

## SPC SciCoFish project aims to improve collection of reef fisheries scientific data to support management

*The new SPC Scientific Support for the Management of Coastal and Oceanic Fisheries in the Pacific Islands Region (SciCoFish) project funded by the European Union, first implemented in 2011, has taken up the challenge to assess coastal living marine resources, management systems and resource status to inform management. A regional workshop was held in Fiji in April 2011 to discuss the basic monitoring needs for Pacific Island countries and territories to effectively manage their coastal fisheries resources and identify gaps in scientific information on fisheries accessible to countries. The workshop identified the development of standardised and effective data collection and monitoring methodologies as a priority.*

A creel and market survey can provide most of the basic information needed to get a good understanding of the status of a fishery and its evolution if the survey is done over the long term. More importantly, it can also be designed to answer the most common or the most important management questions. A draft simple Creel and Market Survey Manual was completed in March 2012. It provides step-by-step instructions on how to plan, design and implement a statistically valid survey and how to enter and analyse data to support management, including using pre-written queries to derive useful information.

To add flexibility to the method, we took the approach of “slicing” the data and the sampling into minimum units repeatable over time and/or over several sites to increase coverage. This creel and market survey method is being trialled in Nauru, Tonga and Federated States of Micronesia (FSM), and will then be made available to other SPC member countries.

The SciCoFish Finfish Fisheries Scientist visited the first trial country, Nauru, from 29 May to 20 June 2012. During the visit, six fisheries officers from the Nauru Fisheries and Marine Resources Authority were introduced to and trained on the creel and market survey method. The training consisted of lectures on what creel and market surveys are, how sampling is designed, how sites are selected and how surveys are effectively planned and conducted. Management questions were also discussed, including the data and information needed for management purposes. Practical hands-on training was also provided on how to identify fish using meristic characters and the

catch data that need to be collected. The data from the pilot survey conducted during the first week of the visit were then used to train the local officers on data entry using the database and on survey design optimisation. The last two weeks were spent on conducting the main survey using the methodology elaborated after the pilot survey. The survey site for the main survey conducted in Nauru included villages from Boe to Nibok. The Nauru Fisheries and Marine Resources Authority aims to do three more surveys to cover the rest of the island before the end of the year.

### What is a creel<sup>1</sup> and market survey?

A creel survey, sometimes called a fishermen survey or a beach survey, is the collection of information on the catch obtained directly from fishers at the landing sites. This type of survey produces the most comprehensive data on catch and fishing effort, and usually allows for the sampling of large quantities of fish at relatively few landing sites. The information collected can include biological information on finfish and invertebrate species caught (including their size and/or weight), fishing gear used, amount of effort (fishers, hours), cost of the fishing operation (fuel, ice, etc.), and income received if the fish is sold at the landing site.

Creel surveys are often used to estimate the condition of the fished resource. However, some characteristics measured during a creel survey (such as fish size) may not be representative of the actual resource as the fishing strategy influences (filters) the sampling: e.g. fishers may target specific species or a set range of fish sizes. Therefore, creel surveys are a “fisheries-dependent” form of sampling.

A market survey is the collection of information on catch being sold or traded through a fish market, stall or shop. It is generally not well adapted to the evaluation of the condition of the resource as data are even more filtered than those obtained in creel surveys. In many markets, part of the catch is processed (salted, smoked, cut in pieces, or combined with other food products), making it difficult to relate catch sold and wild populations. As in creel surveys, the information collected can include biological information.

Market surveys provide a way to verify and validate the data collected in creel surveys, particularly on the value of the catch. They also give a broader view of the fishery than creel surveys, as it is almost impossible to survey all fishers at all landing sites.

<sup>1</sup> Creel is an Irish word for a type of small wicker basket mainly used by anglers to hold their catch.



*Left: Collecting data from fishermen when they land their catch during a creel survey in Nauru.  
Right: Training on the collection of biological data of reef fish in the Marshall Islands (images: B. Yeeting).*

The second trial was organised in Tonga on 6–17 August 2012 for six local fisheries officers. Two of them came from the outer islands of Ha'apai and Vava'u. Although Tonga is much bigger than Nauru, the survey method was flexible enough to allow for selection of an appropriate site where the survey could be done within the time available. The creel survey site was on the eastern side of Tongatapu, from Navutoka to Manuka Village.

The trials in Nauru and Tonga have focused on creel surveys. For the FSM trial, planned for the second half of September 2012, we will focus on the market survey method.

Parallel to the creel and market survey work, we collected biological data to provide a better understanding of the biology of selected important reef fish species. The SciCoFish Fisheries Scientist visited Kiribati from 7 to 17 May 2012 and trained five fisheries officers. The training included lectures to explain basic fisheries biology and the importance of biological information such as length–weight relationship, age and growth of fish, maturity stage and gonadal index for the management of fisheries. Hands-on training was also provided on identification of fish using meristic characters, sexing fish, and the extraction of gonads and otoliths. Assistance on biological monitoring programme design and species selection was also provided. This work in Kiribati followed similar work done in Marshall Islands (3–13 July 2012), where four fisheries officers were trained, and in Nauru (during the creel and market survey visit), where six officers were trained. FSM will receive biological sampling training in September 2012.

It was interesting to note several positive remarks from the countries that participated in the training for these data collection activities.

“The information will be a great help to explain growth of fish and the reasons for setting size limits to fishing communities,” said Delvin from Nauru.

Vilimo from Tonga commented, “We should have collected this data a long time ago. The creel and market survey data will help us verify the status of our fishery... the biological information is exactly what we need to know to set up new or refine existing management regulations,” while Silika from Vavau said, “This will be very useful for monitoring our Special Management Areas with the communities.”

“We have always wanted to find a practical way of determining spawning aggregation times for some of our important food fish species so that we can start protecting them. Gonadal index will provide a simple and inexpensive way to start working on this,” said Fisheries Research Assistant Aranteiti from Kiribati.

To support these data collection activities, SPC has provided some basic data collection equipment such as weighing scales, measuring boards, dissecting kits and sample containers. Furthermore, SPC is organising attachment training for Pacific Island fisheries officers on the analysis of creel and market survey data and on the processing of otoliths for determining aging. In collaboration with the French Institute of Research for Development (IRD), a first workshop on this subject was conducted in the second half of August 2012 in Noumea.

### For more information:

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