

## TUNA AND BILLFISH ASSESSMENT PROGRAMME (TBAP)

The TBAP is about to embark on a major, new, large-scale tagging programme that will add substantially to existing knowledge of the yellowfin and skipjack stocks in the region. Planning for the implementation of the Regional Tuna Tagging Project, proposed for EEC funding under Lome III is proceeding on the basis that funds should be available in mid-1989. This project will become the major focus for TBAP research activities over the triennium 1989-91. To prepare for this major expansion in research activity, and in recognition of the increasing importance of the statistical services required both to member countries and in support of TBAP research initiatives, the TBAP has been split into two integral but functionally separate projects, the Fisheries Statistics Project and the Tuna and Billfish Research Project. This provides a clearer definition of staff responsibilities and activities within the scope of the TBAP, and further recognises the role of the Fisheries Statistics Project in supporting other SPC fisheries projects.

### A. TUNA AND BILLFISH RESEARCH PROJECT

#### 1. Goal

Help countries develop, manage and rationally exploit the renewable oceanic resources of the SPC region (the tuna resource constitutes the largest fishery resource available to member countries).

#### 2. Objectives

To conduct scientific research on stocks of tunas and billfish supporting fisheries in the SPC region and on the environmental factors that affect them.

#### 3. Activities

- i. **Assessment of interaction between fisheries for oceanic species.** This activity will be made up of the following components:
  - a. A large-scale tagging programme is required to address questions relating to the interaction of skipjack and yellowfin tuna fisheries in the western Pacific. Specifically, recapture data from this programme will be used to develop a generalised quantitative description of the movements of yellowfin and skipjack from which estimates of interactions between existing and potential fisheries may be derived. Direct estimates of interaction between gear types will also be obtained. Funding for this programme has been secured and field activities are scheduled to begin in August 1989.
  - b. Collaborative in-country tagging experiments on yellowfin and/or skipjack will be integrated into the regional project and will be conducted concurrently. These will be designed to answer questions regarding interaction between specific fisheries of concern. In some cases, previous estimates of skipjack yield from the Skipjack Survey and Assessment Programme will also be updated. The tagging experiments will also provide training opportunities for local staff and possibly enable a more continuous time-series of releases to be established. Solomon Islands, which has the largest domestic tuna fishery in the region, is the first country in which an in-country experiment will be carried out. Operational details are currently being finalised, and field work is expected to begin before July 1989.
  - c. The interaction between purse seine and longline fisheries for yellowfin will be studied using detailed catch and effort data during a three-month attachment of a Japanese scientist to the TBAP beginning in October 1989. The attachment was organised through the Standing

Committee on Tuna and Billfish and will hopefully lead to further collaborative studies of this nature.

- d. The remaining avenue for investigation of fishery interaction is the analysis of length-frequency data from the various fisheries. This will involve identifying cohorts in the length-frequency data and comparing their size and occurrence in time and space between fisheries. A preliminary analysis of this type using extensive length frequency samples collected in the Solomon Islands National Fishery has been completed. Further data requirements and methodologies for more sophisticated length-frequency analyses have been identified. Post sampling of tuna catches will be initiated at key unloading points.

**ii. Assessing and monitoring the levels of exploitation of stocks of commercially important tuna and billfish species.**

This activity will involve regular reviews of fisheries data for the purpose of monitoring catch and effort trends for skipjack and yellowfin at regional, sub-regional and country-specific levels. At the country level, comparison of yields-per-unit-area with established tuna fisheries elsewhere may provide a useful albeit crude indication of the level of exploitation. Country specific results will be reported in confidential documents while regional results will be published quarterly in a Regional Tuna Bulletin. Several country reports have now been prepared (Papua New Guinea, Marshall Islands) and others are in preparation.

As time permits, the data holdings on billfish and albacore fisheries will also be reviewed. A preliminary assessment of the adequacy of current billfish data for stock assessment purposes was undertaken and the next emphasis will be on the joint analysis of complimentary data, notably length frequency, with other data holders.

In response to the rapid expansion of the South Pacific surface albacore fishery, the Tuna Programme has become actively involved in monitoring catch levels and transshipments within the region. Funding is being sought to enable albacore to be tagged during the 1989/90 season, to provide information on the biological parameters of the resource, which may already be close to over-exploitation.

A second South Pacific Albacore Research Workshop (SPAR) is planned for June 1989 to address the questions of data holdings, data exchange protocols and review the results of current research.

**iii. Studies on the biology and ecology of commercially important tuna, billfish and bait species.**

- a. For two years, Tuna Programme staff have been collaborating with biologists and physical oceanographers from ORSTOM on the difficult problem of using data on the "climate" of the ocean to predict catches of tuna. Major trends affecting fisheries have been identified and the correlation between specific oceanographic features and catch patterns continue as an ongoing investigation. ORSTOM has provided data that they co-ordinate from "ships of opportunity" which record physical oceanographic information over broad geographical areas and time periods. As the fisheries assessment data base improves with the further development of the fisheries statistics project, the advancement of this type of work will be facilitated.
- b. Since 1986, two requests have been received to study catches of baitfish supporting local commercial pole-and-line vessels and advise on developing effective methods of monitoring catches and maintaining statistics of baitfishing activities. The importance of managing a data base system on the commercial pole-and-line fisheries and using this data to perform analyses on the baitfish stocks has been stressed by the national fisheries staff. The multi-species nature of most bait-fisheries, and the fluctuating abundance of small pelagic species in general, requires a systematic, well-planned, approach to data summarisation. The work

of the Tuna Programme has and will continue to focus on addressing requests from member countries to assist in these types of studies.

**iv. Provision of fisheries observers and advice on development of observer programmes.**

- a. From its outset the TBAP has been requested by member countries to provide personnel to board foreign flag vessels. The objectives were twofold: to ascertain the validity of data recording and to provide assistance with the development of national observer programmes. Subsequently, a one week training course was run for island nationals and an observer manual was published in an effort to standardize the information gathered and assist the observers. Member countries have also requested the participation of TBAP in the training of the observers to board U.S. purse seiners in accordance with the multilateral treaty. Programme staff have contributed to the production of a manual for these observers, principally the on-board sampling section and design of a length frequency log book.
- b. The data generated by observers working on U.S. purse seiners for the requirements of the multilateral treaty provide valuable scientific information. Pacific Island parties to the treaty have thus requested the assistance of the TBAP in data handling and processing. These data are currently being used to ascertain the validity of the logsheets and provide a more accurate description of fishing effort. Ancillary biological and environmental data will also be used in the ecological studies on tuna.
- c. The Programme has been involved in the collaborative research effort on South Pacific albacore, representing the interests of Island countries. During 1988/89, the surface fishery for albacore increased enormously with an influx of Asian gillnetters into the fishery. In order to monitor this development, the TBAP, with assistance from the New Zealand Government, coordinated an observer programme. The large quantity of data collected will be analysed and presented at the SPAR Workshop in June 1989.

**v. Monitoring the use of fish aggregation devices.**

- a. Fisheries divisions have expressed considerable interest in research programmes to study the dynamics of tuna around FADs and two countries have requested joint research projects with the TBAP to look at short range tuna movement in relation to FADs. Where feasible, this question will be investigated during the in-country components of the Regional Tuna Tagging Project.
- b. In an effort to answer the many requests from Island countries for information, the TBAP will actively participate in workshops, coordinate various in-country research projects, disseminate the information and assist in field activities.

**B. FISHERIES STATISTICS PROJECT (FSP)**

**1. Goal**

Provide statistical services to national fisheries departments and SPC fisheries programmes.

**2. Objectives**

Maintain and report on the regional oceanic fisheries database.

Assist with the collection and analysis of fisheries data at regional and national levels.

### 3. Activities

#### i. Regional tuna fisheries database.

Since its inception, the TBAP has compiled a database on industrial tuna fisheries in the region. The main sources of data have been daily catch and effort logsheets provided to SPC by member countries; the logsheets have been obtained either from distant-water fishing nations under access agreements or from vessels operating locally. Unloading data have also been received from several countries.

Catch and effort data for vessels fishing in the region during 1987 and 1988 were received from American Samoa, Australia, the Cook Islands, the Federated States of Micronesia, Fiji, French Polynesia, Kiribati, the Marshall Islands, New Zealand, Palau, Papua New Guinea, Solomon Islands, Tonga, Tuvalu, the United States and Vanuatu. Unloading data were received from the Commonwealth of the Northern Marianas, Fiji, Guam and New Caledonia.

Coverage by the SPC database of tuna fishing activities in the region is continuously improving. A backlog of data for Japanese longliners and pole-and-line vessels and South Korean longliners, for 1984-1987, was received from French Polynesia. Past data from the Solomon Islands purse seine and pole-and-line fisheries, the largest domestic fisheries in the region, were supplied. Under the terms of the recently implemented fisheries treaty between the United States and certain Pacific Islands nations, data on American purse seiners are now available. Back data have also been received from Australia and New Zealand.

Reports summarising the tuna fishery logsheet data are sent back to the countries supplying the data, usually within two or three weeks of receipt of the logsheets at SPC. These reports are used by SPC-member countries to monitor their fisheries and to provide statistical support for fisheries management.

#### ii. SPC Regional Tuna Bulletin.

In August 1988, the Fisheries Statistics Project first prepared the SPC Regional Tuna Bulletin for publication. The Tuna Bulletin has since been distributed on a quarterly basis to fisheries officers within the region and to research institutions and industry within the region and beyond. The publication has been particularly well-received, in part because it represents the only authoritative source of detailed information on the collective industrial tuna fisheries in the Central and Western Pacific, the largest tuna fishery world-wide.

#### iii. National fishery statistical systems.

In order to assist member countries with processing of data from industrial tuna fisheries and to assist in establishing systems for collection and processing of data for coastal fisheries, the Fisheries Statistics Project advises and assists with the design and implementation of national fishery statistical systems.

Tuna fishery databases have been developed and installed in the Federated States of Micronesia, Fiji, Guam, the Marshall Islands and Papua New Guinea. Each database has been customised to the needs of the individual country.

Database systems for local in-shore fisheries were developed for several countries at the SPC Fisheries Statistics Workshop held recently at the University of the South Pacific in Suva. Participants at the workshop included fisheries officers from Fiji, Papua New Guinea, Tonga, Tuvalu, Vanuatu and Western Samoa.

**iv. Statistical support for other SPC Fisheries Projects.**

Statistical support is provided to other SPC Fisheries Projects, in particular the Tuna and Billfish Research Project, the Deep Sea Fisheries Development Project, the Inshore Fisheries Research Project and the Regional Fisheries Training Programme.

The research activities of the Tuna and Billfish Research Project are supported by the regional tuna fisheries database maintained by the FSP. Databases for observer data from the South Pacific albacore fishery and sampling data from albacore transshipment activity in New Caledonia have also been developed.

The FSP has recently implemented a database for detailed catch statistics collected by the Deep Seas Fisheries Development Project since 1981. The database will be used by the Inshore Fisheries Research Project for analysis.

The FSP assisted the Regional Fisheries Training Programme with organisation of the recently-held SPC Fisheries Statistics Workshop at the University of the South Pacific and shared in tutoring of the participants at the workshop. A database covering fisheries trainees in the region was also developed.

**v. Cooperation with other organisations**

An ongoing activity of the FSP has been to liaise with the various organisations concerned with monitoring of industrial and artisanal fisheries, both within the region and beyond, including the Forum Fisheries Agency, the Inter-American Tropical Tuna Commission, the FAO/UNDP Indo-Pacific Tuna Programme and the Fisheries Statistics Unit of the Food and Agriculture Organization of the United Nations.