Fish on line

Australia's fishing zone almost equals the country's land surface area, making it the world's second largest national fishing zone. Yet our fishing industry is small, concentrating on a limited number of estuarine, coastal, pelagic (surface and mid-water), and demersal (bottom-living) fish that occur off the relatively densely populated north-eastern, south-eastern, and south-western coasts.

The establishment of the Australian 200-nautical-mile fishing zone in 1979 has brought various fish stocks — presently exploited by foreign vessels — under Australian control. Under the Law of the Sea, declaration of the zone imposes an obligation on Australia to manage and conserve its fish resources, and to permit other countries access to these resources if they are not being utilized.

Off the northern coast, foreign fleets catch shark, tuna, and Spanish mackerel, while off the north-western coast they catch thread-fin bream, tropical snappers, emperors, goatfish, hair tails, and other species. No equivalent Australian fishing operations exist at the moment.

To properly manage our fisheries, Australian authorities need to know the answers to a few basic questions — what and how much is being caught and how do fishermen make their catches? Until recently, much of that information was simply not available, buried in log books of boats from ports outside Australia.

The CSIRO Division of Fisheries Research and the Commonwealth Department of Primary Industry set up a Fisheries Information System in 1979, to store, retrieve, and analyse catch and effort data from foreign trawl vessels operating in the Australian 200-mile zone. It has since

On board a Japanese squid boat that operates off Tasmania.

been expanded to include domestic fisheries and those outside the Australian fishing zone. Mr Graeme Morris of the Division and Mr David Num of the Commonwealth Department have helped develop the log-book and database records and storage.

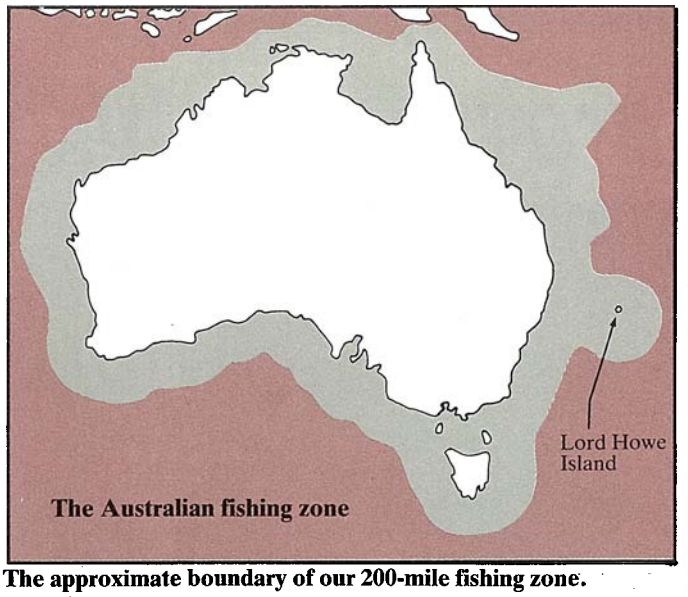
The System uses CSIRO's Australia-wide computing network, CSIRONET, to collect and distribute information. Mr Morris developed and maintains the computer software, while the task of collecting, checking, and entering data into the database rests with the Department of Primary Industry.

'Data' means, in most cases, log-book entries and radio reports from both foreign vessels and Australian-managed fisheries such as the northern prawn fishery in the Gulf of Carpentaria. The Division's scientists also use the System for storing data from their research cruises. State Fisheries Departments have been provided with terminals to enable them to tap into the database.

Each log-book entry represents one fishing operation — perhaps one trawl, one day's longlining, or one gill net set. The entry records time of catch, where the fish were caught, how long the operation took, the weight and species of fish netted, and, in some cases, weather details.

These data units can be simple one-line entries or comprehensive descriptions. To add to the variety, more than 30 different log-book formats exist for more than 10 different methods of fishing. All logs carry the basic what, how, when, and where information about a catch; they may, in addition, contain data on depth, temperature, searching-gear type, speed and direction of the vessel, and so on.

Log-books in the native language of the operator are issued to the skippers by State fisheries officers. When a vessel enters port, a State inspector checks and collects the log-books.



The approximate boundary of our 200-mile fishing zone.

Poling for tuna in southern Australian waters.

The Department of Primary Industry sends observers onto domestic and foreign boats to see that the log-books are being correctly filled in. An observer stays on board for a complete fishing operation, noting how the crew categorize fish, the type of equipment they use, and general shipboard practice.

Who uses the system? Inquiries come from a number of quarters — fisheries research scientists, fisheries managers, and, yes, fishermen. Dr Morris comments that the system was designed to be 'user-friendly' because many people retrieving data from it will have had little experience with computers.

Users retrieve information about operations they wish to investigate by specifying the date, fishing method, area, nationality, and species caught. For example, a researcher could retrieve all data concerning Taiwanese vessels using pair trawling to catch lizard fish on the North-West Shelf in March–June, 1982. Catch per unit effort can be estimated and recorded, and a fisherman would be able to find out answers to questions such as: for how long does a gill net need to be set to catch a certain quantity of shark?.

The data can also be analysed in a number of ways. Maps showing the distribution of weights of fish caught or type of boat used can be displayed; and these may be further split by month, species, or fishing method.

Information contained in radio reports from foreign boats can be useful for short-term management decisions, such as the setting of quotas. The facility will also enable the Department of Primary Industry and State authorities to monitor catches against quotas and assess fishing stocks. One of the Fisheries Information System's major functions is to provide information to Australian fisheries management bodies prior to negotiations on foreign vessel access to areas such as the North-West Shelf.

Mary Lou Considine

Corrections

The article 'Checking the safety of solution mining' in *Ecos* 39 stated that CRA Ltd had conducted pilot-scale tests on a cyanide system of gold extraction and had been refused permission by the Victorian government to go ahead with the enterprise. In fact, no such tests were conducted. CRA applied for permission to use a cyanide solution in small-scale trials, but then identified an alternative system and informed the government that it had ceased its research into the use of cyanide. CRA Ltd had not been refused permission to test the cyanide system.

Dr John Floyd is a Professorial Research Fellow in Extractive Metallurgy in the Department of Chemical Engineering at the University of Melbourne, not Professor of Metallurgy at the University as stated in the article 'Smelting by submerged combustion' in *Ecos 39*.