Signed-off Version

Department of Conservation

Nature and Extent of Conservation Services for the 1998/99 Financial Year

Hon. Dr Nick Smith
M.P. for Nelson

Minister of Conservation
Minister of Corrections

Associate Minister of Social Welfare
Associate Minister of Immigration

98/8345

28 July 1998

1998/99 Conservation Services Levy Nature and Extent White Paper as Approved by the Minister of Conservation.

1. I hereby approve the attached 1998/99 Nature and Extent White Paper for the Conservation Services Levy Programme.

2. The total value of work approved (after deduction of the $199,000 contribution from the Operational Science Fund) is $1,053,113.

3. The deletions from the version of the Nature and Extent White Paper circulated for consultation are as follows:

   - **327 observer days** allocated for the hake, hoki and southern blue whiting trawl fisheries are deleted. With the 1997/98 Nature and Extent White Paper coverage changed from the Fishing Year (October to September) to the Financial Year (July to June). Thus levies for observations on the trawl fisheries for hoki, southern blue whiting and hake, carried out between 1 July 1998 and 30 September 1998, have already been struck in the 1997/98 round and do not appear in this paper. This results in a saving of $98,918 dollars.
   - Project CSL 1B (**Processing and analysis of fisheries observer project data**) which appeared in both the Ministry of Fisheries White Paper (as ENV9801) and The Department of Conservation White Paper will be levied in the Ministry of Fisheries' White Paper. Thus $132,000 is deducted from the Conservation Services Levy proposed in 1998/99.
   - Projects CSL3A (iv) (**Black browed and grey headed albatross on Campbell Island**) and CSL3A (v) (**Grey petrel on Antipodes Island**) are deleted resulting in savings of $22,500 and $84,100 respectively. Thus the fishing industry liability for seabird monitoring programmes, after taking account for the $199,000 contributed by the Operational Science Fund, is $245,000.

Nick Smith
Minister of Conservation

- 4 AUG 1998

Cslwhitepap\18aug8

Parliament Office: Beehive Suite 4.1, Parliament House, WELLINGTON. Telephone: (04) 471 9978, Facsimile: (04) 473 6118
Electorate Office: 544 Waimea Road, Annesbrook, NELSON. Telephone: (03) 547 2314, Facsimile: (03) 547 2315

Conservation Services

Introduction

The Fisheries Act 1996, in Part XIV, Section 262 allows the Crown to recover its costs in respect of the provision of conservation services being:

Outputs produced by the Minister of Conservation or the Director-General of Conservation of the Department of Conservation that enable those persons to perform their statutory powers, duties, and functions related to the adverse effects of commercial fishing on protected species; including -

a) Research relating to such effects on protected species; and

b) Research on measures to mitigate the adverse effects of commercial fishing on protected species; and

c) The development of population management plans under the Marine Mammals Protection Act 1978 and the Wildlife Act 1953.

These services are known in the Act as 'Conservation Services'.

For the 1995/96, 1996/7 and 1997/98 fishing years, the Department of Conservation initiated projects through Conservation Services Levies (CSL) in the following major areas:

1. Observer coverage targeted at protected species bycatch in selected fisheries;
2. Analysis and estimation of bycatch data for protected species;
3. Research and development of mitigation measures;
4. Bycatch carcass retrieval and identification;
5. Monitoring of certain populations of protected species taken as bycatch.

DOC is proposing a similar set of projects for the 1998/99 fishing year. New initiatives are some work on the Chatham Island Mollymawk specifically aimed at determining whether small area closures can provide effective protection for this species and at-sea observation of the squid jig fleet off Otago to check reports of bird and mammal interactions in this fishery. There is a substantial increase in expenditure on the Marine Mammal Exclusion Device (MMED) for trawl nets (up from $34,650 in 1997/98 to $122,650 in 1998/99). This is to finance the work required to determine the proportion of marine mammals ejected alive from this device. There is also a substantial increase in the cost of the autopsy of sea birds. This arises because Te Papa Tongarewa (That National Museum of New Zealand) no longer wishes to autopsy bird and thus no longer subsidises the work.

Work continues on the two Population Management Plans (NZ sea lion and wandering albatrosses) initiated in the 1995/96 fishing year. In 1998/99 it is proposed to commence work on a PMP for Hector's Dolphin.

As previously intimated the Ministry of Fisheries and the Department of Conservation have agreed to jointly manage the standard statistical analysis of bycatch. This project will be managed by an

interdepartmental technical group. Thus the project appears is in the Ministry of Fisheries White Paper as ENV9801.

In the 1997/98 fishing year work is scheduled to finish on foraging and population dynamics of Southern Royal Albatross, Grey-headed Albatross and Black-browed Albatross (part 1997/98 CSL 3A(iv)), on the at-sea observation of the bycatch of Hector's dolphin between Motunau and Timaru (part 1997/98 CSL 1A and part 1997/98 CSL 1B) and on the power analysis modelling of albatross monitoring studies (1997/98 CSL 3A(v)). Consequently, these projects do not appear in the 1998/99 White Paper.

The Minister gratefully acknowledges the support and assistance that has been provided in the development of these projects by the Ministry of Fisheries and Approved Parties.

Observer Programme

Fisheries Observer Programme - observer seadays

Project: The collection by fisheries observers of statistically robust data on the incidental take of protected marine species.

Project Code: CSL 1A
Project Cost: $ 213 553
Start Date: 1 July 1998
Completion Date: Ongoing - subject to annual review

Project Objectives:
To obtain statistically reliable information on the number of protected species incidentally taken in a number of commercial fisheries;

To verify the accuracy of reporting by commercial fishers of protected species bycatch;

To identify possible means for mitigating the incidental take of protected species;

To collect other biological information on protected species bycatch.

Objectives for 1998/99:
To meet the project objectives, above, in a number of commercial fisheries where the bycatch of protected marine species occurs or is thought to occur, viz:

Trawl fisheries for: jack mackerel, squid, orange roughy and scampi; pelagic and demersal longline fisheries; and the squid jig fishery off the Otago coast, levies are approved in this paper.

With the 1997/98 Nature and Extent White Paper coverage changed fron the Fishing Year (October to September) to the Financial Year (July to June). Thus levies for observations on the trawl fisheries for hoki, southern blue whiting and hake, usually carried out between 1 July 1998 and 30 September 1998, have already been struck in the 1997/98 round and do not appear in this paper.

Fishery	JMA	SQUID trawl	SQUID jigged	ORH	Pelagic longline	Demersal longline	Total
	Jack Mackerel	Squid trawl	Squid jigged	Orange Roughy	Tuna longlining	Ling	
CSL funding of Observer Programme (sea days)	66 [In Taranaki Bight]	200	100 [Off Otago coast]	50 [Auckland Islands Shelf]	195	Ling 90 days [includes Chatham Is vessels]	701

In the trips in the table above, and for the hoki, hake and southern blue whiting trawl fisheries levied in 1997/98, observers will be required to treat the collection, packaging and storage of protected species by-catch animals and associated data as the primary task.

Cost Estimate:

Observer costs (MFish, 1028 days - including salary, travel, overheads @ $275/day)	192,775
Report editing, printing and distribution costs	1,500
DOC administrative costs (@ 10% of total)	19,278
TOTAL	**$213,553**

Background:

The Minister of Conservation intends to purchase adequate observer coverage during fishing year 1998/99 in those fisheries known to incur a significant incidental take of protected marine species to meet the statutory requirements outlined in section 262 of the Fisheries Act 1996.

The proposed number of observer days to be purchased through CSL funding for 1998/99 and their allocation between specific fisheries are shown in the table above.

The Department will advocate for the deployment of observers in the fisheries described to provide an acceptable level of confidence that the observed level of incidental take of protected species is representative of the incidental take rate of the whole fleet.

Provided satisfactory service is provided it is proposed that the Observer Programme of the Ministry of Fisheries will provide the observer services. The Ministry of Fisheries Programme may not be prepared to provide the observer services for vessels based in the Chatham Islands in which case another contractor will be sought.

The overhead is used to fund a Department of Conservation officer to brief and debrief observers, maintain instruction manuals and collate information.

Marine mammal carcass recovery project

Project: The collection of biological data on protected marine mammal species incidentally caught in commercial fisheries.

Project Code: CSL 1C
Project Cost: $34,160
Start Date: 1 October 1998
Completion Date: 30 September 1999

Project Objectives:
To collect specimens of marine mammal incidentally taken in fishing operations for the determination of: species; age; sex; reproductive status; stomach contents; and general condition.

To analyse the above data to establish a population profile of those species caught incidentally as bycatch.

Objectives for 1998/99:

To collect, and return to port for autopsy by qualified personnel, up to 80 marine mammal bycatch specimens, this total to include all sea lions and small cetaceans, and some fur seals. The fur seals will principally be known-age animals bearing DoC tags applied on natal rookeries

Autopsy to examine species, age, sex, reproductive status, stomach contents and general condition of the specimens to establish a population profile for those species caught as bycatch.

Cost Estimate:

Packaging and labelling @ $16/bag	960
Transport from wharf @ $250/pallet/tonne	7,500
Storage @ $40/pallet/month	1,000
Autopsy contract	20,000
Report editing, printing and distribution costs	1,500
DOC administrative costs (@ 10% of total)	3,200
TOTAL	**$34,160**

Background:
Before this project started in 1995/96, the bodies of most of the marine mammals incidentally taken in commercial fishing operations are dumped at sea, thus losing the opportunity to collect a considerable amount of valuable biological data related to species, age, sex, reproductive status and other physiological parameters. This project will provide for the return to port, storage, transport and autopsy of up to 80 marine mammals incidentally taken during the 1998/99 fishing year by vessels carrying Ministry of Fisheries and/or industry observers. The data collected will provide a profile of the population taken as bycatch, and will generate essential information on the impact of commercial fishing on marine mammals.

This project will be contestable.

Seabird carcass recovery project

Project: The collection of biological data on protected seabird species incidentally caught in commercial fisheries.

Project Code: CSL 1D
Project Cost: $33 000
Start Date: 1 October 1998
Completion Date: 30 September 1999

Project Objectives:
To collect specimens of protected seabirds incidentally taken in fishing operations for the analyses of: species; age (where possible); sex; reproductive status; stomach contents; and general condition.

To analyse the above data to establish a population profile of those species caught incidentally as bycatch.

Objectives for 1998/99:
To collect, and return to port for autopsy by qualified personnel, up to 350 seabird bycatch specimens.

Autopsy to examine species, age (where possible) , sex, reproductive status, stomach contents and general condition of the specimens to establish a population profile for those species incidentally taken as bycatch.

Cost Estimate:

Autopsy and identification contracts	20,000
Transport from wharf to autopsy room	6,000
Labelling and packing	2,500
Report editing, printing and distribution costs	1,500
DOC administration costs (@ 10% of total)	3,000
TOTAL	**$33,000**

Background:
This project will provide for the return to port, storage, transport and autopsy of up to 350 seabirds incidentally taken during the 1998/99 fishing year by vessels carrying Ministry of Fisheries and/or industry observers. The data collected will provide a profile of the population taken as bycatch, and will generate essential information on the impact of commercial fishing on seabirds.

During the 1996/97 fishing season over 350 birds were returned, many more than anticipated. Similar numbers are expected in the 1997/98 and 1998/99fishing year. About 50 of these birds will be from the trawl fleet and the balance from demersal and surface longline fisheries.
The previous contractor, Te Papa Tongarewa (The Museum of New Zealand), has elected not to continue with this autopsy work because its magnitude impacts of the routine duties of its staff and because of health and safety reasons. It is, therefore, necessary to move the work to a satisfactory autopsy room. There are a limited number of people who can reliably identify some sea birds down to species (e.g. differentiate between Antipodes and Auckland Island Wandering Albatross).

However, much of the autopsy work such as breeding status, disease status, stomach contents etc can be done by a wider range of staff.

Te Papa Tongarewa used to subsidise this autopsy work by providing identification labels and paying transport of birds from the port of landing to the Museum. These subsidies have now ceased and are thus explicitly costed.

The most satisfactory solution would be to send the birds to Massey University for identification and autopsy. Training in identification could be given by Department of Conservation staff and it is likely that some concomitant studies would result – eg disease status for some species. If the project were to move to Massey University the above are the likely costs.

The Department of Conservation recommends the move to Massey University and seeks stakeholders' views on this and whether the project should continue to be contestable.

Mitigation devices to minimise bycatch

Seabirds

Project: The research, design and development of mitigation measures to minimise the incidental take of seabirds protected under the First Schedule of the Conservation Act 1987, and the Wildlife Act 1953.

Project Code: CSL 2A
Project Cost: $106,000
Start Date: 1 October 1998
Completion Date: Ongoing - subject to annual review

Project Objectives:
To continue research, development and evaluation of operational methods and devices to avoid, remedy or mitigate the incidental take in commercial longline fishing operations of protected seabirds.

Objectives for 1998/99

Tuna
By the end of 1997/8 the underwater setting device will either:

1. Have been thoroughly sea tested and be shown to enable bait setting to occur with ease and without interruption, and to be effective in deterring seabirds from taking bait. If this is the case, the objective will be to commence introduction of the chute on to surface longline vessels and inform fishers of correct use of the chute.
2. Require further refinement and testing before it is ready for introduction to the surface longline fleet. If this is the case, the objective will be to undertake this work, so the device is ready for introduction to the fleet in 1999/2000.

Ling and Snapper
To research methods of mitigating bird catch during the set of demersal longlines targeting both ling and snapper.

Captures at Hauling
Some vessels, particularly small vessels using a monofilament main line, land the majority of their bycatch birds alive. It is likely that many such birds are caught at hauling. Some vessels in the fleet use clever methods to avoid capture at hauling and these methods need to be researched, collated and disseminated.

Cost Estimate:

Contracts	92,000
Report editing, printing and distribution costs	4,500
DOC administration costs (@ 10% of total)	9,500
TOTAL	**$106,000**

Background:

Tuna

At the beginning of the 1995/6 fishing year, a technical group of fishers, fishing industry representatives, observers, and government representatives met to discuss the range of possible ways seabirds could be deterred from taking baits during surface longlining operations. The group agreed that development of a mechanism for setting bait underwater held potential.

During 1995/6, two prototype underwater setting devices were developed. The technical group viewed the two devices in operation during a one day demonstration on the F.V "Kariqa", (owned by Mike and Soo Wells). The group recommended that the device designed and built by Akroyd Walshe Ltd be developed and tested further. This device sets the bait and sidebranch through a chute. Funding from the Australian Fisheries Management Authority has since been secured to develop the other underwater setting device, which was built and designed by MS Engineering, in co-operation with David Kellian, a tuna fisher. This second device sets the bait underwater in a retrievable capsule (see Seafood New Zealand Vol. 5, No 2, or Smith and Bentley (1997) and Barnes and Walshe (1997) for full descriptions of the two prototype devices).

Solander Fisheries, Moana Pacific Ltd, and Tobe International generously provided vessels for the chute to be trailed on. As a result of these trials, a number of design features of the chute have been modified and sea trials are continuing. Once the chute has been refined to a point where it performs well, and is safe and durable, trials to assess its effectiveness in keeping seabirds away from bait will be undertaken. Moana Pacific Ltd and Solander have generously offered to assist in this part of the programme.

In 1995/6 a contract was let to the Fishing Industry Board to construct and deliver tori lines to tuna vessels. In 1996/7 a second contract was let to obtain feedback from those fishers who received the tori lines,through a telephone questionnaire. A report summarising the results of the questionnaire will be published in the first half of the 1998 calendar year.

Ling and Snapper

During the 1997/8 fishing year, a seabird observer will be placed on a ling vessel to collect information which will assist in identifying potential ways of minimising take of bait by seabirds. This will include collection of information on behaviour of different species of seabirds around the vessel during setting and hauling, bait take rates by seabirds, length of time each bait is available to seabirds, effect of offal discharge on seabird behaviour etc. The Department will liaise with fishing companies targeting ling before finalising the work programme of the observer, to ensure the maximum benefit is made of this trip. Sandfords Ltd offer to carry the observer is appreciated.

At the end of this project, the Department will discuss the outcomes of this project with representatives from the ling fishery and agree on mitigation measures which could be trialed and evaluated during the 1998/99 fishing year.
A similar project will commence in the snapper fishery in 1998/99.

A separate report summarising all measures being used to deter seabirds from taking bait on demersal longline fleets in other parts of the world will be prepared in 1997/8.

Technical Advice

It is proposed that a technical working group, including representatives from industry, will review progress on the current 1997/98 seabird bycatch mitigation projects, and provide technical input to projects planned for the 1998/99 fishing year.

Contestability

This project will be contestable.

Marine mammals

Project: Mitigation of the incidental take of marine mammals in commercial trawling operations.

Project Code: CSL 2B
Project Cost: $124 300
Start Date: 1 October 1998
Completion Date: Ongoing - subject to annual review

Project Objectives:
To develop and evaluate operational methods and devices to mitigate the incidental take of marine mammals in commercial trawling operation.

Objectives for 1997/98:
Testing of the escape of live marine mammals at sea.

Cost Estimate:

Consultancy (Includes at-sea time)	30,000
Recompense for lost fishing time on a commercial vessel	20,000
Hire of underwater video gear. Insurance.	30,000
Construction of custom MMED and associated netting devices.	30,000
Report editing, printing and distribution costs	3,000
DOC administration costs (@ 10% of total)	11,300
TOTAL	**$124,300**

Background:
Attempts to mitigate the incidental take of marine mammals in commercial trawling have been made through changes in operational procedures (e.g. the fishing industry's Code of Practice).

During the 1997/98 Fishing Year, this project provided for the at-sea testing of a Marine Mammal Escape Device (MMED), its effect on fish quality and the refinement of escape hatch designs. The next stage will be to demonstrate that the device (or devices if industry elects to simultaneously test the device being developed by Sealord) releases marine mammals alive from nets used in the squid and hoki trawl fisheries.

The use of live animals for experiments in fishing situations will require permits under the Marine Mammals Protection Act 1977 and will also require Animal Ethics Committee approval. Given the recent mortalities of New Zealand sea lion these initial trials will probably need to be done with fur seals, most probably in the winter West Coast hoki fishery.

While innovative solutions may be forthcoming from the research community, there are two obvious, although rather pedestrian, ways that this research can be carried out. One is an array of video cameras mounted along the net so that the progress of a trapped animal can be observed for at least several seconds and a judgement made about the animal's status. This has the disadvantage that judgements may be equivocal if the animal shows no movement of if underwater visibility is poor. Another way would be for animals that have been ejected from the net by the MMED to be retained in a cage placed over the escape hatch and filmed in this cage to see if they are alive. Ethics

Approval will almost certainly be contingent on release of the animals once it has been ascertained that they are alive. This means that the cameras in the cage have to be cabled in a way that ensures they can be monitored during the fishing operation, and the cage fitted with a remotely controlled release mechanism.

The indicative costs above are based on nominal recompense to a commercial trawling operation for fishing time lost while the work is in progress and on the fishing industry providing free of charge at-sea expertise for these experiments to be carried out. Stakeholders may prefer that these at-sea costs be explicitly costed and charged.

This project will be contestable.

Project: Mitigation of incidental take of Hector's Dolphins in commercial setnet fishing operations

Project Code: CSL 2C
Project Cost: $60,500
Start Date: 1 October, 1998
Completion Date: 1 September, 1999

Project Objective:
To develop acoustic methods and devices to mitigate the incidental take of Hector's dolphins commercial setnet fishing operations.

Objectives for 1997/98:
Further development of acoustic pingers and the study of Hector's dolphin behaviour in the presence of pingers. Specifically:

1. Measure and examine ambient sound levels near the study site and in fishing areas in order to assist the design of sounds that will be effective without causing undue environmental disturbance.
2. Use a sound generator or custom-built pingers to simulate a selected range of frequencies and observe Hector's dolphin behaviour and distribution relative to these sounds.
3. Determine, with a high-frequency hydrophone, if Hector's dolphins are using their biological sonar in the vicinity of, or in response to, the pinger sounds.

Cost Estimate:

Consultancy (Acoustic Technician)	10,000
Operational costs (field programme costs in New Zealand)	11,000
Shipping and travel costs	19,000
Analysis and report preparation	5,000
Equipment costs (Hydrophone, Recorders, Pingers)	10,000
DoC administration costs (@ 10% total)	5,500
TOTAL	**$60,500***

*In addition, there is approximately $75,000 of in-kind contributions from the New England Aquarium Research and Conservation Departments and the University of New Hampshire Ocean Engineering School. These in-kind distributions include senior scientists' time, use of a $100,000 tape recorder, and other research equipment.

Background
Staff from the New England Aquarium and DOC have been working on a research program on Hector's Dolphin since 1989. This research has focused on management related research and is chronicled in a variety of publications (Stone *et.al.* 1992; 1994; 1995; 1997). Based on the success of an acoustic pinger by-catch reduction program in the United States with harbour porpoise (Kraus *et al.* 1995), work was begun on the experimental task of observing Hector's dolphin distributions and reactions to various frequency pingers. While this work has shown promise, funding has only

allowed the testing of existing pingers that have been used in other fishery/marine mammal conflicts. Funding is needed to explore a wider range of acoustic characteristics to find sounds most effective for Hector's dolphin.

This work will be done in co-operation with the Akaroa Department of Conservation Field Centre, the New England Aquarium, the University of New Hampshire, and the University of Canterbury.

References:

Kraus, S.D., A Reed, E. Anderson, K. Baldwin, A. Solow, T. Spradlin, J. Williamson. 1995. A field test of the use of acoustic alarms top reduce incidental mortality of harbour porpoise in gillnets. Final Report to the National Fish and Wildlife Foundation, Washington D.C. USA. April 1995. 19p

Stone, G., S. Dawson, E. Slooten, A. Yoshinaga, J. Brown, M. Rutledge, S.Smith, and J. Young. 1992. Hector's Dolphin Research Program, 1990-1992. IN:Banks Peninsula Marine Mammal Technical Report, 1992. Published by: New Zealand Department of Conservation, Private Bag, Victoria Street, Christchurch, New Zealand.

Stone, G., J. Goodyear, A. Hutt and A. Yoshinaga. 1994. A new non-invasive tagging method for studying Hector's dolphins. Marine Technology Society Journal, 28 (1).

Stone, G. , Brown, J. and Yoshinaga, A. 1995. Diurnal movement patterns of Hector's dolphins as observed from cliff-tops. Marine Mammal Science, 11(3).

Stone, G., Kraus, S., Hutt, A., Martin, S., Yoshinaga, A., and Joy, L. 1997. Reducing By-catch: Can acoustic pingers keep Hector's dolphins out of fishing nets? Marine Technology Society Journal, 31 (2).

Bycatch species research projects

Introduction

In the 1996/97 fishing year the majority of the cost of this set of projects was proposed to be allocated to the STN fishery (tuna fishery). As a result of agreement between the Ministers of Conservation, Science and Fisheries $179,000 was allocated from the government science envelope (administered by the Ministry of Research, Science and Technology) to offset the cost of the STN levy. This was calculated as covering 75% of the total STN allocation of Project 3A - Monitoring of protected seabird bycatch.

Project 3A - costs	1996/97 fishing year	MoRST grant
1996/97	$289,000	$179,000
1997/98	$361,000	$194,500
1998/99	$550,600	$199.000

The Department of Conservation applied to MoRST for funding on a similar basis for the 1997/98 fishing year and MORST granted $194,500 for the 1997/98 fishing year. The Department of Conservation has again applied to MoRST and $199,000 has been granted for the 1998/99 fishing year. It is anticipated that this will be the last year of such grants.

This grant is reflected as a deduction in the project summary table, but **not** in the individual project costs listed below.

Annual variation in the number of birds breeding is large in long-lived, biennial breeding species such as wandering albatross and censuses of breeding birds need to be repeated regularly and over a relatively long period to detect population trends. Small increases in mortality (e.g. a total mortality increase of 1%pa) can lead cumulatively to large population declines (Weimerskirch and Jouventin, 1987). In order to have the statistical power to detect these declines populations will need to be censused annually until at least 2006.

In the 1997/98 White Paper CSL Project 3A(v) was simulation of albatross populations using the Antipodes and Aucklands Island wandering albatross studies. It was hoped that an outcome of this modelling would be an optimisation of the experimental methods used in wandering albatross and other long-lived seabird studies. This modelling work has not yet been let and so the wandering albatross studies proposed this year are subject to revision in the light of the simulation work.

Monitoring of protected seabird bycatch

Auckland Island wandering albatross

Project: Evaluation of the impact of fisheries bycatch on the Auckland Island wandering albatross.

Project Code: CSL 3A (i)
Project Cost: $124 800
Start Date: October 1998
Completion Date: Ongoing - subject to annual review

Project Objectives:

To determine the present size and population trends of the Auckland Island wandering albatross (*Diomedea gibsoni*) through annual census of nesting pairs on Adams Island.

To determine annual adult survival and recruitment.

To determine which areas of ocean are important Auckland Island wandering albatross foraging areas and to assess whether conflict between longline fisheries and albatross can be reduced through zoning.

To collect further population data.

Objectives for 1998/99:

To determine the survival of adult birds banded between 1991 and 1996, and to band all new pairs nesting in the study area.

To determine breeding success in 1998; to band all 1998 season study area fledglings; and to search for birds banded as chicks in 1995 to assess year-of-first-return, and recruitment rates.

To census a representative sample of the Wandering Albatross breeding population in 1999.

Map the foraging zones of 5 male and 5 female adults in the last half of their breeding year and the first half of their non breeding year using satellite telemetry

Cost Estimate:

Transport	31,500
Consultants (salary, overheads etc)	33,400
Equipment (including tracking transmitters, satellite time etc)	46,900
Report editing, printing and distribution costs	1,500
DOC administration costs (@ 10% of total)	11,500
TOTAL	**$124,800**

Background:

MAF observer data between 1987 and 1992 and Ministry of Fisheries observer data in the 1996/97 fishing year in New Zealand's EEZ found wandering albatrosses were a frequent bycatch in longline tuna fisheries. Studies of wandering albatross elsewhere have implicated bycatch as a factor in the decline of the species. Because wandering albatross are such a long lived and slow reproducing species, a fisheries induced reduction of adult survival by 1%pa led to a 50% decline in the population on the Crozet Islands over a 20 year period (Weimerskirch, H., Jouventin, P., 1987: Population dynamics of the wandering albatross, *Diomedea exulans*, of the Crozet Islands: causes and consequences of the population decline. *Oikos 49*: 315-322).

No reliable population data exists for the NZ subspecies of wandering albatross. Before a maximum level of fishing related mortality can be set, survival, recruitment and population size must be known. To allow reduction of conflict between albatross and the longline fisheries, the most important albatross foraging grounds need to be identified.

The planned research project focuses on banding and recovery of both juvenile birds and adult breeding pairs during annual visits to the Auckland Islands, plus annual census of the breeding population. Satellite telemetry will be used to determine which parts of the ocean are most used by Auckland Island wandering albatross, particularly during vulnerable periods of the birds life cycle.

Five pairs of Auckland Islands wandering albatross will be fitted with satellite tags in the summer of 1999/99. These transmitters will run for two years.

Antipodes Island wandering albatross

Project: Evaluation of the impact of fisheries bycatch on the Antipodes Island wandering albatross.

Project Code: CSL 3A (ii)
Project Cost: $146,600
Start Date: 1 October 1998
Completion Date: Ongoing - subject to annual review

Project Objectives:
To determine the present size and population trends of the Antipodes Island wandering albatross (*Diomedea antipodensis*) through annual census of nesting pairs on Antipodes Island.

To determine annual adult survival and recruitment.

To determine which areas of ocean are important Antipodes Island wandering albatross foraging areas, and to assess whether conflict between long-line fisheries and albatross can be reduced through zoning.

To collect further population data.

Objectives for 1998/99:

To determine the survival of adult birds banded between 1991 and 1997, and to band all new pairs nesting in the study area.

To determine breeding success in 1998; to band all 1998 season study area fledglings; and to search for birds banded as chicks in 1996 in assessment of recruitment rates.

To census a representative sample of the Wandering Albatross breeding population in 1999.

Through satellite telemetry, map the foraging zones of 5 male and 5 female adults in the last half of their breeding year and the first half of their non breeding year.

Cost Estimate:

Transport	51,500
Consultants (Salary, overheads etc)	33,400
Equipment (including tracking transmitters and satellite time)	46,900
Report editing, printing and distribution costs	1,500
DOC administration costs (@ 10% of total)	13,300
TOTAL	**$146,600**

Background:
MAF observer data between 1987 and 1992 and Ministry of Fisheries observer data in the 1996/97 fishing year in New Zealand's EEZ found wandering albatrosses were a frequent bycatch in longline tuna fisheries. Studies of wandering albatross elsewhere have implicated bycatch as a

factor in the decline of the species. Because wandering albatross are such a long lived and slow reproducing species, a fisheries induced reduction of adult survival by 1%pa led to a 50% decline in the population on the Crozet Islands over a 20 year period (Weimerskirch, H., Jouventin, P., 1987: Population dynamics of the wandering albatross, *Diomedea exulans*, of the Crozet Islands: causes and consequences of the population decline. *Oikos 49*: 315-322).

No reliable population data exists for the NZ subspecies of wandering albatross. Before a maximum level of fishing related mortality can be set, survival, recruitment and population size must be known. To allow reduction of conflict between albatross and the longline fisheries, the most important albatross foraging grounds need to be identified.

The planned research project focuses on banding and recovery of both juvenile birds and adult breeding pairs during annual visits to Antipodes Island, plus annual census of the breeding population. Satellite telemetry will be used to determine which parts of the ocean are most used by Antipodes Island wandering albatross, particularly during vulnerable periods of the bird's life cycle.

F) pairs of Antipodes Island wandering albatross were fitted with satellite tags in the summer of 1997/98. These transmitters were designed to run for two years with the harnesses and devices falling off the birds after that time. Because of a programming error made by SIRTRAC Ltd the harnesses released after 77 days instead of two years. SIRTRAC have agreed to provide and program new transmitters for the 1998/99 field season at no cost. The satellite tracking costs are prepaid until 30 June 1998 but the $40 000 charges for the twelve months from 1 July 1998 are included in the equipment costs above.

Black petrel - Great Barrier Island

Project: Evaluation of the impact of fisheries bycatch on the black petrel of Great Barrier Island.

Project Code: CSL 3A (iii)
Project Cost: $17,000
Start Date: 1 October 1998
Completion Date: 30 September 1999 - subject to annual review

Project Objectives:
To undertake a census of black petrel (*Procellaria parkinsoni*) on Great Barrier Island via burrow monitoring and the banding of adults and fledglings, initially over four consecutive breeding seasons to establish adult mortality, breeding success and recruitment.

Objectives for 1998/99:
To monitor a sample of black petrel breeding burrows (minimum 50, maximum 100) on Great Barrier Island and determine the number of eggs laid in the study burrows

To band all adults in the study area.

To band all fledglings in the study area during the 1997/98 breeding season.

To band as many other black petrel as possible.

Cost Estimate:

Salary	11,000
Operating (transport, camp accommodation, incidentals, food)	3,000
Report editing, printing and distribution costs	1,500
DOC administration costs (@ 10% of total)	1,500
TOTAL	**$ 17,000**

Background:
The total population of black petrels (*Procellaria parkinsoni*) numbers about 5000 birds. This species is endemic to New Zealand and confined to Great and Little Barrier Islands. Great Barrier is the stronghold. Scavenging from fishing vessels is common, and this makes the black petrel vulnerable to bycatch. A domestic longline vessel, fishing within New Zealand's EEZ, reported catching six black petrel on a single set during 1993, and others have been reported caught since. No reliable population data exists for the black petrel. Before a maximum level of fishing related mortality can be set, survival, recruitment and population size must be known. This study will investigate adult mortality, breeding success and recruitment in relation to fisheries interactions.

Part of the contract for the work on Black Petrels in the 1997/98 year is the production of a publishable research paper which will synthesise the results of the three seasons of field work that have been funded by CSL. It is possible that the results of that synthesis will refocus this work

because for the first time it will be possible to draw comparisons in productivity and breeding numbers between seasons.

Foraging of Chatham Island Albatross (Chatham Island Mollymawk)

Project: Foraging of Chatham Island Albatross (Chatham Island Mollymawk)

Project Code: CSL 3A (vi)
Project Cost: $155,600
Start Date: 1 October 1998
Completion Date: 30 September 1999

Project Objectives:
Identification of Foraging areas for the Chatham Island Albatross (Chatham Island Mollymawk, *Diomedea eremita*) during its breeding season.

Objectives for 1998/99:
To satellite tag ten breeding Chatham Island Albatross at the start of the 1998/99 breeding season to ascertain precisely where this species forages while incubating and raising its chicks.

Cost Estimate:

Transmitters and Satellite time (satellite time for first twelve months only)	120,000
Field costs	20,000
Report editing, printing and distribution costs	1,500
DOC administration costs (@ 10% of total)	14,100
TOTAL	**$155,600**

Background:
The Chatham Island Albatross (Chatham Island Mollymawk) is one of the world's rarest albatrosses and is ranked by the IUCN as critically endangered. Currently the only nesting site is The Pyramid in the Chatham Islands. It is thought that there may currently be as few as c2500 pairs (G. Taylor, pers. obs.). In the 1996/97 fishing year five Chatham Island Mollymawks were among the 302 birds returned for autopsy from observed longline vessels: four of these birds were from demersal ling longliners and one from a pelagic longliner.

Because of the critically endangered nature of these birds, DoC has an active research programme in place. It has been observed that the non-sitting bird of a pair frequently returns to the nest in the evening, suggesting that foraging is close to the Chatham Islands. Observations at sea and the positions of capture in 1996/97 suggest that this species might have a tightly defined foraging area. If this area can be identified and fishing vessels directed elsewhere while the nesting birds are vunerable then fishing bycatch may be minimised.

Monitoring of protected marine mammal bycatch

New Zealand sea lion

Project: Evaluation of the impact of fisheries bycatch on the New Zealand sea lion.

Project Code: CSL 3B(i)
Project Cost: $122,600
Start Date: 1 October 1998
Completion Date: Ongoing - subject to annual review

Project Objectives:
To measure annual pup production for the New Zealand sea lion (*Phocarctos hookeri*) on the Auckland Islands, provide estimates of female reproductive parameters, and investigate the foraging ecology of the sea lion in so far as it directly relates to the Auckland shelf squid trawl fishery for a period of at least 5 years.

Objectives for 1998/99:
1. To measure pup production on the Auckland Islands
2. To tag adults and females to provide estimates of parameters in an age-structured model
3. To investigate foraging ecology as it relates to the Auckland shelf squid trawl fishery.

Cost Estimate:

Technical assistant salary, allowances etc.	42,000
Vessel charter and field operations (this is costed at 50% of known costs)	69,500
Report editing, printing and distribution costs	1,500
DOC administration costs (@ 10% of total)	11,100
TOTAL	**$122,600**

Background:
The New Zealand sea lion is a species found in the area between Cook Strait, Campbell Island, Macquarie Island, and the southeast of the South Island. The range for this species is centred on the Auckland Islands, with the main breeding colonies on Dundas, Enderby and the Figure of Eight Islands. In recent years population estimates for the sea lion have been calculated from pup population counts. Fishery interaction occurs as a result of the overlap of the southern squid trawl fishery and the sea lion's foraging areas around the Auckland shelf. This project will determine the population status for the sea lion, investigate foraging ecology and measure female reproductive parameters.

There is little known about the population dynamics of this species. The present population estimate is calculated using annual pup production and then, using female reproductive parameters, this is modelled to yield an overall population estimate. Because of the sea lion mortality event in January 1998 it is expected that the estimation of population numbers from this method will now not be possible until approximate equilibrium returns. Never-the-less, estimates of pup production will be essential as an input to the population modelling and to assess the speed of return to approximate equilibrium.

All of the reproductive parameters that have been used in the model to date have been derived from other species. It is not known if these estimates are representative of the dynamics of the NZ sea lion. There is also no information available on survivorship or recruitment. To measure these parameters requires the capture and marking of individuals (approximately 500 a year), and then subsequent observations in successive years to yield recapture information. Three marking methods will be used - double flipper tags, freeze branding and a Permanent Implantable Transponder (PIT) tag. The PIT tags are a small chip that is implanted beneath the skin surface and has a uniquely identifiable number that can be detected by a "reader" unit. This permanent marking system is necessary as other pinniped studies have suffered from a high rate of mark loss (both flipper tags and freeze brands are known to be "lost") and hence a reduction in the power of the statistical estimates.

The research into the foraging ecology and measurement of female reproductive parameters will be managed by a senior DOC scientist. The costs of this scientists time on this work will continue to be covered by existing DOC funding. Furthermore, significant costs of capital equipment such as anaesthetic machines and other capture and handling equipment are not being proposed for CSL funding. As a significant proportion of this work is necessary as a direct consequence of the squid fishery, funds from CSL are required to fund the acquisition of the PIT tags; 50% of the cost of remote tracking devices and data loggers associated with the foraging work; and technical and field assistance.

Hector's Dolphin

Project: Quantifying the abundance of Hector's dolphins

Project Code: CSL 3B (ii)
Project Cost: $70,000
Start Date: 31 October 1998
Completion Date: 30 September 1999

Project Objectives:
To provide an updated and statistically robust population estimate for Hector's dolphin.

Objectives for 1997/98:
To carry out a line transect survey of the east coast South Island area between Timaru and Te Wae Wae Bay and using the results derive a statistically robust population estimate for Hector's dolphin in this region.
To calibrate the degree to which boat-based trackline estimates need to be corrected for the attraction of Hector's dolphins to the trackline boat.

Cost Estimate:

Statistical and other consultants etc.	9,800
Travel	3,500
Field operations	33,960
Helicopter costs	15,000
Report editing, printing and distribution costs	1,500
DOC administration costs (@ 10% of total)	6,240
TOTAL	**$70,000**

Background:

Line-transect techniques offer a well-proven method of estimating abundance (e.g. Buckland et al. 1993). The first ever line-transect dolphin survey in new Zealand waters was conducted in Canterbury waters in the summer of 1998. It was successful, proving that excellent line transect data can be gathered at moderate cost. Analyses of the orientation of dolphins when they were first spotted suggest that some dolphin groups move towards the boat and that the abundance estimates need to be corrected for this.

Line-transect surveys make two important assumptions: That animals are detected in their initial location (i.e. before movement occurs in response to the survey vessel), and that no sightings on the vessel's trackline are missed. If sightings on the trackline are missed, abundance will be underestimated. If dolphins are attracted to the survey vessel before they are seen by observers, abundance will be overestimated. In these cases, abundance estimates need to be corrected for responsive movement and/or for missed sightings. For example, abundance estimates for Dall's porpoise (Turnock et al. 1995) were corrected for both.

It is proposed to extend the 1998 survey to cover the coastal area between Te Wae Wae Bay and Timaru. Based on existing distribution data (Dawson and Slooten, 1988), the survey would cover three strata (i) Inshore high density areas (Te Wae Wae Bay - Riverton) (ii) Inshore low density areas (Riverton - Timaru), and (iii) offshore low density areas. Sampling will be conducted so as to reach 60 detections (for reliable estimation of the "detection function") in the inshore high-density areas. It may not be feasible to aim for 60 detections in the other strata; if not, the detection function estimated for the high-density area will be used (this is normal practice). At least 350 n.mi of on-effort trackline will be needed in strata (i) and (ii).

Additionally, simultaneous helicopter/boat surveys will be used to estimate the fraction missed on the trackline, and the degree to which abundance estimates need to be corrected for responsive movement. To reduce the amount of time and resources needed for this part of the work, this could be done in a calm, high-density area (eg. Banks Peninsula) in which data can be accrued rapidly. Methods will be based on those of Turnock et al. (1995). The helicopter will be flown in front of the survey vessel. In conjunction with an independent observer on the survey vessel, the aerial observer will track sightings to determine whether they are seen by the primary observers onboard ship, and the distance at which dolphins react to the survey vessel. Calculations based on line-transect sighting rates at Banks Peninsula in summer 1998 suggest that 20 hours of helicopter time will produce the necessary number of sightings to estimate a correction factor.

Literature cited

Buckland, S.T., Anderson, D.R., Burnham, K.P., and Laake, J.L. 1993. Distance Sampling: Estimating Abundance of Biological Populations. Chapman and Hall, London. 446pp.

Dawson, S.M. & Slooten, E. 1988. Hector's Dolphin *Cephalorhynchus hectori*: Distribution and abundance. Report of the International Whaling Commission (Spec. Issue) 9: 315-324.

Turnock, B.J., Buckland, S.T. and Boucher, G.C. Population abundance of Dall's porpoise (*Phocoenoides dalli*) in the western north Pacific Ocean. Report of the International Whaling Commission (Spec. issue) 16: 381-387

Population Management Plans

Project: The development of Population Management Plan for Hector's Dolphin.

Project Code: CSL 4A
Project Cost: $44,000
Start Date: 1 October 1998
Completion Date: Ongoing - subject to annual review

Project Objectives:
The development of Population Management Plans (PMP's) for protected species of marine wildlife containing all or any of the following:

An assessment of the biology and status of threatened species or other marine wildlife;

An assessment of any known fisheries interaction with marine wildlife;

The degree of risk caused by fishing related mortality and other human induced sources of mortality to threatened and other marine wildlife whether within the territorial waters of New Zealand or New Zealand Fisheries waters or elsewhere within the range of the species;

An estimate of the range of human induced mortality for threatened and other species of marine wildlife within which the criteria specified below will be met;

An estimate of the range of fishing related mortality for threatened species and other marine wildlife within which the criteria specified below will be met;

The maximum allowable level of fishing related mortality for threatened species and other marine wildlife within which the criteria specified below will be met;

Recommendations to the Minister of Fisheries on measures to mitigate the fishing related mortality of threatened species and other marine wildlife;

Recommendations to the Minister of Fisheries on the level of information to be collected on fishing related mortality.

The criterion to be met in determining a maximum level of fishing related mortality is:

In the case of threatened species, the level of fishing related mortality should not prevent the species achieving a non-threatened status as soon as reasonably practicable, and in any event within a period not exceeding 20 years.

In the case of any other marine wildlife, the level of fishing related mortality should neither cause a net reduction in the size of the population nor seriously threaten the reproductive capacity of the species.

Objectives for 1998/99:
To develop a PMP for Hector's dolphin.

Cost Estimate:	
Salary/operating	40,000
DOC administration costs (@ 10% of total)	4,000
TOTAL	**$44,000**

Background:
Hector's dolphin is New Zealand's only endemic cetacean, and is one of the least abundant marine mammals in the world. Set net fisheries in both South and North Islands are known to have incurred a significant incidental take of Hector's dolphin in recent years. Observer projects to estimate the current rate of incidental take have been included as CSL projects in both 1996/97 and 1997/98.

Population Management Plans (PMP's) will be prepared in consultation with the fishing industry, environmental organisations, Conservation Boards affected by the plan, and any other persons that the Director General of Conservation (DG) considers represent environmental, commercial, iwi and recreational interests. Notice of any draft plan shall be published in Auckland, Wellington and Dunedin. Every notice shall state that the draft plan is available for inspection and that any persons interested in lodging a submission on the draft may do so by a specified date.

After having regard to the provisions in the Wildlife and Marine Mammals Protection Act, the submissions, and any other matters the Minister considers relevant, the Minister may approve the PMP subject to the concurrence of the Minister of Fisheries.

The Minister of Fisheries may concur with the PMP after having regard to the impacts of implementing the maximum allowable level of fishing related mortality on the fishing industry and such other matters as the Minister considers relevant.

The approved plan will be available for public inspection. Any approved plan may be amended as necessary subject to further consultation and the process outlined above.

Department of Conservation, Fisheries Act 1986 - Conservation Services Levy 1998/99 Fishing Year

Project Summary Table

Code	Project	Objective	Inputs	Outputs	Standards and Specifications
	OBSERVER PROJECTS **Total cost $280,713**				
CSL 1A	Fisheries Observer Programme - observer seadays	Objective 1	$213,553	Collection of statistically reliable data by fisheries observers on the incidental take of protected marine species	See MFish standards F58 Information Collection and Management Services
CSL 1B	Processing and analysis of fisheries observer project data	Objective 1	Charged under Mfish project ENV9801	Statistical analysis of observer data for the 1997/98 fishing year plus inseason estimates for sea lion kills in the 1998/99 fishing year.	To be specified in contract documentation
CSL 1C	Marine mammal carcass recovery project	Objectives 1, 4	$34,160	Biological data on marine mammal bycatch specimens recorded by fisheries observers and vessel operators	To be specified in contract documentation, also see MFish standards F58 Information Collection and Management Services
CSL 1D	Seabird carcass recovery project	Objective 1	$33,000	Biological data on seabird bycatch specimens recorded by fisheries observers and vessel operators	To be specified in contract documentation, also see MFish standards F58 Information Collection and Management Services
	MITIGATION MEASURES **Total Cost $290,800**				
CSL 2A	Mitigation measures to minimise bycatch of seabirds	Objective 2	$106,000	Research, design and development of measures and devices to mitigate seabird bycatch	To be specified in contract documentation
CSL 2B	Mitigation measures to minimise bycatch of marine mammals in trawl fisheries	Objective 2	$124,300	Research, design and development of measures and devices to mitigate marine mammal bycatch	To be specified in contract documentation
CSL 2C	Mitigation measures to minimise bycatch of Hector's Dolphins in commercial setnets	Objective 2	$60,500	Research, design and development of measures and devices to mitigate marine mammal bycatch	To be specified in contract documentation

	RESEARCH PROJECTS **Total cost $437,600**				
CSL 3A	Monitoring of populations of protected seabird bycatch species	Objectives 3, 4	$444,000 less MoRST grant of $199,000 =$245,000	Population status; breeding success; recruitment and mortality rates; and foraging zones of high priority seabird bycatch species.	To standards set by DOC Science and Research Division
CSL 3B	Monitoring of populations of protected marine mammal bycatch species	Objectives 3, 4	$192,600	Measurement of New Zealand sea lion 1998/99 pup production at the Auckland Islands; statistical modelling of fisheries impacts; determination of female reproductive parameters, and ongoing work on foraging ecology as it relates to fisheries. Survey Hector's Dolphins Timaru to Te Wae Wae Bay; Calibration of Hector's dolphin behaviour toward line transect vessels..	To standards set by DOC Science and Research Division
	POPULATION MANAGEMENT PLANS **Total cost $44,000**				
CSL 4A	Development of Population Management Plan	Objective 5	$44,000	Development of a Population Management plan for Hector's dolphin	To standards set by DOC Science and Research Division and the Marine Mammal Protection Act 1977 (as amended by the Fisheries Act 1996)
	OVERALL COST $1,053,113 [GST EXCLUSIVE]				

Department of Conservation, Fisheries Act 1996 - Conservation Services Levy 1998/99 Fishing Year

Appendix to Project Summary Table

Main objective: To work in partnership with the New Zealand commercial fishing industry, Ministry of Fisheries, and other interested groups, to assess the impacts of fishing operations on protected marine species and to develop and investigate the effectiveness of mitigation measures which minimise the incidental take of protected marine species in interactions with the New Zealand commercial fishing industry. "Objectives" referenced in table above:

1. To ensure that during the 1998/99 Fishing Year, adequate bycatch data is collected, verified and analysed to give a sufficiently reliable estimate of the numbers and characteristics of the incidental take of protected marine species in New Zealand commercial fisheries interactions to enable the Minister of Conservation to carry out his/her statutory duties; (Projects CSL 1A, 1B, 1C, 1D).

2. In partnership with the Minister of Fisheries and sector groups, to develop and test mitigation measures designed to minimise the incidental take of protected marine species; (Projects CSL 2A, 2B, 2C).

3. To research the status and population demography of protected marine species so as to enable the Minister of Conservation to make informed decisions about the relative threat of New Zealand commercial fisheries interactions on individual species, and to carry out his/her statutory duties; (Projects CSL 3A, 3B).

4. On a species specific basis to assess fisheries related mortality and the spatial and temporal aspects of commercial fisheries interactions, to provide information on the impact of New Zealand commercial fishing interactions on protected marine species (as opposed to fisheries outside the EEZ, and the variety of other causes of mortality), to enable the Minister of Conservation to carry out his/her statutory duties; (Projects CSL 3A, 3B).

5. Develop, in consultation with the Minister of Fisheries and Approved Parties, Population Management Plans. (Project CSL 4A)

Standards

Conservation Services Levy Standards

Fisheries Observer Project - Projects CSL 1A, 1C and 1D

Standards Documents	Reference
Information Collection and Management Services	Ministry of Fisheries - FS 8
Biological Data Collection by Scientific Observers	Ministry of Fisheries - RES 15

Other Projects

Documents	Reference
Department of Conservation, Science and Research Division, Science Planning Handbook for 1997/98	Department of Conservation, S&R Internal Report No. 149
Department of Conservation, CSL Contestable Tendering Process	Department of Conservation
Department of Conservation, Science and Research Division, contract for service	Department of Conservation

CSL#	Year	File #	SCO Series (Contracts)	Contractor	DoCFIN	Budget	Comments
1A	98/99	SCO 3013	Mfish Observer Agreement	Ministry of Fisheries	17/6713/01	$192,775	
1C	98/99	SCO 3042	Autopsy of Marine Mammals	DoC (CJR Robertson)	17/6742/01	$29,460	
1D	98/99	SCO 3051	Autopsy of Seabirds	DOC (CJR Robertson)	17/6751/01	$28,500	
2A	98/99	SCO 3061	Development of Underwater setting method - multiple contracts	Paul Barnes	17/6761/01	$92,000	
2B	98/99	SCO 3073	Marine Mammal Exclusion Device		17/6773/01	$110,000	
2C	98/99	SCO 3071	Pingers on Gillnets	Greg Stone	17/6771/01	$55,000	
3A(i)	98/99	SCO 3087	Auckland Island Wandering Albatross	Graeme Elliott	17/6787/01 & 02	$111,800	
3A(ii)	98/99	SCO 3088	Antipodes Island Wandering Albatross	Graeme Elliott	17/6788/01	$131,800	
3A(iii)	98/99	SCO 3089	Black petrel - Great Barriers Is	Elizabeth Bell	17/6789/01	$14,000	
3A(vi)	98/99	SCO 3091	Chatham Is Albatross	DoC (CJR Robertson)	17/6791/01	$140,000	
3B (i)	98/99	SCO 3090	New Zealand Sea lion	DoC (Ian Wilkinson, Childerhouse, etc)	17/6790/01	$110,000	
3B(ii)	98/99	SCO 3074	Line Transect survey of Hector's dolphin Timaru - Te Wae Wae Bay	Uni. Otago (Steve Dawson)	17/6774/01	$62,260	
4A	98/99	SCO 3021	Hector's Dolphin PMP		17/6721/01	$40,000	