

SCIENCE & RESEARCH INTERNAL REPORT NO.127

**THE FRESHWATER FISH DATABASE:
A USER GUIDE FOR DOC USERS**

by

Jody Richardson and Helen Adcock

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THE FRESHWATER FISH DATABASE

A User Guide for DOC Users

by

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ABSTRACT

This user guide is intended to be used in conjunction with the DOC copy of the NIWAR freshwater fish computer database, to enable users to access information correctly and efficiently. It contains information on the background of the data, and some guidelines on data interpretation and use, as well as several appendices of maps and database lists to assist users of the database.

1. INTRODUCTION

The NIWAR (formerly MAF Fisheries) freshwater fish database is a comprehensive collection of site-specific fish records covering the whole of New Zealand, including Chatham and Stewart Islands. DOC now holds selected fields from the database on line. This user guide provides users with the information needed to extract and interpret data from the database.

2. BACKGROUND

The freshwater fish database was established in 1977. The purpose of establishing a computer-based system was to ensure information on the occurrence and distribution of freshwater fish species did not get lost in forgotten files and personal notebooks, was systematically recorded and was able to be retrieved rapidly.

The first data to be entered were historical MAF Fisheries records and data from major museum collections; about 2300 records pre-date 1977. These records are numbered from for the South Island, and 55000-56000 for the North Island.

In 1978, a standard form (card) for data collection was designed (Appendix I) and distributed to all MAF Fisheries staff engaged in field work. Booklets of cards were also given to Fish and Game Councils, Regional Water Boards, other government departments, and private consultants, many of whom are active contributors to the database.

Only selected fields from these cards (numbering 1-9999) and the historical cards (>50000) are stored on the database; the card and catchment number, the location, date, and time, imperial and metric map references, and the species found. Where additional data exists on these cards, these are gradually being added to the database. About 1800 of these records have been upgraded to date.

After a review of the database in 1986, a new form was designed (Appendix II; start number 10000), and the amount of data stored on the computer was increased. All the data shown in Appendix II are able to be stored on the database (about 85 fields of information). In January 1992, the database held 9053 records, and the extent of national coverage (main islands only) is shown in Appendix III.

Nine fields of data for all 9053 records are held by DOC. These are: the card and catchment number, the location, date, and fishing method, NZMS 1 and NZMS 260 map references, and the species found and their abundance. An update of the entire database is to be provided by NIWAR every six months, including all new cards that have been entered, and all additional data that have been added to the database.

3. HOW TO EXTRACT DATA

The database is designed to be a user-friendly method of obtaining data from the NIWAR Freshwater Fisheries Database. A concise on-line help facility is available to assist with any problems you may encounter.

In addition to the nine fields taken directly from the database, several additional fields have been generated from the metric map reference to aid DOC users. These include ecological district (Appendix IV), land district (Appendix V) and DOC Conservancy (Appendix VI). The catchment number of each record is from "Catchments of New Zealand" issued by the Soil and Rivers Control Council, December 1956. Species lists, sorted on scientific and common name are contained in Appendices VII and VIII, respectively, and a list of fishing methods is contained in Appendix IX.

You can enter the database by selecting the option on your PC menu, which should have been set up by your LAN Administrator. If not, the database can be accessed by exiting to DOS, selecting the directory containing the appropriate files, and typing "RUNTIME START" at the C:/> prompt.

On entering the application, several introductory screens will appear. Hitting the <ENTER> key, and/or entering the required information at the prompt will take you into the application.

There is one screen of site information for each record, and another screen will display information on species present, and their abundance and number for each site. On entering the database the site information for the first record is always displayed, but this record may change when a sort is performed.

Data fields which are stored on the NIWAR copy of the database (but not issued to DOC) are still accessible to DOC staff through at normal charging rates. Requests for additional information should be addressed to Jody Richardson, NIWAR, Ecosystems Division, P.O. Box 11-115, Hamilton.

3.1 How to use the menus

The up and down arrow keys will scroll the menu choices. When the required option is highlighted, hit to action that choice. Some procedures may take some time to complete, due to the size of the databases used by the application.

The <ESCAPE> key will return you to the main menu from any popup menus, but hitting the left and right arrows from any menu, or the key from the main menu will crash you out of the application, due to a bug in the dBASE IV software.

3.2 Menu options

3.2.1 List species info

Each site may have any number of species associated with it, and this information is stored in a second database. When this command is actioned, a search will be performed on this database, and a new screen will appear, displaying the species information (name, abundance and number). Hitting the <ENTER> key will return to the main "site" database.

3.2.2 Next record

Moves to the next record of the currently viewed database.

3.2.3 Previous record

Moves to the previous record of the currently viewed database.

3.2.4 Go to record no.

Prompts for a record number to go to. Record numbers are not constant. If a sort search is performed on the database, the first record after the command is actioned becomes RECORD 1, etc.

3.2.5 Search records

When this command is actioned, a popup menu will be displayed, and the user must select the field to search on, e.g. CONSERVANCY. Another popup menu may then appear, requesting the information to search for within that field, e.g. NELSON/MARLBOROUGH. Some fields, such as SITE NAME, may require the user to type in the characters to search for. In this case, it is possible to search on a string, searching on SITE NAME for the string "LAGOON" will find "OKARITO LAGOON", "PUKEPUKE LAGOON", etc. If more than one record is found, then the records are subsetted into a smaller database for viewing, printing, etc.

This search facility only allows the user to search on one field at a time, but nested searches can be performed. For example, to find a LAGOON in the WANGANUI CONSERVANCY which contains BROWN MUDFISH, you would first search the main database on CONSERVANCY for WANGANUI. Then search the resulting on NAME for LAGOON, then finally search that on SPECIES NAME for BROWN MUDFISH. To return to the main database, action the command CLEAR. This resets the application to the first record of the main database. All the options on the main menu may be performed on subsets of data (except for the CLEAR command).

A second date field may be displayed in brackets beneath the main date field. This second date is the date that will be searched on, as IV will not accept blanks in a date field.

The SITE NAME of a site is not a unique identifier, i.e. a search for a site name may result in several records being found. The only unique identifying field for each record is the CARD NUMBER.

You should always search for SPECIES NAME on the smallest possible subset, as this search takes the longest amount of time to complete, and therefore it is more efficient to search on a smaller number of records.

3.2.6 List site records

This command will display a screen showing card number, site name, catchment number, metric map, and metric map reference, for all sites in the currently viewed The arrow keys, the key and the and <PREVIOUS> keys will scroll the list. When you exit LIST, you will be returned to the record that is highlighted when you bit the key to exit.

3.2.7 Print record

There are three options on the PRINT menu. The first option will print all the information for the currently viewed record. The second will print all the information for every record in the currently viewed database, starting at the first record, i.e. if a search results in a subset of five records, then actioning this print command will print all five records. The third option will print a summary for the currently viewed database, i.e. it will print the site name and the species present at that site, for every record in the current database.

There is a prompt before printing begins, which will ask whether the user wishes to print direct to the printer, or to a print file. The application has been set up with print codes for an OKI Microline printer. If this is the on-line printer (the printer attached to the PC used) then printing directly to the printer is the best option. However, if you wish to print the records on a laser printer, or incorporate the information in a report, then a print file can be created (FISH.TXT) which will be saved to a floppy disk on the A: drive of the PC. This file can then be retrieved into 5.1, and should be correctly formatted for the Courier or any other non-proportional (fixed-width) font. Some re-formatting will be required for proportional fonts such as Times Roman.

A new print file is created each time a print job is sent to the A: drive, and this will overwrite any print file already on the disk, so if a job needs to be saved, you must rename it on the disk, transfer it to another drive (or directory), or use a different floppy disk.

Screen dumps can be performed by hitting <SHIFT> and SCREEN> together, and this information will be printed on the on-line printer, not sent to a print file.

3.2.8 Sort records

A sort may be performed on any field from the popup menu, i.e. site name, card number, date, etc. and will be performed in ascending alphabetical or numerical order, depending on the field chosen.

3.2.9 Clear

This will reset the application to the first record of the main database. When a new search procedure is started, CLEAR must be performed to reset the application, or the search will only be performed on the currently viewed subset. Quitting the application has the same effect as actioning the CLEAR command.

3.2.10 Quit

Closes all the database files and returns the user to the PC menu.

4. DATA INTERPRETATION

Site-specific presence/absence data like the freshwater fish database must be used with caution, especially if your fisheries knowledge is not comprehensive. A species might not be recorded at a particular site on a particular occasion, but may occur at sites up or downstream, or seasonally. Data may need to be interpreted on a catchment-wide or stream-wide basis rather than by site. The collection date might also be an important factor to consider.

Most native freshwater fish species migrate to or from the sea during various stages of their life cycles. The absence of a particular species from a site may not be due to unsuitable habitat, but because it is the wrong time of year, or there is a blockage to migration downstream.

Species abundance data should also be interpreted with caution. Measures such as "abundant" or "common" are subjective descriptions noted by the observer, and not tied to any defined density measures. Numerical data are more objective, but the accuracy of numerical data depends on the fishing method and the species recorded. For example, bullies often sink rapidly after being stunned by electric fishing and are hard to scoop up with nets, particularly if the substrate is uneven. Often numerical counts will be followed by the comment "many more observed".

Other database factors that can cause misinterpretation might arise from typographical errors, data of doubtful quality, or misidentification of species. Before entering any data, NIWAR staff check each card, and query contributors if the data do not agree with current knowledge of species distribution and habitat.

A limited number of NIWAR staff can enter or change data on the database, and each card is double-checked before being merged into the database. Nevertheless, there will undoubtedly be some errors. If you find any, please inform Jody Richardson, NIWAR, Ecosystems Division, Hamilton.

Many of the older records are of dubious quality for two main reasons; most do not contain a complete species list, and many of the map references may be inaccurate as these were added after interpretation of the site description, which was often very sketchy. This particularly applies to cards numbered greater than 50000.

The fishing method will give an indication of how complete a species list is; methods such as "observation" or "hand net" will probably not give as complete a list as "electric fishing" or extensive use of traps and nets.

If you have any concerns about interpreting data from the database, you should contact Jody Richardson, NIWAR, Ecosystems Division, Hamilton for clarification.

5. A FEW RULES ABOUT DATA USE

MAF Fisheries and DOC had a memorandum of agreement regarding use of data from the database (Appendix X). This agreement is shortly to be renegotiated with NIWAR. It is important to remember data are contributed by a large number of agencies, and no single organization can be said to own the information.

Under the memorandum of agreement, any database information used by DOC (published or otherwise) must include acknowledgment of the source of the data. Under no circumstances may data be given to third parties without the prior approval of NIWAR (please contact Jody Richardson, NIWAR, Ecosystems Division, P.O. Box 11-115, Hamilton). This is so we can ensure the contributor of that data is informed, and is agreeable to its release to another party.

NIWAR retains responsibility for maintenance of the database, including entry of all new data. DOC staff cannot enter any data directly onto the database; new data should be channelled through NIWAR. This will ensure consistency and continuity of the database, as well as ensure the data are available to all database users. DOC staff should thus make sure their data are properly recorded on database forms and forwarded to Jody Richardson, NIWAR, Ecosystems Division, Hamilton.

Periodically, we intend to review use and problems associated with the freshwater fish database. If you encounter any errors in the database, have problems extracting or interpreting data, or find the data is inadequate for the job, please document the problem and let the authors know. This will assist us to provide you with accessible, accurate, and practical freshwater fisheries information.

APPENDIX 1 - ORIGINAL DATABASE CARD (1978)

FRESHWATER FISH SURVEY - PLEASE RETURN TO:		Fisheries Research Division, Ministry of Agriculture and Fisheries, P.O. Box 297, Wellington.		9834								
Catalogue Number	418/3	River/Lake System	Waikou River		Catchment Number	092280						
Date	4/8/81	Sampling Locality	Waiorongamai Stream									
Time (NZS.T)	1205-1250	Access	loop road bridge									
Observer	JR TE BA	NZMS 1 Coordinates	248 747	NZMS 1 Map No.	N 57	Lat. Long. -						
Fishing Method	electric	Distance Surveyed	100 m	Permanent Water	<input checked="" type="checkbox"/> No	Tidal Water	<input checked="" type="checkbox"/> Yes					
HABITAT DATA												
WATER	Colour	nil	Clarity	clear	Conduct.	75 μ A/cm	Temp.	7.8°C	pH	7.11		
	Estimated Flow	3 cumec	Average Width	8 m	Depth Range	10-100 cm	DO - 13 mg/l					
Flow Type %	Swift		Sluggish		Pool	10	Run		Riffle	20	Torrent	70
Bottom Type %	Bed Rock	10	Boulder	30	Gravel		Sand	5	Mud		Coarse	large
Cover in water - type and abundance							boulders, banks	stones 55				
Aquatic vegetation - macrophytes							no	fish - yes				
Type of river/stream/lake							steep trib, old gold mining stm					
Condition of river/stream/lake (e.g. level, pollution, modifications)							normal flow, emerging from a gorge					
Notes on valley/vegetation							2nd growth bush, manuka, punga, gorse					
Bottom fauna							very sparse					
Purpose of work (e.g. Hons, degree material, Acc. Soc. data base, etc.)							Hg survey					
General Comments							photos 1/19-21					
FISH OBSERVED												
	SPECIES	ABUNDANCE		CONDITIONS WHERE CAUGHT			COMMENTS *		†			
1	S. gairdnerii	2 large + 7 yearlings							2			
2	C. fosteri	1		fast water								
3	G. basalis	2										
4												
5												
6												
7												
8												
9												
10												
11												
12												
NOTES- trout												
1003	440 g x 333 mm		♀ not spawned									
1004	630 g x 370 mm		♂ " "									
* Size, Peculiarities, Spawning, Juveniles, etc.							† Specimens Retained.					
							These sections must be filled in; other sections optional but desirable.					

APPENDIX II - REVISED DATABASE CARD (1986)

FRESHWATER FISH DATABASE FORM		PLEASE RETURN FORM TO: MAFFish Fisheries Research Centre P.O. Box 401 6016 ROTORUA		11259		
Date 25/2/89	River/Lake system Motueka River	Catchment number 570090				
Time 0930-1100	Sampling locality Pearse River					
Observer Ward/Eldon	Access Pearse Valley Road	Altitude (m) 125				
Organisation NAF/MAF	Map no. N27	Coords. 914 970		Island dist. (km) 30		
Fishing method backpack	Area fished (m ²) 296	Permanent water (yes/no/unknown) (yes)		Tidal water (yes/no/unknown) (no)		
HABITAT DATA						
Water	Colour (blue/green/tea/uncoloured/other) (blue)			Clarity (clear/milky/dirty) (clear)	Temp. 10.5	pH
	Average width (m) 7.4	Average depth (m) 0.5	Maximum depth (m) 1.2	Conductivity		
Habitat type (%)	Soil	Backwater	Pool	Run	Riffle 75	Flood torrent Cascade
Substrate type (%)	Mud	Sand 5	Fine gravel 10	Coarse gravel 10	Cobble 15	Boulder 60 Bedrock
Fish cover (%)	Substrate 20	weed algae	instream debris	Bank veg.	Undercut banks	O/head shade 5 Other 20*
Catchment vegetation (%)	Native forest 35	Exotic forest 20	Horti-culture	Urban zone	Scrub 45	Pastoral Other
Nocturnal vegetation (%)	Native forest 5	Exotic forest 5	Grass tussock 5	Exposed bed 30	Scrub willow 55	Raupo tax Other
Type of river/stream/lake forest + scrub drainage, steep high country						Photo no. ✓
Water level (low/normal/high/unknown) (low)	Downstream blockage (yes/no/unknown) (yes)		Pollution (low/moderate/high) (low)			
Bottom fauna abundance (low/moderate/high/unknown) (moderate)	Predominant species group (mayflies/caddis/snails/other) (mayflies)					
FISH DATA						
Species and life stage		Abundance*	Length data (see reverse)		Comments/capture location	
A. dieffenbachii		6	182-320 mm		cobbles/margins	
G. brevipinnis		2	169-222 mm		boulders/ torrent	
General comments about site or fish						
* turbulent white water						
natural confined waterfall downstream						
* Use abundant, common, occasional, rare or numbers observed						
These sections must be filled in						

APPENDIX III - DATABASE COVERAGE FOR THE NORTH AND SOUTH ISLANDS, JANUARY 1992



APPENDIX IV - ECOLOGICAL REGIONS AND DISTRICTS OF NEW ZEALAND, 3rd Edition, 1988

THREE KINGS
01.01 Three Kings
TE PAHI
02.01 Te Pahi
AUPOURI
04.01 Aupouri

WESTERN NORTHLAND
05.01 Mangamohi
05.02 Hokianga
05.03 Tairāwhiti
05.04 Hokianga
EASTERN NORTHLAND
06.01 Eastern Northland and Islands
06.02 Tairāwhiti
FOUR KNIGHTS
07.01 Four Knights
KAIKARA
08.01 Kaipara
AUCKLAND
09.01 Rodney
09.02 Waitakere
09.03 Tairāwhiti
09.04 Rangitikei
09.05 Great Gulf Islands
09.06 Auckland
09.07 Manukau
09.08 Hauraki

COROMANDEL
10.01 Great Barrier
10.02 Great Barrier
10.03 Coromandel
10.04 Mercury Islands
10.05 Thames
10.06 Tairāwhiti
10.07 Waikato
10.08 Te Araroa
10.09 Waikato

WAIKATO
11.01 Manawatu
11.02 Manawatu
11.03 Manawatu
11.04 Manawatu
11.05 Manawatu
11.06 Manawatu
11.07 Waikato

TAIRĀWHITI
12.01 Bay of Plenty
12.02 Bay of Plenty
12.03 Bay of Plenty
NORTHERN VOLCANIC PLATEAU
13.01 Bay of Plenty
13.02 Bay of Plenty
13.03 Bay of Plenty
13.04 Bay of Plenty
13.05 Bay of Plenty

WHAKATANE
14.01 Bay of Plenty
14.02 Bay of Plenty
14.03 Bay of Plenty

WESTERN VOLCANIC PLATEAU
15.01 Bay of Plenty
15.02 Bay of Plenty
15.03 Bay of Plenty

CENTRAL VOLCANIC PLATEAU
16.01 Bay of Plenty
16.02 Bay of Plenty

EASTERN VOLCANIC PLATEAU
17.01 Bay of Plenty
17.02 Bay of Plenty

TONGAREWA
18.01 Bay of Plenty

RANGITIKEI
19.01 Bay of Plenty
19.02 Bay of Plenty

EAST COAST
20.01 Bay of Plenty
20.02 Bay of Plenty
20.03 Bay of Plenty

WAIKATO
21.01 Bay of Plenty
21.02 Bay of Plenty
21.03 Bay of Plenty

WAIKATO
22.01 Bay of Plenty
22.02 Bay of Plenty
22.03 Bay of Plenty

ECOLOGICAL REGIONS AND DISTRICTS OF NEW ZEALAND (1988)	
BOUNDARIES AND NAMES	
REFERENCE	
Ecological Region boundary	—
Ecological Region name	AUPOURI
Connections between Ecological Regions across water	---
Ecological District boundary	----
Ecological District number and name	16.02 Tairāwhiti

KING COUNTRY
23.01 Waikato
23.02 Tairāwhiti
TARANAKI
24.01 North Tairāwhiti
24.02 Manawatu
EDMONT
25.01 Egmont
MOUNTAIN
26.01 Manawatu
26.02 Manawatu
26.03 Manawatu
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26.96 Manawatu
26.97 Manawatu
26.98 Manawatu
26.99 Manawatu
26.00 Manawatu



- SOUNDS-WELLINGTON**
 29.01 Wellington
 29.02 Cook Strait
 29.03 Tairāwhiti
 29.04 Tairāwhiti
- RŌHŪNGŌ**
 40.01 Pahuru
 40.02 Pūru
 40.03 Pūru
- WAIKATO**
 41.01 Waikato
 41.02 Waikato
 41.03 Waikato
 41.04 Waikato
- BAY OF PLANTAGENET**
 42.01 Waikato
 42.02 Waikato
 42.03 Waikato
- MŌKAIWAI**
 43.01 Waikato
 43.02 Waikato
 43.03 Waikato
- CLARENDON**
 44.01 Waikato
 44.02 Waikato
 44.03 Waikato
- KAIKŪIA**
 45.01 Waikato
 45.02 Waikato
 45.03 Waikato
- NORTH-WEST NELSON**
 46.01 Westland
 46.02 Westland
 46.03 Westland
 46.04 Westland
 46.05 Westland
 46.06 Westland
 46.07 Westland
 46.08 Westland
 46.09 Westland
- NELSON**
 47.01 Nelson
 47.02 Nelson
 47.03 Nelson
 47.04 Nelson
- NORTH WESTLAND**
 48.01 Westland
 48.02 Westland
 48.03 Westland
 48.04 Westland
 48.05 Westland
 48.06 Westland
 48.07 Westland
 48.08 Westland
 48.09 Westland
- SPITZER**
 49.01 Westland
 49.02 Westland
 49.03 Westland
 49.04 Westland
 49.05 Westland

ECOLOGICAL REGIONS AND DISTRICTS OF NEW ZEALAND 1988

BOUNDARIES AND NAMES

REFERENCE

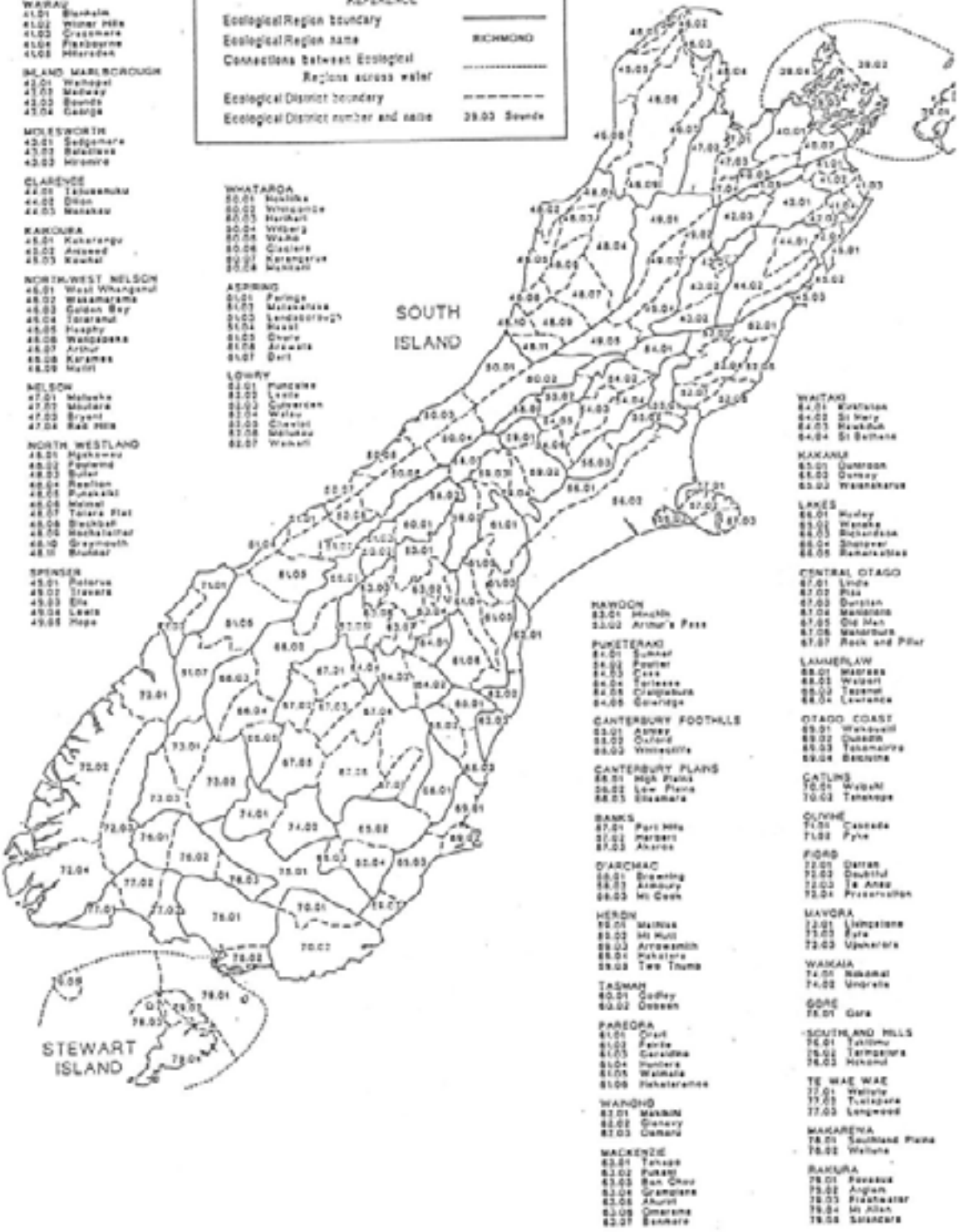
Ecological Region boundary ————

Ecological Region name ———— RICHMOND

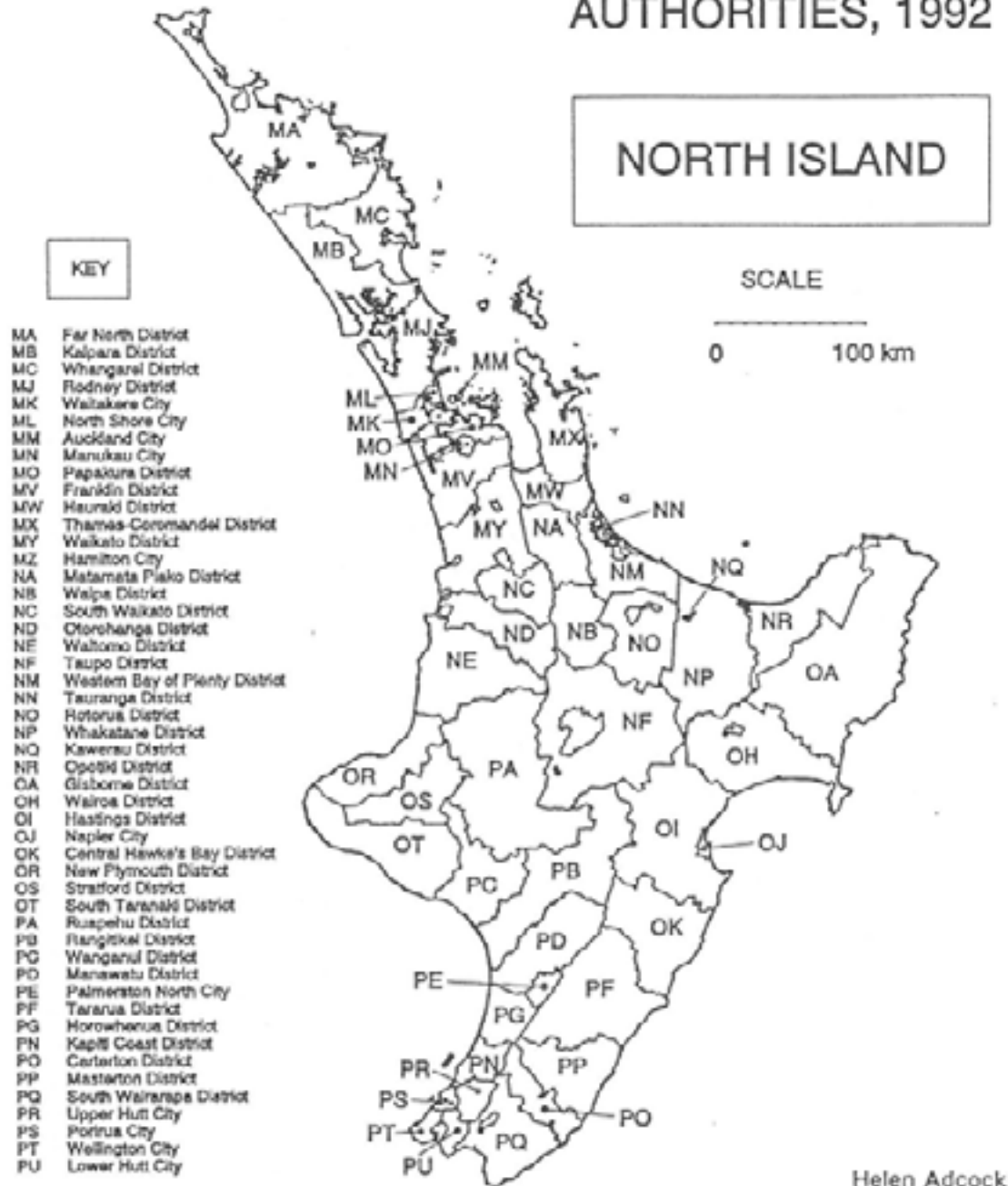
Connections between Ecological Regions across water ————

Ecological District boundary - - - - -

Ecological District number and name 39.03 Sounds



NEW ZEALAND LOCAL AUTHORITIES, 1992

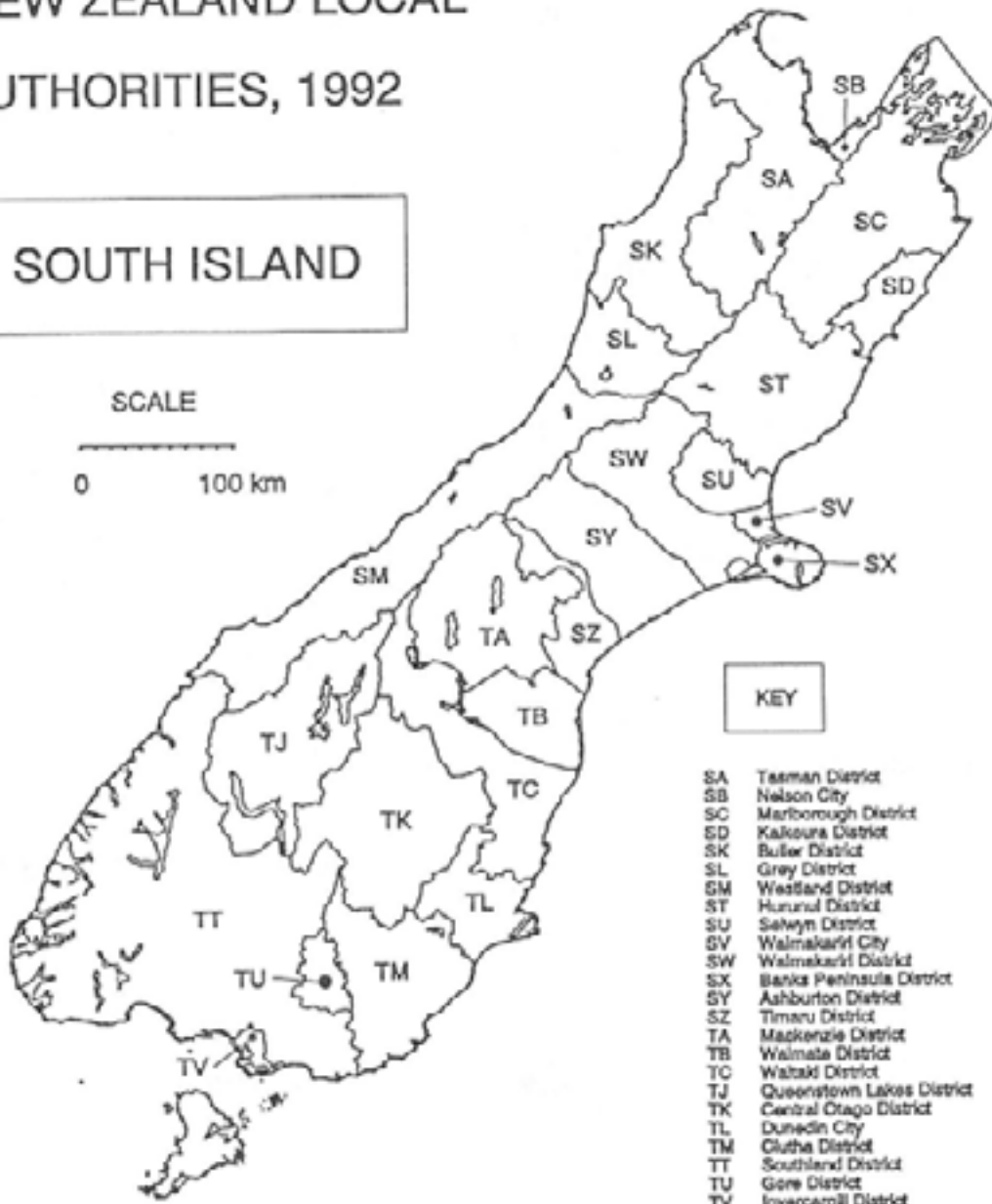


Helen Adcock
Science and Research Division
Department of Conservation, April 1992

NEW ZEALAND LOCAL AUTHORITIES, 1992

SOUTH ISLAND

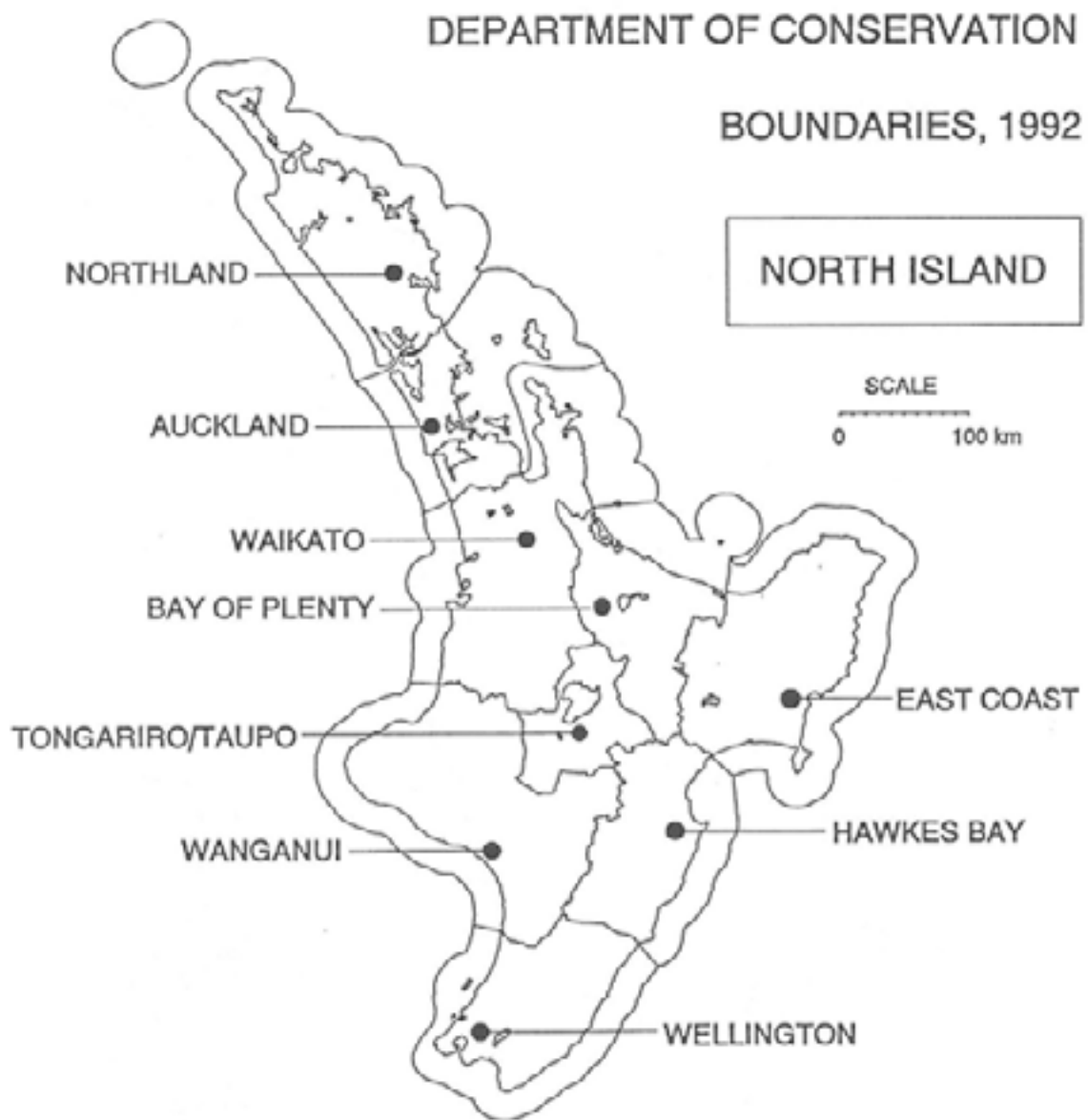
SCALE
0 100 km



KEY	
SA	Tasman District
SB	Nelson City
SC	Marlborough District
SD	Kaikoura District
SK	Buller District
SL	Grey District
SM	Westland District
ST	Hurunui District
SU	Selwyn District
SV	Waimakariri City
SW	Waimakariri District
SX	Banks Peninsula District
SY	Ashburton District
SZ	Timaru District
TA	Mackenzie District
TB	Waimata District
TC	Wairaki District
TJ	Queenstown Lakes District
TK	Central Otago District
TL	Dunedin City
TM	Clutha District
TT	Southern District
TU	Gore District
TV	Invercargill District

Helen Adcock
Science and Research Division
Department of Conservation, April 1992

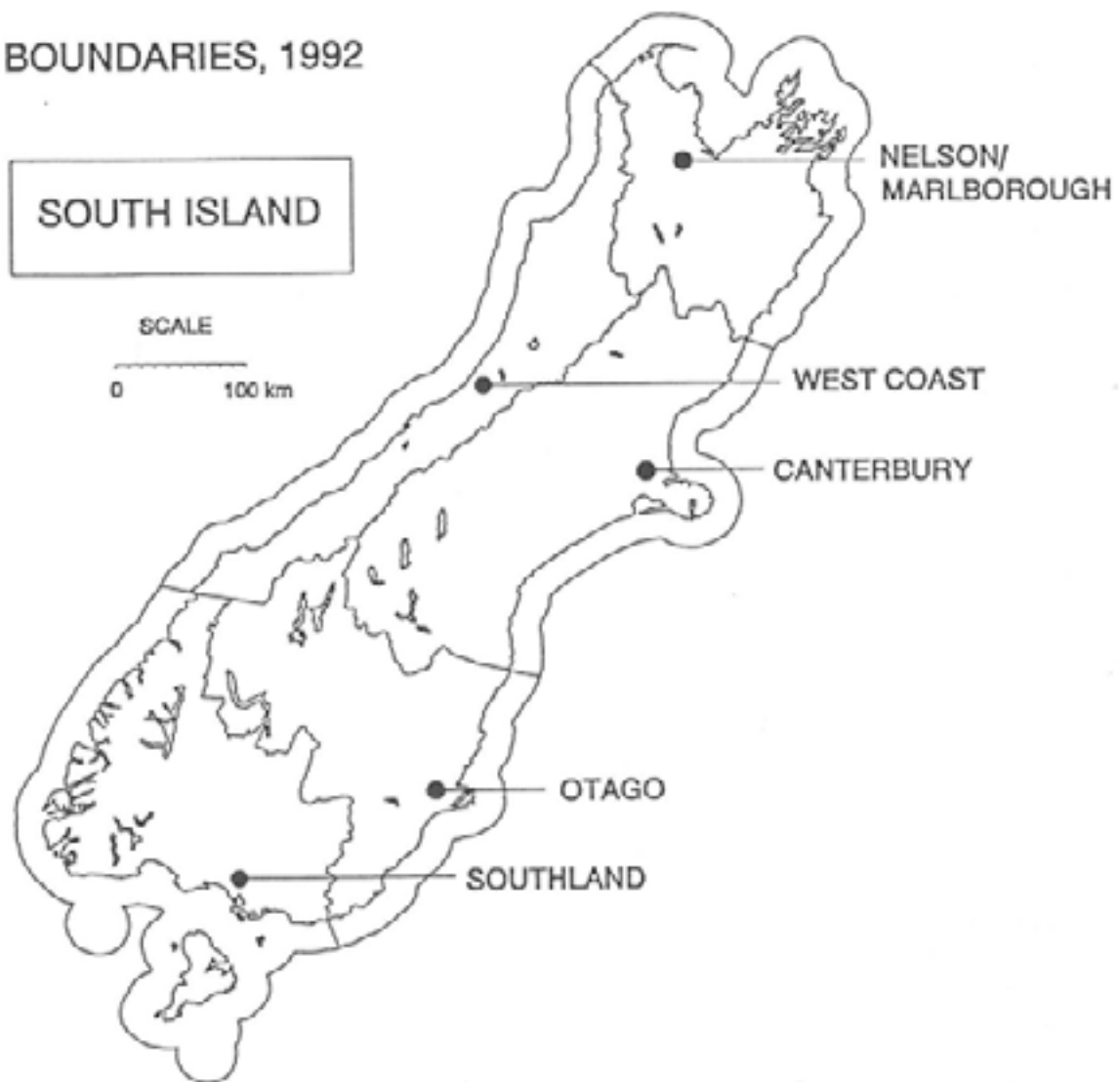
APPENDIX VI - DEPARTMENT OF CONSERVATION BOUNDARIES, 1992



Helen Adcock
Science and Research Division
Department of Conservation, April 1992

DEPARTMENT OF CONSERVATION

BOUNDARIES, 1992



Helen Adcock
Science and Research Division
Department of Conservation, April 1992

APPENDIX VII - FISH SPECIES LIST (sorted on scientific name)

Scientific Name	Common Name	(N)ative/(E)xotic
<i>Aldrichetta forsteri</i>	Yelloweyed mullet	N
<i>Anguilla australis</i>	Shortfinned eel	N
<i>Anguilla dieffenbachii</i>	Longfinned eel	N
<i>Anguilla sp.</i>	Unidentified eel	N
<i>Arripis trutta</i>	Kahawai	N
<i>Carassius auratus</i>	Goldfish	E
<i>Cheimarrichthys fosteri</i>	Torrentfish	N
<i>Ctenopharyngodon idella</i>	Grass carp	E
<i>Cyprinus carpio</i>	Koi carp	E
<i>Galaxias anomalus</i>	Otago galaxias	N
<i>Galaxias argentus</i>	Giant kokopu	N
<i>Galaxias brevipinnis</i>	Koaro	N
<i>Galaxias divergens</i>	Dwarf galaxias	N
<i>Galaxias fasciatus</i>	Banded kokopu	N
<i>Galaxias gracilis</i>	Dwarf inanga	N
<i>Galaxias maculatus</i>	Inanga	N
<i>Galaxias paucispondylus</i>	Alpine galaxias	N
<i>Galaxias postvectis</i>	Shortjawed kokopu	N
<i>Galaxias prognathus</i>	Longjawed galaxias	N
<i>Galaxias sp.</i>	Unidentified galaxias	N
<i>Galaxias vulgaris</i>	Common river galaxias	N
<i>Gambusia affinis</i>	Mosquitofish	E
<i>Geotria australis</i>	Lamprey	N
<i>Gobiomorphus basalis</i>	Cran's bully	N
<i>Gobiomorphus breviceps</i>	Upland bully	N
<i>Gobiomorphus cotidianus</i>	Common bully	N
<i>Gobiomorphus gobioides</i>	Giant bully	N
<i>Gobiomorphus hubbsi</i>	Bluegilled bully	N
<i>Gobiomorphus buttoni</i>	Redfinned bully	N
<i>Gobiomorphus sp.</i>	Unidentified bully	N
<i>Ictalurus nebulosus</i>	Catfish	E
<i>Leptoscopus macropygus</i>	Stargazer	N
<i>Leuciscus idus</i>	Golden orfe	E
Marine sp.	Marine species	
<i>Mugil cephalus</i>	Grey mullet	N
<i>Mugil sp.</i>	Unidentified mullet	N
<i>Neochanna apoda</i>	Brown mudfish	N
<i>Neochanna burrowsius</i>	Canterbury mudfish	N
<i>Neochanna diversus</i>	Black mudfish	N
Nil	No species recorded	
<i>Oncorhynchus mykiss</i>	Rainbow trout	E
<i>Oncorhynchus nerka</i>	Sockeye salmon	E
<i>Oncorhynchus tshawytscha</i>	Chinook salmon	E
<i>Paranephrops planifrons</i>	Koura	N

<i>Paranephrops sp.</i>	Koura	N
<i>Perca fluviatilis</i>	Perch	E
<i>Poecilia latipinna</i>	Sailfin molly	E
<i>Poecilia reticulata</i>	Guppy	E
<i>Prototroctes oxyrhynchus</i>	Grayling	N
<i>Retropinna retropinna</i>	Common smelt	N
<i>Rhombosolea leporina</i>	Yellowbelly flounder	N
<i>Rhombosolea plebeia</i>	Sand flounder	N
<i>Rhombosolea retiaria</i>	Black flounder	N
<i>Rhombosolea sp</i>	Unidentified flounder	N
<i>Salmo salar</i>	Atlantic salmon	E
<i>Salmo sp.</i>	Unidentified trout	E
<i>Salmo trutta</i>	Brown trout	E
<i>Salvelinus fontinalis</i>	Brook char	E
<i>Scardinius erythrophthalmus</i>	Rudd	E
<i>Stokellia anisodon</i>	Stokell's smelt	N
<i>Tinca tinca</i>	Tench	E
<i>Tripterygion nigripinne</i>	Cockabully	N
<i>Tripterygion sp.</i>	Marine cockabullies	N

APPENDIX VIII - FISH SPECIES LIST (sorted on common name)

Scientific Name	Common Name	(N)ative/(E)xotic
Alpine galaxias	<i>Galaxias paucispondylus</i>	N
Atlantic salmon	<i>Salmo salar</i>	E
Banded kokopu	<i>Galaxias fasciatus</i>	N
Black flounder	<i>Rhomboselea retiaria</i>	N
Black mudfish	<i>Neochanna diversus</i>	N
Bluegilled bully	<i>Gobwmorphus hubbsi</i>	N
Brook char	<i>Salvelinus fontinalis</i>	E
Brown mudfish	<i>Neochanna apoda</i>	N
Brown trout	<i>Salmo trutta</i>	E
Canterbury mudfish	<i>Neochanna burrowsius</i>	N
Catfish	<i>Ictalurus nebulosus</i>	E
Chinook salmon	<i>Oncorhynchus tshawytscha</i>	E
Cockabully	<i>Tripterygion nigripenne</i>	N
Common bully	<i>Gobiomorphus cotidianus</i>	N
Common river galaxias	<i>Galaxias vulgaris</i>	N
Common smelt	<i>Retropinna retropinna</i>	N
Cran's bully	<i>Gobiomorphus basalis</i>	N
Dwarf galaxias	<i>Galaxias divergens</i>	N
Dwarf inanga	<i>Galaxias gracilis</i>	N
Giant bully	<i>Gobiomorphus gobwides</i>	N
Giant kokopu	<i>Galaxias argentus</i>	N
Golden orfe	<i>Leuciscus idus</i>	E
Goldfish	<i>Carassius auratus</i>	E
Grass carp	<i>Ctenopharyngodon idella</i>	E
Grayling	<i>Prototroctes oxyrhynchus</i>	N
Grey mullet	<i>Mugil cephalus</i>	N
Guppy	<i>Poecilia reticulata</i>	E
Inanga	<i>Galaxias maculatus</i>	N
Kahawai	<i>Arripis trutta</i>	N
Koaro	<i>Galaxias brevipinnis</i>	N
Koi carp	<i>Cyprinus carpio</i>	E
Koura	<i>Paranephrops sp.</i>	N
Koura	<i>Paranephrops planifrons</i>	N
Lamprey	<i>Geotria australis</i>	N
Longfinned eel	<i>Anguilla dieffenbachii</i>	N
Longjawed galaxias	<i>Galaxias prognathus</i>	N
Marine cockabullies	<i>Tripterygion sp.</i>	N
Marine species	Marine sp.	
Mosquitofish	<i>Gambusia affinis</i>	E
No species recorded	<i>nil</i>	
Otago galaxias	<i>Galaxias anomalus</i>	N
Perch	<i>Perca fluviatilis</i>	E
Rainbow trout	<i>Oncorhynchus mykiss</i>	E
Redfinned bully	<i>Gobwmorphus buttoni</i>	N

Rudd	<i>Scardinius erythrophthalmus</i>	E
Sailfin molly	<i>Poecilia latipinna</i>	E
Sand flounder	<i>Rhombosolea plebeia</i>	N
Shortfinned eel	<i>Anguilla australis</i>	N
Shortjawed kokopu	<i>Galaxias postvectis</i>	N
Sockeye salmon	<i>Oncorhynchus nerka</i>	E
Stargazer	<i>Leptoscopus macropygus</i>	N
Stokell's smelt	<i>Stokellia anisodon</i>	N
Tench	<i>Tinca tinca</i>	E
Torrentfish	<i>Cheimarrichthys fosteri</i>	N
Unidentified bully	<i>Gobiomorphus sp.</i>	N
Unidentified eel	<i>Anguilla sp.</i>	N
Unidentified flounder	<i>Rhombosolea sp.</i>	N
Unidentified galaxias	<i>Galaxias sp.</i>	N
Unidentified mullet	<i>Mugil sp.</i>	N
Unidentified trout	<i>Salmo sp.</i>	E
Upland bully	<i>Gobiomorphus breviceps</i>	N
Yellowbelly flounder	<i>Rhombosolea leporina</i>	N
Yelloweyed mullet	<i>Aldrichetta forsteri</i>	N

APPENDIX IX - FISHING METHODS

Fishing method

Angling
Box trap
Combination of nets
Combination of nets and electric fishing
Combination of nets and traps
Diving
Electric fishing, machine type unknown
Electric fishing, mains set
Electric fishing, packset
Fry trap
Fyke net, including minifykes
Gee minnow trap
Gill net
Hand net
Hinaki
Observation only
Other (dynamite, poison, spearing, releases, etc)
Plankton net
Push net
Seine net
Set net
Traps and electric fishing
Unknown method
Unknown type of net
Unknown type of trap
Whitebait net

APPENDIX X - MEMORANDUM OF AGREEMENT

**MEMORANDUM OF AGREEMENT
between
MAF FISHERIES
and
DEPARTMENT OF CONSERVATION**

SUBJECT

Access and use of the Freshwater Fish Database.

BACKGROUND

Fisheries created and maintains a computer based collection of site-specific freshwater fish records. Data are contributed by MAF Fisheries, Fish and Game Councils, regional councils, private consultants, interested individuals and government departments, including the Department of Conservation (DOC). Contributors may request that their data be kept confidential for up to three years.

Fisheries aims to treat the data as being of national interest and to encourage the widest possible use of the data. However, contributors' interests must also be protected.

DOC is to receive a subset of the database for internal use. This memorandum of agreement sets out the responsibilities of each department.

NATURE OF THE INFORMATION

The database is a collection of information from site-specific field observations. An NZMS 260 map reference pinpoints the site, and data include the fish species present and physical information about the site. The database consists of the field data sheets and computer files of the raw data.

FISHERIES RESPONSIBILITIES DOC RESPONSIBILITIES

- A. To update and maintain the database as required.
- B. To liaise with contributors concerning data collection and new developments.
- C. To ensure confidential data is protected.

- D. To issue DOC with selected fields from the database (database subsets) every six months.
- E. To extract additional data for DOC as required. Charges will cover actual costs of supplying the additional information based on current Fisheries charge-out rates for the staff involved.

DOC RESPONSIBILITIES

- A. To ensure database information issued by MAF Fisheries is available to DOC staff.
 - B. To ensure data issued to DOC is used responsibly.
 - Any presentations or documents (published or otherwise) shall include clear and prominent acknowledgement of the database to MAF Fisheries.
 - Data issued to DOC must not be released to third parties without prior consultation with MAF Fisheries.
25. To ensure collected by DOC is available for entry onto the national database, with usual contributor confidentiality rights.

FINANCING

DOC will pay MAF Fisheries an annual fee for their copies of the database subsets. The amount to be paid each year will be decided by joint agreement between the two departments.

REPORTING AND REVIEW OF AGREEMENT

DOC Science and Research Division and MAF Fisheries will report to each other annually on usage and operating problems with a view to optimising usage and operating effectiveness. This agreement may be reviewed and revised to the mutual satisfaction of DOC and MAF Fisheries at that time.