Fish on file

Perhaps fish are not the first creatures that spring to mind when one thinks of collecting. However, creating collections of fish — as of plants and other animals — is important in modern science, and CSIRO has built up an impressive one that takes its place alongside the better-known assemblages of insects, plants, and terrestrial vertebrates that the Organisation also maintains.

Despite decades of fish-collecting, we still don't know all the different types that live in the waters around Australia as, for historical reasons, our region is not as well studied as the Northern Hemisphere.

Mr Ian Munro, a CSIRO fisheries scientist, started the collection 40 years ago while preparing books about Indo-Pacific fishes. He retired in 1984, leaving to CSIRO's Division of Fisheries the collection now named in his honour.

The practice of preserving fish for scientific study dates back to Europe in the 17th century. A well-ordered collection allows land-dwelling biologists to study more easily the variety and distribution of species in a region, as well as the anatomy of individuals. It's possible to see whether certain species change their distribution over time, and how closely related one species is to another. It's also possible to obtain a great deal of general biological information of interest to ichthyologists.

The 100 000 adult specimens in the CSIRO I.S.R. Munro Collection represent between two and three thousand species from a wide range of different habitats. Most come from Australian waters, but fish taken from Papua New Guinea, the Solomon Islands, New Zealand, Antarctica, and elsewhere are also present.

Two handsome wobbegongs — members of the shark family — found in Australian waters. Both are species of the genus *Orectolobus*, but the one on the left is as yet undescribed. These paintings are by Roger Swainson.

This great mass of fish is probably the second-largest collection in Australia in terms of the number of different species represented (the largest is at the Australian Museum in Sydney). However, it is not so large when ranked according to the number of actual specimens because, by careful and selective assembling, fisheries scientists have restricted the number of duplicates.

The scientists obtained the material from expeditions and cruises on survey ships, and also benefited from incorporating the collections of the Tasmanian Department of Sea Fisheries, other government organisations, and professional fishermen.

The CSIRO collection possesses an unusually large proportion of bottom-dwelling fish and those from our continental slopes. (Museum collections tend to contain mainly shallow-water species.) Moreover, it includes numerous rare species, many of which are not yet identified.

Dr Peter Last, also of the Division of Fisheries in Hobart, is in charge of the collection. He is still describing species new to science — a rare process for those working on fish from the Northern Hemisphere.

Another unusual feature is the special emphasis on sharks and rays. Now, such large creatures present a daunting prospect to collectors and so are often under-represented. After all, you can keep hundreds of specimens of sardine-sized fish in the space of a tank designed to hold one shark.

Our knowledge of the sharks and rays in the ocean around us therefore lags behind our knowledge of some other groups of fish, and Dr Last and his colleagues are using the collection to prepare a guide to Australian species of them, which should be published soon. However, the main problem the collection faces is lack of storage space.

The fish biologists are also putting out to sea to find out more about our fish resources, and in the last 2 years have increased the number of species known around our coasts by about 100. The work confirms that our part of the world — compared with, say, the North Atlantic — is rich in diversity of species, although not always in abundance.

But a collection is not static; just to maintain one requires constant work. In this case, fish that were originally stored in formalin are being transferred into a solution of 70% alcohol. This is because long-term saturation in formalin damages the boney tissues of the fish, rendering the animals useless for X-ray photography.

In addition, to be of use to scientists, a collection's knowledge base needs to be accessible. So, all the records of the collection are being put on computer, and the Division has received an Australian Biological Resources Grant to establish this computerised registration system.

Eventually, the CSIRO collection will be linked into an Australia-wide Museum Collection Network, accessible to all who wish to use it for research. Undoubtedly, it will play an important part in helping us to understand and use wisely the biological resources of our oceans.

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