

# 2.1. Scientific Information

2003/2004 Annual

New Zealand

## 2.1.1 FORWARD PLANS

### Latitudinal Gradient Project (LGP)

The Latitudinal Gradient Project (LGP) is aimed at increasing the understanding of the coastal marine, freshwater and terrestrial ecosystems that exist along the Victoria Land coastline in the Ross Sea region, and describing potential environmental variability that may occur in the future.

Antarctica New Zealand is providing the logistical capabilities for research camps to be located at specific sites along the Victoria Land coast. Thus, the opportunity to work at particular locations in collaboration with other scientists from various disciplines and National Antarctic Programmes is provided.

LGP has been formally incorporated into the SCAR programme RiSCC (Regional Sensitivity to Climate Change). Certain data collected within the LGP will be housed and made available within the RiSCC database framework. Details on how the data will be shared and the timing of when the data will be made available have yet to be decided. It is intended that publications arising from the LGP will be published in a special issue of a refereed journal.

Cape Hallett was the site for the first research season of the Latitudinal Gradient Project, an international study of how marine and terrestrial ecosystems differ from north to south. Antarctica New Zealand provided the logistical support for the Cape Hallett camp, which hosted 16 New Zealand scientists and 6 US scientists during the season.

The Latitudinal Gradient Project will study five sites over the next decade along the Victoria Land coast of Antarctica. The information gained will increase our understanding of polar ecosystems and enable us to predict how climate change will affect these ecosystems.

The research will continue at Cape Hallett for two more years, before moving along to other points on the coast. The Victoria Land coastline spans 14 degrees of latitude along a narrow longitudinal band from Cape Adare to the southern end of the Ross Ice Shelf. For more information, visit the project's website, [www.lgp.aq](http://www.lgp.aq). This site includes the background to the LGP, the collaborative programmes and organisations involved, a description of the science projects being undertaken, and information on the study sites including maps, imagery, publications and data.

### ANDRILL

ANDRILL is a multinational scientific initiative to investigate Antarctica's role in Cenozoic to recent (65 million years ago to the present) global environmental change, and hence its potential future role, through stratigraphic drilling of Antarctica's ice marginal sedimentary basins. An ANDRILL consortium has been established, comprising four countries – Germany, Italy, New Zealand and the United States of America.

A key aim of ANDRILL is to understand the role of Antarctic drivers on global climate variability, which requires a fundamental knowledge of cryospheric evolution not only in recent times, but also for times as long ago as 40 million years into the past. This was a time when global temperature and atmospheric carbon dioxide (CO<sub>2</sub>) were last similar to that

which might well be reached by the end of this century. Through better understanding the interaction between the Antarctic cryosphere (ice sheets, ice shelves, and sea ice) and global systems during previous warmer periods, there will be a more comprehensive understanding of the impacts of predicted future climate warming – both in Antarctica and globally.

The goals of ANDRILL are to:

- Determine the fundamental behaviour of the Antarctic cryosphere, including the magnitude and frequency of its changes on centennial to million year time-scales.
- To obtain geological records from critical intervals in the development of the Antarctic cryosphere to guide and test glaciological and climatic models.
- To document the evolution and timing of major Antarctic rift and tectonic systems, and the stratigraphic development of associated sedimentary basins.
- To determine, by correlating near-ice margin and Southern Ocean stratigraphic records, the role of the Antarctic in climate change process.

## 2.1.2 SCIENCE ACTIVITIES IN PREVIOUS YEAR

<b>Subject</b>	<b>Investigation</b>	<b>Locality</b>	<b>Principal Investigator</b>
Geology	Geophysical and Site Surveys in Support of ANDRILL targets Beneath the McMurdo Ice Shelf	McMurdo Ice Shelf	Dr Gary Wilson
Marine	Latitudinal Patterns in the Abundance of Ross Sea Meroplankton	Coastal areas of Cape Hallett	Dr Mary A. Sewell
Terrestrial Biology	Evaluation of Deterioration Historic Huts and Terrestrial Biodiversity	Cape Evans, Cape Royds	Professor Roberta L. Farrell
Terrestrial Biology	Biodiversity and Performance of Lichens and Mosses	Cape Hallett	Prof T G Allan Green
Human Impacts / Marine Biology	Long-Term Impacts of Human Disturbance on Breeding Adelie Penguins	Cape Bird	Dr Joseph Waas
Terrestrial Biology	Biodiversity of Terrestrial Arthropods in Southern Victoria Land	Lakes Vanda and Vida	Dr Ian Hogg
Molecular Biology	Molecular Ecology of Antarctic Fauna	Cape Bird	Professor David Lambert
Marine Biology/Human impacts	Corticosterone and Stress Responses in Adelie Penguins	Cape Bird	Dr John F. Cockrem
Oceanography	Cape Roberts Tide Gauge	Cape Roberts	Mr. A.R. Pyne
Marine Biology	Antarctic Sea Ice, Algal Productivity and Global Climate Change	Cape Hallett	Dr Ken Ryan
Glaciology / Climatology	NZ ITASE – Climate Variability Along the Victoria Land Coast	Evans Piedmont and Erebus	Dr Nancy Bertler
Geology	Paleozoic Tectonics of the Gondwana Margin	Miller Glacier	Prof John D. Bradshaw
Glaciology	Ice Shelf Sensitivity and Change	McMurdo Ice Shelf	Dr Wendy Lawson
Atmospheric	Dynamics and Ionisation in the Antarctic Middle Atmosphere	Arrival Heights Ross Island	Dr Adrian McDonald
Geology	Influence of Moisture on Rock Wethering Processes	Skelton Glacier and Terra Nova Bay	Ms Christine Elliott
Marine Biology	Thermal Sensitivity of Swimming Performance in Antarctic Fish	Scott Base	Assoc Prof. Bill Davison
Geology	Explosive Intensity of Pre-Flood Basalt Eruptions	Allan Hills	Dr. James D.L. White
Geology	Magmatic and Metamorphic Evolution of the Ross Orogen, Transantarctic Mountains	Skelton Glacier and Royal Society Range	Prof Alan Cooper
Marine Biology	Effects of Variation in Marine	Turtle Rock	Dr Lloyd Davies

	Productivity on Reproduction in Weddell Seals		
Glaciology	Basal Ice and Substrate Deformation at Subfreezing Temperatures	Victoria Glacier Wright Glacier	Dr Sean Fitzsimons
Marine Biology	Latitudinal Gene Drift in Ross Sea Organisms	Cape Hallett	Dr Craig Marshall
Marine Biology	Photolyase Mediated DNA Repair in the Embryos and Larvae of Antarctic Invertebrates Exposed to Ultraviolet Radiation (UV-R)	Scott Base	Dr. Miles Lamare
Atmospheric	Monitoring Magnetosphere-Ionosphere Coupling and Space Weather at High Latitudes	Arrival Heights	Professor Brian J. Fraser
Sociology	Examining the Values of Visitors to the Ross Sea Region	Scott Base	Dr Gary Steel
Freshwater and Marine Ecology	Antarctic Aquatic Ecosystems	Cape Hallett, Bratina Island and Cape Evans	Dr. Ian Hawes
Marine Biology	Antarctic Aquatic Ecosystems (Coastal)	Cape Evans and Terra Nova Bay	Dr Vonda Cummings
Atmospheric	Drivers of Global Change in the Antarctic: Atmospheric Remote-Sensing	Scott Base, Arrival Heights	Dr Stephen Wood
Atmospheric	Drivers of Global Change in the Antarctic: Atmospheric Air Sampling	Sampling Intercontinental	Mr Gordon Brailsford
Climatology	Climate Data Acquisition – Scott Base and Arrival Heights, Antarctica	Scott Base, Arrival Heights	Andrew Harper
Marine Biology	The Evolution of the Transantarctic Mountains and its Associated Rift System.	Terra Nova Bay and David Glacier	Dr Stephen Bannister
Geology	Mapping Glacio-Marine Sequences in the Eastern Victoria Land Basin	Northern Victoria Land	Dr Stuart Henrys
Paleoclimate Research	Collaborative Project with French Antarctic Programme	Dome C	Dr Uwe Morganstern
Marine Biology	Adelie Penguin Population Dynamics	Cape Bird	Dr Peter Wilson
Terrestrial / human impacts	Environmental Protection of Ice-Free Regions of Antarctica	Granite Harbour and Cape Hallett	Dr Jackie Aislabie

## 2.2 Operational Information

### 2003/2004 Annual

New Zealand

#### 2.2.1 NATIONAL EXPEDITIONS

##### 2.2.1.1 Year-round Facility

###### Scott Base

- **Region:** Ross Island, McMurdo Sound
  - **Latitude:** 77°51'00"S
  - **Longitude:** 166°46'00"E
  - **Date opened:** 25 January 1957
  - **Maximum population:** 85 person (summer), average 10 person (winter)
  - **Medical support:** Scott Base has a first aid facility. Advanced medical care is available at McMurdo Station (United States Antarctic Program)
- 

##### 2.2.1.2 Summer Field Camp

###### LGP

- **Region:** Cape Hallett, Northern Victoria Land, Ross Sea Region
  - **Latitude:** 72°19'13"S
  - **Longitude:** 170°13'34"E
  - **Period of operations:** 3<sup>rd</sup> November 2003 to 9<sup>th</sup> February 2004
  - **Maximum population:** 15 persons
  - **Medical support:** Camp staff with pre-hospital emergency training. Field camp first aid box with additions and survival gear.
- 

##### 2.2.1.3 Refuge Huts

###### Cape Royds Hut

- **Region:** Cape Royds, Ross Island
- **Latitude:** 77°33'02.5"S
- **Longitude:** 166°10'20"E
- **Medical facilities:** Survival box
- **Accommodation capacity:** 2 person

###### Cape Evans Hut

- **Region:** Cape Evans on the west coast of Ross Island at northern entrance to Erebus Bay

- **Latitude:** 77°38'18"S
- **Longitude:** 166°24'25"E
- **Medical facilities:** Nil
- **Accommodation capacity:** 4 person in two small huts

### Lower Wright Hut

- **Region:** South side of Wright Valley (approximately 1 mile west of Wright Lower Glacier)
- **Latitude:** 77°26.5'S
- **Longitude:** 162°39.1'E  
(NOTE: this hut's position is incorrect on both USCG 1:250,000 & 1: 50,000 maps)
- **Medical facilities:** Survival box
- **Accommodation capacity:** 2 person

### Bratina Island Hut

- **Region:** Near northern tip of Brown Peninsula
- **Latitude:** 78°01'S
- **Longitude:** 165°32'E
- **Medical facilities:** Nil
- **Accommodation capacity:** 3 very small huts accommodate 6 maximum

### Cape Bird Hut

- **Region:** Adjacent to Adelie penguin rookeries at northern tip of Macdonalds Beach
- **Latitude:** 77°13'06"S
- **Longitude:** 166°26'10"E
- **Medical facilities:** Survival box on beach below hut (77°13'10"S 166°25" 48"E)
- **Accommodation capacity:** 8 person

### Lake Vanda

- **Region:** Three re-locatable huts opposite former site of Vanda Station, near the mouth of the Onyx River
- **Latitude:** 77°31'S
- **Longitude:** 161°40'E
- **Medical facilities:** Nil
- **Accommodation capacity:** 8 person

## Cape Roberts

- **Region:** Situated on promontory on south east edge of Granite Harbour
- **Latitude:** 77°02'S
- **Longitude:** 163°12'E
- **Medical facilities:** Survival box
- **Accommodation capacity:** 4 person

## Cape Hallett (joint US/NZ station abandoned in 1973)

- **Region:** Adelie penguin rookery on Seabee Hook
- **Latitude:** 72°19'S
- **Longitude:** 170°16'E
- **Medical facilities:** Survival box
- **Accommodation capacity:** Nil (NOTE: all huts were removed during the 2003-04 season)

---

### 2.2.1.4 Major Field Activities

- **NZ Event No:** K001W – Geophysical Site Surveys for the Proposed ANDRILL Drill Sites
- **Region:** McMurdo Ice Shelf
- **Latitude:** 77°39'S
- **Longitude:** 164°42'E
  
- **NZ Event No:** K002 – Latitudinal Gradient Project
- **Region:** Cape Hallett, Victoria Land Coast
- **Latitude:** 72°19'S
- **Longitude:** 170°13'E
  
- **NZ Event No:** K081 – Antarctic Aquatic Ecosystem (Inland)
- **Region:** Bratina Island, Lake Hoare
- **Latitude:** Bratina Island 78°01'S, Lake Hoare 77°38'S
- **Longitude:** Bratina Island 163°32'E, Lake Hoare 162°51'E
  
- **NZ Event No:** K049 – ITASE
- **Region:** Victoria Valley, Evans Piedmont Glacier
- **Latitude:** Victoria Valley 77°23'S, Evans Piedmont Glacier 76°44'S
- **Longitude:** Victoria Valley 162°00'E, Evans Piedmont Glacier 162°40'E

#### 2.2.1.5 Vessels

- **Vessel:** RV Tangaroa
  - **Country of registration:** New Zealand
  - **Voyage dates:** Single voyage 24 January 2004 – 10 March 2004
  - **Area of operation:** Ross Sea
  - **Port of departure and arrival:** Lyttelton, New Zealand
  - **Purpose of voyage:** Scientific research cruise
- 

#### 2.2.1.6 Aircraft

##### C130H Hercules

- **Number and type of aircraft:** 2 x Lockheed C-130H Hercules
- **Planned number of flights:** 15
- **Period of flights:** 17 November – 20 December 2003
- **Routes:** Christchurch to McMurdo and return
- **Purpose:** Delivery of personnel and supplies from New Zealand to Ross Island

##### Bell 212 Helicopter

- **Number and type of aircraft:** 1 x Bell 212
- **Planned number of flights:** Various
- **Period of flights:** 7 November 2003 – 24 January 2004
- **Routes:** Operations within 100nm of Scott Base
- **Purpose:** Delivery of personnel and supplies from Scott Base to field camp sites

##### P3K Orion

- **Number and type of aircraft:** Various P3K Orion
  - **Planned number of flights:** Various
  - **Period of flights:** December 2003 – March 2004
  - **Routes:** Various
  - **Purpose:** Surveillance in support of the CCAMLR System of Inspection
- 

#### 2.2.1.7 Research Rockets

Not applicable

---



### 2.2.1.8 Military

- **Number and ranks of military personnel:**

<b>Number</b>	<b>Rank</b>
1	Major General
1	Air Vice-Marshall
1	Lieutenant Commander
1	Lieutenant Colonel
3	Flying Officer
4	Flight Lieutenant
1	Lieutenant
1	Sub Lieutenant
2	Warrant Officer
2	Sergeant Engineer
1	Sergeant Air Load Master
2	Sergeant
7	Corporal
2	Lance Corporal
1	Leading Able Communications Operator
4	Sapper
1	Leading Aircraft Person
1	Signalman
2	Private
various	Other
<b>38</b>	<b>Total</b>

- **Number and type of personal armaments carried:** Nil
- **Number and type of armaments on ships and aircraft:** Nil
- **List of armaments on stations/bases:** Nil

---

## 2.2.2 NON-GOVERNMENTAL EXPEDITIONS

### 2.2.2.1 Ship-Based Operations

#### Akademik Shokalskiy

- **Flag state:** Russia
- **Operator:** Heritage Expeditions Ltd
- **Number of voyages:** 3
- **Departure dates:** 9 December 2003, 5 January 2004, 2 February 2004
- **Ports of departure / arrival:** Hobart, Bluff
- **Areas of operation:** Cape Adare, Terra Nova Bay, Cape Royds, McMurdo Station, Scott Base, Franklin Island, Cape Hallett, Inexpressible Island, Cape Bird, Commonwealth Bay

### **2.2.2.2 Land-Based Operations**

Nil

---

## 2.3. Permit Information

2003/2004 Annual

New Zealand

### 2.3.1 VISITS TO PROTECTED AREAS

#### ASPAs 105, Beaufort Island, Ross Sea

Event Number	Number authorised	Dates	Purpose
K122	2	30/12/2003	Adelie penguin research

#### ASPAs 106, Cape Hallett, Victoria Land

Event Number	Number authorised	Dates	Purpose
K018	2	18/11-16/12/2003	LGP camp
K024	4	21/01-02/02/2004	Botanical survey, mapping, photographic archiving
K043	4	17/11-16/12/2003	Camping and transit to research sites on sea ice
K066	2	17/11-16/12/2003	Fishing
K081	1	13-20/01/2004	Walking, collecting and benthic mat samples from ponds
K123	2	13-20/01/2004	Soil characterisation
K124	1	13-20/01/2004	Vegetation survey, mapping and sample collection

#### ASPAs 122, Arrival Heights, Hut Point Peninsula, Ross Island

Event Number	Number authorised	Dates	Purpose
K055	4	16-23/01/2004	Operations and maintenance of radar
K069	1	11-15/01/2004	Annual maintenance, upgrade, and calibration of scientific equip.
K087	1	27/08/2003-27/01/2004	Air sampling
K087	1	27/01/2004	Maintenance
K087	1	29/01/2004	Maintenance
K089	1	14-15/01/2004	Annual calibration of meteorological equipment
K131	1	12/11/2003	Inspection of proposed new lab site for EARP
K131	1	13/11/2003	Checking communications equipment
K230	1	13/12/2002	Photography
K423	2	Not known	Inspection of Satellite Earth Station equipment and structure

### ASPA 124, Cape Crozier, Ross Island

Event Number	Number authorised	Dates	Purpose
K034	4	21-24/11/2003	Penguin research
K450	1	18/11/2003	Deploy GPS receiver with G079
K450	1	18/11/2003	Maintenance of GPS receiver with G079

### ASPA 155, Historic Hut, Cape Evans, Ross Island

Event Number	Number authorised	Dates	Purpose
K141E	3	02/10/03	Recreation
K400	3	10/10/03	Maintenance and recreation
K401	5	10/10/03	Maintenance and recreation
K402	1	10/10/03	Maintenance and recreation
K414	1	10/10/03	Maintenance and recreation
Fam	12	26/10/03	Recreation
K401	5	28/10/03	Education and recreation
K416	1	28/10/03	Education and recreation
K412	3	30/10/03	Recreation
K414	1	30/10/03	Recreation
K401	6	Unknown	Recreation
K424	2	Unknown	Recreation
K401	2	02/11/03	Recreation
K068	1	02/11/03	Recreation
K141	3	02/11/03	Recreation
K450	2	02/11/03	Recreation
K082	3	Unknown	Recreation
K053	3	16/11/03	Recreation
K401	1	20/11/04	Media and recreation
K400	2	20/11/04	Media and recreation
K310	2	20/11/04	Media and recreation
K414/322	1	20/11/04	Media and recreation
K313	2	20/11/04	Media and recreation
K401	1	23/11/03	Recreation
K402	2	23/11/03	Recreation
K057	3	23/11/03	Recreation
K301	6	26/11/03	Official visitors
K500	2	26/11/03	Official visitors
K400	1	26/11/03	Official visitors
K401	1	26/11/03	Official visitors
K001	5	07/12/03	Recreation
USAP	1	07/12/03	Recreation
K400	1	11/12/03	Education
K210	3	11/12/03	Education
K201	1	11/12/03	Education
K401	1	11/12/03	Education

MTT	2	14/12/03	Recreation
K401	2	14/12/03	Recreation
K423	2	14/12/03	Recreation
K425	3	14/12/03	Recreation
K420	2	14/12/03	Recreation
K300	7	17/12/03	Official visitors
K401	3	20/12/03	Education
K200	24	20/12/03	Education
K401	2	21/12/03	Recreation
K402	2	21/12/03	Recreation
K420	1	21/12/03	Recreation
K021	4	13/01/04	Research
K021	5	14/01/04	Research
K232	2	15/01/04	Recreation
K021	10	15/01/04	Research
K021	6	16/01/04	Research
K311	2	16/01/04	Media
K303	4	17/01/04	Official visitors
K440	6	17/01/04	Conservation
K400	4	31/01/04	Recreation
K404	2	31/01/04	Recreation

### ASPA 157, Historic Hut, Backdoor Bay, Cape Royds, Ross Island

<b>Event Number</b>	<b>Number authorised</b>	<b>Dates</b>	<b>Purpose</b>
K141E	3	02/10/03	Recreation
K400	3	10/10/03	Maintenance and recreation
K401	5	10/10/03	Maintenance and recreation
K402	1	10/10/03	Maintenance and recreation
K414	1	10/10/03	Maintenance and recreation
Fam	12	26/10/03	Recreation
K401	5	28/10/03	Education and recreation
K416	1	28/10/03	Education and recreation
K401	2	02/11/03	Recreation
K068	1	02/11/03	Recreation
K141	3	02/11/03	Recreation
K450	2	02/11/03	Recreation
K053	3	16/11/03	Recreation
K401	1	18/11/03	Minder
K400	2	18/11/03	Minder
K310	2	18/11/03	Media
K311	3	19/11/03	Media
K322	2	20/11/03	Media
K401	5	23/11/03	Recreation
K402	4	23/11/03	Recreation
K313	2	23/11/03	Recreation
K141	1	23/11/03	Recreation
K057	3	23/11/03	Recreation
K001	1	23/11/03	Recreation

K401	1	28/11/03	Media
K400	2	28/11/03	Media
K310	2	28/11/03	Media
K400	1	10/12/03	Education
K401	1	10/12/03	Education
K210	4	10/12/03	Education
MTT	2	14/12/03	Recreation
K401	2	14/12/03	Recreation
K423	2	14/12/03	Recreation
K425	3	14/12/03	Recreation
K420	2	14/12/03	Recreation
K401	3	20/12/03	Education
K200	24	20/12/03	Education
K401	2	21/12/03	Recreation
K300	7	17/12/03	Official visitors
K402	2	17/12/03	Recreation
K420	1	17/12/03	Recreation
K400	1	13/01/04	Minder
K321	1	13/01/04	Artist
K232	1	13/01/04	Education
K440	6	14/01/04	Conservation
K303	4	17/01/04	Official visitors
K311	2	17/01/04	Media
K021	2	17/01/04	Research
K021	4	18/01/04	Research
K021	4	19/01/04	Research
K400	4	31/01/04	Recreation
K404	2	31/01/04	Recreation

### ASPA 158 Historic Hut, Hut Point, Ross Island

Event Number	Number authorised	Dates	Purpose
K421	3	21/10/03	Recreation
K401	1	21/10/03	Recreation
K402	1	21/10/03	Recreation
K416	1	22/10/03	Familiarisation
K400	1	22/10/03	Minder
K425	3	23/10/03	Recreation
K080	2	25/10/03	Recreation
K056	2	31/10/03	Recreation
K401	1	Unknown	Recreation
K421	3	Unknown	Recreation
NIWA	2	Unknown	Recreation
K064	3	07/11/03	Recreation
K401	1	08/11/03	Recreation
K063	1	08/11/03	Recreation
K323	2	18/11/03	Media
K401	1	08/11/03	Recreation
USAP	1	08/11/03	Recreation
K401	1	Unknown	Recreation
K400	1	Unknown	Recreation

K049	1	Unknown	Recreation
K043	4	13/11/03	Recreation
K001	5	13/11/03	Recreation
K440	5	13/11/03	Conservation
K322/K41			
4	1	17/11/03	Education
K310	2	17/11/03	Media
K400	1	17/11/03	Recreation
K451	1	17/11/03	Recreation
K301	9	25/11/03	Official visitors
K400	1	25/11/03	Recreation
K302	7	26/11/03	Official visitors
K314	2	03/12/03	Media
K049	2	05/12/03	Recreation
K400	1	08/12/03	Recreation
USAP	1	08/12/03	Recreation
K233	1	11/12/03	Recreation
K500	1	11/12/03	Recreation
K400	1	12/12/03	Education
K210	4	12/12/03	Education
K230	1	12/12/03	Education
K300	7	18/12/03	Official visitors
K400	1	26/12/03	Recreation
K425	2	26/12/03	Recreation
K001	1	27/12/03	Recreation
K200	23	30/12/03	Recreation
K002	1	31/12/03	Recreation
K131	3	Unknown	Education
K110	1	01/01/04	Recreation
K401	1	01/01/04	Recreation
K001	1	01/01/04	Recreation
K411	1	02/01/04	Recreation
K200	1	03/01/04	Recreation
K021	4	12/01/04	Research
K021	6	13/01/04	Research
K232	1	13/01/04	Education
K321	2	13/01/04	Artists
K021	2	17/01/04	Research
K024	1	17/01/04	Recreation
K021	4	18/01/04	Research
K103	3	18/01/04	Recreation
K021	4	19/01/04	Research
B424	3	19/01/04	Recreation
K028	4	19/01/04	Recreation
K027	3	19/01/04	Recreation
K220	2	19/01/04	Education
K450	1	19/01/04	Official visitor
K402	1	19/01/04	Minder
K401	1	19/01/04	Minder
K303	3	19/01/04	Official visitor
K400	1	19/01/04	Minder
K311	1	20/01/04	Media

K420	1	25/01/04	Recreation
K401	1	25/01/04	Recreation
K423	2	25/01/04	Recreation
K073	1	01/02/04	Recreation
K401	1	17/02/04	Recreation
K420	1	17/02/04	Recreation
K401	3	Unknown	Recreation

### 2.3.2 TAKING AND HARMFUL INTERFERENCE WITH FLORA AND FAUNA

Event No.	Species	Location	Type or amount	Purpose
K018	Plankton	Cape Hallett	68 samples taken	Taxonomic research
K024	<i>Bryum argenteum</i> <i>Bryum subrotundifolium</i> <i>Bryum pseudotriquetrum</i> <i>Sarconeurum glaciale</i> <i>Grimmia</i> sp. <i>Amandinea petermannii</i> <i>Buellia frigida</i> <i>Caloplaca</i> sp. <i>Caloplaca citrina</i> <i>Caloplaca saxicola</i> <i>Candelaria murrayi</i> <i>Candelariella flava</i> <i>Lecanora expectans</i> <i>Lecanora</i> cf. <i>mons-nivis</i> <i>Lecanora physciella</i> <i>Lecida</i> sp. <i>Physcia caesia</i> <i>Physcia dubia</i> <i>Rhizoplaca</i> sp. <i>Rhizoplaca melanophthalma</i> <i>Xanthoria elegans</i> <i>Xanthoria mawsonii</i>	Cape Hallett ASPA 106	3 samples of each	Biodiversity and performance research
K027	<i>Pygoscelis adeliae</i>	Cape Bird	256 blood sampling handling	Anthropogenic disturbance research
K028	<i>Stereotydeus mollis</i>	Wright Valley – Lake Vanda	200	Biodiversity research
K028	<i>Gomphiocephalus hodgsoni</i>	Wright Valley – Lake Vanda	40	Biodiversity research
K028	<i>Stereotydeus mollis</i>	Victoria Valley – Lake Vida	280	Biodiversity research
K028	<i>Gomphiocephalus hodgsoni</i>	Victoria Valley – Lake Vida	320	Biodiversity research
K030	<i>Pygoscelis adeliae</i>	Cape Bird	544 captured, banded and blood samples taken.	Molecular ecology research



K034	<i>Pygoscelis adeliae</i>	Cape Bird	130 – observed	Stress responses research
K034	<i>Pygoscelis adeliae</i>	Cape Royds	7 – blood and cloacal samples	Stress responses research
K034	<i>Pygoscelis adeliae</i>	Cape Crozier ASPAs 125	8 – blood and cloacal samples	Stress responses research
K057	<i>Pagothenia borchgrevinki</i>	Fish hut – sea ice in front of SB.	190 - removed	Cardiovascular and respiratory physiology research
K057	<i>Pagothenia borchgrevinki</i>	Sea ice	30 - removed	Cardiovascular and respiratory physiology research
K063	<i>Leptonychotes weddellii</i>	Turtle Rock	2	Research into the effect of spatial and temporal variation in marine productivity on energy acquisition
K063	<i>Leptonychotes weddellii</i>	Hutton Cliffs	48	Research into the effect of spatial and temporal variation in marine productivity on energy acquisition
K068	<i>Sterechinus neumayeri</i>	Cape Armitage	40 – capture and release	Research on photolyase mediated DNA repair in the embryos and larvae of invertebrates exposed to ultraviolet radiation (UV-R)
K068	<i>Odontaster validus</i>	Cape Armitage	15 – capture and release 15 – removal	Research on photolyase mediated DNA repair in the embryos and larvae of invertebrates exposed to ultraviolet radiation (UV-R)
K068	<i>Perknaster aurorae</i>	Cape Armitage	10 - removal	Research on photolyase

				mediated DNA repair in the embryos and larvae of invertebrates exposed to ultraviolet radiation (UV-R)
Ko68	<i>Acodontaster conspicuus</i>	Cape Armitage	10 -removal	Research on photolyase mediated DNA repair in the embryos and larvae of invertebrates exposed to ultraviolet radiation (UV-R)
Ko68	<i>Sterechinus neumayeri</i>	Cinder Cones	50- removal	Research on photolyase mediated DNA repair in the embryos and larvae of invertebrates exposed to ultraviolet radiation (UV-R)
Ko68	<i>Odontaster validus</i>	Cinder Cones	20 -removal	Research on photolyase mediated DNA repair in the embryos and larvae of invertebrates exposed to ultraviolet radiation (UV-R)
Ko68	<i>Perknaster aurorae</i>	Cinder Cones	10 -removal	Research on photolyase mediated DNA repair in the embryos and larvae of invertebrates exposed to ultraviolet radiation (UV-R)
Ko68	<i>Odontaster validus</i>	Cape Evans	30 -removal	Research on photolyase mediated DNA repair in the embryos and larvae of invertebrates

				exposed to ultraviolet radiation (UV-R)
Ko68	<i>Odontaster validus</i>	Cape Armitage	15 – capture and release 15 – removal	Research on photolyase mediated DNA repair in the embryos and larvae of invertebrates exposed to ultraviolet radiation (UV-R)
Ko81	Microbial mats	Bratina Island	550g collected	Aquatic ecosystems research
Ko81	Microbial mats	Labyrinth	180g collected	Aquatic ecosystems research
Ko81	Microbial mats	Victoria Valley	18g collected	Aquatic ecosystems research
Ko81	Microbial mats	ASPA 106	49g collected	Aquatic ecosystems research
Ko82	<i>Phyllophora spp</i>	Cape Evans	10g collected	Coastal ecosystems research
Ko82	<i>Phymatolithon spp</i>	Cape Evans	10g collected	Coastal ecosystems research
Ko82	Benthic macrofauna	Cape Evans	50g collected	Coastal ecosystems research
Ko83	Epifaunal animals	Cape Adare Cape Hallett Coulman Island Cape Russell		
K122	<i>Pygoscelis adeliae</i>	Cape Bird	1072 – measure, band, attach instruments, observe	Population dynamics research
K124	Cyanobacteria	Cape Hallett	6 Eppendorf tubes	Research into evolution and dispersal of algae
K124	Green algae	Cape Hallett	6 Eppendorf tubes	Research into evolution and dispersal of algae
K200	<i>Leptonychotes weddellii</i>	Hutton Cliffs	63 counted	Seal census

### **2.3.3 INTRODUCTION OF NON-NATIVE SPECIES**

No non-native species were introduced, other than for food purposes.

## 2.4. Environmental Information

2003/2004 Annual

New Zealand

### 2.4.1 COMPLIANCE WITH THE PROTOCOL

No new measures were adopted during the 2003/2004 period.

### 2.4.2 LIST OF IEES AND CEES

The following IEES were considered for the 2003/2004 Antarctic summer season:

Activity	Holder	Notes
Construction of a New Warm Store Facility, Scott Base, Antarctica	Julian Tangaere Operations Manager Antarctica New Zealand	Activity approved to proceed in accordance with IEE and conditions.
Ross Sea Heritage Restoration Project Part 1: Shackleton's Hut, Cape Royds, Antarctica	Nigel Watson Director Antarctic Heritage Trust	Activity approved to proceed in accordance with IEE and conditions. Permit for restoration activities in ASPA 157 issued.
Latitudinal Gradient Project Cape Hallett Camp	Shulamit Gordon Project Manager Antarctica New Zealand	Activity approved to proceed in accordance with IEE and conditions. Permit for entry into ASPA 106 issued.
Tour expedition using the <i>Academik Shokalskiy</i>	Rodney Russ Heritage Expeditions Ltd (New Zealand)	Activity approved to proceed in accordance with IEE and conditions. Permit for entry to ASPAs 106, 155, 157, 158 and 159 issued.
Tour expedition using the <i>Kapitan Khlebnikov</i>	Werner Stambach Quark Expeditions (United States)	Activity approved to proceed in accordance with IEE and conditions. Permit for entry to ASPAs 106, 155, 157, 158 and 159 issued.

### 2.4.3 MONITORING ACTIVITIES REPORT

The following environmental monitoring related to New Zealand activities was undertaken.

Activity	Location	Procedures	Information	Action
Photo records	Scott Base	Photographs taken from 7 established photo-points	A key change observable this year was preparation of the warm store site.	None. It is hoped that this will provide a valuable visual record of alterations

		around Scott Base.		to the base area and topography.
Fuel handling, storage and use	Scott Base and field operations	Volume of fuel stored and used monthly, by type. Number and locations of fuel spills.	Less fuel was used than in the previous year. Three spills totalling 145 litres occurred.	Vehicle repairs and procedural changes to prevent future spills.
Waste	Scott Base and field operations	Total waste disposed of to landfill in New Zealand recorded.  Analysis of waste generated at Scott Base conducted.	General waste levels have stayed relatively constant over the last five years, with the exception of a peak in the 2002/03 season, largely due to the refit of Scott Base's 3A accommodation unit and other projects which created large quantities of construction waste. An increasing quantity of biological hazardous waste may be considered a positive indicator, as it is primarily composed of human waste from the field, and reflects an increasing practice of removing rather than dumping these wastes on site.	Waste reduction efforts to continue.

#### 2.4.4 WASTE MANAGEMENT PLANS

The following planning documents are in place for Scott Base and New Zealand field operations:

- Antarctica New Zealand Waste Management Policy (last updated July 2004)
  - Antarctica New Zealand Waste Management Handbook (to be updated October 2004).
- These are available on Antarctica New Zealand's website [www.antarcticanz.govt.nz](http://www.antarcticanz.govt.nz).

During the past year, waste has been separated, stored, transported and disposed of in accordance with these documents. Efforts to minimise waste by source reduction are ongoing. All wastes other than sewage and domestic wastewater are returned to New Zealand for disposal (items recyclable within New Zealand are sent to appropriate agencies for recycling).

A wastewater treatment plant for Scott Base has been installed and became operational in October 2002.

## 2.5. Relevant National Legislation

2003/2004 Annual

New Zealand

### 2.5.1 EXISTING MEASURES

New Zealand has domestic laws implementing the Antarctic Treaty, the Convention for the Conservation of Antarctic Marine Living Resources and the Protocol on Environmental Protection to the Antarctic Treaty. These are:

Antarctica Act 1960

Antarctic Marine Living Resources Act 1981

Antarctica (Environmental Protection) Act 1994

These are available at [http://www.legislation.govt.nz/browse\\_vw.asp?content-set=pal\\_statutes](http://www.legislation.govt.nz/browse_vw.asp?content-set=pal_statutes).

### 2.5.2 MEASURES ADOPTED THROUGH THE YEAR

No new legislation was adopted during the 2003/2004 period.

The following measures were adopted during the 2003/2004 period to give effect to obligations arising from ATCM recommendations in accordance with Article IX of the Antarctic Treaty:

Measure	Description	Date of effect
Measure 1 (2003)	Secretariat of the Antarctic Treaty	Approved 13 October 2003
Measure 2 (2003)	Antarctic Protected Areas System: Management Plans for ASPAs	Approved 13 October 2003
Measure 3 (2003)	Antarctic Protected Areas System: Revised List of Historic Sites and Monuments	Approved 13 October 2003

## **2.6. Other Information**

### **2003/2004 Annual**

**New Zealand**

#### **2.6.1 INSPECTION REPORTS**

No inspections were conducted during the 2003/2004 season.

#### **2.6.2 NOTICE OF ACTIVITIES UNDERTAKEN IN CASE OF EMERGENCIES**

No activities were undertaken in case of emergency during 2003/04.