: drowned valley, impounded by development of the Wairau fan-floodplain-delta-beach ridge system

PARENT MATERIAL: alluvium **VEGETATION:** sedge rushland; willow stands; harakeke flaxland

SOILS: lowland yellow-brown earths (Koromiko), gley soils, organic soils

IMPORTANCE: 2 **SIGNIFICANCE:** (i) the only remaining large area of wetland soils in Marlborough Sounds (other than saline gley recent soils). (ii) peats at the site are important sample sites for Quaternary studies.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** many introduced weeds; adjacent land drainage

TENURE: government purpose reserve (wildlife management) **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Iain Campbell **DATE OF INFORMATION:** May 1990

REFERENCES: Department of Lands and Survey (1984)

(14) Altimarloch

REGIONAL/CITY COUNCIL(S): Nelson/Marlborough **ECOLOGICAL DISTRICTS(S):** 42-01 Waihopai

LOCALITY and GRID REFERENCE: Awatere Valley Rd, Seddon P29 829426

AREA(ha): 20 **ALTITUDE(m):** 220-280 **RAINFALL(mm):** 800

TOPOGRAPHY: fan over alluvial terraces **PARENT MATERIAL:** andesitic volcanic colluvium from volcanics within greywacke **VEGETATION:** introduced grassland; matagouri shrubland

SOILS: brown granular loams and clays (Middlehurst)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) illustrates Quaternary pedological and geomorphological history, as well as paleosols.

VULNERABILITY: 1 **MODIFICATIONS/THREATS:** has been burned; still grazed

TENURE: pastoral lease

CONTACT PERSON: Iain Campbell **DATE OF INFORMATION:** May 1991

(15) Isolated Hill Scenic Reserve

REGIONAL/CITY COUNCIL(S): Nelson/Marlborough **ECOLOGICAL DISTRICTS(S):** 42-04 George and 42-03 Medway

LOCALITY and GRID REFERENCE: head of Waima River, 9 km N of Kekerengu P29 933206

AREA(ha): 1836 **ALTITUDE(m):** 300-1245 **RAINFALL(mm):** 900-1200

TOPOGRAPHY: steep to precipitous colluvial and bedrock mountain slopes and tops **PARENT MATERIAL:** complex Cretaceous and Lower Tertiary calcareous deposits and derived colluvium and alluvium **VEGETATION:** beech forest; rockland; podocarp forest; broadleaved forest and scrub; podocarp-broadleaved forest; podocarp-beech forest; snow tussock shrubland; short tussock grassland

SOILS: rendzina and related soils (Amuri Kaitoa), yellow-grey - yellow-brown earths intergrade (Kekerengu), recent soils (Waimakariri-Shallow)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) contains one of the greatest ranges of relatively undisturbed rendzina

soil-vegetation associations in New Zealand.(ii) rated as "one of the most important reserves in New Zealand" (Williams 1982) because of the tremendous range of vegetation communities in a small area, unusual plant communities and rare species of plants.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** grazed by sheep and goats

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Iain Campbell **DATE OF INFORMATION:** July 1991

REFERENCES: Williams (1982) McCaskill (1981)

(16) Sedgemere

REGIONAL/CITY COUNCIL(S): Nelson/Marlborough **ECOLOGICAL DISTRICTS(S):** 43-01 Sedgemere

LOCALITY and GRID REFERENCE: intermontane basin between the Wairau and Acheron rivers N30 044980

AREA(ha): 963 **ALTITUDE(m):** 970-1370 **RAINFALL(mm):** 1300

TOPOGRAPHY: moraines and outwash in an intermontane basin; major fault traces – kettlehole tarns, sag ponds and fault depression tarns; large alluvial fans; solifluction lobes and patterned ground; landslide deposit **PARENT MATERIAL:** greywacke and argillite till and alluvium **VEGETATION:** sedgeland; turfand; cushionfield; red tussock grassland; rushland; reedland; shrubland

SOILS: gley recent soils (Dobson), recent soils (Tasman), upland yellow-brown earths (Katrine)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) wide range of intermontane basin soils and soil-vegetation associations, reflecting the interaction of glacial, fluvial and tectonic processes

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** grazed by cattle; pine plantation remnants (have been felled, but left in place); Canada goose grazing; cattle causing pugging of some wetlands; roads and 4WD roads; introduced plants are dominant in places

TENURE: unalienated Crown land, recommended area for protection **OWNER/MANAGER:** Molesworth Station, Department of Conservation, Landcorp

CONTACT PERSON: Les Basher **DATE OF INFORMATION:** May 1991

REFERENCES: Basher (1988) Courtney (1989)

(17) Crimea - Cat

REGIONAL/CITY COUNCIL(S): Nelson/Marlborough **ECOLOGICAL DISTRICTS(S):** 43-02 Balaclava

LOCALITY and GRID REFERENCE: head of Crimea and Cat Creeks, 12 km E of Lake Tennyson N30 972910

AREA(ha): 2545 **ALTITUDE(m):** 1065-1980 **RAINFALL(mm):** 1200

TOPOGRAPHY: moderately steep colluvial mountain slopes with both steep, rocky and gently-sloping, rounded ridgetops; weakly glaciated – ice-scoured bluffs, cirque basins and moraines **PARENT MATERIAL:** greywacke and argillite and derived colluvium; minor till **VEGETATION:** snow tussock grassland; short tussock grassland; subalpine scrub and herbfield; beech forest

SOILS: upland yellow-brown earths (Spenser Bealey), alpine steepeland soils, etc. (Alpine)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) contains Bealey soils under original vegetation near eastern limit. Notable for the soil-beech forest association.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** has been burned and grazed

TENURE: unalienated Crown land, recommended area for protection **OWNER/MANAGER:** Molesworth Station, Department of Conservation, Landcorp

CONTACT PERSON: Les Basher **DATE OF INFORMATION:** May 1991

REFERENCES: Basher (1988) Courtney (1989)

(18) Edwards-Muntz

REGIONAL/CITY COUNCIL(S): Nelson/Marlborough **ECOLOGICAL DISTRICTS(S):** 43-02 Balaclava

LOCALITY and GRID REFERENCE: intermontane basin at the confluence of the Leader Dale and the Clarence River, 15 km N of Hanmer N31 930690

AREA(ha): 4130 **ALTITUDE(m):** 870-1340 **RAINFALL(mm):** 1200

TOPOGRAPHY: intermontane basin of low colluvial hills and river flats – fault-tilted terraces/scarps, terraces, fault depressions, sag ponds, braided riverbeds, scattered rock outcrops **PARENT MATERIAL:** greywacke and argillite and derived alluvium and colluvium **VEGETATION:** short tussock grassland; mixed indigenous scrub; red tussock grassland; sedgeland; cushionfield; beech forest; stunted exotic pine plantation

SOILS: upland yellow-brown earths (Craigieburn Cass Tekoa Kaikoura), gley recent soils (Dobson), recent soils (Tasman)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) includes a moderate range of relatively unmodified soils and soil-vegetation associations.(ii) unmodified gley recent soils under red tussock grassland are nationally uncommon.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** parts have been burned; still grazed by cattle; cattle also causing pugging of wetlands; crossed by road and electricity transmission lines; pine plantation trials; wildling pines and rowan from forests near Hanmer and Hieracium spp. are problems

TENURE: unalienated Crown land, pastoral lease, recommended area for protection **OWNER/MANAGER:** Molesworth Station, St James Station, Department of Conservation, Landcorp
CONTACT PERSON: Les Basher **DATE OF INFORMATION:** May 1991
REFERENCES: Basher (1988) Courtney (1989)

(19) Leader Dale - Big Bush

REGIONAL/CITY COUNCIL(S): Nelson/Marlborough **ECOLOGICAL DISTRICTS(S):** 43-02 Balaclava
LOCALITY and GRID REFERENCE: head of Leader Dale, 25 km NNW of Hanmer N31 007739
AREA(ha): 2918 **ALTITUDE(m):** 950-1820 **RAINFALL(mm):** 1000
TOPOGRAPHY: moderately steep to steep colluvial hill and mountain slopes with occasional scree, bedrock slopes, buttresses and bluffs; minor glacial features – cique basins and glacially-moulded slopes; valley floors with alluvial fan, terraces and stream channels **PARENT MATERIAL:** greywacke and argillite and derived colluvium and alluvium
VEGETATION: red tussock grassland; short tussock grassland; beech forest; grassland and mixed indigenous scrub; gravelfield/cobblefield; rockland
SOILS: upland yellow-brown earths (Tekoa Craigieburn Kaikoura), gley recent soils (Dobson)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) contains large remnants of formerly more extensive associations of upland yellow-brown earths under red tussock grassland and mountain beech forest.
VULNERABILITY: 2 **MODIFICATIONS/THREATS:** has been burned and grazed
TENURE: unalienated Crown land, recommended area for protection **OWNER/MANAGER:** Molesworth Station, Department of Conservation, Landcorp
CONTACT PERSON: Les Basher **DATE OF INFORMATION:** May 1991
REFERENCES: Basher (1988) Courtney (1989)

(20) Maukuratawhai

REGIONAL/CITY COUNCIL(S): Nelson/Marlborough **ECOLOGICAL DISTRICTS(S):** 43-02 Balaclava
LOCALITY and GRID REFERENCE: true left side of Clarence River, opposite Hanmer Range, 10 km N of Hanmer N31 972636
AREA(ha): 3151 **ALTITUDE(m):** 760-1585 **RAINFALL(mm):** 1200
TOPOGRAPHY: steep colluvial and bedrock mountain slopes and tops **PARENT MATERIAL:** greywacke and argillite and derived colluvium **VEGETATION:** beech forest; kanuka shrubland; Dracophyllum scrub and shrubland; snow tussock grassland
SOILS: upland yellow-brown earths (Tekoa Craigieburn Kaikoura), recent soils (Tasman)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) contains large remnants of the formerly more extensive Tekoa soil – mountain beech forest association.
VULNERABILITY: 2 **MODIFICATIONS/THREATS:** has been grazed and burned
TENURE: unalienated Crown land, recommended area for protection **OWNER/MANAGER:** Molesworth Station, Department of Conservation, Landcorp
CONTACT PERSON: Les Basher **DATE OF INFORMATION:** May 1991
REFERENCES: Basher (1988) Courtney (1989)

(21) Severn

REGIONAL/CITY COUNCIL(S): Nelson/Marlborough **ECOLOGICAL DISTRICTS(S):** 43-02 Balaclava
LOCALITY and GRID REFERENCE: headwaters of Severn River, 30 km SW of St Arnaud N30 138110
AREA(ha): 3392 **ALTITUDE(m):** 1160-2200 **RAINFALL(mm):** 1200
TOPOGRAPHY: very steep colluvial mountain slopes – extensive scree and bare ground; many bluffs in upper parts; hanging valleys and waterfalls; cirque basins and tarns; terminal and lateral moraines; wide, flat valley floor **PARENT MATERIAL:** greywacke and argillite and derived colluvium **VEGETATION:** snow tussock grassland; short tussock grassland; gravelfield; scrub
SOILS: upland yellow-brown earths (Tekoa Kaikoura), alpine steep-land soils, etc. (Alpine)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) large area with limited range of soils, but relatively unmodified vegetation.
VULNERABILITY: 2 **MODIFICATIONS/THREATS:** still grazed
TENURE: unalienated Crown land, recommended area for protection **OWNER/MANAGER:** Molesworth Station, Department of Conservation, Landcorp
CONTACT PERSON: Les Basher **DATE OF INFORMATION:** May 1991
REFERENCES: Basher (1988) Courtney (1989)

(22) Wairau-Island Pass-Tennyson

REGIONAL/CITY COUNCIL(S): Nelson/Marlborough **ECOLOGICAL DISTRICTS(S):** 43-02 Balaclava
LOCALITY and GRID REFERENCE: headwaters of Clarence and Wairau Rivers, 40 km SW of St Arnaud M30 866963

AREA(ha): 6470 **ALTITUDE(m):** 970-2200 **RAINFALL(mm):** 1300

TOPOGRAPHY: steep to very steep colluvial mountain slopes and tops; minor bedrock mountain slopes and tops; relic glacial landscape – aretes, cirque basins and associated tarns, terminal and lateral moraines, valley floor lake; alluvial fans; extensive screes; braided riverbed; valley mouth gorges; rock avalanche **PARENT MATERIAL:** greywacke and argillite and derived colluvium, alluvium and till; peat; minor semi-schist **VEGETATION:** short tussock grassland; snow tussock grassland; subalpine scrub; red tussockland; beech forest; wetland communities

SOILS: upland yellow-brown earths (Katrine Spenser Bealey), alpine steepland soils, etc. (Alpine), gley soils (Dobson), organic soils, recent soils (Tasman)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) large, relatively unmodified area including a wide range of soils and soil-vegetation associations, reflecting a wide range of mountain and valley landforms.(ii) soils and paleosols at Island Pass and on the moraines at Lake Tennyson are special scientific study sites.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** grazed by cattle; roads and 4WD roads; hut; introduced plants (especially chewings fescue, Yorkshire fog, meadow grass and Hieracium spp.) are locally dominant

TENURE: unalienated Crown land, scenic reserve, pastoral lease, recommended area for protection **OWNER/MANAGER:** Molesworth Station, Department of Conservation, Landcorp, St James Station

CONTACT PERSON: Les Basher **DATE OF INFORMATION:** May 1991

REFERENCES: Basher (1988) Courtney (1989)

(23) Hanmer Conservation Park

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 43-03 Miromiro

LOCALITY and GRID REFERENCE: mostly south-facing slope of Hanmer Range, Hanmer Springs township is on terraces and footslopes below M32 859565

AREA(ha): 9391 **ALTITUDE(m):** 365-1880 **RAINFALL(mm):** 1200

TOPOGRAPHY: steep colluvial and bedrock mountain slopes; outwash terraces **PARENT MATERIAL:** greywacke and argillite and derived colluvium and outwash gravels **VEGETATION:** beech forest; shrubland; snow tussock grassland

SOILS: upland yellow-brown earths (Kaikoura Bealey Tekoa Katrine)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) contains upland yellow-brown earths under a moderate range of vegetation types over a moderate altitudinal range.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** has been burned and grazed; many introduced plants throughout

TENURE: conservation park **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Les Basher **DATE OF INFORMATION:** May 1990

REFERENCES: Department of Lands and Survey (1984)

(24) Rachel Range

REGIONAL/CITY COUNCIL(S): Nelson/Marlborough **ECOLOGICAL DISTRICTS(S):** 44-02 Dillon

LOCALITY and GRID REFERENCE: northern part of the Rachel Range N30 227960

AREA(ha): 1987 **ALTITUDE(m):** 940-1930 **RAINFALL(mm):** 700

TOPOGRAPHY: steep colluvial and bedrock mountain slopes with broad rounded summits; extensive screes and gravelfields on mountain tops **PARENT MATERIAL:** greywacke and argillite and derived colluvium **VEGETATION:** scree gravelfield communities; snow tussock grassland; flaxland; mountain tauhinu shrubland

SOILS: upland yellow-brown earths (Kaikoura Muller Benmore)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) one of the few soil sites in low rainfall parts of Nelson/Marlborough with little modified vegetation cover.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** still grazed

TENURE: unalienated Crown land, recommended area for protection **OWNER/MANAGER:** Molesworth Station, Department of Conservation, Landcorp

CONTACT PERSON: Les Basher **DATE OF INFORMATION:** May 1991

REFERENCES: Basher (1988) Courtney (1989)

(25) Gloster-Rough - Clarence Faces

REGIONAL/CITY COUNCIL(S): Nelson/Marlborough **ECOLOGICAL DISTRICTS(S):** 44-02 Dillon and undescribed district (Kahutara)

LOCALITY and GRID REFERENCE: true left side of Clarence River between Dillon and Tweed Rivers N31 271 778

AREA(ha): 7911 **ALTITUDE(m):** 550-2170 **RAINFALL(mm):** 700

TOPOGRAPHY: steep colluvial and bedrock mountain slopes with rounded ridge crests; extensive bluffs, screes and bare ground; many gullies; narrow strip of alluvial terraces; fault saddles **PARENT MATERIAL:** greywacke and argillite and derived colluvium **VEGETATION:** gravelfield; grassland; scrub; totara treeland; rockland

SOILS: upland yellow-brown earths (Muller Benmore), alpine steepland soils, etc. (Alpine)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) a large area containing the best examples of a moderate range of soil types and soil – vegetation associations, including remnants of the original forest cover.

VULNERABILITY: 2

TENURE: unalienated Crown land **OWNER/MANAGER:** Molesworth Station, Department of Conservation, Landcorp

CONTACT PERSON: Les Basher **DATE OF INFORMATION:** May 1991

REFERENCES: Basher (1988) Courtney (1989)

(26) Tone

REGIONAL/CITY COUNCIL(S): Nelson/Marlborough **ECOLOGICAL DISTRICTS(S):** 44-02 Dillon and 44-01 Tapuae-O-Uenuku

LOCALITY and GRID REFERENCE: south-west Inland Kaikoura Range O30 423982

AREA(ha): 7076 **ALTITUDE(m):** 880-2250 **RAINFALL(mm):** 800

TOPOGRAPHY: steep to very steep mountain slopes and tops with extensive areas of rock bluffs, ravel slopes and scree' wide shingle floodplains and alluvial fans **PARENT MATERIAL:** greywacke and argillite and derived colluvium and alluvium **VEGETATION:** totara treeland; shrubland; snow tussock grassland; rockland

SOILS: upland yellow-brown earths (Muller Benmore), alpine steepland soils, etc. (Alpine)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) a large area notable for the sequence of Muller, through Benmore to Alpine soils under the best remaining native vegetation. (ii) upland yellow-brown earths under dense tall tussock grassland do not occur in other parts of Tapuae-O-Uenuku Ecological District.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** parts have been burned; still grazed by sheep and goats

TENURE: stewardship land, private land, unalienated Crown land, pastoral lease **OWNER/MANAGER:** Department of Conservation, Muller Station, Molesworth Station, Middlehurst Station

CONTACT PERSON: Les Basher **DATE OF INFORMATION:** May 1991

REFERENCES: Basher (1988) Courtney (1989)

(27) Jordan Stream Scenic Reserve

REGIONAL/CITY COUNCIL(S): Nelson/Marlborough **ECOLOGICAL DISTRICTS(S):** 44-03 Manakau

LOCALITY and GRID REFERENCE: Puhipuhi Valley, 15 km MW of Kaikoura P31 801843

AREA(ha): 173 **ALTITUDE(m):** 450-1280 **RAINFALL(mm):** 1400

TOPOGRAPHY: gently-sloping to steep colluvial mountain slopes **PARENT MATERIAL:** greywacke and argillite and derived colluvium **VEGETATION:** Dracophyllum-podocarp-broadleaved-snow tussock shrubland; podocarp-broadleaved forest; podocarp-beech forest; podocarp forest; broadleaved forest; beech forest; kanuka forest

SOILS: upland yellow-brown earths (Kaikoura Tekoa Patutu Puhi-Puhi)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) contains vegetation-altitudinal sequences [and soil-vegetation associations] that are not reserved elsewhere in Marlborough (Williams 1982).

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** parts have been logged; deer present

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Iain Campbell **DATE OF INFORMATION:** July 1991

NOTES: The vegetation of some adjacent areas is in better condition than that in this reserve.

REFERENCES: Williams (1982) McCaskill (1981)

(28) Marfells Beach

REGIONAL/CITY COUNCIL(S): Nelson/Marlborough **ECOLOGICAL DISTRICTS(S):** 45-01 Kekerengu

LOCALITY and GRID REFERENCE: 1 km E of Lake Grassmere Q29 112414

AREA(ha): 20 **ALTITUDE(m):** 0-170 **RAINFALL(mm):** 750

TOPOGRAPHY: colluvial hillslopes **PARENT MATERIAL:** sandstone and mudstone and derived colluvium **VEGETATION:** tauhinu shrubland

SOILS: yellow-grey earths (Flaxbourne Ward)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) relatively unmodified coastal soil-shrubland associations are uncommon in the ecological district. This is one of the best remaining examples.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** grazed by stock

TENURE: recreation reserve, recommended area for protection **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Iain Campbell **DATE OF INFORMATION:** May 1990

REFERENCES: Breese et al. (1986)

(29) Porangarau Stream

REGIONAL/CITY COUNCIL(S): Nelson/Marlborough **ECOLOGICAL DISTRICTS(S):** 45-01 Kekerengu

LOCALITY and GRID REFERENCE: 4 km SW of Clarence rivermouth P30 835920

AREA(ha): 50 ALTITUDE(m): 10-100 RAINFALL(mm): 1100

TOPOGRAPHY: steep colluvial hillslopes and bluffs **PARENT MATERIAL:** limestone and derived colluvium

VEGETATION: broadleaved forest including mature podocarps

SOILS: yellow-grey earths (Woodbank), rendzina and related soils (Kaitoa)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) one of the best broadleaved forests in the ecological district.

VULNERABILITY: 2

TENURE: freehold, recommended area for protection

CONTACT PERSON: Iain Campbell **DATE OF INFORMATION:** May 1990

REFERENCES: Breese et al. (1986)

(30) Shingle Fans

REGIONAL/CITY COUNCIL(S): Nelson/Marlborough **ECOLOGICAL DISTRICTS(S):** 45-01 Kekerengu

LOCALITY and GRID REFERENCE: 7 km NNW of Clarence rivermouth P30 843026

AREA(ha): 770 ALTITUDE(m): 0-320 RAINFALL(mm): 750

TOPOGRAPHY: colluvial hillslopes; bluffs; alluvial terrace **PARENT MATERIAL:** Tertiary sediments, limestone and derived colluvium **VEGETATION:** broadleaved forest; podocarp/broadleaved forest; kanuka and manuka scrub; totara scrub

SOILS: yellow-grey earths (Woodbank Medway), rendzina and related soils (Amuri)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) a large area containing a moderate range of locally representative soil-vegetation associations.

VULNERABILITY: 2

TENURE: stewardship land, recommended area for protection **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Iain Campbell **DATE OF INFORMATION:** May 1990

REFERENCES: Breese et al. (1986)

(31) Woodside Creek

REGIONAL/CITY COUNCIL(S): Nelson/Marlborough **ECOLOGICAL DISTRICTS(S):** 45-01 Kekerengu

LOCALITY and GRID REFERENCE: 7 km W of Waima rivermouth P29 968202

AREA(ha): 170 ALTITUDE(m): 30-500 RAINFALL(mm): 900

TOPOGRAPHY: colluvial hillslopes and ridge **PARENT MATERIAL:** greywacke, argillite and limestone and derived colluvium **VEGETATION:** beech forest; broadleaved forest and scrub; mixed podocarp forest

SOILS: yellow-grey - yellow-brown earths intergrade (Kekerengu), rendzina and related soils (Amuri Kaitoa), yellow-grey earths (Wharanui)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) contains a good example of formerly more extensive beech and hardwood forests on a moderate range of soils.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** still grazed

TENURE: private land, recommended area for protection **OWNER/MANAGER:** Woodside Station

CONTACT PERSON: Iain Campbell **DATE OF INFORMATION:** May 1990

REFERENCES: Breese et al. (1986)

(32) Aniseed

REGIONAL/CITY COUNCIL(S): Nelson/Marlborough **ECOLOGICAL DISTRICTS(S):** 45-02 Aniseed

LOCALITY and GRID REFERENCE: 12 km NE of Hapuku rivermouth P31 773851

AREA(ha): 1000 ALTITUDE(m): 0-700 RAINFALL(mm): 1800

TOPOGRAPHY: colluvial hillslopes and ridges; bluffs and gullies **PARENT MATERIAL:** greywacke and argillite and derived colluvium **VEGETATION:** podocarp forest; podocarp-broadleaved forest; beech forest; broadleaved forest and scrub; kanuka and manuka scrub

SOILS: lowland yellow-brown earths (Patutu), lowland yellow-brown earths (Hurunui)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) a large area containing a moderate range of relatively undisturbed soil-vegetation associations. Includes associations that were formerly more widespread.

VULNERABILITY: 2

TENURE: freehold, recommended area for protection **OWNER/MANAGER:** R Cameron, Kaikoura

CONTACT PERSON: Iain Campbell **DATE OF INFORMATION:** May 1990

REFERENCES: Breese et al. (1986)

(33) Blue Duck Scientific Reserve

REGIONAL/CITY COUNCIL(S): Nelson/Marlborough **ECOLOGICAL DISTRICTS(S):** 45-02 Aniseed

LOCALITY and GRID REFERENCE: 19 km N of Kaikoura P31 705809

AREA(ha): 86 ALTITUDE(m): 300-457 RAINFALL(mm): 1100

TOPOGRAPHY: colluvial hill slopes and tops **PARENT MATERIAL:** Upper Cretaceous rock colluvium **VEGETATION:** podocarp/broadleaved forest; podocarp/beech forest; broadleaved forest; introduced grassland

SOILS: lowland yellow-brown earths (Patutu)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) contains one of the best examples of lowland yellow-brown earths under podocarp forest in southern Marlborough.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** 4WD road

TENURE: scientific reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Iain Campbell **DATE OF INFORMATION:** May 1990

REFERENCES: Department of Lands and Survey (1984) Williams (1982) McCaskill (1981)

(34) Paparoa Point Scenic Reserve

REGIONAL/CITY COUNCIL(S): Nelson/Marlborough **ECOLOGICAL DISTRICTS(S):** 45-02 Aniseed

LOCALITY and GRID REFERENCE: between Kaikoura and Clarence Rivers, adjacent SH 1 P31 792852

AREA(ha): 46 **ALTITUDE(m):** 20-213 **RAINFALL(mm):** 1000

TOPOGRAPHY: steep colluvial hill slopes and gullies **PARENT MATERIAL:** colluvium derived from greywacke

VEGETATION: podocarp/broadleaved forest; kanuka forest; introduced grassland

SOILS: lowland yellow-brown earths (Patutu)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) a good local example of lowland yellow-brown earths under coastal vegetation (including podocarps and remnant beech forest).

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** stock damage

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Iain Campbell **DATE OF INFORMATION:** May 1990

REFERENCES: Department of Lands and Survey (1984) Williams (1982) McCaskill (1981)

(35) Puhi Puhi Scenic Reserve

REGIONAL/CITY COUNCIL(S): Nelson/Marlborough **ECOLOGICAL DISTRICTS(S):** 45-02 Aniseed

LOCALITY and GRID REFERENCE: W bank of Puhi Puhi valley, just below junction with the Clinton River P31 708816

AREA(ha): 15 **ALTITUDE(m):** 150-180 **RAINFALL(mm):** 1200

TOPOGRAPHY: terrace remnants, floodplain **PARENT MATERIAL:** alluvium **VEGETATION:** stonefield; broadleaved forest; podocarp-broadleaved forest; podocarp forest

SOILS: recent soils (Waimakariri-Shallow), rendzina and related soils (Kaitoa)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) special site because of the sequence of young Waimakariri soils (derived from alluvium) on floodplains and low terraces.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** crossed by road; fluvial erosion by Puhi Puhi River

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Iain Campbell **DATE OF INFORMATION:** March 1991

REFERENCES: Department of Lands and Survey (1984) Williams (1982) McCaskill (1981)

(36) Puhi Puhi Valley

REGIONAL/CITY COUNCIL(S): Nelson/Marlborough **ECOLOGICAL DISTRICTS(S):** 45-02 Aniseed

LOCALITY and GRID REFERENCE: 6.5 km N of mouth of Hapuku River P31 718830

AREA(ha): 50 **ALTITUDE(m):** 270-460 **RAINFALL(mm):** 1200

TOPOGRAPHY: colluvial hillslope and ridge **PARENT MATERIAL:** limestone and derived colluvium **VEGETATION:** mountain lacebark treeland; kanuka forest

SOILS: rendzina and related soils (Kaitoa)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) contains the best local example of the formerly much more extensive mountain lacebark treeland which is characteristic of high fertility, limestone sites.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** has been grazed; is being eroded by Puhupuhi River

TENURE: freehold, recommended area for protection **OWNER/MANAGER:** R Jones, Kaikoura

CONTACT PERSON: Iain Campbell **DATE OF INFORMATION:** May 1990

REFERENCES: Breese et al. (1986)

(37) Rakautara

REGIONAL/CITY COUNCIL(S): Nelson/Marlborough **ECOLOGICAL DISTRICTS(S):** 45-02 Aniseed

LOCALITY and GRID REFERENCE: 8 km NE of Hapuku rivermouth P31 769828

AREA(ha): 10 **ALTITUDE(m):** 0-170 **RAINFALL(mm):** 1200

TOPOGRAPHY: greywacke and argillite and derived colluvium **PARENT MATERIAL:** colluvial hillslopes **VEGETATION:** karaka forest

SOILS: lowland yellow-brown earths (Patutu)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) the best example of lowland yellow-brown earths under karaka forest in the ecological district. This association was formerly widespread; little now remains.

VULNERABILITY: 2

TENURE: freehold, recommended area for protection **OWNER/MANAGER:** D Moore, Kaikoura

CONTACT PERSON: Iain Campbell **DATE OF INFORMATION:** May 1990

REFERENCES: Breese et al. (1986) McCaskill (1981)

(38) Stewart Creek

REGIONAL/CITY COUNCIL(S): Nelson/Marlborough **ECOLOGICAL DISTRICTS(S):** 45-02 Aniseed

LOCALITY and GRID REFERENCE: 5 km W of Clarence rivermouth P30 808925

AREA(ha): 900 **ALTITUDE(m):** 70-1300 **RAINFALL(mm):** 1700

TOPOGRAPHY: colluvial hillslopes and bluffs and gullies; alluvial terrace; scree **PARENT MATERIAL:** greywacke and argillite and derived colluvium **VEGETATION:** totara forest and scrub; beech forest; broadleaved forest; podocarp/broadleaved forest; inaka shrubland; snow tussock grassland; kanuka forest; kanuka-manuka scrub; herbfield
SOILS: lowland yellow-brown earths (Patutu), lowland yellow-brown earths (Hurunui), rendzina and related soils (Kaitoa)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) a large area containing a moderate range of soil types and soil-vegetation associations. Wide range of slopes, aspects and altitudes represented.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** grazed by stock

TENURE: freehold, recommended area for protection **OWNER/MANAGER:** D and J Millton, Kaikoura

CONTACT PERSON: Iain Campbell **DATE OF INFORMATION:** May 1990

REFERENCES: Breese et al. (1986)

(39) Totara Dam

REGIONAL/CITY COUNCIL(S): Nelson/Marlborough **ECOLOGICAL DISTRICTS(S):** 45-02 Aniseed

LOCALITY and GRID REFERENCE: 8 km N of Hapuku rivermouth P31 723823

AREA(ha): 10 **ALTITUDE(m):** 300-600 **RAINFALL(mm):** 1500

TOPOGRAPHY: colluvial hillslopes **PARENT MATERIAL:** limestone colluvium **VEGETATION:** totara forest and scrub

SOILS: rendzina and related soils (Kaitoa)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) only totara forest on limestone colluvium soils in the ecological district. This association was formerly much more extensive.

VULNERABILITY: 2

TENURE: freehold, recommended area for protection **OWNER/MANAGER:** JR Howard, Hapuku

CONTACT PERSON: Iain Campbell **DATE OF INFORMATION:** May 1990

REFERENCES: Breese et al. (1986)

(40) Cemetery Bush

REGIONAL/CITY COUNCIL(S): Nelson/Marlborough **ECOLOGICAL DISTRICTS(S):** 45-03 Kowhai

LOCALITY and GRID REFERENCE: north bank, Hapuku rivermouth P31 718766

AREA(ha): 5 **ALTITUDE(m):** 3 **RAINFALL(mm):** 1000

TOPOGRAPHY: alluvial terrace **PARENT MATERIAL:** alluvium derived from greywacke and argillite **VEGETATION:** broadleaved-podocarp forest

SOILS: lowland yellow-brown earths (Hapuku)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) best example of a soil-vegetation association that was once widespread but is now rare in the northern South Island. (ii) valuable reference site for surrounding farmland.

VULNERABILITY: 2

TENURE: freehold, protected private land, recommended area for protection **OWNER/MANAGER:** Maori trustees - c/o Mr Hauata, Masterton

CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** May 1990

REFERENCES: Breese et al. (1986)

(41) Hapuku Scenic Reserve

REGIONAL/CITY COUNCIL(S): Nelson/Marlborough **ECOLOGICAL DISTRICTS(S):** 45-03 Kowhai

LOCALITY and GRID REFERENCE: south bank of the Hapuku River, N of Kaikoura O31 693769

AREA(ha): 63 **ALTITUDE(m):** 30-120 **RAINFALL(mm):** 850

TOPOGRAPHY: floodplain; terraces **PARENT MATERIAL:** greywacke alluvium **VEGETATION:** kanuka forest; kanuka-manuka scrub; herbfield; gravelfield; introduced grassland and treeland

SOILS: recent soils (Waimakariri-Shallow)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) contains recent river deposits soils developed under a moderate range of vegetation. Soil-vegetation associations of this kind are now nationally rare (particularly in the lowlands), and even more so in reserves (Williams 1982).

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** stock grazing; some exotic weeds; frequently used as a rubbish dump

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Iain Campbell **DATE OF INFORMATION:** May 1990

REFERENCES: Department of Lands and Survey (1984) Williams (1982) McCaskill (1981)

(42) Kowhai Bush

REGIONAL/CITY COUNCIL(S): Nelson/Marlborough **ECOLOGICAL DISTRICTS(S):** 45-03 Kowhai

LOCALITY and GRID REFERENCE: 18 km NW of Kaikoura O31 597706

AREA(ha): 250 **ALTITUDE(m):** 50-150 **RAINFALL(mm):** 1200-1600

TOPOGRAPHY: alluvial fan **PARENT MATERIAL:** alluvium derived from greywacke and argillite **VEGETATION:** kanuka forest

SOILS: recent soils (Waimakariri)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) the best example of recent soils under kanuka forest on an alluvial fan in the ecological district.

VULNERABILITY: 2

TENURE: recommended area for protection, soil and water protection reserve **OWNER/MANAGER:** Nelson/Marlborough Regional Council

CONTACT PERSON: Iain Campbell **DATE OF INFORMATION:** May 1990

REFERENCES: Breese et al. (1986)

(43) Mt Ross

REGIONAL/CITY COUNCIL(S): Nelson/Marlborough **ECOLOGICAL DISTRICTS(S):** 45-03 Kowhai

LOCALITY and GRID REFERENCE: 10 km N of Kaikoura O31 647751

AREA(ha): 7 **ALTITUDE(m):** 150 **RAINFALL(mm):** 1400

TOPOGRAPHY: alluvial fan **PARENT MATERIAL:** alluvium **VEGETATION:** broadleaved forest

SOILS: lowland yellow-brown earths (Hapuku)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) best example of alluvial fan lowland yellow-brown earths with broadleaved forest cover in the ecological district.

VULNERABILITY: 2

TENURE: freehold, recommended area for protection **OWNER/MANAGER:** AM Harnett, Kaikoura

CONTACT PERSON: Iain Campbell **DATE OF INFORMATION:** May 1990

REFERENCES: Breese et al. (1986)

(44) Puklowski Open Space Covenant

REGIONAL/CITY COUNCIL(S): Nelson/Marlborough **ECOLOGICAL DISTRICTS(S):** 46-02 Wakamarama

LOCALITY and GRID REFERENCE: at Pakawau, 10 km N of Collingwood M24 843717

AREA(ha): 5.7 **ALTITUDE(m):** 50 **RAINFALL(mm):** 1600-2400

TOPOGRAPHY: marine terrace **PARENT MATERIAL:** marine sands derived from greywacke and granite **VEGETATION:** broadleaved/podocarp forest

SOILS: yellow-brown sands (Okari)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) coastal yellow-brown sands under forest is an association that is rare nationally. (ii) this is possibly the only example of soils on sand dunes in Nelson/Marlborough.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** grazed until mid-1970s; few possums

TENURE: freehold, QEII National Trust open space covenant **OWNER/MANAGER:** GG and HG Puklowski, QEII National Trust

CONTACT PERSON: Iain Campbell **DATE OF INFORMATION:** May 1990

REFERENCES: Department of Lands and Survey (1984) QEII National Trust (Nelson/Marlborough) file 5/9/8

(45) Paynes Ford Scenic Reserve

REGIONAL/CITY COUNCIL(S): Nelson/Marlborough **ECOLOGICAL DISTRICTS(S):** 46-03 Golden Bay

LOCALITY and GRID REFERENCE: 26 km SE of Collingwood N26 942353

AREA(ha): 62 **ALTITUDE(m):** 30-100 **RAINFALL(mm):** 1500

TOPOGRAPHY: river flats; terraces; colluvial hillslopes; scattered limestone outcrops and tomos **PARENT MATERIAL:** Recent alluvium; glacial outwash; limestone **VEGETATION:** broadleaved forest; podocarp/broadleaved forest; introduced scrub; bracken and regenerating kanuka

SOILS: rendzina and related soils (Tarakohe), recent soils (Karamaea), lowland yellow-brown earths

IMPORTANCE: 3 **SIGNIFICANCE:** (i) one of the few reserves representing the rendzina and related soils group, and the only representation of Tarakohe soils in this inventory.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** old railway embankment

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Iain Campbell **DATE OF INFORMATION:** May 1990
REFERENCES: Department of Lands and Survey (1984)

(46) Washbourne Scenic Reserve

REGIONAL/CITY COUNCIL(S): Nelson/Marlborough **ECOLOGICAL DISTRICTS(S):** 46-03 Golden Bay
LOCALITY and GRID REFERENCE: 10 km S of Collingwood, southern bank of Onekaka River at Onekaka M25 852485
AREA(ha): 9.8 **ALTITUDE(m):** 13-38 **RAINFALL(mm):** 2550
TOPOGRAPHY: poorly drained river terraces **PARENT MATERIAL:** silt and gravel alluvium derived from schist, marble and calcareous mudstone **VEGETATION:** podocarp-broadleaved-beech forest; kanuka scrub and forest; sedgeland
SOILS: lowland yellow-brown earths (Onahau)
IMPORTANCE: 2 **SIGNIFICANCE:** (i) this is the only site of moist alluvial flats soils with original forest cover reserved in Nelson region. Similar sites are uncommon nationally.
VULNERABILITY: 3
TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Iain Campbell **DATE OF INFORMATION:** May 1990
REFERENCES: Department of Lands and Survey (1984) McCaskill (1975a)

(47) Abel Tasman National Park

REGIONAL/CITY COUNCIL(S): Nelson/Marlborough **ECOLOGICAL DISTRICTS(S):** 46-04 Totaranui and 46-07 Arthur
LOCALITY and GRID REFERENCE: north-west Nelson, between Golden Bay and Tasman Bay N26 075300
AREA(ha): 22 543 **ALTITUDE(m):** 0-1171 **RAINFALL(mm):** 1200-3200
TOPOGRAPHY: rolling and steep colluvial hillslopes and tops; sandy beaches; large estuaries; islands; reefs and rocky coastline; karst topography – marble outcrops, caves, sinkholes and plateau **PARENT MATERIAL:** granite and marble and derived colluvium **VEGETATION:** beech forest; beech-podocarp forest; kanuka-manuka shrubland; podocarp/broadleaved forest; saltmarsh communities; flaxland; tussock-shrubland
SOILS: lowland yellow-brown earths (Kaiteriteri Pokororo Kairuru), recent soils (Sherry), rendzina and related soils (Pikikirunga)
IMPORTANCE: 1 **SIGNIFICANCE:** (i) large, little-disturbed area containing a wide range of soils (not reflected in the soil list above), landforms and vegetation.
VULNERABILITY: 3 **MODIFICATIONS/THREATS:** parts have been logged and burned; roading; gorse and radiata pine common; early farming settlements; large numbers of Maori archeological sites
TENURE: national park **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Iain Campbell **DATE OF INFORMATION:** May 1991
REFERENCES: Department of Lands and Survey (1984) NZMS 183 Abel Tasman National Park Department of Lands and Survey (1986)

(48) Goulard Downs Scenic Reserve

REGIONAL/CITY COUNCIL(S): Nelson/Marlborough **ECOLOGICAL DISTRICTS(S):** 46-05 Heaphy
LOCALITY and GRID REFERENCE: between Aorere and Heaphy Rivers M26 550340
AREA(ha): 6564 **ALTITUDE(m):** 600-1468 **RAINFALL(mm):** 3000
TOPOGRAPHY: flat to steep plateau (structurally controlled – not a peneplain) **PARENT MATERIAL:** Tertiary bedrock and derived colluvium **VEGETATION:** red tussock grassland; shrub-grassland; beech-rata scrub and forest; beech forest
SOILS: upland podzolised yellow-brown earths and podzols (Denniston Wakamarama), lowland yellow-brown earths (Paturau)
IMPORTANCE: 2 **SIGNIFICANCE:** (i) unmodified soils developed on a structurally controlled surface under tussock grassland are rare elsewhere in New Zealand and are also rare internationally.
VULNERABILITY: 3
TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Iain Campbell **DATE OF INFORMATION:** December 1987
REFERENCES: Department of Lands and Survey (1984) McCaskill (1975a)

(49) Northwest Nelson Conservation Park

REGIONAL/CITY COUNCIL(S): Nelson/Marlborough **ECOLOGICAL DISTRICTS(S):** 46-06 Wangapeka, 46-05 Heaphy, 46-07 Arthur and 46-02 Wakamarama
LOCALITY and GRID REFERENCE: Tasman Mountains – Arthur, Wakamarama, Burnett and Lockett Ranges, NW

South Island M26 690160

AREA(ha): 376 328 **ALTITUDE(m):** 0-1830 **RAINFALL(mm):** 1500-4000

TOPOGRAPHY: steep colluvial mountain slopes and tops; large river valleys; extensive karst features – plateau and caves; cirque basins; terraces; long coastline – beaches and promontories **PARENT MATERIAL:** granite and derived colluvium **VEGETATION:** beech forest; podocarp forest; subalpine scrub; snow tussock grassland; wetland and herbfield communities

SOILS: upland podzolised yellow–brown earths and podzols (Kaniere Wakamarama Matiri Whitcombe Hohonu Denniston Haupiri), lowland podzolised yellow–brown earths and podzols (Kangahu Pakawau), lowland yellow–brown earths (Tadmor Pakawau Onehaka), rendzina and related soils (Pikikiruna), brown granular loams and clays (Dun), recent soils (Tasman)

IMPORTANCE: 1 **SIGNIFICANCE:** (i) outstanding range of soils, including soils derived from limestone.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** parts have been burned, logged, grazed and mined; possums and deer still present

TENURE: conservation park **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Iain Campbell **DATE OF INFORMATION:** February 1991

REFERENCES: Department of Lands and Survey (1984)

(50) Huia Cave Scenic Reserve

REGIONAL/CITY COUNCIL(S): Nelson/Marlborough **ECOLOGICAL DISTRICTS(S):** 46–07 Arthur

LOCALITY and GRID REFERENCE: 10 km N of Glenhope on west side of Tadmor River M28 834599

AREA(ha): 23 **ALTITUDE(m):** 390-460 **RAINFALL(mm):** 1750

TOPOGRAPHY: low colluvial spur and terrace remnants **PARENT MATERIAL:** granite, siltstone, mudstone and limestone and derived colluvium **VEGETATION:** beech forest; beech–broadleaved forest; bracken fernland

SOILS: lowland yellow–brown earths (Tadmor)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) a good compact example of a moderate range of soil–vegetation associations.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** former limestone works; parts have been logged

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Iain Campbell **DATE OF INFORMATION:** May 1990

REFERENCES: Department of Lands and Survey (1984) McCaskill (1975a)

(51) Snowdens Bush Scenic Reserve

REGIONAL/CITY COUNCIL(S): Nelson/Marlborough **ECOLOGICAL DISTRICTS(S):** 47–01 Motueka

LOCALITY and GRID REFERENCE: just N of Brightwater N27 185824

AREA(ha): 5.6 **ALTITUDE(m):** 30

TOPOGRAPHY: flat terrace **PARENT MATERIAL:** alluvial gravel **VEGETATION:** totara–titoki forest

SOILS: recent soils (Waimea), yellow–grey – yellow–brown earths intergrade (Motupiko)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) one of two remaining areas of soils under native bush on the Waimea Plain.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** formerly accessible to stock

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Iain Campbell **DATE OF INFORMATION:** December 1987

REFERENCES: Department of Lands and Survey (1984)

(52) Big Bush

REGIONAL/CITY COUNCIL(S): Nelson/Marlborough **ECOLOGICAL DISTRICTS(S):** 47–02 Moutere

LOCALITY and GRID REFERENCE: Donald Creek tributary of Tadmor River, 4 km N of Hope Saddle M28 873 566

AREA(ha): 7 **ALTITUDE(m):** 480-600 **RAINFALL(mm):** 1500

TOPOGRAPHY: steep colluvial hillslope catchment **PARENT MATERIAL:** lithified early Pleistocene conglomerate (Moutere Gravel Formation) **VEGETATION:** beech/podocarp–broadleaved forest

SOILS: lowland podzolised yellow–brown earths and podzols (Hope Perth), lowland yellow–brown earths (Donald)

IMPORTANCE: 1 **SIGNIFICANCE:** (i) internationally known scientific research site that provides a soils benchmark to understanding responses to disturbance in adjoining catchments.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** undisturbed (but native forest in nearby catchments has been harvested and replaced with radiata pine)

TENURE: stewardship land **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Geoff Mew **DATE OF INFORMATION:** May 1991

NOTES: Another contact person is Rick Jackson.

REFERENCES: Campbell and Mew (1986) Pearce et al. (1983) Jackson (1985) Pearce et al. (1982) Forest Research Institute (1988)

(53) Eves Valley Scenic Reserve

REGIONAL/CITY COUNCIL(S): Nelson/Marlborough **ECOLOGICAL DISTRICTS(S):** 47-02 Moutere
LOCALITY and GRID REFERENCE: West Waimea Plain N27 143859
AREA(ha): 28 **ALTITUDE(m):** 85-200 **RAINFALL(mm):** 950
TOPOGRAPHY: colluvial hillslopes and valley floor **PARENT MATERIAL:** outwash gravel and colluvium
VEGETATION: beech forest; broadleaved scrub; introduced shrubland
SOILS: yellow-grey - yellow-brown earths intergrade (Rosedale Dovedale)
IMPORTANCE: 2 **SIGNIFICANCE:** (i) one of few reserved areas of alluvial soils under black beech forest in the Nelson region.
VULNERABILITY: 3 **MODIFICATIONS/THREATS:** parts have been logged and burned.
TENURE: scenic reserve **OWNER/MANAGER:** Department of Lands and Survey (1984)
CONTACT PERSON: Iain Campbell **DATE OF INFORMATION:** December 1987
REFERENCES: Department of Lands and Survey (1984) McCaskill (1975a)

(54) Aniseed Valley Scenic Reserve

REGIONAL/CITY COUNCIL(S): Nelson/Marlborough **ECOLOGICAL DISTRICTS(S):** 47-03 Bryant
LOCALITY and GRID REFERENCE: north bank Hackett River, 10 km E of Brightwater N28 295790
AREA(ha): 83 **ALTITUDE(m):** 150-400 **RAINFALL(mm):** 1250-1400
TOPOGRAPHY: moderately steep to steep colluvial hill slopes; limestone bluffs with waterfalls and cave **PARENT MATERIAL:** sandstone, siltstone, limestone and derived colluvium; small area of ultramafic rocks **VEGETATION:** beech forest; broadleaved forest; podocarp forest; rockland; shrubland; bracken fernland
SOILS: lowland yellow-brown earths (Whangamoia), brown granular loams and clays (Dun)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) wide range of soils derived from limestone, ultramafic rocks and greywacke, as well as a wide range of soil-vegetation associations.
VULNERABILITY: 3 **MODIFICATIONS/THREATS:** long history of burning and grazing
TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Iain Campbell **DATE OF INFORMATION:** May 1990
REFERENCES: Department of Lands and Survey (1984) McCaskill (1975a)

(55) Denniston Scenic Reserve

REGIONAL/CITY COUNCIL(S): West Coast **ECOLOGICAL DISTRICTS(S):** 48-01 Ngakawau
LOCALITY and GRID REFERENCE: southern bank of the Waimangaroa River running back to Whareata River, between Denniston and Waimangaroa K29 085415
AREA(ha): 684 **ALTITUDE(m):** 25-610 **RAINFALL(mm):** 3800-5700
TOPOGRAPHY: steep colluvial hillslopes leading to plateau; gorges; bluffs **PARENT MATERIAL:** granite, gneiss, greywacke and Tertiary rocks including coal measures and derived colluvium **VEGETATION:** podocarp-beech-broadleaved forest; beech forest; pakihi community; rockland; low scrub; moorland
SOILS: upland podzolised yellow-brown earths and podzols (Millerton Wakamarama Denniston), lowland podzolised yellow-brown earths and podzols (Okarito), upland yellow-brown earths, gley soils
IMPORTANCE: 2 **SIGNIFICANCE:** (i) contains a moderate range of soils including Millerton soils which are only represented at one other site on the inventory. (ii) soils on coal measures are nationally uncommon.
VULNERABILITY: 3 **MODIFICATIONS/THREATS:** history of coal mining and settlement; crossed by road
TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Geoff Mew **DATE OF INFORMATION:** May 1990
REFERENCES: McCaskill (1975a) Department of Lands and Survey (1984)

(56) Stockton Creek Scenic Reserve

REGIONAL/CITY COUNCIL(S): West Coast **ECOLOGICAL DISTRICTS(S):** 48-01 Ngakawau
LOCALITY and GRID REFERENCE: three small areas at Stockton, 29 km NE of Westport L28 185520
AREA(ha): 13 **ALTITUDE(m):** 275-385 **RAINFALL(mm):** 3800
TOPOGRAPHY: plateau, colluvial hill slopes **VEGETATION:** podocarp-beech/broadleaved forest; manuka shrubland; beech-broadleaved shrubland;
SOILS: upland podzolised yellow-brown earths and podzols (Denniston Millerton), gley soils (Trent), upland yellow-brown earths (Koranui)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) a good example of Denniston and Millerton soils under native vegetation.
VULNERABILITY: 3
TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Geoff Mew **DATE OF INFORMATION:** May 1990
NOTES: Called "Stockton Scenic Reserve" in McCaskill (1975a).
REFERENCES: Department of Lands and Survey (1984) McCaskill (1975a)

(57) Blackwater Ecological Area

REGIONAL/CITY COUNCIL(S): West Coast **ECOLOGICAL DISTRICTS(S):** 48-03 Buller

AREA(ha): 9150 **ALTITUDE(m):** 60-1220 **RAINFALL(mm):** 4000-8000

TOPOGRAPHY: very steep colluvial mountain slopes; bluffs; terraces **PARENT MATERIAL:** granite and gneiss and Tertiary sediments and limestone, and derived colluvium and alluvium **VEGETATION:** beech forest; podocarp/broadleaved forest; podocarp-beech forest; subalpine scrub

SOILS: upland podzolised yellow-brown earths and podzols (Kaniere Matiri Hohonu), lowland yellow-brown earths (Punakaiki)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) a very large, little-disturbed area containing a moderate range of soils and soil-vegetation associations.

VULNERABILITY: 3

TENURE: ecological area **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Geoff Mew **DATE OF INFORMATION:** September 1991

NOTES: This area is part of Ohikonui Forest (formerly State Forest 58).

REFERENCES: Department of Lands and Survey (1984)

(58) Lower Buller Gorge Scenic Reserve

REGIONAL/CITY COUNCIL(S): West Coast **ECOLOGICAL DISTRICTS(S):** 48-03 Buller

LOCALITY and GRID REFERENCE: both sides of the Buller River, from 14 km of river mouth upstream for 17 km K29 070270

AREA(ha): 5941 **ALTITUDE(m):** 15-840 **RAINFALL(mm):** 3000-5000

TOPOGRAPHY: steep gorge comprising very steep colluvial mountain slopes and precipitous bluffs; terraces

PARENT MATERIAL: granite and gneiss and derived colluvium and alluvium; also greywacke, breccia-conglomerate and quartzose coal measures **VEGETATION:** (podocarp)/beech forest; podocarp-beech/broadleaved forest; podocarp forest; broadleaved forest

SOILS: upland podzolised yellow-brown earths and podzols (Kaniere Matiri), lowland yellow-brown earths (Punakaiki Ahaura)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) a large, little-disturbed area containing a moderate range of soils and soil-vegetation associations. (ii) represents agriculturally important Ahaura soils under native vegetation.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** railroad; highway

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Geoff Mew **DATE OF INFORMATION:** September 1991

REFERENCES: Department of Lands and Survey (1984)

(59) Larry River

REGIONAL/CITY COUNCIL(S): West Coast **ECOLOGICAL DISTRICTS(S):** 48-04 Reefton

LOCALITY and GRID REFERENCE: 10 km NNE of Reefton L30 204072

AREA(ha): 11.6 **ALTITUDE(m):** 137-290 **RAINFALL(mm):** 2000

TOPOGRAPHY: very gently sloping terrace **PARENT MATERIAL:** post-glacial and glacial outwash **VEGETATION:** manuka/Sphagnum-bracken-fern scrub

SOILS: lowland podzolised yellow-brown earths and podzols (Okarito), organic soils (Kini), recent soils, lowland yellow-brown earths

IMPORTANCE: 2 **SIGNIFICANCE:** (i) well-known scientific research site that provides a soils benchmark to disturbance in adjoining catchments. (ii) naturally acid site which is a useful reference for understanding the effects of acid rain. Several overseas scientists have carried-out research projects in this catchment.

VULNERABILITY: 1 **MODIFICATIONS/THREATS:** threatened by forestry development

TENURE: Crown land **OWNER/MANAGER:** Timberlands

CONTACT PERSON: Rick Jackson **DATE OF INFORMATION:** May 1991

NOTES: Soil sets clearly reflect the effect of microtopography.

REFERENCES: Ross et al. (1977) Collier (1988) Jackson (1987)

(60) Shenandoah Scenic Reserve

REGIONAL/CITY COUNCIL(S): West Coast **ECOLOGICAL DISTRICTS(S):** 48-04 Reefton

LOCALITY and GRID REFERENCE: three areas on western bank of the Maruia river near Maruia Falls, 55 km N of Springs Junction L29 465250

AREA(ha): 331 **ALTITUDE(m):** 167-760 **RAINFALL(mm):** 2500-3800

TOPOGRAPHY: colluvial mountain slopes with bedrock outcrops; fans; terraces **PARENT MATERIAL:** granite and derived colluvium and outwash **VEGETATION:** beech-(podocarp) forest; broadleaved forest; secondary broadleaved forest and scrub

SOILS: upland podzolised yellow-brown earths and podzols (Kaniere), lowland yellow-brown earths (Ikamatua Ahaura)

Deadman)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) represents a good range of lowland yellow-brown earths under native vegetation.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** parts have been logged; pigs present

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Geoff Mew **DATE OF INFORMATION:** May 1990

REFERENCES: Department of Lands and Survey (1984) McCaskill (1975a)

(61) Upper Buller Gorge Scenic Reserve

REGIONAL/CITY COUNCIL(S): West Coast **ECOLOGICAL DISTRICTS(S):** 48-04 Reefton

LOCALITY and GRID REFERENCE: runs 1.6 km on both sides of the Buller River from 8 km WSW of Murchison L29 380360

AREA(ha): 5920 **ALTITUDE(m):** 100-750 **RAINFALL(mm):** 1600-2400

TOPOGRAPHY: steep colluvial and bedrock mountain slopes; terraces; many slips from earthquake activity **PARENT**

MATERIAL: granite and minor Tertiary sedimentary rocks and limestone, and derived colluvium and alluvium

VEGETATION: podocarp-cedar/beech-podocarp forest; podocarp/beech forest; broadleaved forest

SOILS: upland podzolised yellow-brown earths and podzols (Kaniere Matiri Wakamarama), lowland yellow-brown earths (Blackball Ikamatua), recent soils (Hokitika)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) a large, relatively undisturbed area containing a wide range of soils and soil-vegetation associations.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** history of mining and roading; parts have been burned

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Geoff Mew **DATE OF INFORMATION:** September 1991

REFERENCES: Department of Lands and Survey (1984)

(62) Victoria Conservation Park

REGIONAL/CITY COUNCIL(S): West Coast **ECOLOGICAL DISTRICTS(S):** 48-04 Reefton, 48-07 Totara Flat, 49-03 Ella and 49-01 Rotorua

LOCALITY and GRID REFERENCE: Victoria Range and nearby ranges; between SHs 7 and 65 L30 340100

AREA(ha): 209 327 **ALTITUDE(m):** 130-1693 **RAINFALL(mm):** 2000-4500

TOPOGRAPHY: mostly steep colluvial mountain slopes and tops; historically moderately glaciated - cirque basins,

glaciated valleys; tarns; landslide-dammed lake (Lake Christobel); alluvial river terraces (pre- and post-glacial)

PARENT MATERIAL: greywacke, argillite, granite, gneiss and marble and derived colluvium, alluvium and minor till

VEGETATION: beech forest; podocarp forest; podocarp-beech forest; broadleaved subalpine shrubland; snow tussock grassland

SOILS: upland podzolised yellow-brown earths and podzols (Kaniere Hohonu McKerrow Haast Lewis), lowland yellow-brown earths (Blackball Ahaura Ikamatua), lowland podzolised yellow-brown earths and podzols (Kumara Waiuta Okarito), recent soils (Hokitika)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) a large little modified area containing a moderate range of soils and soil-vegetation and soil-landform associations.(ii) contains podzolised soils developed in a wide range of parent materials.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** parts have been logged and mined; low populations of red deer, chamois and goats

TENURE: conservation park **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Geoff Mew **DATE OF INFORMATION:** July 1991

NOTES: Comprises two main blocks and several smaller parts.

REFERENCES: Department of Lands and Survey (1984)

(63) Nikau Scenic Reserve

REGIONAL/CITY COUNCIL(S): West Coast **ECOLOGICAL DISTRICTS(S):** 48-05 Punakaiki

LOCALITY and GRID REFERENCE: adjacent SH 6, 4 km N of Punakaiki K30 719943

AREA(ha): 20.2 **ALTITUDE(m):** 5 **RAINFALL(mm):** 2800

TOPOGRAPHY: coastal plain - flat with low ridges parallel to the coast **PARENT MATERIAL:** Recent marine gravels and sands **VEGETATION:** podocarp-broadleaved forest; bracken-gorse scrub; flax-broadleaved shrubland

SOILS: yellow-brown sands (Okari), gley recent soils (Karangarua)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) a nearly complete sequence of coastal plain soil-vegetation associations.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** drainage both within and outside the reserve could alter soils; threatened by mining of sands (for ilmenite, zircon and monazite)

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Geoff Mew **DATE OF INFORMATION:** July 1991

REFERENCES: June et al. (1981) McCaskill (1975d)

(64) Tiropahi Ecological Area

REGIONAL/CITY COUNCIL(S): West Coast **ECOLOGICAL DISTRICTS(S):** 48-05 Punakaiki

LOCALITY and GRID REFERENCE: Charleston Forest (formerly SF 128) K30 850080

AREA(ha): 3451 **ALTITUDE(m):** 150-1110 **RAINFALL(mm):** 3000

TOPOGRAPHY: outwash terraces, dunes **PARENT MATERIAL:** outwash, aeolian deposits **VEGETATION:** podocarp/broadleaved forest; podocarp-beech forest; semi-bog forest; beech forest

SOILS: lowland podzolised yellow-brown earths and podzols (Tiropahi Addison)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) a large area containing a moderate range of lowland podzolised yellow-brown earths and podzols under native vegetation.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** fire-induced pakihi; history of coal mining; prospecting licenses held over area

TENURE: ecological area **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Geoff Mew **DATE OF INFORMATION:** May 1990

REFERENCES: Department of Lands and Survey (1984)

(65) Paparoa National Park

REGIONAL/CITY COUNCIL(S): West Coast **ECOLOGICAL DISTRICTS(S):** 48-05 Punakaiki and 48-06 Maimai

LOCALITY and GRID REFERENCE: west coast South Island, between Charleston and Barrytown K30 800000

AREA(ha): 30 327 **ALTITUDE(m):** 0-1406 **RAINFALL(mm):** 2400-9600

TOPOGRAPHY: steep colluvial mountain slopes – hanging valleys, truncated spurs, bluffs, cirque basins, glaciated valleys, craggy peaks and ridges; karst landscape – river gorges, karren, blind valleys, self-draining basins, caves, shafts and passages; high coastal cliffs, caves, sandy beaches, "pancake rocks" at Dolomite Point **PARENT MATERIAL:** granite, gneiss, limestone, sandstone and derived colluvium and alluvium **VEGETATION:** podocarp-broadleaved forest; podocarp-beech-broadleaved forest; pakihi community; Dracophyllum-broadleaved shrubland; broadleaved shrubland; herbfield; turfland

SOILS: upland podzolised yellow-brown earths and podzols (Wakamarama Kaniere Matiri Hohonu), lowland yellow-brown earths (Punakaiki Okarito), lowland podzolised yellow-brown earths and podzols (Charleston), recent soils (Hokitika)

IMPORTANCE: 1 **SIGNIFICANCE:** (i) contains a wide range of relatively unmodified soil types and soil-vegetation and soil-landform associations.

VULNERABILITY: 3

TENURE: national park **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Geoff Mew **DATE OF INFORMATION:** July 1991

REFERENCES: Dennis (1981)

(66) Ikamatua Plain

REGIONAL/CITY COUNCIL(S): West Coast **ECOLOGICAL DISTRICTS(S):** 48-07 Totara Flat

LOCALITY and GRID REFERENCE: 25 km SW of Reefton K31 014793 **ALTITUDE(m):** 107-170 **RAINFALL(mm):** 1872

TOPOGRAPHY: hummocky, gently-sloping terraces **PARENT MATERIAL:** post-glacial and glacial outwash **VEGETATION:** introduced grassland

SOILS: recent soils (Hokitika), lowland yellow-brown earths (Ikamatua Ahaura), lowland podzolised yellow-brown earths and podzols (Okarito)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) illustrates stages in morphological development of soil from recent soils through to immature and mature yellow-brown earths, and eventually gley podzols on high terraces of glacial origin.

VULNERABILITY: 1 **MODIFICATIONS/THREATS:** pastoral development.

TENURE: freehold

CONTACT PERSON: Geoff Mew **DATE OF INFORMATION:** May 1990

NOTES: The boundaries of the most significant areas have not yet been determined.

REFERENCES: Ross et al. (1977)

(67) Waipuna Forest Ecological Area

REGIONAL/CITY COUNCIL(S): West Coast **ECOLOGICAL DISTRICTS(S):** 48-07 Totara Flat

LOCALITY and GRID REFERENCE: Granville Forest (formerly SF 47) K31 070680

AREA(ha): 1910 **ALTITUDE(m):** 190-370

TOPOGRAPHY: flat to undulating outwash terrace **PARENT MATERIAL:** outwash **VEGETATION:** podocarp forest; beech forest; beech-broadleaved forest; beech-podocarp forest

SOILS: lowland podzolised yellow-brown earths and podzols (Okarito Hukarere), lowland yellow-brown earths (Ahaura Deadman)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) contains good examples of a range of lowland yellow-brown earth soils under native vegetation.

VULNERABILITY: 3

TENURE: ecological area **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Geoff Mew **DATE OF INFORMATION:** May 1990

REFERENCES: Department of Lands and Survey (1984)

(68) Arnold River I Scenic Reserve

REGIONAL/CITY COUNCIL(S): West Coast **ECOLOGICAL DISTRICTS(S):** 48-09 Hochstetter

LOCALITY and GRID REFERENCE: true right side of Arnold River, 20 km SE of Greymouth K32 804514

AREA(ha): 228 **ALTITUDE(m):** 80-180 **RAINFALL(mm):** 3000

TOPOGRAPHY: floodplain; alluvial terraces; steep colluvial hillslopes and moraine **PARENT MATERIAL:** Recent alluvium and till **VEGETATION:** podocarp-broadleaved forest; podocarp forest

SOILS: lowland podzolised yellow-brown earths and podzols (Kumara), lowland yellow-brown earths (Ahaura)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) contains soils under virgin kahikatea forest – an association that is rare nationally; lowland soils under original forest are also uncommon internationally.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** grazed by stock; forest clearance by duck shooters and surveyors

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Geoff Mew **DATE OF INFORMATION:** July 1991

REFERENCES: June et al. (1981) McCaskill (1975d)

(69) Deadman Ecological Area

REGIONAL/CITY COUNCIL(S): West Coast **ECOLOGICAL DISTRICTS(S):** 48-09 Hochstetter

LOCALITY and GRID REFERENCE: 12 km SSE of Blackball K31 843605

AREA(ha): 240 **ALTITUDE(m):** 110-390 **RAINFALL(mm):** 2500

TOPOGRAPHY: dissected outwash terraces **PARENT MATERIAL:** outwash **VEGETATION:** dense rimu forest; broadleaved forest

SOILS: lowland yellow-brown earths (Blackwater Callaghans), gley soils (Maimai), lowland podzolised yellow-brown earths and podzols (Okarito)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) a moderate range of soils under native forest.

VULNERABILITY: 3

TENURE: ecological area **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Geoff Mew **DATE OF INFORMATION:** May 1990

NOTES: Part of Mawhero Forest (formerly SF 33)

REFERENCES: Department of Lands and Survey (1984)

(70) Lake Hochstetter Forest Ecological Area

REGIONAL/CITY COUNCIL(S): West Coast **ECOLOGICAL DISTRICTS(S):** 48-09 Hochstetter

LOCALITY and GRID REFERENCE: flanks Ahaura River K31 970640

AREA(ha): 1803 **ALTITUDE(m):** 270-400 **RAINFALL(mm):** 3000

TOPOGRAPHY: moraine and outwash surfaces; terraces and dissected colluvial hill slopes **PARENT MATERIAL:** till and outwash **VEGETATION:** podocarp-broadleaved forest; podocarp forest; beech forest; beech-podocarp forest

SOILS: lowland yellow-brown earths (Blackball), lowland podzolised yellow-brown earths and podzols (Hochstetter Moana Mawhera Hukarere), gley soils (Maimai)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) large undisturbed area with a moderate variety of soils and soil-vegetation associations, at the beech/podocarp interface.

VULNERABILITY: 3

TENURE: ecological area **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Geoff Mew **DATE OF INFORMATION:** May 1990

NOTES: Part of Hochstetter Forest (formerly State Forest 26).

REFERENCES: Department of Lands and Survey (1984)

(71) Lady Lake Scenic Reserve

REGIONAL/CITY COUNCIL(S): West Coast **ECOLOGICAL DISTRICTS(S):** 48-11 Brunner

LOCALITY and GRID REFERENCE: 9 km E of Moana K32 929439

AREA(ha): 281 **ALTITUDE(m):** 140 **RAINFALL(mm):** 4000

TOPOGRAPHY: lake enclosed by flat to hilly moraine; swamps; colluvial hillslopes **PARENT MATERIAL:** till and alluvium **VEGETATION:** aquatic and wetland communities; podocarp-broadleaved forest; podocarp forest

SOILS: gley soils (Flagstaff), organic soils (Rotokohu)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) an area of little-disturbed soil-vegetation associations.

VULNERABILITY: 3

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Geoff Mew **DATE OF INFORMATION:** May 1990

REFERENCES: Department of Lands and Survey (1984) June et al. (1981) McCaskill (1975d)

(72) Lake Brunner Scenic Reserve

REGIONAL/CITY COUNCIL(S): West Coast **ECOLOGICAL DISTRICTS(S):** 48-11 Brunner

LOCALITY and GRID REFERENCE: SW side of Lake Brunner, 33 km SW of Greymouth K32 871369

AREA(ha): 3747 **ALTITUDE(m):** 100-1300 **RAINFALL(mm):** 5000

TOPOGRAPHY: steep colluvial mountainslopes; terrace treads; two lakes **PARENT MATERIAL:** granite and derived colluvium; Recent alluvium; till **VEGETATION:** podocarp-broadleaved forest; broadleaved forest; subalpine scrub; snow tussock grassland; herbfield

SOILS: upland podzolised yellow-brown earths and podzols (Hohonu Kaniere), gley recent soils (Harihari Karangarua), lowland yellow-brown earths (Blackball)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) contains a moderate range of soil-vegetation associations reflecting an altitude sequence and the different parent materials.

VULNERABILITY: 3

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Geoff Mew **DATE OF INFORMATION:** July 1991

REFERENCES: June et al. (1981) McCaskill (1975d)

(73) Moana Scenic Reserve

REGIONAL/CITY COUNCIL(S): West Coast **ECOLOGICAL DISTRICTS(S):** 48-11 Brunner

LOCALITY and GRID REFERENCE: adjacent Moana township K32 850479

AREA(ha): 59 **ALTITUDE(m):** 50-400 **RAINFALL(mm):** 3000

TOPOGRAPHY: moraine ridges and terrace dissected by two streams **PARENT MATERIAL:** till (Loopie Formation)

VEGETATION: podocarp-broadleaved forest; introduced grassland; podocarp forest

SOILS: lowland yellow-brown earths (Hochstetter Ngahere)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) one of few significant areas of reserved podocarp-hardwood forest on youngest glacial outwash soils in North Westland. Includes unlogged forest stands.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** parts have been logged; crossed by a road

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Geoff Mew **DATE OF INFORMATION:** May 1990

REFERENCES: Department of Lands and Survey (1984) June et al. (1981) McCaskill (1975d)

(74) Howard River

REGIONAL/CITY COUNCIL(S): Nelson/Marlborough **ECOLOGICAL DISTRICTS(S):** 49-01 Rotorua

LOCALITY and GRID REFERENCE: between Lake Rotorua and Lake Rototiti M29 830330 **ALTITUDE(m):** 460-660 **RAINFALL(mm):** 2300

TOPOGRAPHY: dissected moraines; colluvial hillslopes **PARENT MATERIAL:** semi-schist, greywacke and argillite and derived colluvium and till **VEGETATION:** beech forest; introduced grassland; scrub; shrubland

SOILS: lowland yellow-brown earths (Howard Kawatiri)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) major geomorphic significance with respect to Quaternary tectonic and geomorphic history. Includes a series of glacial surfaces spanning the Porika-last glaciation period, and offset features along the Alpine Fault.

VULNERABILITY: 1 **MODIFICATIONS/THREATS:** has been logged; pastoral development; parts still grazed

TENURE: private land

CONTACT PERSON: Iain Campbell **DATE OF INFORMATION:** May 1991

NOTES: Boundaries of most significant soil sites have not yet been defined.

(75) Maruia

REGIONAL/CITY COUNCIL(S): West Coast **ECOLOGICAL DISTRICTS(S):** 49-01 Rotorua

LOCALITY and GRID REFERENCE: south side of Station Creek, below confluence with Coal Creek L31 481894

AREA(ha): 40 **ALTITUDE(m):** 400 **RAINFALL(mm):** 1600

TOPOGRAPHY: flat glacial outwash terrace **PARENT MATERIAL:** alluvial sand and silt over gravel **VEGETATION:** beech forest

SOILS: lowland yellow-brown earths (Ahaura)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) natural forest system carbon budget has been studied in detail – possibly better than anywhere else in the World.(ii) good example of Ahaura soils under beech forest.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** nearby sites have been experimentally logged
TENURE: stewardship land **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Kevin Tate **DATE OF INFORMATION:** June 1991
NOTES: Very similar to sites in nearby Victoria Forest Park .

(76) Tophouse Scenic Reserve

REGIONAL/CITY COUNCIL(S): Nelson/Marlborough **ECOLOGICAL DISTRICTS(S):** 49-01 Rotorua
LOCALITY and GRID REFERENCE: alongside Motupiko River, adjacent to Tophouse N29 015385
AREA(ha): 37 **ALTITUDE(m):** 620-685 **RAINFALL(mm):** 1525
TOPOGRAPHY: terraces and moraine **PARENT MATERIAL:** fluvioglacial outwash and moraine **VEGETATION:** beech forest; wetland communities
SOILS: upland yellow-brown earths (Tophouse)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) good example of Tophouse soils under native vegetation.
VULNERABILITY: 3 **MODIFICATIONS/THREATS:** parts have been logged
TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Iain Campbell **DATE OF INFORMATION:** September 1991
REFERENCES: Department of Lands and Survey (1984)

(77) Nelson Lakes National Park

REGIONAL/CITY COUNCIL(S): West Coast **ECOLOGICAL DISTRICTS(S):** 49-02 Travers, 49-03 Ella and 49-01 Rotorua
LOCALITY and GRID REFERENCE: southern Nelson/Marlborough, inland North Westland M30 865145
AREA(ha): 96 112 **ALTITUDE(m):** 430-2339 **RAINFALL(mm):** 1500-2500
TOPOGRAPHY: steep colluvial and bedrock mountain slopes and tops; glacial topography – cirque basins, glacial valley lakes, tarns, moraines, aretes, roches moutonnes, large rivers; straddles Alpine Fault – displaced landforms **PARENT MATERIAL:** greywacke and schist and derived colluvium, as well as minor till and alluvium (some argillite)
SOILS: upland podzolised yellow-brown earths and podzols (Lewis), upland yellow-brown earths (Spenser Katrine), alpine steeppland soils, etc. (Alpine), lowland yellow-brown earths (Kawatiri Hope)
IMPORTANCE: 1 **SIGNIFICANCE:** (i) large area of unmodified vegetation and a wide range of soils and soil-vegetation associations.
VULNERABILITY: 2 **MODIFICATIONS/THREATS:** major valley floors were once grazed; some parts have been burned and prospected; skifield on Mt Robert
TENURE: national park **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Iain Campbell **DATE OF INFORMATION:** May 1991
REFERENCES: Department of Lands and Survey (1984) NZMS 164 Nelson Lakes (edition 4) (1980) Department of Conservation (1989a)

(78) Lewis Pass National Reserve

REGIONAL/CITY COUNCIL(S): Canterbury and West Coast **ECOLOGICAL DISTRICTS(S):** 49-03 Ella and 49-04 Lewis
LOCALITY and GRID REFERENCE: includes the entire headwaters of the Maruia River from near Springs Junction up to the Lewis and Ada Passes, as well as forested slopes in the headwaters of the Lewis River up from the Hope River confluence. M31 605695
AREA(ha): 13 737 **ALTITUDE(m):** 463-2012 **RAINFALL(mm):** 2150-3175
TOPOGRAPHY: mostly steep colluvial mountain slopes, minor bedrock mountain slopes; river terraces and fans many cirques and moraines, some tarns; bisected by the Alpine Fault – there are hot springs at the greywacke-schist interface
PARENT MATERIAL: mostly bedrock of greywacke, argillite and schist bedrock; minor amounts of interbedded volcanics, marble, granite and diorite; minor colluvium and alluvium **VEGETATION:** beech forest; subalpine shrubland; snow tussock grassland; rockland; grassland; herbfield; introduced grassland; matagouri shrubland
SOILS: upland podzolised yellow-brown earths and podzols (Lewis), upland yellow-brown earths (Spenser Katrine), recent soils (Tasman)
IMPORTANCE: 2 **SIGNIFICANCE:** (i) large area including a moderate range of upland soils under original vegetation cover. (ii) contains the only full range of beech forests in Canterbury.
VULNERABILITY: 3 **MODIFICATIONS/THREATS:** previous gold-mining in reserve; cattle grazing of river flats and clearings; reserve bisected by SH 7; camping and picnic areas and walking tracks
TENURE: national reserve **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** May 1990
REFERENCES: Department of Lands and Survey (1984) McCaskill (1975a)

(79) Camp Creek

REGIONAL/CITY COUNCIL(S): West Coast **ECOLOGICAL DISTRICTS(S):** 49-05 Hope

LOCALITY and GRID REFERENCE: tributary of the Poerua River, near Lake Brunner K32 921326
AREA(ha): 600 **ALTITUDE(m):** 150-1800 **RAINFALL(mm):** 6500
TOPOGRAPHY: steep, dissected colluvial mountain slopes and tops, cirque basin, minor alluvial fans and terraces
PARENT MATERIAL: high grade schist and derived colluvium and alluvium **VEGETATION:** broadleaved forest
SOILS: upland yellow-brown earths, recent soils, upland podzolised yellow-brown earths and podzols (Otira McKerrow), organic soils
IMPORTANCE: 2 **SIGNIFICANCE:** (i) comprises a moderate range of lowland and upland soils under native vegetation and high rainfall.(ii) soil and soil vegetation associations have been intensively studied.
VULNERABILITY: 3 **MODIFICATIONS/THREATS:** possum and deer browsing
TENURE: stewardship land (formerly state forest) **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Glenn Stewart **DATE OF INFORMATION:** December 1987
REFERENCES: Stewart & Harrison (1987) Harrison (1985a) Harrison (1985b)

(80) Eldon Coates Scenic Reserve

REGIONAL/CITY COUNCIL(S): West Coast **ECOLOGICAL DISTRICTS(S):** 49-05 Hope
LOCALITY and GRID REFERENCE: 13 km E of Lake Haupiri L32 161487
AREA(ha): 57 **ALTITUDE(m):** 200 **RAINFALL(mm):** 3500
TOPOGRAPHY: valley floor **PARENT MATERIAL:** Recent river gravel and swamp deposits **VEGETATION:** podocarp-beech forest
SOILS: lowland yellow-brown earths (Ikamatua)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) good example of a soil formed from recent alluvium under a now rare forest type.
VULNERABILITY: 3 **MODIFICATIONS/THREATS:** cattle have damaged understorey; crossed by road
TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Geoff Mew **DATE OF INFORMATION:** May 1990
REFERENCES: Department of Lands and Survey (1984) McCaskill (1975d)

(81) Lake Sumner Conservation Park

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 49-05 Hope, 54-01 Sumner and 53-01 Minchin
LOCALITY and GRID REFERENCE: head of Hurunui and Hope Rivers, central South Island L32 418434
AREA(ha): 102 296 **ALTITUDE(m):** 463-2012 **RAINFALL(mm):** 1200-3000
TOPOGRAPHY: colluvial and bedrock mountain slopes and tops; minor cirque basins and moraines **PARENT MATERIAL:** greywacke and argillite and derived colluvium; minor beds of basic volcanic intrusions **VEGETATION:** beech forest; kanuka and manuka scrub; subalpine scrub; snow tussock grassland; red tussock grassland; short tussock grassland
SOILS: upland yellow-brown earths (Spenser Kaikoura Katrine Tekoa Bealey), alpine steepland soils, etc. (Alpine), recent soils (Tasman)
IMPORTANCE: 1 **SIGNIFICANCE:** (i) very extensive area including a wide range of unmodified soils and soil-vegetation associations.
VULNERABILITY: 3 **MODIFICATIONS/THREATS:** parts have been burned; still grazed by deer, possums and chamois
TENURE: conservation park **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Les Basher **DATE OF INFORMATION:** December 1987
REFERENCES: Department of Lands and Survey (1984) NZMS 274/16 (1982)

(82) Bach Creek Government Purpose Reserve

REGIONAL/CITY COUNCIL(S): West Coast **ECOLOGICAL DISTRICTS(S):** 50-01 Hokitika
LOCALITY and GRID REFERENCE: 8 km S of Hokitika, adjacent Hokitika River J33 480216
AREA(ha): 205 **ALTITUDE(m):** 15 **RAINFALL(mm):** 2400-3200
TOPOGRAPHY: floodplain swamp **PARENT MATERIAL:** silt alluvium **VEGETATION:** kahikatea forest; wetland communities
SOILS: gley recent soils (Harihari Karangarua)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) the reserve protects relatively unmodified examples of Hokitika and Karangarua soils, which have been extensively drained and converted into pastureland.
VULNERABILITY: 3
TENURE: government purpose reserve (wildlife management) **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Geoff Mew **DATE OF INFORMATION:** September 1991
REFERENCES: Department of Lands and Survey (1984)

(83) Klein Swamp Government Purpose Reserve

REGIONAL/CITY COUNCIL(S): West Coast **ECOLOGICAL DISTRICTS(S):** 50–01 Hokitika

LOCALITY and GRID REFERENCE: 12 km E of Hokitika

AREA(ha): 110 **ALTITUDE(m):** 20–30 **RAINFALL(mm):** 2400–3200

TOPOGRAPHY: floodplain swamp; terrace riser **PARENT MATERIAL:** peat; alluvium **VEGETATION:** wetland communities; broadleaved forest

SOILS: gley recent soils (Karangarua)

IMPORTANCE: 3 SIGNIFICANCE: (i) Karangarua soils have been extensively drained and converted to pastureland. This site is a good example of Karangarua soils under native vegetation.

VULNERABILITY: 3

TENURE: government purpose reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Geoff Mew **DATE OF INFORMATION:** September 1991

REFERENCES: Department of Lands and Survey (1984)

(84) Lake Kaniere Scenic Reserve

REGIONAL/CITY COUNCIL(S): West Coast **ECOLOGICAL DISTRICTS(S):** 50–01 Hokitika

LOCALITY and GRID REFERENCE: 16 km E of Hokitika J33 581172

AREA(ha): 7252 **ALTITUDE(m):** 80–1200 **RAINFALL(mm):** 3600

TOPOGRAPHY: glacial lake flanked by steep colluvial mountain slopes; moraine and outwash terraces and Recent river flats and fans **PARENT MATERIAL:** granite and greywacke and derived colluvium, alluvium, outwash gravel and till **VEGETATION:** podocarp forest; podocarp/broadleaved forest; subalpine shrubland; snow tussock grassland

SOILS: lowland podzolised yellow–brown earths and podzols (Kumara), upland podzolised yellow–brown earths and podzols (Atarau Ruru Clodagh), gley soils (Maimai Flagstaff), recent soils (Turiwhate)

IMPORTANCE: 2 SIGNIFICANCE: (i) largest and most diverse of Westland scenic reserves – preserves a wide range of soils, as well as landforms and vegetation types. (ii) largest remaining terrace rimu forest and probably the largest remaining reserve with matai.

VULNERABILITY: 3 MODIFICATIONS/THREATS: some silver pine has been logged; parts still grazed and trampled by stock and deer; transected by roads; tracks; nature interpretation facilities and other buildings

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Geoff Mew **DATE OF INFORMATION:** May 1990

REFERENCES: Department of Lands and Survey (1984) Wardle (1980) McCaskill (1975d)

(85) Cropp River

REGIONAL/CITY COUNCIL(S): West Coast **ECOLOGICAL DISTRICTS(S):** 50–02 Whitcombe

LOCALITY and GRID REFERENCE: entire catchment of Cropp River, a tributary of the Whitcombe River J34 458 900

AREA(ha): 2850 **ALTITUDE(m):** 240–2140 **RAINFALL(mm):** 10 000

TOPOGRAPHY: very steep to precipitous colluvial mountainslopes and tops; minor areas of terraces and fans **PARENT MATERIAL:** biotite schist and derived colluvium **VEGETATION:** broadleaved forest; subalpine scrub; snow tussock grassland; herbfield

SOILS: upland yellow–brown earths, upland podzolised yellow–brown earths and podzols (Otira McKerrow), alpine steepland soils, etc. (Alpine), gley recent soils, organic soils

IMPORTANCE: 1 SIGNIFICANCE: (i) contains a wide range of soil groups under extremely high rainfall (rare internationally) and rapid erosion under native vegetation communities. Illustrates soil–landscape–vegetation relationships under extreme rainfall and naturally extremely high erosion rates. (ii) site of multidisciplinary study of geology/tectonics, climate/hydrology, soils and erosion, and vegetation.

VULNERABILITY: 3 MODIFICATIONS/THREATS: deer and possum browsing

TENURE: stewardship land **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Les Basher **DATE OF INFORMATION:** July 1991

REFERENCES: Basher (1986) Basher et al. (1988) Tonkin et al. (1985)

(86) Fergusons Bush Scenic Reserve

REGIONAL/CITY COUNCIL(S): West Coast **ECOLOGICAL DISTRICTS(S):** 50–03 Harihari

LOCALITY and GRID REFERENCE: adjacent SH 6, 8 km SW of Ross I33 264047

AREA(ha): 712 **ALTITUDE(m):** 0–250 **RAINFALL(mm):** 3500

TOPOGRAPHY: colluvial hill slopes and moraine ridge; coastal swamp; terraces **PARENT MATERIAL:** till; outwash gravel; peat **VEGETATION:** podocarp–broadleaved forest; podocarp forest; mixed indigenous scrub; fern–sedgeland

SOILS: lowland yellow–brown earths (Arahura), lowland podzolised yellow–brown earths and podzols (Okarito), organic soils (Kini)

IMPORTANCE: 3 SIGNIFICANCE: (i) a large area containing a moderate range of relatively undisturbed soils and

soil-vegetation associations.

VULNERABILITY: 3

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Geoff Mew **DATE OF INFORMATION:** May 1990

REFERENCES: Department of Lands and Survey (1984) Wardle (1981) McCaskill (1975d)

(87) Mount Hercules Scenic Reserve

REGIONAL/CITY COUNCIL(S): West Coast **ECOLOGICAL DISTRICTS(S):** 50-03 Harihari

LOCALITY and GRID REFERENCE: between Whataroa and Poerua Rivers I34 040760

AREA(ha): 8024 **ALTITUDE(m):** 50-400 **RAINFALL(mm):** 4000

TOPOGRAPHY: low moraine hills; mountain plateau **PARENT MATERIAL:** till derived from schist and greywacke; peat **VEGETATION:** podocarp/broadleaved forest; wetland communities

SOILS: lowland podzolised yellow-brown earths and podzols (Okarito Waiuta), lowland yellow-brown earths (Arahura)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) a large, little-disturbed area containing a moderate range of soils.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** highway

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Geoff Mew **DATE OF INFORMATION:** September 1991

REFERENCES: Department of Lands and Survey (1984) McCaskill (1975d)

(88) Poerua River Scenic Reserve

REGIONAL/CITY COUNCIL(S): West Coast **ECOLOGICAL DISTRICTS(S):** 50-03 Harihari

LOCALITY and GRID REFERENCE: 1 km W of Harihari I34 085811

AREA(ha): 176 **ALTITUDE(m):** 50-120 **RAINFALL(mm):** 4000

TOPOGRAPHY: flat to rolling terraces and moraines **PARENT MATERIAL:** Recent alluvium and gravel till

VEGETATION: podocarp-broadleaved forest; podocarp forest; sedgeland; flaxland; fernland

SOILS: lowland yellow-brown earths (Arahura), gley recent soils (Harihari)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) nationally rare example of fertile recent alluvial soils with kahikatea forest cover.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** cattle damage; strip cut for powerline route; threatened by drainage along deep drains beside SH 6

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Geoff Mew **DATE OF INFORMATION:** May 1990

REFERENCES: Department of Lands and Survey (1984) Wardle (1980) McCaskill (1975d)

(89) Saltwater Ecological Area

REGIONAL/CITY COUNCIL(S): West Coast **ECOLOGICAL DISTRICTS(S):** 50-03 Harihari

LOCALITY and GRID REFERENCE: 30 km NW of Franz Josef township I34 993832

AREA(ha): 1438 **ALTITUDE(m):** 10-30 **RAINFALL(mm):** 3000

TOPOGRAPHY: lagoon; peat bogs; dunes; outwash fans; moraines **PARENT MATERIAL:** alluvium, aeolian deposits, peat, till **VEGETATION:** wetland communities; podocarp forest

SOILS: lowland podzolised yellow-brown earths and podzols (Kumara Okarito Waiuta), organic soils (Kini), gley recent soils (Harihari)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) site contains a moderate range of wetland soils under native vegetation.

VULNERABILITY: 3

TENURE: ecological area **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Geoff Mew **DATE OF INFORMATION:** May 1990

NOTES: This site is part of Saltwater Forest (formerly SF 40).

REFERENCES: Department of Lands and Survey (1984)

(90) Saltwater Lagoon Scenic Reserve

REGIONAL/CITY COUNCIL(S): West Coast **ECOLOGICAL DISTRICTS(S):** 50-03 Harihari

LOCALITY and GRID REFERENCE: on coast SW of mouth of Poerua River I34 947868

AREA(ha): 1359 **ALTITUDE(m):** 0-30 **RAINFALL(mm):** 3000

TOPOGRAPHY: lagoon, sand spit with dunes, alluvial flats, moraine ridge and terrace **PARENT MATERIAL:** aeolian deposits; alluvium; till **VEGETATION:** aquatic communities; podocarp-broadleaved forest

SOILS: lowland podzolised yellow-brown earths and podzols (Kumara), organic soils (Kini), yellow-brown sands (Mahinapua)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) yellow-brown sands with relatively unmodified native forest cover are nationally uncommon. (ii) includes a moderate range of soil-vegetation associations.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** parts have been burned and grazed; history of gold mining

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Geoff Mew **DATE OF INFORMATION:** March 1991
REFERENCES: Department of Lands and Survey (1984) Wardle (1981) McCaskill (1975d)

(91) Waitangiroto Nature Reserve

REGIONAL/CITY COUNCIL(S): West Coast **ECOLOGICAL DISTRICTS(S):** 50–03 Harihari
LOCALITY and GRID REFERENCE: 10 km NE of Okarito township H34 866802
AREA(ha): 1214 **ALTITUDE(m):** 0-75 **RAINFALL(mm):** 3000
TOPOGRAPHY: alluvial flats and swamps **PARENT MATERIAL:** Recent alluvium and beech deposits, glacial till and outwash **VEGETATION:** podocarp–broadleaved forest; podocarp forest; shrubland; wetland communities
SOILS: gley recent soils (Harihari), lowland yellow–brown earths (Arahura), lowland podzolised yellow–brown earth and podzols (Waiuta), organic soils (Kini)
IMPORTANCE: 2 **SIGNIFICANCE:** (i) includes a moderate range of soils under relatively unmodified native vegetation.(ii) lowland podocarp forest was nationally originally much more extensive but has been much reduced in extent by logging and pastoral development. This is the "best reserve of kahikatea forest in New Zealand" (Wardle 1980).(iii) contains relatively unmodified representatives of soils that are agriculturally important on the West Coast.
VULNERABILITY: 3 **MODIFICATIONS/THREATS:** parts have been burnt and milled; grazed by cattle until mid–1970s

TENURE: nature reserve **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Geoff Mew **DATE OF INFORMATION:** May 1990
REFERENCES: Department of Lands and Survey (1984) Wardle (1980) McCaskill (1975d)

(92) Waitangitaona Scenic Reserve

REGIONAL/CITY COUNCIL(S): West Coast **ECOLOGICAL DISTRICTS(S):** 50–03 Harihari
LOCALITY and GRID REFERENCE: left bank Waitangitaona River I35 969658
AREA(ha): 179 **ALTITUDE(m):** 60-150 **RAINFALL(mm):** 4500
TOPOGRAPHY: moraine terrace and wall; riverflat **PARENT MATERIAL:** till and alluvial gravel **VEGETATION:** podocarp/broadleaved forest; podocarp forest and treeland; gravelfield communities
SOILS: upland podzolised yellow–brown earths and podzols (Matiri), gley recent soils (Harihari), gley soils (Hokitika)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) a little–disturbed area containing a moderate range of soils under native vegetation.
VULNERABILITY: 3 **MODIFICATIONS/THREATS:** crossed by road; cattle grazing
TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Geoff Mew **DATE OF INFORMATION:** September 1991
REFERENCES: Department of Lands and Survey (1984) McCaskill (1975d)

(93) Rohutu Scenic Reserve

REGIONAL/CITY COUNCIL(S): West Coast **ECOLOGICAL DISTRICTS(S):** 50–06 Glaciers
LOCALITY and GRID REFERENCE: 3 km S of Whataroa I35 937653
AREA(ha): 492 **ALTITUDE(m):** 100-500 **RAINFALL(mm):** 4300
TOPOGRAPHY: two knolls comprising colluvial and bedrock hill slopes; terrace; fan and moraine **PARENT MATERIAL:** granite, schist and derived colluvium **VEGETATION:** podocarp–broadleaved forest
SOILS: lowland yellow–brown earths (Arahura), upland podzolised yellow–brown earths and podzols (Matiri), recent soils (Hokitika)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) contains a moderate range of soils developed on several landforms and parent materials, under relatively unmodified vegetation.
VULNERABILITY: 3 **MODIFICATIONS/THREATS:** some areas of cattle trespass and logging
TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Geoff Mew **DATE OF INFORMATION:** May 1990
REFERENCES: Department of Lands and Survey (1984) Wardle (1980) McCaskill (1975d)

(94) Westland National Park

REGIONAL/CITY COUNCIL(S): West Coast **ECOLOGICAL DISTRICTS(S):** 50–06 Glaciers, 50–05 Waiho and 50–08 Mahitahi
LOCALITY and GRID REFERENCE: west coast South Island, Calley to Karangarua catchments plus lowland areas H35 790420
AREA(ha): 117 555 **ALTITUDE(m):** 0-3498 **RAINFALL(mm):** 3000-11000
TOPOGRAPHY: mostly steep to very steep colluvial and bedrock mountain slopes that have been strongly glaciated; remnant permanent snowfields and glaciers; on the outwash, many moraines, extensive outwash surfaces, swamps and lakes; coastal dunes, beaches and lagoons **PARENT MATERIAL:** greywacke, argillite and some granite; also alluvium

and till **VEGETATION:** podocarp–broadleaved forest; broadleaved forest; subalpine scrub; short tussock grassland; alpine herbfield and rockland

SOILS: upland podzolised yellow–brown earths and podzols (Haast McKerrow Matiri), alpine steepland soils, etc. (Alpine), lowland podzolised yellow–brown earths and podzols (Okarito Kumara Waita), organic soils (Kini), lowland yellow–brown earths (Arahura Ikamatua), gley recent soils (Karangarua Harihari)

IMPORTANCE: 1 **SIGNIFICANCE:** (i) very extensive area including a wide range of unmodified soils and soil–vegetation and soil–landform associations, under a wide range of climates.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** history of gold–mining on inland waterways and beaches; parts have been logged; crossed by SH 6 and other roads

TENURE: national park **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Geoff Mew **DATE OF INFORMATION:** January 1991

REFERENCES: Department of Lands and Survey (1984) Department of Conservation (1989b) Stevens (1968)

(95) Mahitahi Scenic Reserve

REGIONAL/CITY COUNCIL(S): West Coast **ECOLOGICAL DISTRICTS(S):** 50–07 Karangarua

LOCALITY and GRID REFERENCE: 2 km S of Bruce Bay township G36 348249

AREA(ha): 22 **ALTITUDE(m):** 0–2 **RAINFALL(mm):** 4300

TOPOGRAPHY: terrace and swamp **PARENT MATERIAL:** Recent alluvium and peat **VEGETATION:** podocarp–broadleaved forest

SOILS: gley recent soils (Karangarua), organic soils (Kini)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) a good example of kahikatea forest on lowland soils. This association is nationally much reduced from its former extent, but less so in Westland.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** cattle damage

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Geoff Mew **DATE OF INFORMATION:** May 1990

REFERENCES: Wardle (1980) Department of Lands and Survey (1984) McCaskill (1975d)

(96) Haast Dunes

REGIONAL/CITY COUNCIL(S): West Coast **ECOLOGICAL DISTRICTS(S):** 51–04 Haast

LOCALITY and GRID REFERENCE: along coast between Haast and Waita Rivers, extending inland to Bayon Hill F37 947018

AREA(ha): 1600 **ALTITUDE(m):** 0–40 **RAINFALL(mm):** 3470

TOPOGRAPHY: series of coastal dunes and interdune hollows **PARENT MATERIAL:** aeolian sands and peat **VEGETATION:** podocarp forest; wetland communities

SOILS: lowland yellow–brown earths, recent soils, lowland podzolised yellow–brown earths and podzols (Waita), organic soils (Kini)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) one of the best little–modified Holocene dune systems under high rainfall. (ii) classic site for studies of processes leading to the development of podzols in sandy materials.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** grazing and pasture development along foredune

TENURE: stewardship land **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Les Basher **DATE OF INFORMATION:** February 1991

NOTES: Soil pH ranges from 3.0 to a high of 4.4.

REFERENCES: Molloy (1988) Priestley et al. (1990) Metcalf (1989)

(97) Okuru Scenic Reserve

REGIONAL/CITY COUNCIL(S): West Coast **ECOLOGICAL DISTRICTS(S):** 51–04 Haast

LOCALITY and GRID REFERENCE: N of the Okuru River bridge, 10 km SW of Haast F37 834938

AREA(ha): 40 **ALTITUDE(m):** 3–15 **RAINFALL(mm):** 3500

TOPOGRAPHY: coastal dunes and alluvial flats **PARENT MATERIAL:** aeolian and alluvial deposits **VEGETATION:** podocarp forest; broadleaved scrub

SOILS: lowland podzolised yellow–brown earths and podzols (Waita)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) a good example of a coastal soil–vegetation association that has been much reduced in extent along the West Coast.

VULNERABILITY: 3

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Geoff Mew **DATE OF INFORMATION:** May 1990

REFERENCES: Department of Lands and Survey (1984)

(98) Waipara-Arawata Confluence

REGIONAL/CITY COUNCIL(S): West Coast **ECOLOGICAL DISTRICTS(S):** 51–06 Arawata

LOCALITY and GRID REFERENCE: confluence of Waipara and Arawata Rivers, 30 km from coast E38 627532

AREA(ha): 250 ALTITUDE(m): 47-62 RAINFALL(mm): 6400

TOPOGRAPHY: very gently-sloping alluvial terraces (three treads) – all >2000 years old **PARENT MATERIAL:** alluvium derived from schist **VEGETATION:** beech–podocarp forest; broadleaved shrubland; conifer–podocarp forest; introduced grassland

SOILS: recent soils (Kairangarua), lowland podzolised yellow–brown earths and podzols, gley recent soils

IMPORTANCE: 3 **SIGNIFICANCE:** (i) vegetation and soil development at this site has been studied and described.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** has been grazed; introduced plants are locally abundant

TENURE: stewardship land **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Geoff Mew **DATE OF INFORMATION:** May 1990

REFERENCES: Smith and Lee (1984)

(99) Mount Aspiring National Park

REGIONAL/CITY COUNCIL(S): West Coast and Otago **ECOLOGICAL DISTRICTS(S):** 51–06 Arawata, 51–05 Okuru and 51–07 Dart

LOCALITY and GRID REFERENCE: traverses the main divide from Haast River in the north to the Humbolt Mountains in the south F39 712392

AREA(ha): 355 543 ALTITUDE(m): 30-3027 RAINFALL(mm): 1300-5000

TOPOGRAPHY: steep to very steep mountains east of the Alpine Fault; heavily glaciated – many permanent snowfields, glaciers, hanging valleys and cirques **PARENT MATERIAL:** mostly schist, some greywacke and argillite; minor ultramafic rocks; minor alluvium and till **VEGETATION:** beech–broadleaved forest; beech–podocarp forest; subalpine scrub; snow tussock grassland; short tussock grassland; alpine herbfield and rockland; ultramafic communities

SOILS: upland podzolised yellow–brown earths and podzols (Haast McKerrow Polnoon), alpine steepland soils, etc. (Alpine), brown granular loam/clay – yellow–brown earths intergrade (Hollyford Bryneira), brown granular loams and clays (Olivine), gley recent soils (Harihari), recent soils (Matukituki)

IMPORTANCE: 1 **SIGNIFICANCE:** (i) very extensive area including a wide range of unmodified soils and soil–vegetation associations.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** red deer, chamois, thar, goat, hare and possum; crossed by SH 6 (Haast Pass); historical mining at Red Hills, as well as bulldozer access tracks

TENURE: national park **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** January 1991

REFERENCES: Department of Lands and Survey (1984)

(100) Goose Bay - Omihi Scenic Reserve

REGIONAL/CITY COUNCIL(S): Nelson/Marlborough **ECOLOGICAL DISTRICTS(S):** 52–01 Hundalee

LOCALITY and GRID REFERENCE: adjacent to SH 1 between Goose Bay and Oaro, 17 km SE of Kaikoura O32 534586

AREA(ha): 201 ALTITUDE(m): 0-430 RAINFALL(mm): 1000

TOPOGRAPHY: steep colluvial hillslopes and coastal shelf **PARENT MATERIAL:** greywacke colluvium **VEGETATION:** broadleaved forest

SOILS: lowland yellow–brown earths (Patutu)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) one of the largest reserves on this part of the coast and contains a moderate variety of habitats from sunny faces to deep, shady gullies. (ii) coastal soil–vegetation associations are nationally uncommon.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** has been logged and is grazed by stock; crossed by SH 1 and Main North Railway; camping areas

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Iain Campbell **DATE OF INFORMATION:** December 1989

NOTES: Comprises several discrete parts adjacent to SH 1 between Oaro and Goose Bay.

REFERENCES: Williams (1982) McCaskill (1981)

(101) Hyde Open Space Covenant

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 52–01 Hundalee

LOCALITY and GRID REFERENCE: true right side of junction of Spey and Conway Rivers, 15 km from SH1 at end of Ngaroma Road O32 372510

AREA(ha): 70 ALTITUDE(m): 100-180 RAINFALL(mm): 1270

TOPOGRAPHY: steep colluvial hillslopes **PARENT MATERIAL:** sandstone and siltstone and derived colluvium **VEGETATION:** podocarp/beech forest

SOILS: yellow–grey – yellow–brown earths intergrade (Hundalee)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) possibly the only remaining example of Hundalee soils under native vegetation.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** has been logged
TENURE: freehold, QEII open space covenant **OWNER/MANAGER:** N Hyde, Cheviot
CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** December 1987
REFERENCES: Department of Lands and Survey (1984)

(102) Limestone Creek Scenic Reserve

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 52-01 Hundalee
LOCALITY and GRID REFERENCE: 28 km SW of Kaikoura O32 461485
AREA(ha): 4.2 **ALTITUDE(m):** 120 **RAINFALL(mm):** 1200
TOPOGRAPHY: steep colluvial hillslopes **PARENT MATERIAL:** greywacke colluvium. **VEGETATION:** beech forest; introduced grassland and ferns; broadleaved forest
SOILS: lowland yellow-brown earths (Hurunui)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) this is one of the few remnants of Hurunui soils under beech forest in southern Marlborough (this association was formerly much more extensive).
VULNERABILITY: 3
TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** December 1989
REFERENCES: Department of Lands and Survey (1984) Williams (1982) McCaskill (1981)

(103) Lottery Bush Scenic Reserve

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 52-01 Hundalee
LOCALITY and GRID REFERENCE: 12 km NNE of Waiau N32 175506
AREA(ha): 109 **ALTITUDE(m):** 275-460 **RAINFALL(mm):** 1100
TOPOGRAPHY: low rolling colluvial hillslopes and outwash **PARENT MATERIAL:** Tertiary sandstone and some loess; glacial outwash on terraces **VEGETATION:** podocarp-beech forest; beech forest; kanuka-manuka scrub; introduced grassland
SOILS: yellow-grey - yellow-brown earths intergrade (Wandle), yellow-grey earths (Lottery)
IMPORTANCE: 2 **SIGNIFICANCE:** (i) few soils derived from Tertiary sandstone remain under native forest in New Zealand. This is probably the only site where Wandle and Lottery soils are protected (they cover 5000 and 7500 ha respectively). (ii) soils under forest on terraces in dry parts of the South Island are uncommon.
VULNERABILITY: 3 **MODIFICATIONS/THREATS:** has been logged; still grazed by cattle, pigs and possums
TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** December 1987
REFERENCES: Kelly (1972) Department of Lands and Survey (1984) McCaskill (1974)

(104) Culverden Scientific Reserve

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 52-03 Culverden
LOCALITY and GRID REFERENCE: 10 km E of Culverden, beneath the Lowry Peaks Range N33 008258
AREA(ha): 10 **ALTITUDE(m):** 180 **RAINFALL(mm):** 700
TOPOGRAPHY: terrace **PARENT MATERIAL:** glacial outwash gravels with very thin cover of loess **VEGETATION:** kanuka-matagouri shrubland; short tussock grassland
SOILS: yellow-grey earths (Balmoral)
IMPORTANCE: 2 **SIGNIFICANCE:** (i) one of the few remaining examples of yellow-grey earths under shrubland, an association that originally covered large areas of the Canterbury Plains. Yellow-grey earths with original vegetation cover are also nationally uncommon.
VULNERABILITY: 3 **MODIFICATIONS/THREATS:** has been burned and grazed
TENURE: scientific reserve **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** December 1987
REFERENCES: Department of Lands and Survey (1984)

(105) Medbury

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 52-03 Culverden
LOCALITY and GRID REFERENCE: Schimmings Road, near Hurunui River M33 840160
AREA(ha): 70 **ALTITUDE(m):** 240 **RAINFALL(mm):** 800-1200
TOPOGRAPHY: upper outwash terrace **PARENT MATERIAL:** outwash derived from greywacke and argillite
VEGETATION: kanuka treeland; (grass)/mossfield; short tussock grassland
SOILS: yellow-grey earths (Balmoral)
IMPORTANCE: 2 **SIGNIFICANCE:** (i) largest remaining area of uncultivated soils on Canterbury lowlands. Vegetation is in good condition and the soil-vegetation association is not protected elsewhere. (ii) nationally, natural lowland soil-vegetation associations are very uncommon.

VULNERABILITY: 1 **MODIFICATIONS/THREATS:** has been burned – probably in Maori and/or early European times; still extensively grazed by sheep; some introduced grasses, wildling pines and broom
TENURE: private land **OWNER/MANAGER:** K Stewart, Cheviot
CONTACT PERSON: Colin Meurk **DATE OF INFORMATION:** May 1991
NOTES: Woodland is more dense and taller than at Bankside and Culverden Scientific Reserves – more or less intermediate to Eyrewell Scientific Reserve. Total area including nearby fescue tussocklands is 100 ha. Site is under negotiation for formal protection; contact Mark Davis, PL/PNAP Section, Canterbury Conservancy, Department of Conservation, before approaching landowner.
REFERENCES: Meurk (1988a)

(106) Gore Bay Scenic Reserve

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 52–05 Cheviot
LOCALITY and GRID REFERENCE: near Gore Bay settlement, 8 km SSE of Cheviot O33 352149
AREA(ha): 63 **ALTITUDE(m):** 0–100 **RAINFALL(mm):** 900
TOPOGRAPHY: coastal faces and gullies of a bench 75–100 m above sea level; includes an example of "badland" erosion and a prominent chalk sandstone bluff **PARENT MATERIAL:** loess over Tertiary deposits **VEGETATION:** broadleaved forest and scrub; manuka scrub; short tussock grassland; frequent exotic trees
SOILS: yellow–grey – yellow–brown earths intergrade (Medina)
IMPORTANCE: 2 **SIGNIFICANCE:** (i) one of a few remaining reserves of yellow–grey – yellow–brown earth intergrades under coastal native vegetation in Canterbury (two other sites at Banks Peninsula, where the soils are markedly different). (ii) possibly the only protected natural area representing Medina soils.
VULNERABILITY: 3 **MODIFICATIONS/THREATS:** has been burned and grazed
TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** December 1987
NOTES: Erosion processes have formed spectacular "badland" landform features known as "The Cathedrals".
REFERENCES: Kelly (1972) Department of Lands and Survey (1984)

(107) Waiau River Mouth Scenic Reserve

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 52–05 Cheviot
LOCALITY and GRID REFERENCE: 1.5 km from coast, 9 km NE of Cheviot O33 395269
AREA(ha): 40 **ALTITUDE(m):** 7–230 **RAINFALL(mm):** 900
TOPOGRAPHY: steep colluvial hillslopes, terraces **PARENT MATERIAL:** greywacke and derived colluvium and alluvium **VEGETATION:** podocarp–broadleaved forest; kanuka forest and scrub; introduced grassland with short tussock
SOILS: lowland yellow–brown earths (Hurunui)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) good example of Hurunui soils under podocarp–broadleaved forest.
VULNERABILITY: 3 **MODIFICATIONS/THREATS:** grazed by cattle, sheep, pig and possum, but regeneration potential is good
TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** December 1987
NOTES: The reserve is unique in Canterbury for the occurrence of hinau and titoki in the canopy (Kelly 1972).
REFERENCES: Kelly (1972) Department of Lands and Survey (1984) McCaskill (1974)

(108) Napenape Scenic Reserve

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 52–06 Motunau
LOCALITY and GRID REFERENCE: 5 km SW of Hurunui River mouth, 15 km S of Cheviot N33 300069
AREA(ha): 47 **ALTITUDE(m):** 9–225 **RAINFALL(mm):** 850
TOPOGRAPHY: colluvial hillslopes; slump area comprising bedrock outcrops, screes, fans, sinkholes and blockfields
PARENT MATERIAL: calcareous sandstone and limestone (Amuri Group) **VEGETATION:** broadleaved forest
SOILS: yellow–grey earths (Stonyhurst), rendzina and related soils (Waikari)
IMPORTANCE: 2 **SIGNIFICANCE:** (i) yellow–grey earths under native forest are uncommon in New Zealand. (ii) this is probably the only site where Waikari and Stonyhurst soils are protected.
VULNERABILITY: 3 **MODIFICATIONS/THREATS:** has been burned and grazed
TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** December 1987
NOTES: Nationally unique mass movement landform.
REFERENCES: Department of Lands and Survey (1984) McCaskill (1974)

(109) Arthurs Pass National Park

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 53–02 Arthurs Pass, 50–02 Whitcombe and 53–01 Minchin

LOCALITY and GRID REFERENCE: Arthurs Pass, central South Island K33 077071

AREA(ha): 94 422 **ALTITUDE(m):** 300-2271 **RAINFALL(mm):** 2000-9000

TOPOGRAPHY: steep to very steep colluvial and bedrock mountainslopes and tops; cirques basins – some with permanent snowfields/glaciers and tarns; braided riverbeds and wide river flats; large rock avalanche features; moraines; ridge rents; deep gorges **PARENT MATERIAL:** mainly greywacke and argillite, some volcanic rock and schist in the west **VEGETATION:** beech forest; podocarp/broadleaved forest; broadleaved forest; subalpine scrub; snow tussock grassland; alpine fellfields; rockland; gravelfield;

SOILS: upland yellow-brown earths (Spenser Bealey Kaikoura Katrine), upland podzolised yellow-brown earths and podzols (Lewis Otira Whitcombe), alpine steepland soils, etc. (Alpine), recent soils (Tasman)

IMPORTANCE: 1 **SIGNIFICANCE:** (i) very extensive area including a very wide range of soils and soil-vegetation associations.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** crossed by SH 73 and the Christchurch-Hokitika railway line; grazed by possums, deer and chamois

TENURE: national park **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Les Basher **DATE OF INFORMATION:** December 1987

NOTES: There are significant climate and vegetation differences on either side of the main divide.

REFERENCES: Kelly (1972) Department of Lands and Survey (1984)

(110) Betwixt

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 54-03 Cass

LOCALITY and GRID REFERENCE: adjacent SH73, 4 km WNW of Cass settlement K34 061961

AREA(ha): 1300 **ALTITUDE(m):** 600-1900 **RAINFALL(mm):** 1500

TOPOGRAPHY: steep colluvial mountain slopes; screes and bluffs; alluvial fans; incised gullies and roche moutonne features **PARENT MATERIAL:** greywacke and argillite and derived alluvium and till **VEGETATION:** mixed shrubland; matagouri and manuka scrub; beech forest; scree communities; subalpine scrub; snow tussock grassland

SOILS: upland yellow-brown earths (Bealey Kaikoura), gley recent soils (Dobson)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) contains valuable wetland soil remnants. (ii) montane scrub in Pylon Gully is one of the few sites of soils under relict scrub in Cass and Craigieburn Ecological Districts that was not forested previous to human arrival.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** has been burnt and grazed

TENURE: pastoral lease, conservation park, recommended area for protection **OWNER/MANAGER:** Coralynn Station, Department of Conservation

CONTACT PERSON: Phil Tonkin **DATE OF INFORMATION:** March 1991

REFERENCES: Shanks et al. (1990)

(111) Boundary Stream

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 54-03 Cass

LOCALITY and GRID REFERENCE: catchment head of Boundary Stream, 20 km WNW of Cass settlement L33 243001

AREA(ha): 2500 **ALTITUDE(m):** 760-1010 **RAINFALL(mm):** 1700

TOPOGRAPHY: steep colluvial mountain slopes; many rock outcrops; extensive mountain top scree deposits; periglacial features – frost rubble sheets with well-developed stone stripes; two small tarns behind landslide deposits; fault scarps

PARENT MATERIAL: greywacke and derived colluvium and alluvium **VEGETATION:** beech forest; subalpine scrub; snow tussock grassland; alpine herbfield; rockland; gravelfield; aquatic communities

SOILS: upland yellow-brown earths (Bealey Kaikoura), recent soils (Tasman)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) one of the few catchments in the Canterbury foothill ranges with a largely intact natural treeline, as well as a good altitudinal sequence of soils and vegetation.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** has been burned and grazed

TENURE: pastoral lease, recommended area for protection **OWNER/MANAGER:** Mt White Station

CONTACT PERSON: Phil Tonkin **DATE OF INFORMATION:** March 1991

NOTES: The area is due to be retired from grazing.

REFERENCES: Shanks et al. (1990)

(112) Broken River Limestone

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 54-03 Cass

LOCALITY and GRID REFERENCE: adjacent Porter River and Cass Stream, 23 km S of Cass settlement K34 223 960

AREA(ha): 850 **ALTITUDE(m):** 590-995 **RAINFALL(mm):** 900

TOPOGRAPHY: prominent escarpments, screes and karst landforms (including shallow sinkholes); mass movement debris slopes; outwash surfaces **PARENT MATERIAL:** Tertiary sedimentary rocks – greensand, calcareous mudstone,

limestone, basaltic tuff, conglomerate, sandstone, mudstone and low-grade coal; outwash gravels; mass movement debris

VEGETATION: rockland; gravelfield; short tussock grassland

SOILS: upland yellow-brown earths (Cass Tekoa Craigieburn), rendzina and related soils (Castle), recent soils (Tasman)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) includes a moderate range of soil types, reflecting the varied geology.(ii) includes type localities for the Parapet, Coleridge, Thomas, Enys, Bridge and Broken soil forms, as well as classes of the Tasman, Snowgrass and Cass soil forms (Lynn 1987).(iii) areas of limestone ranker soils with *Poa acicularifolia* turf are limited to a few sites in the South Island.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** has been burned; is still grazed

TENURE: endowment lease, pastoral lease, freehold, recommended area for protection **OWNER/MANAGER:** University of Canterbury;

CONTACT PERSON: Phil Tonkin **DATE OF INFORMATION:** March 1991

NOTES: This area also contains many special limestone plants, and is of high geological interest.

REFERENCES: Shanks et al. (1990) Lynn (1987)

(113) Cass

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 54-03 Cass

LOCALITY and GRID REFERENCE: adjacent Cass settlement K34 097962

AREA(ha): 940 **ALTITUDE(m):** 530-1360 **RAINFALL(mm):** 1500

TOPOGRAPHY: steep colluvial and bedrock mountain slopes; screes and debris flow chutes; alluvial fans and moraines

PARENT MATERIAL: greywacke and argillite and derived till and alluvium **VEGETATION:** beech forest; mixed scrub and shrubland; introduced grassland; sedgeland

SOILS: upland yellow-brown earths (Cass Tekoa Snowgrass), recent soils (Tasman), gley recent soils (Dobson)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) biological studies have been carried out here for most of the past century (especially of vegetation change and effects of grazing).

VULNERABILITY: 2

TENURE: endowment lease, recommended area for protection, pastoral lease **OWNER/MANAGER:** University of Canterbury, Craigieburn and Grasmere Stations

CONTACT PERSON: Phil Tonkin **DATE OF INFORMATION:** March 1991

NOTES: The RAP is centred on the University of Canterbury field station and is covered by a conservation covenant.

REFERENCES: Shanks et al. (1990)

(114) Lake Hawdon

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 54-03 Cass

LOCALITY and GRID REFERENCE: adjacent Christchurch-Greymouth railway, 13 km SE of Cass settlement L34 163890

AREA(ha): 250 **ALTITUDE(m):** 580-640 **RAINFALL(mm):** 1000

TOPOGRAPHY: lakes in kettlehole and glacier-excavated rock hollows; ablation moraine **PARENT MATERIAL:** till, outwash and alluvial sediments derived from greywacke and argillite **VEGETATION:** red tussock grassland; short tussock grassland; reedland; sedgeland; turfand

SOILS: gley recent soils (Dobson), gley soils (Lyndon), upland yellow-brown earths (Cass)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) contains one of the two largest and most diverse wetlands in the district (the other is Little Flora in the upper Esk valley).(ii) includes a large area of Lyndon and Dobson soils under red tussockland. This association was formerly much more extensive throughout the ecological district but has been much reduced by drainage, burning and grazing.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** Drainage is contributing to drying-out of the wetlands

TENURE: endowment lease, legal road, Crown land, recommended area for protection **OWNER/MANAGER:** University of Canterbury, Craigieburn Station

CONTACT PERSON: Phil Tonkin **DATE OF INFORMATION:** March 1991

NOTES: A conservation covenant is being negotiated for the area.

REFERENCES: Shanks et al. (1990)

(115) Lazyman

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 54-03 Cass

LOCALITY and GRID REFERENCE: lower western slopes of the Puketeraki Range, above Esk River, 32 km E of Cass settlement L34 326980

AREA(ha): 200 **ALTITUDE(m):** 915-1040 **RAINFALL(mm):** 2000

TOPOGRAPHY: outwash terrace; small tarns; deeply incised streams **PARENT MATERIAL:** outwash gravels derived from greywacke and argillite **VEGETATION:** tauhinu shrubland; cushion bog; beech forest

SOILS: upland yellow-brown earths (Craigieburn), gley soils (Lyndon), organic soils

IMPORTANCE: 3 **SIGNIFICANCE:** (i) contains a moderate range of little-modified soil-vegetation associations

that were formerly much more extensive in the ecological district.

VULNERABILITY: 2

TENURE: pastoral lease, legal road, recommended area for protection **OWNER/MANAGER:** Esk Head Station

CONTACT PERSON: Phil Tonkin **DATE OF INFORMATION:** March 1991

NOTES: Terrace is of Otarama age, whereas Little Flora area is outwash of Blackwater age.

REFERENCES: Shanks et al. (1990)

(116) Little Flora

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 54-03 Cass

LOCALITY and GRID REFERENCE: adjacent to and inbetween East Branch Poulter River and Nigger Stream (an Esk River tributary), 29 km NE of Cass settlement L33 338044

AREA(ha): 1400 **ALTITUDE(m):** 670-1040 **RAINFALL(mm):** 2000

TOPOGRAPHY: lateral and terminal moraine ridges; meltwater channels; tarns; outwash terraces and erosion pavement

PARENT MATERIAL: till, outwash, greywacke and alluvium **VEGETATION:** shrublands; tauhinu shrubland with short tussock grassland; matagouri scrub; sedgeland; red tussock grassland; cushionfield; turfand

SOILS: upland yellow-brown earths (Craigieburn Cass), gley soils (Lyndon), recent soils (Tasman)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) includes a moderate range of soils and soil-vegetation associations.(ii) contains one of the largest and least modified wetlands in Cass Ecological District.(iii) soil-bog pine shrubland associations are uncommon in New Zealand – this is one of five major sites in the South Island.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** has been burned; still grazed by cattle; pig rooting

TENURE: pastoral lease, legal road, recommended area for protection **OWNER/MANAGER:** Mt White Station

CONTACT PERSON: Phil Tonkin **DATE OF INFORMATION:** March 1991

NOTES: This is one of the most important areas in the district for the preservation of rare flora and little modified vegetation.

REFERENCES: Shanks et al. (1990)

(117) Mounds of Misery

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 54-03 Cass

LOCALITY and GRID REFERENCE: saddle between Cox and Nigger valleys, 29 km NE of Cass settlement L33 273093

AREA(ha): 2000 **ALTITUDE(m):** 640-1770 **RAINFALL(mm):** 2000

TOPOGRAPHY: ablation moraine with numerous tarns and swamps; outwash gravels; colluvial steep mountain slopes; bluffs and shattered outcrops on the summit ridges; extensive screes; and debris flow fans **PARENT MATERIAL:** till, outwash, alluvium and greywacke **VEGETATION:** moss herbfield; turfand; cushion-mossfield; sedgeland; snow tussock grassland; beech forest; gravelfield; rockland

SOILS: upland yellow-brown earths (Cass Bealey Tekoa Kaikoura), gley soils (Lyndon), recent soils (Tasman)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) classic example of soils on moraines and other high altitude landforms.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** parts grazed by sheep

TENURE: pastoral lease, freehold, stewardship land, recommended area for protection **OWNER/MANAGER:** Mt White Station

CONTACT PERSON: Phil Tonkin **DATE OF INFORMATION:** March 1991

NOTES: The Royal Forest and Bird Protection Society has recommended that part of the area covered by the recommended area for protection be added to Arthurs Pass National Park.

REFERENCES: Shanks et al. (1990)

(118) Porter River Terrace Riser

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 54-03 Cass

LOCALITY and GRID REFERENCE: adjacent Porter River, 33 km S of Cass settlement K34 072749

AREA(ha): 40 **ALTITUDE(m):** 670-700 **RAINFALL(mm):** 900

TOPOGRAPHY: terrace riser **PARENT MATERIAL:** greywacke and argillite outwash, and greensand **VEGETATION:** shrubland including sweet brier

SOILS: upland yellow-brown earths (Cass), rendzina and related soils (Iron-Creek)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) change in shrub vegetation on different substrates is an important feature.

VULNERABILITY: 2

TENURE: freehold, pastoral lease, recommended area for protection **OWNER/MANAGER:** Castle Hill Station

CONTACT PERSON: Phil Tonkin **DATE OF INFORMATION:** March 1991

REFERENCES: Shanks et al. (1990)

(119) Waimakariri Gorge

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 54-03 Cass

LOCALITY and GRID REFERENCE: adjacent Waimakariri Gorge, 27 km SE of Cass township L34 255855

AREA(ha): 2000 **ALTITUDE(m):** 350-975 **RAINFALL(mm):** 1500
TOPOGRAPHY: deep gorge with spectacular bluffs; kame and outwash terraces above **PARENT MATERIAL:** greywacke and argillite and derived outwash and till **VEGETATION:** broadleaved forest; mountain beech forest; rockland
SOILS: upland yellow-brown earths (Tekoa Cass)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) contains soil-vegetation associations that do not occur elsewhere in the district and are rare elsewhere in the eastern foothills of Canterbury.
VULNERABILITY: 2
TENURE: university endowment land, crown land, legal road, recommended area for pro **OWNER/MANAGER:** Craigieburn Station, Department of Conservation (Oxford Forest)
CONTACT PERSON: Phil Tonkin **DATE OF INFORMATION:** March 1991
REFERENCES: Shanks et al. (1990)

(120) Craigieburn Conservation Park

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 54-05 Craigieburn
LOCALITY and GRID REFERENCE: Craigieburn and Grey Ranges, 43 km WNW of Oxford K34 934867
AREA(ha): 35 735 **ALTITUDE(m):** 700-2200 **RAINFALL(mm):** 1200-3000
TOPOGRAPHY: steep colluvial and bedrock mountain slopes with rounded tops; extensive planar screes; cirque basins; moraines; fans; terraces; fault scarps **PARENT MATERIAL:** greywacke and argillite and derived colluvium, and minor alluvium **VEGETATION:** beech forest; snow tussock grassland; gravelfield; shrubland; short tussock grassland; red tussock grassland; matagouri and manuka scrub
SOILS: upland yellow-brown earths (Spenser Kaikoura Bealey Katrine Tekoa), alpine steepland soils, etc. (Alpine), upland podzolised yellow-brown earths and podzols (Lewis), recent soils (Tasman)
IMPORTANCE: 1 **SIGNIFICANCE:** (i) very extensive area containing a wide range of little-modified soil-vegetation associations.
VULNERABILITY: 3 **MODIFICATIONS/THREATS:** parts have been burned and grazed; deer and chamois present
TENURE: conservation park **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Les Basher **DATE OF INFORMATION:** October 1989
REFERENCES: Department of Lands and Survey (1984)

(121) Acheron Hill

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 54-06 Coleridge
LOCALITY and GRID REFERENCE: true left bank of the Acheron River near its confluence with the Rakaia River; 6.5 km SE of Lake Coleridge settlement K35 949555
AREA(ha): 4 **ALTITUDE(m):** 426-460 **RAINFALL(mm):** 900
TOPOGRAPHY: terrace treads and risers, narrow floodplain and till-mantle hillslopes **PARENT MATERIAL:** greywacke and derived moraine, outwash and loess **VEGETATION:** prostrate kowhai shrubland
SOILS: recent soils (Kowai Tasman), upland yellow-brown earths (Tekapo)
IMPORTANCE: 2 **SIGNIFICANCE:** (i) Kowai soils under dense prostrate kowhai are nationally uncommon.(ii) soil sites under native vegetation are uncommon in the driest parts of the mid-Canterbury high country.
VULNERABILITY: 2 **MODIFICATIONS/THREATS:** threatened by invasion of broom and sweet brier
TENURE: freehold, recommended area for protection **OWNER/MANAGER:** Big Ben Station
CONTACT PERSON: Phil Tonkin **DATE OF INFORMATION:** February 1991
REFERENCES: Shanks et al. (1990)

(122) Big Ben Swamp

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 54-06 Coleridge
LOCALITY and GRID REFERENCE: between Acheron River and Big Ben Range (known locally as Black Hills), 10 km W of Lake Coleridge settlement K35 990574
AREA(ha): 210 **ALTITUDE(m):** 700-730 **RAINFALL(mm):** 900
TOPOGRAPHY: low relief hills and shallow meltwater channels **PARENT MATERIAL:** Tui Creek advance moraine and outwash over greywacke **VEGETATION:** sedgeland; red tussock grass-sedgeland
SOILS: gley recent soils (Dobson), upland yellow-brown earths (Tekapo)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) area is the best remaining dry red tussockland in the district.
VULNERABILITY: 2 **MODIFICATIONS/THREATS:** has been grazed and burned
TENURE: freehold, recommended area for protection **OWNER/MANAGER:** Mr J Cook
CONTACT PERSON: Phil Tonkin **DATE OF INFORMATION:** February 1991
REFERENCES: Shanks et al. (1990)

(123) Black Hole

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 54-06 Coleridge

LOCALITY and GRID REFERENCE: base of the Big Ben Range; 10 km W of Lake Coleridge settlement K35 009 558

AREA(ha): 50 **ALTITUDE(m):** 560-640 **RAINFALL(mm):** 900

TOPOGRAPHY: old meltwater channel; steep-sided bedrock outcrops **PARENT MATERIAL:** moraine and outwash as well as colluvium derived from greywacke and argillite **VEGETATION:** sedgeland; flax-sedgeland; broadleaved scrub

SOILS: upland yellow-brown earths (Tekoa), gley recent soils (Dobson)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) one of a series of soil sites under harakeke and pukio swamps that were formerly much more extensive in the district

VULNERABILITY: 2

TENURE: freehold, recommended area for protection **OWNER/MANAGER:** Mr J Cook

CONTACT PERSON: Phil Tonkin **DATE OF INFORMATION:** February 1991

REFERENCES: Shanks et al. (1990)

(124) Clay Range

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 54-06 Coleridge

LOCALITY and GRID REFERENCE: near confluence of Harper and Avoca Rivers; 23 km N of Lake Coleridge settlement K34 939765

AREA(ha): 500 **ALTITUDE(m):** 700-1100 **RAINFALL(mm):** 1800

TOPOGRAPHY: partially dissected bedrock bench; many bedrock knobs, recessional moraines and tarns; old blockfields; meltwater channels **PARENT MATERIAL:** greywacke and argillite and derived till **VEGETATION:** broadleaved scrub and shrublands; short tussock grassland; kanuka-manuka scrub; turfand; reedland; sedgeland; red tussock grassland

SOILS: upland yellow-brown earths (Craigieburn Cass Tekoa), gley soils (Lyndon), organic soils

IMPORTANCE: 3 **SIGNIFICANCE:** (i) contains a moderate of soils and soil-vegetation associations.

VULNERABILITY: 2

TENURE: university endowment lease, recommended area for protection **OWNER/MANAGER:** University of Canterbury, Ryton/Olympus Station

CONTACT PERSON: Phil Tonkin **DATE OF INFORMATION:** March 1991

REFERENCES: Shanks et al. (1990)

(125) Coleridge Downs Lakeside

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 54-06 Coleridge

LOCALITY and GRID REFERENCE: SW corner of Peak Hill (1244 m), adjacent Lake Coleridge, 3.5 km N of lake Coleridge settlement K35 898626

AREA(ha): 20 **ALTITUDE(m):** 507-595 **RAINFALL(mm):** 800

TOPOGRAPHY: meltwater drainage channel; valley outflow dammed by a steep gravel beach **PARENT MATERIAL:** till and greywacke **VEGETATION:** snow tussock grass-shrubland; tauhinu scrub; broadleaved forest; flax-sedgeland

SOILS: upland yellow-brown earths (Tekapo), gley recent soils (Lyndon)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) a small remnant of a formerly much more extensive moraine soil-vegetation association.

VULNERABILITY: 2

TENURE: freehold, legal road, recommended area for protection **OWNER/MANAGER:** Mr JN Murchison, Coleridge Downs Station

CONTACT PERSON: Phil Tonkin **DATE OF INFORMATION:** February 1991

REFERENCES: Shanks et al. (1990)

(126) Gargarus

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 54-06 Coleridge

LOCALITY and GRID REFERENCE: Gargarus (1646 m), near the confluence of the Harper and Avoca Rivers, 28 km N of Lake Coleridge settlement K34 872789

AREA(ha): 950 **ALTITUDE(m):** 610-1645 **RAINFALL(mm):** 2000

TOPOGRAPHY: steep colluvial and bedrock mountain slopes; moraines; kame terraces; lake **PARENT MATERIAL:** greywacke and argillite and derived till and alluvium **VEGETATION:** reedland; red tussock grassland; sedgeland; tussock-sedgeland; cushion-gravelfield; snow tussock grassland

SOILS: upland yellow-brown earths (Cass Tekoa Bealey), gley soils (Lyndon), gley recent soils (Dobson)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) moderate range of little-modified soil-vegetation associations.

VULNERABILITY: 2

TENURE: pastoral lease, legal road, Crown land, recommended are for protection **OWNER/MANAGER:** Glenthorn Station

CONTACT PERSON: Phil Tonkin **DATE OF INFORMATION:** March 1991
REFERENCES: Shanks et al. (1990)

(127) Mt Barker Tarns

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 54-06 Coleridge
LOCALITY and GRID REFERENCE: between Mt Barker (896 m) and Acheron River, 8 km W of Lake Coleridge settlement K35 971598
AREA(ha): 180 **ALTITUDE(m):** 550-670 **RAINFALL(mm):** 900
TOPOGRAPHY: undulating moraine surface with irregular arc-shaped ridges and numerous kettleholes and drainage channels **PARENT MATERIAL:** Acheron Advance till derived from greywacke and argillite **VEGETATION:** short tussock grassland with matagouri; aquatic turfand; sedgeland
SOILS: upland yellow-brown earths (Acheron Tekapo), gley recent soils (Dobson), organic soils
IMPORTANCE: 3 **SIGNIFICANCE:** (i) this area contains the most ecologically important group of kettlehole tarns in the district.(ii) contains a moderate range of relative unmodified soil-vegetation associations.
VULNERABILITY: 2 **MODIFICATIONS/THREATS:** cattle pugging at some tarn margins; wildling pines
TENURE: endowment lease, recommended area for protection **OWNER/MANAGER:** University of Canterbury, Acheron Bank Station
CONTACT PERSON: Phil Tonkin **DATE OF INFORMATION:** February 1991
REFERENCES: Shanks et al. (1990)

(128) Mt Cotton

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 54-06 Coleridge
LOCALITY and GRID REFERENCE: Mt Cotton (1469 m), adjacent Lake Coleridge, 16.5 km N of Lake Coleridge settlement K34 887718
AREA(ha): 100 **ALTITUDE(m):** 1220-1470 **RAINFALL(mm):** 1700
TOPOGRAPHY: rounded colluvial and bedrock mountain top; patterned ground **PARENT MATERIAL:** greywacke and argillite **VEGETATION:** snow tussock grassland; subalpine scrub; fellfield
SOILS: upland yellow-brown earths (Kaikoura Tekoa)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) contains the only remaining large Kaikoura soil-dense slim snow tussockland association in the district.
VULNERABILITY: 2 **MODIFICATIONS/THREATS:** still grazed by sheep
TENURE: endowment lease, recommended area for protection **OWNER/MANAGER:** University of Canterbury, Ryton/Olympus Station
CONTACT PERSON: Phil Tonkin **DATE OF INFORMATION:** March 1991
REFERENCES: Shanks et al. (1990)

(129) Mt Georgina

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 54-06 Coleridge
LOCALITY and GRID REFERENCE: Mt Georgina (944 m), 9 km NE of Lake Coleridge settlement K35 961644
AREA(ha): 980 **ALTITUDE(m):** 550-945 **RAINFALL(mm):** 900
TOPOGRAPHY: ice-rounded colluvial and bedrock hillslopes; basin infilled by fluvio-glacial deposits; narrow gorge; kettlehole lakes; alluvial fans and moraines **PARENT MATERIAL:** greywacke and argillite and derived colluvium, fluvio-glacial deposits and till **VEGETATION:** broadleaved scrub; snow tussock grassland; snow tussock grassland and Dracophyllum scrub; beech forest; short tussock grassland; turfand; tall aquatic communities
SOILS: gley soils (Tarnmoor), upland yellow-brown earths (Craigieburn Cass Tekoa)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) most extensive soils under red tussock grassland and bog pine in the district.(ii) good altitudinal sequence of soil-vegetation associations.
VULNERABILITY: 2 **MODIFICATIONS/THREATS:** 4WD road
TENURE: endowment lease, recommended area for protection **OWNER/MANAGER:** University of Canterbury, Lake Coleridge Station
CONTACT PERSON: Phil Tonkin **DATE OF INFORMATION:** February 1991
REFERENCES: Shanks et al. (1990)

(130) Mt Oakden

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 54-06 Coleridge
LOCALITY and GRID REFERENCE: near confluence of Harper and Rakaia rivers, 24 km NW of Lake Coleridge settlement K34 814724
AREA(ha): 1200 **ALTITUDE(m):** 460-1615 **RAINFALL(mm):** 2000
TOPOGRAPHY: steep, glacially-smoothed colluvial and bedrock mountain slopes dissected by closely spaced straight gullies with active debris flows; large areas of fine scree; steep fans; summit plateau area with hummocky periglacial relief,

fault traces and stone stripes **PARENT MATERIAL:** greywacke and argillite and derived colluvium **VEGETATION:** beech forest; subalpine scrub–tussockland; snow tussock grassland; broadleaved treeland and forest; boulderfield; kanuka scrub

SOILS: upland yellow–brown earths (Tekoa Bealey Cass), lowland yellow–brown earths (Hurunui)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) comprises the largest area of mountain beech forest soils in Coleridge Ecological District and the only complete altitudinal sequence of vegetation recommended for protection.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** parts have been burned – further fires are a threat

TENURE: pastoral lease, recommended area for protection **OWNER/MANAGER:** Mt Oakden Station

CONTACT PERSON: Phil Tonkin **DATE OF INFORMATION:** March 1991

REFERENCES: Shanks et al. (1990)

(131) Ryton Gorge

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 54–06 Coleridge

LOCALITY and GRID REFERENCE: Ryton Gorge (the Ryton River drains into Lake Coleridge), 14 km N of Lake Coleridge settlement K34 932705

AREA(ha): 550 **ALTITUDE(m):** 580–1100 **RAINFALL(mm):** 1100

TOPOGRAPHY: fluvioglacial surfaces dissected by Ryton River to form gorge; small isolated bedrock knobs; steep colluvial mountain slopes; moraines **PARENT MATERIAL:** greywacke and argillite and derived fluvioglacial deposits and till **VEGETATION:** kanuka scrub and shrubland; broadleaved forest; sedgeland; short tussock grassland; gravelfield

SOILS: upland yellow–brown earths (Tekoa Craigieburn Cass), gley recent soils (Dobson), recent soils (Tasman)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) contains a moderate range of some of the most dense and largest soil–vegetation associations characteristic of Coleridge Ecological District.

VULNERABILITY: 2

TENURE: endowment lease, recommended area for protection **OWNER/MANAGER:** University of Canterbury, Ryton/Olympus Station

CONTACT PERSON: Phil Tonkin **DATE OF INFORMATION:** February 1991

REFERENCES: Shanks et al. (1990)

(132) Ryton Lakes

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 54–06 Coleridge

LOCALITY and GRID REFERENCE: between the Harper – Rakaia River confluence, 18 km N of Lake Coleridge settlement K34 900739

AREA(ha): 1550 **ALTITUDE(m):** 550–1100 **RAINFALL(mm):** 1800

TOPOGRAPHY: steep colluvial and bedrock mountain slopes, with many scree; moraine and outwash surfaces, meltwater channels, lakes and alluvial fans **PARENT MATERIAL:** greywacke, argillite, till, outwash and alluvium **VEGETATION:** kanuka shrubland; short tussock grassland; reedland; rushland; sedgeland; red tussock grassland; turfand; gravelfield

SOILS: upland yellow–brown earths (Cass Tekoa), gley soils (Lyndon), gley recent soils (Dobson)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) includes a moderate range of soils and soil–vegetation associations under native vegetation.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** has been burned and grazed

TENURE: freehold, endowment lease, legal road, Crown land, recommended area for protection **OWNER/MANAGER:** University of Canterbury

CONTACT PERSON: Phil Tonkin **DATE OF INFORMATION:** February 1991

NOTES: The wetlands are ecologically the most important in Coleridge District.

REFERENCES: Shanks et al. (1990)

(133) Rakaia Gorge and Terraces

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 54–06 Coleridge and 55–03 Whitecliffs

LOCALITY and GRID REFERENCE: Rakaia Gorge, 70 km W of Christchurch K35 988448

AREA(ha): 450 **ALTITUDE(m):** 300–425 **RAINFALL(mm):** 900–1100

TOPOGRAPHY: river gorge with spectacular volcanic and outwash cliffs and terraces **PARENT MATERIAL:** outwash gravels and laminated silts over andesite **VEGETATION:** broadleaved forest; short tussock grassland

SOILS: recent soils (Kowai), lowland yellow–brown earths (Hurunui)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) this site includes one of the few remnants of Hurunui soils under montane forest at low altitudes in Canterbury, (ii) Kowai soils under dense silver tussockland were formerly much more extensive at the heads of the fans forming the Canterbury Plains (but are now much reduced in extent owing mainly to cultivation).

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** parts have been burned and grazed

TENURE: freehold, recommended area for protection **OWNER/MANAGER:** Bayfield Station, Terrace Downs

Station, Big Ben Station, Highland Deer Farm

CONTACT PERSON: Phil Tonkin **DATE OF INFORMATION:** February 1991

NOTES: Part of the forest has been gifted by the previous landowner as a scenic reserve but the site has not yet been surveyed or gazetted. Most of the area is owned by a Japanese consortium, who plan to develop it into a golf course. This proposal threatens the viability of the silver tussockland.

REFERENCES: Shanks et al. (1990)

(134) Clayton Hill Co. Ltd Open Space Covenant

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 55-02 Oxford

LOCALITY and GRID REFERENCE: 4 km NE of Oxford L35 427690

AREA(ha): 5 **ALTITUDE(m):** 250 **RAINFALL(mm):** 1000

TOPOGRAPHY: rolling colluvial and loessial hillslopes **PARENT MATERIAL:** loess **VEGETATION:** beech forest; podocarp-broadleaved forest

SOILS: yellow-grey - yellow-brown earths intergrade (Oxford)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) yellow-grey - yellow-brown earth intergrades under forest were formerly much more extensive but have been much reduced by logging and cultivation. This site and View Hill Scenic Reserve are probably the only sites in Canterbury where this soil type is protected.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** heavily grazed until 1977

TENURE: QEII National Trust open space covenant, private land **OWNER/MANAGER:** John Roy, "Rutherford" Farm, Oxford

CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** December 1987

REFERENCES: Kelly (1972) QEII National Trust (Canterbury) file 5/11/1 Department of Lands and Survey (1984)

(135) Johnston Tussock Open Space Covenant

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 55-02 Oxford

LOCALITY and GRID REFERENCE: Lees Valley Road, 10 km N of Oxford L34 462744

AREA(ha): 80 **ALTITUDE(m):** 450-500 **RAINFALL(mm):** 1000

TOPOGRAPHY: steep colluvial hillslopes and tops **PARENT MATERIAL:** greywacke and derived colluvium **VEGETATION:** short tussock grassland

SOILS: lowland yellow-brown earths (Hurunui)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) Hurunui soils under dense silver tussockland are an uncommon soil-vegetation association, and protected at very few sites.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** part fenced - sheep grazing only

TENURE: freehold, QEII National Trust open space covenant **OWNER/MANAGER:** RHM Johnston, QEII National Trust

CONTACT PERSON: Les Basher **DATE OF INFORMATION:** July 1991

REFERENCES: QEII National Trust (Canterbury) file 5/11/22A

(136) View Hill Scenic Reserve

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 55-02 Oxford

LOCALITY and GRID REFERENCE: 10 km WNW of Oxford L35 343696

AREA(ha): 31 **ALTITUDE(m):** 358-480 **RAINFALL(mm):** 1050

TOPOGRAPHY: colluvial hillslopes **PARENT MATERIAL:** Tertiary marine formations with some loess **VEGETATION:** beech-podocarp forest; manuka scrub; beech and coprosma scrub; introduced grassland

SOILS: lowland yellow-brown earths (Alford-Forest), yellow-grey - yellow-brown earths intergrade (Oxford)

IMPORTANCE: 1 **SIGNIFICANCE:** (i) good example of a yellow-grey - yellow-brown earth intergrade on Tertiary parent material at low altitudes (most are developed for farming).

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** has been grazed

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** December 1987

NOTES: The beech-rimu forest is a regionally significant botanical feature.

REFERENCES: Kelly (1972) Department of Lands and Survey (1984) McCaskill (1974)

(137) Hoods Bush Scenic Reserve, plus private pro

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 55-03 Whitecliffs

LOCALITY and GRID REFERENCE: Canterbury foothills, 18 km SW of Springfield L35 137475

AREA(ha): 22 **ALTITUDE(m):** 460-640 **RAINFALL(mm):** 1120

TOPOGRAPHY: steep colluvial hill and gully slopes **PARENT MATERIAL:** rhyolite (Mt Misery Group) **VEGETATION:** beech forest; introduced grassland

SOILS: upland yellow-brown earths (Koikoi)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) good example of an upland yellow-brown earth from rhyolite under native vegetation. This and Sharplin Falls Scenic Reserve are probably the only reserves with soils from rhyolite under forest in the South Island.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** has been grazed

TENURE: scenic reserve, private protected land **OWNER/MANAGER:** N and DN Bates, SHJ Robb and GE Birling, Department of Conservation

CONTACT PERSON: Les Basher **DATE OF INFORMATION:** December 1987

REFERENCES: Kelly (1972) Department of Lands and Survey (1984) McCaskill (1974)

(138) Tottey Open Space Covenant

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 56-01 High Plains

LOCALITY and GRID REFERENCE: between Winterslow Road and Taylors Stream, 45 km NNE of Staveley K36 857317

AREA(ha): 81 **ALTITUDE(m):** 400 **RAINFALL(mm):** 1200

TOPOGRAPHY: flat outwash terrace **PARENT MATERIAL:** outwash **VEGETATION:** beech/broadleaved forest

SOILS: yellow-grey - yellow-brown earths intergrade (Ruapuna)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) Ruapuna soils under beech forest are rare; most have been logged and developed for pasture.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** has been logged and grazed

TENURE: QEII National Trust open space covenant, private land **OWNER/MANAGER:** AB and SL Tottey, Staveley; QEII National Trust

CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** December 1987

REFERENCES: Department of Lands and Survey (1984) QEII National Trust (Canterbury) file 5/11/9

(139) Arowhenua Bush

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 56-02 Low Plains

LOCALITY and GRID REFERENCE: adjacent Opihi River, near Arowhenua settlement, 15 km N of Timaru K38 704596

AREA(ha): 1 **ALTITUDE(m):** 25 **RAINFALL(mm):** 600-800

TOPOGRAPHY: fan/floodplain formed by Opihi River; includes shallow gully **PARENT MATERIAL:** loess and alluvium derived from greywacke and argillite **VEGETATION:** broadleaved treeland; introduced grassland

SOILS: yellow-grey earths (Waitohi)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) this area and Riccarton Bush contain almost the only examples of the once extensive forests of the lower plains (Burrows 1984). (ii) the only known example of Waitohi soils, which cover 18 200 ha, under native vegetation.

VULNERABILITY: 1 **MODIFICATIONS/THREATS:** has been cutover; disastrous fire in 1860; severe wind damage in August 1975; hawthorn present; smothering of shrubs by Muehlenbeckia is a major weed problem; stopbank alongside reserve boundary

TENURE: freehold **OWNER/MANAGER:** RL Lyon

CONTACT PERSON: Colin Meurk **DATE OF INFORMATION:** February 1991

NOTES: One hectare is fenced; the surrounding area (approximately 10 ha) is no longer ploughed or cultivated. Extensive native plantings.

REFERENCES: Burrows (1984)

(140) Avon Mouth

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 56-02 Low Plains

LOCALITY and GRID REFERENCE: mouth of the Avon River, where it enters the Avon-Heathcote Estuary M35 877425

AREA(ha): 10 **ALTITUDE(m):** 1 **RAINFALL(mm):** 650

TOPOGRAPHY: tidal mud flats and islands **PARENT MATERIAL:** estuarine silts and clays **VEGETATION:** salt marsh

SOILS: saline gley recent soils (Motukarara)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) undeveloped estuarine soil - vegetation associations in urban areas are nationally uncommon.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** bridge; threatened by reclamation; car and other rubbish dump site

TENURE: recreation reserve **OWNER/MANAGER:** Christchurch City Council

CONTACT PERSON: Brian Molloy **DATE OF INFORMATION:** May 1991

NOTES: The largest and most natural of six saline wetlands in Christchurch. Christchurch City Council working to enhance natural values.

REFERENCES: Molloy (1971) Raeside and Rennie (1974)

CONTACT PERSON: Phil Tonkin **DATE OF INFORMATION:** March 1991

REFERENCES: Shanks et al. (1990)

(127) Mt Barker Tarns

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 54-06 Coleridge

LOCALITY and GRID REFERENCE: between Mt Barker (896 m) and Acheron River, 8 km W of Lake Coleridge settlement K35 971598

AREA(ha): 180 **ALTITUDE(m):** 550-670 **RAINFALL(mm):** 900

TOPOGRAPHY: undulating moraine surface with irregular arc-shaped ridges and numerous kettleholes and drainage channels **PARENT MATERIAL:** Acheron Advance till derived from greywacke and argillite **VEGETATION:** short tussock grassland with matagouri; aquatic turfland; sedgeland

SOILS: upland yellow-brown earths (Acheron Tekapo), gley recent soils (Dobson), organic soils

IMPORTANCE: 3 **SIGNIFICANCE:** (i) this area contains the most ecologically important group of kettlehole tarns in the district.(ii) contains a moderate range of relative unmodified soil-vegetation associations.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** cattle pugging at some tarn margins; wildling pines

TENURE: endowment lease, recommended area for protection **OWNER/MANAGER:** University of Canterbury, Acheron Bank Station

CONTACT PERSON: Phil Tonkin **DATE OF INFORMATION:** February 1991

REFERENCES: Shanks et al. (1990)

(128) Mt Cotton

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 54-06 Coleridge

LOCALITY and GRID REFERENCE: Mt Cotton (1469 m), adjacent Lake Coleridge, 16.5 km N of Lake Coleridge settlement K34 887718

AREA(ha): 100 **ALTITUDE(m):** 1220-1470 **RAINFALL(mm):** 1700

TOPOGRAPHY: rounded colluvial and bedrock mountain top; patterned ground **PARENT MATERIAL:** greywacke and argillite **VEGETATION:** snow tussock grassland; subalpine scrub; fellfield

SOILS: upland yellow-brown earths (Kaikoura Tekoa)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) contains the only remaining large Kaikoura soil-dense slim snow tussockland association in the district.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** still grazed by sheep

TENURE: endowment lease, recommended area for protection **OWNER/MANAGER:** University of Canterbury, Ryton/Olympus Station

CONTACT PERSON: Phil Tonkin **DATE OF INFORMATION:** March 1991

REFERENCES: Shanks et al. (1990)

(129) Mt Georgina

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 54-06 Coleridge

LOCALITY and GRID REFERENCE: Mt Georgina (944 m), 9 km NE of Lake Coleridge settlement K35 961644

AREA(ha): 980 **ALTITUDE(m):** 550-945 **RAINFALL(mm):** 900

TOPOGRAPHY: ice-rounded colluvial and bedrock hillslopes; basin infilled by fluvio-glacial deposits; narrow gorge; kettlehole lakes; alluvial fans and moraines **PARENT MATERIAL:** greywacke and argillite and derived colluvium, fluvio-glacial deposits and till **VEGETATION:** broadleaved scrub; snow tussock grassland; snow tussock grassland and Dracophyllum scrub; beech forest; short tussock grassland; turfland; tall aquatic communities

SOILS: gley soils (Tammoor), upland yellow-brown earths (Craigieburn Cass Tekoa)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) most extensive soils under red tussock grassland and bog pine in the district.(ii) good altitudinal sequence of soil-vegetation associations.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** 4WD road

TENURE: endowment lease, recommended area for protection **OWNER/MANAGER:** University of Canterbury, Lake Coleridge Station

CONTACT PERSON: Phil Tonkin **DATE OF INFORMATION:** February 1991

REFERENCES: Shanks et al. (1990)

(130) Mt Oakden

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 54-06 Coleridge

LOCALITY and GRID REFERENCE: near confluence of Harper and Rakaia rivers, 24 km NW of Lake Coleridge settlement K34 814724

AREA(ha): 1200 **ALTITUDE(m):** 460-1615 **RAINFALL(mm):** 2000

TOPOGRAPHY: steep, glacially-smoothed colluvial and bedrock mountain slopes dissected by closely spaced straight gullies with active debris flows; large areas of fine scree; steep fans; summit plateau area with hummocky periglacial relief,

fault traces and stone stripes **PARENT MATERIAL:** greywacke and argillite and derived colluvium **VEGETATION:** beech forest; subalpine scrub-tussockland; snow tussock grassland; broadleaved treeland and forest; boulderfield; kanuka scrub

SOILS: upland yellow-brown earths (Tekoa Bealey Cass), lowland yellow-brown earths (Hurunui)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) comprises the largest area of mountain beech forest soils in Coleridge Ecological District and the only complete altitudinal sequence of vegetation recommended for protection.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** parts have been burned – further fires are a threat

TENURE: pastoral lease, recommended area for protection **OWNER/MANAGER:** Mt Oakden Station

CONTACT PERSON: Phil Tonkin **DATE OF INFORMATION:** March 1991

REFERENCES: Shanks et al. (1990)

(131) Ryton Gorge

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 54–06 Coleridge

LOCALITY and GRID REFERENCE: Ryton Gorge (the Ryton River drains into Lake Coleridge), 14 km N of Lake Coleridge settlement K34 932705

AREA(ha): 550 **ALTITUDE(m):** 580–1100 **RAINFALL(mm):** 1100

TOPOGRAPHY: fluvioglacial surfaces dissected by Ryton River to form gorge; small isolated bedrock knobs; steep colluvial mountain slopes; moraines **PARENT MATERIAL:** greywacke and argillite and derived fluvioglacial deposits and till **VEGETATION:** kanuka scrub and shrubland; broadleaved forest; sedgeland; short tussock grassland; gravelfield

SOILS: upland yellow-brown earths (Tekoa Craigieburn Cass), gley recent soils (Dobson), recent soils (Tasman)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) contains a moderate range of some of the most dense and largest soil-vegetation associations characteristic of Coleridge Ecological District.

VULNERABILITY: 2

TENURE: endowment lease, recommended area for protection **OWNER/MANAGER:** University of Canterbury, Ryton/Olympus Station

CONTACT PERSON: Phil Tonkin **DATE OF INFORMATION:** February 1991

REFERENCES: Shanks et al. (1990)

(132) Ryton Lakes

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 54–06 Coleridge

LOCALITY and GRID REFERENCE: between the Harper – Rakaia River confluence, 18 km N of Lake Coleridge settlement K34 900739

AREA(ha): 1550 **ALTITUDE(m):** 550–1100 **RAINFALL(mm):** 1800

TOPOGRAPHY: steep colluvial and bedrock mountain slopes, with many screes; moraine and outwash surfaces, meltwater channels, lakes and alluvial fans **PARENT MATERIAL:** greywacke, argillite, till, outwash and alluvium

VEGETATION: kanuka shrubland; short tussock grassland; reedland; rushland; sedgeland; red tussock grassland; turfand; gravelfield

SOILS: upland yellow-brown earths (Cass Tekoa), gley soils (Lyndon), gley recent soils (Dobson)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) includes a moderate range of soils and soil-vegetation associations under native vegetation.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** has been burned and grazed

TENURE: freehold, endowment lease, legal road, Crown land, recommended area for protection **OWNER/MANAGER:** University of Canterbury

CONTACT PERSON: Phil Tonkin **DATE OF INFORMATION:** February 1991

NOTES: The wetlands are ecologically the most important in Coleridge District.

REFERENCES: Shanks et al. (1990)

(133) Rakaia Gorge and Terraces

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 54–06 Coleridge and 55–03 Whitecliffs

LOCALITY and GRID REFERENCE: Rakaia Gorge, 70 km W of Christchurch K35 988448

AREA(ha): 450 **ALTITUDE(m):** 300–425 **RAINFALL(mm):** 900–1100

TOPOGRAPHY: river gorge with spectacular volcanic and outwash cliffs and terraces **PARENT MATERIAL:** outwash gravels and laminated silts over andesite **VEGETATION:** broadleaved forest; short tussock grassland

SOILS: recent soils (Kowai), lowland yellow-brown earths (Hurunui)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) this site includes one of the few remnants of Hurunui soils under montane forest at low altitudes in Canterbury. (ii) Kowai soils under dense silver tussockland were formerly much more extensive at the heads of the fans forming the Canterbury Plains (but are now much reduced in extent owing mainly to cultivation).

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** parts have been burned and grazed

TENURE: freehold, recommended area for protection **OWNER/MANAGER:** Bayfield Station, Terrace Downs

Station, Big Ben Station, Highland Deer Farm

CONTACT PERSON: Phil Tonkin **DATE OF INFORMATION:** February 1991

NOTES: Part of the forest has been gifted by the previous landowner as a scenic reserve but the site has not yet been surveyed or gazetted. Most of the area is owned by a Japanese consortium, who plan to develop it into a golf course. This proposal threatens the viability of the silver tussockland.

REFERENCES: Shanks et al. (1990)

(134) Clayton Hill Co. Ltd Open Space Covenant

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 55-02 Oxford

LOCALITY and GRID REFERENCE: 4 km NE of Oxford L35 427690

AREA(ha): 5 **ALTITUDE(m):** 250 **RAINFALL(mm):** 1000

TOPOGRAPHY: rolling colluvial and loessial hillslopes **PARENT MATERIAL:** loess **VEGETATION:** beech forest; podocarp-broadleaved forest

SOILS: yellow-grey - yellow-brown earths intergrade (Oxford)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) yellow-grey - yellow-brown earth intergrades under forest were formerly much more extensive but have been much reduced by logging and cultivation. This site and View Hill Scenic Reserve are probably the only sites in Canterbury where this soil type is protected.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** heavily grazed until 1977

TENURE: QEII National Trust open space covenant, private land **OWNER/MANAGER:** John Roy, "Rutherford" Farm, Oxford

CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** December 1987

REFERENCES: Kelly (1972) QEII National Trust (Canterbury) file 5/11/1 Department of Lands and Survey (1984)

(135) Johnston Tussock Open Space Covenant

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 55-02 Oxford

LOCALITY and GRID REFERENCE: Lees Valley Road, 10 km N of Oxford L34 462744

AREA(ha): 80 **ALTITUDE(m):** 450-500 **RAINFALL(mm):** 1000

TOPOGRAPHY: steep colluvial hillslopes and tops **PARENT MATERIAL:** greywacke and derived colluvium **VEGETATION:** short tussock grassland

SOILS: lowland yellow-brown earths (Hurunui)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) Hurunui soils under dense silver tussockland are an uncommon soil-vegetation association, and protected at very few sites.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** part fenced - sheep grazing only

TENURE: freehold, QEII National Trust open space covenant **OWNER/MANAGER:** RHM Johnston, QEII National Trust

CONTACT PERSON: Les Basher **DATE OF INFORMATION:** July 1991

REFERENCES: QEII National Trust (Canterbury) file 5/11/22A

(136) View Hill Scenic Reserve

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 55-02 Oxford

LOCALITY and GRID REFERENCE: 10 km WNW of Oxford L35 343696

AREA(ha): 31 **ALTITUDE(m):** 358-480 **RAINFALL(mm):** 1050

TOPOGRAPHY: colluvial hillslopes **PARENT MATERIAL:** Tertiary marine formations with some loess **VEGETATION:** beech-podocarp forest; manuka scrub; beech and coprosma scrub; introduced grassland

SOILS: lowland yellow-brown earths (Alford-Forest), yellow-grey - yellow-brown earths intergrade (Oxford)

IMPORTANCE: 1 **SIGNIFICANCE:** (i) good example of a yellow-grey - yellow-brown earth intergrade on Tertiary parent material at low altitudes (most are developed for farming).

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** has been grazed

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** December 1987

NOTES: The beech-rimu forest is a regionally significant botanical feature.

REFERENCES: Kelly (1972) Department of Lands and Survey (1984) McCaskill (1974)

(137) Hoods Bush Scenic Reserve, plus private pro

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 55-03 Whitecliffs

LOCALITY and GRID REFERENCE: Canterbury foothills, 18 km SW of Springfield L35 137475

AREA(ha): 22 **ALTITUDE(m):** 460-640 **RAINFALL(mm):** 1120

TOPOGRAPHY: steep colluvial hill and gully slopes **PARENT MATERIAL:** rhyolite (Mt Misery Group) **VEGETATION:** beech forest; introduced grassland

SOILS: upland yellow-brown earths (Koikoi)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) good example of an upland yellow-brown earth from rhyolite under native vegetation. This and Sharplin Falls Scenic Reserve are probably the only reserves with soils from rhyolite under forest in the South Island.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** has been grazed

TENURE: scenic reserve, private protected land **OWNER/MANAGER:** N and DN Bates, SHJ Robb and GE Birling, Department of Conservation

CONTACT PERSON: Les Basher **DATE OF INFORMATION:** December 1987

REFERENCES: Kelly (1972) Department of Lands and Survey (1984) McCaskill (1974)

(138) Tottey Open Space Covenant

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 56-01 High Plains

LOCALITY and GRID REFERENCE: between Winterslow Road and Taylors Stream, 45 km NNE of Staveley K36 857317

AREA(ha): 81 **ALTITUDE(m):** 400 **RAINFALL(mm):** 1200

TOPOGRAPHY: flat outwash terrace **PARENT MATERIAL:** outwash **VEGETATION:** beech/broadleaved forest

SOILS: yellow-grey - yellow-brown earths intergrade (Ruapuna)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) Ruapuna soils under beech forest are rare; most have been logged and developed for pasture.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** has been logged and grazed

TENURE: QEII National Trust open space covenant, private land **OWNER/MANAGER:** AB and SL Tottey, Staveley; QEII National Trust

CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** December 1987

REFERENCES: Department of Lands and Survey (1984) QEII National Trust (Canterbury) file 5/11/9

(139) Arowhenua Bush

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 56-02 Low Plains

LOCALITY and GRID REFERENCE: adjacent Opihi River, near Arowhenua settlement, 15 km N of Timaru K38 704596

AREA(ha): 1 **ALTITUDE(m):** 25 **RAINFALL(mm):** 600-800

TOPOGRAPHY: fan/floodplain formed by Opihi River; includes shallow gully **PARENT MATERIAL:** loess and alluvium derived from greywacke and argillite **VEGETATION:** broadleaved treeland; introduced grassland

SOILS: yellow-grey earths (Waitohi)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) this area and Riccarton Bush contain almost the only examples of the once extensive forests of the lower plains (Burrows 1984). (ii) the only known example of Waitohi soils, which cover 18 200 ha, under native vegetation.

VULNERABILITY: 1 **MODIFICATIONS/THREATS:** has been cutover; disastrous fire in 1860; severe wind damage in August 1975; hawthorn present; smothering of shrubs by Muehlenbeckia is a major weed problem; stopbank alongside reserve boundary

TENURE: freehold **OWNER/MANAGER:** RL Lyon

CONTACT PERSON: Colin Meurk **DATE OF INFORMATION:** February 1991

NOTES: One hectare is fenced; the surrounding area (approximately 10 ha) is no longer ploughed or cultivated. Extensive native plantings.

REFERENCES: Burrows (1984)

(140) Avon Mouth

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 56-02 Low Plains

LOCALITY and GRID REFERENCE: mouth of the Avon River, where it enters the Avon-Heathcote Estuary M35 877425

AREA(ha): 10 **ALTITUDE(m):** 1 **RAINFALL(mm):** 650

TOPOGRAPHY: tidal mud flats and islands **PARENT MATERIAL:** estuarine silts and clays **VEGETATION:** salt marsh

SOILS: saline gley recent soils (Motukarara)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) undeveloped estuarine soil - vegetation associations in urban areas are nationally uncommon.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** bridge; threatened by reclamation; car and other rubbish dump site

TENURE: recreation reserve **OWNER/MANAGER:** Christchurch City Council

CONTACT PERSON: Brian Molloy **DATE OF INFORMATION:** May 1991

NOTES: The largest and most natural of six saline wetlands in Christchurch. Christchurch City Council working to enhance natural values.

REFERENCES: Molloy (1971) Raeside and Rennie (1974)

(141) Bankside Scientific Reserve

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 56-02 Low Plains

LOCALITY and GRID REFERENCE: 6 km SE of Bankside township L36 424195

AREA(ha): 2.6 **ALTITUDE(m):** 67 **RAINFALL(mm):** 635

TOPOGRAPHY: alluvial plain surface (formerly Selwyn-Rakaia floodplain) comprising sanddunes, prominent stream channel and stony plains and ridges **PARENT MATERIAL:** Holocene alluvium from greywacke and argillite

VEGETATION: short tussock/moss grassland; kanuka scrub

SOILS: recent soils (Eyre-Paparua)

IMPORTANCE: 1 **SIGNIFICANCE:** (i) represents "last substantial remnant of primitive scrub and grassland on surfaces of its precise age on the Canterbury Plains The Eyre-Paparua complex alone covers 100 000 ha in the South Island ... Bankside thus provides a basic reference for one of the plains' largest soil groups" (Molloy 1970).

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** Polynesian fires; sheep grazing until about 1969; water-race

TENURE: scientific reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Brian Molloy **DATE OF INFORMATION:** December 1987

NOTES: Surrounded by developed farmland.

REFERENCES: Kelly (1972) Molloy (1970) Ward et al. (1964) Department of Lands and Survey (1984) McCaskill (1974)

(142) Cockayne Reserve

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 56-02 Low Plains

LOCALITY and GRID REFERENCE: between the Avon River and New Brighton Road, Christchurch M35 867447

AREA(ha): 10 **ALTITUDE(m):** 2 **RAINFALL(mm):** 650

TOPOGRAPHY: tidal flats and alluvial floodplain **PARENT MATERIAL:** estuarine silts and sands **VEGETATION:** flaxland; broadleaved shrubland; herbfield; introduced treeland; reedland

SOILS: recent soils (Taitapu)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) lowland wetlands, especially in urban areas, are nationally rare. They were formerly much more extensive but have been drained and developed for settlement.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** lowering of water table following drainage, lowering of water input and damage from fire have led to considerable deterioration of the vegetation; car park and road construction; willow and many other introduced plants present

TENURE: recreation reserve **OWNER/MANAGER:** Christchurch City Council

CONTACT PERSON: Brian Molloy **DATE OF INFORMATION:** May 1991

REFERENCES: Molloy (1971) Partridge (1984) Raeside and Rennie (1974)

(143) Coopers Lagoon Wildlife Management Reserve

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 56-02 Low Plains

LOCALITY and GRID REFERENCE: tidal lagoon 7 km W of Lake Ellesmere M37 539042

AREA(ha): 97 **ALTITUDE(m):** 97 **RAINFALL(mm):** 650

TOPOGRAPHY: flat alluvial plain surface and tidal lagoon **PARENT MATERIAL:** Holocene alluvium **VEGETATION:** swamp and salt marsh communities

SOILS: organic soils (Waimairi), gley recent soils (Taitapu), recent soils (Waimakariri)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) the reserve contains a moderate range of soil types. (ii) saline and lowland organic and gley recent soils under native vegetation are nationally uncommon owing to cultivation and drainage.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** has been grazed

TENURE: wildlife management reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** December 1987

REFERENCES: Department of Lands and Survey (1984)

(144) Eyrewell Scientific Reserve

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 56-02 Low Plains

LOCALITY and GRID REFERENCE: adjacent to Eyrewell Forest, 10 km S of Oxford L35 449579

AREA(ha): 2.3 **ALTITUDE(m):** 210 **RAINFALL(mm):** 863

TOPOGRAPHY: flat to gently undulating outwash terrace with slight depressions of abandoned watercourses **PARENT MATERIAL:** loess and glacial outwash gravels from greywacke and argillite **VEGETATION:** shrub grassland; kanuka/moss scrub; introduced grassland

SOILS: yellow-grey earths (Lismore)

IMPORTANCE: 1 **SIGNIFICANCE:** (i) represents "the largest primitive community known for the Canterbury Plains and one of the most stable climaxes in our post-glacial history" (Molloy and Ives 1972). Representation of an agriculturally very important and extensive (100 000 ha) soil group. Eyrewell is "one of the most important reference sites for plants and soils in Canterbury" (Molloy and Ives 1972).

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** Polynesian fires; sheep-grazing until reserved in about 1970
TENURE: scientific reserve **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Brian Molloy **DATE OF INFORMATION:** December 1987
REFERENCES: Molloy and Ives (1972) Kelly (1972) Department of Lands and Survey (1984) McCaskill (1974)

(145) Great Island

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 56-02 Low Plains
LOCALITY and GRID REFERENCE: between SH 1 and the coast in the Rakaia River L36 385125
AREA(ha): 150 **ALTITUDE(m):** 50 **RAINFALL(mm):** 700
TOPOGRAPHY: braided channels and recent floodplains; dunes **PARENT MATERIAL:** alluvium derived from greywacke and argillite **VEGETATION:** kowhai treeland; grassland; wetland (water race) communities
SOILS: recent soils (Selwyn Waimakariri)
IMPORTANCE: 2 **SIGNIFICANCE:** (i) one of few remaining examples of Waimakariri and Selwyn soils under natural vegetation.
VULNERABILITY: 2 **MODIFICATIONS/THREATS:** leased to local farmer and lightly grazed; gorse
TENURE: reserve land vested in local authority, Crown land, freehold **OWNER/MANAGER:** Canterbury Regional Council, Department of Conservation
CONTACT PERSON: Brian Molloy **DATE OF INFORMATION:** May 1991
NOTES: Natural fluvial erosion and deposition occurring.
REFERENCES: Molloy (1971)

(146) Halkett

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 56-02 Low Plains
LOCALITY and GRID REFERENCE: between Waimakariri River and Old West Coast Road, 5 km SW of Sheffield M35 534484
AREA(ha): 10 **ALTITUDE(m):** 130 **RAINFALL(mm):** 800
TOPOGRAPHY: undulating floodplain **PARENT MATERIAL:** alluvium and loess derived from greywacke and argillite **VEGETATION:** kowhai woodland; short tussock grassland; wetland communities
SOILS: recent soils (Waimakariri Selwyn)
IMPORTANCE: 2 **SIGNIFICANCE:** (i) a unique example of youthful soils under natural vegetation.
VULNERABILITY: 2 **MODIFICATIONS/THREATS:** water races; lightly grazed by sheep – no hay is permitted to be fed out; gorse (careful spraying);
TENURE: river protection reserve **OWNER/MANAGER:** Canterbury Regional Council
CONTACT PERSON: Brian Molloy **DATE OF INFORMATION:** May 1991
NOTES: Vascular plant species checklist available from Canterbury Regional Council.
REFERENCES: Molloy (1971)

(147) Harewood

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 56-02 Low Plains
LOCALITY and GRID REFERENCE: five disjoint sites between the Old West Coast Road and Waimakariri River, 8 km WNW of Christchurch International Airport M35 640470
AREA(ha): 70 **ALTITUDE(m):** 65 **RAINFALL(mm):** 650
TOPOGRAPHY: floodplain; sand dunes; terraces **PARENT MATERIAL:** alluvium derived from greywacke and argillite **VEGETATION:** broadleaved treeland; kanuka-matagouri shrubland; grassland; shrub-grassland
SOILS: recent soils (Selwyn Waimakariri)
IMPORTANCE: 2 **SIGNIFICANCE:** (i) small remnants of formerly much more extensive soil-vegetation associations.
VULNERABILITY: 2 **MODIFICATIONS/THREATS:** grazed; parts have been cultivated; Orana Park developments
TENURE: river protection reserve, private land **OWNER/MANAGER:** Canterbury Regional Council
CONTACT PERSON: Colin Meurk **DATE OF INFORMATION:** May 1991
NOTES: Other remnants are at GR: M35 643483, 648482, 650497 and 675483.

(148) Harts Creek Wildlife Management Reserve

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 56-02 Low Plains
LOCALITY and GRID REFERENCE: western margin of Lake Ellesmere M36 582126
AREA(ha): 232 **ALTITUDE(m):** 1.5-2 **RAINFALL(mm):** 650
TOPOGRAPHY: flat estuary **PARENT MATERIAL:** Holocene alluvium **VEGETATION:** swamp – salt marsh communities
SOILS: saline gley recent soils (Motukarara)
IMPORTANCE: 2 **SIGNIFICANCE:** (i) few saline gley recent soils under native vegetation are protected in New Zealand. They were formerly much more extensive but have been reduced by drainage and cultivation.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** has been grazed
TENURE: wildlife management reserve **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** December 1987
NOTES: Adventive plants invading swamp.
REFERENCES: Department of Lands and Survey (1984)

(149) Riccarton Bush Scenic Reserve

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 56-02 Low Plains
LOCALITY and GRID REFERENCE: Riccarton suburb, Christchurch M35 772420
AREA(ha): 11 **ALTITUDE(m):** 12 **RAINFALL(mm):** 635
TOPOGRAPHY: flat outwash surface depression **PARENT MATERIAL:** alluvium from greywacke and argillite (late Holocene) **VEGETATION:** introduced grassland and specimen trees; podocarp/broadleaved forest; broadleaved forest
SOILS: gley recent soils (Taitapu), recent soils (Kaiapoi Waimakariri)
IMPORTANCE: 1 **SIGNIFICANCE:** (i) only preservation of young gley soils with lowland kahikatea forest under low rainfall in Canterbury, and one of the few such sites in New Zealand (such sites are very important agriculturally).(ii) soils have been studied in detail.
VULNERABILITY: 3 **MODIFICATIONS/THREATS:** has been drained, but now irrigated; human trampling; tracking; many introduced plants
TENURE: scenic reserve **OWNER/MANAGER:** Board of Trustees – Christchurch City Council, Deans family and the Royal Society
CONTACT PERSON: Brian Molloy and Trevor Webb **DATE OF INFORMATION:** December 1987
NOTES: Reserve also contains historic pioneer cottage and Edwardian home, set among notable introduced trees and spacious lawns.
REFERENCES: Department of Lands and Survey (1984) Kelly (1972) McCaskill (1974)

(150) Travis Swamp

REGIONAL/CITY COUNCIL(S): Christchurch City **ECOLOGICAL DISTRICTS(S):** 56-02 Low Plains
LOCALITY and GRID REFERENCE: Burwood suburb, Christchurch M35 845465
AREA(ha): 80 **ALTITUDE(m):** 1 **RAINFALL(mm):** 650
TOPOGRAPHY: sand dune and interdune sequence; wetland fed by Travis stream and natural artesian wells; deep and shallow peats **PARENT MATERIAL:** alluvium, aeolian deposits and peat **VEGETATION:** introduced shrubland; reedland; flaxland; sedgeland; introduced treeland; mire
SOILS: yellow-brown sands (Aranui Waikuku), organic soils (Waimairi)
IMPORTANCE: 2 **SIGNIFICANCE:** (i) largest and most accessible freshwater swampland in Christchurch. This is a valuable remnant of the native soil-vegetation associations which have almost entirely been drained and subdivided.
VULNERABILITY: 2 **MODIFICATIONS/THREATS:** has been partly drained; threatened by subdivision proposal; many rampant introduced plants; still grazed
TENURE: private land, Crown land, Landcorp **OWNER/MANAGER:** Travis County Estates, Landcorp
CONTACT PERSON: Colin Meurk **DATE OF INFORMATION:** February 1991
NOTES: "Historical benchmark of the city's natural environment" (Meurk 1989).
REFERENCES: Bellamy (1990) Meurk (1988b) Harris (1990) Harris et al. (1946)

(151) Tutae Patu Wildlife Reserve

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 56-02 Low Plains
LOCALITY and GRID REFERENCE: 3 km E of Woodend township M35 859646
AREA(ha): 49 **ALTITUDE(m):** 5 **RAINFALL(mm):** 650
TOPOGRAPHY: freshwater coastal sand dunes, lake and swamp **PARENT MATERIAL:** alluvium and aeolian deposits **VEGETATION:** sedgeland; introduced scrub
SOILS: yellow-brown sands (Kairaki)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) one of only two sites containing Kairaki soils on this inventory.
VULNERABILITY: 3
TENURE: government purpose reserve (wildlife reserve) **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** December 1987
NOTES: Formerly called Woodend Lagoon Government Purpose Reserve (Department of Lands and Survey 1984).
REFERENCES: Department of Lands and Survey (1984)

(152) Wilson Swamp Wildlife Management Reserve

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 56-02 Low Plains
LOCALITY and GRID REFERENCE: 10 km N of Christchurch City M35 812528
AREA(ha): 10 **ALTITUDE(m):** 20 **RAINFALL(mm):** 650

TOPOGRAPHY: freshwater coastal swamp **PARENT MATERIAL:** postglacial dune sand **VEGETATION:** sedgeland; introduced scrub
SOILS: recent soils (Kaiapoi), yellow-brown sands (Kairaki)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) one of only two sites in this inventory containing Kairaki soils.
VULNERABILITY: 3
TENURE: wildlife management reserve **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** December 1987
NOTES: This site could be quite important if it also contains good examples of Waikuku soils.
REFERENCES: Department of Lands and Survey (1984)

(153) Kaitorete Spit Scientific Reserve

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 56-03 Ellesmere
LOCALITY and GRID REFERENCE: 56 km SW of Christchurch M37 689076
AREA(ha): 128 **ALTITUDE(m):** 0-6 **RAINFALL(mm):** 650
TOPOGRAPHY: coastal sand dunes and gravel beaches **PARENT MATERIAL:** beach gravels and aeolian sands derived from greywacke and argillite **VEGETATION:** sandfield; shrubland; herbfield
SOILS: yellow-brown sands (Taumutu)
IMPORTANCE: 2 **SIGNIFICANCE:** (i) preserves young dune and gravel soils uncommon elsewhere in New Zealand.
VULNERABILITY: 3 **MODIFICATIONS/THREATS:** has been burned and grazed
TENURE: scientific reserve **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** December 1987
NOTES: Probably also of value for geomorphology dating studies.
REFERENCES: Department of Lands and Survey (1984)

(154) Yarrs Flat Government Purpose Reserve

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 56-03 Ellesmere
LOCALITY and GRID REFERENCE: western margin of Lake Ellesmere M36 682208
AREA(ha): 286 **ALTITUDE(m):** 1.5-2 **RAINFALL(mm):** 650
TOPOGRAPHY: flat lake margin **PARENT MATERIAL:** Holocene alluvium **VEGETATION:** sedgeland; herbfield; introduced grassland
SOILS: saline gley recent soils (Motukarara)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) probably the best representative of Motukarara soils under native vegetation in Canterbury.
VULNERABILITY: 3 **MODIFICATIONS/THREATS:** has been grazed
TENURE: wildlife management reserve **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** December 1987
REFERENCES: Department of Lands and Survey (1984)

(155) Ahuriri Farms Ltd Open Space Covenant (B)

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 57-01 Port Hills
LOCALITY and GRID REFERENCE: Port Hills, 4 km N of Motukarara M36 772247
AREA(ha): 87 **ALTITUDE(m):** 20-300 **RAINFALL(mm):** 650
TOPOGRAPHY: colluvial hillslopes **PARENT MATERIAL:** loess and loess colluvium over basalt **VEGETATION:** podocarp forest
SOILS: yellow-grey earths (Takahe-Kiwi)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) a good example of yellow-grey earth soils under forest.
VULNERABILITY: 3 **MODIFICATIONS/THREATS:** has been grazed
TENURE: QEII National Trust open space covenant, private land **OWNER/MANAGER:** QEII National Trust; PJ Graham
CONTACT PERSON: Bruce Trangmar **DATE OF INFORMATION:** December 1990
REFERENCES: Department of Lands and Survey (1984) QEII National Trust (Canterbury) file 5/11/6B

(156) Ahuriri Farms Ltd Open Space Covenant (A)

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 57-01 Port Hills
LOCALITY and GRID REFERENCE: Port Hills, 4 km N of Motukarara M36 782254
AREA(ha): 20 **ALTITUDE(m):** 20-300 **RAINFALL(mm):** 650-800
TOPOGRAPHY: colluvial hillslopes **PARENT MATERIAL:** loess and loess colluvium **VEGETATION:** short tussock grassland
SOILS: yellow-grey earths (Takahe-Kiwi)
IMPORTANCE: 2 **SIGNIFICANCE:** (i) best example of yellow-grey earths under silver tussockland on the Port

Hills – and one of the best in Canterbury.(ii) covers a wide altitude range for yellow–grey earths.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** has been grazed

TENURE: QEII National Trust open space covenant, private land **OWNER/MANAGER:** QEII National Trust; PJ Graham,

CONTACT PERSON: Bruce Trangmar **DATE OF INFORMATION:** December 1987

REFERENCES: Kelly (1972) QEII National Trust (Canterbury) file 5/11/6A Department of Lands and Survey (1984)

(157) Ahuriri and Coopers Knob

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 57–01 Port Hills

LOCALITY and GRID REFERENCE: southern end Summit Road, Port Hills, Banks Peninsula M36 797266

AREA(ha): 26 **ALTITUDE(m):** 427–573 **RAINFALL(mm):** 900

TOPOGRAPHY: colluvial hillslopes and tops; bluffs **PARENT MATERIAL:** greywacke loess and colluvium derived from basalt **VEGETATION:** fernland; introduced grassland; broadleaved forest and scrub

SOILS: upland yellow–brown earths (Summit), brown granular loams and clays (Rapaki)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) this is the only significant remnant of soils under podocarp/mixed broadleaved forest on the Port Hills (this association was formerly much more extensive).(ii) preserves upland soil under native vegetation on easy slopes.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** has been burned and grazed

TENURE: scenic reserve **OWNER/MANAGER:** Christchurch City Council

CONTACT PERSON: Bruce Trangmar **DATE OF INFORMATION:** December 1987

NOTES: There are scattered matai and kahikatea in the mixed broadleaved forest. Rapaki soils are brown granular loams (there are no brown granular clays on Banks Peninsula).

REFERENCES: Kelly (1972) Griffiths (1974) Department of Lands and Survey (1984) McCaskill (1974)

(158) Kennedys Bush Scenic Reserve

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 57–01 Port Hills

LOCALITY and GRID REFERENCE: 3 km S from Dyers Pass on Port Hills Summit Road M36 795310

AREA(ha): 87 **ALTITUDE(m):** 230–490 **RAINFALL(mm):** 800–900

TOPOGRAPHY: steep colluvial hillslopes; rounded colluvial hilltops **PARENT MATERIAL:** loess and loess colluvium; some basalt **VEGETATION:** fernland–scrub; short tussock – introduced grassland; broadleaved forest; kanuka forest

SOILS: upland yellow–brown earths (Summit), brown granular loams and clays (Rapaki)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) this is the largest of the few remaining sites of Summit and Rapaki soils under native forest on the drier north aspect slopes on Banks Peninsula. This soil vegetation association was formerly much more extensive but has been drastically reduced by Polynesian and European burning and grazing.(ii) brown granular loams under native forest vegetation are uncommon in the South Island.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** has been burned and grazed

TENURE: scenic reserve **OWNER/MANAGER:** Christchurch City Council

CONTACT PERSON: Bruce Trangmar **DATE OF INFORMATION:** December 1987

NOTES: Rapaki soils are brown granular loams (there are no brown granular clays on Banks Peninsula).

REFERENCES: Kelly (1972) Griffiths (1974) Department of Lands and Survey (1984) McCaskill (1974)

(159) Prendergasts Bush Open Space Covenant

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 57–01 Port Hills

LOCALITY and GRID REFERENCE: below Summit Road, Port Hills, 3.5 km E of Taitapu M36 786270

AREA(ha): 56 **ALTITUDE(m):** 200–400 **RAINFALL(mm):** 650

TOPOGRAPHY: south–facing colluvial hillslopes/gully **PARENT MATERIAL:** greywacke loess and loess colluvium **VEGETATION:** podocarp–broadleaved forest; manuka and kanuka scrub

SOILS: upland yellow–brown earths (Summit), yellow–grey earths (Takahe–Kiwi)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) a very good example of a yellow–grey earth under forest.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** formerly grazed; mostly fenced; some gorse

TENURE: freehold, QEII National Trust open space covenant **OWNER/MANAGER:** official mortgagee, QEII National Trust

CONTACT PERSON: Bruce Trangmar **DATE OF INFORMATION:** July 1991

NOTES: Vegetation is in better condition than Ahuriri Farms Ltd Open Space Covenant (B).

REFERENCES: QEII National Trust (Canterbury) file 5/11/8

(160) Hay Scenic Reserve

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 57–02 Herbert

LOCALITY and GRID REFERENCE: 2 km S of Pigeon Bay, N side of Banks Peninsula N36 018227

AREA(ha): 6 ALTITUDE(m): 25 RAINFALL(mm): 900

TOPOGRAPHY: valley floor including several indistinct terraces and a stream **PARENT MATERIAL:** alluvium from loess, basalt and andesite **VEGETATION:** broadleaved forest; podocarp-broadleaved forest; exotic conifers and broadleaved trees

SOILS: recent soils (Barry)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) soils under the "Best example of lowland, alluvial, podocarp/broadleaved forest near the coast reserved in Canterbury" (Kelly 1972). Well-drained counterpart to poorly-drained Riccarton Bush.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** limited in centre of reserve

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Bruce Trangmar **DATE OF INFORMATION:** December 1987

REFERENCES: Kelly (1972) Department of Lands and Survey (1984) McCaskill (1974)

(161) Herbert Peak Scenic Reserve

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 57-02 Herbert

LOCALITY and GRID REFERENCE: 12 km NW of Kaituna Valley, Banks Peninsula M36 895234

AREA(ha): 241 ALTITUDE(m): 335-919 RAINFALL(mm): 1525

TOPOGRAPHY: steep colluvial and bedrock hillslopes and tops; many bluffs **PARENT MATERIAL:** basalt and derived colluvium, and greywacke loess **VEGETATION:** introduced grassland; broadleaved forest; flax-shrubland

SOILS: brown granular loams and clays (Stewart-Summit Stewart-Akaroa), upland yellow-brown earths (Bossu)

IMPORTANCE: 1 **SIGNIFICANCE:** (i) excellent reserve of upland and lowland soils under a wide spectrum of altitude and native vegetation. "If there had to be just one bush reserve on Banks Peninsula, this would have to be it" and "The widest cross-section of vegetation surviving on the Peninsula - the core reserve" (Kelly 1972). (ii) brown granular loams are uncommon in the South Island. They are relatively extensive on Banks Peninsula, but the original forest cover has been much reduced by burning and grazing.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** has been grazed and parts have been burned

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Bruce Trangmar **DATE OF INFORMATION:** December 1987

NOTES: Stewart-Summit and Stewart-Akaroa soils are brown granular loams (there are no brown granular clays on Banks Peninsula). In the 1950s and 1960s all the adult cedars died. No satisfactory explanation has yet been given to explain this.

REFERENCES: Kelly (1972) Department of Lands and Survey (1984) McCaskill (1974)

(162) Kaituna Valley Scenic Reserve

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 57-02 Herbert

LOCALITY and GRID REFERENCE: 4 km NE of Kaituna, southern Banks Peninsula M36 848182

AREA(ha): 6 ALTITUDE(m): 15 RAINFALL(mm): 1000

TOPOGRAPHY: valley floor **PARENT MATERIAL:** alluvium from basalt and greywacke loess **VEGETATION:** broadleaved-(podocarp) forest; introduced grassland; shrub-flaxland

SOILS: recent soils (Barry)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) one of the few young fertile soil sites with kahikatea forest remnants on Banks Peninsula, but not a very good example (Hay Scenic Reserve is better).

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** has been grazed; revegetation of alien strains of native plants

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Bruce Trangmar **DATE OF INFORMATION:** December 1987

NOTES: Also has titoki stands which are regionally uncommon.

REFERENCES: Kelly (1972) Department of Lands and Survey (1984) McCaskill (1974)

(163) Morice Settlement Scenic Reserve

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 57-02 Herbert

LOCALITY and GRID REFERENCE: 6 km NE of Little River, central Banks Peninsula N36 965207

AREA(ha): 6.2 ALTITUDE(m): 259-305 RAINFALL(mm): 1000

TOPOGRAPHY: colluvial hillslopes **PARENT MATERIAL:** greywacke loess and loess colluvium, with basalt and andesite boulders **VEGETATION:** podocarp/broadleaved forest; scrub; introduced grassland

SOILS: yellow-grey - yellow-brown earths intergrade (Pawson)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) one of few reserves containing yellow-grey - yellow-brown earth intergrade soils.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** has been logged and grazed

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Bruce Trangmar **DATE OF INFORMATION:** December 1987

REFERENCES: Kelly (1972) Department of Lands and Survey (1984) Dennis (1986) McCaskill (1974)

(164) Mt Fitzgerald Scenic Reserve

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 57-02 Herbert
LOCALITY and GRID REFERENCE: 8 km NE of Little River, central Banks Peninsula N36 970220
AREA(ha): 44 **ALTITUDE(m):** 500-826 **RAINFALL(mm):** 1400
TOPOGRAPHY: steep colluvial hillslopes and tops; many bluffs **PARENT MATERIAL:** greywacke loess, and loess and volcanic colluvium **VEGETATION:** broadleaved forest; podocarp forest; podocarp-broadleaved forest and scrub; introduced grassland; rockland
SOILS: upland yellow-brown earths (Summit), brown granular loams and clays (Stewart-Summit Stewart-Akaroa)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) one of the two best moist montane sites reserved on Banks Peninsula.
VULNERABILITY: 3 **MODIFICATIONS/THREATS:** has been grazed and logged; possums and goats present, as well as some sheep and goats
TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Bruce Trangmar **DATE OF INFORMATION:** December 1987
NOTES: Stewart-Summit and Stewart-Akaroa soils are brown granular loams (there are no brown granular clays on Banks Peninsula).
REFERENCES: Kelly (1972) Department of Lands and Survey (1984)

(165) Mt Sinclair Scenic Reserve

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 57-02 Herbert
LOCALITY and GRID REFERENCE: 5 km SW of Pigeon Bay, central Banks Peninsula N36 987208
AREA(ha): 62 **ALTITUDE(m):** 580-843 **RAINFALL(mm):** 1400
TOPOGRAPHY: steep colluvial hillslopes and tops; small bluffs **PARENT MATERIAL:** greywacke loess and loess colluvium, and some basalt and derived colluvium **VEGETATION:** podocarp-broadleaved forest; snow tussock grassland; tussock-shrubland; introduced grassland
SOILS: upland yellow-brown earths (Summit), brown granular loams and clays (Stewart-Summit)
IMPORTANCE: 2 **SIGNIFICANCE:** (i) may be the best example of upland yellow-brown earth under snow tussock and forest on Banks Peninsula.
VULNERABILITY: 3 **MODIFICATIONS/THREATS:** milling, grazing
TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Bruce Trangmar **DATE OF INFORMATION:** December 1987
NOTES: Stewart-Summit soils are brown granular loams (there are no brown granula clays on Banks Peninsula).
REFERENCES: Kelly (1972) Department of Lands and Survey (1984)

(166) Armstrong Scenic Reserve

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 57-03 Akaroa
LOCALITY and GRID REFERENCE: 4 km SE of Akaroa, Banks Peninsula N37 094082
AREA(ha): 36 **ALTITUDE(m):** 413-813 **RAINFALL(mm):** 1400
TOPOGRAPHY: steep colluvial and bedrock hillslopes and tops (lava flows); steep bluffs; gully **PARENT MATERIAL:** greywacke loess colluvium and mixed loess/basalt colluvium **VEGETATION:** beech forest; snow tussock grassland with Dracophyllum; gorse scrub; broadleaved scrub and forest; podocarp forest
SOILS: upland yellow-brown earths (Bossu), brown granular loams and clays (Stewart-Summit Stewart-Akaroa)
IMPORTANCE: 2 **SIGNIFICANCE:** (i) this and Hinewai are the only reserves on Banks Peninsula with soils under substantial beech forest (other smaller remnants on the peninsula are not protected).
VULNERABILITY: 3 **MODIFICATIONS/THREATS:** has been grazed; possum damage; part burned in 1984
TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Bruce Trangmar **DATE OF INFORMATION:** December 1987
NOTES: Cedar community is of biological importance. Stewart-Summit and Stewart-Akaroa soils are brown granular loams (there are no brown granular clays on Banks Peninsula).
REFERENCES: Kelly (1972) Dennis (1986) Department of Lands and Survey (1984) McCaskill (1974)

(167) Carews Peak Scenic Reserve

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 57-03 Akaroa
LOCALITY and GRID REFERENCE: 9 km WSW of Akaroa, Banks Peninsula N37 995068
AREA(ha): 67 **ALTITUDE(m):** 305-670 **RAINFALL(mm):** 1100
TOPOGRAPHY: steep colluvial hillslopes at bottom of a steep gully, divided by rounded spurs; small bluffs **PARENT MATERIAL:** mixed basalt colluvium and greywacke loess **VEGETATION:** broadleaved forest; broadleaved-(podocarp) forest; kanuka forest; gorse scrub; fernland
SOILS: brown granular loams and clays (Stewart-Summit Stewart-Akaroa), upland yellow-brown earths (Summit)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) large reserve, covering a wide altitudinal range.
VULNERABILITY: 3 **MODIFICATIONS/THREATS:** has been grazed and logged; gorse and possums present

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Bruce Trangmar **DATE OF INFORMATION:** December 1987
NOTES: Stewart–Summit and Stewart–Akaroa soils are brown granular loams (there are no brown granular clays on Banks Peninsula).
REFERENCES: Kelly (1972) Department of Lands and Survey (1984) Dennis (1986)

(168) Dan Rogers Creek Scenic Reserve

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 57–03 Akaroa
LOCALITY and GRID REFERENCE: on E side and just inside Akaroa Harbour, 7 km S of Akaroa N37 072040
AREA(ha): 7 **ALTITUDE(m):** 0–225 **RAINFALL(mm):** 635
TOPOGRAPHY: steep to very steep bluffs; colluvial hillslopes **PARENT MATERIAL:** basaltic colluvium; little greywacke loess **VEGETATION:** introduced grassland and scrub; broadleaved forest and scrub; rockland; flaxland
SOILS: brown granular loams and clays (Evans–Kiwi), yellow–grey earths (Takahe–Kiwi)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) one of two completely coastal bush reserves in Canterbury (the other is Palm Gully Scenic Reserve). Soils are probably very thin but may be quite diverse due to ledges where soils are considered peaty.
VULNERABILITY: 3 **MODIFICATIONS/THREATS:** has been burned and grazed but regenerating well
TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Bruce Trangmar **DATE OF INFORMATION:** December 1987
NOTES: Contains a rich and special flora. Evens–Kiwi soils are brown granular loams (there are no brown granular clays on Banks Peninsula).
REFERENCES: Kelly (1972) Department of Lands and Survey (1984) Dennis (1986) McCaskill (1974)

(169) Devils Gap Scenic Reserve

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 57–03 Akaroa
LOCALITY and GRID REFERENCE: 7 km SE of Little River, Banks Peninsula N37 966089
AREA(ha): 49 **ALTITUDE(m):** 225–490 **RAINFALL(mm):** 1150
TOPOGRAPHY: steep colluvial and bedrock hillslopes (lava flows); steep bluffs and gully walls **PARENT MATERIAL:** basalt and derived colluvium; some greywacke loess colluvium **VEGETATION:** broadleaved forest; snow tussock grassland; fernland; kanuka scrub/forest; rockland
SOILS: brown granular loams and clays (Stewart–Summit Stewart–Akaroa), lowland yellow–brown earths (Akaroa)
IMPORTANCE: 2 **SIGNIFICANCE:** (i) brown granular loams are uncommon in the South Island. They are relatively extensive on Banks Peninsula, but few sites have native forest cover (even if it is mostly induced).
VULNERABILITY: 3 **MODIFICATIONS/THREATS:** has been logged and burned
TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Bruce Trangmar **DATE OF INFORMATION:** December 1987
NOTES: Stewart–Summit and Stewart–Akaroa soils are brown granular loams (there are no brown granular clays on Banks Peninsula). The reserve contains the lowest altitude snow tussock grasslands on Banks Peninsula. They were probably induced by Polynesian burning.
REFERENCES: Kelly (1972) Dennis (1986) Department of Lands and Survey (1984) McCaskill (1974)

(170) Hinewai

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 57–03 Akaroa
LOCALITY and GRID REFERENCE: SE Banks Peninsular, 4 km E of Akaroa N36 125105
AREA(ha): 109 **ALTITUDE(m):** 200–620 **RAINFALL(mm):** 2000
TOPOGRAPHY: moderately steep to steep colluvial hillslopes at head of fluvial valley; some buttresses and bluffs; many waterfalls and cascades **PARENT MATERIAL:** greywacke loess, and basalt and derived colluvium **VEGETATION:** kanuka forest; broadleaved forest; beech forest; introduced grassland; gorse scrub
SOILS: brown granular loams and clays (Stewart–Summit), lowland yellow–brown earths (Akaroa), yellow–grey earths (Kiwi)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) soils under beech forest are very much reduced from their former extent on Banks Peninsula. (ii) contains some of the most developed and oldest soils on Banks Peninsula.
VULNERABILITY: 3 **MODIFICATIONS/THREATS:** history of slash, burn, and revert and farming
TENURE: private protected land **OWNER/MANAGER:** Maurice White Conservation Trust
CONTACT PERSON: Hugh Wilson **DATE OF INFORMATION:** August 1991
NOTES: The area is actively managed for the protection and restoration of native vegetation and wildlife. A large adjacent area (formerly Otanerito Station) has recently been purchased by the Maurice White Conservation Trust.
REFERENCES: Wilson (1989) Wilson (1991)

(171) Magnet Bay Scenic Reserve

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 57–03 Akaroa

LOCALITY and GRID REFERENCE: Magnet Bay Valley, 7 km SSW of Little River, Banks Peninsula N37 913089
AREA(ha): 19 **ALTITUDE(m):** 75-275 **RAINFALL(mm):** 800
TOPOGRAPHY: steep colluvial valley hillslopes and valley floor; few bluffs **PARENT MATERIAL:** greywacke loess colluvium with some basalt **VEGETATION:** broadleaved forest and scrub; short tussock – introduced grassland; kanuka scrub
SOILS: yellow–grey earths (Takahe–Kiwi)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) good example of wetter yellow–grey earths.(ii) one of the best near–coastal lowland forest reserves on Bank Peninsula (Kelly 1972).
VULNERABILITY: 3 **MODIFICATIONS/THREATS:** burned in the 1880s; possums present
TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Bruce Trangmar **DATE OF INFORMATION:** December 1987
REFERENCES: Kelly (1972) Department of Lands and Survey (1984) Dennis (1986) McCaskill (1974)

(172) Okuti Valley Scenic Reserve

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 57–03 Akaroa
LOCALITY and GRID REFERENCE: 4 km ESE of Little River, Banks Peninsula N36 965137
AREA(ha): 4.4 **ALTITUDE(m):** 90-150 **RAINFALL(mm):** 1000
TOPOGRAPHY: gently–sloping terrace and colluvial hillslopes **PARENT MATERIAL:** greywacke loess, some colluvium **VEGETATION:** broadleaved forest and scrub; kanuka forest
SOILS: yellow–grey – yellow–brown earths intergrade (Pawson)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) probably best reservation of yellow–grey – yellow–brown earth intergrades on Banks Peninsula and possibly in Canterbury.
VULNERABILITY: 3 **MODIFICATIONS/THREATS:** has been logged and grazed; possums present
TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Bruce Trangmar **DATE OF INFORMATION:** December 1987
REFERENCES: Kelly (1972) Department of Lands and Survey (1984) Dennis (1986) McCaskill (1974)

(173) Otepatotu Scenic Reserve

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 57–03 Akaroa
LOCALITY and GRID REFERENCE: east of Summit Road, 8 km NE of Akaroa N36 114175
AREA(ha): 40 **ALTITUDE(m):** 550-756 **RAINFALL(mm):** 1250
TOPOGRAPHY: steep colluvial hillslopes; bedrock bluffs **PARENT MATERIAL:** mixed greywacke loess/basaltic colluvium **VEGETATION:** podocarp forest; broadleaved forest; introduced grassland
SOILS: brown granular loams and clays (Stewart–Summit Stewart–Akaroa)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) a good example of brown granular loams under montane forest.
VULNERABILITY: 3 **MODIFICATIONS/THREATS:** has been logged and grazed; walking tracks; some pines and gorse
TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Bruce Trangmar **DATE OF INFORMATION:** December 1987
NOTES: Stewart–Summit and Stewart–Akaroa soils are brown granular loams (there are no brown granular clays on Banks Peninsula).
REFERENCES: Kelly (1972) Department of Lands and Survey (1984) Dennis (1986) McCaskill (1974)

(174) Palm Gully Scenic Reserve

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 57–03 Akaroa
LOCALITY and GRID REFERENCE: near the head on the east side of Akaroa Harbour N37 068050
AREA(ha): 17 **ALTITUDE(m):** 0-335 **RAINFALL(mm):** 635
TOPOGRAPHY: extremely steep gorge and sheer bluffs; many waterfalls, bluffs and buttresses **PARENT MATERIAL:** basaltic colluvium with some greywacke loess **VEGETATION:** rockland; broadleaved forest; introduced grassland; fernland
SOILS: brown granular loams and clays (Evans–Kiwi)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) this reserve comprises the best remaining coastal forest remnant on Banks Peninsular – parts of it being close to untouched (Kelly 1972). (ii) brown granular loams are uncommon in the South Island. They are relatively extensive on Banks Peninsular but the original forest cover has been much reduced by burning and grazing.
VULNERABILITY: 3 **MODIFICATIONS/THREATS:** parts have been burned and grazed
TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Bruce Trangmar **DATE OF INFORMATION:** December 1990
NOTES: Ask Jeff or Trish Patterson, local farmer, for access permission to the reserve. Evens–Kiwi soils are brown granular loams (there are no brown granular clays on Banks Peninsula).
REFERENCES: Kelly (1972) Department of Lands and Survey (1984) Dennis (1986) McCaskill (1974)

(175) Peraki Saddle Scenic Reserve

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 57-03 Akaroa

LOCALITY and GRID REFERENCE: N of Carews Peak, 8 km SE of Little River, Banks Peninsula N37 986094

AREA(ha): 74 **ALTITUDE(m):** 245-730 **RAINFALL(mm):** 1270

TOPOGRAPHY: very steep colluvial and bedrock hillslopes; many rock outcrops **PARENT MATERIAL:** mixed basaltic loess/colluvium **VEGETATION:** podocarp-broadleaved forest; short tussock – introduced grassland; broadleaved scrub

SOILS: brown granular loams and clays (Stewart-Summit Stewart-Akaroa), upland yellow-brown earths (Summit Bossu), lowland yellow-brown earths (Akaroa)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) contains good examples of upland brown granular loams, upland yellow-brown earths and lowland yellow-brown earths under little-modified vegetation. Most aspects are represented. (ii) one of the best hillslope podocarp forest remnants on Banks Peninsula (Kelly 1972).

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** has been burned and grazed; possums present

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Bruce Trangmar **DATE OF INFORMATION:** December 1987

NOTES: Stewart-Summit and Stewart-Akaroa soils are brown granular loams (there are no brown granular clays on Banks Peninsula).

REFERENCES: Kelly (1972) Department of Lands and Survey (1984) Dennis (1986) McCaskill (1974)

(176) Double Hill

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 59-01 Mathias

LOCALITY and GRID REFERENCE: part of Double Hill (682 m) – a roche moutonne on the Rakaia River valley floor near its confluence with the Mathias River, 17 km NW of Lake Coleridge settlement K35 738670

AREA(ha): 60 **ALTITUDE(m):** 457-670 **RAINFALL(mm):** 1300

TOPOGRAPHY: moderately steep to steep colluvial hillslopes, a few ice-scoured rock outcrops and buttresses, moraine, small steep-sided gullies, valley floor wetland **PARENT MATERIAL:** greywacke, argillite, till and Recent alluvium

VEGETATION: short tussock grassland with matagouri; broadleaved scrub; rushland; turfand

SOILS: upland yellow-brown earths (Mesopotamia), gley recent soils (Dobson), recent soils (Tasman)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) provides a rare opportunity to protect a catenary sequence from a floodplain wetland to a hilltop. (ii) hillslope sites in the high country have been much modified. This site is the best remaining example in the district.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** parts recently burnt and root-raked

TENURE: pastoral lease, recommended area for protection **OWNER/MANAGER:** Double Hill station

CONTACT PERSON: Les Basher **DATE OF INFORMATION:** April 1991

REFERENCES: Arand and Glenny (1990)

(177) Hydra Waters - Chimera Fan

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 59-01 Mathias

LOCALITY and GRID REFERENCE: Rakaia River valley floor, 20 km NW of Lake Coleridge settlement K34 722 713

AREA(ha): 710 **ALTITUDE(m):** 457-609 **RAINFALL(mm):** 1500

TOPOGRAPHY: low-angled and moderately steep alluvial fans, floodplain wetland **PARENT MATERIAL:** Recent alluvium **VEGETATION:** moss-short tussock grassland; red tussock grassland; short tussock grassland; sedgeland

SOILS: gley recent soils (Dobson), recent soils (Tasman), upland yellow-brown earths (Cass)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) includes a soil-landform sequence from a floodplain to fans. (ii) wetlands are an international priority for protection. The Hydra Waters is the largest wetland in the Rakaia valley. The vegetation is in excellent condition.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** some historical topdressing and oversowing.

TENURE: pastoral lease, conservation agreement, recommended area for protection **OWNER/MANAGER:** Mt Algidus Station

CONTACT PERSON: Les Basher **DATE OF INFORMATION:** April 1991

NOTES: The Rakaia River is the most valuable salmon fishery in New Zealand, and the Hydra Waters is one of the four most important salmon spawning areas in the catchment.

REFERENCES: Arand and Glenny (1990)

(178) Kakapo Fans

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 59-01 Mathias

LOCALITY and GRID REFERENCE: Wilberforce River valley floor, 27 km NNW of Lake Coleridge settlement K34 775805

AREA(ha): 120 **ALTITUDE(m):** 549-762 **RAINFALL(mm):** 2000

TOPOGRAPHY: debris flow fan and alluvial fan **PARENT MATERIAL:** Recent alluvium derived from greywacke, argillite and metavolcanics **VEGETATION:** short tussock grassland with matagouri; matagouri scrub; beech treeland **SOILS:** recent soils (Tasman)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) the fans have the most extensive and dense matagouri cover of any in the district. The site is part of the natural altitudinal sequence between the Wilberforce River and nearby colluvial mountain slopes. Little modified fans like these are uncommon on main valley floors in the Canterbury high country.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** grazed and has been burnt

TENURE: pastoral lease, recommended area for protection **OWNER/MANAGER:** Mt Algidus Station

CONTACT PERSON: Les Basher **DATE OF INFORMATION:** April 1991

REFERENCES: Arand and Glenny (1990)

(179) Little Goat Hill

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 59-01 Mathias

LOCALITY and GRID REFERENCE: near Wilberforce River – Harper River confluence, 17 km NNW of Lake Coleridge settlement K34 873775

AREA(ha): 70 **ALTITUDE(m):** 503-533 **RAINFALL(mm):** 1500

TOPOGRAPHY: located at the toe of a large alluvial fan on the Wilberforce riverbed **PARENT MATERIAL:** Recent alluvium derived from greywacke and argillite **VEGETATION:** sedgeland; short tussock grassland with matagouri; sedgeland; matagouri shrubland

SOILS: gley recent soils (Dobson), recent soils (Tasman)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) the wetland vegetation communities only occur at one other site in the district. Wetlands, especially those on main valley floors, are a national priority for protection.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** cattle have modified drier parts of the area.

TENURE: freehold, pastoral lease, recommended area for protection **OWNER/MANAGER:** Mt Algidus Station

CONTACT PERSON: Les Basher **DATE OF INFORMATION:** April 1991

REFERENCES: Arand and Glenny (1990)

(180) Martello Swamp

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 59-01 Mathias

LOCALITY and GRID REFERENCE: on the western side of the peninsular that separates the Wilberforce and Rakaia Rivers, 16 km NW of Lake Coleridge settlement K35 771694

AREA(ha): 65 **ALTITUDE(m):** 457 **RAINFALL(mm):** 1300

TOPOGRAPHY: wetland on a low terrace above the Rakaia River floodplain **PARENT MATERIAL:** Recent alluvium

VEGETATION: sedgeland; reedland; red tussock grassland

SOILS: gley recent soils (Dobson)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) lowland wetland soils are a national priority for protection. This site is a good example of wetland soils under relatively unmodified vegetation.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** dry margins grazed by sheep and cattle.

TENURE: freehold, pastoral lease, recommended area for protection **OWNER/MANAGER:** Mt Algidus Station

CONTACT PERSON: Les Basher **DATE OF INFORMATION:** April 1991

NOTES: Part of the area is being eroded by the Rakaia River.

REFERENCES: Arand and Glenny (1990)

(181) Mt Algidus

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 59-01 Mathias

LOCALITY and GRID REFERENCE: southern slopes of Mt Algidus (1404 m) and big Goat Hill (1669 m), 20 km NW of Lake Coleridge settlement K34 772731

AREA(ha): 720 **ALTITUDE(m):** 488-1768 **RAINFALL(mm):** 1300-1700

TOPOGRAPHY: steep to very steep colluvial mountain slopes dissected by long, parallel, deep and narrow gullies; small lateral moraine, outwash terraces, planar screes, rock outcrops and buttresses **PARENT MATERIAL:** greywacke and argillite and minor derived Recent alluvium and till **VEGETATION:** gravelfield; beech forest; manuka and kanuka shrublands; snow tussock grasslands; alpine herbfields and fellfields

SOILS: upland yellow-brown earths (Bealey Spenser), alpine steepland soils, etc. (Alpine)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) the forest on the lower slopes of Mt Algidus has a rich lower montane element occurring at an unusually high altitude: miro, matai, and a number of understorey shrubs that are uncommon in the Rakaia basin. These species are relics of forests that were formerly more extensive in the Rakaia valley. (ii) the area contains a moderate diversity of soils and vegetation communities over a wide altitudinal range.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** sheep grazing, has been burnt and logged, 4WD road and water supply track

TENURE: freehold, pastoral lease, stewardship area, ecological area, recommended area for protection **OWNER/MANAGER:**

Mt Algidus Station, Department of Conservation

CONTACT PERSON: Les Basher **DATE OF INFORMATION:** April 1991

REFERENCES: Arand and Glenney (1990)

(182) Prospect Hill

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 59-01 Mathias

LOCALITY and GRID REFERENCE: Prospect Hill, near the confluence of Lake Stream and the Rakaia River, 32 km WNW of Lake Coleridge settlement J35 565648

AREA(ha): 50 **ALTITUDE(m):** 730-760 **RAINFALL(mm):** 2000

TOPOGRAPHY: drumlin-like terminal moraines and many small lakes; outwash, terminal and ablation moraines and roche moutonne nearby **PARENT MATERIAL:** till and outwash **VEGETATION:** red tussock grassland; short tussock grassland with matagouri

SOILS: gley recent soils (Dobson), upland yellow-brown earths (Cass Katrine)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) in the high country, roche moutonnes and other ice-sculptured landforms have mostly been greatly modified through burning, grazing, topdressing and oversowing. The soil-vegetation associations at this site are important for they are relatively unmodified.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** grazed and threatened by drainage, burning and further roading

TENURE: pastoral lease, recommended area for protection **OWNER/MANAGER:** Upper Lake Heron Station

CONTACT PERSON: Les Basher **DATE OF INFORMATION:** April 1991

NOTES: Also an important sample site for determining Quaternary fire and vegetation history (Russell 1980).

REFERENCES: Harrington et al. (1986) Arand and Glenney (1990) Russell (1980)

(183) Rolleston Range

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 59-01 Mathias

LOCALITY and GRID REFERENCE: southern Rolleston Range, 22 km NW of lake Coleridge settlement K34 733 803

AREA(ha): 5350 **ALTITUDE(m):** 609-2195 **RAINFALL(mm):** 1500-3000

TOPOGRAPHY: steep to very steep colluvial and bedrock mountain slopes and tops, dissected below 1250 m by deep narrow gullies; steep, bouldery stream beds; above 1250 m there are many rock outcrops, buttresses and bluffs and rockfall scree and narrow scree chutes, cirque basins **PARENT MATERIAL:** greywacke and argillite **VEGETATION:** beech forest; podocarp-broadleaved scrub; snow tussock grassland; rockland; gravelfield

SOILS: upland yellow-brown earths (Bealey Spenser), upland podzolised yellow-brown earths and podzols (Lewis)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) a large area of high natural values including a moderate range of mountainland soils and soil-vegetation associations.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** there is an unused quarry at the mouth of Boulderstone Stream

TENURE: pastoral lease, stewardship area, recommended area for protection **OWNER/MANAGER:** Mt Algidus Station, Department of Conservation

CONTACT PERSON: Les Basher **DATE OF INFORMATION:** April 1991

REFERENCES: Arand and Glenney (1990)

(184) South Ragged Range

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 59-01 Mathias

LOCALITY and GRID REFERENCE: south-facing slopes of the southern part of the Ragged Range, 33 km WNW of Lake Coleridge settlement J35 585697

AREA(ha): 3120 **ALTITUDE(m):** 549-2111 **RAINFALL(mm):** 1700-3000

TOPOGRAPHY: steep to very steep colluvial and bedrock mountain slopes, valleys are separated by sharp ridges, planar scree, Holocene cirque moraines, tarn, fragmented lateral moraine remnants, kame terrace, spur facets dissected by long, parallel gullies **PARENT MATERIAL:** greywacke and argillite **VEGETATION:** gravelfield; beech forest; beech-kanuka forest; podocarp-broadleaved forest, scrub and shrublands; snow tussock grassland; rocklandcommunities

SOILS: upland yellow-brown earths (Bealey Spenser), alpine steepand soils, etc. (Alpine)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) a large area of high natural values including a moderate range of mountainland soils and soil-vegetation associations.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** parts have been burnt but have recovered well

TENURE: stewardship area, pastoral lease, recommended area for protection **OWNER/MANAGER:** Manuka Point Station, Department of Conservation

CONTACT PERSON: Les Basher **DATE OF INFORMATION:** April 1991

REFERENCES: Arand and Glenney (1990)

(185) Wilberforce

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 59-01 Mathias
LOCALITY and GRID REFERENCE: the Wilberforce riverbed near its confluence with the Harper River, 20 km NNW of Lake Coleridge settlement K34 804781
AREA(ha): 1560 **ALTITUDE(m):** 472-558 **RAINFALL(mm):** 1400-1700
TOPOGRAPHY: multiple river and flood channels separated by sand and gravel bars, small island and channel backwaters **PARENT MATERIAL:** Recent alluvium **VEGETATION:** gravelfield; cushion-gravelfield; short tussock grassland with matagouri; herbfield
SOILS: recent soils (Tasman)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) the site includes the full range of youthful braided river soils and soil-vegetation associations in the ecological district (representing associations that are characteristic of Canterbury).
VULNERABILITY: 2 **MODIFICATIONS/THREATS:** River flow at the southern end of the RAP is diverted by a large gravel dam into Oakden Canal and then to Lake Coleridge.
TENURE: pastoral lease, Crown land under national water conservation order, recommended area for protection
OWNER/MANAGER: Mt Algidus Station, Department of Conservation
CONTACT PERSON: Les Basher **DATE OF INFORMATION:** April 1991
REFERENCES: Arand and Glenny (1990)

(186) Alford Range Wetlands

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 59-02 Mt Hutt
LOCALITY and GRID REFERENCE: 7 km N of Alford Forest K36 837394
AREA(ha): 35 **ALTITUDE(m):** 884-975 **RAINFALL(mm):** 1500
TOPOGRAPHY: colluvial mountain top hollow and slopes **PARENT MATERIAL:** greywacke and argillite
VEGETATION: red tussock grassland; cushionfield
SOILS: gley recent soils (Dobson), organic soils, upland yellow-brown earths (Koikoi)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) relatively undisturbed wetlands are nationally much reduced from their former extent. Many high country wetlands have been drained, topdressed, oversown and heavily grazed.
VULNERABILITY: 2 **MODIFICATIONS/THREATS:** severe pig rooting; few introduced plants
TENURE: pastoral lease **OWNER/MANAGER:** Winterslow Station
CONTACT PERSON: Les Basher **DATE OF INFORMATION:** May 1991
REFERENCES: Arand and Glenny (1990)

(187) Alford Scenic Reserve

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 59-02 Mt Hutt
LOCALITY and GRID REFERENCE: 13 Km WNW of Methven K36 891341
AREA(ha): 35.4 **ALTITUDE(m):** 460-565 **RAINFALL(mm):** 1000
TOPOGRAPHY: high terrace; colluvial hill toeslope; braided river floodplain **PARENT MATERIAL:** glacial outwash gravels and colluvium from greywacke **VEGETATION:** beech/podocarp forest; beech forest; broadleaved scrub and forest; gorse scrub; beech/broadleaved forest; gravelfield
SOILS: lowland yellow-brown earths (Staveley Alford-Forest Hurunui)
IMPORTANCE: 2 **SIGNIFICANCE:** (i) best example of terrace soils with beech and vigorous kahikatea regeneration in Canterbury.(ii) good example of Hurunui soils under native vegetation.
VULNERABILITY: 3 **MODIFICATIONS/THREATS:** has been grazed
TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Les Basher **DATE OF INFORMATION:** December 1987
REFERENCES: Kelly (1972) Department of Lands and Survey (1984) McCaskill (1974)

(188) East Branch Stour River

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 59-02 Mt Hutt
LOCALITY and GRID REFERENCE: between Manuka Range and Mt Somers Range, 12 km NW of Mt Somers township J36 699386
AREA(ha): 70 **ALTITUDE(m):** 792-914 **RAINFALL(mm):** 1100
TOPOGRAPHY: low-angled colluvial mountain slopes and moraine; alluvial fan toe; broad low-angled saddle
PARENT MATERIAL: till and alluvium derived from greywacke and argillite **VEGETATION:** red tussock grassland; red tussock - broadleaved shrub-grassland; matagouri-broadleaved shrubland
SOILS: upland yellow-brown earths (Cass Tckoa), recent soils (Tasman), gley recent soils (Dobson)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) high natural values in a part of the district that has low values for natural communities.(ii) contains the only example of Dobson soils under red tussock grassland in the district.
VULNERABILITY: 2 **MODIFICATIONS/THREATS:** grazed by sheep and cattle; abundant exotic grasses
TENURE: pastoral lease, recommended area for protection **OWNER/MANAGER:** Clent Hills Station

CONTACT PERSON: Les Basher **DATE OF INFORMATION:** May 1991

NOTES: The site comprises three disjoint parts – other grid reference centres are K36 705370 and 727346.

REFERENCES: Arand and Glenny (1990)

(189) Grahams Creek

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 59–02 Mt Hutt

LOCALITY and GRID REFERENCE: south end of Centre Spur, 6 km N of Alford Forest settlement K36 841362

AREA(ha): 20 **ALTITUDE(m):** 579-670 **RAINFALL(mm):** 1900

TOPOGRAPHY: colluvial hillslope; terrace riser **PARENT MATERIAL:** greywacke and argillite and derived colluvium and alluvium **VEGETATION:** short tussock grassland; broadleaved shrubland

SOILS: upland yellow–brown earths (Craigieburn Tekoa)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) contains uncommon soil–vegetation associations. The Tekoa soil–Olearia shrubland association is not represented in RAPs elsewhere in the district.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** grazed by sheep; 4WD road; further roading is a threat

TENURE: pastoral lease, recommended area for protection **OWNER/MANAGER:** Winterslow Station

CONTACT PERSON: Les Basher **DATE OF INFORMATION:** May 1991

NOTES: Contains Canterbury pink broom which is endemic to Canterbury and has a threat status of "rare".

REFERENCES: Arand and Glenny (1990)

(190) Hutt Stream Fan

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 59–02 Mt Hutt

LOCALITY and GRID REFERENCE: adjacent Double Hill Run Road, 12 km NW of Rakaia Gorge K35 941536

AREA(ha): 3 **ALTITUDE(m):** 366-427 **RAINFALL(mm):** 1100

TOPOGRAPHY: terrace riser **PARENT MATERIAL:** Pleistocene outwash gravels derived from greywacke and argillite **VEGETATION:** prostrate kowhai shrubland

SOILS: upland yellow–brown earths (Cass)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) unusual soil–vegetation association. Prostrate kowhai is uncommon in inland mid–Canterbury and only protected in Canterbury at Mt Cavendish Scenic Reserve.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** grazed by sheep – they control the abundant *Vulpia bromoides*

TENURE: pastoral lease, recommended area for protection **OWNER/MANAGER:** Glenrock Station

CONTACT PERSON: Les Basher **DATE OF INFORMATION:** May 1991

REFERENCES: Arand and Glenny (1990)

(191) Middle Creek

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 59–02 Mt Hutt

LOCALITY and GRID REFERENCE: southern part of Black Hill Range, 17 km N of Alford Forest settlement K35 825496

AREA(ha): 1940 **ALTITUDE(m):** 701-2126 **RAINFALL(mm):** 1000-2000

TOPOGRAPHY: steep colluvial mountain slopes with large areas of bare ground and planar scree; many scattered rock outcrops and buttresses; cirque basins with tarns, rock glaciers and rockfall deposits; gorge; terrace tread and riser **PARENT MATERIAL:** greywacke and argillite and derived colluvium and alluvium **VEGETATION:** podocarp scrub; snow tussock grassland; short tussock grassland; gravel field; fellfield; cushionfield

SOILS: upland yellow–brown earths (Kaikoura Tekoa), alpine steepland soils, etc. (Alpine)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) large relatively unmodified area with a moderate range of soils and soil–vegetation associations. Includes the most natural Halls totara–mountain toatoa scrub and slim snow tussock grassland in the ecological district.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** now retired from grazing; hares are common

TENURE: pastoral lease, recommended area for protection **OWNER/MANAGER:** Glenrock Station

CONTACT PERSON: Les Basher **DATE OF INFORMATION:** May 1991

REFERENCES: Arand and Glenny (1990)

(192) Mount Somers

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 59–02 Mt Hutt

LOCALITY and GRID REFERENCE: centred around Mt Somers (1697 m), includes southern faces of the Winterslow Range K36 785307

AREA(ha): 6260 **ALTITUDE(m):** 427-1687 **RAINFALL(mm):** 1000-1600

TOPOGRAPHY: steep colluvial and bedrock mountain slopes and gently–sloping tops; fault scarps – pug and crush zones, large exposures of convoluted, columnar–jointed rhyolite; ignimbrite flow sheets; many bluffs; tarns; highly weathered blockfields; canyon; scree **PARENT MATERIAL:** greywacke and argillite; Mt Somers Volcanics rhyolite and andesite (minor dacite, dolerite and tuff) **VEGETATION:** beech forest; snow tussock grassland; red tussock

grassland; short tussock grassland; manuka scrub; podocarp-broadleaved shrubland; cushionfield; fellfield
SOILS: upland yellow-brown earths (Koikoi Tekoa Kaikoura), brown granular loams and clays (Middlehurst), organic soils

IMPORTANCE: 2 **SIGNIFICANCE:** (i) a large, relatively undisturbed area containing a wide range of soils and soil-vegetation associations, reflecting the range of soil parent materials, landforms and wide range of aspects and altitude.(ii) important South Island representative of volcanic soils under original vegetation.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** parts have been burned and logged; still grazed by sheep and chamois; walking tracks; two huts; 4WD road; threatened by fire

TENURE: pastoral occupation license, stewardship land, scenic reserve **OWNER/MANAGER:** Mt Somers Station; Department of Conservation

CONTACT PERSON: Les Basher **DATE OF INFORMATION:** May 1991

NOTES: This area includes Sharplin Falls Scenic Reserve. Approximately 400 vascular plant species have been recorded from Mt Somers, representing almost 25 % of the number of native species (Arand and Glennie 1990). The bog pine-mountain toatoa shrubland is the largest of its type in Canterbury. It was probably more extensive in montane Canterbury between 12 000 and 10 000 years ago.

REFERENCES: Arand and Glennie (1990)

(193) Nell Stream

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 59-02 Mt Hutt

LOCALITY and GRID REFERENCE: 7 km NE of Lake Heron J35 650590

AREA(ha): 1130 **ALTITUDE(m):** 823-1990 **RAINFALL(mm):** 1500

TOPOGRAPHY: steep colluvial and bedrock mountain slopes; extensive planar screes; steep bluffly gorge; cirque basins

PARENT MATERIAL: greywacke and argillite and derived colluvium **VEGETATION:** snow tussock grassland; gravelfield; podocarp-broadleaved scrub; broadleaved scrub; beech forest

SOILS: upland yellow-brown earths (Kaikoura Tekoa)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) Tekoa soils under silver beech forest is an uncommon association in the "gap" between Arthurs Pass and the Dart River (Otago). The remaining stands probably existed through the late Otiran glaciation.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** grazed by sheep; parts have been burned

TENURE: pastoral lease, recommended area for protection **OWNER/MANAGER:** Glenfalloch Station

CONTACT PERSON: Les Basher **DATE OF INFORMATION:** May 1991

REFERENCES: Arand and Glennie (1990)

(194) Powerhouse Stream

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 59-02 Mt Hutt

LOCALITY and GRID REFERENCE: north-east slopes of Donald Hill (1524 m), near the Wilberforce-Rakaia confluence K35 806614

AREA(ha): 280 **ALTITUDE(m):** 488-1524 **RAINFALL(mm):** 1500

TOPOGRAPHY: steep to very steep colluvial mountainslopes and tops; bluffly gorge and high waterfall; planar colluvial mountain slopes **PARENT MATERIAL:** greywacke and argillite and derived colluvium; till **VEGETATION:** short tussock grassland; snow tussock grassland; broadleaved scrub; broadleaved/(sweet brier) forest

SOILS: lowland yellow-brown earths (Hurunui), upland yellow-brown earths (Tekoa Kaikoura Puketeraki)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) the lowland yellow-brown earths-mixed hardwood forest association is a valuable remnant of an originally extensive soil-vegetation association.(ii) upland yellow-brown earth under dense slim snow tussockland on north-facing slopes are nationally uncommon.(iii) lowland yellow-brown earths under short tussock grassland are also uncommon.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** lower part of the catchment is tracked and grazed by sheep.

TENURE: pastoral lease, recommended area for protection **OWNER/MANAGER:** Glenariffe Station (Glenaan)

CONTACT PERSON: Les Basher **DATE OF INFORMATION:** May 1991

REFERENCES: Arand and Glennie (1990)

(195) Pudding Hill

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 59-02 Mt Hutt

LOCALITY and GRID REFERENCE: one large and three small catchments south of Mt Hutt (2188 m), 7 km W of Rakaia Gorge K35 906419

AREA(ha): 3600 **ALTITUDE(m):** 549-2188 **RAINFALL(mm):** 1200-2000

TOPOGRAPHY: moderately steep to very steep colluvial mountain slopes and minor bedrock slopes and tops; extensive screes; solifluction lobes; relic rock glaciers; minor rounded to flat mountain tops (Waimaungan Glaciation outwash surfaces) **PARENT MATERIAL:** greywacke and argillite and derived colluvium **VEGETATION:** beech forest; Dracophyllum scrub; snow tussock grassland; gravelfield; alpine herbfield; cushionfield

SOILS: upland yellow-brown earths (Tekoa Kaikoura), lowland yellow-brown earths (Hurunui), alpine steepland soils, etc. (Alpine)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) a large relatively unmodified area containing a moderate range of soils and soil-vegetation associations over a very wide altitudinal range.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** still grazed by sheep; skifield buildings and facilities; Scots pine, willow and green alder have been planted for erosion control

TENURE: stewardship land, scenic reserve, local purpose reserve, private land **OWNER/MANAGER:** Department of Conservation; Mt Alford Station

CONTACT PERSON: Les Basher **DATE OF INFORMATION:** May 1991

NOTES: Includes Mt Hutt Forest and Pudding Hill Scenic Reserve.

REFERENCES: Arand and Glenny (1990)

(196) Rakaia Faces Forest Remnants

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 59-02 Mt Hutt

LOCALITY and GRID REFERENCE: opposite Double Hill roche moutonne, 15 km WNW of Lake Coleridge settlement K35 727632

AREA(ha): 40 **ALTITUDE(m):** 549-1128 **RAINFALL(mm):** 1000-1500

TOPOGRAPHY: extremely steep-sided gorges with frequent rock buttresses **PARENT MATERIAL:** greywacke and argillite **VEGETATION:** broadleaved-podocarp-beech forest; manuka-matagouri-broadleaved scrub

SOILS: upland yellow-brown earths (Tekoa)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) a good example of the formerly much more extensive Tekoa soil-forest association (now largely replaced by tussockland and introduced grassland).

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** stock browsing understory in accessible places; fire is the greatest threat

TENURE: pastoral lease, recommended area for protection **OWNER/MANAGER:** Double Hill Station

CONTACT PERSON: Les Basher **DATE OF INFORMATION:** May 1991

NOTES: The RAP is in three parts - Other grid reference centres are NZMS260: K35 739632 and 754629.

REFERENCES: Arand and Glenny (1990)

(197) Redcliffe Hill

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 59-02 Mt Hutt

LOCALITY and GRID REFERENCE: lower Redcliffe Stream, 5 km SW of Lake Coleridge settlement K35 866558

AREA(ha): 110 **ALTITUDE(m):** 457-936 **RAINFALL(mm):** 1400

TOPOGRAPHY: steep colluvial mountain slopes; high outwash gravel cliffs; contorted and indurated lake sediments

PARENT MATERIAL: greywacke and argillite and derived colluvium, outwash and till; minor Tertiary sands, marl and limestone and derived colluvium **VEGETATION:** beech forest; broadleaved forest; matagouri-broadleaved scrub

SOILS: upland yellow-brown earths (Tekoa), lowland yellow-brown earths (Hurunui), rendzina and related soils

IMPORTANCE: 3 **SIGNIFICANCE:** (i) contains a moderate range of soils including uncommon rendzina soils under little modified vegetation.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** localised dense cover of introduced herbs and grasses; grazed by sheep and cattle

TENURE: pastoral lease, freehold, recommended area for protection **OWNER/MANAGER:** Glenrock Station

CONTACT PERSON: Les Basher **DATE OF INFORMATION:** May 1991

REFERENCES: Arand and Glenny (1990)

(198) Redcliffe Saddle

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 59-02 Mt Hutt

LOCALITY and GRID REFERENCE: between the Black Hill Range and the Mount Hutt Range K35 859531

AREA(ha): 200 **ALTITUDE(m):** 853-975 **RAINFALL(mm):** 1400

TOPOGRAPHY: outwash gravel basin floor; large alluvial fans; gullies **PARENT MATERIAL:** loess over outwash gravel **VEGETATION:** short tussock grassland; red tussock grassland; sedgeland

SOILS: upland yellow-brown earths (Craigieburn Cass), gley recent soils (Dobson)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) upland yellow-brown earths under fescue tussock grassland is an associations that is much reduced from its former extent, owing to burning, grazing and topdressing and oversowing.(ii) relatively unmodified wetland soils are also a priority for protection.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** has been burned; is still grazed; many introduced species (especially Yorkshire fog, sweet vernal, cocksfoot and Trifolium spp.)

TENURE: pastoral lease **OWNER/MANAGER:** Glenrock Station

CONTACT PERSON: Les Basher **DATE OF INFORMATION:** May 1991

REFERENCES: Arand and Glenny (1990)

(199) Station Creek

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 59–02 Mt Hutt

LOCALITY and GRID REFERENCE: north side catchment of Palmer Range, 5 km SW of Double Hill (682 m) J35 686622

AREA(ha): 710 **ALTITUDE(m):** 549–1990 **RAINFALL(mm):** 1600

TOPOGRAPHY: steep colluvial mountain slopes and tops; some large planar screes; narrow gullies; lateral moraines; fault shear zone **PARENT MATERIAL:** greywacke and argillite and derived colluvium and till **VEGETATION:** broadleaved forest; beech forest; grassland; fellfield

SOILS: upland yellow–brown earths (Tekoa Kaikoura), lowland yellow–brown earths (Hurunui)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) contains a moderate range of soils reflecting a wide altitudinal range.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** stock still browse forest; introduced plants are locally abundant

TENURE: pastoral lease, recommended area for protection **OWNER/MANAGER:** Glenfalloch Station

CONTACT PERSON: Les Basher **DATE OF INFORMATION:** May 1991

REFERENCES: Arand and Glenny (1990)

(200) Steepface Hill

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 59–02 Mt Hutt

LOCALITY and GRID REFERENCE: northern part of Mt Hutt Range, 6 km S of Lake Coleridge settlement K35 896517

AREA(ha): 580 **ALTITUDE(m):** 1097–1875 **RAINFALL(mm):** 1400

TOPOGRAPHY: steep to very steep colluvial mountain slopes and tops with extensive scree and frequent rock outcrops, buttresses and bluffs; cirque moraine/rock glacier deposits **PARENT MATERIAL:** greywacke and argillite and derived colluvium **VEGETATION:** gravelfield; snow tussock grassland; cushionfield

SOILS: upland yellow–brown earths (Tekoa Kaikoura)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) extensive area of north–facing Tekoa and Kaikoura soils under relatively undisturbed vegetation (regionally uncommon association). Good contrast with south–facing slopes opposite.

VULNERABILITY: 2

TENURE: pastoral lease, recommended area for protection **OWNER/MANAGER:** Redcliffe Station

CONTACT PERSON: Les Basher **DATE OF INFORMATION:** May 1991

REFERENCES: Arand and Glenny (1990)

(201) Turtons

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 59–02 Mt Hutt

LOCALITY and GRID REFERENCE: northern part of Black Hill Range and eastern part of Palmer Range, as well as valley floor inbetween, 7 km W of Lake Coleridge settlement K35 804588

AREA(ha): 2160 **ALTITUDE(m):** 1006–2046 **RAINFALL(mm):** 100–1500

TOPOGRAPHY: steep colluvial and bedrock mountain slopes including many planar screes; mostly flat mountain tops; solifluction lobes; small tarns; several flat–topped, low–relief outwash terrace and alluvial fan basin floor features, all deeply dissected **PARENT MATERIAL:** greywacke and argillite and derived colluvium; till and outwash **VEGETATION:** snow tussock grassland; red tussock grassland; gravelfield; cushionfield

SOILS: upland yellow–brown earths (Tekoa Kaikoura Puketeraki), recent soils (Tasman), organic soils

IMPORTANCE: 3 **SIGNIFICANCE:** (i) an extensive area of high natural value, preserving a moderate range of soils and soil–vegetation associations.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** 4WD road; musterers hut; still grazed

TENURE: pastoral leases, pastoral occupation license, recommended area for protection **OWNER/MANAGER:** Double Hill, Glenariffe (Glenaan) and Glenrock Stations

CONTACT PERSON: Les Basher **DATE OF INFORMATION:** May 1991

REFERENCES: Arand and Glenny (1990)

(202) Whaleback Fans

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 59–02 Mt Hutt

LOCALITY and GRID REFERENCE: near Lake Stream and Rakaia River confluence, 15 km N of Lake Heron J35 606644

AREA(ha): 210 **ALTITUDE(m):** 579–853 **RAINFALL(mm):** 1800

TOPOGRAPHY: alluvial fans – extensive recently deposited gravels and stones **PARENT MATERIAL:** greywacke and argillite alluvium **VEGETATION:** gravelfield; matagouri scrub; short tussock – introduced grassland

SOILS: recent soils (Tasman)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) the recent soil–matagouri scrub association on alluvial fans was formerly much more extensive through the Canterbury high country. This site has escaped intensive development.

VULNERABILITY: 1 **MODIFICATIONS/THREATS:** introduced plants abundant; most natural vegetation exists only as small "islands" surrounded by gravelfields
TENURE: pastoral lease, recommended area for protection **OWNER/MANAGER:** Glenfalloch
CONTACT PERSON: Les Basher **DATE OF INFORMATION:** May 1991
REFERENCES: Arand and Glenny (1990)

(203) Winterslow

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 59-02 Mt Hutt
LOCALITY and GRID REFERENCE: southern slopes of the Old Man Range, 12 km NNW of Alford Forest settlement K35 764402
AREA(ha): 3780 **ALTITUDE(m):** 701-2330 **RAINFALL(mm):** 1200-2000
TOPOGRAPHY: steep to very steep colluvial mountain slopes; bedrock outcrops and buttresses; cirque basins infilled with scree, moraine and rock glaciers; moderately steep fluvio-glacial mountain slopes; extensive screes **PARENT MATERIAL:** greywacke and argillite and derived colluvium and till **VEGETATION:** gravelfield; snow tussock grassland; broadleaved scrub; alpine herbfield; red tussock grassland
SOILS: upland yellow-brown earths (Kaikoura Tekoa Craigieburn Cass), lowland yellow-brown earths (Hurunui), alpine steepland soils, etc. (Alpine)
IMPORTANCE: 2 **SIGNIFICANCE:** (i) large, highly natural area including a moderate range of soils and soil-vegetation associations.
VULNERABILITY: 2 **MODIFICATIONS/THREATS:** unfenced and grazed by sheep, cattle, wild pigs and chamois; 4WD roads; musterers hut
TENURE: pastoral lease, pastoral occupation licence, recommended area for protection **OWNER/MANAGER:** Winterslow Station
CONTACT PERSON: Les Basher **DATE OF INFORMATION:** May 1991
REFERENCES: Arand and Glenny (1990)

(204) Cameron River

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 59-03 Arrowsmith
LOCALITY and GRID REFERENCE: Cameron River catchment, Lake Heron basin J35 519558
AREA(ha): 7035 **ALTITUDE(m):** 760-2790 **RAINFALL(mm):** 1500-3500
TOPOGRAPHY: steep colluvial and bedrock mountain slopes and tops; many screes and bluffs; terminal moraine loops and lateral moraines; outwash terrace remnants **PARENT MATERIAL:** greywacke and argillite colluvium, till, alluvium **VEGETATION:** snow tussock grassland; red tussock grassland; grassland-scrub; shrubland; broadleaved scrub; rockland; fellfield
SOILS: upland yellow-brown earths (Kaikoura Cass Craigieburn Tekoa), alpine steepland soils, etc. (Alpine)
IMPORTANCE: 2 **SIGNIFICANCE:** (i) large area including a wide range of soils and soil-vegetation associations.
VULNERABILITY: 2 **MODIFICATIONS/THREATS:** parts have been burned and are still grazed; two huts
TENURE: stewardship land, pastoral lease, recommended area for protection **OWNER/MANAGER:** Department of Conservation; Upper Lake Heron and Arrowsmith Stations
CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** December 1987
NOTES: Includes a classic Holocene-late Pleistocene moraine sequence.
REFERENCES: Harrington et al. (1986)

(205) Dogs Range

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 59-03 Arrowsmith
LOCALITY and GRID REFERENCE: 4 km N of Lake Clearwater J36 527380
AREA(ha): 1572 **ALTITUDE(m):** 850-1400 **RAINFALL(mm):** 1000-1500
TOPOGRAPHY: steep colluvial mountain slopes; very gently sloping plateau; gelifluction terraces and lobes; bluffs and screes **PARENT MATERIAL:** weakly schistose greywacke colluvium, till and alluvium **VEGETATION:** snow tussock grassland; podocarp-kanuka forest and scrub; red tussock grassland
SOILS: upland yellow-brown earths (Kaikoura Puketeraki)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) contains excellent examples of upland yellow-brown earth-tussock grassland and mountain toatoa associations.
VULNERABILITY: 2
TENURE: Crown land, pastoral lease, recommended area for protection
CONTACT PERSON: Les Basher **DATE OF INFORMATION:** May 1990
REFERENCES: Harrington et al. (1986) Harvey (1974)

(206) Lower Lake Stream Forest Remnants

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 59-03 Arrowsmith
LOCALITY and GRID REFERENCE: 18 km N of Lake Heron J35 428566

AREA(ha): 591 **ALTITUDE(m):** 640-1100 **RAINFALL(mm):** 2000
TOPOGRAPHY: steep-sided gullies; fault shear zones **PARENT MATERIAL:** greywacke and argillite and derived colluvium **VEGETATION:** beech forest; broadleaved-podocarp-snow tussock shrubland
SOILS: upland yellow-brown earths (Cass Kaikoura)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) sole remnant in this district of soils under native forest cover.
VULNERABILITY: 2 **MODIFICATIONS/THREATS:** grazed
TENURE: pastoral lease, recommended area for protection **OWNER/MANAGER:** Upper Lake Heron Station
CONTACT PERSON: Les Basher **DATE OF INFORMATION:** May 1990
REFERENCES: Harrington et al. (1986)

(207) Upper Lawrence

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 59-03 Arrowsmith
LOCALITY and GRID REFERENCE: 10 km NNW Lawrence-Clyde confluence J35 428566
AREA(ha): 642 **ALTITUDE(m):** 820-2370 **RAINFALL(mm):** 3000
TOPOGRAPHY: steep colluvial and bedrock mountain slopes and tops; cirques; alluvial fan **PARENT MATERIAL:** greywacke and argillite and derived colluvium **VEGETATION:** podocarp-broadleaved forest; matagouri-broadleaved shrubland; snow tussock grassland
SOILS: upland yellow-brown earths (Kaikoura Tekoa), alpine steepland soils, etc. (Alpine)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) contains a wide range of vegetation communities on Kaikoura and Tekoa soils.
VULNERABILITY: 2
TENURE: Crown land, pastoral lease, recommended area for protection **OWNER/MANAGER:** Department of Conservation, Erewhon Station
CONTACT PERSON: Les Basher **DATE OF INFORMATION:** December 1987
REFERENCES: Harrington et al. (1986)

(208) Bush Creek Fan

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 59-04 Hakatere
LOCALITY and GRID REFERENCE: 5.5 km upstream from Lake Stream - Rakaia River confluence J35 582605
AREA(ha): 164 **ALTITUDE(m):** 620-760 **RAINFALL(mm):** 1500
TOPOGRAPHY: truncated alluvial fan with inset terraces, active stream channels **PARENT MATERIAL:** greywacke and argillite alluvium **VEGETATION:** matagouri shrubland and scrub; red tussock grassland; cushionfield
SOILS: upland yellow-brown earths (Cass), recent soils (Tasman)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) little modified alluvial fans on main valley floors are uncommon in Canterbury. The site exhibits good successional development of vegetation on Tasman and Cass soils.
VULNERABILITY: 2 **MODIFICATIONS/THREATS:** has been grazed
TENURE: pastoral lease, recommended area for protection **OWNER/MANAGER:** Upper Lake Heron Station
CONTACT PERSON: Les Basher **DATE OF INFORMATION:** December 1987
REFERENCES: Harrington et al. (1986)

(209) Butler Downs Forest

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 59-04 Hakatere
LOCALITY and GRID REFERENCE: 40 km NW of Peel Forest village J36 365231
AREA(ha): 179 **ALTITUDE(m):** 790-1160 **RAINFALL(mm):** 1000
TOPOGRAPHY: moderately sloping lateral moraine and colluvial mountain footslopes **PARENT MATERIAL:** till and greywacke colluvium **VEGETATION:** beech forest
SOILS: upland yellow-brown earths (Cass Kaikoura)
IMPORTANCE: 2 **SIGNIFICANCE:** (i) upland yellow-brown earths under beech forest was formerly much more extensive in the mid-Canterbury high country. This is one of the few remaining sites; it is notable for including forest on moraine and hillslopes.
VULNERABILITY: 2
TENURE: freehold, recommended area for protection, part retired
CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** December 1987
REFERENCES: Harrington et al. (1986)

(210) Maori Lakes Nature Reserve and Wildlife Res

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 59-04 Hakatere
LOCALITY and GRID REFERENCE: 25 km NW of Mt Somers settlement J36 619359
AREA(ha): 7 **ALTITUDE(m):** 623 **RAINFALL(mm):** 700
TOPOGRAPHY: moraine and outwash surface **PARENT MATERIAL:** alluvium and till derived from greywacke

and argillite **VEGETATION:** aquatic vegetation; sedgeland; short tussock grassland

SOILS: gley recent soils (Dobson)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) the only good representatives of Dobson soils under sedge swamp and raupo in Canterbury scenic reserves.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** parts have been grazed and burned

TENURE: nature reserve, wildlife reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Les Basher **DATE OF INFORMATION:** December 1987

REFERENCES: Kelly (1972) Department of Lands and Survey (1984) McCaskill (1974)

(211) Paddle Hill Creek

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 59–04 Hakatere

LOCALITY and GRID REFERENCE: 5 km NW of Lake Clearwater J36 555353

AREA(ha): 390 **ALTITUDE(m):** 780-810 **RAINFALL(mm):** 1000

TOPOGRAPHY: fluvoiglacial outwash terraces **PARENT MATERIAL:** outwash derived from greywacke and argillite **VEGETATION:** short tussock grassland; red tussock grassland; sedgeland

SOILS: upland yellow–brown earths (Tekapo Pukaki)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) includes some of the best upland yellow–brown earth – tussockland associations in Hakatere Ecological District.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** has been grazed

TENURE: pastoral lease, recommended area for protection **OWNER/MANAGER:** Hakatere Station

CONTACT PERSON: Les Basher **DATE OF INFORMATION:** December 1987

REFERENCES: Harrington et al. (1986) Harvey (1974)

(212) Swin Fan

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 59–04 Hakatere

LOCALITY and GRID REFERENCE: Lake Heron basin J35 658456

AREA(ha): 741 **ALTITUDE(m):** 690-910 **RAINFALL(mm):** 1000

TOPOGRAPHY: gently sloping terraced alluvial fan; braided stream channel **PARENT MATERIAL:** alluvium derived from greywacke and argillite **VEGETATION:** cushionfield; short tussock grassland; matagouri shrubland

SOILS: recent soils (Tasman), gley recent soils (Dobson), upland yellow–brown earths (Pukaki Acheron Tekapo)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) represents a sequence of soils at different ages and stages of development.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** has been burned and grazed; fire and pastoral development are biggest threats

TENURE: pastoral lease, recommended area for protection **OWNER/MANAGER:** Upper Lake Heron Station, Clent Hills Station

CONTACT PERSON: Les Basher **DATE OF INFORMATION:** December 1987

REFERENCES: Harrington et al. (1986)

(213) Black Birch Creek

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 59–05 Two Thumb

LOCALITY and GRID REFERENCE: Black Birch Creek catchment, a Two Thumb Range tributary of the Rangitata River, 32 km NW of Peel Forest township J36 331335

AREA(ha): 3977 **ALTITUDE(m):** 600-2545 **RAINFALL(mm):** 2000-3000

TOPOGRAPHY: recently glaciated valley – cirque basins, mountains with permanent snow, extensive scree deposits, steep rock bluffs, moraine loop, gorge **PARENT MATERIAL:** greywacke and argillite **VEGETATION:** snow tussock–short tussock grassland; snow tussock grassland; cushionfield; rockland

SOILS: upland yellow–brown earths (Cass Kaikoura), alpine steepland soils, etc. (Alpine)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) large relatively unmodified area including good altitudinal and aspect sequences of high country mountainland soils and soil–vegetation associations.(ii) includes the largest remnants in the district of the formerly more extensive association of (pre–human) upland yellow–brown earths under mountain beech forest.

VULNERABILITY: 2

TENURE: freehold, pastoral lease, recommended area for protection **OWNER/MANAGER:** Mesopotamia Station

CONTACT PERSON: Phil Tonkin **DATE OF INFORMATION:** April 1991

REFERENCES: Harrington et al. (1986)

(214) Bush Stream

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 59–05 Two Thumb

LOCALITY and GRID REFERENCE: headwaters of Bush Stream, a tributary of the Rangitata River, 30 km NW of Peel Forest township I36 288170

AREA(ha): 747 ALTITUDE(m): 1400-2000 RAINFALL(mm): 1500

TOPOGRAPHY: glacially-sculpted rolling plateau with numerous tarns and bogs; steep colluvial mountain slopes and tops; extensive scree; rock glaciers; cirque basins **PARENT MATERIAL:** greywacke and argillite and derived till and colluvium **VEGETATION:** snow tussock-short tussock grassland; cushionfield

SOILS: upland yellow-brown earths (Kaikoura), alpine steepland soils, etc. (Alpine), organic soils

IMPORTANCE: 3 **SIGNIFICANCE:** (i) contains a moderate range of little-modified soil vegetation associations.(ii) the tarns and associated soil-wetland associations are unique in Two Thumb Ecological District.

VULNERABILITY: 2

TENURE: pastoral lease, recommended area for protection **OWNER/MANAGER:** Mesopotamia Station

CONTACT PERSON: Les Basher **DATE OF INFORMATION:** April 1991

REFERENCES: Harrington et al. (1986)

(215) Edwards North Branch

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 59-05 Two Thumb

LOCALITY and GRID REFERENCE: north branch tributary of Edward Stream, south western slopes of Two Thumb Range, 15 km NW of Lake Tekapo township I37 201949

AREA(ha): 1732 ALTITUDE(m): 1050-2060 RAINFALL(mm): 900

TOPOGRAPHY: colluvial mountain slopes and tops; cirque basins; rolling moraines **PARENT MATERIAL:** greywacke and argillite and derived colluvium and till **VEGETATION:** snow tussock grassland; short tussock grassland; short tussock grassland-cushionfield

SOILS: upland yellow-brown earths (Kaikoura), alpine steepland soils, etc. (Alpine), yellow-grey earths (Omarama)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) contains a moderate range of altitudes and aspects of little-disturbed soil-vegetation associations.

VULNERABILITY: 2

TENURE: pastoral lease, recommended area for protection **OWNER/MANAGER:** Mt Hay Station

CONTACT PERSON: Les Basher **DATE OF INFORMATION:** April 1991

REFERENCES: Harrington et al. (1986)

(216) Forest Creek Beech Remnants

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 59-05 Two Thumb

LOCALITY and GRID REFERENCE: north eastern part of Two Thumb range, 20 km NW of Peel Forest township J36 371181

AREA(ha): 511 ALTITUDE(m): 670-1070 RAINFALL(mm): 1500

TOPOGRAPHY: steep terrace risers; colluvial hillslopes; "badlands" type erosion features **PARENT MATERIAL:** weathered non-marine greywacke gravels **VEGETATION:** beech forest

SOILS: upland yellow-brown earths (Kaikoura Cass), recent soils (Tasman)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) one of the very few remnants of the upland yellow-brown earth - mountain beech forest association that was formerly much more extensive in the district.

VULNERABILITY: 2

TENURE: freehold, pastoral lease, recommended area for protection **OWNER/MANAGER:** Mr L. Prouting, Ben McLeod Station, Mesopotamia Station

CONTACT PERSON: Les Basher **DATE OF INFORMATION:** April 1991

REFERENCES: Harrington et al. (1986)

(217) Lower South Opuha

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 59-05 Two Thumb

LOCALITY and GRID REFERENCE: southeastern slopes of the Two Thumb Range, 17 km NNW of Burke Pass township I37 275923

AREA(ha): 455 ALTITUDE(m): 610-1280 RAINFALL(mm): 900

TOPOGRAPHY: steep colluvial mountain slopes; terrace treads and risers; riverbed **PARENT MATERIAL:** weakly schistose greywacke **VEGETATION:** manuka scrub; manuka-broadleaved shrubland; broadleaved forest; Dracophyllum-snow tussock grassland

SOILS: lowland yellow-brown earths (Hurunui)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) contains remnant and seral stands of the lowland yellow-brown earth - manuka scrub and mountain toatoa/hardwood forest associations that are now much reduced from their original extent.(ii) includes a moderate range of altitudes and aspects.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** has been grazed; 4WD road

TENURE: pastoral lease, recommended area for protection, freehold **OWNER/MANAGER:** Stoneleigh Station

CONTACT PERSON: Les Basher **DATE OF INFORMATION:** April 1991

REFERENCES: Harrington et al. (1986)

(218) Mount Dobson

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 59-05 Two Thumb

LOCALITY and GRID REFERENCE: upper part of Firewood Stream catchment, a tributary of the Opihi River, 15 km NW of Lake Tekapo township I37 220913

AREA(ha): 2117 **ALTITUDE(m):** 600-2100 **RAINFALL(mm):** 900

TOPOGRAPHY: colluvial and bedrock mountain slopes and tops, cirque basins **PARENT MATERIAL:** weakly schistose greywacke **VEGETATION:** Dracophyllum-snow tussock shrubland; matagouri-sweet brier/short tussock shrubland; matagouri-broadleaved shrubland; snow tussock grassland; Dracophyllum-short tussock shrubland; gravelfield; rocklandcommunities

SOILS: upland yellow-brown earths (Kaikoura), alpine steepland soils, etc. (Alpine), lowland yellow-brown earths (Hurunui)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) large relatively unmodified area containing the best lowland yellow-brown earth – totara/hardwood forest association in the district. These are remnants of pre-human vegetation cover that was formerly much more extensive.

VULNERABILITY: 2

TENURE: pastoral lease, Crown land, recommended area for protection **OWNER/MANAGER:** Cloudy Peaks Station

CONTACT PERSON: Phil Tonkin **DATE OF INFORMATION:** April 1991

REFERENCES: Harrington et al. (1986)

(219) Stone Hut Moraine

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 59-05 Two Thumb

LOCALITY and GRID REFERENCE: Waterfall Stream catchment, a Two Thumb range tributary of the Macauley River I36 223242

AREA(ha): 722 **ALTITUDE(m):** 910-220 **RAINFALL(mm):** 2000-3000

TOPOGRAPHY: lateral moraine and colluvial mountain slopes and tops; cirque basins **PARENT MATERIAL:** greywacke and argillite and derived colluvium and till **VEGETATION:** snow tussock grassland; snow tussock-red tussock grassland; broadleaved shrubland; rockland; gravelfield

SOILS: upland yellow-brown earths (Puketeraki Kaikoura), alpine steepland soils, etc. (Alpine)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) contains a moderate range of soil-vegetation associations.

VULNERABILITY: 2

TENURE: pastoral lease, recommended area for protection

CONTACT PERSON: Les Basher **DATE OF INFORMATION:** April 1991

REFERENCES: Harrington et al. (1986)

(220) Conways Bush

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 61-01 Orari

LOCALITY and GRID REFERENCE: Raes Road, 10.5 km NW of Geraldine J37 640872

AREA(ha): 20 **ALTITUDE(m):** 260 **RAINFALL(mm):** 1000

TOPOGRAPHY: terrace tread **PARENT MATERIAL:** loess over outwash gravel **VEGETATION:** podocarp/broadleaved forest; kanuka treeland

SOILS: recent soils (Eyre-Paparua)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) good example of a recent soil with a native forest cover. This association was once much more extensive (Eyre-Paparua soils cover 105 500 ha) but has been almost entirely transformed into farmland. Conways Bush is therefore a valuable reference site.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** has been logged and grazed; now well fenced

TENURE: protected private land **OWNER/MANAGER:** Royal Forest and Bird Protection Society (South Canterbury), c/o Innes Stegger, Geraldine

CONTACT PERSON: Colin Meurk **DATE OF INFORMATION:** May 1991

NOTES: QEII National Trust covenant protection for nearby and adjacent sites is being negotiated.

(221) Hae Hae Te Moana Scenic Reserve

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 61-01 Orari

LOCALITY and GRID REFERENCE: 13 km WNW Geraldine, adjacent Temoana Road J37 573839

AREA(ha): 60 **ALTITUDE(m):** 245-365 **RAINFALL(mm):** 1150

TOPOGRAPHY: steep colluvial valley wall; small terraces **PARENT MATERIAL:** greywacke colluvium **VEGETATION:** broadleaved forest and scrub; introduced scrub and grassland

SOILS: lowland yellow-brown earths (Hurunui), yellow-grey earths (Opuha), recent soils (Mayfield)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) contains a moderate range of soils, although vegetation is "nothing special" (Kelly 1972).

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** has been burned and grazed by sheep and cattle; some broom

and gorse

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** December 1987

REFERENCES: Kelly (1972) Department of Lands and Survey (1984) McCaskill (1974)

(222) Morrison Open Space Covenant

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 61-01 Orari

LOCALITY and GRID REFERENCE: 13 km SW of Geraldine, S of SH 79 J38 580720

AREA(ha): 87 **ALTITUDE(m):** 160-327 **RAINFALL(mm):** 800-1000

TOPOGRAPHY: moderately steep colluvial hillslopes and gullies **PARENT MATERIAL:** greywacke loess

VEGETATION: (podocarp)-broadleaved forest

SOILS: yellow-grey earths (Opuha)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) a good regional example of a yellow-grey earth and a soil-vegetation association that was formerly much more extensive.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** fenced; some gorse and wilding pine

TENURE: freehold, QEII National Trust open space covenant **OWNER/MANAGER:** I and J Morrison

CONTACT PERSON: Brian Molloy **DATE OF INFORMATION:** July 1991

NOTES: Drier than Peel Forest and Talbot Forest. Site used for rock climbing. Maori rock drawings and bats present.

REFERENCES: QEII National Trust (Canterbury) file 5/11/2

(223) Orari Gorge Scenic Reserve

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 61-01 Orari

LOCALITY and GRID REFERENCE: 13 km NW of Geraldine J37 640901

AREA(ha): 80 **ALTITUDE(m):** 290-430 **RAINFALL(mm):** 1000

TOPOGRAPHY: rolling colluvial hillslopes; small terraces **PARENT MATERIAL:** greywacke and derived colluvium and loess **VEGETATION:** broadleaved forest; introduced grassland; podocarp forest

SOILS: yellow-grey earths (Opuha Claremont), lowland yellow-brown earths (Hurunui)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) yellow-grey earths under forests were formerly much more extensive in Canterbury, and the rest of the South Island. They have been much reduced by burning, logging and grazing. Though largely secondary forest this is the best remaining reserve for kahikatea regeneration in Canterbury, and the only one with kahikatea in association with mahoe - mixed broadleaved forest.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** has been logged; parts still grazed by sheep

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** December 1987

NOTES: The name is misleading - there is no gorge in the reserve.

REFERENCES: Kelly (1972) Department of Lands and Survey (1984) McCaskill (1974)

(224) Peel Forest Park Scenic Reserve

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 61-01 Orari

LOCALITY and GRID REFERENCE: 22 km N of Geraldine J37 694004

AREA(ha): 785 **ALTITUDE(m):** 260-1370 **RAINFALL(mm):** 1000-1200

TOPOGRAPHY: steep colluvial hillslopes; outwash terraces **PARENT MATERIAL:** greywacke and derived colluvium and alluvium **VEGETATION:** Dracophyllum-snow tussock scrub; broadleaved forest; broadleaved-beech-podocarp forest; broadleaved-podocarp forest

SOILS: lowland yellow-brown earths (Hurunui Peel-Forest), upland yellow-brown earths (Kaikoura), recent soils (Mayfield), yellow-grey - yellow-brown earths intergrade (Hororata)

IMPORTANCE: 1 **SIGNIFICANCE:** (i) internationally, yellow-grey earths under forest are uncommon. This site preserves the largest remaining area of yellow-grey earths (on terraces) under podocarp forest in New Zealand. This soil-vegetation association was formerly much more extensive but is now restricted to only a few remnants (others include Talbot Forest, Orari Gorge and Claremont Scenic Reerves).(ii) the reserve includes an excellent altitudinal sequence of soils and vegetation.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** has been logged; recreation and camping areas; walking tracks

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** December 1987

REFERENCES: Kelly (1972) Department of Lands and Survey (1984) McCaskill (1974)

(225) Waihi Gorge Scenic Reserve

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 61-01 Orari

LOCALITY and GRID REFERENCE: 13 km NW of Geraldine J37 592892

AREA(ha): 56 ALTITUDE(m): 300-410 RAINFALL(mm): 1300

TOPOGRAPHY: steep bedrock gorge wall and terrace remnants **PARENT MATERIAL:** greywacke colluvium and alluvium **VEGETATION:** broadleaved forest, scrub and shrubland; introduced grassland; podocarp forest

SOILS: lowland yellow-brown earths (Hurunui), yellow-grey - yellow-brown earths intergrade (Kakahu), yellow-grey earths (Opuha)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) contains a moderate range of soils including Kakahu and Opuha soils which are only protected at two other sites in Canterbury.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** grazed by sheep and deer

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** December 1987

REFERENCES: Kelly (1972) Department of Lands and Survey (1984) McCaskill (1974)

(226) Musgrave Estate Open Space Covenant

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 61-03 Geraldine

LOCALITY and GRID REFERENCE: true right side of Waihi River, near Woodbury, 8 km NNE of Geraldine J37 662858

AREA(ha): 13.8 ALTITUDE(m): 200 RAINFALL(mm): 700

TOPOGRAPHY: high outwash terrace **PARENT MATERIAL:** greywacke and argillite Holocene alluvium

VEGETATION: podocarp forest

SOILS: recent soils (Eyre-Paparua Templeton Waimakariri)

IMPORTANCE: 1 **SIGNIFICANCE:** (i) a good example of recent soils with native forest cover. This association was formerly much more extensive but has been reduced in extent by logging and pastoral development. The soils at this site are "well-drained associates of those at Riccarton Bush" (Kelly 1972).

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** has been grazed; parts infested with sycamore, cherry laurel, blackberry and ash

TENURE: QEII National Trust open space covenant, freehold **OWNER/MANAGER:** DJ, DD and CJ Musgrave; QEII National Trust

CONTACT PERSON: Colin Meurk **DATE OF INFORMATION:** December 1987

REFERENCES: QEII National Trust (Canterbury) file 5/11/4 Department of Lands and Survey (1984)

(227) Talbot Forest Scenic Reserve

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 61-03 Geraldine

LOCALITY and GRID REFERENCE: Geraldine J38 689789

AREA(ha): 26 ALTITUDE(m): 118-186 RAINFALL(mm): 750-800

TOPOGRAPHY: rolling colluvial hillslopes **PARENT MATERIAL:** loess over basalt **VEGETATION:** podocarp-broadleaved forest; broadleaved forest and scrub; introduced treeland and scrub

SOILS: yellow-grey earths (Claremont)

IMPORTANCE: 1 **SIGNIFICANCE:** (i) the best example of low rainfall yellow-grey earths under podocarp-broadleaved forest in New Zealand. This soil-vegetation association was formerly much more extensive but is now reduced to only a few remnants (others are at Orari Gorge and Claremont scenic reserves).

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** many tracks; many introduced weeds including blackberry and gorse; generally surrounded by exotic trees

TENURE: scenic reserve

CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** December 1987

REFERENCES: Kelly (1972) Department of Lands and Survey (1984)

(228) Waitohi Bush Recreation Reserve

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 61-03 Geraldine

LOCALITY and GRID REFERENCE: 15 km SW of Geraldine J38 597679

AREA(ha): 9 ALTITUDE(m): 150-230 RAINFALL(mm): 700

TOPOGRAPHY: gently sloping colluvial hillslopes **PARENT MATERIAL:** loess over sandstones and coarse gravels **VEGETATION:** introduced scrub and forest; podocarp-broadleaved forest

SOILS: yellow-grey earths (Timaru)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) may be the least modified representative of Timaru soils under native forest.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** has been logged

TENURE: reserve not classified **OWNER/MANAGER:** Timaru District Council

CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** December 1987

REFERENCES: Kelly (1972)

(229) Claremont Scenic Reserve

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 61-05 Waimate

LOCALITY and GRID REFERENCE: 13 km W of Timaru J39 574423
AREA(ha): 15 **ALTITUDE(m):** 180-300 **RAINFALL(mm):** 680
TOPOGRAPHY: moderately steep undulating outwash terrace **PARENT MATERIAL:** loess and old outwash gravels, over basalt **VEGETATION:** broadleaved forest; introduced scrub
SOILS: yellow-grey earths (Claremont)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) valuable representation of a soil-vegetation association near the fringes of the former distribution of forest (now reduced by logging and pastoral development).
VULNERABILITY: 3 **MODIFICATIONS/THREATS:** parts have been logged
TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** December 1987
NOTES: Soils are probably more diverse than indicated owing to the moderate range of parent materials.
REFERENCES: Kelly (1972) Department of Lands and Survey (1984) McCaskill (1974)

(230) Matata Scenic Reserve

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 61-05 Waimate
LOCALITY and GRID REFERENCE: 30 km W of Timaru J39 397408
AREA(ha): 103 **ALTITUDE(m):** 335-640 **RAINFALL(mm):** 800
TOPOGRAPHY: steep to extremely steep gorge bluffs; steep colluvial hillslopes; valley floor **PARENT MATERIAL:** greywacke and derived colluvium **VEGETATION:** broadleaved forest and scrub; short tussock-introduced grassland; introduced grassland
SOILS: lowland yellow-brown earths (Hurunui)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) a good example of Hurunui soils under low-rainfall and mixed broadleaved forest. A good complement to Mt Nimrod Scenic Reserve.
VULNERABILITY: 3 **MODIFICATIONS/THREATS:** grazed by sheep and cattle
TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** December 1987
REFERENCES: Kelly (1972) Department of Lands and Survey (1984) McCaskill (1974)

(231) Mt Nimrod Scenic Reserve

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 61-05 Waimate
LOCALITY and GRID REFERENCE: E flank of Hunters Hills, White Rock River, 30 km W of Timaru J39 399387
AREA(ha): 209 **ALTITUDE(m):** 350-670 **RAINFALL(mm):** 800+
TOPOGRAPHY: steep colluvial hillslopes and tops; valley floor; terraces **PARENT MATERIAL:** greywacke and derived colluvium and alluvium **VEGETATION:** broadleaved forest; short tussock grassland
SOILS: lowland yellow-brown earths (Hurunui), yellow-grey earths (Rapuawai)
IMPORTANCE: 2 **SIGNIFICANCE:** (i) a very good example of hill country yellow-brown earths under native vegetation at about their lowest rainfall end.
VULNERABILITY: 3 **MODIFICATIONS/THREATS:** parts have been logged; sheep and wallaby grazing; tracks
TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** December 1987
REFERENCES: Kelly (1972) Department of Lands and Survey (1984) Department of Lands and Survey (1980)

(232) Pareora Scenic Reserve

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 61-05 Waimate
LOCALITY and GRID REFERENCE: Pareora River, 32 km WNW of Timaru J38 395508
AREA(ha): 10 **ALTITUDE(m):** 260-350 **RAINFALL(mm):** 735
TOPOGRAPHY: undulating colluvial hillslopes; bluffs **PARENT MATERIAL:** mainly limestone and derived colluvium; some greywacke alluvium **VEGETATION:** broadleaved forest and scrub; introduced grassland and forest; rockland
SOILS: rendzina and related soils (Waratah)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) lowland rendzina soils under native vegetation are nationally uncommon. They only occur elsewhere in Canterbury at Napenape scenic reserve. (ii) this is the only representation of Waratah soils on this inventory.
VULNERABILITY: 3 **MODIFICATIONS/THREATS:** crossed by road
TENURE: scenic reserve **OWNER/MANAGER:** McKenzie District Council
CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** December 1987
REFERENCES: Kelly (1972) Department of Lands and Survey (1984) McCaskill (1974)

(233) Tasman Smith Scenic Reserve

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 61-05 Waimate
LOCALITY and GRID REFERENCE: east flank Hunters Hills, 34 km WNW of Timaru J38 366505

AREA(ha): 20 ALTITUDE(m): 450-600 RAINFALL(mm): 750

TOPOGRAPHY: steep gully and adjacent colluvial hillslopes **PARENT MATERIAL:** greywacke and derived colluvium **VEGETATION:** short tussock – introduced grassland with shrubs; broadleaved scrub and forest

SOILS: lowland yellow–brown earths (Hurunui)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) a good example of hill country yellow–brown earths under native vegetation at about their lowest rainfall end.(ii) silver beech is only reserved elsewhere in Canterbury at Lewis Pass National Reserve.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** has been grazed

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** December 1987

REFERENCES: Kelly (1972) Department of Lands and Survey (1984) McCaskill (1974)

(234) Cochranes Bush

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 62–01 Makikihi

LOCALITY and GRID REFERENCE: near Travistock Road, 24 km SW of Timaru J39 563245

AREA(ha): 2 ALTITUDE(m): 100-120 RAINFALL(mm): 650

TOPOGRAPHY: rounded hilltop (including north– and south–facing slopes) and hillslopes, in an undulating hill landscape **PARENT MATERIAL:** deep loess

SOILS: yellow–grey earths (Claremont)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) lowland yellow–grey earths with native forest cover are nationally rare.(ii) Claremont soils under native forest vegetation only occur elsewhere at Claremont Scenic Reserve. The Cochranes Bush site is a more widespread landform unit and is therefore likely to be a better representative of Claremont soils.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** pigs; some eucalyptes and pines

TENURE: private land **OWNER/MANAGER:** David Cochrane

CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** August 1991

NOTES: Measures to formally protect the site began several years ago. Farmer is sympathetic to protection proposal. Protection advocacy by South Canterbury Royal Forest and Bird Protection Society.

REFERENCES: Kear et al. (1967)

(235) Balmoral Fescue and Red Tussock Grassland

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 63–01 Tekapo

LOCALITY and GRID REFERENCE: 30 km NW of Twizel I37 943825

AREA(ha): 360 ALTITUDE(m): 760-855 RAINFALL(mm): 600

TOPOGRAPHY: lateral moraines and kame terrace **PARENT MATERIAL:** till and outwash derived from greywacke and argillite **VEGETATION:** red tussock grassland; short tussock grassland

SOILS: upland yellow–brown earths (Tekapo)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) a good example of undulating to rolling loess–covered Tekapo soils on moraine under tussock. This is one of the best remaining unmodified sites in the Mackenzie Basin.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** has been burned; still grazed

TENURE: recommended area for protection, pastoral lease **OWNER/MANAGER:** Pukaki Downs Station

CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** May 1990

NOTES: Location shown on map in Espie et al. (1984) is incorrect (Mark Davis, PL/PNAP Section, Department of Conservation, Christchurch, pers. comm.)

REFERENCES: Espie et al. (1984)

(236) Coal River

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 63–01 Tekapo

LOCALITY and GRID REFERENCE: north–east side of Lake Tekapo, 26 km NNE of Lake Tekapo township I37 185077

AREA(ha): 840 ALTITUDE(m): 745-1250 RAINFALL(mm): 800-1200

TOPOGRAPHY: colluvial hillslopes; lateral moraines **PARENT MATERIAL:** till and outwash derived from greywacke and argillite **VEGETATION:** short tussock grassland; broadleaved scrub; snow tussock grassland

SOILS: upland yellow–brown earths (Mesopotamia Puketeraki Kaikoura)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) moderate range of upland yellow–brown earths under an altitude sequence of native vegetation.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** has been burned and grazed

TENURE: pastoral lease, recommended area for protection **OWNER/MANAGER:** Mt Gerald Station, Richmond Station

CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** May 1990

REFERENCES: Espie et al. (1984)

(237) Defence Area Balmoral Station

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 63-01 Tekapo
LOCALITY and GRID REFERENCE: 13 km NW of Lake Tekapo township I37 982920
AREA(ha): 38 **ALTITUDE(m):** 885 **RAINFALL(mm):** 800-900
TOPOGRAPHY: lateral moraine **PARENT MATERIAL:** till derived from greywacke and argillite **VEGETATION:** red tussock-short tussock grassland
SOILS: upland yellow-brown earths (Tekapo Cass)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) dry lowland soils with red tussockland are uncommon in Canterbury.
VULNERABILITY: 2
TENURE: recommended area for protection, freehold **OWNER/MANAGER:** New Zealand Defense Department
CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** May 1990
NOTES: May be part Balmoral Station.
REFERENCES: Espie et al. (1984)

(238) Glenmore Tarns

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 63-01 Tekapo
LOCALITY and GRID REFERENCE: south of Cass River, 14 km NNW of Lake Tekapo township J37 036983
AREA(ha): 930 **ALTITUDE(m):** 760-1000 **RAINFALL(mm):** 1700
TOPOGRAPHY: moraine **PARENT MATERIAL:** till derived from greywacke and argillite **VEGETATION:** aquatic vegetation; short tussock grassland
SOILS: upland yellow-brown earths (Tekapo)
IMPORTANCE: 2 **SIGNIFICANCE:** (i) large area of wetland and "dry" soils under native vegetation. Regarded as the most outstanding area of kettle holes in New Zealand.
VULNERABILITY: 2
TENURE: pastoral lease, recommended area for protection **OWNER/MANAGER:** Glenmore Station
CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** May 1990
REFERENCES: Espie et al. (1984)

(239) Head of Irishman Creek

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 63-01 Tekapo
LOCALITY and GRID REFERENCE: 15 km NW of Lake Tekapo I37 958967
AREA(ha): 450 **ALTITUDE(m):** 975-1160 **RAINFALL(mm):** 1600
TOPOGRAPHY: lateral moraine; many tarns; relic boulderfield **PARENT MATERIAL:** deep loess and till
VEGETATION: red tussock grassland; short tussock grassland
SOILS: upland yellow-brown earths (Cass), gley soils (Braemar Cox)
IMPORTANCE: 2 **SIGNIFICANCE:** (i) excellent example of a relatively undisturbed soil-vegetation associations.(ii) contains good drainage catenas on moraine.
VULNERABILITY: 2 **MODIFICATIONS/THREATS:** has been burned; still grazed; live ammunition area
TENURE: pastoral lease, defense area **OWNER/MANAGER:** The Jollie Station; Ministry of Defence
CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** May 1991
REFERENCES: Espie et al. (1984)

(240) Mount Cook Station Swamp

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 63-01 Tekapo
LOCALITY and GRID REFERENCE: mouth of Jollie River, 40 km N of Lake Pukaki dam H37 843018
AREA(ha): 56 **ALTITUDE(m):** 610-795 **RAINFALL(mm):** 1600
TOPOGRAPHY: valley terrace tread; lateral moraine **PARENT MATERIAL:** till and alluvium derived from greywacke and argillite **VEGETATION:** sedgeland; snow tussock grassland
SOILS: gley recent soils (Dobson), upland yellow-brown earths (Mesopotamia Cass)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) a good example of valley floor wetland soils under native vegetation. One of the best *Carex secta* swamps in the ecological district.
VULNERABILITY: 2
TENURE: pastoral lease, recommended area for protection **OWNER/MANAGER:** Mt Cook Station
CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** May 1990
REFERENCES: Espie et al. (1984)

(241) Small Island

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 63-01 Tekapo
LOCALITY and GRID REFERENCE: island adjacent to Motuariki Island, Lake Tekapo I36 114934
AREA(ha): 22 **ALTITUDE(m):** 715 **RAINFALL(mm):** 800

TOPOGRAPHY: island **PARENT MATERIAL:** greywacke and argillite **VEGETATION:** broadleaved scrub
SOILS: upland yellow-brown earths (Tekapo)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) the island contains Tekapo soils under native vegetation that was formerly more common in the ecological district.
VULNERABILITY: 2
TENURE: Crown land, freehold **OWNER/MANAGER:** Department of Conservation, Electricorp
CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** May 1990
REFERENCES: Espie et al. (1984)

(242) Southern Lake Pukaki Scrub

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 63-01 Tekapo
LOCALITY and GRID REFERENCE: south end of Lake Pukaki, 10 km NNW of Twizel H38 840662
AREA(ha): 340 **ALTITUDE(m):** 520-610 **RAINFALL(mm):** 600
TOPOGRAPHY: terminal moraine **PARENT MATERIAL:** till derived from greywacke and argillite **VEGETATION:** broadleaved shrubland; short tussock grassland
SOILS: upland yellow-brown earths (Tekapo)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) large shrublands on terminal moraine are regionally uncommon.
VULNERABILITY: 2 **MODIFICATIONS/THREATS:** has been burned and grazed
TENURE: recommended area for protection, unalienated Crown land, pastoral lease, freehold **OWNER/MANAGER:** Department of Conservation, Landcorp, Simons Pass Station
CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** May 1990
REFERENCES: Espie et al. (1984)

(243) Tekapo Military Camp Tussock

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 63-01 Tekapo
LOCALITY and GRID REFERENCE: 12 km W of Lake Tekapo township I37 009859
AREA(ha): 1000 **ALTITUDE(m):** 760-1035 **RAINFALL(mm):** 700
TOPOGRAPHY: outwash surface; hillslopes and hollows; tilted hillslope scarp slump and backslope; two tarns
PARENT MATERIAL: tills, outwash and colluvium derived from greywacke and argillite **VEGETATION:** red tussock grassland; matagouri-short tussock grassland; wetland communities
SOILS: upland yellow-brown earths (Tekapo), gley soils (Cox Braemar)
IMPORTANCE: 2 **SIGNIFICANCE:** (i) deep Tekapo soils on gentle relief surfaces (Wolds Formation) under relatively unmodified vegetation are uncommon. The site also includes pockets of poor drainage.
VULNERABILITY: 2
TENURE: recommended area for protection, mainly pastoral lease, freehold **OWNER/MANAGER:** Balmoral Station, Department of Conservation, Ministry of Defense
CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** May 1990
REFERENCES: Espie et al. (1984)

(244) Western Lake Pukaki Scrub

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 63-01 Tekapo
LOCALITY and GRID REFERENCE: western side of Lake Pukaki, 14 km N of Twizel H38 797716
AREA(ha): 25 **ALTITUDE(m):** 625-640 **RAINFALL(mm):** 650
TOPOGRAPHY: lateral moraine **PARENT MATERIAL:** till derived from greywacke and argillite **VEGETATION:** matagouri-broadleaved scrub; short tussock grassland; broadleaved shrubland
SOILS: upland yellow-brown earths (Tekapo)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) one of the few remaining upland yellow-brown earth - montane scrub associations in the district.
VULNERABILITY: 2
TENURE: recommended area for protection (scientific reserve), pastoral lease **OWNER/MANAGER:** Pukaki Downs Station
CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** May 1990
REFERENCES: Espie et al. (1984)

(245) Gladstone Flats

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 63-02 Pukaki
LOCALITY and GRID REFERENCE: 15 km NW of Twizel H38 721693
AREA(ha): 530 **ALTITUDE(m):** 610-825 **RAINFALL(mm):** 900
TOPOGRAPHY: gently sloping outwash terrace and moraine **PARENT MATERIAL:** outwash and till derived from greywacke and argillite **VEGETATION:** red tussock grassland; bog pine shrubland; short tussock grassland

SOILS: upland yellow-brown earths (Bendhu Craigieburn Cass), gley soils (Cox Braemar)
IMPORTANCE: 2 **SIGNIFICANCE:** (i) some of the best examples of upland yellow-brown earth and gley soils under red tussock grassland in the Mackenzie Basin. This association was formerly much more extensive but has been much reduced in extent by grazing, topdressing and oversowing. (ii) the bog pine community is uncommon in New Zealand.
VULNERABILITY: 2 **MODIFICATIONS/THREATS:** depleted by rabbit grazing and hieracium
TENURE: recommended area for protection, pastoral lease **OWNER/MANAGER:** Pukaki Downs Station
CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** May 1990
NOTES: Part of the area is a Mackenzie Basin grazing trial site. Fairly typical association of well-drained soils developed under bog pine with associated poorly-drained soils. Benhu soils developed under bog pine preserved elsewhere (Bendhu Scientific Reserve).
REFERENCES: Espie et al. (1984)

(246) Grays River

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 63-02 Pukaki
LOCALITY and GRID REFERENCE: 24 km E of Twizel I38 015609
AREA(ha): 350 **ALTITUDE(m):** 395 **RAINFALL(mm):** 500
TOPOGRAPHY: swamp occupying a river channel **PARENT MATERIAL:** greywacke and argillite alluvium
VEGETATION: sedgeland; wetland communities
SOILS: recent soils (Tasman), gley recent soils (Dobson)
IMPORTANCE: 2 **SIGNIFICANCE:** (i) contains a moderate range of wetland soils under relatively undisturbed vegetation. The site is a remnant of the previously extensive Grays swamp.
VULNERABILITY: 2
TENURE: pastoral lease
CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** May 1991
NOTES: An important wildlife refuge. Native fish species present.
REFERENCES: Espie et al. (1984)

(247) Hakataramea Pass Fan

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 63-02 Pukaki
LOCALITY and GRID REFERENCE: 23 km S of Lake Tekapo township I38 115632
AREA(ha): 100 **ALTITUDE(m):** 550-580 **RAINFALL(mm):** 550
TOPOGRAPHY: inset alluvial fan **PARENT MATERIAL:** alluvium derived from greywacke and argillite
VEGETATION: short tussock grassland
SOILS: upland yellow-brown earths (Mackenzie)
IMPORTANCE: 2 **SIGNIFICANCE:** (i) fairly typical shallow stony outwash soil in a dry climate. Relatively unmodified soil-vegetation associations on alluvial fans on main valley floors are uncommon in the high country.
VULNERABILITY: 2
TENURE: recommended area for protection, pastoral lease **OWNER/MANAGER:** Department of Conservation, Landcorp
CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** May 1990
REFERENCES: Espie et al. (1984)

(248) Lower Duncan Stream

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 63-02 Pukaki
LOCALITY and GRID REFERENCE: 20 km N of Twizel H38 755753
AREA(ha): 190 **ALTITUDE(m):** 760-1005 **RAINFALL(mm):** 900
TOPOGRAPHY: basin floor **PARENT MATERIAL:** fluvioglacial outwash derived from greywacke and argillite
VEGETATION: snow tussock grassland; red tussock grassland
SOILS: upland yellow-brown earths (Craigieburn Bendhu), recent soils (Rhoboro Buscott Bendrose)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) moderate range of low altitude soils with good snow tussock grassland cover.
VULNERABILITY: 2
TENURE: recommended area for protection
CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** May 1990
REFERENCES: Espie et al. (1984)

(249) Maryburn Flats

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 63-02 Pukaki
LOCALITY and GRID REFERENCE: between SH 8 and the Tekapo River, 25 km NE of Twizel I38 007700
AREA(ha): 1000 **ALTITUDE(m):** 550-580 **RAINFALL(mm):** 600
TOPOGRAPHY: outwash terrace sequence; braided riverbed **PARENT MATERIAL:** outwash gravels; Recent

alluvium and loess **VEGETATION:** short tussock grassland; introduced grassland; broadleaved/(short tussock) shrubland

SOILS: upland yellow-brown earths (Pukaki Acheron Holbrook), recent soils (Tasman Larbreck Bendrose Sawdon)

IMPORTANCE: 1 **SIGNIFICANCE:** (i) the best remaining representation of the range of soils on outwash terraces of different ages in the Mackenzie Basin. The soil-vegetation associations were formerly much more extensive, but have been reduced by burning and grazing. (ii) terrace soils under grassland in low rainfall areas are uncommon internationally.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** has been burned; still grazed by sheep and rabbits

TENURE: recommended areas for protection, pastoral lease **OWNER/MANAGER:** Maryburn Station

CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** May 1990

REFERENCES: Espie et al. (1984)

(250) McMillan Stream

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 63-02 Pukaki

LOCALITY and GRID REFERENCE: 20 km NNW of Twizel H38 725721

AREA(ha): 16 **ALTITUDE(m):** 810-885 **RAINFALL(mm):** 900

TOPOGRAPHY: fan head trench **PARENT MATERIAL:** alluvium derived from greywacke and argillite **VEGETATION:** beech forest

SOILS: upland yellow-brown earths (Cass), recent soils (Rhoboro)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) only stand of Cass soils with mountain beech forest cover in the ecological district.

VULNERABILITY: 2

TENURE: recommended area for protection, pastoral lease **OWNER/MANAGER:** Pukaki Downs

CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** May 1990

REFERENCES: Espie et al. (1984)

(251) Pukaki Flats

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 63-02 Pukaki

LOCALITY and GRID REFERENCE: adjacent SH 8, 3 km N of Twizel H38 808610

AREA(ha): 300 **ALTITUDE(m):** 490 **RAINFALL(mm):** 600

TOPOGRAPHY: basin floor **PARENT MATERIAL:** fluvioglacial outwash derived from greywacke and argillite

VEGETATION: short tussock grassland

SOILS: upland yellow-brown earths (Mackenzie)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) a good example of Mackenzie soils under native vegetation.

VULNERABILITY: 2

TENURE: recommended area for protection, pastoral lease **OWNER/MANAGER:** Ben Ohau Station

CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** May 1990

REFERENCES: Espie et al. (1984)

(252) Simons Hill

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 63-02 Pukaki

LOCALITY and GRID REFERENCE: 14 km SE of Lake Pukaki township I38 947597

AREA(ha): 175 **ALTITUDE(m):** 520-945 **RAINFALL(mm):** 600

TOPOGRAPHY: colluvial hillslopes and tops **PARENT MATERIAL:** greywacke and argillite and derived colluvium

VEGETATION: short tussock grassland; kowhai scrub

SOILS: yellow-grey earths (Omarama), brown-grey earths (Waitaki)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) good example of relatively unmodified soil-vegetation associations on north and south aspect hillslopes under low rainfall.

VULNERABILITY: 2

TENURE: recommended area for protection, pastoral lease **OWNER/MANAGER:** Simons Hill Station, Department of Conservation, Landcorp

CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** May 1990

REFERENCES: Espie et al. (1984)

(253) Sterickers Mound

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 63-02 Pukaki

LOCALITY and GRID REFERENCE: 13 km SSW of Lake Tekapo township I38 131751

AREA(ha): 420 **ALTITUDE(m):** 575-760 **RAINFALL(mm):** 600

TOPOGRAPHY: colluvial hillslope and hillslope hollow; valley terrace floodplain **PARENT MATERIAL:** greywacke and argillite and derived colluvium and alluvium **VEGETATION:** broadleaved scrub; sedgeland

SOILS: upland yellow-brown earths (Pukaki Holbrook), yellow-grey earths (Meyer)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) one of only two sites on this inventory containing Holbrook soils.
VULNERABILITY: 2
TENURE: recommended areas for protection, pastoral lease **OWNER/MANAGER:** Holbrook Station
CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** May 1990
REFERENCES: Espie et al. (1984)

(254) Tekapo River Terrace

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 63-02 Pukaki
LOCALITY and GRID REFERENCE: 5 km SW of Lake Tekapo township I38 048795
AREA(ha): 180 **ALTITUDE(m):** 625-670 **RAINFALL(mm):** 600
TOPOGRAPHY: valley alluvial terrace **PARENT MATERIAL:** alluvium derived from greywacke and argillite
VEGETATION: short tussock grassland
SOILS: upland yellow-brown earths (Acheron), recent soils (Larbreck Tasman)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) a good example of Acheron soils under fescue tussockland.
VULNERABILITY: 2
TENURE: recommended area for protection, pastoral lease **OWNER/MANAGER:** Sawdon Station
CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** May 1990
REFERENCES: Espie et al. (1984)

(255) Tekapo-Pukaki River Flats

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 63-02 Pukaki
LOCALITY and GRID REFERENCE: between Tekapo and Pukaki Rivers, 11 km E of Twizel I38 911546
AREA(ha): 80 **ALTITUDE(m):** 395 **RAINFALL(mm):** 500
TOPOGRAPHY: intermontane basin floor **PARENT MATERIAL:** fluvioglacial outwash derived from greywacke and argillite **VEGETATION:** short tussock grassland
SOILS: upland yellow-brown earths (Mackenzie)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) a good example of Mackenzie soils under native vegetation.
VULNERABILITY: 2
TENURE: pastoral lease, recommended area for protection **OWNER/MANAGER:** Simons Hill Station
CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** May 1990
REFERENCES: Espie et al. (1984)

(256) The Pyramid

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 63-02 Pukaki
LOCALITY and GRID REFERENCE: 10 km WSW of Twizel township H38 732611
AREA(ha): 300 **ALTITUDE(m):** 535-610 **RAINFALL(mm):** 700
TOPOGRAPHY: basin floor **PARENT MATERIAL:** fluvioglacial outwash derived from greywacke and alluvium
VEGETATION: manuka/short tussock scrub
SOILS: upland yellow-brown earths (Bendhu Tekapo)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) this is the only upland yellow-brown earth-manuka scrub association known from the district.
VULNERABILITY: 2
TENURE: recommended area for protection
CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** May 1990
REFERENCES: Espie et al. (1984)

(257) Dorcy Stream

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 63-03 Ben Ohau
LOCALITY and GRID REFERENCE: eastern side of Lake Ohau, 30 km N of Omarama H38 613622
AREA(ha): 27 **ALTITUDE(m):** 520-790 **RAINFALL(mm):** 1000
TOPOGRAPHY: colluvial hillslope hollow **PARENT MATERIAL:** greywacke and argillite and derived colluvium
VEGETATION: beech forest
SOILS: upland yellow-brown earths (Cass)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) remnant of formerly much more extensive soil-forest association.
VULNERABILITY: 2
TENURE: recommended area for protection, pastoral lease **OWNER/MANAGER:** Glen Lyon Station
CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** May 1990
NOTES: Beech remnant is well-buffered by a 50 m wide strip of shrubland.
REFERENCES: Espie et al. (1984)

(258) Fraser Stream Headwaters

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 63-03 Ben Ohau

LOCALITY and GRID REFERENCE: 16 km NW of Twizel H38 648673

AREA(ha): 175 **ALTITUDE(m):** 1495-1980 **RAINFALL(mm):** 1200-2000

TOPOGRAPHY: colluvial mountain slopes and tops **PARENT MATERIAL:** greywacke, argillite and schist and derived colluvium **VEGETATION:** snow tussock grassland; short tussock grassland; alpine herbfield

SOILS: upland yellow-brown earths (Kaikoura), alpine steepland soils, etc. (Alpine)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) a good example of Kaikoura soils under tussockland.

VULNERABILITY: 2

TENURE: pastoral lease, recommended area for protection **OWNER/MANAGER:** Rhoboro Downs Station

CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** May 1990

REFERENCES: Espie et al. (1984)

(259) Irishman Stream

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 63-03 Ben Ohau

LOCALITY and GRID REFERENCE: 22 km NW of Twizel H38 660793

AREA(ha): 425 **ALTITUDE(m):** 640-1280 **RAINFALL(mm):** 1600-2000

TOPOGRAPHY: colluvial mountain slopes **PARENT MATERIAL:** greywacke and argillite and derived colluvium

VEGETATION: beech forest

SOILS: upland yellow-brown earths (Cass Kaikoura)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) a valuable benchmark site of a soil vegetation association that was formerly much more extensive. This is the second largest remnant of mountain beech forest in MacKenzie Ecological Region (the largest is at Upper Maitland).

VULNERABILITY: 2

TENURE: pastoral lease, recommended area for protection, stewardship land **OWNER/MANAGER:** Glen Lyon Station, Department of Conservation

CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** May 1990

REFERENCES: Espie et al. (1984)

(260) Lake Ohau Moraine Scrub

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 63-03 Ben Ohau

LOCALITY and GRID REFERENCE: southern end of Lake Ohau, 20 km E of Twizel H38 638521

AREA(ha): 290 **ALTITUDE(m):** 520-580 **RAINFALL(mm):** 800

TOPOGRAPHY: ablation moraine **PARENT MATERIAL:** till derived from greywacke, argillite and schist

VEGETATION: matagouri scrub; aquatic communities; tauhinu and kowhai scrub

SOILS: upland yellow-brown earths (Craigieburn Cass)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) moderate range of little-modified soil-vegetation associations.

VULNERABILITY: 2

TENURE: freehold, recommended area for protection **OWNER/MANAGER:** Mr D Blue

CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** May 1990

REFERENCES: Espie et al. (1984)

(261) Mount Ben Ohau

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 63-03 Ben Ohau

LOCALITY and GRID REFERENCE: southern slopes of Ben Ohau (1521 m), 16 km W of Twizel H38 627555

AREA(ha): 215 **ALTITUDE(m):** 510-1520 **RAINFALL(mm):** 1400

TOPOGRAPHY: very steep colluvial mountain slopes and tops **PARENT MATERIAL:** greywacke and argillite and derived colluvium **VEGETATION:** podocarp forest; snow tussock grassland; herbfield; fellfield

SOILS: upland yellow-brown earths (Kaikoura Tekoa)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) soils support some of the driest forests in New Zealand, and the best example of a regenerating Halls totara forest in the district.

VULNERABILITY: 2

TENURE: recommended area for protection **OWNER/MANAGER:** Ruataniwha Station

CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** May 1990

REFERENCES: Espie et al. (1984)

(262) Upper Gladstone Valley

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 63-03 Ben Ohau

LOCALITY and GRID REFERENCE: 20 km NNW of Twizel H38 684739

AREA(ha): 2340 **ALTITUDE(m):** 825-2105 **RAINFALL(mm):** 1000-2500

TOPOGRAPHY: colluvial mountain slopes and tops **PARENT MATERIAL:** greywacke, argillite and schist and derived colluvium **VEGETATION:** snow tussock–short tussock grassland; broadleaved scrub
SOILS: upland yellow–brown earths (Tekoa Kaikoura), alpine steepland soils, etc. (Alpine)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) together with Gladstone Flats, this site forms an excellent altitude sequence of soils and soil–vegetation associations from piedmont floor to the second–highest peak in the Mackenzie Ecological Region.
VULNERABILITY: 2
TENURE: pastoral lease, recommended area for protection **OWNER/MANAGER:** Pukaki Downs Station
CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** May 1990
REFERENCES: Espie et al. (1984)

(263) Big Range

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 63–04 Grampians
LOCALITY and GRID REFERENCE: Big Range, 23 km NW of Otematata I39 014397
AREA(ha): 840 **ALTITUDE(m):** 610–1310 **RAINFALL(mm):** 1200
TOPOGRAPHY: colluvial mountain slopes and tops **PARENT MATERIAL:** greywacke, argillite and schist and derived colluvium **VEGETATION:** snow tussock grassland; red tussock grassland; matagouri–broadleaved scrub
SOILS: upland yellow–brown earths (Benmore), yellow–grey earths (Omarama)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) large, good example of dry yellow–brown and yellow–grey earths with native vegetation cover.(ii) includes the only red tussockland in the district, and the only high altitude red tussockland in the ecological region.
VULNERABILITY: 2
TENURE: pastoral lease, recommended area for protection **OWNER/MANAGER:** Black Forest Station
CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** May 1990
REFERENCES: Espie et al. (1984)

(264) Black Rocks - Grampian Range

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 63–04 Grampians
LOCALITY and GRID REFERENCE: Grampian Mountains, 30 km S of Lake Tekapo township I39 131500
AREA(ha): 670 **ALTITUDE(m):** 1220–1920 **RAINFALL(mm):** 1200
TOPOGRAPHY: mountain top with periglacial features **PARENT MATERIAL:** greywacke and argillite **VEGETATION:** fellfield
SOILS: upland yellow–brown earths (Benmore)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) one of the best examples of the Benmore soil under fellfield in the ecological district.
VULNERABILITY: 2
TENURE: pastoral lease, recommended area for protection **OWNER/MANAGER:** Grampians Station, Curraghmore Station
CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** May 1990
REFERENCES: Espie et al. (1984)

(265) MacKenzie Pass

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 63–04 Grampians
LOCALITY and GRID REFERENCE: Dalgety Range, 27 km SE of Lake Tekapo township I38 188638
AREA(ha): 480 **ALTITUDE(m):** 700–1370 **RAINFALL(mm):** 600
TOPOGRAPHY: colluvial mountain slopes and tops; boulderfield **PARENT MATERIAL:** greywacke, argillite and schist and derived colluvium **VEGETATION:** matagouri–broadleaved scrub; snow tussock grassland; fellfield; broadleaved scrub
SOILS: yellow–grey earths (Meyer)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) contains a moderate range of little–disturbed soil–vegetation associations.
VULNERABILITY: 2
TENURE: pastoral lease, recommended area for protection **OWNER/MANAGER:** Grampians Station, Mt Dalgety Station
CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** May 1990
REFERENCES: Espie et al. (1984)

(266) Rollesby Range above Rollesby Station

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 63–04 Grampians
LOCALITY and GRID REFERENCE: Rollesby Range, 15 km SSE of Lake Tekapo township I38 182727
AREA(ha): 94 **ALTITUDE(m):** 1000–1500 **RAINFALL(mm):** 600–1000

TOPOGRAPHY: colluvial mountain slopes and tops **PARENT MATERIAL:** greywacke and argillite and derived colluvium **VEGETATION:** snow tussock grassland; Dracophyllum-snow tussock scrub
SOILS: upland yellow-brown earths (Kaikoura), yellow-grey earths (Omarama)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) an excellent example of little-modified, south facing soil-vegetation associations.
VULNERABILITY: 2
TENURE: pastoral lease, recommended area for protection **OWNER/MANAGER:** Rollesby Station
CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** May 1990
REFERENCES: Espie et al. (1984)

(267) South Grampians above Stony River

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 63-04 Grampians
LOCALITY and GRID REFERENCE: Grampian Mountains, 35 km SE of Twizel I39 134460
AREA(ha): 60 **ALTITUDE(m):** 1435-1555 **RAINFALL(mm):** 1200
TOPOGRAPHY: colluvial mountain slopes and tops **PARENT MATERIAL:** greywacke and argillite and derived colluvium **VEGETATION:** short tussock grassland; snow tussock grassland
SOILS: upland yellow-brown earths (Benmore)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) good example of the effect of aspect on grassland composition and soils.
VULNERABILITY: 2
TENURE: pastoral lease, recommended area for protection **OWNER/MANAGER:** Curraghmore Station, Streamlands Station
CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** May 1990
REFERENCES: Espie et al. (1984)

(268) South-East Faces Mt Dalgety

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 63-04 Grampians
LOCALITY and GRID REFERENCE: Dalgety Range, 30 km SW of Fairlie I38 209524
AREA(ha): 450 **ALTITUDE(m):** 700-1705 **RAINFALL(mm):** 1200
TOPOGRAPHY: colluvial mountain slopes and tops; terraces **PARENT MATERIAL:** colluvium and alluvium derived from greywacke and argillite **VEGETATION:** snow tussock grassland; matagouri/short tussock grassland; snow tussock-short tussock grassland; Dracophyllum scrub
SOILS: upland yellow-brown earths (Kaikoura Dalgety)
IMPORTANCE: 2 **SIGNIFICANCE:** (i) contains a moderate range of soil-vegetation associations. (ii) includes snow tussocklands on valley fill terrace soils. This is the only known example in Mackenzie Ecological Region; the association is also nationally uncommon.
VULNERABILITY: 2
TENURE: pastoral lease, recommended area for protection **OWNER/MANAGER:** Mt Dalgety Station
CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** May 1990
REFERENCES: Espie et al. (1984)

(269) Birchwood Lagoon

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 63-05 Ahuriri
LOCALITY and GRID REFERENCE: Ahuriri River valley, 40 km NW of Omarama G39 400491
AREA(ha): 265 **ALTITUDE(m):** 730 **RAINFALL(mm):** 1300
TOPOGRAPHY: terrace tread and floodplain including small streams, river braids and ox-bow lakes **PARENT MATERIAL:** alluvium derived from greywacke, argillite and schist **VEGETATION:** sedgeland
SOILS: gley recent soils (Dobson)
IMPORTANCE: 2 **SIGNIFICANCE:** (i) wetlands are an international priority for protection. Birchwood Lagoon is the largest wetland in Mackenzie Ecological Region. The vegetation is in very good condition.
VULNERABILITY: 2
TENURE: pastoral lease, recommended area for protection **OWNER/MANAGER:** Birchwood Station
CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** May 1990
REFERENCES: Espie et al. (1984)

(270) Firewood Bush

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 63-05 Ahuriri
LOCALITY and GRID REFERENCE: 40 km NW of Omarama G38 381523
AREA(ha): 660 **ALTITUDE(m):** 745-1675 **RAINFALL(mm):** 1500
TOPOGRAPHY: colluvial mountain slope; floodplain; coalescing alluvial fans **PARENT MATERIAL:** schist and derived colluvium and alluvium **VEGETATION:** short tussock grassland; snow tussock grassland; Dracophyllum scrub;

broadleaved scrub; beech forest; podocarp scrub; snowbank, rockland; gravel field

SOILS: alpine steep land soils, etc. (Alpine), upland podzolised yellow-brown earths and podzols (Whitcombe), gley recent soils (Dobson)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) contains a moderate range of soils and soil-vegetation associations, under relatively unmodified vegetation.

VULNERABILITY: 2

TENURE: pastoral lease, recommended area for protection **OWNER/MANAGER:** Birchwood Station

CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** May 1990

REFERENCES: Espie et al. (1984)

(271) Frosty Gully

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 63-05 Ahuriri

LOCALITY and GRID REFERENCE: 13 km WSW of Omarama H39 555252

AREA(ha): 42 **ALTITUDE(m):** 580-760 **RAINFALL(mm):** 850

TOPOGRAPHY: colluvial mountain slopes **PARENT MATERIAL:** greywacke and argillite and derived colluvium

VEGETATION: podocarp treeland; short tussock grassland

SOILS: yellow-grey earths (Omarama)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) one of the best remnants in the district of a formerly much more extensive soil-vegetation association.

VULNERABILITY: 2

TENURE: recommended area for protection

CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** May 1990

REFERENCES: Espie et al. (1984)

(272) Lake Dumb-bell

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 63-05 Ahuriri

LOCALITY and GRID REFERENCE: Ohau Range, 28 km W of Twizel H38 513577

AREA(ha): 48 **ALTITUDE(m):** 1525-1615 **RAINFALL(mm):** 2500

TOPOGRAPHY: cirque basin tarn and shore **PARENT MATERIAL:** till and colluvium derived from greywacke and argillite **VEGETATION:** snow tussock grassland

SOILS: organic soils

IMPORTANCE: 3 **SIGNIFICANCE:** (i) soil-vegetation association that is unique in the district.

VULNERABILITY: 2

TENURE: stewardship land, recommended area for protection **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** May 1990

REFERENCES: Espie et al. (1984)

(273) Lindis Pass

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 63-05 Ahuriri

LOCALITY and GRID REFERENCE: 28 km WSW of Omarama G39 442294

AREA(ha): 650 **ALTITUDE(m):** 760 **RAINFALL(mm):** 1000

TOPOGRAPHY: colluvial mountain slopes and tops; valley floor flats **PARENT MATERIAL:** greywacke and argillite and derived colluvium **VEGETATION:** short tussock grassland; snow tussock grassland; red tussock grassland; matagouri scrub

SOILS: upland yellow-brown earths (Kaikoura Cass), yellow-grey earths (Omarama), gley recent soils (Dobson)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) contains a moderate range of soil-vegetation associations, from valley floor to mountain tops, under native vegetation.

VULNERABILITY: 2

TENURE: scenic reserve, pastoral lease, recommended area for protection **OWNER/MANAGER:** Department of Conservation, Dalrachney Station, Dunstan Downs Station

CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** May 1990

REFERENCES: Espie et al. (1984)

(274) Mid Ahuriri

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 63-05 Ahuriri

LOCALITY and GRID REFERENCE: 25 km NW of Omarama G39 451437

AREA(ha): 1930 **ALTITUDE(m):** 730-1295 **RAINFALL(mm):** 1500-3500

TOPOGRAPHY: colluvial mountain slopes and tops; moraines **PARENT MATERIAL:** greywacke and argillite and derived colluvium and alluvium **VEGETATION:** snow tussock grassland; short tussock grassland; matagouri-broadleaved scrub; podocarp scrub

SOILS: upland yellow-brown earths (Kaikoura Cass), alpine steepland soils, etc. (Alpine), gley recent soils (Dobson)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) contains a moderate range of soils under native vegetation, including the best stand of snow totara scrub in the ecological district.

VULNERABILITY: 2

TENURE: pastoral lease, recommended area for protection **OWNER/MANAGER:** Quailburn Station

CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** May 1990

REFERENCES: Espie et al. (1984)

(275) Shamrock Hut Flats

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 63-05 Ahuriri

LOCALITY and GRID REFERENCE: mid-Ahuriri River valley, 40 km NW of Omarama G38 398587

AREA(ha): 555 **ALTITUDE(m):** 760-915 **RAINFALL(mm):** 2000

TOPOGRAPHY: floodplain; terrace **PARENT MATERIAL:** alluvium derived from schist, greywacke and argillite

VEGETATION: gravelfield; short tussock grassland; matagouri scrub; moss-sedgeland; podocarp shrubland

SOILS: recent soils (Tasman)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) represents recent soils under high rainfall with a moderate range of vegetation associations.

VULNERABILITY: 2

TENURE: pastoral lease, recommended area for protection **OWNER/MANAGER:** Birchwood Station

CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** May 1990

REFERENCES: Espie et al. (1984)

(276) Upper Maitland

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 63-05 Ahuriri

LOCALITY and GRID REFERENCE: 35 km NW of Omarama G38 477561

AREA(ha): 2000 **ALTITUDE(m):** 1525-1615 **RAINFALL(mm):** 2500-5000

TOPOGRAPHY: steep colluvial mountain slopes and tops; large valley floor, screes and rock outcrops **PARENT MATERIAL:** greywacke and argillite and derived colluvium and alluvium **VEGETATION:** snow tussock grassland; beech forest; rockland; gravelfield; short tussock grassland

SOILS: upland yellow-brown earths (Spenser), alpine steepland soils, etc. (Alpine)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) a large area containing the largest and best examples of mountain beech forest in Mackenzie region.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** grazed by cattle

TENURE: freehold, pastoral lease, stewardship land, recommended area for protection **OWNER/MANAGER:** Mrs Weatherall (Lake Ohau Station), Birchwood Station, Department of Conservation

CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** May 1990

REFERENCES: Espie et al. (1984)

(277) Freehold Creek

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 63-05 Ahuriri and 63-06 Omarama

LOCALITY and GRID REFERENCE: eastern slopes of Ohau range, near Lake Ohau settlement H38 559556

AREA(ha): 275 **ALTITUDE(m):** 535-1100 **RAINFALL(mm):** 1600

TOPOGRAPHY: colluvial mountainslope gullies **PARENT MATERIAL:** greywacke and argillite and derived colluvium **VEGETATION:** beech forest

SOILS: upland yellow-brown earths (Kaikoura Cass Craigieburn Tekoa), recent soils (Tasman)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) large remnant of the formerly much more extensive upland yellow-brown earth - beech forest association.

VULNERABILITY: 2

TENURE: recommended area for protection, stewardship land - part subject to long-term lease **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** December 1987

NOTES: The area is in three parts - also at GR: H38 559556 and 556569.

REFERENCES: Espie et al. (1984)

(278) Ben Omar Swamp

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 63-06 Omarama

LOCALITY and GRID REFERENCE: 7 km NE of Omarama H39 736351

AREA(ha): 130 **ALTITUDE(m):** 395 **RAINFALL(mm):** 500

TOPOGRAPHY: river course swamp **PARENT MATERIAL:** alluvium derived from greywacke and argillite
VEGETATION: sedgeland

SOILS: gley recent soils (Dobson Grays)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) lowland wetland soils with relatively unmodified vegetation cover are a national priority for protection.

VULNERABILITY: 2

TENURE: stewardship land, recommended area for protection **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** May 1990

REFERENCES: Espie et al. (1984)

(279) Bendhu Scientific Reserve

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 63-06 Omarama

LOCALITY and GRID REFERENCE: 14.5 km NW of Omarama H39 609385

AREA(ha): 47 **ALTITUDE(m):** 560-575 **RAINFALL(mm):** 700

TOPOGRAPHY: gently rolling moraine **PARENT MATERIAL:** loess from greywacke; till **VEGETATION:** podocarp-broadleaved shrubland; herbfield

SOILS: upland yellow-brown earths (Bendhu)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) unique pedological development under bog pine.(ii) the best remaining remnant of a soil-vegetation association that was formerly much more extensive over the Mackenzie basin.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** has been burned and grazed

TENURE: scientific reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** December 1987

NOTES: Rare kaki (black stilt) occupies surrounding wetland.

REFERENCES: Department of Lands and Survey (1984) Molloy and Hislop (1975)

(280) Claycliffs - Omarama Badlands

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 63-06 Omarama

LOCALITY and GRID REFERENCE: adjacent Ahuriri River, 10 km W of Omarama H39 609307

AREA(ha): 90 **ALTITUDE(m):** 490-670 **RAINFALL(mm):** 550

TOPOGRAPHY: basin floor; fault scarp with "badlands" erosion features **PARENT MATERIAL:** outwash gravels derived from greywacke and agillite; Tertiary colluvium **VEGETATION:** matagouri-broadleaved scrub; broadleaved shrubland

SOILS: yellow-grey earths (Omarama), upland yellow-brown earths (Tekapo)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) similar scrub/shrublands are uncommon in the rest of the ecological district.

VULNERABILITY: 3

TENURE: QEII National Trust open space covenant, freehold, recommended area for protection **OWNER/MANAGER:** QEII National Trust, Tony Aubrey (Claycliffs Station)

CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** December 1987

REFERENCES: Espie et al. (1984) Molloy et al. (1976)

(281) Glen Eyrie Downs Tussock

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 63-06 Omarama

LOCALITY and GRID REFERENCE: adjacent Wairepa Creek, 22 km SW of Twizel H39 613451

AREA(ha): 490 **ALTITUDE(m):** 565-610 **RAINFALL(mm):** 800

TOPOGRAPHY: outwash surface and moraine; tarns **PARENT MATERIAL:** outwash and moraine derived from greywacke, argillite and schist **VEGETATION:** red tussock grassland; tarn margin communities

SOILS: upland yellow-brown earths (Ohau Pukaki Craigieburn), gley recent soils (Cox Braemar)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) good catenary sequences under relatively unmodified vegetation that was formerly much more extensive.

VULNERABILITY: 2

TENURE: recommended area for protection, pastoral lease **OWNER/MANAGER:** Glen Eyrie Downs Station

CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** December 1987

NOTES: Parts have been modified through pastoral development since documentation in Espie et al. (1984).

REFERENCES: Espie et al. (1984)

(282) Glenburn Swamp

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 63-06 Omarama

LOCALITY and GRID REFERENCE: 7 km E of Omarama H39 749296

AREA(ha): 20 **ALTITUDE(m):** 360-365 **RAINFALL(mm):** 500

TOPOGRAPHY: lake edge swamp **PARENT MATERIAL:** alluvium **VEGETATION:** sedgeland

SOILS: gley recent soils (Dobson)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) remnant of gley recent soil with a good vegetation cover.

VULNERABILITY: 2

TENURE: recommended area for protection, pastoral lease **OWNER/MANAGER:** Glenburn Station

CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** May 1990

NOTES: Tenure may be freehold.

REFERENCES: Espie et al. (1984)

(283) Lake Ohau Road - Shelton Downs

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 63-06 Omarama

LOCALITY and GRID REFERENCE: near southern end of Lake Ohau, 20 km WSW of Twizel H39 624500

AREA(ha): 925 **ALTITUDE(m):** 580-610 **RAINFALL(mm):** 900

TOPOGRAPHY: ablation and terminal moraine – ridges and hollows, tarns **PARENT MATERIAL:** till derived from greywacke and argillite **VEGETATION:** sedgeland; herbfield; short tussock grassland; broadleaved scrub

SOILS: upland yellow-brown earths (Ohau), gley recent soils (Cox Braemar)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) good preservation of diverse soil-landform relationships.

VULNERABILITY: 2

TENURE: recommended area for protection, freehold **OWNER/MANAGER:** M King (Sheldon Downs Station)

CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** December 1987

REFERENCES: Espie et al. (1984) Johnson (1980)

(284) Lake Ohau Shoreline Shrub

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 63-06 Omarama

LOCALITY and GRID REFERENCE: W shore of Lake Ohau, 28 km NNW of Omarama G38 486557

AREA(ha): 275 **ALTITUDE(m):** 520-535 **RAINFALL(mm):** 800

TOPOGRAPHY: lateral moraine **PARENT MATERIAL:** till derived from greywacke and argillite **VEGETATION:** matagouri/broadleaved scrub; red tussock grassland; manuka scrub

SOILS: upland yellow-brown earths (Cass), recent soils (Rhoboro)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) contains a moderate range of good quality soil-vegetation associations.

VULNERABILITY: 2

TENURE: recommended area for protection, freehold

CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** May 1990

REFERENCES: Espie et al. (1984)

(285) Serpentine Creek

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 63-06 Omarama

LOCALITY and GRID REFERENCE: 15 km NW of Omarama H39 607426

AREA(ha): 59 **ALTITUDE(m):** 765-610 **RAINFALL(mm):** 800

TOPOGRAPHY: valley floor floodplain **PARENT MATERIAL:** alluvium derived from greywacke and argillite **VEGETATION:** red tussock grassland

SOILS: gley recent soils (Dobson)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) remnant of gley recent soil with native vegetation cover. Lowland and valley floor wetland soils are a national priority for protection.

VULNERABILITY: 2

TENURE: recommended area for protection, freehold, pastoral lease **OWNER/MANAGER:** E Hardy (Glen Eyrie Downs Station), Ribbonwood Station

CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** May 1990

NOTES: Uncertain tenure – may be entirely freehold.

REFERENCES: Espie et al. (1984)

(286) Spring Creek

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 63-06 Omarama

LOCALITY and GRID REFERENCE: adjacent SH 8, km SW of Twizel H39 722480

AREA(ha): 230 **ALTITUDE(m):** 490-520 **RAINFALL(mm):** 600

TOPOGRAPHY: outwash terrace **PARENT MATERIAL:** outwash and alluvium derived from greywacke, argillite and schist **VEGETATION:** short tussock/Hieracium grassland

SOILS: upland yellow-brown earths (Mackenzie)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) possibly the best remaining example in the district of outwash soil under fescue tussock grassland.

VULNERABILITY: 2 MODIFICATIONS/THREATS: Hieracium present

TENURE: recommended area for protection **OWNER/MANAGER:** Glenbrook Station

CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** December 1987

NOTES: Typical of deeper Mackenzie soils.

REFERENCES: Espie et al. (1984)

(287) Benmore Range Tops

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 63-07 Benmore

LOCALITY and GRID REFERENCE: Benmore Range, 17 km S of Twizel H39 803443

AREA(ha): 850 **ALTITUDE(m):** 1160-1845 **RAINFALL(mm):** 1100

TOPOGRAPHY: colluvial hillslopes and tops (with periglacial landform features) **PARENT MATERIAL:** greywacke and argillite and derived colluvium **VEGETATION:** snow tussock grassland; short tussock grassland; fellfield; gravelfield

SOILS: upland yellow-brown earths (Benmore), yellow-grey earths (Omarama), alpine steep-land soils, etc. (Alpine)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) a large area containing a moderate range of soils with relatively undisturbed vegetation cover, covering a wide range of aspects.

VULNERABILITY: 2

TENURE: endowment lease, recommended area for protection **OWNER/MANAGER:** Glencairn Station, Glenbrook Station, Totara Peak Station, University of Otago

CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** May 1990

REFERENCES: Espie et al. (1984)

(288) Big Gully

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 63-07 Benmore

LOCALITY and GRID REFERENCE: 5 km NW of Otematata H39 848211

AREA(ha): 12 **ALTITUDE(m):** 365-490 **RAINFALL(mm):** 800

TOPOGRAPHY: colluvial hillslope **PARENT MATERIAL:** greywacke and argillite and derived colluvium **VEGETATION:** short tussock grassland

SOILS: brown-grey earths (Waitaki)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) good example of a brown-grey earth under fescue tussock.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** has been grazed

TENURE: recommended area for protection

CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** May 1991

REFERENCES: Espie et al. (1984)

(289) Coal Creek

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 63-07 Benmore

LOCALITY and GRID REFERENCE: 14 km N of Otematata H39 851315

AREA(ha): 145 **ALTITUDE(m):** 505-1310 **RAINFALL(mm):** 500

TOPOGRAPHY: colluvial hillslopes; boulderfield; alluvial fan **PARENT MATERIAL:** greywacke and argillite and derived colluvium and alluvium **VEGETATION:** short tussock grassland; matagouri-broadleaved scrub; cushionfield; podocarp treeland

SOILS: upland yellow-brown earths (Benmore Dalgety)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) a good example of upland yellow-brown earths under a moderate range of vegetation associations.

VULNERABILITY: 2

TENURE: endowment lease, recommended area for protection **OWNER/MANAGER:** University of Otago, Peak Valley Station

CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** May 1990

REFERENCES: Espie et al. (1984)

(290) Glencairn

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 63-07 Benmore

LOCALITY and GRID REFERENCE: Benmore Range H39 836451

AREA(ha): 200 **ALTITUDE(m):** 800 **RAINFALL(mm):** 700

TOPOGRAPHY: steep colluvial hillslopes **PARENT MATERIAL:** greywacke and derived colluvium **VEGETATION:** short tussock grassland; cushion herbfield with matagouri

SOILS: yellow-grey earths (Omarama)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) good aspect contrast resulting in documented significant soil and vegetation differences which have been documented.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** heavily grazed (including rabbits) **OWNER/MANAGER:** B Aubrey

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** May 1991

NOTES: The ridge has not been topdressed.

REFERENCES: McIntosh et al. (1981)

(291) Mount St Cuthbert

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 63-07 Benmore

LOCALITY and GRID REFERENCE: 7 km SSE of Omarama I39 906290

AREA(ha): 1150 **ALTITUDE(m):** 550-1525 **RAINFALL(mm):** 1100

TOPOGRAPHY: steep colluvial mountainslopes with rounded tops; boulderfields; gullies; terraces **PARENT MATERIAL:** greywacke and argillite and derived colluvium **VEGETATION:** snow tussock grassland; broadleaved scrub; short tussock grassland; cushion tussock grassland; podocarp shrubland/treeland

SOILS: upland yellow-brown earths (Benmore Kirkliston), yellow-grey earths (Omarama)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) moderate range of dryland soils and soil-vegetation associations.

VULNERABILITY: 2

TENURE: recommended area for protection

CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** December 1987

REFERENCES: Espie et al. (1984)

(292) Scrub Gully

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 63-07 Benmore

LOCALITY and GRID REFERENCE: 10 km NNW of Otematata I39 906290

AREA(ha): 880 **ALTITUDE(m):** 360-1005 **RAINFALL(mm):** 1100

TOPOGRAPHY: colluvial hillslopes and tops; terrace **PARENT MATERIAL:** greywacke and argillite and derived colluvium **VEGETATION:** matagouri scrub; short tussock grassland; broadleaved scrub

SOILS: yellow-grey earths (Omarama), brown-grey earths (Waitaki)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) one of the few yellow-grey/brown-grey earth - shrubland associations remaining in the driest part of the Mackenzie Basin.

VULNERABILITY: 2

TENURE: recommended area for protection

CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** December 1987

REFERENCES: Espie et al. (1984)

(293) Whalans Stream

REGIONAL/CITY COUNCIL(S): Canterbury **ECOLOGICAL DISTRICTS(S):** 63-07 Benmore

LOCALITY and GRID REFERENCE: 3 km E of Benmore Dam I39 900230

AREA(ha): 67 **ALTITUDE(m):** 380-640 **RAINFALL(mm):** 500

TOPOGRAPHY: colluvial hillslope **PARENT MATERIAL:** greywacke and alluvium and derived colluvium **VEGETATION:** broadleaved shrubland

SOILS: brown-grey earths (Waitaki)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) brown-grey earths with dense shrubland cover are uncommon in the district.

VULNERABILITY: 2

TENURE: recommended area for protection

CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** May 1990

REFERENCES: Espie et al. (1984)

(294) Otematata Station

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 64-02 St Mary

LOCALITY and GRID REFERENCE: 1 km W of Otematata H40 860177

AREA(ha): 15 **ALTITUDE(m):** 350 **RAINFALL(mm):** 500

TOPOGRAPHY: alluvial fan **PARENT MATERIAL:** silty alluvium **VEGETATION:** halophytic vegetation; introduced grassland

SOILS: brown-grey earths (Ranfurly Grampians)

IMPORTANCE: 1 **SIGNIFICANCE:** (i) one of the least-disturbed examples of Ranfurly and Grampian soils under native vegetation. (ii) site is also of very high importance for its geology, flora and insect values.

VULNERABILITY: 1 **MODIFICATIONS/THREATS:** gully erosion; grazed; track through site

TENURE: private land **OWNER/MANAGER:** Hugh Cameron

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** October 1990

REFERENCES: McIntosh et al. (1990a)

(295) Otamatapaio

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 64-03 Hawkdun

LOCALITY and GRID REFERENCE: 9 km WNW of Otematata H39 795218 **ALTITUDE(m):** 460 **RAINFALL(mm):** 500

TOPOGRAPHY: fan and gully **PARENT MATERIAL:** fan alluvium **VEGETATION:** introduced grassland
SOILS: brown-grey earths (Waitaki Otematata)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) unique soil with red weathering, possibly of Tertiary age.
VULNERABILITY: 1 **MODIFICATIONS/THREATS:** grazed
TENURE: private land **OWNER/MANAGER:** Bog Roy Station
CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** October 1989
REFERENCES: McIntosh et al. (1990a)

(296) Dasher

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 65-02 Dansey
LOCALITY and GRID REFERENCE: 40 km WSW of Oamaru I42 145578
AREA(ha): 1620 **ALTITUDE(m):** 700-1300 **RAINFALL(mm):** 1200-1600
TOPOGRAPHY: gently-sloping broad mountain top; steep colluvial mountain slopes and tops; boulderfields **PARENT MATERIAL:** schist and various volcanic rocks and derived colluvium **VEGETATION:** snow tussock grassland; red tussock grassland; rushland; sedgeland; cushionfield; broadleaved scrub; fern-shrubland
SOILS: upland yellow-brown earths (Kaikoura Kirkliston), brown granular loams and clays (Saddle), gley soils, organic soils
IMPORTANCE: 3 **SIGNIFICANCE:** (i) contains a moderately wide range of relatively unmodified soils and soil-vegetation associations.(ii) soils derived from volcanic rock and having a relatively unmodified vegetation cover are uncommon in the South Island.
VULNERABILITY: 2 **MODIFICATIONS/THREATS:** introduced plants; 4WD road; huts
TENURE: pastoral lease, recommended area for protection **OWNER/MANAGER:** The Dasher Station and Mt Dasher Station
CONTACT PERSON: Alan Hewitt **DATE OF INFORMATION:** July 1991
REFERENCES: Comrie (1991) Hewitt (1990)

(297) Hughie

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 65-02 Dansey
LOCALITY and GRID REFERENCE: 30 km WSW of Oamaru I42 225580
AREA(ha): 370 **ALTITUDE(m):** 450-700 **RAINFALL(mm):** 800-1200
TOPOGRAPHY: steep colluvial mountain slopes dissected by small creeks separated by rounded ridges **PARENT MATERIAL:** schist and derived colluvium **VEGETATION:** broadleaved forest; broadleaved shrubland; manuka shrubland
SOILS: lowland yellow-brown earths (Silver-Peaks)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) contains the largest remnants of lowland yellow-brown earths under manuka shrubland and broadleaved forest in the ecological district.
VULNERABILITY: 2 **MODIFICATIONS/THREATS:** grazed by stock; possums, introduced plants (browntop, *Hieracium pilosella*, catsear)
TENURE: pastoral lease, recommended area for protection **OWNER/MANAGER:** Mt Dasher Station
CONTACT PERSON: Alan Hewitt **DATE OF INFORMATION:** July 1991
REFERENCES: Comrie (1991) Hewitt (1990)

(298) Nobbler

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 65-02 Dansey
LOCALITY and GRID REFERENCE: 7 km W of Danseys Pass township I41 005753
AREA(ha): 320 **ALTITUDE(m):** 740-1350 **RAINFALL(mm):** 800-1200
TOPOGRAPHY: steep colluvial mountain slopes with broad mountain tops; large slump, blockfield **PARENT MATERIAL:** greywacke and derived colluvium **VEGETATION:** snow tussock shrubland; snow tussock grassland; red tussock grassland; cushionfield; blockfield
SOILS: upland yellow-brown earths (Kirkliston Kaikoura), gley soils
IMPORTANCE: 3 **SIGNIFICANCE:** (i) contains the most extensive and least modified upland yellow-brown earth - shrubland associations in the ecological district.
VULNERABILITY: 2 **MODIFICATIONS/THREATS:** minor presence of introduced plants and little evidence of grazing or burning
TENURE: pastoral lease **OWNER/MANAGER:** Mt Alexander Station and Shortlands Station
CONTACT PERSON: Alan Hewitt **DATE OF INFORMATION:** July 1991
REFERENCES: Comrie (1991) Hewitt (1990)

(299) Pisgah

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 65-02 Dansey
LOCALITY and GRID REFERENCE: 45 km W of Oamaru I41 060660

AREA(ha): 1980 ALTITUDE(m): 700-1640 RAINFALL(mm): 1200-1400

TOPOGRAPHY: steep colluvial mountain slopes with broad intervening ridges; extensive coarse screes; large slumps; alluvial terrace **PARENT MATERIAL:** schist and derived colluvium and alluvium **VEGETATION:** snow tussock grassland; Dracophyllum-snow tussock shrubland; broadleaved shrubland; short tussock grassland; rushland; gravelfield **SOILS:** upland yellow-brown earths (Kaikoura Kirkliston)

IMPORTANCE: 2 SIGNIFICANCE: (i) contains the greatest diversity of upland yellow-brown earth - vegetation associations of any recommended area for protection in Dansey Ecological District.(ii) contains the only substantial example of alluvial terrace soils under native vegetation in the ecological district (soils not differentiated).

VULNERABILITY: 2 MODIFICATIONS/THREATS: 4WD roads

TENURE: pastoral lease, recommended area for protection **OWNER/MANAGER:** Dome Hills Station, Pisgah Downs Station, Sunset Farm Station, Clover Flats Station

CONTACT PERSON: Alan Hewitt **DATE OF INFORMATION:** July 1991

REFERENCES: Comrie (1991) Hewitt (1990)

(300) Stalker Plateau

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 65-02 Dansey

LOCALITY and GRID REFERENCE: 30 km SW of Oamaru I42 245525

AREA(ha): 240 ALTITUDE(m): 640-860 RAINFALL(mm): 800-1200

TOPOGRAPHY: broad, largely flat and poorly drained mountain top; low relief ridges and hollows **PARENT MATERIAL:** greywacke and subschist **VEGETATION:** red tussock grassland; snow tussock grassland; broadleaved shrubland

SOILS: upland yellow-brown earths (Kirkliston), lowland yellow-brown earths (Kakahu)

IMPORTANCE: 3 SIGNIFICANCE: (i) contains the most extensive and relatively unmodified upland yellow-brown earth - red tussock grassland and lowland yellow-brown earth - snow tussock grassland associations in the ecological district (below 800 m).

VULNERABILITY: 2 MODIFICATIONS/THREATS: introduced plants (browntop, catsear and white clover); road; hut

TENURE: pastoral lease, recommended area for protection **OWNER/MANAGER:** Mt Stalker Station

CONTACT PERSON: Alan Hewitt **DATE OF INFORMATION:** July 1991

REFERENCES: Comrie (1991) Hewitt (1990)

(301) Trotters Gorge Scenic Reserve

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 65-03 Waianakarua

LOCALITY and GRID REFERENCE: 8.5 km NE of Palmerston J42 358315

AREA(ha): 152 ALTITUDE(m): 30-180 RAINFALL(mm): 625

TOPOGRAPHY: colluvial hillslopes and deep gorges **PARENT MATERIAL:** colluvium from a variety of Tertiary materials **VEGETATION:** kanuka/manuka scrub; kanuka forest; gorse-fern scrub; rockland

SOILS: yellow-grey - yellow-brown earths intergrade (Kakahu Kaitangata), lowland yellow-brown earths (Taratu Hurunui)

IMPORTANCE: 3 SIGNIFICANCE: (i) contains a variety of soils on colluvium from Tertiary parent rocks, under native vegetation.

VULNERABILITY: 3 MODIFICATIONS/THREATS: parts have been burned and grazed; pig rooting; picnic area, University of Otago hut

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** April 1990

NOTES: Called "Trotter's Creek Domain" in Allen (1978).

REFERENCES: Department of Lands and Survey (1984) Campbell (1977) Allen (1978)

(302) Waianakarua Scenic Reserve

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 65-03 Waianakarua

LOCALITY and GRID REFERENCE: Big Kuri Creek, 6.5 km W of Hampden J42 316391

AREA(ha): 128 ALTITUDE(m): 150-554 RAINFALL(mm): 622

TOPOGRAPHY: steep colluvial hillslopes **PARENT MATERIAL:** schist and derived colluvium **VEGETATION:** podocarp-broadleaved forest; manuka scrub; introduced grassland

SOILS: yellow-grey - yellow-brown earths intergrade (Kakahu), lowland yellow-brown earths (Hurunui Tuapeka)

IMPORTANCE: 3 SIGNIFICANCE: (i) contains a moderate variety of soils at near coastal site.

VULNERABILITY: 3 MODIFICATIONS/THREATS: heavily grazed (in 1976)

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** April 1990

REFERENCES: Department of Lands and Survey (1984) Allen (1978) McCaskill (1975b)

(303) Crescent Island Scenic Reserve

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 66-02 Wanaka

LOCALITY and GRID REFERENCE: island in Lake Wanaka F40 972150

AREA(ha): 117 **ALTITUDE(m):** 277-490 **RAINFALL(mm):** 640

TOPOGRAPHY: roche moutonee island with steep colluvial slopes, some bluffs **PARENT MATERIAL:** schist colluvium and till **VEGETATION:** broadleaved forest; introduced grassland with bracken and kanuka; kanuka forest

SOILS: yellow-grey earths (Arrow)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) yellow-grey earths with open native forest vegetation is now mostly gone in the area. (ii) good example of strong aspect controls on soil processes.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** probably has been grazed and burned

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** April 1990

NOTES: Also known as Rabbit Island.

REFERENCES: Department of Lands and Survey (1984) Allen (1978) McCaskill (1975b)

(304) Ben Lomond Scenic Reserve

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 66-04 Shotover

LOCALITY and GRID REFERENCE: 4 km NW of Queenstown, southern slopes of Ben Lomond E41 642687

AREA(ha): 151 **ALTITUDE(m):** 400-1730 **RAINFALL(mm):** 849

TOPOGRAPHY: steep colluvial and bedrock mountain slopes and tops **PARENT MATERIAL:** schist and derived colluvium **VEGETATION:** snow tussock grassland; Dracophyllum-snow tussock grassland; Dracophyllum-broadleaved scrub; beech forest

SOILS: upland yellow-brown earths (Dunstan)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) a good altitude sequences of yellow-brown earths from under forest to subalpine shrubland.

VULNERABILITY: 3

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** April 1990

REFERENCES: Department of Lands and Survey (1984) Allen (1978) McCaskill (1975b)

(305) Chain Hills

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 67-01 Lindis

LOCALITY and GRID REFERENCE: 5 km S of Lindis Pass G40 448134

AREA(ha): 1230 **ALTITUDE(m):** 790-1610 **RAINFALL(mm):** 600-800

TOPOGRAPHY: steep colluvial mountain slopes; solifluction landforms; talus patches; low terraces **PARENT MATERIAL:** semi-schist and derived colluvium and alluvium **VEGETATION:** snow tussock grassland; short tussock grassland; red tussock grassland; matagouri-broadleaved shrubland; podocarp shrubland

SOILS: upland yellow-brown earths (Kaikoura), alpine steepland soils, etc. (Alpine)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) contains Kaikoura soils with a moderate range of relatively unmodified vegetation types.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** many exotics at lower altitudes

TENURE: pastoral lease, recommended area for protection **OWNER/MANAGER:** Morven Hills Station

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** May 1990

REFERENCES: Ward et al. (1987)

(306) Dip Creek Beech

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 67-01 Lindis

LOCALITY and GRID REFERENCE: 10 km SW of Lindis Pass G40 371160

AREA(ha): 10 **ALTITUDE(m):** 670-880 **RAINFALL(mm):** 650

TOPOGRAPHY: steep colluvial gully slopes **PARENT MATERIAL:** schist and derived colluvium **VEGETATION:** beech forest

SOILS: yellow-grey earths (Arrow)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) one of the few remaining remnants of yellow-grey earths with mountain beech forest cover in New Zealand. This site is also significant because the mountain beech is at its driest limits.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** threatened by fire and domination by exotics

TENURE: recommended area for protection, pastoral lease **OWNER/MANAGER:** Morven Hills Station

CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** December 1987

REFERENCES: Ward et al. (1987)

(307) Dip Creek Totara

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 67-01 Lindis

LOCALITY and GRID REFERENCE: 10 km SW of Lindis Pass G40 377153

AREA(ha): 20 **ALTITUDE(m):** 610-850 **RAINFALL(mm):** 600

TOPOGRAPHY: steep colluvial slopes broken by rocky ribs and gullies; talus cone **PARENT MATERIAL:** schist and derived colluvium **VEGETATION:** podocarp treeland with matagouri; broadleaved scrub; short tussock-introduced grassland

SOILS: yellow-grey earths (Arrow)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) driest site in the district – notable for the Arrow soils under original vegetation cover (although modified).

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** abundant briar and other exotics; threatened by fire

TENURE: pastoral lease, recommended area for protection **OWNER/MANAGER:** Morven Hills Station

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** December 1987

REFERENCES: Ward et al. (1987)

(308) Double Peak

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 67-01 Lindis

LOCALITY and GRID REFERENCE: 2 km S of Lindis Pass G40 436175

AREA(ha): 650 **ALTITUDE(m):** 760-1430 **RAINFALL(mm):** 600-800

TOPOGRAPHY: steep colluvial mountain slopes and tops **PARENT MATERIAL:** semi-schist and derived colluvium

VEGETATION: snow tussock grassland; short tussock grassland; red tussock grassland; matagouri shrubland; rockland

SOILS: upland yellow-brown earths (Kaikoura)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) one of the few remaining snow tussocklands in Lindis Ecological District that has not been extensively modified by oversowing and topdressing. This site is more diverse than adjacent Lindis Pass Scenic Reserve.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** tussockland depleted on sunny faces; threatened by further fire and erosion

TENURE: pastoral lease, recommended area for protection **OWNER/MANAGER:** Morven Hills Station

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** May 1990

REFERENCES: Ward et al. (1987)

(309) East Camp Creek

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 67-01 Lindis

LOCALITY and GRID REFERENCE: 20 km N of Tarras G40 256083

AREA(ha): 710 **ALTITUDE(m):** 550-1160 **RAINFALL(mm):** 600-800

TOPOGRAPHY: steep colluvial and bedrock mountain slopes; valley asymmetry (bedrock controlled); narrow alluvial terraces **PARENT MATERIAL:** semi-schist and derived colluvium and alluvium **VEGETATION:** snow tussock grassland; short tussock grassland; kanuka shrubland; rockland; matagouri shrubland; cushion-herbfield

SOILS: upland yellow-brown earths (Dunstan), yellow-grey earths (Arrow)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) large area of soils with kanuka shrubland (which was formerly much more extensive) and also relatively unmodified snow tussockland at low altitudes.

VULNERABILITY: 2

TENURE: pastoral lease, recommended area for protection **OWNER/MANAGER:** Bargour Station, Glenfoyle Station

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** May 1987

REFERENCES: Ward et al. (1987)

(310) Lagoon Creek

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 67-01 Lindis

LOCALITY and GRID REFERENCE: 4 km SE of Hawea Flat G40 191090

AREA(ha): 20 **ALTITUDE(m):** 490-700 **RAINFALL(mm):** 600-800

TOPOGRAPHY: steep bedrock and colluvial slopes **PARENT MATERIAL:** semi-schist and derived colluvium

VEGETATION: matagouri-broadleaved-sweet brier shrubland

SOILS: yellow-grey earths (Arrow)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) the yellow-grey earth – kanuka shrubland association was formerly much more extensive (though still a minor association).

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** many exotic ground cover species; threatened by fire

TENURE: recommended area for protection (scientific reserve) **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** May 1990

REFERENCES: Ward et al. (1987)

(311) Lindis Head

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 67-01 Lindis

LOCALITY and GRID REFERENCE: 13 km N of Lindis Pass G39 421316

AREA(ha): 460 **ALTITUDE(m):** 860-1610 **RAINFALL(mm):** 700

TOPOGRAPHY: steep colluvial mountain slopes; cirque basin; coarse stable talus slopes; large see-seated slump; small gullies and rocky ribs **PARENT MATERIAL:** schist and derived colluvium **VEGETATION:** snow tussock grassland; gravelfield; herbfield; matagouri-broadleaved shrubland

SOILS: upland yellow-brown earths (Dunstan), alpine steepland soils, etc. (Alpine)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) a good example of Dunstan soils under tussock grassland.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** 4WD roads; exotic herbs at lower altitudes

TENURE: recommended area for protection, pastoral lease **OWNER/MANAGER:** Longslip Station

CONTACT PERSON: Trevor Webb **DATE OF INFORMATION:** December 1987

REFERENCES: Ward et al. (1987)

(312) South Hawea Flat

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 67-01 Lindis

LOCALITY and GRID REFERENCE: 4 km N of Luggate G40 150050

AREA(ha): 590 **ALTITUDE(m):** 270-370 **RAINFALL(mm):** 600-800

TOPOGRAPHY: outwash terraces, with preserved braided channels; small pond; several dry gullies - fluted cliffs of gravel **PARENT MATERIAL:** outwash gravel, minor loess **VEGETATION:** short tussock grassland; cushionfield

SOILS: upland yellow-brown earths (Dunstan Luggate)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) one of the best remaining examples of Dunstan and Luggate soils on hills and terraces under tussock grassland. These associations were formerly much more extensive but has been reduced by pastoral development.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** strong exotic component; threatened by pastoral development and partial submergence under Lake Dunstan

TENURE: recommended area for protection, freehold, marginal strip **OWNER/MANAGER:** Mr PW Campbell, ESS Marketing Ltd, Electricorp Production, Department of Conservation

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** December 1987

REFERENCES: Ward et al. (1987)

(313) Cromwell Chafer Beetle Nature Reserve

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 67-02 Pisa

LOCALITY and GRID REFERENCE: 2 km SW of Cromwell G41 141655

AREA(ha): 98 **ALTITUDE(m):** 216 **RAINFALL(mm):** 500

TOPOGRAPHY: flat outwash terrace with sand dunes **PARENT MATERIAL:** alluvium and aeolian deposits **VEGETATION:** cushionfield-introduced grassland

SOILS: brown-grey earths (Cromwell)

IMPORTANCE: 1 **SIGNIFICANCE:** (i) one of the few sites with brown-grey earths under *Raoulia* cushionfield(ii) unmodified soils developed on inland dunes are rare internationally(iii) contains nationally unique associations of soils, landforms, vegetation and insects.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** many exotic plant species; has been grazed

TENURE: nature reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** April 1990

REFERENCES: Ward et al. (1987)

(314) Double Rock

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 67-02 Pisa

LOCALITY and GRID REFERENCE: 5 km W of Cromwell F41 053670

AREA(ha): 150 **ALTITUDE(m):** 210-630 **RAINFALL(mm):** 400-600

TOPOGRAPHY: colluvial mountain slopes and tops; large slump with irregular surface **PARENT MATERIAL:** schist and derived colluvium **VEGETATION:** short tussock grassland; cushionfield; broadleaved shrubland; broadleaved-matagouri shrubland

SOILS: brown-grey earths (Alexandra)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) good example of a brown-grey earth under relatively undisturbed vegetation.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** introduced species locally dominant; threatened by topdressing, oversowing, fire and weeds

TENURE: freehold, recommended area for protection **OWNER/MANAGER:** AJ and SM Strain

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** May 1990

REFERENCES: Ward et al. (1987)

(315) Lower Meg

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 67-02 Pisa

LOCALITY and GRID REFERENCE: 2 km upstream Roaring Meg from powerstation adjacent SH 6 F41 993731

AREA(ha): 20 **ALTITUDE(m):** 430-640 **RAINFALL(mm):** 716

TOPOGRAPHY: steep colluvial and bedrock gully slopes; active slumping **PARENT MATERIAL:** schist and derived colluvium and alluvium **VEGETATION:** beech forest; manuka shrubland; broadleaved shrubland; matagouri-broadleaved-sweet brier shrubland; rockland; exotic treeland

SOILS: yellow-grey earths (Arrow)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) contains good examples of a moderate range woodland vegetation on yellow-grey earths.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** exotic trees, shrubs and herbs; engineering works for hydro-scheme; threatened by Douglas fir invasion

TENURE: recommended area for protection, pastoral lease **OWNER/MANAGER:** Lowburn Station, Waitiri Station

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** May 1990

REFERENCES: Ward et al. (1987)

(316) Luggate Creek

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 67-02 Pisa

LOCALITY and GRID REFERENCE: 5.5 km WSW of Luggate F40 095986

AREA(ha): 150 **ALTITUDE(m):** 430-910 **RAINFALL(mm):** 600-800

TOPOGRAPHY: rolling to steep bedrock slopes and bluffs **PARENT MATERIAL:** schist **VEGETATION:** kanuka shrubland and scrub; matagouri-broadleaved shrubland; Dracophyllum shrubland; podocarp treeland; beech forest

SOILS: yellow-grey earths (Arrow Blackstone)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) contains the highest diversity of woody communities and species in the ecological district – typical of formerly more widespread soil-vegetation associations.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** many exotic herbs; moderate threat from fire and slopewash from oversowing and topdressing

TENURE: freehold, pastoral lease, recommended area for protection **OWNER/MANAGER:** Bell Estate, Midrun Station

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** May 1990

NOTES: Key species are regenerating well.

REFERENCES: Ward et al. (1987)

(317) Pisa Tops

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 67-02 Pisa

LOCALITY and GRID REFERENCE: 13 km E of Cardrona F41 064858

AREA(ha): 8560 **ALTITUDE(m):** 670-1960 **RAINFALL(mm):** 800-1000

TOPOGRAPHY: gently-tilted summit plateau; cirque basins – steep cliffs, small talus cones, tarns, moraine and solifluction deposits; rounded ridges except for scattered tors – solifluction lobes, stone pavements and soil hummocks; peatlands; deeply incised valleys **PARENT MATERIAL:** schist and derived colluvium and till **VEGETATION:** cushionfield; short tussock grassland; snow tussock grassland; fellfield; herbfield

SOILS: upland yellow-brown earths (Carrick Dunstan Obelisk)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) a large highly natural area encompassing a moderate range of soil-vegetation associations.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** some indigenous vegetation probably induced; possible threats from stock (localised) and off-road vehicles in fragile cushionfields

TENURE: recommended area for protection **OWNER/MANAGER:** Mt Pisa Station, Waiorau Station, Locharburn Station

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** December 1987

REFERENCES: Ward et al. (1987)

(318) Skeleton Stream

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 67-02 Pisa

LOCALITY and GRID REFERENCE: 10 km SSE of Cardrona F41 991752

AREA(ha): 240-340 **ALTITUDE(m):** 640-1340 **RAINFALL(mm):** 600-800

TOPOGRAPHY: colluvial hillslopes – both stable and actively slumping; bluffs **PARENT MATERIAL:** schist and derived colluvium **VEGETATION:** broadleaved shrubland; matagouri shrubland; short tussock grassland; snow tussock grassland

SOILS: upland yellow-brown earths (Dunstan), yellow-grey earths (Arrow)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) contains a moderate range of soil-vegetation associations, including remnants

of the previously widespread soils under narrow-leaved snow tussockland and diverse shrubland associations.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** exotic plant species locally dominant; threat from stock damage and fire

TENURE: pastoral lease, recommended area for protection **OWNER/MANAGER:** Lowburn Valley Station

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** May 1990

REFERENCES: Ward et al. (1987)

(319) Wrights Gully

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 67-02 Pisa

LOCALITY and GRID REFERENCE: 15 km S of Cardrona F41 928738

AREA(ha): 630 **ALTITUDE(m):** 850-1600 **RAINFALL(mm):** 400-600

TOPOGRAPHY: entire catchment with marked asymmetry – moderately steep colluvial mountain slopes formed by slump/earth flow mechanisms opposite steep colluvial and bedrock slopes; periglacial features on summit ridge **PARENT MATERIAL:** schist and derived colluvium **VEGETATION:** snow tussock grassland; cushionfield; short tussock grassland

SOILS: upland yellow-brown earths (Dunstan)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) contains upland yellow-brown earths with a good tussock cover over a wide altitude range.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** has been burned and grazed; threatened by fire and pastoral development of lower altitude parts

TENURE: recommended area for protection, pastoral lease **OWNER/MANAGER:** Waitiri Station

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** May 1990

REFERENCES: Ward et al. (1987)

(320) Bendigo Protected Private Land

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 67-03 Dunstan

LOCALITY and GRID REFERENCE: Logantown, 18 km NE of Cromwell G41 235793

AREA(ha): 115 **ALTITUDE(m):** 425-640 **RAINFALL(mm):** 400-600

TOPOGRAPHY: dissected, gently-sloping colluvial mountain slopes **PARENT MATERIAL:** schist and derived colluvium **VEGETATION:** kanuka shrubland; sedgeland; rushland

SOILS: yellow-grey earths (Blackstone)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) a good example of Blackstone soils under native vegetation.

VULNERABILITY: 3

TENURE: protected private land (historic purposes) **OWNER/MANAGER:** J Perriam

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** December 1987

NOTES: Site is a historic reserve within Otago Goldfields Park

REFERENCES: Ward et al. (1987)

(321) Bendigo Tops

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 67-03 Dunstan

LOCALITY and GRID REFERENCE: Dunstan Mountains, 15 km NE of Cromwell G41 268715

AREA(ha): 600 **ALTITUDE(m):** 1250-1590 **RAINFALL(mm):** 400-600

TOPOGRAPHY: very gently sloping mountain summit plateau; periglacial features – soil hummocks and stone stripes; string bogs; few small tarns **PARENT MATERIAL:** schist and derived colluvium **VEGETATION:** short tussock grassland; cushionfield; sedgeland; shrubland; herbfield

SOILS: upland yellow-brown earths (Dunstan Carrick), yellow-grey earths (Arrow)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) one of the best examples of soils on periglacial landforms in New Zealand.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** has been grazed

TENURE: recommended area for protection, pastoral lease **OWNER/MANAGER:** Bendigo Station, Matakanui Station

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** May 1987

NOTES: Separated by an arbitrary boundary with Neds Creek record.

REFERENCES: Ward et al. (1987)

(322) Fairfax Spur

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 67-03 Dunstan

LOCALITY and GRID REFERENCE: 5 km ESE of Cromwell F41 005645

AREA(ha): 1190 **ALTITUDE(m):** 210-1650 **RAINFALL(mm):** 400-600

TOPOGRAPHY: gently-sloping colluvial mountain slopes and tops; outwash terraces; distinctive hummocky terrain; localised slumping; solifluction lobes and terraces; tors **PARENT MATERIAL:** schist and derived colluvium and

solifluction debris and loess **VEGETATION:** short tussock grassland; snow tussock grassland; broadleaved shrubland; cushionfield; thyme shrubland; matagouri-broadleaved shrubland; introduced grassland and sweet brier
SOILS: brown-grey earths (Alexandra), yellow-grey earths (Arrow), upland yellow-brown earths (Dunstan Carrick)
IMPORTANCE: 2 **SIGNIFICANCE:** (i) excellent altitudinal sequence of soils, in one of the driest parts of New Zealand.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** tracking; water-races; minor sluicing; much bare ground and introduced species; threatened by spread of exotic plants and oversowing

TENURE: pastoral lease, recommended area for protection **OWNER/MANAGER:** Waenga Station, Waikerikeri Station

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** June 1991

NOTES: Waikerikeri recommended area for protection is contiguous to the east.

REFERENCES: Ward et al. (1987)

(323) Neds Creek

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 67-03 Dunstan

LOCALITY and GRID REFERENCE: 14 km E of Omahau G41 281689

AREA(ha): 430 **ALTITUDE(m):** 670-1560 **RAINFALL(mm):** 400-600

TOPOGRAPHY: steep colluvial mountain slopes (scarp face) and tops; periglacial phenomena – soil hummocks and stripes **PARENT MATERIAL:** schist and derived colluvium **VEGETATION:** snow tussock grassland; short tussock grassland; podocarp treeland; podocarp-Dracophyllum shrubland and scrub; cushion-herbfield; manuka shrubland; matagouri shrubland

SOILS: upland yellow-brown earths (Carrick Dunstan), yellow-grey earths (Arrow)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) good example of upland yellow-brown earths and yellow-grey soils under relatively unmodified vegetation.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** abundant exotics at lower altitudes; some threat from fire, oversowing and topdressing

TENURE: recommended area for protection

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** May 1987

NOTES: Separated by an arbitrary boundary from Bendigo Tops recommended area for protection.

REFERENCES: Ward et al. (1987)

(324) North Dunstan

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 67-03 Dunstan

LOCALITY and GRID REFERENCE: 34 km S of Lindis Pass G40 465904

AREA(ha): 1400 **ALTITUDE(m):** 640-1695 **RAINFALL(mm):** 600-800

TOPOGRAPHY: rolling to steep colluvial mountain slopes and broad tops; gorges; coarse talus slopes; waterfalls; periglacial features – soil hummocks, solifluction lobes and scattered tors; asymmetric valleys; large-scale slumping

PARENT MATERIAL: schist/semi-schist and derived colluvium **VEGETATION:** snow tussock grassland; short tussock grassland; alpine flushes; podocarp treeland; broadleaved-matagouri shrubland; Dracophyllum shrubland; cushionfield

SOILS: upland yellow-brown earths (Dunstan), yellow-grey earths (Arrow Blackstone)

IMPORTANCE: 1 **SIGNIFICANCE:** (i) one of the largest and least modified areas in Central Otago. Also notable for the high diversity of soil-vegetation associations, reflecting the wide range of altitudes, aspects and landforms.(ii) soils under relatively unmodified tussock grasslands are rare internationally.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** parts have been burned and oversown; threatened by fire, grazing and oversowing

TENURE: stewardship land **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** May 1987

NOTES: Area of site is smaller than the recommended area for protection in Ward et al. (1987).

REFERENCES: Ward et al. (1987)

(325) Pisa Flats

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 67-03 Dunstan

LOCALITY and GRID REFERENCE: 13 km NNE of Cromwell G41 162791

AREA(ha): 3-4 **ALTITUDE(m):** 200 **RAINFALL(mm):** 500

TOPOGRAPHY: flat terrace, shallow former river channel **PARENT MATERIAL:** loess **VEGETATION:** introduced grassland; halophytic vegetation

SOILS: brown-grey earths (Manorburn Molyneux)

IMPORTANCE: 1 **SIGNIFICANCE:** (i) the only remaining Central Otago soil site retaining native flora and fauna including halophytes. Most other sites have been destroyed by border-dyke irrigation. Similar sites are uncommon

internationally.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** rabbit and sheep grazing; many introduced plant species; threatened by flooding from adjacent norder-dyked pasture

TENURE: private land **OWNER/MANAGER:** Mr Tom Gilmore

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** October 1989

REFERENCES: McIntosh et al. (1990a)

(326) Scotts Creek

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 67-03 Dunstan

LOCALITY and GRID REFERENCE: 14 km NE of Omahau G41 321719

AREA(ha): 350 **ALTITUDE(m):** 640-1395 **RAINFALL(mm):** 600-800

TOPOGRAPHY: colluvial mountain slopes and tops **PARENT MATERIAL:** schist and derived colluvium

VEGETATION: snow tussock grassland; podocarp-Dracophyllum-matagouri-broadleaved shrubland

SOILS: upland yellow-brown earths (Dunstan), yellow-grey earths (Arrow)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) the soil-vegetation association was previously much more extensive in the Cromwell Gorge area.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** threatened by fire

TENURE: recommended area for protection, pastoral lease, freehold **OWNER/MANAGER:** Matakanui Station, Messrs AM and RW Naylor

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** May 1987

REFERENCES: Ward et al. (1987)

(327) Waikerikeri

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 67-03 Dunstan

LOCALITY and GRID REFERENCE: 25 km N of Alexandra G41 246652

AREA(ha): 1190 **ALTITUDE(m):** 580-1675 **RAINFALL(mm):** 1000

TOPOGRAPHY: colluvial mountain slopes on the eastern scarp face of the Dunstan Mountains; summit plateaux; spectacular periglacial landscape - large tors, soil hummocks and solifluction lobes and terraces; large-scale slumping; gorges with steep rock bands and bluff walls **PARENT MATERIAL:** schist and derived colluvium **VEGETATION:** snow tussock grassland; manuka shrubland; Dracophyllum shrubland; broadleaved shrubland; cushionfield

SOILS: upland yellow-brown earths (Carrick Dunstan), yellow-grey earths (Arrow)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) one of the largest areas of Dunstan soils under native woody vegetation in Central Otago. The area also includes several small, uncommon communities - bog pine shrublands, Halls totara treeland and snow totara shrubland.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** some exotic species at lower altitudes; threat from fire and pastoral development at lower altitude; has been burned and grazed

TENURE: recommended area for protection

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** May 1987

NOTES: Probably New Zealand's best tor landscape (i.e. greatest concentration of large and varied tors (Ward et al. (1987)).

REFERENCES: Ward et al. (1987)

(328) Belmont Salt-pans

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 67-04 Maniototo

LOCALITY and GRID REFERENCE: 30 km NW of Middlemarch H42 681 426 **ALTITUDE(m):** 395 **RAINFALL(mm):** 400

TOPOGRAPHY: undulating floodplain or low terrace **PARENT MATERIAL:** Holocene alluvium **VEGETATION:** halophytic vegetation

SOILS: brown-grey earths (Linnburn)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) a very good example of a solonetzic soil-vegetation association.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** lucerne drilling

TENURE: private land, covered by a conservation covenant **OWNER/MANAGER:** Messrs Smith & Murray (Belmont Station)

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** October 1989

NOTES: Largest inland site of *Sarcocornia quinqueflora*.

REFERENCES: McIntosh et al. (1990a)

(329) Chatto Creek

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 67-04 Maniototo

LOCALITY and GRID REFERENCE: 15 km NE of Alexandra G42 360579

AREA(ha): 5 ALTITUDE(m): 245 RAINFALL(mm): 400

TOPOGRAPHY: colluvial hillslopes with some steep gully sides; rolling ridge crest **PARENT MATERIAL:** dissected terrace **VEGETATION:** halophytic vegetation

SOILS: brown-grey earths (Chapman)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) large fenced remnant of the formerly more extensive saline soils of Central Otago.

VULNERABILITY: 1 **MODIFICATIONS/THREATS:** 25% bare ground and erosion (wind and tunnel gully); Ministry of Works and Development saltbush trial site

TENURE: private land **OWNER/MANAGER:** Andrew Kenny, Alexandra

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** October 1989

REFERENCES: McIntosh et al. (1990a) Patrick (1990)

(330) Galloway No. 1

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 67-04 Maniototo

LOCALITY and GRID REFERENCE: Crawford Hills, 9 km NE of Alexandra G42 338496

AREA(ha): 20 ALTITUDE(m): 250-350 RAINFALL(mm): 400

TOPOGRAPHY: high terrace treads and risers; sarsen stone boulders **PARENT MATERIAL:** schist with a veneer of Quaternary fluvial gravels **VEGETATION:** short tussock grassland

SOILS: brown-grey earths (Manorburn)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) nationally, solonchic soils are rare. This site is a valuable educational resource. (ii) includes soil-flora-insect associations that are unique internationally, and rare nationally.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** Telecom cable put in under site in 1988; extensive grazing

TENURE: pastoral lease, recommended area for protection **OWNER/MANAGER:** Galloway Station

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** October 1989

NOTES: Flora includes the rare *Lepidium sisymbrioides* ssp. *matua*.

REFERENCES: McIntosh et al. (1990a)

(331) Patearoa Saline Area

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 67-04 Maniototo

LOCALITY and GRID REFERENCE: 27 km NW of Middlemarch. H42 715390

AREA(ha): 20 ALTITUDE(m): 395 RAINFALL(mm): 500

TOPOGRAPHY: flat, rolling and undulating floodplain and low terrace **PARENT MATERIAL:** schist and alluvium **VEGETATION:** halophytic vegetation

SOILS: brown-grey earths (Patearoa)

IMPORTANCE: 1 **SIGNIFICANCE:** (i) excellent example of saline soils under native vegetation. Similar sites are uncommon internationally.

VULNERABILITY: 1 **MODIFICATIONS/THREATS:** still grazed

TENURE: private land **OWNER/MANAGER:** Mr J Beattie

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** October 1989

NOTES: Includes very diverse insect fauna.

REFERENCES: McIntosh et al. (1990a)

(332) Serpentine Flat

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 67-04 Maniototo

LOCALITY and GRID REFERENCE: 22 km WNW of Middlemarch H43 637243

AREA(ha): 136 ALTITUDE(m): 550-552 RAINFALL(mm): 600

TOPOGRAPHY: flat floodplain **PARENT MATERIAL:** alluvium **VEGETATION:** introduced grassland with sedges and rushes

SOILS: gley recent soils (Paerau)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) one of the few sites of reserved gley soils in the medium altitude zone. Nationally, gley recent soils are a priority for protection.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** introduced grasses abundant

TENURE: government purpose reserve (wildlife management) **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** April 1990

NOTES: Ecological district boundary redefined from 67-06 Manorburn in McEwen (1987) by Fagan and Pillai (1990). Much of the nearby soil landscape has been drained by channels, depleting the soil's value as upland sponges which help to hold back floodwaters which threaten the Taieri lowlands. Attempts to reserve nearby wetlands (and their associated gley and organic soils) have been resisted by the agricultural community and local authority (Molloy 1988).

REFERENCES: Department of Lands and Survey (1984) Molloy (1988) Fagan and Pillai (1990)

(333) Sutton Salt Lake

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 67-04 Maniototo

LOCALITY and GRID REFERENCE: Sutton, 8 km SSW of Middlemarch H43 826106

AREA(ha): 140 **ALTITUDE(m):** 240 **RAINFALL(mm):** 600

TOPOGRAPHY: rolling peneplain with schist tors and ridges; flat lake bed (seasonal) **PARENT MATERIAL:** schist and loess **VEGETATION:** short tussock grassland; halophytic vegetation

SOILS: yellow-grey earths (Pukerangi Matarae), gley soils (Ardlui)

IMPORTANCE: 1 **SIGNIFICANCE:** (i) represents soils of the dry inland schist country, including saline soils. Similar sites are uncommon internationally.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** lake edge has been grazed; walkway and information panels

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** February 1990

NOTES: The lake is seasonally dry. Saltiness is the combined result of weathering of the surrounding schist and the fact that the basin has no outlet. The reserve contains the only inland salt lake in New Zealand. Soil samples are from sites adjacent to the reserve.

REFERENCES: Department of Conservation (1990) Peat (1991) McIntosh (1990) Ragg and Miller (1978)

(334) Wilsons Rd

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 67-04 Maniototo

LOCALITY and GRID REFERENCE: 15 km SW of Ranfurly H42 735487 **ALTITUDE(m):** 395 **RAINFALL(mm):** 400

TOPOGRAPHY: flat to undulating floodplain **PARENT MATERIAL:** Holocene alluvium **VEGETATION:** halophytic vegetation

SOILS: brown-grey earths (Linnburn)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) important site because no obvious Tertiary influence on parent material or groundwater is apparent locally.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** has been drained, grazed and top-dressed

TENURE: private land, covered by a conservation covenant

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** October 1989

NOTES: Type site for *Lepidium kirkii*.

REFERENCES: McIntosh et al. (1990a)

(335) Bannock Burn - Old Woman Range

REGIONAL/CITY COUNCIL(S): Otago and Southland **ECOLOGICAL DISTRICTS(S):** 67-05 Old Man

LOCALITY and GRID REFERENCE: 20 km W of Alexandra F42 014456

AREA(ha): 2700 **ALTITUDE(m):** 600-1740 **RAINFALL(mm):** 1600-2000

TOPOGRAPHY: high summit plateaux, outlier cirque basins and a deep gully **PARENT MATERIAL:** schist and derived colluvium **VEGETATION:** cushionfield; herbfield; snow tussock grassland; short tussock grassland; matagouri-broadleaved shrubland

SOILS: upland yellow-brown earths (Carrick Dunstan), yellow-grey earths (Arrow Blackstone), brown-grey earths (Alexandra)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) excellent altitudinal sequence of soils under some of the least modified vegetation in Central Otago.(ii) pedologically interesting soils formed on periglacial landforms.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** lower parts have been burned and oversown – still are threats

TENURE: pastoral lease, recommended area for protection **OWNER/MANAGER:** Cairnmuir Station, Carrick Station, Happy Valley Station, Hawksburn Station

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** December 1987

REFERENCES: Brumley et al. (1986)

(336) Chapman Road I

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 67-05 Old Man

LOCALITY and GRID REFERENCE: 2 km SW of Alexandra G42 252435 **ALTITUDE(m):** 150 **RAINFALL(mm):** 350

TOPOGRAPHY: rolling to undulating peneplain **PARENT MATERIAL:** schist **VEGETATION:** halophytic vegetation

SOILS: brown-grey earths (Chapman)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) one of the few sites in McIntosh et al. (1990) classified as saline rather than alkaline.(ii) close to type site for Manorburn soil.(iii) excellent vegetation zonation.

VULNERABILITY: 1 **MODIFICATIONS/THREATS:** holding paddock next to homestead

TENURE: private land **OWNER/MANAGER:** Mr McGregor

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** October 1989

REFERENCES: McIntosh et al. (1990a)

(337) Chapman Road II

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 67-05 Old Man

LOCALITY and GRID REFERENCE: 4 km SW of Alexandra G42 240432

AREA(ha): 8 **ALTITUDE(m):** 170 **RAINFALL(mm):** 350

TOPOGRAPHY: undulating to rolling valley floor **PARENT MATERIAL:** schist **VEGETATION:** halophytic vegetation

SOILS: brown-grey earths (Manorburn)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) relatively unmodified saline soil remnants are uncommon in Central Otago because most have been destroyed by border-dyke irrigation. (ii) type site for Manorburn soil.

VULNERABILITY: 1 **MODIFICATIONS/THREATS:** considerable disturbance by gold-mining, clay mining, and recreational use

TENURE: private land leased to 4WD club **OWNER/MANAGER:** LJ and NM McGregor, RD 1, Alexandra

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** October 1989

REFERENCES: McIntosh et al. (1990a)

(338) Long Gully Bluffs

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 67-05 Old Man

LOCALITY and GRID REFERENCE: north aspect slopes of Long Gully catchment, 10 km SW of Cromwell F41 024611

AREA(ha): 380 **ALTITUDE(m):** 340 1050 **RAINFALL(mm):** 800-1200

TOPOGRAPHY: steep derivative slopes; gentle colluvial slopes; ridge crest tors **PARENT MATERIAL:** schist and derived colluvium **VEGETATION:** broadleaved scrub; short tussock grassland

SOILS: brown-grey earths (Alexandra), yellow-grey earths (Arrow Blackstone)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) contains both brown-grey and yellow-grey earths under relatively unmodified vegetation.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** threatened by infestation by briar, fire and exotic grasses; stock browsing lower slopes

TENURE: pastoral lease, recommended area for protection **OWNER/MANAGER:** Mt Difficulty Station

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** May 1990

REFERENCES: Brumley et al. (1986)

(339) Molyneux Faces

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 67-05 Old Man

LOCALITY and GRID REFERENCE: sunny western flanks of the Cromwell Gorge, 10 km SE of Cromwell G42 177589

AREA(ha): 250 **ALTITUDE(m):** 150-1100 **RAINFALL(mm):** 350

TOPOGRAPHY: steep colluvial mountain slopes; deep gorge; rock bluffs and buttresses; localised block slump terracing **PARENT MATERIAL:** schist and derived colluvium **VEGETATION:** short tussock grassland; matagouri-broadleaved scrub; rockland; kanuka shrubland

SOILS: brown-grey earths (Alexandra Pigburn), yellow-grey earths (Arrow), upland yellow-brown earths (Dunstan Carrick)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) contains both brown-grey and yellow-grey earths under relatively unmodified vegetation.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** threatened by oversowing, briar, stock and damming of Clutha River

TENURE: pastoral lease, recommended area for protection **OWNER/MANAGER:** Cairnmuir Station

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** May 1990

REFERENCES: Brumley et al. (1986)

(340) Mt Difficulty

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 67-05 Old Man

LOCALITY and GRID REFERENCE: two adjoining catchments on the northern slopes of Mt Difficulty, between the Kawarau and Nevis Rivers, 10 km W of Cromwell F41 008671

AREA(ha): 400 **ALTITUDE(m):** 200-1280 **RAINFALL(mm):** 800

TOPOGRAPHY: steep colluvial and bedrock mountain slopes; bluffs; large-scale slump and earthflows; rubblefields **PARENT MATERIAL:** schist and derived colluvium **VEGETATION:** short tussock grassland; matagouri-broadleaved scrub

SOILS: yellow-grey earths (Arrow Blackstone), upland yellow-brown earths (Dunstan Carrick), brown-grey earths (Alexandra)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) the area includes some of the most intact and diverse examples of semi-arid soil-vegetation associations in Central Otago.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** has been burned and grazed

TENURE: recommended area for protection, pastoral lease

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** December 1987

NOTES: Mt Difficulty is a large landslide by world standards.

REFERENCES: Brumley et al. (1986)

(341) Northern Garvie Mountains

REGIONAL/CITY COUNCIL(S): Southland and Otago **ECOLOGICAL DISTRICTS(S):** 67-05 Old Man

LOCALITY and GRID REFERENCE: 35 km WSW of Alexandra F42 972346

AREA(ha): 5200 **ALTITUDE(m):** 1100-1870 **RAINFALL(mm):** 2000-2500

TOPOGRAPHY: mountain top plateaux with solifluction, moraine and lightly glaciated features (shallow cirque basins, glacial steps, buttresses and aretes); post-glacial block slumps; colluvial slopes and boulderfields; terraced alluvial deposits; moraines; fault trace **PARENT MATERIAL:** schist and derived solifluction debris, till and colluvium

VEGETATION: snow tussock grassland; mossfield; cushionfield; herbfield

SOILS: upland yellow-brown earths (Carrick Dunstan)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) contains the largest area of unmodified upland yellow-brown earths under snow tussockland in the ecological district (and one of the largest in Central Otago).

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** has been lightly grazed; some threat from fire and cattle damage of wetlands

TENURE: pastoral lease, marginal strip, recommended area for protection **OWNER/MANAGER:** Nokomai Station, Glenray Station, Department of Conservation

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** May 1990

REFERENCES: Brumley et al. (1986)

(342) Obelisk - Old Man Ranges

REGIONAL/CITY COUNCIL(S): Otago and Southland **ECOLOGICAL DISTRICTS(S):** 67-05 Old Man

LOCALITY and GRID REFERENCE: 25 km SSW of Alexandra G42 124312

AREA(ha): 6400 **ALTITUDE(m):** 460-1700 **RAINFALL(mm):** 2000-2500

TOPOGRAPHY: moderately-sloping to steep summit plateau; colluvial and ripply colluvial mountain slopes; fault scarp; active and relic periglacial features – tors, solifluction terraces, lag surfaces, soil hummocks and stripes; cirque basin; block slump terraces; terminal moraine and meander watercourses **PARENT MATERIAL:** schist and derived colluvium **VEGETATION:** short tussock grassland; matagouri-sweet brier-broadleaved scrub; broadleaved scrub; snow tussock grassland; mossfield; cushion-herbfield; herbfield; sedgeland

SOILS: upland yellow-brown earths (Obelisk Carrick Dunstan), yellow-grey earths (Blackstone Arrow)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) an outstanding range of soil-vegetation associations, showing striking altitudinal and climatic gradients.(ii) spans a pedologically important soil boundary between upland yellow-brown earths and yellow-grey earths.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** parts have been burned and grazed; cattle damage to wetlands; threatened by oversowing and cattle grazing and trailbike tracking

TENURE: pastoral lease, recommended area for protection **OWNER/MANAGER:** Hawksburn Station, Cairnmuir Station, Carrick Station

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** May 1987

REFERENCES: Brumley et al. (1986)

(343) Potters Creek

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 67-05 Old Man

LOCALITY and GRID REFERENCE: 17 km SW of Cromwell F42 992561

AREA(ha): 900 **ALTITUDE(m):** 610-1280 **RAINFALL(mm):** 800-1200

TOPOGRAPHY: lightly and regularly incised colluvial mountain slopes and tops; tors; gorges; bluffs and buttresses; extensive rubble/scree **PARENT MATERIAL:** schist and derived colluvium **VEGETATION:** short tussock grassland; snow tussock grassland; rockland; matagouri-broadleaved scrub; moss-sedgeland

SOILS: yellow-grey earths (Arrow), upland yellow-brown earths (Dunstan Carrick)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) spans an important soil boundary between yellow-grey earths and upland yellow-brown earths.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** has been logged and burned; many exotic species downvalley; old goldmining tailings

TENURE: pastoral lease, recommended area for protection **OWNER/MANAGER:** Crown
CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** December 1987
REFERENCES: Brumley et al. (1986)

(344) Southern Garvie Mountains

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 67-05 Old Man
LOCALITY and GRID REFERENCE: southern end of Garvie Mountains, 30 km W of Roxburgh Dam F43 883207
AREA(ha): 2650 **ALTITUDE(m):** 1300-1830 **RAINFALL(mm):** 2000
TOPOGRAPHY: cirque basins – steep headwall bluffs, buttressed sidewalls, basal moraine ridges, tarns; colluvial mountain slopes; periglacial features – soil hummockfields, solifluction lobes and terraces; plateau surfaces; recent fault trace; meander boglands **PARENT MATERIAL:** schist and derived colluvium, till and solifluction debris
VEGETATION: snow tussock grassland; snowbank and solifluction communities
SOILS: upland yellow-brown earths (Carrick Dunstan), upland podzolised yellow-brown earths and podzols (Mangatua), recent soils (Matukituki)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) contains a moderate range of soils on glacial, periglacial and structural landforms.(ii) striking soil differences on either side of the range.(ii) contains the most extensive and diverse wetlands in the ecological district.
VULNERABILITY: 2 **MODIFICATIONS/THREATS:** has been grazed; threatened by fire and stock disturbance, also trail bike damage
TENURE: pastoral lease, marginal strip, recommended area for protection **OWNER/MANAGER:** Nokomai Station, Glenarary Station, Department of Conservation
CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** June 1991
REFERENCES: Brumley et al. (1986)

(345) Welshmans - Camerons Creeks

REGIONAL/CITY COUNCIL(S): Southland **ECOLOGICAL DISTRICTS(S):** 67-05 Old Man
LOCALITY and GRID REFERENCE: 25 km W of Roxborough Hydro F43 944158
AREA(ha): 1500 **ALTITUDE(m):** 1070-1400 **RAINFALL(mm):** 1200
TOPOGRAPHY: block-faulted plateaux landscape – gently-sloping to steep colluvial mountain slopes; faults **PARENT MATERIAL:** schist and derived colluvium **VEGETATION:** Hebe-short tussock shrubland; red tussock grassland; snow tussock grassland; cushion-moss sedge land; bog pine shrubland
SOILS: upland yellow-brown earths (Carrick Dunstan), upland podzolised yellow-brown earths and podzols (Polnoon), organic soils (Otanomomo)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) contains a moderate range of soil-vegetation associations, including scrub and shrubland communities typical of former bushline associations.
VULNERABILITY: 2 **MODIFICATIONS/THREATS:** has been burned, grazed and oversown; scrub remnants threatened by fire
TENURE: pastoral lease, marginal strip, recommended area for protection **OWNER/MANAGER:** Glenarary Station, Department of Conservation
CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** May 1990
NOTES: The bog pine association was not recorded elsewhere in the ecological district.
REFERENCES: Brumley et al. (1986)

(346) West Branch Waikaia River

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 67-05 Old Man
LOCALITY and GRID REFERENCE: 30 km SW of Alexandra F43 020237
AREA(ha): 750 **ALTITUDE(m):** 550-1200 **RAINFALL(mm):** 1500
TOPOGRAPHY: gorge with steep derivative slopes including buttresses, rubblefields and colluvial slopes; bluffs; slump **PARENT MATERIAL:** schist and derived colluvium **VEGETATION:** snow tussock grassland; podocarp-Dracophyllum-broadleaved shrubland; podocarp forest
SOILS: upland yellow-brown earths (Dunstan Waikaia)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) contains the only remnants in the ecological district of the formerly extensive forest and scrub communities.
VULNERABILITY: 2 **MODIFICATIONS/THREATS:** parts have been burned and heavily browsed; introduced grasses are locally abundant; fire is the greatest threat
TENURE: pastoral lease, marginal strip, recommended area for protection **OWNER/MANAGER:** Glenarary Station, Department of Conservation
CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** June 1991
REFERENCES: Brumley et al. (1986)

(347) Deakers

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 67-06 Manorburn

LOCALITY and GRID REFERENCE: 24 km NW of Ranfurly H41 609745

AREA(ha): 40 **ALTITUDE(m):** 700-890 **RAINFALL(mm):** 600-800

TOPOGRAPHY: steep colluvial hillslopes with tors **PARENT MATERIAL:** schist and derived colluvium **VEGETATION:** snow tussock grassland; short tussock grassland; rockland

SOILS: upland yellow-brown earths (Dunstan Teviot)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) outstanding example of tall tussockland on a strongly acid upland yellow-brown earth (McIntosh 1989). (ii) low altitude site for intact snow tussock grassland association.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** has been burned, grazed, topdressed and oversown; large rabbit numbers in the past

TENURE: private land, recommended area for protection **OWNER/MANAGER:** Mr Deaker

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** April 1990

NOTES: Valuable for measuring erosion rates. The site is now in the process of being sold to P and D Young.

REFERENCES: McIntosh (1989a) Fagan and Pillai (1990)

(348) Greenland

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 67-06 Manorburn

LOCALITY and GRID REFERENCE: 24 km NE of Roxburgh G43 456222

AREA(ha): 1970 **ALTITUDE(m):** 750-920 **RAINFALL(mm):** 600-800

TOPOGRAPHY: gently undulating colluvial hillslopes; nivation hollows; fault trace **PARENT MATERIAL:** loess; loess on schist colluvium **VEGETATION:** red tussock grassland; short tussock grassland; dwarf turf-shrubland

SOILS: upland yellow-brown earths (Teviot Tawhiti), yellow-grey earths (Blackstone)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) moderate range of soils on periglacial landforms. (ii) valuable reference site for Tawhiti silt loam (not present in any protected natural areas). (iii) useful site for measuring erosion rates on rolling land.

VULNERABILITY: 2

TENURE: pastoral lease, recommended area for protection **OWNER/MANAGER:** Mr G Sullivan

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** April 1990

REFERENCES: McIntosh (1989a) Fagan and Pillai (1990)

(349) Long Valley Ridge

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 67-06 Manorburn

LOCALITY and GRID REFERENCE: 32 km SE of Alexandra H42 568318

AREA(ha): 1690 **ALTITUDE(m):** 860-1170 **RAINFALL(mm):** 600-800

TOPOGRAPHY: gently-sloping to steep colluvial hillslopes; rock outcrops; terraces; seepage slopes; floodplain **PARENT MATERIAL:** loess on schist colluvium **VEGETATION:** red tussock grassland; short tussock grassland; sedge mossfield; cushionfield

SOILS: upland yellow-brown earths (Teviot)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) largely unmodified compared with other east Otago uplands. Outstanding site for studying natural distribution of soils and vegetation. (ii) unusual mosaic of wetland soils and vegetation.

VULNERABILITY: 2

TENURE: recommended area for protection, private land **OWNER/MANAGER:** Mr J Gibson, Mr K Heckler, Mr D Blakely

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** April 1990

REFERENCES: McIntosh (1989a) Fagan and Pillai (1990)

(350) Maori Creek

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 67-06 Manorburn

LOCALITY and GRID REFERENCE: 32 km E of Alexandra H42 591461

AREA(ha): 60 **ALTITUDE(m):** 640-790 **RAINFALL(mm):** 600

TOPOGRAPHY: steep colluvial hillslopes; rock outcrops; valley floor **PARENT MATERIAL:** schist and derived colluvium and loess **VEGETATION:** matagouri-broadleaved rock shrubland; short tussock-introduced grassland; matagouri shrubland; matagouri-short tussock shrubland

SOILS: upland yellow-brown earths (Dunstan), yellow-grey earths (Arrow)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) valuable for soil and landscape studies because it shows the influence of aspect on soils and vegetation (yellow-grey earths on sunny faces, yellow-brown earths on shady faces).

VULNERABILITY: 2

TENURE: private land, recommended area for protection **OWNER/MANAGER:** Philip Horrex

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** April 1990

REFERENCES: McIntosh (1989a) Fagan and Pillai (1990)

(351) Moa Creek

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 67-06 Manorburn

LOCALITY and GRID REFERENCE: Ida Valley, 18 km ENE of Alexandra G42 439489 **ALTITUDE(m):** 455

RAINFALL(mm): 500

TOPOGRAPHY: flat to gently undulating alluvial plain; seasonal evaporation ponds; scattered sarsen stone boulders

PARENT MATERIAL: schist **VEGETATION:** halophytic vegetation

SOILS: brown-grey earths (Manorburn)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) good example of rare saline soils with indigenous flora and fauna.

VULNERABILITY: 1 **MODIFICATIONS/THREATS:** still grazed

TENURE: private land **OWNER/MANAGER:** Mr Nevil

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** October 1989

REFERENCES: McIntosh et al. (1990a) Fagan and Pillai (1990)

(352) Nature Gully

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 67-06 Manorburn

LOCALITY and GRID REFERENCE: 19 km WNW of Ranfurly H41 635667

AREA(ha): 25 **ALTITUDE(m):** 610-760 **RAINFALL(mm):** 400

TOPOGRAPHY: steep bedrock and colluvial hillslopes **PARENT MATERIAL:** schist and derived colluvium

VEGETATION: short tussock-introduced grassland; matagouri-broadleaved shrubland; broadleaved-snow tussock shrubland; rockland

SOILS: yellow-grey earths (Arrow)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) valuable for research on erosion rates in yellow-grey earth steepland soils.

VULNERABILITY: 2

TENURE: private land, recommended area for protection **OWNER/MANAGER:** Murray McNight

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** April 1990

REFERENCES: New Zealand Soil Bureau (1968) McIntosh (1989a) Fagan and Pillai (1990)

(353) Pinelheugh

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 67-06 Manorburn

LOCALITY and GRID REFERENCE: 16 km NE of Roxburgh G43 354247

AREA(ha): 1160 **ALTITUDE(m):** 800-1070 **RAINFALL(mm):** 600-800

TOPOGRAPHY: gently-rolling, rounded colluvial hillslopes; steep, dissected colluvial hillslopes; tors; buttresses

PARENT MATERIAL: loess on schist colluvium, some alluvium **VEGETATION:** red tussock grassland; snow tussock grassland; red tussock-snow tussock grassland; short tussock grassland; sedge-mossfield

SOILS: upland yellow-brown earths (Teviot), gley soils

IMPORTANCE: 2 **SIGNIFICANCE:** (i) the best-known site for representing Teviot soils over their total altitudinal range, as well as a moderate range of aspects and slopes. (ii) soils under dry tussockland associations are uncommon internationally.

VULNERABILITY: 2

TENURE: pastoral lease, recommended area for protection

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** April 1990

NOTES: Useful site for measuring erosion rates on rolling land.

REFERENCES: McIntosh (1989a) Fagan and Pillai (1990)

(354) Totara

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 67-06 Manorburn

LOCALITY and GRID REFERENCE: 20 km E of Omakau H41 645634

AREA(ha): 70 **ALTITUDE(m):** 760-920 **RAINFALL(mm):** 600

TOPOGRAPHY: steep colluvial and bedrock hillslopes; rounded ridge top; gorge **PARENT MATERIAL:** loess over schist colluvium **VEGETATION:** snow tussock grassland; short tussock grassland; rockland

SOILS: upland yellow-brown earths (Teviot)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) good example of Teviot soils under snow tussock grassland, an association which was formerly much more extensive in the ecological district.

VULNERABILITY: 2

TENURE: private land, recommended area for protection

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** April 1990

REFERENCES: McIntosh (1989a) Fagan and Pillai (1990)

(355) Glendhu

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 68-02 Waipori

LOCALITY and GRID REFERENCE: between Gardiners Track road and Waipori River, 9 km NNW of Lawrence

H44 550805

AREA(ha): 220 **ALTITUDE(m):** 480-676 **RAINFALL(mm):** 1300

TOPOGRAPHY: rolling to steep colluvial mountain slopes and tops **PARENT MATERIAL:** schist colluvium overlain by loess (especially on lower parts of north facing slopes) **VEGETATION:** snow tussock/introduced grassland; red tussock/rush-sedge grassland

SOILS: upland yellow-brown earths (Mahinerangi Waipori Nardoo Lammerlaw), organic soils (Bungtown), gley soils (Pioneer)

IMPORTANCE: 1 **SIGNIFICANCE:** (i) excellent altitudinal range of soils.(ii) internationally known scientific study site (especially for hydrological studies). Has great potential for pedological studies of the long-term effects of converting tussock grassland to exotic forest.

VULNERABILITY: 1 **MODIFICATIONS/THREATS:** some introduced grasses; very little grazing by sheep

TENURE: Crown land **OWNER/MANAGER:** Timberlands

CONTACT PERSON: Rick Jackson **DATE OF INFORMATION:** May 1991

REFERENCES: Hewitt (1982) Bonell et al. (1990) Pearce et al. (1984) O'Loughlin et al. (1984)

(356) Lammerlaws and Lammermoors

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 68-02 Waipori

LOCALITY and GRID REFERENCE: extends from Lammermoor Range to Lammerlaw Range and Lake Onslow Region H43 535075

AREA(ha): 700 **ALTITUDE(m):** 650-1000 **RAINFALL(mm):** 600-1000

TOPOGRAPHY: rolling hillslopes with deep gullies (dissected peneplain) **PARENT MATERIAL:** loess and schist colluvium

SOILS: upland podzolised yellow-brown earths and podzols (Maungatua Lammerlaw), upland yellow-brown earths (Teviot)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) large area of soils under unmodified vegetation.(ii) soils under sequences of climate and vegetation.(iii) soils have been characterised in detail.

VULNERABILITY: 1 **MODIFICATIONS/THREATS:** grazed by sheep and cattle; 4WD roads; trailbike damage of wetlands

TENURE: pastoral lease **OWNER/MANAGER:** Rocklands Station, Beaumont Station, Castle Dent Station and Halwyn Station

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** August 1991

REFERENCES: McIntosh and Backholm (1981) McIntosh et al. (1983)

(357) Whisky Gully Scenic Reserve

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 68-03 Tapanui

LOCALITY and GRID REFERENCE: 5 km SE of Tapanui G45 231660

AREA(ha): 100 **ALTITUDE(m):** 300-700 **RAINFALL(mm):** 800

TOPOGRAPHY: steep colluvial mountainslopes **PARENT MATERIAL:** schist colluvium **VEGETATION:** beech forest; broadleaved-podocarp/snow tussock forest; introduced grassland

SOILS: lowland yellow-brown earths (Tuapeka), upland yellow-brown earths (Waikaia), upland podzolised yellow-brown earths and podzols (Maungatua), organic soils (Kaherekoau), recent soils (Mataura)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) contains a moderate range of soils, including some under beech forest (which was formerly more extensive).

VULNERABILITY: 3

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** April 1990

NOTES: Called "Tapanui Domain" in Allen (1978)

REFERENCES: New Zealand Soil Bureau (1968) Allen (1978)

(358) Goodwood Scenic Reserve

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 69-01 Waikouaiti

LOCALITY and GRID REFERENCE: 6 km SE of Palmerston J43 347182

AREA(ha): 19 **ALTITUDE(m):** 30-70 **RAINFALL(mm):** 500

TOPOGRAPHY: rolling colluvial hills **PARENT MATERIAL:** schist loess over sandy limestone and sandstone **VEGETATION:** podocarp-broadleaved/snow tussock forest; broadleaved forest; broadleaved-podocarp forest

SOILS: yellow-grey - yellow-brown earth intergrades (Warepa Karitane)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) one of the only protected remnants of coastal podocarp/broadleaved forest in Otago.

VULNERABILITY: 3

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** April 1990
REFERENCES: Department of Lands and Survey (1984) Allen (1978) McCaskill (1975b)

(359) Shag Point Scientific Reserve

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 69-01 Waikouaiti
LOCALITY and GRID REFERENCE: 7 km E of Palmerston J43 385244
AREA(ha): 55 **ALTITUDE(m):** 78-100 **RAINFALL(mm):** 600
TOPOGRAPHY: steep colluvial hillslopes with rock outcrops **PARENT MATERIAL:** greywacke breccia conglomerate, coarse feldspathic sandstone, siltstone and mudstone and derived colluvium **VEGETATION:** snow tussock grassland; gorse scrub; fernland; rockland
SOILS: lowland yellow-brown earths (Taratu)
IMPORTANCE: 2 **SIGNIFICANCE:** (i) lowest altitude and most coastal site with soil under snow tussock grassland (narrow-leaved snow tussock) in New Zealand. This soil-vegetation association was formerly much more extensive.
VULNERABILITY: 3
TENURE: scientific reserve **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** October 1989
REFERENCES: Ward and Munro (1989)

(360) Flagstaff Scenic Reserve

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 69-02 Dunedin
LOCALITY and GRID REFERENCE: 2 km W of Dunedin I44 133831
AREA(ha): 99 **ALTITUDE(m):** 490-670 **RAINFALL(mm):** 1245
TOPOGRAPHY: colluvial hillslopes and hilltops; basalt plateau **PARENT MATERIAL:** basalt colluvium and schist loess **VEGETATION:** snow tussock/harakeke grassland; manuka scrub; broom scrub; kaikawaka forest
SOILS: brown granular loam/clay - yellow-brown earths intergrade (Mihiwaka Mihiwaka-Tokoiti), brown granular loams and clays (Swampy), upland yellow-brown earths (Porteous), upland podzolised yellow-brown earths and podzols (Leith)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) contains a wide variety of soils and soil-vegetation associations.
VULNERABILITY: 3 **MODIFICATIONS/THREATS:** vulnerable to fire; walking tracks
TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** April 1990
REFERENCES: Tomlinson and Leslie (1978) Allen (1978) McCaskill (1975b)

(361) Harbour Cone

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 69-02 Dunedin
LOCALITY and GRID REFERENCE: Harbour Cone, 2 km S of Portobello I44 270816
AREA(ha): 1 **ALTITUDE(m):** 100 **RAINFALL(mm):** 700
TOPOGRAPHY: steep colluvial gully and hillslopes **PARENT MATERIAL:** basalt and loess
SOILS: brown granular loam/clay - yellow-brown earths intergrade (Portobello Kaimata)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) only area where low altitude coastal soils on basalt are preserved under native forest on Otago Peninsular.
VULNERABILITY: 3
TENURE: protected private land (covenant) **OWNER/MANAGER:** H Koch and Dr P Cooke
CONTACT PERSON: Peter Johnson **DATE OF INFORMATION:** August 1991
NOTES: Only area with rimu on Otago Peninsular.

(362) Heyward Point Scenic Reserve

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 69-02 Dunedin
LOCALITY and GRID REFERENCE: NW entrance to Otago Harbour, 20 km NE of Dunedin J44 304916
AREA(ha): 45 **ALTITUDE(m):** 0-190 **RAINFALL(mm):** 665
TOPOGRAPHY: coastal promontory with steep cliffs; beach and colluvial hillslopes **PARENT MATERIAL:** basalt and derived colluvium; loess **VEGETATION:** rockland; introduced grassland; introduced grassland with broadleaved and podocarp shrubs; broadleaved scrub and forest
SOILS: brown granular loams and clays (Highcliff-Warepa), yellow-brown sands (Brighton)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) one of two reserves in Otago of this type of dry coastal podocarp/broadleaved forest on brown granular loams.
VULNERABILITY: 3 **MODIFICATIONS/THREATS:** wind and stock damage; large part is pasture
TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** April 1990
REFERENCES: Department of Lands and Survey (1984) Allen (1978) McCaskill (1975b)

(363) Mount Cargill Scenic Reserve

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 69-02 Dunedin

LOCALITY and GRID REFERENCE: 7 km NE of Dunedin I44 199855

AREA(ha): 180 **ALTITUDE(m):** 366-677 **RAINFALL(mm):** 1000

TOPOGRAPHY: steep colluvial hillslopes and undulating planar tops **PARENT MATERIAL:** basalt and other Dunedin volcanics, and derived colluvium **VEGETATION:** Dracophyllum-broadleaved scrub; kaikawaka forest; introduced grassland; podocarp-broadleaved forest; beech forest

SOILS: brown granular loam/clay – yellow-brown earths intergrade (Mihiwaka-Tokoiti Mihiwaka), brown granular loams and clays (Cargill), upland podzolised yellow-brown earths and podzols (Leith)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) the largest protected natural area in the South Island of brown granular loams and clays under native forest (including uncommon kaikawaka). (ii) contains a moderate range of soil-vegetation and soil-landform associations.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** has been grazed and burned; 4WD road; broadcasting transmitter

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** April 1990

REFERENCES: Campbell (1971) Allen (1978) Campbell (1977) Department of Lands and Survey (1984) McCaskill (1975b)

(364) Mt Pleasant Scenic Reserve

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 69-02 Dunedin

LOCALITY and GRID REFERENCE: above Sawyers Bay, Otago Harbour, 10 km NW of Dunedin city centre I44 225870

AREA(ha): 15.6 **ALTITUDE(m):** 366-527 **RAINFALL(mm):** 975

TOPOGRAPHY: moderately steep to steep colluvial slopes below steep bluffs **PARENT MATERIAL:** basalt colluvium **VEGETATION:** podocarp-broadleaved forest; broadleaved forest; kaikawaka forest

SOILS: brown granular loam/clay – yellow-brown earths intergrade (Mihiwaka), upland podzolised yellow-brown earths and podzols (Leith Cargill)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) regionally good example of soils under kaikawaka forest.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** stock damage

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** July 1991

REFERENCES: Allen (1978)

(365) Maungatua Domain

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 69-03 Tokomairiro

LOCALITY and GRID REFERENCE: north-eastern slopes of Maungatua, adjacent Woodside township, 20 km W of Dunedin H44 893803

AREA(ha): 274 **ALTITUDE(m):** 90-580 **RAINFALL(mm):** 650

TOPOGRAPHY: steep colluvial hillslopes dissected by steep gullies **PARENT MATERIAL:** schist and derived colluvium **VEGETATION:** beech forest; snow tussock grassland; podocarp-broadleaved forest

SOILS: yellow-grey earths (Henley Tokomairiro)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) yellow-grey earths with little modified forest cover are rare nationally. (ii) this is one of the more intact bush areas in Otago.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** picnic area; walking tracks; some gorse

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** July 1991

REFERENCES: Allen (1978)

(366) Maungatua Scientific Reserve

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 69-03 Tokomairiro

LOCALITY and GRID REFERENCE: 19 km W of Mosgiel H44 860771

AREA(ha): 553 **ALTITUDE(m):** 366-890 **RAINFALL(mm):** 1016

TOPOGRAPHY: dissected peneplain remnant – rolling colluvial hillslopes; some deeply dissected gullies; tarns **PARENT MATERIAL:** schist and derived loess and colluvium **VEGETATION:** snow tussock grassland; beech forest; Dracophyllum-broadleaved scrub; cushion herb moor

SOILS: lowland yellow-brown earths (Tuapeka), upland podzolised yellow-brown earths and podzols (Teviot Maungatua), upland yellow-brown earths (Wehenga Lammerlaw)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) moderate range of soil-vegetation associations. (ii) silver beech forest was formerly much more extensive, but has been reduced by logging and pastoral development.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** has been grazed; vulnerable to trail bike and cattle damage
TENURE: scientific reserve **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** April 1990
REFERENCES: Department of Lands and Survey (1984) Allen (1978) McCaskill (1975b)

(367) Taieri River Scenic Reserve

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 69-03 Tokomairiro

LOCALITY and GRID REFERENCE: 19 km NE of Milton I45 916589

AREA(ha): 215 **ALTITUDE(m):** 0-230 **RAINFALL(mm):** 762

TOPOGRAPHY: steep colluvial hillslopes; deep gullies; Taieri River headland cliffs **PARENT MATERIAL:** schist loess and colluvium **VEGETATION:** podocarp/broadleaved forest; broadleaved scrub and forest; kanuka treeland; rockland; introduced grassland; salt marsh

SOILS: lowland yellow-brown earths (Akatore), yellow-grey - yellow-brown earths intergrade (Warepa), gley soils (Taieri)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) contains a moderate variety of soils under native vegetation. Aspect effects on soils and vegetation are marked.

VULNERABILITY: 3

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** April 1990

REFERENCES: Wright et al. (1946) McCaskill (1975b)

(368) Waiora Yellow-Grey Earth Reserve

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 69-03 Tokomairiro

LOCALITY and GRID REFERENCE: 6 km N of Mosgiel, Waiora Farm, Invermay Research Centre (MAF) I44 055 849

AREA(ha): 10 **ALTITUDE(m):** 220 **RAINFALL(mm):** 900

TOPOGRAPHY: rolling terrace remnant **PARENT MATERIAL:** schist loess **VEGETATION:** snow tussock grassland; introduced grassland including gorse

SOILS: yellow-grey earths (Waitahuna)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) probably the only example of untopdressed and unlimed loessial yellow-grey earth on rolling land with grassland cover at 300 m altitude. Important reference site for surrounding agricultural soils.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** has been heavily grazed with cattle

TENURE: private land covered by a management agreement **OWNER/MANAGER:** Scout Association

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** April 1990

NOTES: Leased to Ministry of Agriculture and Fisheries.

REFERENCES: McIntosh (1985a) McIntosh (1985b)

(369) Waipori Falls Scenic Reserve

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 69-03 Tokomairiro

LOCALITY and GRID REFERENCE: 26 km SW of Mosgiel H44 776717

AREA(ha): 1352 **ALTITUDE(m):** 30-490 **RAINFALL(mm):** 1000

TOPOGRAPHY: very steep colluvial hillslopes and deep gullies **PARENT MATERIAL:** schist and derived colluvium **VEGETATION:** beech forest; broadleaved forest; beech-broadleaved forest; kanuka forest; kanuka/broadleaved forest

SOILS: lowland yellow-brown earths (Tuapeka), upland yellow-brown earths (Taioma Waipori)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) large area containing a moderate range of soils under native vegetation over a wide range in altitude and aspects.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** parts have been burned; roads; hydro lake and dam; willows and poplars; semi-wild sheep grazing

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** April 1990

REFERENCES: Department of Lands and Survey (1984) Allen (1978) McCaskill (1975b)

(370) Otanomomo Scientific Reserve

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 69-04 Balclutha

LOCALITY and GRID REFERENCE: 6 km S of Balclutha H46 585296

AREA(ha): 36 **ALTITUDE(m):** 7 **RAINFALL(mm):** 706

TOPOGRAPHY: flat floodplain **PARENT MATERIAL:** loess and alluvium **VEGETATION:** podocarp forest; introduced grassland; sedgeland; rushland

SOILS: yellow-grey earths (Finegand Tokomairiro), gley soils (Taieri)

IMPORTANCE: 1 **SIGNIFICANCE:** (i) one of the finest example of podocarp forest on loessial yellow-grey earths

in New Zealand, as well as the only stand of podocarp forest on alluvial plain soils in Otago).(ii) lowland soils with native forest cover are rare internationally.(iii) important reference site for moister yellow-grey earths in southern South Island (c.f. Talbot Forest in Canterbury).

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** has been grazed; aggressive introduced plants present; drainage of adjacent lands has lowered the water table and reduced regeneration of the podocarp species.

TENURE: scientific reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** April 1990

REFERENCES: Cutler (1957) McCaskill (1975b)

(371) Pukerau Red Tussock Scientific Reserve

REGIONAL/CITY COUNCIL(S): Southland **ECOLOGICAL DISTRICTS(S):** 70-01 Waipahi

LOCALITY and GRID REFERENCE: adjacent SH 1, 11 km E of Gore F45 071496

AREA(ha): 5 **ALTITUDE(m):** 106 **RAINFALL(mm):** 750

TOPOGRAPHY: flat outwash terrace and moraine swamp **PARENT MATERIAL:** outwash gravel, peat and till

VEGETATION: red tussock grassland; rushland; introduced grassland

SOILS: organic soils (Andrews)

IMPORTANCE: 1 **SIGNIFICANCE:** (i) this is one of the few remaining sites of lowland organic soils under native vegetation in New Zealand. Similar sites are also rare internationally.(ii) the site is one of the best remaining lowland organic soil - red tussock grassland associations in New Zealand.

VULNERABILITY: 3

TENURE: scientific reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** April 1990

NOTES: Requires clearing of introduced species, e.g. gorse and birch, and establishment of buffer zones to guard against deleterious effects of farming on surrounding land. Scenic qualities of the reserve are readily appreciated by passing motorists and cyclists.

REFERENCES: McIntosh (1988) Allen et al. (1989) Department of Lands and Survey (1984) Caldwell (1974)

(372) Catlins Lake Scenic Reserve

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 70-02 Tahakopa

LOCALITY and GRID REFERENCE: 2 km S of Owaka H46 524102

AREA(ha): 10 **ALTITUDE(m):** 0-30 **RAINFALL(mm):** 1000

TOPOGRAPHY: flat floodplain terraces (lake shore) **PARENT MATERIAL:** tuffaceous greywacke alluvium

VEGETATION: manuka scrub; rush-flax-sedge wetland

SOILS: lowland yellow-brown earths (Owaka)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) contains relatively undisturbed examples of soil-vegetation associations on Holocene coastlines and terraces.

VULNERABILITY: 3

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** May 1990

REFERENCES: Department of Lands and Survey (1984)

(373) Lenz Private Protected Land

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 70-02 Tahakopa

LOCALITY and GRID REFERENCE: on SH 92, 29 km SW Owaka G47 343976

AREA(ha): 550 **ALTITUDE(m):** 20-360 **RAINFALL(mm):** 1152

TOPOGRAPHY: rolling colluvial hillslopes; valley floor floodplain **PARENT MATERIAL:** tuffaceous greywacke and derived colluvium **VEGETATION:** broadleaved forest; broadleaved-podocarp forest; podocarp forest; shrub/rush-moss bog; introduced grassland

SOILS: lowland podzolised yellow-brown earths and podzols (Tautuku)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) good example of low altitude yellow-brown earths under native forest.(ii) together with adjacent William King Scenic Reserve forms an educational area for moderate rainfall site on tuffaceous greywacke, from floodplains near sea-level to hilly slopes at 360 m.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** walking tracks and lodge (Tautuku Lodge); largest trees have been logged

TENURE: private protected land **OWNER/MANAGER:** Royal Forest and Bird Protection Society

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** April 1990

NOTES: Called "Tautuku Private Scenic Reserve" in Allen (1978). Bought by Royal Forest and Bird Protection Society in 1964.

REFERENCES: Department of Lands and Survey (1984) Allen (1978) Ward and Munro (1989) Parmenter (1976) McCaskill (1975b)

(374) Table Hill Scenic Reserve

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 70-02 Tahakopa

LOCALITY and GRID REFERENCE: 14 km SW of Owaka G47 410073

AREA(ha): 252 **ALTITUDE(m):** 152-400 **RAINFALL(mm):** 1224

TOPOGRAPHY: colluvial hillslopes topped by bluffs, above a gently sloping to flat terrace **PARENT MATERIAL:** colluvium from tuffaceous greywacke. **VEGETATION:** beech forest; beech-broadleaved forest; broadleaved forest and scrub

SOILS: lowland podzolised yellow-brown earths and podzols (Tautuku Hinahina)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) a large and good example of soils under a forest type that is not common in Otago.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** has been logged and grazed; picnic site

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** April 1990

REFERENCES: Department of Lands and Survey (1984) Allen (1978) McCaskill (1975b)

(375) Tahakopa Bay Scenic Reserve

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 70-02 Tahakopa

LOCALITY and GRID REFERENCE: mouth of Tahakopa River, 17 km SW of Owaka G47 411000

AREA(ha): 665 **ALTITUDE(m):** 0-120 **RAINFALL(mm):** 1152

TOPOGRAPHY: flat to rolling sanddunes, colluvial hillslopes **PARENT MATERIAL:** aeolian deposits, feldspathic sandstone, tuffaceous sandstone/mudstone **VEGETATION:** podocarp-manuka scrub; podocarp forest; podocarp/broadleaved forest; beech-podocarp forest; sedgeland; sandfield

SOILS: yellow-brown sands (Riverton), lowland yellow-brown earths (Waimahaka), lowland podzolised yellow-brown earths and podzols (Toetoe Tautuku), organic soils (Invercargill)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) excellent example of a soil development sequence from young to old dune deposits and colluvial hillslopes under native vegetation. A wide range of soils and soil-vegetation associations are represented.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** walking tracks; roads

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** April 1990

NOTES: Called "Papatowai Scenic Reserve" in Allen (1978). Comprises several disjoint parts.

REFERENCES: Department of Lands and Survey (1984) Allen (1978)

(376) Tautuku Bay Scenic Reserve

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 70-02 Tahakopa

LOCALITY and GRID REFERENCE: 22 km SW of Owaka G47 371972

AREA(ha): 702 **ALTITUDE(m):** 0-350 **RAINFALL(mm):** 1000

TOPOGRAPHY: rolling colluvial hillslopes; valley floor; coastal terrace and sanddunes **PARENT MATERIAL:** colluvium, alluvial and aeolian deposits **VEGETATION:** podocarp-broadleaved forest; sandfield

SOILS: lowland podzolised yellow-brown earths and podzols (Hinahina), yellow-brown sands (Riverton), organic soils (Invercargill), lowland yellow-brown earths (Waimahaka)

IMPORTANCE: 1 **SIGNIFICANCE:** (i) represents a wide range of soils, landforms and native vegetation types.(ii) soil-vegetation associations were formerly much more extensive but have been much reduced by logging and pastoral development.(iii) soils and soil-vegetation chronosequences have been described in detail.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** marram obliterated native species on the sanddunes; well-used walking tracks; parts have been logged

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** April 1990

REFERENCES: Smith, Allen and Daly (1985) Allen (1978) Department of Lands and Survey (1984) McCaskill (1975b)

(377) Titiroa Scenic Reserve

REGIONAL/CITY COUNCIL(S): Southland **ECOLOGICAL DISTRICTS(S):** 70-02 Tahakopa

LOCALITY and GRID REFERENCE: 3.3 km W of Waimahaka F47 854015

AREA(ha): 46 **ALTITUDE(m):** 30 **RAINFALL(mm):** 1070

TOPOGRAPHY: rolling broad colluvial ridges separated by shallow gullies (ancient sanddunes) **PARENT MATERIAL:** aeolian deposits **VEGETATION:** podocarp-broadleaved forest

SOILS: lowland yellow-brown earths (Titiroa), lowland yellow-brown earths (Owaka)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) one of the few areas along the south coast with native forest on dunes. Original forest on sand dunes is nationally rare.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** has been logged; long history of use by stock
TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** April 1990
NOTES: Requires investigation of origin of dunes
REFERENCES: Department of Lands and Survey (1984) New Zealand Soil Bureau (1968) McCaskill (1975c)

(378) William King Scenic Reserve

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 70-02 Tahakopa
LOCALITY and GRID REFERENCE: 22 km SW of Owaka G47 361986
AREA(ha): 192 **ALTITUDE(m):** 0-200 **RAINFALL(mm):** 1152
TOPOGRAPHY: rolling colluvial hillslopes, terraces **PARENT MATERIAL:** tuffaceous greywacke, and tuff/alluvium
VEGETATION: podocarp-broadleaved forest
SOILS: lowland podzolised yellow-brown earths and podzols (Tautuku)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) together with adjacent Lenz Private Protected Land forms an educational area for a high rainfall site on tuffaceous greywacke.
VULNERABILITY: 3 **MODIFICATIONS/THREATS:** parts have been logged
TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** April 1990
REFERENCES: Department of Lands and Survey (1984) Allen (1978) McCaskill (1975b)

(379) Catlins Conservation Park

REGIONAL/CITY COUNCIL(S): Southland **ECOLOGICAL DISTRICTS(S):** 70-02 Tahakopa and 70-01 Waipahi
LOCALITY and GRID REFERENCE: several disjoint areas in south-east South Island, between Balclutha and Edendale G47 302007
AREA(ha): 58 131 **ALTITUDE(m):** 0-720 **RAINFALL(mm):** 1200-2400
TOPOGRAPHY: parallel ridges generally with steep south-facing sides and gently-sloping to moderately steep north-facing sides and tops; river flats; sand dunes; beaches and rocky promotories **PARENT MATERIAL:** marine and estuarine sandstones and mudstones **VEGETATION:** podocarp-broadleaved forest; podocarp forest; bog forest; beech forest
SOILS: lowland podzolised yellow-brown earths and podzols (Tautuku Hinahina), upland podzolised yellow-brown earths and podzols (Pukepahi), lowland yellow-brown earths (Waimahaka Tawanui Kaiwera Chaslands Owaka), organic soils (Kaherekoau)
IMPORTANCE: 1 **SIGNIFICANCE:** (i) contains a wide range of lowland undisturbed soils and soil-landform-vegetation associations.
VULNERABILITY: 3 **MODIFICATIONS/THREATS:** early history of logging and feral cattle damage
TENURE: conservation park **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** July 1991
REFERENCES: Department of Lands and Survey (1984)

(380) Brown Open Space Covenant

REGIONAL/CITY COUNCIL(S): Southland **ECOLOGICAL DISTRICTS(S):** 70-02 Waimahaka
LOCALITY and GRID REFERENCE: 35 km ESE of Invercargill F47 855035
AREA(ha): 64 **ALTITUDE(m):** 15-50 **RAINFALL(mm):** 800-1200
TOPOGRAPHY: moderately steep colluvial hillslopes **PARENT MATERIAL:** loess and tuffaceous greywacke
VEGETATION: podocarp-broadleaved forest
SOILS: lowland yellow-brown earths (Owaka Titiroa)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) important regional example of soils under unlogged lowland podocarp forest.
VULNERABILITY: 3 **MODIFICATIONS/THREATS:** elderberry present
TENURE: freehold, QEII National Trust open space covenant **OWNER/MANAGER:** G and H Brown, QEII National Trust
CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** July 1991
REFERENCES: QEII National Trust (Southland) file 5/13/1 vspace-6.0mm

(381) Fiordland National Park

REGIONAL/CITY COUNCIL(S): Southland **ECOLOGICAL DISTRICTS(S):** 72-02 Doubtful, 72-01 Darran, 72-03 Te Anau, 72-04 Preservation
LOCALITY and GRID REFERENCE: south-west South Island C42 725369
AREA(ha): 1 023 186 **ALTITUDE(m):** 0-2756 **RAINFALL(mm):** 1200-8000

TOPOGRAPHY: steep colluvial and bedrock mountain slopes; many relic glaciation features – especially glacial lakes, fiord indented coast; islands **PARENT MATERIAL:** gneiss, schist, granite and diorite and smaller amounts of basalt, andisite, marble, greywacke and amphibolite, and derived colluvium and alluvium **VEGETATION:** beech forest; podocarp forest; subalpine scrub; snow tussock grassland; alpine herbfields and gravelfields

SOILS: upland podzolised yellow–brown earths and podzols (Titiraurangi Resolution Garnock Kepler Haast), alpine steepland soils, etc. (Alpine), recent soils (Seaforth Tuatapere Tasman), lowland podzolised yellow–brown earths and podzols (Fiordland Maitai), lowland yellow–brown earths (Borland), yellow–brown loams (Te–Anau Dunstan), brown granular loam/clay – yellow–brown earths intergrade (Eglinton Takitimu Hollyford Bryneira), brown granular loams and clays (Olivine)

IMPORTANCE: 1 **SIGNIFICANCE:** (i) extensive area containing an outstanding range of soils under native vegetation and a wide range of altitudes, rainfalls, parent materials and landforms.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** history of sealing, whaling, gold mining and logging; tourist facilities at Milford Sound – road, airstrip, jetties and accommodation; underground power station at Deep Cove (Doubtful Sound) plus associated transmission lines

TENURE: national park **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** April 1990

REFERENCES: Department of Lands and Survey (1984) Department of Conservation (1988)

(382) Burwood Bush

REGIONAL/CITY COUNCIL(S): Southland **ECOLOGICAL DISTRICTS(S):** 73–02 Eyre

LOCALITY and GRID REFERENCE: Gorge Hill, Te Anau, N of SH 94 D43 260059

AREA(ha): 3104 **ALTITUDE(m):** 450–620 **RAINFALL(mm):** 1000

TOPOGRAPHY: upland plateau and moderately dissected valleys; tarns **PARENT MATERIAL:** outwash gravel and till with some greywacke and Tertiary rocks **VEGETATION:** red tussock grassland; beech forest

SOILS: upland yellow–brown earths (Taringatura), lowland yellow–brown earths (Te–Mara)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) outstanding area of medium altitude soils developed in glacial moraine and outwash, with native vegetation only slightly modified by grazing.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** minor grazing

TENURE: stewardship land **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** November 1991

(383) Eyre

REGIONAL/CITY COUNCIL(S): Otago and Southland **ECOLOGICAL DISTRICTS(S):** 73–02 Eyre

LOCALITY and GRID REFERENCE: upper Eyre Creek E43 504246

AREA(ha): 33 000 **ALTITUDE(m):** 500–2035 **RAINFALL(mm):** 1000

TOPOGRAPHY: steep colluvial and bedrock mountain slopes that have been strongly glaciated; many cirques, hanging valleys, moraines and aretes; many screes **PARENT MATERIAL:** greywacke to finely foliated schist colluvium **VEGETATION:** snow tussock grassland; subalpine scrub; snow tussock shrubland; beech forest; shrub–grassland; boulderfield; gravelfield; rockland

SOILS: upland yellow–brown earths (Kaikoura Waikaia Fairlight), alpine steepland soils, etc. (Alpine)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) contains a wide sequence of soil–vegetation associations. The vegetation is in excellent condition as it has been relatively free from burning and grazing for about 25 years.

VULNERABILITY: 3

TENURE: stewardship land **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** May 1990

REFERENCES: Mark et al. (1989)

(384) West Dome

REGIONAL/CITY COUNCIL(S): Southland **ECOLOGICAL DISTRICTS(S):** 73–02 Eyre

LOCALITY and GRID REFERENCE: 8 km N of Mossburn E43 370029

AREA(ha): 500 **ALTITUDE(m):** 440–975 **RAINFALL(mm):** 1000–1200

TOPOGRAPHY: colluvial and bedrock mountainslopes controlled by differential weathering of the rocks and mass slumping: serpentinite erodes readily and forms gentle slopes; igneous intrusions are more resistant and protrude as small tors or knolls with adjacent screes above smoother slopes formed by extensively jointed greywacke and basalt; dissected by small streams **PARENT MATERIAL:** serpentinite, basalt and igneous intrusives, interbedded with greywacke (Dun Mountain Ophiolite Belt) **VEGETATION:** beech forest; manuka shrubland; red tussock grassland; broadleaved shrubland

SOILS: brown granular loams and clays (Windley Blackridge), brown granular loam/clay – yellow–brown earths intergrade (Twinlaw), upland yellow–brown earths (Taringatura)

IMPORTANCE: 1 **SIGNIFICANCE:** (i) outstanding examples of a wide range of soil–natural vegetation associations,

some on ultramafic parent material rocks. (ii) Windley, Twinlaw, Taringatura and Blackridge soils are not represented in any other records in this inventory.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** grazed by sheep and periodically burned

TENURE: stewardship land, freehold **OWNER/MANAGER:** Department of Conservation, New Zealand Forestry Corporation, HA Taylor

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** April 1990

NOTES: The now-disbanded New Zealand Forest Service recommended for protection as an ecological area 3200 ha centred on West Dome (1271 m). Mark et al (1987) recommended 33 000 ha nearby for protection.

REFERENCES: McIntosh and Lee (1986) Mark et al. (1989)

(385) Wilderness Scientific Reserve

REGIONAL/CITY COUNCIL(S): Southland **ECOLOGICAL DISTRICTS(S):** 73-04 Upukerora

LOCALITY and GRID REFERENCE: adjacent SH 94, Mararoa River, 24 km E of Te Anau D43 082066

AREA(ha): 185 **ALTITUDE(m):** 280 **RAINFALL(mm):** 1023

TOPOGRAPHY: slightly undulating outwash terrace tread; minor moraines **PARENT MATERIAL:** outwash gravels and till from gneiss, granite and diorite **VEGETATION:** bog pine shrubland

SOILS: yellow-brown loams (Monowai)

IMPORTANCE: 1 **SIGNIFICANCE:** (i) yellow-brown loams are uncommon in the South Island. Such sites with a native vegetation cover are even less common.(ii) this is one of the few remaining areas of Monowai soils with a native vegetation cover.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** trench for telephone cable; heather is a major threat; pine trees planted along one boundary

TENURE: scientific reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** April 1990

NOTES: Called "The Wilderness Scenic Reserve" in McCaskill (1975c). Bog pine shrubland is a nationally widespread but uncommon community.

REFERENCES: Department of Lands and Survey (1984) Allen et al. (1989) McCaskill (1975c)

(386) East Dome

REGIONAL/CITY COUNCIL(S): Southland **ECOLOGICAL DISTRICTS(S):** 74-01 Nokomai

LOCALITY and GRID REFERENCE: upper Mataura River, SW slopes below East Dome (1350 m), 24 km NE of Lumsden F43 727021

AREA(ha): 1150 **ALTITUDE(m):** 230-1350 **RAINFALL(mm):** 1200-1600

TOPOGRAPHY: ripply and planar steep colluvial mountain slopes; mountain tops; and deeply incised very steep slopes with frequent rock bluffs and scres **PARENT MATERIAL:** greywacke, argillite and semischist and derived colluvium **VEGETATION:** beech forest; snow tussock shrubland; rockland; gravelfield

SOILS: upland yellow-brown earths (Kaikoura Fairlight)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) a large area covering a wide altitudinal range, as well as a wide range of highly natural vegetation communities on upland yellow-brown earths.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** has been burned

TENURE: pastoral lease, marginal strip, recommended area for protection **OWNER/MANAGER:** Nokomai Station, Glenlapa Station, Department of Conservation

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** February 1991

NOTES: Significant scree habitats and attendant flora.

REFERENCES: Dickinson (1989)

(387) Gow Burn

REGIONAL/CITY COUNCIL(S): Southland **ECOLOGICAL DISTRICTS(S):** 74-01 Nokomai

LOCALITY and GRID REFERENCE: head of Gow Burn, a tributary of the Waikaia River, 30 km W of Roxburgh F43 903134

AREA(ha): 2450 **ALTITUDE(m):** 320-1750 **RAINFALL(mm):** 1200-2400

TOPOGRAPHY: previously glaciated catchments - cirques, mammilated surfaces, benches, steep rocky headwalls and moraines; deep solifluction deposits; extensive rock bluffs **PARENT MATERIAL:** schist, semi-schist and derived solifluction detritus **VEGETATION:** beech forest; broadleaved forest; tussockland/shrubland; rockland; moss-cushionfields; sedge-mossfields; herbfield

SOILS: upland yellow-brown earths (Carrick Dunstan Waikaia), upland podzolised yellow-brown earths and podzols (Maungatua)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) encompasses the greatest altitudinal range of any recommended area for protection in the ecological district, covering montane to high-alpine soil-vegetation associations. Vegetation is in particularly good condition.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** stock damage in lower section
TENURE: pastoral lease, stewardship land, recommended area for protection **OWNER/MANAGER:** Glenaray Station, Department of Conservation
CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** February 1991
NOTES: Includes part Waikaia Forest.
REFERENCES: Dickinson (1989)

(388) Lower Slate

REGIONAL/CITY COUNCIL(S): Southland **ECOLOGICAL DISTRICTS(S):** 74-01 Nokomai
LOCALITY and GRID REFERENCE: 26 km NE of Lumsden, southern end of Slate Range E43 684085
AREA(ha): 65 **ALTITUDE(m):** 260-640 **RAINFALL(mm):** 800-1200
TOPOGRAPHY: moderately to very steep colluvial mountain slopes and rock bluffs **PARENT MATERIAL:** greywacke, argillite and semi-schist and derived colluvium **VEGETATION:** broadleaved shrubland
SOILS: upland yellow-brown earths (Fairlight)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) the upland yellow-brown earth-shrubland association is likely to have once been widespread in the Nokomai and Mataura valleys.
VULNERABILITY: 2 **MODIFICATIONS/THREATS:** localised stock damage; treated by burning and goats
TENURE: private land, recommended area for protection **OWNER/MANAGER:** WJ Lott
CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** February 1991
NOTES: Rock bluffs harbour a strong population of the rare and endangered mountain daisy *Celmisia hookeri*.
REFERENCES: Dickinson (1988)

(389) Mataura Range

REGIONAL/CITY COUNCIL(S): Southland **ECOLOGICAL DISTRICTS(S):** 74-01 Nokomai
LOCALITY and GRID REFERENCE: SE slopes of Mataura Range, 13 km NNW of Lumsden E44 677962
AREA(ha): 1250 **ALTITUDE(m):** 210-990 **RAINFALL(mm):** 800-1200
TOPOGRAPHY: moderately to deeply incised colluvial mountain slopes, plus alluvial flats **PARENT MATERIAL:** greywacke, argillite and semi-schist and derived colluvium **VEGETATION:** beech forest; beech-broadleaved forest; broadleaved shrubland
SOILS: upland yellow-brown earths (Fairlight Kaikoura)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) contains excellent examples of red beech forest stands that have not been logged, as well as moderately diverse forests and shrublands on upland yellow-brown earths.
VULNERABILITY: 3 **MODIFICATIONS/THREATS:** parts have been logged; deer damage; has been burnt and grazed
TENURE: stewardship land, pastoral lease, recommended area for protection **OWNER/MANAGER:** Department of Conservation, Cattle Flat Station
CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** February 1991
NOTES: Includes part Blackhill Forest.
REFERENCES: Dickinson (1989)

(390) Upper Dome Burn

REGIONAL/CITY COUNCIL(S): Southland and Otago **ECOLOGICAL DISTRICTS(S):** 74-01 Nokomai
LOCALITY and GRID REFERENCE: eastern slopes of Mt Tennyson (1528 m) including the head of the Gow Burn, 18 km SE of Kingston F43 852197
AREA(ha): 1530 **ALTITUDE(m):** 880-1660 **RAINFALL(mm):** 1200-2400
TOPOGRAPHY: mountain top plateaux and moderately steep to very steep colluvial mountain slopes; bluffs; faults, ridge rents, sag ponds and block slump features; many tors; ripply slopes, extensive solifluction features; meandering string bogs **PARENT MATERIAL:** schist solifluction debris and alluvium **VEGETATION:** snow tussock grassland; snow tussock grassland-shrubland; rockland; herbfield; sedgeland
SOILS: upland yellow-brown earths (Carrick), recent soils (Matukituki)
IMPORTANCE: 2 **SIGNIFICANCE:** (i) a large area containing a moderate range of relatively unmodified soil-vegetation associations. (ii) contains the most developed string bog and island wetland systems in New Zealand (they are also internationally important landforms).
VULNERABILITY: 2 **MODIFICATIONS/THREATS:** has been burnt and grazed, also trailbike damage
TENURE: pastoral lease, recommended area for protection **OWNER/MANAGER:** Nokomai Station
CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** February 1991
REFERENCES: Dickinson (1989)

(391) West Waikaia

REGIONAL/CITY COUNCIL(S): Southland **ECOLOGICAL DISTRICTS(S):** 74-01 Nokomai
LOCALITY and GRID REFERENCE: head of Waikaia River, including most of Welshmans Creek, 25 km north-west

of Roxburgh F43 999136

AREA(ha): 2620 **ALTITUDE(m):** 240-1160 **RAINFALL(mm):** 1200-2400

TOPOGRAPHY: deeply incised gorges flanked by schist bluffs, colluvial mountain slopes and plateau tops **PARENT MATERIAL:** greywacke and semi-schist and derived colluvium **VEGETATION:** beech forest; shrubland; snow tussock grassland; rockland

SOILS: upland yellow-brown earths (Waikaia Dunstan Carrick), upland podzolised yellow-brown earths and podzols (Maungatua), recent soils (Mataura)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) a large area containing a moderate range of relatively unmodified soil-vegetation associations.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** widespread deer sign; possums; stock and fire damage on margins

TENURE: stewardship land, pastoral lease, recommended area for protection **OWNER/MANAGER:** Department of Conservation, Glenaray Station

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** January 1991

NOTES: Contains the largest forest remnant in Waikaia Ecological Region.

REFERENCES: Dickinson (1989)

(392) Awatere: Charlies Hill South/Tussock Block

REGIONAL/CITY COUNCIL(S): Southland **ECOLOGICAL DISTRICTS(S):** 74-02 Umbrella

LOCALITY and GRID REFERENCE: 34 km N of Gore; headwaters of Wendon Stream, a Waikaia River tributary F44 932838

AREA(ha): 290 **ALTITUDE(m):** 510-730 **RAINFALL(mm):** 1000

TOPOGRAPHY: a rounded hill with moderately incised colluvial slopes; some deep gullies **PARENT MATERIAL:** schist and schist loess **VEGETATION:** red tussock grassland; snow tussock shrubland; beech forest

SOILS: lowland yellow-brown earths (Tuapeka), upland yellow-brown earths (Pukekoma)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) contains the largest and best examples of soil – mid-altitude tussock-shrubland associations in the ecological district.

VULNERABILITY: 2

TENURE: private land, recommended area for protection **OWNER/MANAGER:** P Jackson

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** February 1991

REFERENCES: Dickinson (1988)

(393) Awatere: Waikaia Stream Headwaters

REGIONAL/CITY COUNCIL(S): Southland **ECOLOGICAL DISTRICTS(S):** 74-02 Umbrella

LOCALITY and GRID REFERENCE: adjacent Waikaia Road; 34 km N of Gore F44 958854

AREA(ha): 30 **ALTITUDE(m):** 330-400 **RAINFALL(mm):** 1300

TOPOGRAPHY: broad, flat to gently sloping, shallowly incised valley **PARENT MATERIAL:** schist loess **VEGETATION:** red tussock grassland; beech forest

SOILS: upland yellow-brown earths (Pukekoma)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) one of the largest upland yellow-brown earth – red tussockland associations in the ecological district. This association is likely to have once covered much of the southern and eastern parts of the district (and the rest of Southland).

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** cattle grazing; bordered by pasture/ploughed land

TENURE: private land, recommended area for protection **OWNER/MANAGER:** AJ Dickson

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** February 1991

REFERENCES: Dickinson (1988)

(394) Coal Creek Bluffs

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 74-02 Umbrella

LOCALITY and GRID REFERENCE: 6.5 km NW of Roxburgh; adjacent Coal Creek, a Clutha River tributary G43 186178

AREA(ha): 20 **ALTITUDE(m):** 460-530 **RAINFALL(mm):** 550

TOPOGRAPHY: rock bluffs and colluvial slopes between two deeply incised streams **PARENT MATERIAL:** schist and derived colluvium and loess **VEGETATION:** broadleaved shrubland

SOILS: yellow-grey earths (Arrow)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) contains a good example of a yellow-grey earth – shrubland association.

VULNERABILITY: 2

TENURE: private land, recommended area for protection **OWNER/MANAGER:** RN Tamblyn

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** February 1991

REFERENCES: Dickinson (1988)

(395) Lake Roxburgh Shrubland

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 74-02 Umbrella

LOCALITY and GRID REFERENCE: 3.5 km N of Roxburgh; adjacent Lake Roxburgh and SH8 G43 226225

AREA(ha): 40 **ALTITUDE(m):** 150-240 **RAINFALL(mm):** 470

TOPOGRAPHY: rock bluffs and colluvial mountain slopes **PARENT MATERIAL:** schist and derived loess and alluvium **VEGETATION:** kanuka shrubland

SOILS: yellow-grey – yellow-brown earths intergrade (Roxburgh)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) this is the only site representing Roxburgh soils recorded on this inventory. (ii) contains the most extensive area of kanuka shrubland (formerly much more extensive) and kowhai groves recorded in the district.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** many adventive species and widespread stock damage

TENURE: private land, recommended area for protection **OWNER/MANAGER:** G Eckhoff

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** February 1991

REFERENCES: Dickinson (1988)

(396) Leithen Burn Headwaters

REGIONAL/CITY COUNCIL(S): Southland **ECOLOGICAL DISTRICTS(S):** 74-02 Umbrella

LOCALITY and GRID REFERENCE: 30 km SW of Roxburgh, Black Umbrella Range F44 005907

AREA(ha): 700 **ALTITUDE(m):** 500-109 **RAINFALL(mm):** 1200-2400

TOPOGRAPHY: deeply incised valley with steep colluvial sideslopes leading to a narrow ridge; few bluffs **PARENT MATERIAL:** greywacke, schist, semi-schist and loess derived from schist **VEGETATION:** snow tussock grassland; snow tussock shrubland; tussock/cushion grassland; rockland

SOILS: upland yellow-brown earths (Leithen Waikaia), upland podzolised yellow-brown earths and podzols (Maungatua), organic soils (Kaherekoau)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) contains a moderate range of soil-vegetation associations.

VULNERABILITY: 2

TENURE: pastoral lease, recommended area for protection **OWNER/MANAGER:** Hakarere Station

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** February 1991

NOTES: Would significantly enhance viability and integrity of adjacent Leithen Bush Scenic Reserve.

REFERENCES: Dickinson (1988)

(397) Leithen Bush Scenic Reserve

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 74-02 Umbrella

LOCALITY and GRID REFERENCE: 25 km NW of Tapanui F44 025844

AREA(ha): 1342 **ALTITUDE(m):** 500 **RAINFALL(mm):** 800

TOPOGRAPHY: steep colluvial mountain slopes; moderately steep ridges and broad mountain tops **PARENT MATERIAL:** schist and derived colluvium **VEGETATION:** beech forest; manuka shrubland; snow tussock shrubland; broadleaved shrubland

SOILS: upland yellow-brown earths (Waikaia Leithen Pukekoma)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) moderate range of soil-natural vegetation associations, covering a good altitudinal range. (ii) largest remnant of upland yellow-brown earths under mountain beech forest in eastern Otago. Formerly very extensive but has been reduced by logging and pastoral development.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** deer grazing

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** April 1990

REFERENCES: Department of Lands and Survey (1984) New Zealand Soil Bureau (1968) Ward and Munro (1989)

(398) Pomahaka River and Boulder Creek Headwaters

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 74-02 Umbrella

LOCALITY and GRID REFERENCE: 14 km NW of Roxburgh; headwaters of the Pomahaka River G43 116220

AREA(ha): 880 **ALTITUDE(m):** 1060-1440 **RAINFALL(mm):** 1200-2400

TOPOGRAPHY: extensive broad colluvial plateau, deeply incised in places; nivation hollows **PARENT MATERIAL:** schist and derived solifluction detritus; loess and peat **VEGETATION:** cushionfield; sedgeland; Dracophyllum shrubland; snow tussock grassland; herbfield; rockland

SOILS: upland yellow-brown earths (Carrick), organic soils (Kaherekoau)

IMPORTANCE: 1 **SIGNIFICANCE:** (i) organic soils under unmodified vegetation are internationally uncommon, but are well represented in this large area. (ii) the area also includes a moderate range of soils and soil-vegetation associations under only slightly unmodified vegetation.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** grazed by cattle; 4WD road and trail bike tracks; goldmining during last century

TENURE: pastoral lease, recommended area for protection **OWNER/MANAGER:** Glenarary Station, MJ and MA Cahill

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** February 1991

REFERENCES: Dickinson (1988)

(399) Waikaia Bush

REGIONAL/CITY COUNCIL(S): Southland **ECOLOGICAL DISTRICTS(S):** 74-02 Umbrella

LOCALITY and GRID REFERENCE: White Umbrella Ridge, upper Waikaia River, 22 km E of Roxburgh F43 025 122

AREA(ha): 1350 **ALTITUDE(m):** 230-1127 **RAINFALL(mm):** 800-1000

TOPOGRAPHY: steep colluvial mountain slopes moderately incised by many narrow and steep-sided gullies; rock bluffs; large area of slumping **PARENT MATERIAL:** greywacke, semi-schist and alluvium **VEGETATION:** beech forest; snow tussock grassland; rocklands

SOILS: upland yellow-brown earths (Carrick Dunstan Waikaia Leithen), recent soils (Mataura)

IMPORTANCE: 1 **SIGNIFICANCE:** (i) large relatively unmodified area with a wide range of soils and soil-vegetation associations. The forest has a natural treeline.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** area has been burnt; widespread deer and possum sign; road through forest stands

TENURE: stewardship land, pastoral lease, recommended area for protection **OWNER/MANAGER:** Department of Conservation, Argyll Station

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** February 1991

NOTES: Note: nearby Piano Flat Domain has "little native vegetation remaining" (Allen et al. 1989). Includes part Waikaia Forest.

REFERENCES: Dickinson (1988)

(400) Whitcomb-Gem Lake-Argyll Burn

REGIONAL/CITY COUNCIL(S): Southland and Otago **ECOLOGICAL DISTRICTS(S):** 74-02 Umbrella

LOCALITY and GRID REFERENCE: Whitcomb Range, 34 km ESE of Roxburgh F43 043053

AREA(ha): 1800 **ALTITUDE(m):** 600-1453 **RAINFALL(mm):** 1200-2400

TOPOGRAPHY: slightly glaciated fault block mountain range comprising moderately steep, planar or ripply colluvial and bedrock mountain slopes; a deeply incised gorge; and major slumping and earth flow processes **PARENT MATERIAL:** schist bedrock and solifluction detritus, and loess from schist **VEGETATION:** beech forest; snow tussock shrubland; cushionfield; sedgeland; herbfield; rockland

SOILS: upland yellow-brown earths (Carrick Dunstan), organic soils (Kaherekoau)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) a large area including a wide range of relatively undisturbed soils and soil-vegetation associations.

VULNERABILITY: 2 **MODIFICATIONS/THREATS:** abundant deer and possum sign; vehicle damage of wetland bogs; area has been burnt

TENURE: pastoral lease, recommended area for protection **OWNER/MANAGER:** Argyll Station, Whitcomb Station, Gem Lake Station

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** February 1991

NOTES: This is the most outstanding area in Umbrella Ecological District in terms of vegetation, flora, fauna and landform diversity. Vegetation modification is very low.

REFERENCES: Dickinson (1988)

(401) Glenburnie Bush

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 75-01 Gore

LOCALITY and GRID REFERENCE: 10 km SSE of Tapanui G45 209589

AREA(ha): 36 **ALTITUDE(m):** 200-300 **RAINFALL(mm):** 830

TOPOGRAPHY: steep colluvial mountain slopes **PARENT MATERIAL:** tuffaceous greywacke and argillite; outwash gravels and till (Hawera series) **VEGETATION:** podocarp-broadleaved forest; broadleaved scrub

SOILS: lowland yellow-brown earths (Tuapeka)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) lowland yellow-brown earths under kahikatea-dominated forest was much more widespread before European settlement. This reserve is one of the few remaining remnants in Otago (and the only one reserved) and is therefore a valuable soil reference site.

VULNERABILITY: 3

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** April 1990

NOTES: Tuapeka series designation is probably inappropriate.

REFERENCES: Department of Lands and Survey (1984) Allen (1978) McCaskill (1975b)

(402) Kingston Crossing

REGIONAL/CITY COUNCIL(S): Southland **ECOLOGICAL DISTRICTS(S):** 75-01 Gore

LOCALITY and GRID REFERENCE: Riversdale-Kingston Crossing Road, Waimea Plains F45 797658

AREA(ha): 8 **ALTITUDE(m):** 160 **RAINFALL(mm):** 760

TOPOGRAPHY: dune form loess on rolling colluvial hillslopes **PARENT MATERIAL:** loess **VEGETATION:** introduced grassland

SOILS: yellow-grey – yellow-brown earths intergrade (Waikoikoi)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) excellent stratigraphic record of loess and tephra (Kawakawa, Griffins Road Upper, Griffins Road Lower and Mt Curl tephra). (ii) important site for dating terraces below loess, and therefore rate of weathering of terrace deposits (McIntosh et al. 1990ii).

VULNERABILITY: 1

TENURE: private land **OWNER/MANAGER:** Mr Tremaine

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** May 1991

NOTES: Drill site needs covenant covering 10mx10m area.

REFERENCES: McIntosh et al. (1990b)

(403) Knapdale Dune

REGIONAL/CITY COUNCIL(S): Southland **ECOLOGICAL DISTRICTS(S):** 75-01 Gore

LOCALITY and GRID REFERENCE: 2 km SE of Knapdale cross roads F45 955571

AREA(ha): 100 **ALTITUDE(m):** 115-122 **RAINFALL(mm):** 800

TOPOGRAPHY: rolling slopes; loess deposit in form of dune parallel to terrace edge **PARENT MATERIAL:** loess

SOILS: yellow-grey earths (Otama)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) unusual clay lamellae, repeated throughout parent materials. (ii) prolific relic insect burrows, possibly *Eudonia sabulosella*. (iii) inland dune (11 m + deep) gives clue to wind direction in last glaciation and periglacial processes operating. (iv) rare chafer beetle (*Prodentia*) found nearby.

VULNERABILITY: 1 **MODIFICATIONS/THREATS:** fertilised and topdressed

TENURE: private land **OWNER/MANAGER:** Mr C Fiske and other farmers

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** August 1991

NOTES: Core samples S6406-S6413 0-7.2 m held at DSIR Land Resources Taita.

REFERENCES: McIntosh et al. (1990b) Kemp and McIntosh (1989)

(404) Popotunoa Hill Scenic Reserve

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 75-01 Gore

LOCALITY and GRID REFERENCE: 1 km N of Clinton G45 297406

AREA(ha): 54 **ALTITUDE(m):** 180-300 **RAINFALL(mm):** 991

TOPOGRAPHY: steep colluvial hillslopes **PARENT MATERIAL:** colluvium from tuffaceous greywacke and argillite

VEGETATION: podocarp-broadleaved forest; podocarp-broadleaved scrub

SOILS: lowland yellow-brown earths (Owaka)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) northernmost site of soils of tuffaceous greywacke under forest.

VULNERABILITY: 3

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** December 1987

REFERENCES: Department of Lands and Survey (1984) McCaskill (1975b)

(405) Caroline Bush Scenic Reserve

REGIONAL/CITY COUNCIL(S): Southland **ECOLOGICAL DISTRICTS(S):** 76-03 Hokonui

LOCALITY and GRID REFERENCE: two parts – 3 and 7 km N of Dipton E44 529725

AREA(ha): 46.9 **ALTITUDE(m):** 270-600 **RAINFALL(mm):** 780

TOPOGRAPHY: gently-sloping to moderately steep colluvial hillslopes **PARENT MATERIAL:** loess from tuffaceous greywacke **VEGETATION:** podocarp-broadleaved forest; manuka scrub; manuka-broadleaved-beech low forest; beech forest; introduced grassland

SOILS: lowland yellow-brown earths (Owaka)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) important remnant of the formerly more extensive Owaka soils under silver beech forest. (ii) includes lowland yellow-brown earth under a range of forest communities.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** sheep, stock and feral pig damage

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** July 1991

NOTES: Other part is at GR: E44 547716.

REFERENCES: Allen et al. (1989)

(406) Croydon Bush Domain

REGIONAL/CITY COUNCIL(S): Otago **ECOLOGICAL DISTRICTS(S):** 76-03 Hokonui

LOCALITY and GRID REFERENCE: 6 km NW of Gore F45 910527

AREA(ha): 957 **ALTITUDE(m):** 150-630 **RAINFALL(mm):** 1000

TOPOGRAPHY: steep colluvial hillslopes and ridges; remnant gravel terraces **PARENT MATERIAL:** Triassic tuffaceous sandstone, siltstone, zeolitised tuff and conglomerate and derived colluvium **VEGETATION:** podocarp forest; podocarp-broadleaved forest; broadleaved scrub

SOILS: lowland yellow-brown earths (Kaiwera Owaka)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) a moderate range of soil-vegetation associations, across a strong rainfall gradient.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** parts have been logged; tracks; facilities

TENURE: domain **OWNER/MANAGER:** Gore Borough Council

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** April 1990

REFERENCES: Allen et al. (1989) McCaskill (1975c)

(407) Glenure Scenic Reserve and Private Protecte

REGIONAL/CITY COUNCIL(S): Southland **ECOLOGICAL DISTRICTS(S):** 76-03 Hokonui

LOCALITY and GRID REFERENCE: 17 km SSE of Lumsden. E44 595708

AREA(ha): 40 **ALTITUDE(m):** 240-430 **RAINFALL(mm):** 780

TOPOGRAPHY: moderately steep colluvial hillslopes **PARENT MATERIAL:** tuffaceous sandstone and basalt conglomerate **VEGETATION:** podocarp/broadleaved forest; broadleaved scrub and forest; red tussock/harakeke scrub; introduced grassland

SOILS: lowland yellow-brown earths (Kaiwera Kaihiku)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) good example of lowland yellow-brown earths in tuffaceous greywacke under a variety of vegetation types that have been little modified. (ii) the lowland yellow-brown earth – podocarp/broadleaved forest association was formerly nationally more extensive, but is now much reduced owing to logging and pastoral development. Kaiwera and Kaihiku soils are extensive in Southland; sites under original vegetation are uncommon.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** noxious weeds are a problem (especially gorse); has been grazed; track; crossed by road

TENURE: scenic reserve, private land **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** April 1990

REFERENCES: Department of Lands and Survey (1984) McIntosh (1986) Allen et al. (1989) McIntosh (1988) McCaskill (1975b)

(408) Otapiri Scenic Reserve

REGIONAL/CITY COUNCIL(S): Southland **ECOLOGICAL DISTRICTS(S):** 76-03 Hokonui

LOCALITY and GRID REFERENCE: 15 km N of Winton E45 602421

AREA(ha): 17.5 **ALTITUDE(m):** 152-183 **RAINFALL(mm):** 1220

TOPOGRAPHY: very steep colluvial hillslopes and flat valley floor **PARENT MATERIAL:** tuffaceous greywacke and derived loess and colluvium **VEGETATION:** podocarp-broadleaved forest; introduced grassland; broadleaved forest

SOILS: lowland yellow-brown earths (Owaka Waimahaka)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) contains the now rather rare lowland yellow-brown earth – kowhai/ribbonwood association, and transition associations to soils under podocarp forest.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** minor cattle damage

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** July 1991

REFERENCES: Allen et al. (1989) McCaskill (1975c)

(409) Southland District Council Open Space Coven

REGIONAL/CITY COUNCIL(S): Southland **ECOLOGICAL DISTRICTS(S):** 76-03 Hokonui

LOCALITY and GRID REFERENCE: 18 km N of Winton E45 510593

AREA(ha): 6.9 **ALTITUDE(m):** 85-115 **RAINFALL(mm):** 800-1200

TOPOGRAPHY: colluvial floodplain **PARENT MATERIAL:** alluvium from greywacke and tuffaceous greywacke **VEGETATION:** kowhai shrubland

SOILS: gley recent soils (Makarewa)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) best remaining example of gley recent soils under kowhai shrubland in Southland. This association was formerly much more extensive.

VULNERABILITY: 3

TENURE: esplanade reserve, freehold, QEII National Trust open space covenant **OWNER/MANAGER:** Southland

District Council, QEII National Trust

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** July 1991

NOTES: The site is the most natural of six similar adjoining sites covered by QEII National Trust open space covenants.

REFERENCES: QEII National Trust (Southland) file 5/13/28

(410) Waitutu Forest and Maori Land

REGIONAL/CITY COUNCIL(S): Southland **ECOLOGICAL DISTRICTS(S):** 77-01 Waitutu

LOCALITY and GRID REFERENCE: southern coast of South Island, Port Craig to Lake Hakapoua C46 543270

AREA(ha): 50 000 **ALTITUDE(m):** 0-570 **RAINFALL(mm):** 1500-4800

TOPOGRAPHY: terraces and colluvial rolling land **PARENT MATERIAL:** loess and colluvium derived from Fiordland complex and Tertiary rocks

SOILS: lowland podzolised yellow-brown earths (Mataura), lowland yellow-brown earths (Hauroko), organic soils (Kaherekoau), gley recent soils (Makarewa), recent soils (Seaforth)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) extensive soils on marine terraces and river terraces with native forest cover are extremely rare.(ii) soils are well characterised. (iii) potentially important site for dating marine and river terraces using loess in a region of moderate uplift.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** history of selective logging near Port Craig.

TENURE: stewardship land, Maori land **OWNER/MANAGER:** Department of Conservation, Waitutu Incorporation

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** August 1991

NOTES: Ex-state forest land is being considered for inclusion into Fiordland National Park, but could revert to Maori ownership. Coastal strip is Maori land and was recently the subject of a chipping proposal.

REFERENCES: Bruce (1984)

(411) Lonekers Bush Scenic Reserve

REGIONAL/CITY COUNCIL(S): Southland **ECOLOGICAL DISTRICTS(S):** 77-02 Tuatapere

LOCALITY and GRID REFERENCE: 20 km N of Tuatapere D45 998599

AREA(ha): 62 **ALTITUDE(m):** 90-120 **RAINFALL(mm):** 965

TOPOGRAPHY: two terraces and intervening riser **PARENT MATERIAL:** gravelly alluvium from tuffaceous greywacke and basic volcanic rocks **VEGETATION:** podocarp forest; podocarp-broadleaved forest; manuka scrub; introduced scrub

SOILS: brown granular loam/clay - yellow-brown earths integrate (Glenelg), lowland yellow-brown earths (Mangapiri)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) lowland podocarp forest on stony terrace gravel soils outside West Coast and Fiordland is rare.(ii) possibly the only remaining site where Mangapiri soil is protected under native vegetation.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** parts have been logged

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** April 1990

REFERENCES: O'Byrne (1986) Allen et al. (1989) Department of Lands and Survey (1984)

(412) Otahu Scenic Reserve

REGIONAL/CITY COUNCIL(S): Southland **ECOLOGICAL DISTRICTS(S):** 77-02 Tuatapere

LOCALITY and GRID REFERENCE: 16 km N of Tuatapere D45 003549

AREA(ha): 13 **ALTITUDE(m):** 61 **RAINFALL(mm):** 965

TOPOGRAPHY: flat terrace tread **PARENT MATERIAL:** gravelly alluvium from tuffaceous greywacke and volcanic rocks. **VEGETATION:** podocarp forest

SOILS: brown granular loam/clay - yellow-brown earths intergrade (Glenelg)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) lowland podocarp forest on stony terrace soils outside West Coast and Fiordland is rare. This soil-vegetation association that was once widespread on the lower terraces of the Waiau River.

VULNERABILITY: 3

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** April 1990

REFERENCES: Department of Lands and Survey (1984) O'Byrne (1986) Allen et al. (1989) McCaskill (1975c)

(413) Piko Piko West Scenic Reserve

REGIONAL/CITY COUNCIL(S): Southland **ECOLOGICAL DISTRICTS(S):** 77-02 Tuatapere

LOCALITY and GRID REFERENCE: 5 km NE of Tuatapere D45 009424

AREA(ha): 11 **ALTITUDE(m):** 25 **RAINFALL(mm):** 1163

TOPOGRAPHY: flat outwash terrace tread and riser and moraines, floodplain **PARENT MATERIAL:** gravelly alluvium from greywacke and basal volcanic rocks, till **VEGETATION:** broadleaved forest; beech forest; beech-podocarp forest

SOILS: lowland yellow-brown earths (Papatotara), recent soils (Tuatapere)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) lowland podocarp forest on stony terrace soil outside West Coast and Fiordland is rare.(ii) together with nearby Tuatapere Scenic Reserve offers an opportunity for studying soil development sequences on surfaces of different ages.

VULNERABILITY: 3

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** April 1990

REFERENCES: O'Byrne (1986) Allen et al. (1989) McCaskill (1975c)

(414) Tuatapere Scenic Reserve

REGIONAL/CITY COUNCIL(S): Southland **ECOLOGICAL DISTRICTS(S):** 77-02 Tuatapere

LOCALITY and GRID REFERENCE: adjacent to lower Waiau River, 2 km N of Tuatapere D45 994420

AREA(ha): 128 **ALTITUDE(m):** 15-46 **RAINFALL(mm):** 1163

TOPOGRAPHY: series of flat terraces **PARENT MATERIAL:** silt and gravel alluvium from tuffaceous greywacke and basic volcanic rocks **VEGETATION:** beech forest; beech-podocarp forest; introduced grassland

SOILS: recent soils (Tuatapere Papatotara), brown granular loam/clay – yellow-brown earths intergrade (Drummond Glenelg), gley recent soils (Alton)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) an excellent site for preserving soil and vegetation changes with increasing landform age. Similar sequences of lowland terrace beech/podocarp forest are rare in New Zealand, and throughout the world.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** crossed by SH 96 and Tuatapere Domain; stock grazing; picnic and camping facilities and tracks

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** April 1990

NOTES: Also at GR: D46 990395.

REFERENCES: O'Byrne (1986) Allen et al. (1989) Department of Lands and Survey (1984) McCaskill (1975c)

(415) Longwood Forest

REGIONAL/CITY COUNCIL(S): Southland **ECOLOGICAL DISTRICTS(S):** 77-03 Longwood

LOCALITY and GRID REFERENCE: upper slopes of the Longwood Range D46 130270

AREA(ha): 23 400 **ALTITUDE(m):** 80-800 **RAINFALL(mm):** 1200-1600

TOPOGRAPHY: steep colluvial hillslopes, rolling hilltops **PARENT MATERIAL:** Longwood intrusives (basic rocks) and loess

SOILS: upland podzolised yellow-brown earth and podzols (Longwood), lowland podzolised yellow-brown earth and podzols (Trail)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) large area of soils under little-disturbed vegetation. (ii) pollen record of peats on hilltops described in McGlone and Bathgate (1983).

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** tracks, deer present

TENURE: stewardship land **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** August 1991

REFERENCES: McGlone and Bathgate (1983)

(416) Mathieson Open Space Covenant

REGIONAL/CITY COUNCIL(S): Southland **ECOLOGICAL DISTRICTS(S):** 77-03 Longwood

LOCALITY and GRID REFERENCE: 15 km E of Riverton D46 106184

AREA(ha): 63.5 **ALTITUDE(m):** 35-45 **RAINFALL(mm):** 1200

TOPOGRAPHY: rolling colluvial hillslopes **PARENT MATERIAL:** tuffaceous greywacke and soft sandstones and mudstones **VEGETATION:** podocarp forest

SOILS: lowland yellow-brown earths (Hauroko), lowland podzolised yellow-brown earths and podzols (Hinahina)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) site displays the contrast between Hauroko and Hinahina soils.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** parts have been logged; formerly heavily modified by cattle **TENURE:** freehold, QEII National Trust open space covenant **OWNER/MANAGER:** JA and R Mathieson, QEII National Trust

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** July 1991

REFERENCES: QEII National Trust (Southland) file 5/13/2 vspace-6.0mm

(417) Drummond Swamp Government Purpose Reserve

REGIONAL/CITY COUNCIL(S): Southland **ECOLOGICAL DISTRICTS(S):** 78-01 Southland Plains

LOCALITY and GRID REFERENCE: 5 km SW of Winton E46 392375

AREA(ha): 256 **ALTITUDE(m):** 60 **RAINFALL(mm):** 900

TOPOGRAPHY: peat dome **PARENT MATERIAL:** peat **VEGETATION:** rushland; introduced grassland

SOILS: organic soils (Andrews)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) lowland organic soils under native vegetation are nationally uncommon. This is the largest area of protected lowland organic soil in inland Southland.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** introduced plants

TENURE: government purpose reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** April 1990

REFERENCES: Department of Lands and Survey (1984) McIntosh (1988)

(418) Edendale Scenic Reserve

REGIONAL/CITY COUNCIL(S): Southland **ECOLOGICAL DISTRICTS(S):** 78-01 Southland Plains

LOCALITY and GRID REFERENCE: 4 km SW Edendale F46 812235

AREA(ha): 64 **ALTITUDE(m):** 60-75 **RAINFALL(mm):** 996

TOPOGRAPHY: gently rolling colluvial hillslopes with shallow gullies **PARENT MATERIAL:** loess **VEGETATION:** podocarp-broadleaved forest; introduced grassland; flaxland

SOILS: lowland yellow-brown earths (Mokotua)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) important large area allowing study of catenary soil sequences under natural vegetation in an otherwise intensively farmed district. The lowland yellow-brown earth – podocarp forest association was formerly much more extensive but has been much reduced by logging and pastoral development.

VULNERABILITY: 3

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** April 1990

NOTES: Forms part of a soil sequence together with Waikiwi and Edendale soils. Needs soil survey to establish range of soils present.

REFERENCES: Department of Lands and Survey (1984) Allen et al. (1989) McCaskill (1975c)

(419) Forest Hill Scenic Reserve

REGIONAL/CITY COUNCIL(S): Southland **ECOLOGICAL DISTRICTS(S):** 78-01 Southland Plains

LOCALITY and GRID REFERENCE: 8 km S of Winton E46 578338

AREA(ha): 579 **ALTITUDE(m):** 60-250 **RAINFALL(mm):** 927

TOPOGRAPHY: colluvial hillslopes including limestone caves and outcrops and derived colluvium **PARENT MATERIAL:** limestone, loess from tuffaceous greywacke **VEGETATION:** podocarp-broadleaved forest; broadleaved forest

SOILS: rendzina and related soils (Kauana), lowland yellow-brown earths (Owaka Southdown), yellow-grey – yellow-brown earths integrate (Pukemutu)

IMPORTANCE: 1 **SIGNIFICANCE:** (i) the reserve is notable for the moderate range of soils (including soils on limestone and soils developed on loess from tuffaceous greywacke) and soil-vegetation associations. (ii) this is one of the few sites in New Zealand where podocarp forest remains on yellow-grey earths derived from loess. Internationally, yellow-grey earths derived from loess are uncommon – particularly sites with native vegetation cover.

VULNERABILITY: 3

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** April 1990

NOTES: The reserve is in two parts – the other is GR: E46 572376.

REFERENCES: Allen et al. (1989) McCaskill (1975c) New Zealand Soil Bureau (1968) Ross et al. (1988) McIntosh (1989b) Department of Lands and Survey (1984)

(420) Kerrs Bush Protected Private Land

REGIONAL/CITY COUNCIL(S): Southland **ECOLOGICAL DISTRICTS(S):** 78-01 Southland Plains

LOCALITY and GRID REFERENCE: 9 km NE of Invercargill E46 583163

AREA(ha): 6.6 **ALTITUDE(m):** 15 **RAINFALL(mm):** 1042

TOPOGRAPHY: flat terraces **PARENT MATERIAL:** loess on marine gravels **VEGETATION:** broadleaved-podocarp forest

SOILS: lowland yellow-brown earths (Waikiwi)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) lowland yellow-brown earths under pokaka-kahikatea forest are now quite rare. (ii) reference area for surrounding Waikiwi soils.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** has been logged and grazed; many introduced plants present

TENURE: protected private land **OWNER/MANAGER:** Mr GA Kerr

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** April 1990

REFERENCES: New Zealand Soil Bureau (1968) Department of Lands and Survey (1984) Allen et al. (1989)

(421) Kingswood Bush Scenic Reserve

REGIONAL/CITY COUNCIL(S): Southland **ECOLOGICAL DISTRICTS(S):** 78-01 Southland Plains

LOCALITY and GRID REFERENCE: 15 km NE of Invercargill E46 696184

AREA(ha): 7.7 **ALTITUDE(m):** 30 **RAINFALL(mm):** 1014

TOPOGRAPHY: rolling colluvial hillslopes **PARENT MATERIAL:** Pleistocene outwash gravels (Wanganui series)

VEGETATION: podocarp-broadleaved forest; broadleaved forest; introduced grassland

SOILS: lowland yellow-brown earths (Waikiwi), gley soils (Otepuni Dacre)

IMPORTANCE: 1 **SIGNIFICANCE:** (i) possibly the only remaining site for Waikiwi soils under original forest cover. These soils cover 51 000 ha of the Southland Plains and have been almost entirely developed for intensive grazing. Lowland soils with native forest cover are internationally rare.

VULNERABILITY: 3

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** April 1990

NOTES: Forms soil sequence together with Seaward Downs and Edendale Reserves (Mokotua soils).

REFERENCES: Bruce (1977) Department of Lands and Survey (1984) Allen et al. (1989) McCaskill (1975c)

(422) Mabel Bush Scenic Reserve

REGIONAL/CITY COUNCIL(S): Southland **ECOLOGICAL DISTRICTS(S):** 78-01 Southland Plains

LOCALITY and GRID REFERENCE: 30 km N of Winton E46 625306

AREA(ha): 65 **ALTITUDE(m):** 30-60 **RAINFALL(mm):** 927

TOPOGRAPHY: flat terrace and floodplain, abandoned river channels, moraine **PARENT MATERIAL:** outwash gravels and clays, till **VEGETATION:** podocarp-broadleaved forest; manuka-podocarp forest; podocarp forest; manuka scrub

SOILS: lowland yellow-brown earths (Titipua Southdown), gley recent soils (Makarewa)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) outstanding example of a soil sequence of poorly-drained Makarewa soils to better drained Southdown soils (with associated native vegetation changes). Lowland yellow-brown earth and gley recent soils with original vegetation cover are now uncommon in Southland, as well as nationally.

VULNERABILITY: 3

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** April 1990

NOTES: The reserve in two parts – the other is at GR: E46 643282.

REFERENCES: Department of Lands and Survey (1984) Allen et al. (1989) Ross et al. (1988) McIntosh (1988) McCaskill (1975c)

(423) Mararua Bush

REGIONAL/CITY COUNCIL(S): Southland **ECOLOGICAL DISTRICTS(S):** 78-01 Southland Plains

LOCALITY and GRID REFERENCE: 2 km NW of Edendale F46 838255

AREA(ha): 24 **ALTITUDE(m):** 40 **RAINFALL(mm):** 1000

TOPOGRAPHY: flat terrace **PARENT MATERIAL:** loess **VEGETATION:** podocarp-broadleaved forest

SOILS: lowland yellow-brown earths (Edendale)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) only known site of native forests on Edendale soils. The forest has never been logged.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** has been browsed by cattle for many years; natural water level appears to have been lowered substantially by deep farm drains; elderberry and sycamore are present

TENURE: private land **OWNER/MANAGER:** Mr DG Crawford

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** April 1990

NOTES: Forms a sequence with Waikiwi and Mokotua soils in Kingswood Bush and Edendale/Seaward Downs Scenic Reserves

(424) Otatara South Scenic Reserve

REGIONAL/CITY COUNCIL(S): Southland **ECOLOGICAL DISTRICTS(S):** 78-01 Southland Plains

LOCALITY and GRID REFERENCE: 6.5 km SW of Invercargill, adjacent to Oreti River estuary E47 485095

AREA(ha): 18 **ALTITUDE(m):** 0-10 **RAINFALL(mm):** 1042

TOPOGRAPHY: terrace, floodplain, sanddunes **PARENT MATERIAL:** marine sands, alluvium and aeolian deposits

VEGETATION: podocarp forest; broadleaved scrub/low forest

SOILS: yellow-brown sands (Otatara)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) yellow-brown sands under Halls totara forest were formerly much more extensive, but more or less confined to this area. Yellow-brown sands with native forest cover are now nationally rare.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** recovering from heavy stock use; gorse present; has been logged; still grazed by sheep, cattle and possums

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** April 1990
REFERENCES: New Zealand Soil Bureau (1968) Allen et al. (1989)

(425) Seaward Downs Scenic Reserve

REGIONAL/CITY COUNCIL(S): Southland **ECOLOGICAL DISTRICTS(S):** 78-01 Southland Plains
LOCALITY and GRID REFERENCE: 9 km SW of Edendale. F46 797185
AREA(ha): 25 **ALTITUDE(m):** 60 **RAINFALL(mm):** 996
TOPOGRAPHY: flat to gently rolling terrace, some shallow gullies **PARENT MATERIAL:** loess over alluvium
VEGETATION: podocarp-broadleaved forest; broadleaved forest; introduced grassland
SOILS: lowland yellow-brown earths (Mokotua)
IMPORTANCE: 2 **SIGNIFICANCE:** (i) one of Southland's "showpiece" reserves (Allen et al. 1989). Excellent and largely intact example of the original lowland yellow-brown earth - podocarp/broadleaved forest association (now much reduced elsewhere through logging and pastoral farming).(ii) large important area allowing study of catenary soil sequences under natural vegetation in an otherwise intensively farmed district.
VULNERABILITY: 3 **MODIFICATIONS/THREATS:** walking tracks; picnic area
TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** April 1990
NOTES: Forms part of a soil sequence together with Waikiwi and Edendale soils. Needs soil survey to establish range of soils present.
REFERENCES: Department of Lands and Survey (1984) Allen et al. (1989) McCaskill (1975c)

(426) Swales Bush Scenic Reserve

REGIONAL/CITY COUNCIL(S): Southland **ECOLOGICAL DISTRICTS(S):** 78-01 Southland Plains
LOCALITY and GRID REFERENCE: 9 km N of Winton E45 491496
AREA(ha): 14 **ALTITUDE(m):** 92 **RAINFALL(mm):** 780
TOPOGRAPHY: flat outwash terrace and moraine **PARENT MATERIAL:** alluvium from schist, greywacke and tuffaceous greywacke; minor till **VEGETATION:** podocarp-broadleaved forest; podocarp-elderberry forest; podocarp-elderberry-broadleaved forest
SOILS: recent soils (Mataura), gley recent soils (Makarewa)
IMPORTANCE: 3 **SIGNIFICANCE:** (i) this is the only protected natural area of a podocarp forest type which formerly covered a much larger area of Recent soils in Southland, and which has now almost completely disappeared.
VULNERABILITY: 3
TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation
CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** April 1990
NOTES: The reserve is in two parts - the other is at GR: E45 496497.
REFERENCES: McIntosh (1988) Allen et al. (1989) McIntosh (1989b) Department of Lands and Survey (1984)

(427) Turnbolls Bush

REGIONAL/CITY COUNCIL(S): Southland **ECOLOGICAL DISTRICTS(S):** 78-01 Southland Plains
LOCALITY and GRID REFERENCE: 24 km N of Invercargill E46 613305
AREA(ha): 34 **ALTITUDE(m):** 25 **RAINFALL(mm):** 930
TOPOGRAPHY: flat floodplain **PARENT MATERIAL:** alluvium from tuffaceous greywacke **VEGETATION:** podocarp forest; sedgeland
SOILS: gley recent soils (Makarewa)
IMPORTANCE: 1 **SIGNIFICANCE:** (i) one of the largest areas remaining of podocarp forest on Makarewa soils on floodplains in Southland. This association was formerly much more extensive but almost all has been milled or selectively logged. (ii) lowland soils with original forest cover are uncommon internationally.
VULNERABILITY: 2
TENURE: private land, open space convenat near formal registration **OWNER/MANAGER:** DPF and P Turnbull
CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** April 1990
REFERENCES: Rance (1990)

(428) Wyndham Scenic Reserve

REGIONAL/CITY COUNCIL(S): Southland **ECOLOGICAL DISTRICTS(S):** 78-01 Southland Plains
LOCALITY and GRID REFERENCE: 3.5 km S of Wyndham F46 892182
AREA(ha): 68 **ALTITUDE(m):** 30-100 **RAINFALL(mm):** 996
TOPOGRAPHY: flat-rolling colluvial hillslopes with broad ridges, separated by steep gullies **PARENT MATERIAL:** outwash gravel, till and loess **VEGETATION:** podocarp forest; broadleaved forest; introduced grassland
SOILS: lowland yellow-brown earths (Kaiwera), recent soils (Mataura)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) one of the few sites on this inventory which represents Kaiwera soils. These are extensive in Southland, but sites under original vegetation are uncommon.

VULNERABILITY: 3

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** April 1990

REFERENCES: Department of Lands and Survey (1984) McIntosh (1988) Allen et al. (1989) McIntosh (1989b) McCaskill (1975c)

(429) Gorge Road Scenic Reserve

REGIONAL/CITY COUNCIL(S): Southland **ECOLOGICAL DISTRICTS(S):** 78-02 Waituna

LOCALITY and GRID REFERENCE: beside Mataura River, 30 km ESE of Invercargill F47 825065

AREA(ha): 19.2 **ALTITUDE(m):** 30 **RAINFALL(mm):** 1070

TOPOGRAPHY: flat river terrace, oxbow lake **PARENT MATERIAL:** Recent alluvium, estuary and swamp deposits

VEGETATION: podocarp-broadleaved forest; podocarp forest; introduced grassland

SOILS: recent soils (Mataura)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) contains the only example of recent river terrace soils under kahikatea/ribbonwood forest in Southland. (ii) Mataura soils cover approximately 70 000 ha but very few areas remain under native vegetation.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** grazed by stock; drains nearby

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** July 1991

REFERENCES: Allen et al. (1989)

(430) Waituna - Seawards Moss

REGIONAL/CITY COUNCIL(S): Southland **ECOLOGICAL DISTRICTS(S):** 78-02 Waituna

LOCALITY and GRID REFERENCE: at Bluff, 20 km SE Invercargill F47 717961

AREA(ha): 11 000 **ALTITUDE(m):** 0-10 **RAINFALL(mm):** 1070

TOPOGRAPHY: freshwater lagoon; gravel bar; low-lying peat bogs **PARENT MATERIAL:** peat; marine gravels and sands **VEGETATION:** manuka-Dracophyllum-fern-rush bog; aquatic vegetation; rushland; red tussock grassland; sandfield

SOILS: organic soils (Otanomomo Invercargill), yellow-brown sands (Otatarā), lowland podzolised yellow-brown earths and podzols (Tisbury)

IMPORTANCE: 1 **SIGNIFICANCE:** (i) contains a moderate range of wetland soils under relatively unmodified vegetation communities including uncommon red tussock grassland on sand dunes. (ii) the most extensive area of protected coastal organic soils in the South Island (and possibly in New Zealand).

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** huts squatting on reserve; large numbers of black-backed gulls attracted to nearby rubbish dumps and effluent have resulted in increased fertility of ecosystems that are naturally low and helped to increase abundance of introduced plants; lagoon used by hunters and fishers; threatened by spread of gorse and lignite mining; parts have been drained and burned

TENURE: scientific reserve; stewardship land; conservation covenant **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Brian Patrick **DATE OF INFORMATION:** April 1990

NOTES: Waituna Wetland Scientific Reserve has been designated under IUCN charter as a wetland of international importance.

REFERENCES: Department of Lands and Survey (1984) Stevenson (1986) Cutler (1957) Allen et al. (1989) McCaskill (1975c)

(431) Bluff Scenic Reserve

REGIONAL/CITY COUNCIL(S): Southland **ECOLOGICAL DISTRICTS(S):** 79-01 Foveaux

LOCALITY and GRID REFERENCE: Bluff Hill at entrance to Bluff Harbour E47 531889

AREA(ha): 150 **ALTITUDE(m):** 0-265 **RAINFALL(mm):** 1145

TOPOGRAPHY: colluvial hillslopes and tops **PARENT MATERIAL:** tuffaceous greywacke sand over norite and ultrabasic rocks **VEGETATION:** broadleaved forest; podocarp-broadleaved forest; broadleaved scrub; manuka scrub; gorse and broom scrub; manuka-Dracophyllum scrub; fernland

SOILS: lowland podzolised yellow-brown earths and podzols (Omaui)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) the only representation on this inventory of Omaui soils. (ii) an almost unmodified remnant of a soil-vegetation association once more widespread on the coastal hills.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** walking tracks; trail bike and cattle damage

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** July 1991

REFERENCES: Allen et al. (1989) McCaskill (1975c)

(432) Anglem Nature Reserve

REGIONAL/CITY COUNCIL(S): Southland **ECOLOGICAL DISTRICTS(S):** 79-02 Anglem

LOCALITY and GRID REFERENCE: northern Stewart Island D48 200700

AREA(ha): 16 997 **ALTITUDE(m):** 0-980 **RAINFALL(mm):** 2500

TOPOGRAPHY: colluvial mountain slopes; colluvial and bedrock mountain tops; sandy beach; cirque basins; tarns

PARENT MATERIAL: diorite and derived colluvium and alluvium **VEGETATION:** podocarp-broadleaved forest; Dracophyllum scrub; manuka forest; turfand; cushionfield

SOILS: subalpine podzolised yellow-brown earth – organic soil intergrades (Anglem Murray), lowland podzolised yellow-brown earths and podzols (Rakiura), organic soils (Kaherekoau), gley soils (Scott-Burn), recent soils (Topeheti), yellow-brown sands (Riverton), alpine steepland soils, etc. (Alpine)

IMPORTANCE: 1 **SIGNIFICANCE:** (i) large area including a wide range of soils under native vegetation communities.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** grazed by whitetail deer, red deer and possum; some small areas have been burned; walking tracks

TENURE: nature reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Phil Tonkin **DATE OF INFORMATION:** February 1991

REFERENCES: Meurk and Wilson (1989) Leamy (1974) McCaskill (1975c)

(433) Mason Bay

REGIONAL/CITY COUNCIL(S): Southland **ECOLOGICAL DISTRICTS(S):** 79-04 Mt Allen

LOCALITY and GRID REFERENCE: west coast, Stewart Island D48 120530

AREA(ha): 800 **ALTITUDE(m):** 0-250 **RAINFALL(mm):** 2400

TOPOGRAPHY: sand dunes **PARENT MATERIAL:** aeolian deposits **VEGETATION:** sandfield; sandy stonefield; broadleaved forest

SOILS: yellow-brown sands (Riverton), yellow-brown sand – podzol intergrades (Tolson)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) outstanding example of soil development sequences on sands of different age (important for studies of buried soils, ventifacts and wind erosion processes).

VULNERABILITY: 1

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Peter McIntosh **DATE OF INFORMATION:** April 1990

REFERENCES: Wilson (1987)

(434) Pegasus Nature Reserve

REGIONAL/CITY COUNCIL(S): Southland **ECOLOGICAL DISTRICTS(S):** 79-04 Mt Allen

LOCALITY and GRID REFERENCE: centred around Tin Range, Stewart Island C49 150340

AREA(ha): 67 441 **ALTITUDE(m):** 0-750 **RAINFALL(mm):** 3000

TOPOGRAPHY: colluvial and minor bedrock mountain slopes; granite domes; rocky coastline; minor snaddunes

PARENT MATERIAL: mostly granite and derived colluvium; some high level beach and sand gravel; some alluvium **VEGETATION:** podocarp-broadleaved forest; broadleaved scrub; podocarp forest; manuka forest; rush-manuka shrubland

SOILS: subalpine yellow-brown earth – organic soil intergrades (Kopeka Deceit), lowland podzolised yellow-brown earths and podzols (Paterson), organic soils (Kaherekoau Kini Otanomomo), alpine steepland soils, etc. (Benbecula Alpine), recent soils (Tikotatahi), subant./southern podzolised yellow-brown earth – organic soil inter. (Waianiwa Pearl), yellow-brown sand – podzol intergrades (Tolson)

IMPORTANCE: 1 **SIGNIFICANCE:** (i) an extensive area containing a wide range of soil types under native vegetation. (ii) includes unique soil-vegetation associations.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** parts have been burned; parts have been mined for tin; mining relics; grazed by whitetail deer and possums

TENURE: nature reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Phil Tonkin **DATE OF INFORMATION:** February 1991

REFERENCES: Meurk and Wilson (1989) Leamy (1974) McCaskill (1975c)

(435) Rakeahua Scenic Reserve

REGIONAL/CITY COUNCIL(S): Southland **ECOLOGICAL DISTRICTS(S):** 79-04 Mt Allen

LOCALITY and GRID REFERENCE: south-west arm Paterson Inlet, central Stewart Island D49 220480

AREA(ha): 6552 **ALTITUDE(m):** 0-681 **RAINFALL(mm):** 2000-3000

TOPOGRAPHY: moderately steep colluvial mountain slopes and tops; valley floor swamps **PARENT MATERIAL:** granite and minor schist and derived colluvium and alluvium **VEGETATION:** podocarp-broadleaved forest; manuka scrub; manuka-Dracophyllum-broadleaved scrub; moorland

SOILS: lowland podzolised yellow-brown earths and podzols (Paterson Pikaroro Hapuatuna), subant./southern podzolised yellow-brown earth – organic soil inter. (Waianiwa), organic soils (Kini Kaherekoau), subalpine yellow-brown earth –

organic soil intergrades (Kopeka), yellow-brown sand – podzol intergrades (Tolson)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) contains a wide range of relatively unmodified soils and soil-vegetation associations.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** walking tracks and huts; deer

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Phil Tonkin **DATE OF INFORMATION:** June 1991

REFERENCES: Meurk and Wilson (1989) McCaskill (1975c) Leamy (1974)

(436) Snares Island

REGIONAL/CITY COUNCIL(S): none **ECOLOGICAL DISTRICTS(S):** 79-06 Snares

LOCALITY and GRID REFERENCE: 200 km SW of Bluff

AREA(ha): 243 **ALTITUDE(m):** 0-130 **RAINFALL(mm):** 1200

TOPOGRAPHY: main island is a plateau with a cliffed coastline having many rocky promontories. **PARENT MATERIAL:** mainly peat (and guano); granite **VEGETATION:** *Olearia lyallii* forest and scrub; short tussock grassland

SOILS: organic soils, lowland podzolised yellow-brown earths and podzols

IMPORTANCE: 1 **SIGNIFICANCE:** (i) one of the least disturbed sites on Earth.(ii) one of the few sites in New Zealand where the actions of burrowing birds are an important part of the soil formation process.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** scientific research station; no introduced mammals

TENURE: nature reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Iain Campbell **DATE OF INFORMATION:** June 1991

NOTES: Comprises one main island (called North East Island), one smaller one and several islets. Topographic map is NZMS 272/1&5 (1:25 000). Location is longitude 166 36'E, latitude 48 01'S.

REFERENCES: McEwen (1987) McCaskill (1975c)

(437) Rangaika Scenic Reserve

REGIONAL/CITY COUNCIL(S): Chatham Island District **ECOLOGICAL DISTRICTS(S):** 80-01 Chathams

LOCALITY and GRID REFERENCE: southern Chatham Island CI 550440

AREA(ha): 406 **ALTITUDE(m):** 0-263 **RAINFALL(mm):** 1200

TOPOGRAPHY: shallowly dissected plateau; colluvial hillslopes; steep coastal cliffs and gullies **PARENT MATERIAL:** peat; basalt and derived colluvium **VEGETATION:** broadleaved scrub; *Dracophyllum*-broadleaved forest and scrub; *Dracophyllum*-fern forest and scrub; introduced grassland

SOILS: organic soils (Awainunga), brown granular loams and clays (Mangahu), alpine steep land soils, etc. (Awatapu)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) a large reserve containing remnants of formerly more widespread soil-vegetation associations.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** has been burned and grazed (by sheep, pigs and cattle)

TENURE: scenic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Phil Tonkin **DATE OF INFORMATION:** June 1991

REFERENCES: Kelly (1983) Given and Williams (1984) Wright (1959)

(438) Rangitira Nature Reserve

REGIONAL/CITY COUNCIL(S): Chatham Island District **ECOLOGICAL DISTRICTS(S):** 80-01 Chathams

LOCALITY and GRID REFERENCE: 40 km SE from Chatham Island CI 760110

AREA(ha): 250 **ALTITUDE(m):** 0-120 **RAINFALL(mm):** 1200

TOPOGRAPHY: moderately steep to very steep colluvial hillslopes; very steep coastal cliffs; rocky shore **VEGETATION:** broadleaved forest and scrub; herbfield; turf land; fernland; introduced grassland

SOILS: brown granular loams and clays (Tiki Rangitahi Awatapu)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) soils that are formed partly as a result of the activities of burrowing birds are nationally rare. The soils are affected by physical disturbance and by being chemically modified through guano deposits and introduction of organic matter into the subsurface horizons.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** sheep farming – sheep removed between 1958-1961; vigorous explosion of forest into old pastures

TENURE: nature reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Phil Tonkin **DATE OF INFORMATION:** June 1991

NOTES: Also called South East Island.

REFERENCES: Kelly (1983) Park (1980) Wright (1959)

(439) Southern Tablelands

REGIONAL/CITY COUNCIL(S): Chatham Island District **ECOLOGICAL DISTRICTS(S):** 80-01 Chathams

LOCALITY and GRID REFERENCE: southern end Chatham Island CI 430400

AREA(ha): 6000 ALTITUDE(m): 0-299 RAINFALL(mm): 1000-1500

TOPOGRAPHY: gently-sloping, shallowly-dissected plateau; peat domes; lakes; cliffed southern coastline **PARENT MATERIAL:** peat; basalt and derived colluvium **VEGETATION:** *Dracophyllum* forest and scrub; fern forest; rushland; introduced grassland; fern-shrubland; fernland

SOILS: organic soils (Awainunga Rekohu-Awainunga), brown granular loams and clays (Mangahu Tiki Tuku Hokopai), alpine steepland soils, etc. (Awatapu)

IMPORTANCE: 2 **SIGNIFICANCE:** (i) contains a wide range of relatively undisturbed soil-vegetation associations. The "key" vegetation conservation area on Chatham Island (Given and Williams 1984).

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** parts have been burned and grazed; threatened by peat mining

TENURE: scenic reserve, freehold **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Phil Tonkin **DATE OF INFORMATION:** June 1991

REFERENCES: Given and Williams (1984) Kelly (1983) Wright (1959)

(440) Taia Bush Historic Reserve

REGIONAL/CITY COUNCIL(S): Chatham Island District **ECOLOGICAL DISTRICTS(S):** 80-01 Chathams

LOCALITY and GRID REFERENCE: between Te Whanga Lagoon and Hanson Bay CI 575637

AREA(ha): 12 ALTITUDE(m): 0-5 RAINFALL(mm): 1200

TOPOGRAPHY: sand dunes **PARENT MATERIAL:** aeolian sands **VEGETATION:** broadleaved forest; sandfield

SOILS: lowland podzolised yellow-brown earths and podzols (Rapunui Te-One)

IMPORTANCE: 3 **SIGNIFICANCE:** (i) best remaining example of this soil-forest association on Chatham Island.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** previously grazed

TENURE: historic reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Phil Tonkin **DATE OF INFORMATION:** June 1991

NOTES: Notable also for dendroglyphs (i.e. Moriori carvings on tree trunks).

REFERENCES: Given and Williams (1984) Kelly (1983) Wright (1959)

(441) Antipodes Islands

REGIONAL/CITY COUNCIL(S): none **ECOLOGICAL DISTRICTS(S):** 82-01 Antipodes

LOCALITY and GRID REFERENCE: 850 km SE of Bluff

AREA(ha): 611 ALTITUDE(m): 0-366 RAINFALL(mm): 2000

TOPOGRAPHY: main island is a plateau with a cliffed coastline with rocky promontories; low isolated hills on plateau with very gently-sloping to steep colluvial sideslopes; many swamps **PARENT MATERIAL:** mostly peat; minor basalt and derived colluvium **VEGETATION:** short tussock grassland; broadleaved scrub; fernland

SOILS: organic soils

IMPORTANCE: 1 **SIGNIFICANCE:** (i) these are some of the most southern latitude island soils on earth. (ii) large areas of undisturbed soils derived from peat are internationally rare.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** history of sealing and shipwrecks; now uninhabited; introduced mammals would cause an environmental disaster

TENURE: nature reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Iain Campbell **DATE OF INFORMATION:** June 1991

NOTES: Comprises one main island (called Antipodes Island) and several islets. Location is longitude 178 47'E, latitude 49 44'S.

REFERENCES: McEwen (1987) McCaskill (1975c)

(442) Auckland Islands

REGIONAL/CITY COUNCIL(S): none **ECOLOGICAL DISTRICTS(S):** 83-01 Auckland Islands

LOCALITY and GRID REFERENCE: 465 km S of Bluff

AREA(ha): 72 560 ALTITUDE(m): 0-670 RAINFALL(mm): 2000

TOPOGRAPHY: main island is a plateau with isolated hills and cliffed coastline **PARENT MATERIAL:** mostly peat

VEGETATION: *Dracophyllum*-broadleaved scrub; broadleaved forest; snow tussock grassland

SOILS: organic soils

IMPORTANCE: 1 **SIGNIFICANCE:** (i) large area of soils derived from peat under very little disturbed vegetation.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** history of whaling and farming; now uninhabited; goats and rabbits present

TENURE: nature reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Iain Campbell **DATE OF INFORMATION:** June 1991

NOTES: Comprises one large island (Auckland Island), five smaller ones and several islets and stacks. This record includes Adams Island which is technically a separate nature reserve.

REFERENCES: McEwen (1987) McCaskill (1975c)

(443) Campbell Island

REGIONAL/CITY COUNCIL(S): none **ECOLOGICAL DISTRICTS(S):** 84-01 Campbell

AREA(ha): 11 331 **ALTITUDE(m):** 0-567 **RAINFALL(mm):** 1450

TOPOGRAPHY: dissected remnant of a volcanic dome – drowned radial valleys, gently sloping to steep colluvial hillslopes and gently sloping ridges; conical hills; mostly cliffed coastline; previously lightly glaciated **PARENT MATERIAL:** mainly peat; minor mineral soils from hawaiite, mugearite, benmoreite, trachyte, tuffs, volcanic breccias, dolerite, mudstone and limestone **VEGETATION:** short tussock grassland; Dracophyllum scrub; broadleaved swamp to scrub; turf meadow; Dracophyllum–snow tussock turf–cushion bog; herbfield

SOILS: organic soils

IMPORTANCE: 1 **SIGNIFICANCE:** (i) large area of soils derived from peat under relatively undisturbed vegetation.

VULNERABILITY: 3 **MODIFICATIONS/THREATS:** historic sealing, whaling and farming (sheep and cattle still present); manned weather station; minor tracks; good regeneration

TENURE: nature reserve **OWNER/MANAGER:** Department of Conservation

CONTACT PERSON: Iain Campbell **DATE OF INFORMATION:** June 1991

NOTES: Comprises one large island (called Campbell Island) and several islets and stacks. Topographic map is NZMS 272/3 (1:25 000). Location is longitude 169 09'E, latitude 52 33'S.

REFERENCES: Campbell (1980) Meurk and Given (1990) McCaskill (1975c)

5 SUMMARY

Site name, soil groups, soil mapping units, and importance ratings of sites in the inventory are summarised on the following lists. Summary lists can also be prepared for selected sites (e.g. chosen by ecological district, regional council or importance rating, or selected individually) and for other fields on the record sheet. Summary tables of the soil groups and mapping units at selected sites can also be generated. Please address all requests for further summary lists and for summary tables to Dr Les Basher, DSIR Land Resources, Private Bag, Christchurch.

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| Glenure Scenic Reserve and Private Protected Land | 407 | Kingswood Bush Scenic Reserve | 421 |
| Gloster-Rough - Clarence Faces | 25 | Klein Swamp Government Purpose Reserve | 83 |
| Goodwood Scenic Reserve | 358 | Knapdale Dune | 403 |

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| Kowhai Bush | 42 | Mathieson Open Space Covenant | 416 |
| | | Maukuratawhai | 20 |
| | | Maungatua Domain | 365 |
| Lady Lake Scenic Reserve | 71 | Maungatua Scientific Reserve | 366 |
| Lagoon Creek | 310 | McMillan Stream | 250 |
| Lake Brunner Scenic Reserve | 72 | Medbury | 105 |
| Lake Dumb-bell | 272 | Mid Ahuriri | 274 |
| Lake Hawdon | 114 | Middle Creek | 191 |
| Lake Hochstetter Forest | 70 | Moa Creek | 351 |
| Ecological Area | | Moana Scenic Reserve | 73 |
| Lake Kaniere Scenic Reserve | 84 | Molyneux Faces | 339 |
| Lake Ohau Moraine Scrub | 260 | Morice Settlement Scenic Reserve | 163 |
| Lake Ohau Road - Shelton Downs | 283 | Morrison Open Space Covenant | 222 |
| Lake Ohau Shoreline Shrub | 284 | Mounds of Misery | 117 |
| Lake Roxburgh Shrubland | 395 | Mount Aspiring National Park | 99 |
| Lake Sumner Conservation Park | 81 | Mount Ben Ohau | 261 |
| Lammerlaws and Lammermoors | 356 | Mount Cargill Scenic Reserve | 363 |
| Larry River | 59 | Mount Cook Station Swamp | 240 |
| Lazyman | 115 | Mount Dobson | 218 |
| Leader Dale - Big Bush | 19 | Mount Hercules Scenic Reserve | 87 |
| Leithen Burn Headwaters | 396 | Mount Somers | 192 |
| Leithen Bush Scenic Reserve | 397 | Mount St Cuthbert | 291 |
| Lenz Private Protected Land | 373 | Mt Algidus | 181 |
| Lewis Pass National Reserve | 78 | Mt Barker Tarns | 127 |
| Limestone Creek Scenic Reserve | 102 | Mt Cotton | 128 |
| Lindis Head | 311 | Mt Difficulty | 340 |
| Lindis Pass | 273 | Mt Fitzgerald Scenic Reserve | 164 |
| Little Flora | 116 | Mt Georgina | 129 |
| Little Goat Hill | 179 | Mt Nimrod Scenic Reserve | 231 |
| Lonekers Bush Scenic Reserve | 411 | Mt Oakden | 130 |
| Long Gully Bluffs | 338 | Mt Pleasant Scenic Reserve | 364 |
| Long Valley Ridge | 349 | Mt Richmond Conservation Park | 11 |
| Longwood Forest | 415 | Mt Ross | 43 |
| Lottery Bush Scenic Reserve | 103 | Mt Sinclair Scenic Reserve | 165 |
| Lower Buller Gorge Scenic | 58 | Mt Stokes | 6 |
| Reserve | | Musgrave Estate Open Space | 226 |
| Lower Duncan Stream | 248 | Covenant | |
| Lower Lake Stream Forest | 206 | | |
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| Lower Meg | 315 | Napenape Scenic Reserve | 108 |
| Lower Slate | 388 | Nature Gully | 352 |
| Lower South Opuha | 217 | Neds Creek | 323 |
| Luggate Creek | 316 | Nell Stream | 193 |
| | | Nelson Lakes National Park | 77 |
| Mabel Bush Scenic Reserve | 422 | Nikau Scenic Reserve | 63 |
| MacKenzie Pass | 265 | Nobbler | 298 |
| Magnet Bay Scenic Reserve | 171 | North Dunstan | 324 |
| Mahitahi Scenic Reserve | 95 | Northern Garvie Mountains | 341 |
| Maori Creek | 350 | Northwest Nelson Conservation | 49 |
| Maori Lakes Nature Reserve and | 210 | Park | |
| Wildlife Reserve | | | |
| Mararua Bush | 423 | Obelisk - Old Man Ranges | 342 |
| Marfells Beach | 28 | Okuru Scenic Reserve | 97 |
| Martello Swamp | 180 | Okuti Valley Scenic Reserve | 172 |
| Maruia | 75 | Onamalutu Recreation Reserve | 12 |
| Maryburn Flats | 249 | Orari Gorge Scenic Reserve | 223 |
| Mason Bay | 433 | Otahu Scenic Reserve | 412 |
| Matata Scenic Reserve | 230 | Otamatapaio | 295 |
| Mataura Range | 389 | Otanomomo Scientific Reserve | 370 |

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| Otapiri Scenic Reserve | 408 | Saltwater Ecological Area | 89 |
| Otatara South Scenic Reserve | 424 | Saltwater Lagoon Scenic Reserve | 90 |
| Otematata Station | 294 | Scotts Creek | 326 |
| Otepatotu Scenic Reserve | 173 | Scrub Gully | 292 |
| | | Seaward Downs Scenic Reserve | 425 |
| Paddle Hill Creek | 211 | Sedgemere | 16 |
| Palm Gully Scenic Reserve | 174 | Serpentine Creek | 285 |
| Paparoa National Park | 65 | Serpentine Flat | 332 |
| Paparoa Point Scenic Reserve | 34 | Severn | 21 |
| Pareora Scenic Reserve | 232 | Shag Point Scientific Reserve | 359 |
| Patearoa Saline Area | 331 | Shamrock Hut Flats | 275 |
| Paynes Ford Scenic Reserve | 45 | Shenandoah Scenic Reserve | 60 |
| Peel Forest Park Scenic Reserve | 224 | Shingle Fans | 30 |
| Pegasus Nature Reserve | 434 | Simons Hill | 252 |
| Pelorus Bridge Scenic Reserve | 10 | Skeleton Stream | 318 |
| Peraki Saddle Scenic Reserve | 175 | Small Island | 241 |
| Piko Piko West Scenic Reserve | 413 | Snares Island | 436 |
| Pinelheugh | 353 | Snowdens Bush Scenic Reserve | 51 |
| Pisa Flats | 325 | South Grampians above Stony River | 267 |
| Pisa Tops | 317 | South Hawea Flat | 312 |
| Pisgah | 299 | South Ragged Range | 184 |
| Poerua River Scenic Reserve | 88 | South-East Faces Mt Dalgety | 268 |
| Pomahaka River and Boulder Creek | 398 | Southern Garvie Mountains | 344 |
| Popotunoa Hill Scenic Reserve | 404 | Southern Lake Pukaki Scrub | 242 |
| Porangarau Stream | 29 | Southern Tablelands | 439 |
| Porter River Terrace Riser | 118 | Southland District Council Open Space Covenant | 409 |
| Potters Creek | 343 | Spring Creek | 286 |
| Powerhouse Stream | 194 | Stalker Plateau | 300 |
| Prendergasts Bush Open Space Covenant | 159 | Station Creek | 199 |
| Prospect Hill | 182 | Steepface Hill | 200 |
| Pudding Hill | 195 | Stephens Island Wildlife Sanctuary | 2 |
| Puhi Puhi Scenic Reserve | 35 | Sterickers Mound | 253 |
| Puhi Puhi Valley | 36 | Stewart Creek | 38 |
| Pukaki Flats | 251 | Stockton Creek Scenic Reserve | 56 |
| Pukerau Red Tussock Scientific Reserve | 371 | Stone Hut Moraine | 219 |
| Puklowski Open Space Covenant | 44 | Sutton Salt Lake | 333 |
| | | Swales Bush Scenic Reserve | 426 |
| Rachel Range | 24 | Swin Fan | 212 |
| Rakaia Faces Forest Remnants | 196 | | |
| Rakaia Gorge and Terraces | 133 | Table Hill Scenic Reserve | 374 |
| Rakautara | 37 | Tahakopa Bay Scenic Reserve | 375 |
| Rakeahua Scenic Reserve | 435 | Taia Bush Historic Reserve | 440 |
| Rangaika Scenic Reserve | 437 | Taieri River Scenic Reserve | 367 |
| Rangatira Nature Reserve | 438 | Talbot Forest Scenic Reserve | 227 |
| Redcliffe Saddle | 197 | Tasman Smith Scenic Reserve | 233 |
| Redcliffe Hill | 198 | Tautuku Bay Scenic Reserve | 376 |
| Riccarton Bush Scenic Reserve | 149 | Tekapo Military Camp Tussock | 243 |
| Roberston Range | 7 | Tekapo River Terrace | 254 |
| Rohutu Scenic Reserve | 93 | Tekapo-Pukaki River Flats | 255 |
| Rollesby Range above Rollesby Station | 266 | The Pyramid | 256 |
| Rolleston Range | 183 | Tiropahi Ecological Area | 64 |
| Ryton Gorge | 131 | Titiroa Scenic Reserve | 377 |
| Ryton Lakes | 132 | Tone | 26 |
| | | Tophouse Scenic Reserve | 76 |
| | | Totara | 354 |

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| Totara Dam | 39 | Waipori Falls Scenic Reserve | 369 |
| Totey Open Space | 138 | Waipuna Forest Ecological Area | 67 |
| · Covenantnantenant | | Wairau-Island Pass-Tennyson | 22 |
| Travis Swamp | 150 | Waitangiroto Nature Reserve | 91 |
| Trotters Gorge Scenic Reserve | 301 | Waitangitaona Scenic Reserve | 92 |
| Tuamarina Government Purpose | 13 | Waitohi Bush Recreation Reserve | 228 |
| Res | | Waituna - Seawards Moss | 430 |
| Tuatapere Scenic Reserve | 414 | Waiutu Forest and Maori Land | 410 |
| Turnbulls Bush | 427 | Washbourne Scenic Reserve | 46 |
| Turtons | 201 | Welshmans - Camerons Creeks | 345 |
| Tutae Patu Wildlife Reserve | 151 | West Branch Waikaia River | 346 |
| | | West Dome | 384 |
| | | West Waikaia | 391 |
| Upper Buller Gorge Scenic | 61 | Western Lake Pukaki Scrub | 244 |
| Reserve | | Westland National Park | 94 |
| Upper Dome Burn | 390 | Whalans Stream | 293 |
| Upper Gladstone Valley | 262 | Whaleback Fans | 202 |
| Upper Lawrence | 207 | Whisky Gully Scenic Reserve | 357 |
| Upper Maitland | 276 | Whitcomb-Gem Lake-Argyle | 400 |
| | | Burn | |
| | | Wilberforce | 185 |
| Victoria Conservation Park | 62 | Wilderness Scientific Reserve | 385 |
| View Hill Scenic Reserve | 136 | William King Scenic Reserve | 378 |
| | | Wilson Swamp Wildlife | 152 |
| | | Management Reserve | |
| Waianakarua Scenic Reserve | 302 | Wilsons Rd | 334 |
| Waiau River Mouth Scenic | 107 | Winterslow | 203 |
| Reserve | | Woodside Creek | 31 |
| Waihi Gorge Scenic Reserve | 225 | Wrights Gully | 319 |
| Waikaia Bush | 399 | Wyndham Scenic Reserve | 428 |
| Waikerikeri | 327 | | |
| Waimakariri Gorge | 119 | | |
| Waiora Yellow-Grey Earth | 368 | Yarrs Flat Government Purpose | 154 |
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| Waipara-Arawata Confluence | 98 | | |

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| Anglem Nature Reserve | 432 | North Dunstan | 324 |
| Antipodes Islands | 441 | Northwest Nelson Conservation Park | 49 |
| Arthurs Pass National Park | 109 | | |
| Auckland Islands | 442 | Otanomomo Scientific Reserve | 370 |
| | | Otematata Station | 294 |
| Bankside Scientific Reserve | 141 | | |
| Big Bush | 52 | Paparoa National Park | 34 |
| | | Patearoa Saline Area | 331 |
| Campbell Island | 443 | Peel Forest Park Scenic Reserve | 224 |
| Catlins Conservation Park | 379 | Pegasus Nature Reserve | 434 |
| Craigieburn Conservation Park | 120 | Pisa Flats | 325 |
| Cromwell Chafer Beetle Nature Reserve | 313 | Pomahaka River and Boulder Creek | 398 |
| Cropp River | 85 | Pukerau Red Tussock Scientific Reserve | 371 |
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| Deep Bay Scenic Reserves | 3 | Riccarton Bush Scenic Reserve | 149 |
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| Eyrewell Scientific Reserve | 144 | Snares Island | 436 |
| | | Sutton Salt Lake | 333 |
| Fiordland National Park | 381 | | |
| Forest Hill Scenic Reserve | 419 | Talbot Forest Scenic Reserve | 227 |
| | | Tautuku Bay Scenic Reserve | 376 |
| Glendhu | 355 | Turnbolls Bush | 427 |
| Herbert Peak Scenic Reserve | 161 | | |
| | | View Hill Scenic Reserve | 136 |
| Kingswood Bush Scenic Reserve | 421 | | |
| | | Waikaia Bush | 399 |
| Lake Sumner Conservation Park | 81 | Waituna - Seawards Moss | 430 |
| | | West Dome | 384 |
| Maryburn Flats | 249 | Westland National Park | 94 |
| Mount Aspiring National Park | 99 | Wilderness Scientific Reserve | 385 |
| Mt Richmond Conservation Park | 11 | | |
| Musgrave Estate Open Space Covenant | 226 | | |

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| Acheron Hill | 121 | Ben Omar Swamp | 278 |
| Ahuriri Farms Ltd Open Space Covenant | 151 | Bendhu Scientific Reserve | 279 |
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| Armstrong Scenic Reserve | 166 | Big Gully | 288 |
| Arnold River I Scenic Reserve | 68 | Birchwood Lagoon | 269 |
| Arowhenua Bush | 139 | Black Birch Creek | 213 |
| Avon Mouth | 140 | Blackwater Ecological Area | 57 |
| | | Blue Duck Scientific Reserve | 33 |
| Balmoral Fescue and Red Tussock | 235 | Boundary Stream | 111 |
| Bannock Burn - Old Woman Range | 325 | Broken River Limestone | 112 |
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| | | Butler Downs Forest | 209 |
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| | | Cameron River | 204 |
| | | Camp Creek | 79 |

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| Chapman Road II | 337 | Covenant | |
| Chatto Creek | 329 | Kaitorete Spit Scientific Reserve | 153 |
| Clayton Hill Co. Ltd Open Space | 134 | Kennedys Bush Scenic Reserve | 158 |
| Covenant | | Kerrs Bush Protected Private | 420 |
| Cochranes Bush | 234 | Land | |
| Cockayne Reserve | 142 | Kingston Crossing | 402 |
| Conways Bush | 220 | Knapdale Dune | 403 |
| Coopers Lagoon Wildlife | 143 | | |
| Management Reserve | | Lake Kaniere Scenic Reserve | 84 |
| Croydon Bush Domain | 406 | Lake Ohau Road - Shelton Downs | 260 |
| Culverden Scientific Reserve | 104 | Lammerlaws and Lammermoors | 356 |
| | | Larry River | 59 |
| D'Urville Island Scenic Reserve | 8 | Leithen Bush Scenic Reserve | 397 |
| Deakers | 347 | Lenz Private Protected Land | 373 |
| Denniston Scenic Reserve | 55 | Lewis Pass National Reserve | 78 |
| Devils Gap Scenic Reserve | 169 | Little Flora | 116 |
| Dip Creek Beech | 306 | Lonekers Bush Scenic Reserve | 411 |
| Dip Creek Totara | 307 | Long Valley Ridge | 349 |
| Double Hill | 176 | Longwood Forest | 415 |
| Drummond Swamp Government | 417 | Lottery Bush Scenic Reserve | 103 |
| Purpose Reserve | | Lower Meg | 315 |
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| Edendale Scenic Reserve | 418 | Mabel Bush Scenic Reserve | 422 |
| Edwards-Muntz | 18 | Mararua Bush | 423 |
| Eves Valley Scenic Reserve | 53 | Martello Swamp | 180 |
| Eyre | 383 | Maruia | 75 |
| | | Mason Bay | 433 |
| Fairfax Spur | 322 | Maungatua Scientific Reserve | 366 |
| Freehold Creek | 277 | Medbury | 105 |
| | | Moa Creek | 351 |
| Galloway No. 1 | 330 | Mounds of Misery | 117 |
| Gladstone Flats | 245 | Mount Ben Ohau | 261 |
| Glen Eyrie Downs Tussock | 281 | Mount Cargill Scenic Reserve | 363 |
| Glencairn | 290 | Mount Dobson | 218 |
| Glenmore Tarns | 238 | Mount Hercules Scenic Reserve | 87 |
| Glenure Scenic Reserve and | 407 | Mount Somers | 192 |
| Private Protected Land | | Mount St Cuthbert | 291 |
| Gloster-Rough - Clarence Faces | 25 | Mt Difficulty | 340 |
| Gore Bay Scenic Reserve | 106 | Mt Nimrod Scenic Reserve | 231 |
| Gorge Road Scenic Reserve | 429 | Mt Sinclair Scenic Reserve | 165 |
| Goulard Downs Scenic Reserve | 48 | | |
| Gow Burn | 387 | Napenape Scenic Reserve | 108 |
| Grays River | 246 | Neds Creek | 323 |
| Great Island | 145 | | |
| Greenland | 348 | Obelisk - Old Man Ranges | 342 |
| | | Onamalutu Recreation Reserve | 12 |
| Haast Dunes | 96 | Otahu Scenic Reserve | 412 |
| Hakataramea Pass Fan | 247 | Otatara South Scenic Reserve | 424 |
| Halkett | 146 | | |
| Hapuku Scenic Reserve | 41 | Pelorus Bridge Scenic Reserve | 10 |
| Harewood | 147 | Piko Piko West Scenic Reserve | 413 |
| Harts Creek Wildlife Management | 148 | Pinelheugh | 353 |
| Reserve | | Pisa Tops | 317 |
| Hay Scenic Reserve | 160 | Pisgah | 299 |
| Head of Irishman Creek | 239 | Poerua River Scenic Reserve | 88 |
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| Howdens Bush Scenic Reserve | 5 | | |
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| Potters Creek | 343 |
| Powerhouse Stream | 194 |
| Prendergasts Bush Open Space Covenant | 159 |
| Prospect Hill | 182 |
| Pudding Hill | 195 |
| Puhi Puhi Scenic Reserve | 35 |
| Puklowski Open Space Covenant | 44 |
| Rakaia Gorge and Terraces | 133 |
| Rakeahua Scenic Reserve | 435 |
| Rangatira Nature Reserve | 438 |
| Redcliffe Saddle | 197 |
| Ryton Lakes | 132 |
| Scotts Creek | 326 |
| Scrub Gully | 292 |
| Seaward Downs Scenic Reserve | 425 |
| Sedgemere | 16 |
| Shag Point Scientific Reserve | 359 |
| Simons Hill | 252 |
| Snowdens Bush Scenic Reserve | 51 |
| South Hawea Flat | 312 |
| South-East Faces Mt Dalgety | 268 |
| Southern Tablelands | 439 |
| Spring Creek | 286 |
| Tahakopa Bay Scenic Reserve | 375 |
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| Ahuriri Farms Ltd Open Space Covenant | 156 |
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| Awatere: Waikaia Stream Headwaters | 393 |
| Bach Creek Government Purpose Reserve | 82 |
| Ben Lomond Scenic Reserve | 304 |
| Bendigo Protected Private Land | 320 |
| Benmore Range Tops | 287 |
| Betwixt | 110 |
| Big Ben Swamp | 122 |
| Big Range | 263 |
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| Black Rocks - Grampian Range | 264 |
| Bluff Scenic Reserve | 431 |
| Brown Open Space Covenant | 380 |
| Brown River Scenic Reserve | 9 |
| Bush Creek Fan | 208 |

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| Titiroa Scenic Reserve | 377 |
| Tone | 26 |
| Totley Open Space Covenant | 138 |
| Travis Swamp | 150 |
| Tuamarina Government Purpose Reserve | 13 |
| Tuatapere Scenic Reserve | 414 |
| Upper Buller Gorge Scenic Reserve | 61 |
| Upper Dome Burn | 390 |
| Victoria Conservation Park | 62 |
| Waikerikeri | 327 |
| Waiora Yellow-Grey Earth Reserve | 368 |
| Wairau-Island Pass-Tennyson | 22 |
| Waitangioto Nature Reserve | 91 |
| Waitohi Bush Recreation Reserve | 228 |
| Waiutu Forest and Maori Land | 410 |
| Washbourne Scenic Reserve | 46 |
| Whitcomb-Gem Lake-Argyle Burn | 400 |
| Winterslow | 203 |
| Wrights Gully | 319 |
| Wyndham Scenic Reserve | 428 |

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| Bush Stream | 214 |
| Carews Peak Scenic Reserve | 167 |
| Caroline Bush Scenic Reserve | 405 |
| Cass | 113 |
| Catlins Lake Scenic Reserve | 372 |
| Chain Hills | 305 |
| Chetwode Island Nature Reserve | 1 |
| Claremont Scenic Reserve | 229 |
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| Coal Creek | 289 |
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| Coleridge Downs Lakeside | 125 |
| Crescent Island Scenic Reserve | 303 |
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| Dan Rogers Creek Scenic Reserve | 168 |
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| Defence Area Balmoral Station | 237 |
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| East Camp Creek | 309 | Lindis Pass | 273 |
| East Dome | 386 | Little Goat Hill | 179 |
| Edwards North Branch | 215 | Long Gully Bluffs | 338 |
| Eldon Coates Scenic Reserve | 80 | Lower Buller Gorge Scenic Reserve | 58 |
| Fergusons Bush Scenic Reserve | 86 | Lower Duncan Stream | 248 |
| Firewood Bush | 270 | Lower Lake Stream Forest Remnants | 206 |
| Flagstaff Scenic Reserve | 360 | Lower Slate | 388 |
| Forest Creek Beech Remnants | 216 | Lower South Opuha | 217 |
| Fraser Stream Headwaters | 258 | Luggate Creek | 316 |
| Frosty Gully | 271 | | |
| Gargarus | 126 | MacKenzie Pass | 265 |
| Garne and Savill Bays Scenic Reserve | 4 | Magnet Bay Scenic Reserve | 171 |
| Glenburn Swamp | 282 | Mahitahi Scenic Reserve | 95 |
| Glenburnie Bush | 401 | Maori Creek | 350 |
| Goodwood Scenic Reserve | 358 | Maori Lakes Nature Reserve and Wildlife Reserve | 210 |
| Goose Bay - Omihi Scenic Reserve | 100 | Marfells Beach | 28 |
| Grahams Creek | 189 | Matata Scenic Reserve | 230 |
| Hae Hae Te Moana Scenic Reserve | 221 | Mataura Range | 389 |
| Hanmer Conservation Park | 23 | Mathieson Open Space Covenant | 416 |
| Harbour Cone | 361 | Maukuratawhai | 20 |
| Heyward Point Scenic Reserve | 362 | Maungatua Domain | 365 |
| Hinewai | 170 | McMillan Stream | 250 |
| Hoods Bush Scenic Reserve | 137 | Mid Ahuriri | 274 |
| Hughie | 297 | Middle Creek | 191 |
| Huia Cave Scenic Reserve | 50 | Moana Scenic Reserve | 73 |
| Hutt Stream Fan | 190 | Molyneux Faces | 339 |
| Hyde Open Space Covenant | 101 | Morice Settlement Scenic Reserve | 163 |
| | | Morrison Open Space Covenant | 222 |
| Ikamatua Plain | 66 | Mount Cook Station Swamp | 240 |
| Irishman Stream | 259 | Mt Algidus | 181 |
| | | Mt Barker Tarns | 127 |
| Jordan Stream Scenic Reserve | 27 | Mt Cotton | 128 |
| Kaituna Valley Scenic Reserve | 162 | Mt Fitzgerald Scenic Reserve | 164 |
| Kakapo Fans | 178 | Mt Georgina | 129 |
| Klein Swamp Government Purpose Reserve | 83 | Mt Oakden | 130 |
| Kowhai Bush | 42 | Mt Pleasant Scenic Reserve | 364 |
| Lady Lake Scenic Reserve | 71 | Mt Ross | 43 |
| Lagoon Creek | 310 | Mt Stokes | 6 |
| Lake Brunner Scenic Reserve | 72 | | |
| Lake Dumb-bell | 272 | Nature Gully | 352 |
| Lake Hawdon | 114 | Nell Stream | 193 |
| Lake Hochstetter Forest Ecological Area | 70 | Nikau Scenic Reserve | 63 |
| Lake Ohau Moraine Scrub | 260 | Nobbler | 298 |
| Lake Ohau Shoreline Shrub | 284 | Northern Garvie Mountains | 341 |
| Lake Roxburgh Shrubland | 395 | | |
| Lazyman | 115 | Okuru Scenic Reserve | 97 |
| Leader Dale - Big Bush | 19 | Okuti Valley Scenic Reserve | 172 |
| Leithen Burn Headwaters | 396 | Orari Gorge Scenic Reserve | 223 |
| Limestone Creek Scenic Reserve | 102 | Otamatapaio | 295 |
| Lindis Head | 311 | Otapiri Scenic Reserve | 408 |
| | | Otepatotu Scenic Reserve | 173 |
| | | | |
| | | Paddle Hill Creek | 211 |
| | | Palm Gully Scenic Reserve | 174 |
| | | Paparoa Point Scenic Reserve | 34 |
| | | Pareora Scenic Reserve | 232 |
| | | Paynes Ford Scenic Reserve | 45 |

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| Peraki Saddle Scenic Reserve | 175 | Table Hill Scenic Reserve | 374 |
| Porangarau Stream | 29 | Taia Bush Historic Reserve | 440 |
| Porter River Terrace Riser | 118 | Taieri River Scenic Reserve | 367 |
| Puhi Puhi Valley | 36 | Tasman Smith Scenic Reserve | 233 |
| Pukaki Flats | 251 | Tekapo River Terrace | 254 |
| Rachel Range | 24 | Tekapo-Pukaki River Flats | 255 |
| Rakaia Faces Forest Remnants | 196 | The Pyramid | 256 |
| Rakautara | 37 | Tiropahi Ecological Area | 64 |
| Rangaika Scenic Reserve | 437 | Tophouse Scenic Reserve | 76 |
| Redcliffe Hill | 198 | Totara | 354 |
| Roberston Range | 7 | Totara Dam | 39 |
| Rohutu Scenic Reserve | 93 | Trotters Gorge Scenic Reserve | 301 |
| Rollesby Range above Rollesby Station | 266 | Turtons | 201 |
| Rolleston Range | 183 | Tutae Patu Wildlife Reserve | 151 |
| Ryton Gorge | 131 | Upper Gladstone Valley | 262 |
| Saltwater Ecological Area | 89 | Upper Lawrence | 207 |
| Saltwater Lagoon Scenic Reserve | 90 | Upper Maitland | 276 |
| Serpentine Creek | 285 | Waianakarua Scenic Reserve | 302 |
| Serpentine Flat | 332 | Waiau River Mouth Scenic Reserve | 107 |
| Severn | 21 | Waihi Gorge Scenic Reserve | 225 |
| Shamrock Hut Flats | 275 | Waimakariri Gorge | 119 |
| Shenandoah Scenic Reserve | 60 | Waipara-Arawata Confluence | 98 |
| Shingle Fans | 30 | Waipori Falls Scenic Reserve | 369 |
| Skeleton Stream | 318 | Waipuna Forest Ecological Area | 67 |
| Small Island | 241 | Waitangitona Scenic Reserve | 92 |
| South Grampians above Stony River | 267 | Welshmans - Camerons Creeks | 345 |
| South Ragged Range | 184 | West Branch Waikaia River | 346 |
| Southern Garvie Mountains | 344 | West Waikaia | 391 |
| Southern Lake Pukaki Scrub | 242 | Western Lake Pukaki Scrub | 244 |
| Southland District Council Open Space Covenant | 409 | Whalans Stream | 293 |
| Stalker Plateau | 300 | Whaleback Fans | 202 |
| Station Creek | 199 | Whisky Gully Scenic Reserve | 357 |
| Steepface Hill | 200 | Wilberforce | 185 |
| Stephens Island Wildlife Sanctuary | 2 | William King Scenic Reserve | 378 |
| Sterickers Mound | 253 | Wilson Swamp Wildlife Management Reserve | 152 |
| Stewart Creek | 38 | Wilsons Rd | 334 |
| Stockton Creek Scenic Reserve | 56 | Woodside Creek | 31 |
| Stone Hut Moraine | 219 | Yarrs Flat Government Purpose Reserve | 154 |
| Swales Bush Scenic Reserve | 426 | | |
| Swin Fan | 212 | | |

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REFERENCES

- Allen, RB 1978 Scenic reserves of Otago land district. *Biological survey of reserves series* 4, Department of Lands and Survey, Wellington. 322 p.
- Allen, RB; Lee, WG and Johnson, PN 1989 Southland. *Biological survey of reserves series* 19, Department of Conservation, Wellington. 233 p.
- Arand, J and Glenny, D 1990 Mathias and Mt Hutt Ecological Districts. *Protected natural areas programme survey report* 12, Department of Conservation, Wellington. 248 p.
- Atkinson, IAE 1961 Conservation of New Zealand soils and vegetation for scientific and educational purposes. *New Zealand science review* 19(4): 65-73.
- Basher, LR 1986 Pedogenesis and erosion history in a high rainfall, mountainous drainage basin - Cropp River, New Zealand. Unpublished PhD thesis, Lincoln College, Lincoln.
- Basher, LR 1988 Soils of Molesworth Station - a report prepared for the Department of Conservation Protected Natural Areas Programme. Unpublished report, Soil Conservation Group (Christchurch), Department of Scientific and Industrial Research.
- Basher, LR; Tonkin, PJ and Daly, GT 1985 Pedogenesis, erosion and revegetation in a mountainous, high rainfall area - Cropp River, New Zealand. In: Campbell, IB (ed.) *Proceedings of the soil dynamics and land use seminar, Blenheim, May 1985*. NZ Society of Soil Science and NZ Soil Conservators Association.
- Bellamy, D 1990 *Moa's Ark - The Voyage of New Zealand*. Television New Zealand and the New Zealand National Heritage Foundation. Penguin Books (NZ) Ltd. 231 p.
- Black, TM; Nowell, SB and Hayward, BW 1991 Inventory of geologically-related historical sites and features of international, national and regional importance. *Geological Society of New Zealand miscellaneous publication* 52. 94 p.
- Bonell, M; Pearce, AJ and Stewart, MK 1990 The identification of runoff-production mechanisms using environmental isotopes in a tussock grassland catchment, eastern Otago, New Zealand. *Hydrological processes* 4: 15-34.
- Breese, ED; Timmins, SM; Garrick, AS; Owen, JM and Jane, GT 1986 Kaikoura Ecological Region. *Protected natural areas programme survey report* 5, Department of Lands and Survey, Wellington. 113 p.
- Bruce, JG 1977 Soils of Woodlands Research Station, Southland, New Zealand. *New Zealand soil survey report* 32. New Zealand Soil Bureau, Department of Scientific and Industrial Research, Wellington. 58 p.

Bruce, JG 1984 Soil survey of the southern part of Waitutu State Forest and adjacent Maori land. *Soil Bureau district office report* GG7, Department of Scientific and Industrial Research, Gore. 28 p.

Brumley, C; Stirling, MW and Manning, MS 1986 Old Man Ecological District. *Protected natural areas programme survey report* 3, Department of Lands and Survey, Wellington.

Burrows, C 1984 Arowhenua Bush: a remnant of the forest of the South Canterbury Plains. *Canterbury Botanical Society journal* 18: 72-78.

Caldwell, DB 1974 A description of the Herron Reserve, north-eastern Southland. Unpublished project report, Botany Department, University of Otago, Dunedin.

Campbell, IB 1971 A weathering sequence of basaltic rocks near Dunedin, New Zealand. *New Zealand journal of science* 14: 907-924.

Campbell, IB 1977 Soils of Waikouaiti County, Otago. *New Zealand Soil Bureau bulletin* 37, Department of Scientific and Industrial Research, Wellington. 60 p.

Campbell, IB 1980 Soil pattern of Campbell Island. *New Zealand journal of science* 24:111-135.

Campbell, IB and Mew, G 1986 Soils under beech forest in an experimental catchment area near Nelson, New Zealand. *Journal of the Royal Society of New Zealand* 16(2): 193-233.

Collier, KJ 1988 Ecology of acid brownwater streams in Westland, New Zealand. Unpublished DPhil thesis, University of Canterbury, Christchurch.

Comrie, J 1991 Dansey Ecological District. Unpublished protected natural areas programme draft survey report. 83 p.

Courtney, SP 1989 *Molesworth protected natural areas programme survey report (draft)*. Interim report prepared for the Molesworth Steering Committee. Department of Conservation, Nelson.

Cutler, EJB 1957 Soils of the lower Clutha plains. *New Zealand Soil Bureau bulletin* 15, Department of Scientific and Industrial Research, Wellington. 40 p.

Dennis, A 1981 *The Paparoas Guide - a recreational guidebook, history and natural history to the Paparoa Range and coastal region between the Grey and Buller Rivers*. Andy Dennis and Native Forest Action Council, Nelson. 248 p.

Dennis, A 1986 *Banks Peninsula Reserves*. Department of Lands and Survey, Christchurch. 79 p.

Department of Conservation 1988 Fiordland National Park Management Plan - Draft Review. *Southern Region management plan series* 1. 106 p.

Department of Conservation 1989a *Nelson Lakes National Park Management Plan 1988-98*. Nelson. 52 p.

Department of Conservation 1989b *Westland National Park Management Plan. National park series 6*, West Coast. 88 p.

Department of Conservation 1990 *Sutton Salt Lake Scenic Reserve. Otago Conservancy information sheet D11*, Dunedin.

Department of Lands and Survey 1980 *Mt Nimrod Scenic Reserve*. Information brochure.

Department of Lands and Survey 1984 *Register of Protected Natural Areas in New Zealand*. Department of Lands and Survey, Wellington. 472 p.

Department of Lands and Survey 1986 *Abel Tasman National Park management plan. Management plan series NP4*. 79 p.

Dickinson, KJM 1988 *Umbrella Ecological District. Protected natural areas programme survey report 7*, Department of Conservation, Wellington. 179 p.

Dickinson, KJM 1989 *Nokomai Ecological District. Protected natural areas programme survey report 9*, Department of Conservation, Wellington. 139 p.

Espie, PR; Hunt, JE; Butts, CA; Cooper, PJ and Harrington, WMA 1984 *Mackenzie Ecological Region. Protected natural areas programme survey report*, Department of Lands and Survey, Wellington.

Fagan, BF and Pillai, L 1990 *Manorburn Ecological District. Unpublished protected natural areas programme draft survey report*. 117 p.

Forest Research Institute 1988 *Recent publications from the Big Bush catchment*. Ministry of Forestry, Ilam. 1 p.

Given, DR and Williams, PA 1984 *Conservation of Chatham Island flora and vegetation*. Botany Division report, DSIR, Christchurch. 123 p.

Grace, J TeH 1959 *Tuwharetoa - The History of the Maori people of the Taupo district*. AH and AW Reed, Wellington. 567 p.

Griffiths, E 1974 *Soils of part of the Port Hills and adjacent plains, Canterbury. New Zealand Soil Bureau bulletin 35*, Department of Scientific and Industrial Research, Wellington. 36 p.

Harrington, WMA; Cooper, PJ; Davis, CM; Higham, TD and Mason, CR 1986 *Heron Ecological Region. Protected natural areas programme survey report*, Department of Lands and Survey, Wellington.

Harris, CS; Fox, JP and Vucetich, CG 1946 Soil report on Travis block with special reference to subsidence. Unpublished Soil Bureau report. 6 p. and map.

Harris, R 1990 *Draft plan for Travis Swamp*. Prepared for the Royal Forest and Bird Protection Society. 17 p.

Harrison, JBJ 1985a Soil distribution and landscape dynamics, Camp Creek, Westland. In: Campbell, IB (ed.) *Proceedings of the soil dynamics and land use seminar, Blenheim, May 1985*. NZ Society of Soil Science and NZ Soil Conservators Association. pp.65-77.

Harrison, JBJ 1985b Steepland recent soils of the Camp Creek catchment, Westland. *New Zealand soil news* 33: 108-111.

Harvey, MD 1974 Soil studies in a high country catchment - Paddle Creek, mid Canterbury. Unpublished MAgSci thesis, Lincoln College, Canterbury.

Hayward, BW and Ward, B 1989 Inventory of New Zealand fossil localities of international, national and regional importance (2nd edition). *Geological Society of New Zealand unpublished report* 89/1.

Hewitt, AE 1990 Soil classification in selected areas of the Dansey Ecological District. *DSIR Land Resources technical record* DN6, DSIR Land Resources, Dunedin. 60 p.

Hewitt, AE 1991 New Zealand Soil Classification (version 3.0). *DSIR Land Resources scientific report* 19, DSIR Land Resources, Dunedin.

Houghton, BF; Hayward, BW; Cole, JW; Hobden, B and Johnston, DM 1991 Inventory of Quaternary volcanic centres and features of the Taupo Volcanic Zone (with additional entries for Mayor Island and the Kermadec Islands). *Geological Society of New Zealand miscellaneous publication* 55. 156 p.

Houghton, BF; Lloyd, EF; Keam, RF and Johnston, DM 1989 Inventory of New Zealand geothermal fields and features (2nd edition). *Geological Society of New Zealand miscellaneous publication* 44.

Jackson, RJ 1985 The effects on soil water of conversion from beech/podocarp forest to pine plantation. In: Campbell, IB (ed.) *Proceedings of the soil dynamics and land use seminar, Blenheim, May 1985*. NZ Society of Soil Science and NZ Soil Conservators Association.

Jackson, RJ 1987 Hydrology of acid wetland before and after draining for afforestation, western New Zealand. *Proceedings of the forest hydrology and watershed management symposium*, Vancouver, August. pp. 465-473.

Johnson, PN 1980 Lake Ohau tarns and kettles - botanical report. Unpublished Botany Division report, Department of Scientific and Industrial Research, Dunedin.

June, SR; Loh, G and Wardle, P 1981 Scenic reserves of North Westland. *Biological survey of reserves series 7*, Department of Lands and Survey, Wellington.

Kear, BS; Gibbs, HS and Miller, RB 1967 Soils of the downs and plains Canterbury and North Otago. *New Zealand Soil Bureau bulletin 14*, Department of Scientific and Industrial Research, Wellington. 92 p.

Kelly, GC 1972 Scenic reserves of Canterbury. *Biological survey of reserves series 2*, Botany Division, Department of Scientific and Industrial Research.

Kelly, GC 1983 Distribution and ranking of remaining areas of indigenous vegetation in the Chatham Islands, with site notes and introductory text. Unpublished Botany Division report, DSIR, Christchurch. 22 p.

Kemp, RA and McIntosh, PD 1989 Genesis of a texturally-banded soil in Southland, New Zealand. *Geoderma* 45:65-81.

Leamy, ML 1974 Soils of Stewart Island (Rakiura), New Zealand. *New Zealand soil survey report 22*. New Zealand Soil Bureau, Department of Scientific and Industrial Research, Wellington.

Lynn, I 1987 Soil landscape models as a basis of land resource assessment, Flock Hill Station, Central Canterbury, New Zealand. Unpublished MSc thesis, Lincoln College.

Mark, AF; Dickinson, KJM; Patrick, BH; Barratt, BIP; Loh, G; McSweeney, GD; Meurk, CD; Simpson, NC and Wilson, JB 1989 An ecological survey of the central part of the Eyre Ecological District, northern Southland, New Zealand. *Journal of the Royal Society of New Zealand* 19 (4): 394-384.

McCaskill, LW 1974 *Scenic reserves of Canterbury*. Department of Lands and Survey, Wellington. 34 p.

McCaskill, LW 1975a *Scenic reserves of Nelson*. Department of Lands and Survey, Wellington. 46 p.

McCaskill, LW 1975b *Scenic reserves of Otago*. Department of Lands and Survey, Wellington. 26 p.

McCaskill, LW 1975c *Scenic reserves of Southland*. Department of Lands and Survey, Wellington. 34 p.

McCaskill, LW 1975d *Scenic reserves of Westland*. Department of Lands and Survey, Wellington. 26 p.

McCaskill, LW 1981 *Scenic reserves of Marlborough / compiled from reports prepared by LW McCaskill; photography by QR Christie*. Department of Lands and Survey, Wellington. 55 p.

- McEwen, M (ed.) 1987 Ecological regions and districts of New Zealand - with four 1:500 000 maps of New Zealand. *New Zealand Biological Resources Centre publication 5*, Department of Conservation, Wellington. 4 parts.
- McGlone, MS and Bathgate, JL 1983 Vegetation and climate history of the Longwood Range, South Island, New Zealand. *New Zealand journal of botany* 21:293-315.
- McIntosh, PD 1985a Soils of Waiora farm, Invermay Agricultural Centre, Otago, New Zealand. *New Zealand soil survey report* 89, New Zealand Soil Bureau, Department of Scientific and Industrial Research, Wellington. 91 p.
- McIntosh, PD 1985b Soil taxonomic descriptions for Waiora farm, Invermay Agricultural Research Centre, New Zealand. *New Zealand Soil Bureau soil taxonomic unit descriptions* 17, Department of Scientific and Industrial Research, Wellington.
- McIntosh, PD 1986 Chemical criteria as an aid to soil mapping in hill country: and example from the Hokonui Hills, Southland, New Zealand. *Soil survey and land evaluation* 6: 73-82.
- McIntosh, PD 1988 Soil taxonomic descriptions for Kaiwera district, eastern Southland, New Zealand. *New Zealand Soil Bureau taxonomic unit descriptions* 24, Department of Scientific and Industrial Research, Wellington.
- McIntosh, PD 1989a Proposed soil-vegetation reference sites on the east Otago uplands: soil characteristics. *Division of Land and Soil Sciences technical record* DN 1, Department of Scientific and Industrial Research, Wellington.
- McIntosh, PD 1989b Soil series descriptions for the soils of the Mandeville district, Southland, New Zealand. *Division of Land and Soil Sciences confidential file report* 1, Department of Scientific and Industrial Research, Wellington.
- McIntosh, PD 1990 Soils and sediments of proposed Sutton Salt Lake Reserve, Middelmarsh. *Division of Land and Soil Sciences technical record* DN4, Department of Lands and Survey, Dunedin.
- McIntosh, PD and Backholm, G 1981 A reconnaissance soil survey of the Otago Uplands. *Invermay Research Centre technical report* 10, Ministry of Agriculture and Fisheries.
- McIntosh, PD and Lee, WG 1986 Soil-vegetation relationships on the Dun Mountain Ophiolite Belt at West Dome, Southland, New Zealand. *Journal of the Royal Society of New Zealand* 16 (4): 363-379.
- McIntosh, PD; Backholm, G and Smith, J 1981 Soil variation related to landscape and vegetation features in North Otago hill country. *New Zealand journal of science* 24: 225-244.
- McIntosh, PD; Beecroft, FG and Patrick, B 1990a Register of saline soil sites in north and central Otago - volume 1. *Division of Land and Soil Sciences technical record* DN5, Department of Lands and Survey, Dunedin.

McIntosh, PD; Eden, DN and Burgham, SJ 1990b Quaternary deposits and landscape evolution in northeast Southland, New Zealand. *Palaeogeography, palaeoclimatology, palaeoecology* 81:95-113.

McIntosh, PD; Lee, WG and Banks, T 1983 Soil development and vegetation trends along a rainfall gradient on the east Otago Uplands. *New Zealand journal of science* 26:379-401.

Metcalf, S (ed.) 1989 *The Otago University Science Students Association 1989 Field Report: Haast*. University of Otago, Botany Department. 45 p.

Meurk, CD 1988a Assessment of kanuka stand, Shimmins Rd, Medbury. Unpublished Botany Division report, Department of Scientific and Industrial Research, Lincoln. 5 p.

Meurk, CD 1988b Travis Swamp revisited. *Canterbury Botanical Society journal* 22:47-57.

Meurk, CD and Given, DR 1990 *Vegetation map of Campbell Island. Scale 1:25 000. Map (1 sheet)*. DSIR Land Resources, Christchurch.

Meurk, CD and Wilson, HD 1989 Stewart Island. *Biological survey of reserves series* 18, Department of Conservation, Wellington.

Molloy, BPJ 1970 Bankside - a new scientific reserve of the Canterbury Plains. *Proceedings of the New Zealand Ecological Society* 17: 47-51.

Molloy, BPJ 1971 Possibilities and problems for nature conservation in a closely settled area. *Proceedings of the New Zealand Ecological Society* 18: 25-37.

Molloy, BPJ and Hislop, WF 1975 Joint report, proposed scientific reserve - Bendhu. Unpublished Botany Division report, Department of Scientific and Industrial Research, Lincoln. 4 p.

Molloy, BPJ and Ives, DW 1972 Biological reserves of New Zealand 1. Eyrewell Scientific Reserve, Canterbury. *New Zealand journal of botany* 10: 673-700.

Molloy, LF 1988 *The Living Mantle - soils in the New Zealand landscape*. Mallinson Rendel, Wellington, in association with the New Zealand Society of Soil Science. 239 p.

New Zealand Forest Service 1982 *Mt Richmond Forest Park Management Plan 1982-1992*. Wellington.

New Zealand Soil Bureau 1968 General survey of the soils of South Island, New Zealand. *New Zealand Soil Bureau bulletin* 27, Department of Scientific and Industrial Research, Wellington. 404 p.

O'Byrne, TN 1986 Soils of part Wallace county, South Island, New Zealand. *New Zealand Soil Bureau soil survey report* 91, Department of Scientific and Industrial Research, Wellington. 120 p.

- O'Loughlin, CL; Rowe, LK and Pearce, AJ 1984 Hydrology of mid-altitude tussock grasslands, upper Waipori catchment, Otago - I: erosion, sediment yields and water quality. *Journal of hydrology (NZ)* 23(2): 45-59.
- Park, GN 1980 Summary of botanical survey of nature reserves in Chatham Islands (Pitt and South East Islands). Unpublished Botany Division Report, DSIR, Christchurch. 11 p.
- Parmenter, GA 1976 Vegetation survey of Lenz Reserve, Otago. *Forest and bird* 201:3-6.
- Partridge, TR 1984 The Cockayne Reserve - a report on its condition. Unpublished Botany Division report, Department of Scientific and Industrial Research, Lincoln. 7 p.
- Pearce, AJ; Phillips, CJ and Campbell, IB 1983 Regolith profiles on slopes underlain by Moutere Gravel Formation, Big Bush State Forest: hydrologic and geomorphic implications. *New Zealand journal of geology and geophysics* 26: 57-70.
- Pearce, AJ; Rowe, LK and O'Loughlin, CL 1982 Hydrologic regime of undisturbed mixed evergreen forests, south Nelson, New Zealand. *Journal of hydrology (NZ)* 21(2): 98-116.
- Pearce, AJ; Rowe, LK and O'Loughlin, CL 1984 Hydrology of mid-altitude tussock grasslands, upper Waipori catchment: II. water balance, flow duration and storm runoff. *Journal of hydrology (NZ)* 23(2): 60-72.
- Peat, N 1991 A saline oasis. *Forest and bird* 22(2): 5.
- Priestley, R 1990 New Zealand landform inventory (2nd approximation). *Research School of Earth Sciences occasional paper* 4, Victoria University of Wellington, Wellington. 164 p.
- Priestley, R; Wyzoczanski, R and Nowell, SB 1991 Inventory of New Zealand mineral sites of international, national and regional importance. *Geological Society of New Zealand miscellaneous publication* 53. 60 p.
- Raeside, JD and Rennie, WF 1974 Soils of Christchurch region, New Zealand: the soil factor in regional planning. *New Zealand soil survey report* 16, New Zealand Soil Bureau, Department of Scientific and Industrial Research, Wellington.
- Ragg, JM and Miller, RB 1978 Soil survey of part Taieri Uplands, Otago, New Zealand. *Soil Bureau bulletin* 39, Department of Scientific and Industrial Research, Wellington. 55 p.
- Rance, B 1990 Turnballs Bush. Unpublished report for the QEII National Trust. 4 p.
- Ross, CW; Barker, PR; Thomas, RF; McQueen, DJ and Wales, JF 1988 Land restoration study - Southland lignite mining. Outline of trial and initial site characterisation. *New Zealand Soil Bureau laboratory report* EP30, Department of Scientific and Industrial Research, Wellington.

- Ross, CW; Mew, G and Searle, PL 1977 Soil sequences on two terrace systems in the North Westland area, New Zealand. *New Zealand journal of science* 20: 231-244.
- Russell, JB 1980 Aranuiian pollen diagrams from montane Canterbury, New Zealand. Unpublished DPhil thesis, University of Canterbury, Christchurch.
- Shanks, A; Glenny, D; Gibson, R; Rosser, K; Roozen, D; Phillipson, S; Steven, J and Arand, J 1990 Coleridge, Craigieburn and Cass Ecological Districts. *Protected natural areas programme survey report* 10, Department of Conservation, Wellington. 306 p.
- Smith, SM and Lee, WG 1984 Vegetation and soil development on a Holocene river terrace sequence, Arawata Valley, South Westland, New Zealand. *New Zealand journal of science* 27: 187-196.
- Smith, SM; Allen, RB and Daly, BK 1985 Soil-vegetation relationships on a sequence of sand dunes, Tautuku Beach, south-east Otago, New Zealand. *Journal of the Royal Society of New Zealand* 15 (3): 295-312.
- Stevens, PR 1968 A chronosequence of soil near the Franz Josef glacier. Unpublished PhD thesis, University of Canterbury.
- Stevenson, G 1986 *Wetlands: discovering New Zealand's shy places*. Government Printing Office, Wellington. 117 p.
- Stewart, GH and Harrison, JBJ 1987 Plant communities, landforms, and soils of a geomorphically active drainage basin, Southern Alps, New Zealand. *New Zealand journal of botany* 25:385-399.
- Stirling, MW 1988 Inventory of New Zealand active earth deformation sites of international, national and regional importance (1st edition). *Geological Society of New Zealand miscellaneous publication* 38.
- Tomlinson, PR and Leslie, DM 1978 Soils of Dunedin city and environs, New Zealand. *New Zealand soil survey report* 37, New Zealand Soil Bureau, Department of Scientific and Industrial Research, Wellington.
- Tonkin, PJ; Basher, LR; Campbell, AS and Sowden, J 1985 Soil development sequences in Westland. In: Pillans, B (ed.) Proceedings of the 2nd CLIMANZ Conference held at Harihari, Westland, New Zealand, February 4-8, 1985. *Geology Department, Victoria University, publication* 33.
- Walls, G 1984 Scenic and allied reserves of the Marlborough Sounds. *Biological survey of reserves series* 13, Department of Lands and Survey, Wellington. 570 p.
- Ward, C; Bruce, DL; Rance, BD and Roozen, DA 1987 Lindis, Pisa and Dunstan Ecological Districts. Unpublished protected natural areas programme survey report.

Ward, WT; Harris, CS and Schapper, HP 1964 Soils and agriculture of Ellesmere County, Canterbury. *New Zealand Soil Bureau Bulletin* 21, Department of Scientific and Industrial Research, Wellington.

Ward, G and Munro, CM 1989 Otago II. *Biological survey of reserves series* 20, Department of Conservation, Wellington.

Wardle, P 1980 Scenic reserves of South Westland. *Biological survey of reserves series* 5, Department of Lands and Survey, Wellington.

Weaver, SD; Johnston, DM and Hayward, BW 1990 Inventory of New Zealand igneous geological sites and features (pre-Quaternary) of international, national and regional importance. *Geological Society of New Zealand miscellaneous publication* 49.

Webb, TH and Espie, PR 1988 Canterbury reserves in relation to the soils of the South Island. Unpublished paper presented to the New Zealand Society of Soil Science conference, Nelson.

Whitehouse, IE; Hayward, B; McIntosh, P and Tonkin, P 1990 Preservation of soils, landforms and geological features. Paper delivered to Natural Heritage Conference, Palmerston North, January 1990. 6 p.

Williams, PA 1982 Scenic reserves of southern Marlborough. *Biological survey of reserves series* 9, Department of Lands and Survey, Wellington. 129 p.

Wilson, HD 1987 *Vegetation of Stewart Island, New Zealand: a supplement to the New Zealand journal of botany*. DSIR Science Information Publishing Centre, Wellington. 131 p.

Wilson, HD 1989 *Hinewai - Management Guidelines*. Maurice White Conservation Trust.

Wilson, HD 1991 *Hinewai - Information and Map*. Pamphlet published by Manuka Press, Christchurch.

Worthy, T 1990 Inventory of New Zealand caves and karst of international, national and regional importance (2nd edition). *Geological Society of New Zealand miscellaneous publication* 47.

Wright, ACS; Richards, J; Lobb, WR and Millar, RB 1946 Soils and their utilisation: Green Island, Kaitangata District. *Soil Bureau bulletin* 6.

NEW ZEALAND SIGNIFICANT SOIL SITES INVENTORY RECORD SHEET
NEW ZEALAND SOCIETY OF SOIL SCIENCE

NAME: _____

LOCAL AUTHORITY: _____

ECOLOGICAL DISTRICT: _____

LOCALITY (enclose map): _____

METRIC MAP: _____ **NON METRIC MAP:** _____

AREA (ha): _____ **ALTITUDE (m):** _____ **RAINFALL (mm):** _____

TOPOGRAPHY (landforms and slopes): _____

PARENT MATERIAL (rock type and regolith): _____

VEGETATION (classes and dominant species): _____

SOIL GROUP(1): _____

SOIL MAPPING UNIT(1): _____

SOIL GROUP(2): _____

SOIL MAPPING UNIT(2): _____

SOIL GROUP(3): _____

SOIL MAPPING UNIT(3): _____

SOIL GROUP(4): _____

SOIL MAPPING UNIT(4): _____

SOIL GROUP(5): _____

SOIL MAPPING UNIT(5): _____

SOIL GROUP(6): _____

SOIL MAPPING UNIT(6): _____

OTHER SOILS: _____

PROFILE(S): _____ **LAB NUMBERS:** _____

IMPORTANCE: 1 = international 2 = national 3 = regional

SIGNIFICANCE: _____

MODIFICATIONS: _____

VULNERABILITY:

1 = site under threat

2 = site formally recommended for protection

3 = site is formally protected

(name threats) _____

TENURE: _____

OWNER/MANAGER: _____

SCIENTIFIC CONTACT PERSON: _____

REFERENCES: _____

NOTES: _____

DATE OF INFORMATION: _____

Note:

- (i) Locations to be shown, where practical, as handdrawn lines on photocopies of NZMS 260 or NZMS 1 base maps.
- (ii) List landforms, parent materials, vegetation and soil groups and mapping units in decreasing order of cover.

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