

**FISHERIES TECHNICAL CONSULTATION ON THE COLLECTION AND
EXCHANGE OF DATA, TUNA RESEARCH AND STOCK ASSESSMENT**

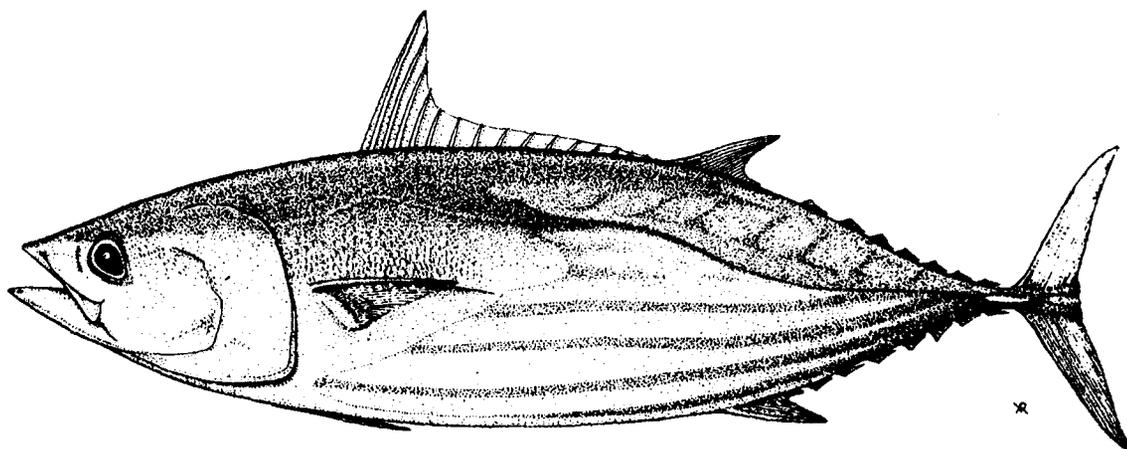
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**CURRENT ARRANGEMENTS FOR CONDUCTING TUNA RESEARCH AND
STOCK ASSESSMENT AT THE SOUTH PACIFIC COMMISSION**

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INTRODUCTION

The Oceanic Fisheries Programme (OFP) of the South Pacific Commission, consistent with its mission statement (ie “ to provide member countries with the scientific information and advice necessary to rationally manage fisheries exploiting the region’s resources of tuna , billfish and related species”), undertakes statistical monitoring and a programme of scientific research on tuna stocks in the region. This region, the Western and Central Pacific Ocean (WCPO), is approximately 30 million km² in extent, bounded by 25°N - 30°S, 120°E - 130°W, and includes the EEZs of 25 member countries and territories, as well as extensive areas of high seas. The region is host to very large fisheries for tropical tunas involving numerous gears and international fleets, locally important artisanal fisheries (especially in Indonesia and the Philippines), temperate water fisheries and recreational fisheries.

This paper reviews work undertaken since 1976 by the OFP, formerly known as the Tuna and Billfish Assessment Programme (TBAP), and its predecessor, the Skipjack Survey and Assessment Programme (SSAP), with emphasis on tuna research and stock assessment, the statistical and monitoring functions having largely been covered in previous sections (see WP1).

It also considers the institutional framework within which the OFP works, as well as the funding arrangements to support the range of OFP activities, reviews the achievements of the SPC tuna research programmes, and briefly considers likely future directions.

THE HISTORY OF TUNA RESEARCH AND STOCK ASSESSMENT AT THE SPC

A chronology of tuna research and associated activity at the SPC is presented in Table 1, with a more detailed narrative following.

Pre-1976

The rapid expansion of first Japanese, then successively Taiwanese and Korean longline activity throughout much of the central and western Pacific during the 1960s and 1970s had relatively little impact on Pacific island states, other than the establishment of shore bases in some countries (eg Vanuatu, Fiji) and the establishment of large canneries in American Samoa. Long range pole-and-line activity by the Japanese fleet, utilizing bait carried from Japan, similarly had little impact on PICs even though, as with longlining, much activity was carried out in what were to become the EEZs of these states. Artisanal tuna fisheries continued to be important to island countries, but generally carried out on a small scale, with the possible exception of French Polynesia, where a sizeable fleet of bonitiers existed. By 1970, the total tuna catch in the SPC area was less than 100,000t, nearly all taken by longline. These longline catches and catch rates had however levelled out after peaking in the mid-1960s.

Research on the tuna stocks of the SPC region at this time was largely confined to work on longline-caught large tunas (*Thunnus* spp.) - in Japan by the Far Seas Fisheries Research Laboratory, the National Taiwan University in Taiwan, and in Australia by CSIRO (southern bluefin tuna). Meanwhile, in several other regions of the world, other tuna research organizations had already become established, notably the Inter-American Tropical Tuna Commission (IATTC) in the eastern Pacific (since 1951), and International Commission for the Conservation of Atlantic Tunas (ICCAT) in the Atlantic (since 1969). SPC involvement in the fisheries area to this time had been restricted to inshore fishery development.

Regional tuna fishery development

With the development of joint-venture pole-and-line operations first in Papua New Guinea (1970), then the Solomon Islands (1971), interest in the skipjack resource, as one with potential for considerable expansion, quickened. Japanese long range pole-and-line vessels, previously fishing in northern parts of the SPC area outside the main homewater season in Japan (May- August), began to fish over a much wider area south of the Equator, and numerous research cruises to the region were undertaken. Papua New Guinea, in 1971, commenced its own programme of statistical monitoring and tuna and baitfish research, including a successful tagging programme, as its fishery rapidly expanded. A pole-and-line fishery was also established in Fiji in 1976, supplying in part a cannery built the year before.

Skipjack Programme established

In response to this awakening interest in the resource, and the complete uncertainty about its extent, the 6th SPC Regional Technical Meeting on Fisheries (RTMF) recommended the formation of an Expert Committee on Tropical Skipjack. This convened for the first time in Tahiti in 1974, and raised at that time the need for a regional research effort directed at skipjack tuna. The second meeting of this Committee, in 1975, proposed and planned a regional Skipjack Survey and Assessment Programme (SSAP), which was adopted by the 8th RTMF, and accepted as an extra-budgetary part of the SPC Work Programme by the 16th South Pacific Conference in October 1976.

The SSAP, supported financially by contributions from Australia, France, Japan, the US, New Zealand and the UK to a total of USD 3.9 million over a four year period, operated from August 1977 to September 1981. Based on the analysis of tag returns from the release of 150,137 tunas (93% skipjack) over the entire SPC region, the SSAP established for the first time, the large size of the resource, and its dynamic nature (estimated regional standing stock of 3 million tonnes, with rapid turnover), documented the migratory nature of the resource, but the relatively limited potential for interaction amongst well separated national fisheries, and generated estimates of biological parameters for skipjack. These results continued to be refined for some years, providing the first definitive assessments of the skipjack stock at regional level for the WCPO. Combined with a range of other data and analyses generated by the SSAP, the results were used to produce a series of 20 country reports, providing an assessment of the skipjack and baitfish resources at national level. It is generally acknowledged that global perspectives concerning skipjack stocks generally were much changed as a result of this baseline work, and largely fuelled the subsequent development of surface fisheries in the western Pacific during the 1980s.

UNCLOS

In 1979, with the declaration of the UN Convention on the Law of the Sea (UNCLOS), many coastal states of the region had already laid claim to custodianship of large EEZs where tuna fishing had previously been unrestricted. The Forum Fisheries Agency was established, with membership restricted to independent island states, along with Australia and New Zealand, and with a primarily political focus (regional management coordination).

Tuna and Billfish Assessment Programme established

With central and western Pacific tuna fisheries continuing to expand (see later), and a continuing need for monitoring and research beyond the successes of the SSAP and involving species other than skipjack, the Tuna and Billfish Assessment Programme (TBAP) was established in October 1981, as a successor to the SSAP, with the establishment of a regional tuna fishery database as its priority activity amongst the 13 activities listed. Other priority activities included the assessment of

interaction, and the assessment and monitoring of levels of exploitation of tuna and billfish stocks. The initial project time frame for the TBAP was three years, to 1984, but this was initially extended to five years, then after comprehensive review in 1986, for a further five years, to 1991. The TBAP began to collect logsheet data from member countries in 1982, in some cases using regional logsheets, but the work of assessing and monitoring the levels of exploitation continued to be hampered by incomplete coverage of tuna catches in the region. Formal publication of some key datasets had also ceased as access negotiations gave data added value. To address this problem, a meeting of coastal states and DWFNs was held in June 1984, with some beneficial results in terms of improved data coverage.

Greater DWFN involvement

Alternative institutional arrangements for the TBAP which would allow greater DWFN data provision and participation were also canvassed at that time. In August 1985, a formal review of such arrangements, ie to allow interested DWFNs and coastal states, both SPC members and non-members, to participate fully in the provision of data and financial inputs, was undertaken. With the support of CRGA and RTMF, one recommendation of this review - that an Expert Committee open to wider membership, which could include DWFNs and FFA, be established as an advisory body to the TBAP and SPC - ultimately lead to the formation of the Standing Committee on Tuna and Billfish in 1988.

Fishery developments

Concurrent with the expansion of the pole-and-line fisheries during the 1970s, the **purse seine** fishery had also been gradually developing, first with Japanese group seiners setting on logs in equatorial areas of the western Pacific, then by single seiners of the US and later Japan as appropriate technology for fishing in the region was developed. The 1980 purse seine catch of 50,000t had become 350,000t by 1983 and continued to increase as other fleets entered the fishery (550,000t in 1989, and 850,000t in 1991). The purse seine catches, unlike pole-and-line catches, included a significant proportion of yellowfin (typically 30%), soon raising the issue of possible interactions with the tropical longline fishery, targetting yellowfin and bigeye. The catches, particularly those made in association with logs, also included a range of other pelagic species, including blue marlin.

In 1985-86, promising exploratory catches of **albacore** along the Sub-Tropical Convergence Zone (STCZ) soon lead to the development of a seasonal troll fishery, involving vessels of several nations. By 1987/88, over 3,000t of albacore were being taken by this fishery. This success attracted the attention of driftnet vessels, expanding from relatively small scale operations in the Tasman Sea (Japanese vessels, 1983 onwards) to large scale operations on the STCZ from 1987 (Japan and Taiwan), with an estimated 1988/89 driftnet albacore catch of 22,000t. As a result of international pressure, the driftnet fishery ceased in 1991. The troll and longline fisheries have continued at similar levels.

Stock assessment

Whilst the SSAP work had a clear and appropriate focus at that time on skipjack, other species, notably yellowfin, began to attract greater attention as the purse seine fishery developed. The first attempt to provide a cohesive overview of the status of stocks of the four main tuna species was made by the TBAP in 1986 (18th RTMF), this overview cautiously concluding that stocks of all species were generally in good condition. The TBAP also continued to report each year on trends in catch rates as indicators of stock abundance. By this time, it was becoming clear that, with continuing gaps in the data coverage, particularly for high seas areas and for some large fleets, a

second well-designed large scale tagging programme represented the best opportunity to obtain the necessary information on the status of yellowfin and possibly also albacore stocks. Funding opportunities began to be explored from 1985 onwards, when a Regional Tuna Tagging Project was approved as part of the SPC Work Programme at the 25th South Pacific Conference. In March 1988, a final dossier was submitted seeking EC Lome III funding under established regional priorities. This funding (3.5M ECU, or approximately US\$4 million) was approved in December 1988 as part of the Pacific Regional Marine Resources Development Programme.

The Regional Tuna Tagging Project

The field aspects of the Project, initially involving the charter of a suitable pole-and-line vessel for 20 months, commenced in December 1989. In combination with several in-country projects and geographical extensions to the project (Indonesia, Philippines, north-eastern Australia, New Caledonia and Wallis/Futuna), nearly 133,000 tunas (33,500 yellowfin and 7,000 bigeye) of representative sizes were tagged and released widely throughout the main study area (10⁰N to 10⁰S, 130⁰E to 180⁰E). An overall return rate of 11.1% has been achieved, and with most sources of tag loss estimated to some extent, it has been possible to achieve most of the project objectives. Estimates of yellowfin exploitation rate and age-dependent mortalities, movement parameters and growth, updated skipjack population estimates, and bigeye movement, plus collection of a range of biological data have all been obtained. The very large tagging database is still being maintained and utilized for a variety of ongoing analyses (eg interactions, simulation modelling), and the tag-based population estimates still form the basis of understanding of the dynamics of tropical tuna species in the region.

In a separate extension of the RTTP project to Philippines waters, a further 14,000 tunas were tagged and released, with over 25% recaptured. This work has provided additional insights into more heavily exploited populations of the same species studied by the RTTP..

Albacore research

With the sharp increase in albacore catches following first the development of the troll fishery along the STCZ in 1987/88, then the driftnet fishery in the same area in 1988/89, a range of scientific information on the resource was needed with some urgency. The TBAP, with funding support from UNDP, BDDP and the EEC, and support from NZ MAFF, mounted an observer programme from 1988/89 onwards on troll vessels (with one trip on a research driftnet vessel), increased port sampling efforts in regional ports, and initiated biological studies on age, growth and reproduction. With EC funding, a medium scale tagging programme was carried out in the 1990/91 and 1991/92, resulting in just under 10,000 albacore being tagged and released along the STCZ, in NZ coastal waters and in Tasmania. Recoveries, currently approaching 200, are still being received.

With ICOD funding, data collection and research efforts were coordinated, and the development of a length-based age-structured assessment model (SPARCLE) commenced. SPAR meetings were held in 1989, 1990, 1991 and 1993, to coordinate research efforts and develop consensus statements on resource issues. With the cessation of driftnet fishing in 1990/91, albacore research has nonetheless continued; data coverage, historical and present, has improved, port sampling continues, and tag returns continued to be received. The now well tuned SPARCLE model indicates that levels of exploitation, present and past, are low, and that the resource is in a healthy state. The 6th SPAR meeting was held in Rarotonga in March 1996, and efforts to improve existing assessments continue.

Catch and effort data

Whilst the RTTP had succeeded in providing the best available information on the condition and dynamics of yellowfin and skipjack stocks in the region, efforts continued to improve the quality and coverage of regional catch and effort data. The quarterly Regional Tuna Bulletin was first published in August 1988, providing a readily accessible summary of available logsheet data by gear and flag. With the US Multilateral Treaty on Fisheries coming into force in mid-1988, virtually full coverage of that purse seine fleet has been available since that time; available aggregated historical data for the period 1981-1985 were provided by the American Tunaboat Association, with the assistance of the IATTC. During 1992, Japan began to supply regional data to SPC in aggregated form for scientific purposes, and from June 1993, with the regional ban on high seas transshipment, the quality of data from the remaining major purse seine fleets (Taiwan, Korea) rapidly improved. Whilst some important gaps in catch and effort data still remain, the overall coverage has improved markedly in the past five years, and provides a valuable basis for monitoring trends in catch rates, and other analyses. In 1994, 796,000t of tuna catch was processed by the OFP in the form of logbook data, representing a coverage rate of approximately 79% for the SPC area.

Since 1994, a Tuna Fishery Yearbook has been published, combining available logbook coverage (for catch rates) with best estimates of total catch, for the four main tuna species.

Regional research groupings

As noted, the Standing Committee on Tuna and Billfish was formed to fulfill an advisory and consultative role to the RTMF, with the involvement of FFA, scientists from DWFNs and island states, and invited technical experts. The role of the SCTB was to assist with the rigorous scientific review by the TBAP (and suggest improvements where appropriate), to assist with the acquisition of data to the TBAP (especially high seas data), and to facilitate collaboration between TBAP staff and outside workers on problems of mutual interest. The SCTB has met every year since 1988, has assisted with the development of a Strategic Plan to guide the work of the TBAP/OFP (see later), and now annually reviews a programme work plan. In 1990, an aggregated database was established at the direction of SCTB, to encourage the submission of data not otherwise available to the TBAP. This database is now part of the regular OFP work programme and is potentially available to interested scientists.

In 1986, in response to developments in the albacore fishery (see earlier), a South Pacific Albacore Research Group (SPAR) was formed with the SPC/TBAP as Secretariat, to encourage cooperation in research on South Pacific albacore. The group met again in 1989, then regularly during the driftnet period (1990 and 1991), and intermittently since then (1993 and 1996). As with the SCTB, an aggregated SPAR database was established in 1990, to encourage the provision of data. This database has been regularly distributed to contributors.

In 1991, concern over increasing catches of yellowfin led to the formation of the Western Pacific Yellowfin Research Group (WPYRG), to deal more specifically with yellowfin issues, and to normally meet in conjunction with SCTB. It has been held each year since 1991, initially under NMFS chairmanship. Its mandate expanded in 1995 to include consideration of bigeye. The group is currently chaired by Japan.

Other research collaboration

Collaboration with Japanese scientists, in the form of visits to SPC Noumea, has taken place on two occasions, November 1989 -February 1990 (to examine yellowfin purse seine/longline

interaction, based on catch data) and in January-March 1994 (to examine the same topic, utilizing tagging data). The provision of aggregated data to the OFP for scientific purposes was earlier noted.

Through the establishment of the Western Pacific Fisheries Consultative Committee (WPFCC) in 1988, cooperation in tuna research with ASEAN countries was promoted, particularly involving Indonesia and the Philippines; this proved especially helpful in extending the coverage of the RTTP to these countries where large tuna fisheries operate on the same stocks of tropical tunas. Two tuna research workshops sponsored by WPFCC were held in April 1989 and August 1994 respectively. Scientists from both countries have regularly attended meetings of the SCTB and WPYRG.

In late 1991, SPC and ORSTOM co-hosted the first FAO Expert Consultation on Interactions of Pacific Tuna Fisheries, which sponsored a three year programme of cooperative research on interaction issues. The second and final consultation of this group was held in early 1996 in Japan.

Taiwan hosted and funded the 4th SPAR meeting in Taipei (1991), and NTU scientists have worked closely with the OFP to improve data coverage. Increased collaboration with Taiwan/ROC scientists is planned for the near future.

The OFP enjoys good relationships with a range of international research agencies, and will shortly be formalizing collaborative links with several of these eg ORSTOM.

Direction of research

Since 1993, the work of the OFP has been guided in broad terms by a Strategic Plan prepared at the direction of SCTB3, and finally accepted by the 32nd South Pacific Conference in October 1992. OFP activities are considered in four areas, respectively Statistics and Monitoring, Biological Research, Assessment and Modelling, and Reporting and Liaison. The direction for research within these activity areas is more specifically provided by an Operational Plan prepared at the direction of SCTB5 for the period 1993-1997, and incorporating new endeavours proposed for funding from Lome IV/ 7th EDF. As noted earlier, STCB now considers each year a review of the previous year's work and a Work Plan for the forthcoming year.

Name change

At the direction of SPC Management, the name of the TBAP, in place since October 1981, was changed to the Oceanic Fisheries Programme (OFP) in early 1994, to better reflect the division of responsibility within SPC between this programme and the Coastal Fisheries Programme.

South Pacific Regional Tuna Resource Assessment and Monitoring Project (SPR TRAMP)

Following the success of the RTTP, which provided a much-needed point assessment of the tropical tuna resource, this five year project was designed to enable the OFP to implement continuous scientific monitoring of the region's tuna fisheries, and to continue to refine and extend tuna resource assessments. The project, with port sampling, scientific observer, biological research, and assessment and modelling components, commenced in July 1994, and has already considerably enhanced OFP capacity in many areas.

Other research issues

Research on species other than the primary tuna target species has thus far been minimal. Despite the inclusion of billfish in the previous programme title ie TBAP, little more has been done than to

monitor catches of billfish species. Support has however been provided to billfish studies at AIMS (Australia), involving several member countries, and catch data is collected and maintained.

At the direction of SCTB4, and also in response to increasing interest in environmental aspects of tuna fisheries, a review of by-catch and discards in western Pacific tuna and billfish fisheries was carried out. After several drafts were carefully reviewed, the report is about to be published.

Since 1988, to provide more detailed information to member countries on their tuna resources, a series of increasingly comprehensive country reports (National Fishery Assessments) has been provided to member countries.

The OFP has recently become involved in bioeconomic modelling of western Pacific tuna fisheries, in collaboration with other agencies.

International arrangements

The SPC area, or WCPO, unlike most other ocean areas of the world where tuna fisheries exist, has no existing formal regional tuna consultative or management body. All parties, coastal states and fishing nations, did however meet for the first time in December 1994, as a **Multilateral High-Level Consultation on South Pacific Tuna Fisheries (MHLC)**, to consider matters of mutual interest. Amongst these were the status of stocks, and the collection and exchange of catch data, consensus papers for which topics were prepared by the OFP at the direction of SCTB7. The convening of the present Consultation arose as a recommendation of the MHLC.

All parties to the 1994 MHLC have subsequently participated actively in the discussions leading to the conclusion of the UN Implementing Agreement, and it is to be expected that discussions on the establishment of regional arrangements will follow.

Reporting arrangements

The OFP is subject to annual peer review and work programme direction by the **Standing Committee on Tuna and Billfish (SCTB)**, which reports to the **Regional Technical Meeting on Fisheries (RTMF)**. The latter is now however held biennially.

As an SPC programme, the OFP also reports within the organizational system, to **CRGA** on the work programme (May) and budget (October), and ultimately, to the **South Pacific Conference**. The OFP also reports on request the results of its work to various regional groupings, such as the **Forum Fisheries Committee** and the **Parties to the Nauru Agreement (PNA)**, and on selected topics to a range of other, mostly scientific, agencies or gatherings eg **WPFCC**, **OFCF**, **Tuna Conference**, **ICCAT**.

CURRENT SPC/OFP TUNA RESEARCH

Work carried out during 1995/96, and work plans for 1996/97 are summarized in SCTB WP2. The current work includes :-

- continued maintenance of the Regional Tuna Fisheries Database and aggregated databases
- coordination of regional port sampling and observer programmes
- maintenance of national fishery statistics systems
- refinement of tag-based population analyses
- age and growth studies of scombrids by daily otolith reading
- tuna stock structure
- modelling environmental determinants of tuna fishery production
- integrated simulation modelling of Pacific tuna fisheries
- bioeconomic analyses of WCPO tuna fisheries
- further development of SPARCLE model for South Pacific albacore

FINANCIAL ASPECTS

The SSAP benefitted, as noted, from funding support totalling US\$3.9 million over a four year period, with nearly 50% of this required for vessel charter costs. Contributions were provided by Australia, Japan, France, the USA, the UK and New Zealand.

Since its inception in 1981, the TBAP has been supported entirely by funding totally external to the SPC's core budget, which is made up of annual assessed contributions from member countries. Funding for the nine year period October 1981 to September 1990 was supplied on a year to year basis by four donors - Australia (AIDAB), France, the USA (USAID) and New Zealand, at an average of around US\$ 700,000 p.a. This funding support was largely absorbed in most years by salaries and associated costs, with little support for operational activities.

With the commencement of the RTTP in late 1989, as a large scale field-oriented activity, the overall scale of OFP activities expanded considerably. This was soon augmented with additional external funding for essentially one-off field activity - EC Lome II funding for albacore tagging, UNDP and UK support for albacore observer work, ICOD funding for albacore research, EC/OCT funding to enable extension of RTTP fieldwork to OCTs (New Caledonia and Wallis/Futuna), and a Technical Assistance Extension of the RTTP to enable RTTP-generated work to be continued beyond its nominal endpoint of 1993. Since 1988, the TBAP/OFP has attracted an average of US\$1.4 million in project-related funding each year.

In 1990, the USAID annual funding changed to a system of two-year grants to support specific OFP activity, and concluded altogether in 1994. Thus, whilst support for field-oriented work was expanding, funding support for continuing OFP activity was contracting. This was ameliorated to some extent by transfers from the RTTP to general OFP funding to compensate for staffing support, but with OFP funding from long term traditional donors at a record low during 1991/92 and 1992/93, it became clear that new sources of funding were required. With the necessary approvals, external consultancy work was contracted during 1992, and has continued in various forms until the present. This has been crucial in being able to maintain the delivery of OFP services at levels required by member countries. Table 2 summarizes funding inputs to the OFP/TBAP

since 1987, and demonstrates how important the provision of additional funding has been to the OFP since 1990.

In 1992, one donor (AusAID) committed to a four year funding cycle (1992/93 - 1996/97), with the funding specifically linked to the Assessment and Modelling activity of the OFP. It has not been possible to interest other donors in such a longer term funding commitment, although France has continued generous support, and linked this a specific activity (Statistics and Monitoring). Thus, funding for ongoing OFP activity at the end of 1994 remained very uncertain. To enable it to consider longer term funding options, SCTB6 was provided with a series of "user-pays" options for future OFP funding, but deferred consideration of this pending the outcome of another review of institutional arrangements for the marine sector in the region. Further, a small group was asked to prioritize activities of the OFP, should funding become limiting. In the event, an increase in funding was provided by AusAID during 1995 to cover one position at risk, and overall funding levels increased.

Long term prospects for continued funding support, at least for ongoing central OFP activity, is uncertain, although prospects for funding new external projects appear good. Such is the dilemma of securing extra-budgetary funding for institutional activity.

ACHIEVEMENTS OF 20 YEARS OF SPC TUNA RESEARCH

In summary, these can be stated as follows:-

Statistics and monitoring

- establishment of the regional tuna fisheries database, its maintenance and the steady improvement in coverage to the present time, making it the most authoritative source of detailed information on WCPO tuna fisheries
- standard regional logsheets developed and accepted
- regular publication of statistical bulletins since 1988, and Yearbook since 1994
- aggregated databases maintained for albacore and tropical tunas
- comprehensive port sampling of tuna catches unloaded in the region, and development of transshipment database
- observer programmes regionally coordinated, and scientific observer programme initiated in 1995.
- national tuna fishery statistics systems developed and maintained

Biological research

- first estimates of skipjack biological parameters (mortality, growth, movement etc) for the WCPO
- first estimates of yellowfin biological parameters for the WCPO, and size-dependent mortality estimated
- rapid and objective response to the urgent need for information on the SP albacore fishery and resource, following the rapid development of surface fisheries in the late 1980s
- estimates of tag shedding and reporting for large-scale tagging experiments
- verification of albacore spawning seasonality and growth, and extent of movement characterized
- tag-based estimates of growth for skipjack, yellowfin, bigeye and albacore

- significant numbers of bigeye tagged for the first time, and movement parameters partly elaborated
- bigeye stock structure under study
- review of by-catch and discards in western Pacific tuna fisheries completed
- relationship between primary productivity and tuna surface fishery catches in the WCPO demonstrated

Assessment and modelling

- SSAP skipjack assessments, which demonstrated the size of the resource in the WCPO for the first time
- tag-based assessment of WCPO yellowfin for the first time
- skipjack assessments updated and found to be consistent with increases in catch
- skipjack and yellowfin movements modelled
- fishery interaction between industrial and artisanal fisheries demonstrated
- integrated model for yellowfin assessment developed
- effect of FADs on tuna surface fisheries modelled
- SPARCLE model developed for S. Pacific albacore assessment
- development of an integrated simulation model of regional tuna fisheries commenced

Reporting and liaison

- preparation of annual reports on the status of stocks of the four main tuna species in the WCPO
- National Fisheries Assessments prepared since 1988 for many countries
- high quality reporting to various regional fora

Table 1 Chronology of tuna research and associated activity at the SPC

1970	Pole-and-line fishery starts in PNG
1971	Pole-and-line fishery starts in the Solomon Islands
1971-1974	Successful tuna research in PNG
1973	6 th RTMF recommends formation of Expert Committee on Tropical Skipjack
1974	Expert Committee meets (Tahiti); concept of regional skipjack research effort
1975	2 nd meeting of Expert Committee plans an SSAP; adopted by 8 th RTMF
1976	SSAP accepted as part of the SPC Work Programme by 16 th SP Conference
1977	SSAP starts; fieldwork commences in October 1977
1977-1980	SSAP field work; 150,137 tunas tagged (93% skipjack)
1979	UNCLOS; EEZs already declared by certain states; FFA established
1981	TBAP initiated October, with establishment of regional database as the priority activity; initial three-year mandate, extended to five years.
1982	TBAP begins collection of logsheet data from member countries
1983	Scientific review of TBAP methodology by Allen, Francis and Wetherall.
1984	Meeting of Coastal States and DWFNs
1985	Review of possible alternative institutional arrangements for the TBAP
1986	Formation of SCTB approved; STCZ albacore troll fishery starts in earnest; SPAR group established, meets in Auckland.
1987	Evaluation of TBAP (Curtin; Crossland and Cavuilati); extended for 5 years; SCTB established (19 th RTMF, 3-7 August 1987)
1988	Publication of Regional Tuna Bulletin (August); SPC policy on data confidentiality; RTTP planning; SCTB meets as such for the first time (Noumea, August); USMLT comes into force; first country report prepared (PNG)
1989	Solomon Islands in-country tagging project; RTTP starts in December 1989; albacore sampling/observer coverage starts; WPFCC held; SCTB 2 (Suva, June); 2 nd SPAR Workshop (Suva, June); 1 st Tuna Research Workshop, Manila
1990	First collaborative study with Japan; SCTB/SPAR databases established; albacore tagging started; stock status papers prepared for RTMF; SCTB3 (Noumea, June); 3 rd SPAR(SAGA) (Noumea, October)
1991	TBAP Strategic Plan prepared and considered by SCTB; by-catch review requested; SCTB 4 and WPYRG 1 (Vila, June); 4 th SPAR (Taipei, November); 1 st FAO Interactions Meeting (Noumea, December); ATA provides historical p/s data, through IATTC; first NFA prepared (FSM)
1992	RTTP field work concludes; PTRP starts; TBAP Strategic Plan adopted by 32 nd Conference; Operational Plan requested by SCTB 5 (Honolulu, June); WPYRG 2; Japan begins to supply aggregated data to SPC for scientific purposes.
1993	RTTP TA Extension; 5 th SPAR Workshop (Tahiti, March); SCTB6 (Pohnpei, June), and WPYRG 3; transshipment ban goes into effect (June 1993).
1994	2 nd ASEAN/PINs Tuna Research Workshop; Tuna Fishery Yearbook published (1993); MHLC (Honiara, December); 2 nd collaborative study with Japan; SPR TRAMP commences (July); SCTB 7 and WPYRG 4 (Palau, August).
1995	2 nd FAO Interactions Meeting (January); UN SFS HMFS concludes (August); STCB 8 and WPYRG 6 (Noumea, August).
1996	Technical Consultation

Table 2: OFP (TBAP) Donor Contributions Summary (CFP units) - Year 7 to the present

Calendar Year	87-88	88-89	89-90	90-91	91-92	92-93	93-94	94-95	95-96
OFP Year	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15
Traditional Donors									
Australia	213,750	162,750	175,500	168,667	185,000	170,013	190,791	293,759	257,650
France	225,000	227,428	225,455	243,638	229,372	140,909	316,909	281,818	255,000
New Zealand	75,000	71,000	66,000	48,642	38,056	21,360	55,000	55,000	0
USAID	204,000	243,000	194,287	126,391	56,753	122,709	119,115	0	0
Sub total	717,750	704,178	661,242	587,338	509,181	454,991	681,815	630,577	512,650
Additional Donors									
PTRP					137,969	60,060	42,080	12,820	0
PNG						10,307	0	0	17,223
FAO						33,705		0	26,437
EC transfer				75,585	30,000	80,000	0	0	0
ACIAR								7,335	15,486
Consultancies									41,862
Sub total				75,585	167,969	184,072	42,080	20,155	101,008
Total	717,750	704,178	661,242	662,923	677,150	639,063	723,895	650,732	613,658

External Project Funding									
RTTP			1,163,000	928,000	1,254,000	93,000			
ATP			35,000	302,000	151,000	10,000			
UK			50,000						
ICOD					332,000				
RTTP Ext.					273,000				
RTTP TA Ext							527,000		