Department of Conservation

Nature and Extent of Conservation Services for the 1997/98 Financial Year

Department of Conservation, Nature and Extent
July 1997

Statement on Conservation Services

The Fisheries Act 1996, Section 267, places an obligation on the Minister of Conservation to determine the following matters:

- The nature and extent of the conservation services, and the cost of those services; and
- The amount or level or standard of the conservation services; and
- The particular projects and activities entailed in the conservation services, and the costs and priorities of those services and activities;

After consultation with persons I consider are representative of those interested in the management and conservation of New Zealand's fisheries and fisheries resources, including such persons or organisations representative of Maori, environmental interests, commercial interests and recreational interests in accordance with the provisions of Section 267 of the Fisheries Act 1996, I hereby determine that in respect to the 1997/98 financial year, the matters defined in Section 267 are as specified in the attached document entitled Nature and Extent of Conservation Services for the 1997/98 Financial Year.

Hon Nick Smith
Minister of Conservation

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

1. Increased observer coverage for selected fisheries;
2. Improved analysis of bycatch data for protected species;
3. Research and development of mitigation measures;
4. Carcass retrieval programme;
5. Monitoring of certain populations of protected species taken as bycatch.

DOC is proposing a similar set of projects for the 1997/98 fishing year. Administrative overheads cover the costs of the following: CSL contracts manager and technical assistant's salaries; travel and other expenses directly related to CSL projects. The increase of 2% (from 8% in 1996/7 to 10% of project costs) is to recover the salary of a technical assistant to work alongside the CSL contracts manager to assist with: CSL publications; expedition planning, data gathering and analysis for the two wandering albatross projects; debriefing observers; and assisting with the carcass recovery programme.

Given the concerns expresses by the fishing industry about the time scale and relevance to fisheries bycatch issues of the albatross monitoring projects, we have included a one year project to mathematically model/analyse this further.

During the course of the consultation process, and supported by Approved Parties, the NZ sea lion project was expanded and a additional project 3B(ii) to quantify the Hector's dolphin population has been added (attached as an addendum to the original 1997/98 White Paper).

The Population Management Plan (PMP) project has been withdrawn, while work continues on the two PMP's (NZ sea lion/wandering albatrosses) initiated in the 1995/96 fishing year.

Agreement has been reached with MFish over the details of exactly what parts of the joint CSL/fisheries services levy projects will be contracted/supervised by which agency. Likewise, the observer seadays allocated by both agencies to the snapper and ling fisheries will be effectively combined as a single programme to achieve greater coverage for the CSL protected species bycatch work.

The Department gratefully acknowledges the support and assistance that has been provided in the development of these projects by the Ministry of Fisheries and Approved Parties, and notes that a large number of bids were received from potential contractors for the 1996/97 projects, most of which were of a high quality.

This White Paper covers work for the third (fully operational) year of CSL. The projects currently funded under CSL are now in their second year, and reports for the first 1995/6 fishing year have been published or are now in preparation. The Department is confident that much valuable information is now becoming available from the current 1996/7 projects, which will contribute to better management of the interactions between commercial fisheries and protected species.

DOC and MFish have agreed to further clarify their respective roles in the analysis of bycatch data obtained through the official MFish observer programme, in the form of a collaborative project, currently specified in these proposals as CSL 1B. Tendering for this project will be delayed until all the details of this collaborative approach are developed.

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: $ 303,000
Start Date: 1 October 1997
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 1997/98:
To meet the project objectives, above, in a number of commercial fisheries where the bycatch of protected marine species occurs viz:

> Trawl fisheries for: hoki, southern blue whiting, jack mackerel, hake, squid and scampi; pelagic and demersal longline fisheries; and commercial set net fisheries and inshore trawlers in the Canterbury Bight/Pegasus Bay area.

To initially implement a level of observer coverage in each fishery to provide a coefficient of variation of 20% in the reliability of the data provided.

Fishery	HOK	SBW	JMA	HAK	NF BY-CATCH	Pelagic longline	Commercial inshore	Demersal longline	**Total**
	Hoki	Southern Blue Whiting	Jack Mackerel	Hake	Non Fish By-catch squid trawl	Tuna longlining	Inshore trawlers and set nets	Ling and Snapper fisheries	
CSL funding of Observer Programme (sea days)	200	97	66	30	213	195	300	Ling 30 days Snapper 20 days	1151

Observers will be required to treat the collection, packaging and storage of protected species by-catch animals and associated data as a primary task. Inclusion of an observer project within the Conservation Services Levy (CSL) will allow for increased observer coverage to provide a more statistically reliable assessment of the numbers of protected species incidentally taken.

Cost Estimate:

Observer costs (MFish, 851 days - including salary, travel, overheads @ $275/day)	234,025
Observer costs (Other, 300 days - commercial inshore trawlers/set nets @ $133/day)	39,900
Report editing, printing and distribution costs	1,500
DOC administrative costs (@ 10% of total)	27,575
TOTAL	**$303,000**

Background:

The Minister of Conservation intends to purchase adequate observer coverage during fishing year 1997/98 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 from the Observer Programme through CSL funding for 1997/98 and their allocation between specific fisheries are shown in the table above.

Final deployment of observer coverage in individual fisheries will be determined following discussion with the Observer Programme and industry.

The Department will enter into separate arrangements for observer coverage in: the set net and inshore trawl fisheries of Canterbury Bight/Pegasus Bay, following consultation with the NZ Fishing Industry Board and other interested parties.

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.

Where possible this project will be incorporated into the existing Ministry of Fisheries Observer Programme.

Processing and analysis of fisheries observer project data

Project: Processing and analyses of fisheries observer data on bycatch of protected marine species.

Project Code: CSL 1B
Project Cost: $32,000
Start Date: 1 February 1998
Completion Date: 31 December 1998

Project Objectives:
To assess the degree of observer coverage over each fishery and assess the statistical power of the data to estimate actual take of marine wildlife. To develop statistically reliable estimates of the bycatch of protected species from observer data, and to identify factors which may influence this bycatch and its mitigation.

Analysis of the data generated by the Observer Programme will provide information on protected marine species bycatch rates and the factors affecting the incidental take of these species.

Objectives for 1997/98:
To process and analyse the data on protected marine species bycatch for the fishing year 1997/98, as well as further analysing existing data where necessary, to establish:

Estimates of protected marine species bycatch by species on a fisheries basis; and where possible:

Estimates of protected marine species bycatch by fishing area on a fisheries basis;

Analyses of the factors which influence the bycatch of protected marine species.

Cost Estimate:

Contract	27,500
Report editing, printing and distribution costs	1,500
DOC administration costs (@ 10% of total)	3,000
TOTAL	**$32,000**

Background:
A number of commercial fisheries in New Zealand have been identified by the Non-Fish Interactions Working Group as incurring an incidental take of protected species of marine mammals and seabirds in CSL 1A.

Adequate levels of observer coverage of these fisheries will be necessary to enable the Ministers of Conservation and Fisheries to fulfil their statutory obligations. Inadequate observer coverage may result in decisions being taken to impose management controls on fisheries before maximum-allowable levels of fishing-related mortality of protected species are achieved or conversely, may result in fishing operations continuing after maximum-allowable levels of fishing-related mortality have in fact been exceeded.

This project will provide the funding for a qualified statistician to analyse the data generated through project CSL 1A, to provide estimates, with confidence intervals, of the incidental take of protected species of marine mammals and seabirds in the fisheries listed (see table CSL 1A) during fishing year 1997/98.

This element of the joint DOC/MFish data analysis project will be contestable. However tendering for Project CSL 1B will be delayed until DOC and MFish have developed a collaborative approach to meeting their bycatch estimation requirements.

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: $34,000
Start Date: 1 October 1997
Completion Date: 30 September 1998

Project Objectives:
To collect specimens of marine mammal incidentally taken in fishing operations for the analyses 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 1997/98:
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 up to 50 fur seals.

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 @ $10/bag	800
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	**$34,000**

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 1997/98 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: $4,500
Start Date: 1 October 1997
Completion Date: 30 September 1998

Project Objectives:
To collect specimens of protected seabirds incidentally taken in fishing operations for the analyses 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 1997/98:
To collect, and return to port for autopsy by qualified personnel, up to 150 seabird bycatch specimens.

Autopsy to examine species, age, 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 contract	2,500
Report editing, printing and distribution costs	1,500
DOC administration costs (@ 10% of total)	500
TOTAL	**$4,500**

Background:
At present, the bodies of many of the seabirds 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 150 seabirds incidentally taken during the 1997/98 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 last fishing season (1995/6) fewer birds were returned than anticipated. However given the inclusion of new inshore fisheries observer programmes, we have arrived at an estimate of 150 seabirds - half that of previous years. Packaging and labelling costs have been removed as sufficient stocks already exist.

This project will 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 1997
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 1997/98:
To continue research on the development of underwater setting methods and other mitigation measures, and evaluation of their effectiveness in reducing seabird bycatch associated with longline fishing.

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:
Attempts to mitigate the incidental take of seabirds in commercial fishing have been made both through changes in operational procedures (e.g. code of practice, setting pelagic longlines at night) and through the development of mitigation devices (e.g. tori lines).

It is proposed that the technical working group, including representatives from industry, will continue to review progress on the current 1996/97 seabird bycatch mitigation projects, and to recommend priorities for the 1997/98 fishing year.

This project will be contestable.

Marine mammals

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

Project Code: CSL 2B
Project Cost: $44,000
Start Date: 1 October 1997
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 fishing operation.

Objectives for 1997/98:
Further development of a Marine Mammal Escape Device (MMED), should objectives of this project for the 1996/97 Fishing Year have been successfully achieved;

Further investigation of the effectiveness of acoustic warning devices (pingers) on gillnets - investigations of the possible application of acoustic devices as deterrents to marine mammals approaching trawlers.

Cost Estimate:

Consultancy (development of MMED)	20,000
Operating costs (development of MMED)	7,000
Consultants sea time (development of MMED)	3,000
Operating costs (pinger experiments)	7,000
Report editing, printing and distribution costs	3,000
DOC administration costs (@ 10% of total)	4,000
TOTAL	**$44,000**

Background:
Attempts to mitigate the incidental take of marine mammals in commercial fishing have been made through both changes in operational procedures (e.g. the fishing industry's Code of Practice) and overseas, through the development of mitigation devices (e.g. acoustic pingers on gillnets).

During the 1996/97 Fishing Year, this project provided for the preliminary development and trialing of a Marine Mammal Escape Device (MMED).

Trials with the MMED scheduled for the 1996/97 Fishing Year will include testing of the MMED in an operational fishing situation to assess whether or not it has any impact on efficiency or fish quality. Further development will include tests to assess the likely effectiveness of the MMED in allowing the escape of captured marine mammals while still alive. This will require the use of underwater videos in an operational situation.

This element of the project involving the MMED will be contestable.

Liaison with overseas experts on the effectiveness of acoustic warning devices on gillnets was initiated during the Fishing Year 1995/96, and preliminary trials on the responses of Hector's dolphins to 'pingers' were undertaken in Akaroa Harbour. It is proposed that further trials be undertaken in 1997/98 by scientists who have been involved in trials with acoustic warning devices on set nets in the Gulf of Maine to further investigate the possible application of this mitigation measure in New Zealand. The sum proposed for these trials will provide logistic support for overseas scientists during a field season in New Zealand.

A New Zealand fishing company is exploring the possible application of acoustic devices on large pelagic trawls to warn marine mammals of approaching trawl gear. The successful tenderer for this contract will maintain a close liaison with investigators in this field.

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 - $179,00 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	CSL (STN) share before MoRST offset	CSL (other tunas/lings) share	CSL (STN) share	MoRST grant
1996/97	$289,000	$239,000	$50,000	$60,000	$179,000
1997/98	$361,000				$194,500

The Department of Conservation applied to MoRST for funding on a similar basis for the 1997/98 fishing year. It has now been confirmed by MoRST that $194,500 has been granted for the 1997/98 fishing year.

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%) 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.

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: $136,000
Start Date: October 1997
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 1997/98:
To census a sample of the wandering albatross breeding population on Adams Island in 1998.

To band up to 500 chicks in the study area on Adams Island, and to determine breeding success in 1997.

To band all new pairs nesting in the study area, and to determine the survival of adults banded in 1991.

Through satellite telemetry, map the foraging zones of juvenile Auckland Island wandering albatross fledging from Adams Island in December 1997.

Cost Estimate:

Transport	56,000
Salary/overheads	29,000
Equipment (tracking transmitters and satellite time)	37,000
Report editing, printing and distribution costs	1,500
DOC administration costs (@ 10% of total)	12,500
TOTAL	**$136,000**

Background:
MAF observer data between 1987 and 1992 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% 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.

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: $139,000
Start Date: 1 October 1997
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 1997/98:
To census a sample of the wandering albatross breeding population on Antipodes Island in 1998.

To band up to 500 chicks in the study area on Antipodes Island, and to determine breeding success in 1997.

To band all new pairs nesting in the study area, and to determine the survival of adults banded in 1994.

Through satellite telemetry, map the foraging zones of juveniles fledging from Antipodes Island in January 1998.

Cost Estimate:

Transport	56,000
Salary/overheads	32,000
Equipment (tracking transmitters and satellite time)	37,000
Report editing, printing and distribution costs	1,500
DOC administration costs (@ 10% of total)	12,500
TOTAL	**$139,000**

Background:
MAF observer data between 1987 and 1992 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% 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.

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 1997
Completion Date: 30 September 1998 - 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 1997/98:
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.

Albatrosses on Campbell Island

Project: Southern Royal, Black-browed, and Grey-headed Albatross on Campbell Island.

Project Code: CSL 3A (iv)
Project Cost: $51,000
Start Date: 1 October 1997
Completion Date: 30 September 1998

Project Objectives:
To investigate the diet, foraging ecology and population trends of three bycatch species of albatross on Campbell Island.

To model, compare and contrast, the population dynamics of the three albatross species on Campbell Island.

To compare the foraging ecologies, diet and life history strategies of Grey-headed and Black-browed albatrosses on Campbell Island with those on other subantarctic islands.

Objectives for 1997/98:
Foraging strategies - how do they vary across species, sexes and between seasons.

Diet studies - determination of principle food sources and seasonal variation.

Population dynamics - examine historical data, model populations of the three albatross species on Campbell Island.

Environmental and anthropogenic factors - examine oceanographic data and bycatch.

Comparison across sites - for Black-brows and for Grey-heads, across subantarctic islands.

Cost Estimate:

NIWA contract final year (Sue Waugh)	26,000
Vessel charter and field operations (this is costed at 50% of known costs)	19,000
Report editing, printing and distribution costs	1,500
DOC administration costs (@ 10% of total)	4,500
TOTAL	**$51,000**

Background:
Although DOC has carried out some monitoring of these three species, more in-depth work is in progress to determine the present numbers and trends in these populations. Is the NZ albatross biodiversity threatened by the same factors identified as causing albatross population decreases at other southern ocean sites (e.g. Weimerskirch and Jouventin, 1987; Croxall *et al.*, 1990)? Moore and Moffat (1990) recorded a marked decrease (38-57%) in the combined populations of Black-browed and Grey-headed albatross on Campbell Island since surveys began in the 1940's. The southern royal albatross population has not been surveyed since 1983. Factors implicated with these declines include sea-surface temperature change, food resource exploitation, and fisheries bycatch mortality. Of the three species, Black-browed albatross have sustained the greatest bycatch mortality in NZ waters. Only wandering albatross and southern buller's have been recorded caught in greater numbers.

This work forms part of a large cooperative study, primarily between CNRS (France), NIWA (NZ) and the Department of Conservation. Sue Waugh is completing some of the work for a doctoral thesis, and is partially funded through NIWA, by a three year contract with DOC. Peter Moore, a DOC scientist, is working on a census of southern royal albatross, and assisting Sue with her work on the other two albatross species. The costs of this scientist's time, and 50% of the operational costs will continue to be funded by DOC, as a proportion of the work relates to the global ecology of the species, ecological strategies and behavioural mechanisms. Work primarily linked to CSL is analysis of bycatch and oceanographic data in relation to diet and foraging zones, and work on population dynamics.

Antipodes and Auckland Island wandering albatross

Project: Simulation modelling of albatross populations

Project Code CSL 3A (v)
Project Cost: $18,000
Start Date: 1 October 1997
Completion Date: 30 July 1998

Project Objectives:
To build and report a general albatross population model using known information (projects CSL 3A(i) and CSL 3A(ii). Using this model simulate the detection level and degree of certainty of changes in an annual population estimate for wandering albatross. In particular, examine the ideal requirement that long-term cumulative population abundance charges of approximately 1% per year can be measured reliably over a 15 year period will be tested.

The population model needs to identify and include all known and presumed sources of uncertainty in order to thoroughly test the likely overall uncertainty in the population trend estimates. The model should be generic, and although it is to be used primarily in respect of the wandering albatross populations on Adams Island and Antipodes Island, the model will be in a form that allows it to be applied to other albatross populations - including other species.

Cost Estimate:

Consultant's contract	15,000
Report editing, printing and distribution costs	1,500
DOC administration costs (@10% of total)	1,500
TOTAL	**$18,000**

Background:

Some of the vital parameters of the albatross populations which are the subject of this project are poorly known and will take almost another decade to determine. While studies similar to CSL 3A(i) and CSL 3A(ii) have been successfully concluded on similar albatross species, the urgency and possible consequences of the surface long line fishery bycatch problem is such that independent verification of the experimental design is required. An outcome of the modelling may be optimisation of the experimental methods used on other long-lived seabird studies.

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: $120,000
Start Date: 1 October 1997
Completion Date: Ongoing - subject to annual review

Project Objectives:
To measure annual pup production as an index of population status 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. To estimate for one year only (1997/98) the annual pup production on Campbell Island.

Objectives for 1997/98:
To measure pup production on the Auckland Islands and Campbell Island, to provide estimates of female reproductive parameters, and to investigate foraging ecology as it relates to the Auckland shelf squid trawl fishery.

Cost Estimate:

Technical assistant salary, allowances etc.	40,000
Vessel charter and field operations (this is costed at 50% of known costs)	34,000
Foraging ecology equipment (this is costed at 50% of known costs)	25,000
Permanent implantable transponder tags and transponder reader	8,700
Report editing, printing and distribution costs	1,500
DOC administration costs (@ 10% of total)	10,800
TOTAL	**$120,000**

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. Population estimates for the sea lion are 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 an index of 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.

All of the reproductive parameters that have been used in the model to date have been derived from other species. It is not know 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 a full time technical assistant.

Campbell Island is the only breeding population outside the Auckland Islands. Little is known about this population. For the 1997/98 year only a pup count will be carried out on Campbell Island. Breeding at Campbell Island is not in dense colonies as in the Auckland Islands but rather as individuals that disperse widely throughout the island. Covering approximately 70 km^2 Campbell Island is covered with rough terrain and dense vegetation that makes sea lions difficult to find and count. All pups found will be double flipper tagged (to ensure that individuals are not counted twice), and released.

Hector's Dolphin

Project: Quantifying the abundance of Hector's dolphins

Project Code: CSL 3B (ii)
Project Cost: $33,500
Start Date: 31 October 1997
Completion Date: 30 September 2000

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 Motunau-Timaru region of the east coast of the South island and using the results derive a statistically robust population estimate for Hector's dolphin in this region.

Cost Estimate:	
Technical assistants salary, allowances etc.	3,000
Travel	4,000
Field operations*	10,000
Equipment	12,000
Report editing, printing and distribution costs	1,500
DOC administration costs (@ 10% of total)	3,000
TOTAL	**$33,500**

*This includes food, fuel, maintenance etc. but not any vessel charter costs. An offer of the use of a suitable catamaran has been already made. Full commercial charter costs have therefore not been included in this proposal. If for any reason this offer were to be withdrawn, we would seek the assistance of the fishing industry and local fishing companies.

Background:

The only quantitative population estimate for Hector's dolphins is now more than 10 years old, and it is no longer appropriate to use these estimates to calculate sustainable levels of fisheries bycatch. The recent discovery of genetically different sub-populations highlights the need for an up to date and "fine grained" set of distribution and abundance data for management purposes. The survey will be concentrated on known areas of highest Hector's dolphin density, and be done over three consecutive summers. The survey design for 1997/98 summer will incorporate three levels of stratification: Banks Peninsula harbours, the sanctuary area out to four nautical miles, and non-sanctuary areas out to 10 nautical miles.

A line transect method will be used. Traditionally, line-transect surveys are done using large (>50m) research vessels, which typically cost more than $NZ10,000/day. This is because the survey platform must be high above the water and stable - the method requiring accurate measurement of angles from the horizon to the animal to calculate the distance each animal is from the trackline. If land is in the background, RADAR will be needed to determine the distance to the land, so that the angle calculation is possible.

To reduce vessel charter costs it is proposed that a 12m displacement catamaran be used. These vessels are inexpensive to run and offer the stability of a much larger monohull.

Methods will follow those developed in the United States (NMFS) for surveys of harbour porpoises. For density estimates to be statistically reliable, a minimum of about 60 detections are needed in each stratum. Preliminary calculations show that within the sanctuary 300-600 nautical miles of trackline would be needed, and for the non-sanctuary area (out to 10 nautical miles) at least 700 and possibly much more (>8000 nautical miles using some combinations of sighting rates and offshore distribution) trackline is anticipated. The Banks Peninsula harbours are far less problematic. Experience suggests that >60 detections could be gained with little effort (<100 nautical miles of trackline). Surveys will be conducted at a standard survey speed of 10 knots in conditions of Beaufort 3 and less, and will require about one month of field time.

During the second summer the West Coast (Whanganui Inlet to Haast) and finally in the third year, the remainder of the east coast, Te Wae Wae Bay and Southland.

Department of Conservation, Fisheries Act 1986 - Conservation Services Levy 1997/98 Fishing Year

Project Summary Table

Code	Project	Objective	Inputs	Outputs	Standards and Specifications
	OBSERVER PROJECTS **Total cost $373,500**				
CSL 1A	Fisheries Observer Programme - observer seadays	Objective 1	$303,000	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	$32,000	Statistical analysis of observer data for the 1997/98 fishing year	To be specified in contract documentation
CSL 1C	Marine mammal carcass recovery project	Objectives 1, 4	$34,000	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	$4,500	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 $150,000**				
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	Objective 2	$44,000	Research, design and development of measures and devices to mitigate marine mammal bycatch	To be specified in contract documentation
	RESEARCH PROJECTS **Total cost $320,000**				
CSL 3A	Monitoring of populations of protected seabird bycatch species	Objectives 3, 4	$361,000 less MoRST grant of $194,500 =$166,500	Population status; breeding success; recruitment and mortality rates; and foraging zones of high priority seabird bycatch species. Albatross simulation modelling.	To standards set by DOC Science and Research Division
CSL 3B	Monitoring of populations of protected marine mammal bycatch species	Objectives 3, 4	$153,500	Measurement of New Zealand sea lion 1997/98 pup production at the Auckland Islands, Campbell Island; 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 Motunau-Timaru..	To standards set by DOC Science and Research Division
	OVERALL COST $843,500 [GST EXCLUSIVE]				

Department of Conservation, Fisheries Act 1996 - Conservation Services Levy 1997/98 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 1997/98 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).

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).

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 1996/97	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	97/98	SCO 3013	Mfish Observer Agreement	Ministry of Fisheries	?	$275,425	
1A	97/98	SCO 3020	Inshore Observer Programme for Hector's dolphin	SEAFIC (Paul Starr)	17/6715/02	(part above)	
1C	97/98	SCO 3041	Autopsy of Marine Mammals	Massey Uni. (Per Madie)	17/6720/01	$30,800	
1D	97/98	SCO 3051	Autopsy of Seabirds	DOC (CJR Robertson)	17/6720/01	$4,000	
2A	97/98	SCO 3061	Development of Underwater setting method - multiple contracts	Paul Barnes	17/6760/01	$96,500	
2A	97/98	SCO 3063	At-sea testing of Underwater setting device for seabird take	Emerald (Declan O'Toole)	17/6715/02	(part above)	
2A	97/98	SCO 3064	At-sea Observation on Demersal longliners	Neville Smith	17/6715/02	(part above)	
2B	97/98	SCO 3071	Pingers on Gillnets	Greg Stone	17/6715/02	$40,000	
3A(i)	97/98	SCO 3083	Auckland Island Wandering Albatross	Graeme Elliott	17/6715/02	$123,500	
3A(ii)	97/98	SCO 3084	Antipodes Island Wandering Albatross	Graeme Elliott	17/6715/02	$126,500	
3A(iii)	97/98	SCO 3085	Black petrels on Great Barrier Island	Elizabeth Bell	17/6715/02	$15,500	
3A(iv)	97/98	SCO 3016	Albatross on Campbell Island	NIWA (Sue Waugh)	17/6715/02	$26,000	
3A(iv)	97/98	SCO 3017	Albatross on Campbell Island	DoC (Peter Moore)	17/6715/02	$19,000	
3A(v)	97/98	SCO 3086	Modelling of Albatross Populations		17/6715/02	$16,500	
3B (i)	97/98	SCO 3090	New Zealand Sea lion	DoC (Ian Wilkinson, Childerhouse, etc)	?	$109,200	
3B(ii)	97/98	SCO 3072	Line Transect survey of Hector's dolphin Motunau to Timaru	Uni. Otago (Steve Dawson)	17/6715/02	$30,500	