and placed between our legs, effectively freed our hands which then could have been used to operate a speargun.

Ideally, the method requires skilled divers and should be carried out in relatively shallow lakes during periods of relatively calm and warm weather.

Advantages

The manta board technique applied during the day provides a rapid means of assessing the general features of a lake, and determining distribution of aquatic plant species.

At night the vertical and horizontal distribution, location, species composition and estimated sizes of fish can be recorded. With sufficient transects good estimates of the size of fish populations probably could be made in shallow lakes.

The technique does require validation which could be done by introducing a known number of tagged or fin-clipped fish into the population before undertaking the survey. We would be interested in validating the method when the opportunity or need arises.

Malcolm Flain is a scientist at MAF Fisheries, Christchurch

The all-new freshwater fish database

by Jody Richardson

MANY *Freshwater Catch* readers will be aware of or use the computer-based freshwater fish database, a comprehensive collection of site-specific fish records. Information from the database is used extensively as background material for catchment inventories and protected natural area surveys, as evidence in water right and water conservation order hearings, and in environmental impact statements and Freshwater Fisheries Reports.

Over the past two years, the database has undergone some major restructuring both in what and how the data are stored. This article aims to update current database users, and I hope encourage others to become active participants.

Background

The database was set up in 1977, mainly to ensure that recent and historical data were not lost or forgotten. At the onset, all data available from MAF Fisheries records were documented and entered, and this was then expanded to include major museum collections. These records make up the historical data. Beginning in 1978, all MAF Fisheries staff engaged in field work were encouraged to fill out database cards so recent information could also be incorporated into the computer files. Booklets of cards were also distributed to acclimatisation societies, regional water boards, other government departments, and private consultants, many of whom elected to become active and valued contributors.

Although the original database cards contained a modest range of information about the physical habitat and the fish species present, only a few elements were actually stored on the computer; the card and catchment number, the location, date, and time,

FRESHWATER FISH DATABASE FORM — PLEASE RETURN FORM TO: MAFFish Fisheries Research Centre P.O. Box ~~951~~ 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 NAS / MAF	~~NZMS1~~ NZMS260 Map no. N27	Coords. 914 970	Inland dist. (km) 30
Fishing method backpack efm	Area fished (m²) ~~or no. nets used~~ 296	Permanent water (yes) no/unknown	Tidal water yes (no) unknown

HABITAT DATA

Water	Colour (blue) green/tea/uncoloured/other:			Clarity (clear) milky/dirty		Temp. 10.5	pH
	Average width (m) 7.4		Average depth (m) 0.5		Maximum depth (m) 1.2		Conductivity
Habitat type (%)	Still	Backwater	Pool	Run	Riffle 75	~~Rapid~~ Torrent 25	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	Overhead shade 5	Other 20*
Catchment vegetation (%)	Native forest 35	Exotic forest 20	Horti-culture	Urban zone	Scrub 45	Pastoral	Other
Riparian vegetation (%)	Native forest 5	Exotic forest 5	Grass tussock 5	Exposed bed 30	Scrub willow 55	Raupo flax	Other
Type of river/stm/lake forest + scrub drainage, steep high country							Photo no. ✓
Water level (low) normal/high/unknown			Downstream blockage (yes) no/unknown			Pollution (nil) low/moderate/high	
Bottom fauna abundance low (moderate) high/unknown			Predominant species group (mayflies) caddis/snails/other:				

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

Figure 1. An excellent example of a new database card, courtesy of Nelson Acclimatisation Society.

the NZMS1 map reference, and the species found. Storage of physical habitat details was limited to water temperature, pH, oxygen concentration, and water colour. By the end of 1985, the database had become a sizeable entity and contained about 6500 records.

During 1986, the database was examined and reviewed by Canadian Ken Minns while he was in New Zealand on a NRAC fellowship. Ken recognised that the database was an impressive and important source of fisheries data, but noted that its usefulness for analytical purposes was limited by a lack of quality control on entries, effective use of

categorical descriptors (predefined choices such as high/medium/low or sizes of substrate), and the incompleteness of the computer storage. He made 25 specific recommendations for improvement, these appear in a MAF Fisheries internal report.

Following publication of the internal report, MAF Fisheries set up a committee to discuss Ken's recommendations and implement those we thought practical and necessary. This resulted in the design of a completely new database card, which incorporated extensive use of categorical descriptors and an expansion of physical habitat details (Fig. 1). A decision was also made to enter as much information from the old and new cards as possible on the computer.

Fortuitously, in 1987 MAF Fisheries purchased and installed a new computer which had a comprehensive database software package, Empress. A new database structure was set up to accommodate all the additional data, and the existing database was transferred to the new computer early in 1988.

Unfortunately, much of the information now recorded on the new cards is not available on the old cards, and many of the old cards are woefully incomplete. The data which can be gleaned from the old cards are gradually being added, however, with priority being given to datasets where there is a good quantity of reliable data. All information from about 600 old cards has been transferred to the new database and this work continues.

The database today

Many improvements have resulted from the database transfer. Virtually every element found on the new cards is now stored on the computer. Data may be retrieved on virtually any element as well. For example, if you want to know the species present in streams where the percentage of boulder is 50, no problem. Numerical data may also be extracted in a convenient format for use with statistical packages such as S, Minitab, or Systat.

Mapping facilities are greatly improved too. Maps can be produced to illustrate the national distribution of a species, or to show species in particular river catchments or geographical regions (Fig. 2). However, the two most frequent and useful requests remain as the locations of particular species and all the data from a particular catchment.

Another major change to the database has been the need to charge for services. To protect agencies who contribute to the database from incurring costs, a two-tiered system of charging has been applied. Basically, contributors to the database get credit for cards they send in to offset charges for extracts, at a ratio of 3:1. Non-contributors are charged a substantial access fee and up to five times as much for each record retrieved. Obviously, there are financial advantages in becoming a contributor to the database.

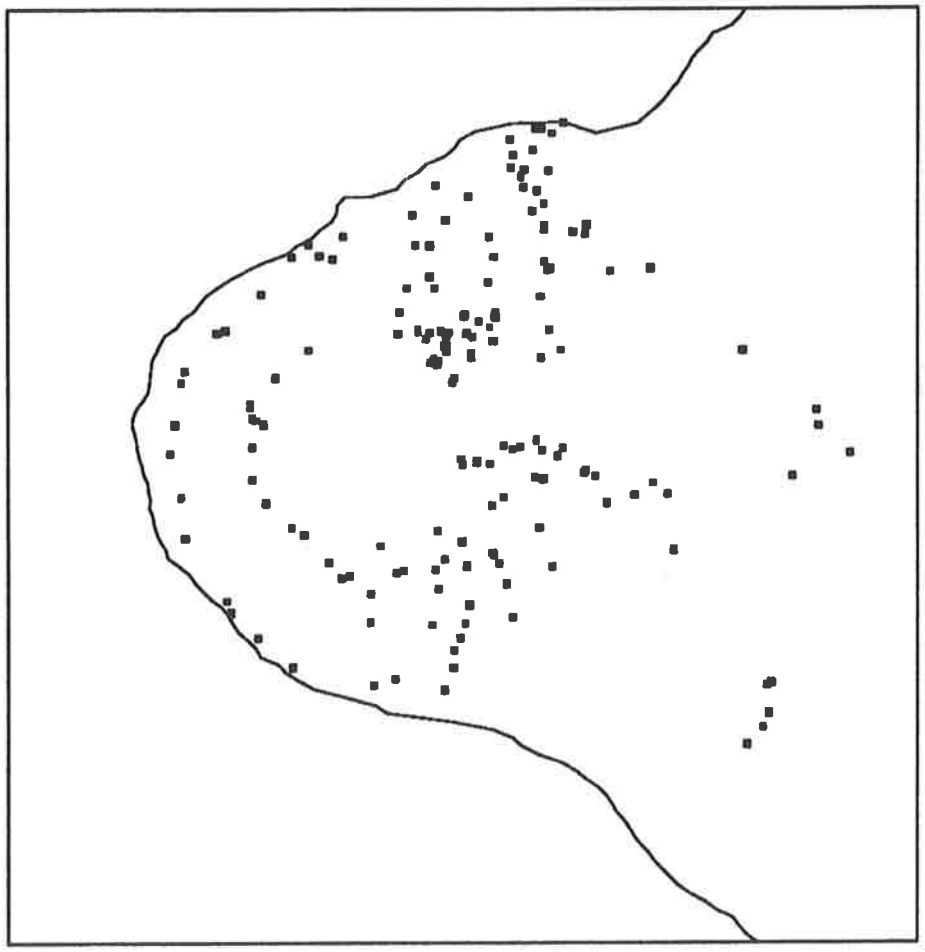

Figure 2. Long-finned eel locations in Taranaki - an example of a regional distribution map produced from the database files.

The database tomorrow

A continuing problem with the database is that requests for information must be processed by MAF Fisheries and this can result in time delays and perhaps the client not receiving exactly what they want. A proposal is under consideration which will permit agencies to have direct access to the database by paying an annual fee, so they can process their own requests. This will ensure that the database is used to its full potential and relieve any need for individual agencies to create their own databases.

Extracting data from the database for novice users will be achieved by running pre-packaged command files from within the database, while users familiar with the Empress query language will be able to formulate their own routines. All new data will continue to be entered by MAF Fisheries to ensure quality control, and no users will be allowed to change any entries.

The freshwater fish database is by far the largest single collection of data for New Zealand's freshwater fish and their habitats. However, any database is only as good as the information and use it receives. The fisheries information you collect, whether you are an amateur observer or an expert, is valuable. Why not ensure it is systematically and properly stored in the freshwater fish database? Full details of how to become a contributor and/or user of the database are available from the author. I strongly encourage everyone engaged in fisheries research and management in New Zealand to contribute to and use this valuable resource.

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