EVALUATION OF THE SOUTH PACIFIC COMMISSION TUNA AND BILLFISH ASSESSMENT PROGRAM

FEBRUARY 1987

AGENCY FOR INTERNATIONAL DEVELOPMENT
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1. TERMS OF REFERENCE AND CONDUCT OF THE STUDY

1.1 The following terms of reference were sent by the Secretary-General to the consultant in December 1986:

1) Evaluate the program as a whole, as well as its various activities and assess how these activities have met with island country aspirations and program priorities.

2) Assess whether the program priorities meet island country needs on the one hand and the long term research needs of the region on the other.

3) Given (1) and (2) above, assess the efficiency and effectiveness of program staff in carrying out project activities and to comment on the adequacy of program staff, division of duties and working methodologies.

4) Identify problem areas and make proposals for improvement.

1.2 The consultant was Mr T.B. Curtin, Canberra, Australia, previously Assistant Secretary, Fisheries, Department of Primary Industry, (Australia), now consulting privately. Mr Curtin's earlier training was in Political Science, Psychology, Public Administration and Environmental Protection.

1.3 The consultancy was conducted over a 6 weeks period from mid January 1987 involving visits to 11 Pacific Island states and organisations in the region, refer Annex 1, and discussions with SPC/TBAP staff in Noumea. A report was required by mid-March 1987, for distribution for the CRGA Meeting to be held on 18 May 1987.

1.4 The consultant extends his thanks to the SPC senior management, TBAP staff and officers in members states, and organisations in the region for their co-operation during the study.

2. THE TUNA AND BILLFISH ASSESSMENT PROGRAM (TBAP)

Origin

2.1 The TBAP is one of the two broad fisheries activities of the South Pacific Commission (SPC). The charter of the SPC, and therefore the TBAP, is to encourage and promote the economic and social welfare and advancement of Pacific peoples. The 5 million or so Pacific Islanders living in the 30 million square kilometer area served by the SPC are, for the most part, coast dwellers. Marine resources have been and will continue to be vitally important to them and it is to be expected that fisheries development and management should feature prominently in SPC priorities.

2.2 The Law of the Sea developments in the 1970's resulted in coastal states securing sovereignty over the living resources of their 200 mile exclusive economic zones. They also assumed the obligation of ensuring the rational exploitation and conservation of these resources.

2.3 This meant that migratory fish such as tuna and billfish, often beyond the reach of island fishermen, became both the property and responsibility of the coastal states. In terms of harvesting the stock the island Governments had the option of reserving the fishery for themselves or allowing other nations access to the fishery for an agreed fee. For the most part they chose the latter. Ninety per cent of the catch of tuna and tuna-like species from the region is taken by Distant Water Fishing (DWF) fleets, principally from Japan and the US but also from Korea, Taiwan and some other nations, for which they paid a total fee in 1986 of approximately $US10 million to various island countries in whose zones they fished.

2.4 In order to properly manage the fishery and to ensure that the maximum economic return by way of access fees was received, the island states needed to know the size of the fish stocks in their waters, the level of fishing effort, which countries' vessel were fishing, where they were fishing, and what prices were being received for the landed catch. As this demanded, in view of the limited resources of individual countries, a regional response, the South Pacific Forum Fisheries Agency was established in 1979 as a regional fisheries management co-ordination body with particular reference to tuna. While the charter of the FFA naturally encompassed obtaining data on all of the above parameters, the organisation did not have the immediate capability to either establish the required data base or undertake the complex analysis needed for stock assessment work.

2.5 The South Pacific Commission did have a capability in this area. Its Skipjack Survey and Assessment Program (SSAP) which ran from 1977 to 1981 obtained a great deal of basic data on the most abundant species of tuna, skipjack. The program involved the tagging of 140 000 fish and the analysis of 6 500 tags recaptured. The standing stock was estimated at about 3 million tonnes, generating an annual turnover of 6 million tonnes and capable of withstanding much greater fishing effort than currently applied.

2.6 The TBAP began in October 1981, shortly after the conclusion of the SSAP, which had accumulated a mass of data which had not been analysed. The TBAP was set up for the ongoing analysis of the SSAP data, to develop a regional statistical program and from the data base created, assess the status of tuna stocks and the extent of interactions between various fisheries.

2.7 While much has been written on the TBAP, I can find no explicit 'mission statement' for the TBAP expressed in terms of its principal objectives, policies and strategies. It does have well-documented specific areas of activity with priorities attached but these change from year to year. A basic statement of mission with clearly specified goals, the achievement of which can be evaluated at predetermined points would seem to be highly desirable.

Component Activities

2.8 The component activities of the TBAP have changed over the years. Initially most staff resources were devoted to the completion of SSAP work in the publication of final Country Reports and analysis of SSAP data. Allocation of staff to the broader statistical program was initially

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slow, increasing as SSAP work was completed. The current lising of TBAP activities determined in August 1985 for what is now the second 5 year phase of the program, is:

1. Collection and evaluation of fisheries data and maintenance of the regional oceanic fisheries assessment data base.
2. Assessment of interaction between fisheries for oceanic species.
3. Assessment and monitoring of the levels of exploitation of stocks of commercially important tuna and billfish species.
4. Studies on the biology and ecology of commercially important tuna, billfish and bait species.
5. Provision of fisheries observers and advice on development of observer programmes.
6. Monitoring the schooling dynamics of fish aggregating devices.
7. Provision of assistance to countries in the implementation of appropriate systems to monitor artisanal and subsistence fisheries.
8. Provision of assistance to countries in training fisheries biologists in various aspects of quantitative fisheries methods.

2.9 The previous listing of activities/priorities, which applied at the commencement of the program in 1981 was as follows:

1. Development of a regional statistical program.
2. Estimation of the degree of interaction between pole-and-line and purse seine fisheries and assessment of the impact of each on tuna resources, principally of skipjack and yellowfin tuna.
3. Assessment and monitoring of the levels of exploitation of the stocks of the commercially important billfish species, especially black marlin, blue marlin, striped marlin, sailfish and swordfish.
4. Continued analyses of the data generated by the Skipjack Programme and evaluation of the impact of these data on resource assessment.
5. Assessment and monitoring of the levels of exploitation of the stocks of the commercially important tuna species, especially yellowfin tuna, bigeye tuna and albacore.
6. Assessment of the biological information necessary for the study of population dynamics of the dominant species.
7. Studies of the biology and ecology of the most important baitfish species used for catching tunas.
8. Comparison of the biological data on major species with relevant oceanographic and environmental information with a view to obtaining a description of the habitat available to each species, and hopefully predicting abundance in certain areas.
9. Evaluation of the use of anchored rafts as tuna aggregating devices.
10. Estimation of the degree of interaction between surface and longline gears exploiting yellowfin tuna, bigeye tuna and albacore, and assessment of optimal exploitation of each species by gear type.
11. Co-ordination of observer programmes on distant water fishing vessels.
12. Assessment of the impact on the stocks of changes in the type of longline gear used, especially the trend towards gear which fishes at greater depth.
13. Evaluation of alternative fish attraction devices.

2.10 The time frame for the achievement of the original objectives above was initially 3 years. This was extended to 5 years with a new completion date of September 1986. During 1985 a review was undertaken with particular reference to the most appropriate institution in the region in which to locate the TBAP. It was decided, without prejudice to any long term decisions, that the TBAP should remain in the SPC for a further 5 year period with a review mid-term about March 1989, to decide the long-term future of the program. The conclusion date of the current program is October 1991.

Staff

2.11 There are 15 positions in the TBAP under the leadership of a Tuna Program Co-ordinator, Dr John Sibert, who replaced Dr R. Kearney in 1984. Establishment information is contained in the following table.

Designation of Established Position	Grade	Post Status	Needed 1987	Contract Expires	Salary CFP France Per Month	Name
Co-Ordinator	P Special	Filled	Yes	30.09.88	539073	Dr J.R. Sibert
Senior Fisheries Scientist (Consultant)		Filled	Yes	31.07.87	800/Day	Mr R. Pianet
Fisheries Scientist	P1	Filled	Yes	08.01.89	464866 (Departing March 1987)	Dr R. Hilborn
Fisheries Scientist	P1	Last occupied by S. Argue 1984				
Fisheries Statistician	P1	Vacant	Yes	(Latest occupant, T. Polachuck, departed November 1986)		
Research Scientist	P2	Filled	Yes	08.02.88	316651	Mr J. Ianelli
Research Scientist	P2	Vacant	Yes	(Last occupied in 1982)		
Research Scientist	P3	Filled	Yes	30.09.88	339825	Mr R.S. Farman
Assistant Fisheries Statistician	P2	Filled	Yes	04.03.87	334151 (Departing March 1987)	Mr B. Moore
Computer Systems Manager	P2	Filled	Yes	30.09.88	334151 (Departing May 1987)	Mr M. Ivanac
Programmer Research Assistant	P5	Filled	Yes	01.08.89	238539	Mr S. Taufao
Research Project Assistant	AT4	Filled	Yes	30.09.88	193651	Miss V. Van Kouwen
Data Entry Technician	AT5	Filled	Yes	31.01.88	141028	Mlle H. Hnepeune
Data Entry Technician	AT6	Vacant	Yes			
Personal Assistant to Programme Co-ordinator	S3	Filled	Yes	04.01.89	182294	Mme H. Wolfgramm Page

2.12 As will be noted serious gaps in the structure have occurred with the departure, within the space of 4 months, of two P1 officers and one P2 officer including the Fisheries Statistician and Assistant Statistician and it is understood the current Programme Co-ordinator may be departing before the end of 1987. By September 1988 none of the existing senior professionals are expected to be with the programme. Programme staff attribute this in large part to downgrading the conditions of service, notably the salary structure.

2.13 For reasons associated with the external funding of the programme and the strength of the US dollar, TBAP salaries came to be noticeably higher than other purportedly equivalent SPC positions. In September 1986, TBAP salaries wee reduced by approximately 30%. Further reductions are proposed when the current Programme Co-ordinator departs. His position will be reduced to the level P1 with a subsequent downward movement of other professional positions, P1 to P2, P2 to P3 etc., except that there will be scope for recruiting near the top of a particular salary range in some cases, i.e. the statistician position reduced from P1 to P2 may be filled at a salary level in the upper P2 range.

2.14 The duties and required qualifications of the Tuna Programme Co-ordinator (TPC) are substantial. He must hold an advanced post-graduate degree and have an acknowledged standing in the scientific community and demonstrated ability to publish. His duties are to:

1. Direct the Tuna and Billfish Assessment Programme in accordance with the priorities set by member countries of the South Pacific Commission.
2. Discuss with member governments and their fisheries staff the provision of fisheries data and the specifications for its analysis.

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3. Discuss with member governments and territories and their fisheries staff, as necessary, the proposed detailed operations of the Programme in their waters.
4. Ensure that the scientific work of the Programme is maintained at an internationally recognised standard.
5. Ensure that the progress of the Programme is accurately reported to all member countries and be responsible for the preparation of all documentation relating to the Programme for the information of member countries.
6. Supervise the preparation of necessary scientific publication arising from the work of the Programme.
7. Assist Management in ensuring that funding is available to carry out the Programme effectively.
8. Provide detailed planning and recruitment in phase with the funding commitments.
9. Maintain close collaboration with the Fisheries Adviser and other appropriate programmes.
10. Perform such other duties within the scope of the Programme and related fields as required by the Director of Programmes or other Principal Officers.

2.15 The requirements for the other senior professional positions are correspondingly high, calling for extensive experience and proven expertise.

2.16 Under the newly introduced Staff Contract Policy, contracts may not be extended beyond 6 years for professional and 10 years for administrative staff.

2.17 The estimated percentage of time allocation by professional staff to the current priorities (refer para. 2.8) are as follows:

	Data Base	Fish Intactn	Expl Rates	Biology Ecology	Obsrv	FAD'	Artsl Stats	Trng	Admin
Professionals									
Sibert	15	15	20						50
Hilborn		75						25	
Pianet				100					
Polacheck	25	25	25				15	10	
Ianelli	10	10	20	25		15	20		
Farman	20		10	10	50	10			
Moore	100								
Taufao	100								
Ivanac*									
Data Entry									
Hnepeune	100								
Other	100								
TOTAL as % of TBAP Professional Time	32	14	8	15	6	3	4	4	6

* Indicates 100% support to other programme staff.

Management

2.18 The TBAP Co-ordinator has comparatively limited management authority, the duty statement referred to above notwithstanding. He may not approve recruitment of staff, publication of professional papers, any expenditure of funds not already released, or any travel. He may not initiate proposals for country visits, he may not even send a telex without higher authorisation. All such activities are approved at the level of upper management. Having to refer everything for decision, often with written justification, can be unduly time-consuming. Apparently this explains the fairly high allocation of Dr Sibert's time (50%) on administration.

2.19 There are reasons for tight central control in any large organisation responsible for a substantial budget and answerable to member governments. Nevertheless the type of arrangement referred to above seems likely to lead to administrative problems. In fact a litany of complaints has been provided by the TBAP staff which would appear to have hampered the carrying out of their function, even allowing for a zealous account of the particular problems cited.

2.20 With regard to management of the technical content of the TBAP this is virtually the exclusive province of the Programme Co-ordinator and senior professional staff. The programme content is submitted to an annual Regional Technical Meeting consisting of Senior Fisheries Officers from the member countries. This group serves a valuable function in terms of providing an occasion for thorough reporting on work performed and giving opportunity for technical officers to express views on the programme. Although technical by definition, in the RTMF proceedings the politics of the region are never far below the surface. The dynamics of the group are such that genuine technical direction of the TBAP is not provided. This absence of scientifically useful external direction would appear to be an unsatisfactory feature of the TBAP.

2.21 It is therefore suggested that a small group of eminent scientists in the field be paid a fee to serve in a 'board of directors', capacity to assess, question and recommend directions for the program. The tendency to turn such a body into a political group by insisting on 'equal' representation should be avoided as far as possible. This group would not replace the existing Regional Technical Committee on Fisheries. Possibly it could meet immediately prior to the Technical Meeting and issue an invitation for member countries to observe its proceedings. A proposal to (re)create a Standing Committee, which may have provided this external direction, has received support but some country reservations have meant that the proposal has not yet been implemented.

Finance

2.22 The TBAP is not financed from the general budget, but externally through contributions from Australia, United States, France and New Zealand. Some administrative support is provided by the SPC which is not charged to the program but this is relatively minor. In effect the TBAP imposes no cost on the Pacific Island states.

2.23 As an extra budgetary program, the TBAP does not enjoy a comfortable level of security. Its life is determined on a term-by-term basis and is subject to the decisions of both the funding organisations and the allocation decisions of the SPC Management. One of the specified duties of the Program Co-ordinator is to help ensure appropriate funding is available.

2.24 The level of funding required varies with the degree of activity. Expenditure in recent years has been (for the year ending in September) 1984 US$750 694; 1985 US$451 027; 1986 US$608 000. Expenditure levels are likely to increase if a proposed tagging program, estimated to cost $2 million over a two year period is undertaken. As yet the necessary funds have not been secured.

3. SERVICES OF TBAP TO MEMBER COUNTRIES

3.1 This chapter documents the main services provided by the TBAP to member governments. They fall broadly into three types of service, namely training, field projects and provision of information.

3.2 The provision of information function is illustrated in the summary tables which follow. They are based exclusively on information supplied directly to the SPC, in most cases by member countries. By way of explanation of the tables, the line prefixed by 'Days' reports the number of vessel-days fishing reported to the SPC and is a direct measure of the volume of work involved in handling the reports. Catches are reported in metric tonnes by major species (ALB – albacore, BET – bigeye tuna, YFT – yellowfin tuna, BFT – bluefin tuna, SJT – skipjack, B-F billfish, ie. the sum of striped marlin, blue marlin, black marlin, broadbill swordfish, and sailfish). The TBAP advises that catches of sharks and incidental catches of other species of tuna have been omitted. In cases where catch weights have not been reported, the best estimate has been used.

3.3 The value of the catch was calculated by TBAP staff on the basis of 1984 US$ prices assuming that all longline-caught fish (with the exception of albacore) are sold as sashimi and that all other fish (including LL albacore) are canning. The tables are not meant to suggest for example that the SPC was responsible for the harvest of US$ 80 millions worth of tuna in FSM in 1984. They do suggest however that the growth in revenue to island states from these catches depends to a certain extent on access to accurate and timely estimates of the total catch and its value when negotiating licensing fees. The perception of member states as to how well the TBAP provides this service varies from country to country, see chapter 4.

3.4 **American Samoa**

September 1984 — Fisheries Statistics Training Course — 1 participant

September–October — Statistics Course follow-up — 1 participant

3.5 **Cook Islands**

September 1984 — Fisheries Statistics Training Course — 1 participant

September 1985 — Statistics Course follow-up — 1 participant

June 1986 — Workshop on Southern Albacore research — 1 participant

July 1986 — Workshop on Stock Assessment Methods — 1 participant

Statistical services — sent first DWFN log sheets in April 1986

February 1987 — Scientist on board R.V. Townsend

3.6 **Federated States of Micronesia**

19 June – 25 July 1982 — Observer trip on **Takuryo Maru No. 1** — B. Gillett; report (Tech. Rep. No. 16)

5–25 February 1983 — Observer trip on **Matsuo Maru** group — B. Gillett; report (Tech. Rep. No. 16)

January 1984 — FSTATS visit to discuss SPC fisheries statistical services — M. Williams

24 March – 20 April 1984 — Observer trip on **Yakushi Maru** — R. Farman; report (Tech. Rep. at present w/PBO)

September 1984 — Fisheries Statistics Training Course — 2 participants

September/October 1985 — Statistics Course follow-up — 2 participants

6–9 January 1986 — observer training course — 2 participants — R. Farman

17–23 April 1986 — FSTATS visit to discuss summary reports, supply computer readable statistical summaries, and advise on log sheet accounting system

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Statistical services — Value of Catch Reported to SPC

	81	82	83	84	85
LL Days	12495	8943	6747	14758	14004
ALB		29	51	57	75
BET	2312	1969	1370	4524	4893
YFT	9240	4899	5948	7405	7105
BFT		4	19	9	10
B-F	665	575	404	1561	1265
Value	$43 148 280	$25 687 270	$27 506 905	$45 128 220	$44 443 245
PS Days	616	842	629	2273	1894
SJT	6172	11388	9263	36666	22388
YFT	3502	4835	1696	6803	5907
BET	106	72	67	20	
	104				
Value	$6 389 240	$10 336 210	$6 557 940	$25 829 390	$17 302 530
PL Days	2984	561	902	2652	1408
SJT	13416	2258	6884	17448	5098
YFT		147	91	231	299
BET		49	44	54	57
Value	$7 378 800	$1 404 580	$3 887 250	$9 832 950	$3 099 380
Total Val	$56 916 320	$37 428 060	$37 952 095	$80 790 560	$64 845 155

3.7 **Fiji**

1982/1983 — Technical assistance on non-traditional baitfishing methods — R. Gillett (request rec'd 3/11/1982)

8–15 January 1983 — To assist with the establishment of a computer system for the Fisheries Division — W. Smith

September 1984 — Fisheries Statistics Training Course — 1 participant

12 October - 10 November 1984 — Observer trip on **MV Western Pacific** — R. Farman; report (Tech. Rep. at present w/PBO)

August/September 1985 — Statistics Course follow-up — 2 participants

June 1986 — Workshop on Southern Albacore research — 1 participant

July 1986 — Workshop on Stock Assessment methods — 1 participant

July–September 1986 — Attachment training for Mitieli Baleivanualala

Statistical services — Value of Catch Reported to SPC

			Year		
	81	82	83	84	85
LL Days	326	1701	250	625	301
ALB	164.4	1037.0	165.7	477.1	176.0
BET	8.0	65.3	8.5	14.7	15.0
YFT	16.0	171.3	22.6	30.4	68.6
B-F	18.7	39.5	6.7	31.4	11.1
Value	$422 985	$2 590 300	$391 115	$1 030 450	$609 935
PS Days			70	58	86
SJT			386	326	502
BET				237	225
170					
Value			$409 010	$366 050	$417 200

	Year				
	81	82	83	84	85
PL Days	799	1891	1186	938	753
SJT	1365	4029	2837	3151	2084
YFT	158	675	347	363	307
Value	$881 890	$2 776 200	$1 848 360	$2 034 340	$1 401 010
Total Val	$1 304 875	$5 388 500	$2 648 485	$3 430 840	$2 428 145

3.8 **French Polynesia**

September 1984 — Fisheries Statistics Training Course — 1 participant

February–March 1985 — Tagging skipjack near FADs — R. Gillett. Supplied tags and associated equipment (Unpublished report) (request rec'd September 1984)

October–November 1985 — Statistics Course follow-up — 1 participant

June 1986 — Workshop on Southern Albacore research — 1 participant

July 1986 — Workshop on Stock Assessment Methods — 1 participant

Statistical Services limited by lack of promised data

3.9 **Guam**

October–November 1985 — Statistics Course follow-up — 1 participant

July 1986 — Workshop on Stock Assessment Methods — 1 participant

3.10 **Kiribati**

18 April — 2 May 1983 — In-country computer software development — W. Smith

16–23 January 1984 — Discussions with Fisheries Division on fisheries statistical services — M. Williams

September 1984 — Fisheries Statistics Training Course — 2 participants

14–20 January 1985 — Evaluation of the availability of baitfish and to develop appropriate methods of catching baitfish (request rec'd 20 November 1984)

18 March 1985 — Evaluation of status of tuna stocks — J. Sibert; report to PFO

August–September 1985 — Statistics Course follow-up — 2 participants

August 1985 — Repairs to computer equipment — M. Ivanac

17 March 1986 — Evaluation of potential for expanded fishery using purse seine vessels, R. Hilborn; report to PFO

January 1986 — Observer training course — 4 participants, R. Farman

July 1986 — Workshop on Stock Assessment Methods — 1 participant

August 1986 — Advice and information on remote sensing applications

November 1986 — Advice on handling of milkfish for use as bait — draft report to PFO

November 1986 — Tagging trials to assess degree of local interaction

November 1986 — Compilation of all available baitfish information since 1977 into computer format

November 1986 — Advice on effective monitoring of baitfish conditions

Statistical services — Value of Catch Reported to SPC

	Year				
	81	82	83	84	85
LL Days	1578	5265	2480	5408	5698
ALB	23	236	148	122	147
BET	782	2684	1163	2868	3953
YFT	755	5169	2411	3750	3564
B-F				662	539
Value	$5 212 210	$27 814 690	$12 629 320	$24 417 300	$28 723 785
PL Days	1754	795	343	534	598
SJT	12268	4431	4667	5007	4386
YFT	111	142	76	40	123
BET	0	0	11	0	76
Value	$6 838 530	$2 554 910	$2 651 720	$2 787 050	$2 566 470
Total Val	$12 051 740	$30 369 600	$15 481 040	$27 204 350	$29 290 255

3.11 Marshall Islands

September 1984 — Fisheries Statistics Training Course — 1 participant
October–November 1985 — Statistics Course follow-up — 1 participant

Statistical services — Value of Catch Reported to SPC

	Year				
	81	82	83	84	85
LL Days	4410	4500	4237	2854	2910
ALB	117.0	43.1	78.1	66.2	40.7
BET	1317.3	1387.2	1283.8	1217.0	1372.4
YFT	2374.0	2819.1	3229.6	1744.7	1252.8
BFT			4.2	1.5	0
B-F			530.9	434.2	487.3
Value	$13 041 600	$14 802 185	$17 347 575	$11 327 815	$10 025 475
PS Days		93			
SJT		837			
YFT		560			
Value		$925 150			
PL Days	1616	2808	3884	983	643
SJT	10313	9243	29243	6672	3751
YFT	17	136	200	79	101
BET	17	48	102	6	31
Value	$5 700 370	$5 236 370	$16 334 310	$3 740 150	$2 172 610
Total Val	$18 741 970	$20 963 705	$33 681 885	$15 067 765	$12 198 085

3.12 New Caledonia

September 1984 — Fisheries Statistics Training Course — 1 participant
October–November 1985 — Statistics Course follow-up — 2 participants
June 1986 — Workshop on Southern Albacore research — 1 participant
July 1986 — Workshop on Stock Assessment Methods — 1 participant

Statistical Services — Value of Catch Reported to SPC

	Year				
	81	82	83	84	85
LL Days			87	320	219
ALB			19.6	169.1	69.1
BET			3.0	17.2	24.6
YFT			36.4	74.2	96.3
BFT			0	2.4	0.4
B-F			61.4	187.0	162.4
Value			$321 150	$1 047 060	$928 325
PL Days	127	677	290	14	9
SJT	226	829	430	32	102
YFT	3	41	25	9	0
BET	0	0	0	1	4
Value	$126 790	$489 960	$257 250	$25 900	$59 420
Total Val	$126 790	$489 960	$578 400	$1 072 960	$987 745

3.13 **Palau**

September 1984 — Fisheries Statistics Training Course — 1 participant

September–October 1985 — Statistics Course follow-up — 1 participant

April 1986 — In-country visit by FSTATS to supply advice on catch reporting procedures

April 1986 — Official Request for assistance in improving small-scale fisheries statistics system; action pending identification of consultant

Statistical Services — Value of Catch Reported to SPC

	Year				
	81	82	83	84	85
LL Days	1248	910		2181	1285
ALB	1.9	0.4		12.9	2.6
BET	152.0	115.5		375.4	240.1
YFT	726.4	190.4		559.6	544.9
Value	$3 190 540	$1 061 140		$3 246 090	$2 767 835
PS Days				375	281
SJT				11115	5792
YFT				965	3189
BET				20	44
Value				$6 930 800	$5 868 990
PL Days				30	
SJT				211	
YFT				0	
BET				4	
Value				$119 370	
Total Val	$3 190 540	$1 061 140		$10 296 260	$8 636 825

3.14 **Papua New Guinea**

September 1984 — Study visit by Ursula Kolkolo for analysis of PNG catch data

September 1984 — Fisheries Statistics Training Course — 1 participant

September–October 1985 — Statistics Course follow-up — 1 participant

April 1986 — Advice on software to Fisheries Research, Kavieng; R. Hilborn

July 1986 — Workshop on Stock Assessment Methods — 1 participant

Statistical services — Value of Catch Reported to SPC

	Year				
	81	82	83	84	85
LL Days	11636	10404	7258	5226	5782
ALB	1093	373	741	666	154
BET	1472	1483	1503	1191	1781
YFT	10339	9187	9642	5345	7439
BFT		0	19	18	0
B-F	741	533	495	535	457
Value	$46 679 420	$40 746 570	$43 072 810	$25 991 110	$34 496 335
PS Days	760	2387	2878	3588	3560
SJT	12651	39075	64606	60083	66143
YFT	5400	15825	16358	30325	21947
BET	119	423	587	309	177
Value	$11 538 620	$34 977 090	$49 581 050	$58 471 870	$54 741 750
PL Days		22	194	27	92
SJT		66	1715	88	355
YFT		11	95	7	58
BET		0	5	0	7
Value		$58 430	$1 028 250	$54 210	$249 200
Total Val	$58 218 240	$75 780 090	$93 680 110	$84 517 190	$89 487 105

3.15 **Solomon Islands**

27 November–1 December 1983 — Consultations with FFA and Fisheries Division regarding services to countries — M. Williams

September 1984 — Fisheries Statistics Training Course — 1 participant

August/October 1985 — Statistics Course follow-up — 2 participants

April 1985 — Visit by P. Nichols to SPC to analyse length-frequency data and Solomon Islands catch statistics

3–7 February 1986 — Evaluations of statistical system; B. Moore, T. Polacheck

April 1986 — Observer trip on Solomon Taiyo vessels; R. Farman

April 1986 — Observer training course — 8 participants; R. Farman

23 June 1986 — Official request for assistance with statistical system; preliminary visit planned for late 1986

July 1986 — Workshop on Stock Assessment Methods — 1 participant

January 1987 — Advice on Artisanal Data Collection (R. Farman)

Statistical services — Value of Catch Reported to SPC

	81	82	83	84	85
LL Days	4178	3276	1456	1211	2555
ALB	644	600	313	176	261
BET	672	399	302	278	951
YFT	3252	1966	1923	614	3224
B-F	307	305	165	205	303
Value	$15 964 370	$10 643 520	$9 002 900	$4 650 655	$16 103 355
PS Days	168	163	237	235	92
SJT	2131	2167	2962	2930	375
YFT	620	486	2095	2209	1750
BET			1		
Value	$1 686 650	$1 606 230	$3 368 780	$3 444 970	$1 656 750
PL Days	62	71		35	434
SJT	797	332		407	3246
YFT	14	27		8	72
BET					5
Value	$449 970	$205 010		$230 490	$1 849 210
Total Val	$16 100 990	$12 454 760	$12 371 680	$8 326 115	$19 611 315

3.16 **Tokelau**

16 May–27 June — Traditional tuna fishing practices; R. Gillett, report (Topc Review No. 27). (Request rec'd July 1984)

3.17 **Tonga**

September 1984 — Fisheries Statistics Training Course — 1 participant

24 April–19 May 1985 — Observer trip on **MV Lofa**; R. Farman, report (Tech. Rep. No. 17)

September–October 1985 — Statistics Course follow-up — 1 participant

February 1986 — Scientist on board **RV Townsend Cromwell** during research cruise for Southern Albacore

June 1986 — Workshop on Southern Albacore research — 1 participant

June 1986 — In-country analysis of statistical system; T. Polacheck, draft report to PFO and FAO

February 1987 — Scientist on Board RV Townsend

July 1986 — Workshop on Stock Assessment Methods — 1 participant

Statistical services — Value of Catch Reported to SPC

	81	82	83	84	85
LL Days		111	123	105	70
ALB		58.5	88.4	60.7	53.1
BET		9.5	5.3	12.1	4.6
YFT		44.8	21.8	25.8	13.8
BFT		0	0	0	0
B-F		15.2		0.0	28.0
Value		$325 620	$239 398	$229 420	$216 310

3.18 **Tuvalu**

18–25 October 1983 — Preliminary baitfish survey — R. Gillett

4 April–7 June 1984 — Baitfish survey; R. Gillett, report (Tech. Rep. No. 14)

September 1984 — Fisheries Statistics Training Course — 1 participant

February 1985 — Evaluation of fisheries statistics collection system; T. Polacheck

July–August 1985 — Consultant (M. Molina) in-country development and training for statistics collection system

September–October 1985 — Statistics Course follow-up — 1 participant

Statistical Services — Value of Catch Reported to SPC

	Year				
	81	82	83	84	85
LL Days	13	637	702	257	
ALB	2.7	254.6	236.7	91.3	
BET	1.4	83.3	183.4	45.1	
YFT	6.8	168.5	387.4	116.5	
B-F	0.0	5.7	19.7	13.9	
Value	$34 020	$1 302 530	$2 427 965	$750 920	

3.19 **Vanuatu**

September 1984 — Fisheries Statistics Training Course — 1 participant

November 1984 — Discussions with Fisheries Division on statistical requirements — T. Polacheck

August 1985 — Statistics Course follow-up — 1 participant

June 1986 — Workshop on Southern Albacore research — 1 participant

July 1986 — Workshop on Stock Assessment Methods — 1 participant

Statistical services — Value of Catch Reported to SPC

	Year				
	81	82	83	84	85
LL Days			642	3943	2378
ALB			446.9	2412.7	1662.1
BET			9.5	89.3	73.7
YFT			49.2	175.9	208.1
BFT				1.6	1.8
B-F			19.0	77.8	50.3
Value			$972 690	$4 975 475	$3 784 440

3.20 **Western Samoa**

September 1984 — Fisheries Statistics Training Course — 1 participant

October–November 1985 — Statistics Course follow-up — 1 participant

July 1986 — Workshop on Stock Assessment Methods — 1 participant

4. ASPIRATIONS AND ATTITUDES OF MEMBER COUNTRIES

4.1 To assess the extent to which TBAP has 'met with island country aspirations' (Terms of Reference), the consultant visited New Caledonia, Vanuatu, Solomon Islands, Kiribati, Marshall Islands, Federated States of Micronesia, Western Samoa, American Samoa, Tonga, Fiji and Papua New Guinea over a 4 week period in January/February 1987. Time constraints meant that only half the Pacific Island member countries of the SPC could be visited and the following account must be qualified accordingly. A list of countries and organisations visited and persons spoken with appears in Annex 1.

4.2 The **aspirations** of the island countries for the TBAP, were taken to mean 'what they hope the TBAP will provide for them' do not seem to have ever been precisely defined, except by implication in the priorities established at the beginning of each of the 5 year phases of the programme. Aspirations differ for the various states depending on their national priorities and also differed over time as local fisheries officers grew in awareness of the issues being considered. Compromises had to be made and priorities agreed. The body through which this was and is achieved is the Regional Technical Meeting on Fisheries. The priority listings for each of the two year phases of the programme were indicated above, paragraphs 2.8 and 2.9.

4.3 Initially member states, at least the tuna rich member states, hoped that the programme would be concerned with **assessment of the status of the tuna stocks.** In particular, states were anxious to know what level of effort could be sustained for the various species and by various fishing methods; and what interaction was there between fisheries in neighbouring countries, between industrial fishing and local traditional and small scale commercial fishing and also between fishing by various methods particularly the effect of purse seining on the longline fishery.

4.4 While Oceanic Tuna fisheries research requirements dominated the TBAP objectives, there has been a growing concern that the **needs of inshore fisheries** were not being met, leading to increased pressure to divert TBAP resources to the more pressing (in the view of some states) local fisheries objectives, such as inshore stock and training of local officers to conduct research even though some of these activities were only marginally associated with the main thrust of the programme.

4.5 An essential prerequisite for research on oceanic tuna stocks was a **comprehensive data base.** A good deal of data had already been accumulated (ref. The SSAP referred to earlier) but it needed to be re-organised and further analysed and also much more data was needed before valid regional stock assessments could be made. Countries therefore agreed that top priority should be given to establishing and managing the data base. This included collecting information on as comprehensive a basis as possible.

4.6 A major shift in country needs, if not the TBAP priorities, was brought about in the early 1980s by the accepted practice of negotiating foreign fishing vessel access fees on the basis of where the foreign fishing vessels were fishing, how much fish of each species they caught, what type of vessel was involved and also the value of the catch. This data (price data excepted) was included on the foreign fishing vessel log sheets supplied to member countries and passed to the TBAP for stock assessment/interaction studies etc., purposes.

4.7 While the negotiating/management value of the log sheet information quickly became prominent, at the same time any immediate urgency for stock status research was overtaken by the advice from TBAP, that the major stocks were capable of withstanding much greater fishing effort or at least that the current level of effort was safe. Although this was qualified with the warning that it was a conclusion based on insufficient data, it had the effect of removing any immediate conservation concerns from the minds of island fisheries officials.

4.8 The consequence of these developments was that the **information service** role of providing data that member countries either themselves or through FFA wanted to manipulate for the management of the foreign fleet and to negotiate the maximum access fee, assumed greater

importance than the long-term research role. Inherent in this service role wac the expectation of quick responses to requests for data, often within a much tighter time-frame than a fisheries research unit would normally be accustomed.

4.9 The third 'aspiration' of island countries could be grouped under the general heading of **training.** Again this is reflected in the priority listing of the second five-year phase of the TBAP, reflecting a significant change from the first phase (1981—1986). The observer programme, artisanal fisheries monitoring systems and instruction in biological quantitative method all have training as a major component. This change was made in response to growing pressure from some states which considered traditional inshore fisheries were more important than industrial tuna fishing.

4.10 As none of the above roles can be properly satisfied with **responsive communications**, island countries expect from the TBAP timely and useful documentation on their work, frequent personal contact, familiarity with country needs and situations, ready access to programme staff, prompt and effective response to requests for help and persuasive presentations of TBAP work.

4.11 There is also the underlying concern that these aspirations should be met at **minimum cost.** This is almost fully satisfied as the TBAP is funded extra-budgetarily by Australia, USA, France and New Zealand. It does receive some administrative support from the SPC infrastructure which is not charged to the TBAP but in terms of cost to the island states, which individually contribute no more than 0.55% of the SPC budget, it is minimal.

4.12 The extent to which the above aspirations have been met, as perceived by the member states visited, varies from state to state.

4.13 In regard to the **stock assessment function** attitudes were expressed as follows:

- long-term study on the status of stocks and related issues is of critical importance and must be continued by some competent organisation;
- The TBAP has provided assurances that the status of the stocks is satisfactory, but the inability to present definitive findings gives some grounds for concern;
- no clear findings have emerged in regard to interaction between industrial tuna fishing and traditional/local fishing and this is a major disappointment;
- no country expressed doubts as to the quality of the work and the competence of individual scientists;
- the programme should concentrate on tuna related work, and not dissipate its efforts with token gestures in other areas such as artisanal fisheries;
- the real needs of the region are not in oceanic tuna but in the inshore and artisanal areas and the SPC should give higher priority to these areas than the meagre efforts of a small proportion of TBAP staffs' time;
- the programme should only engage in research of direct benefit to island countries. Some of the work, e.g. modelling, is only of indirect benefit and should be contracted out to more permanently established institutions;
- reservations were expressed about the proposed tagging programme to be run by the TBAP. It may be better to contract such work to a well-established research institution, some felt;
- concern expressed that the quality of the research will be affected by the reduction in salaries and the rigid application of the six-year staff contract policy which will make it difficult to recruit appropriately qualified scientists. Even now the rate of departure of staff is disturbing;
- the SPC is not an appropriate institution for fisheries research in this region. The Oceanic Fisheries component of the TBAP should be transferred to a more dynamic body capable of responding more effectively to the fisheries needs of island countries. The FFA would be an appropriate organisation for this purpose, some states considered;

- concerned at any moves to transfer the TBAP from the SPC to a more narrowly based organisation and one that has no track record for effective research;

4.14 In regard to the **data base** management function, that is the collection and maintenance of an oceanic fisheries assessment data base, attitudes were as follows:

- general appreciation of the considerable effort on the part of TBAP staff in building the data base to its current level; in the view of more than one expert outside the SPC 'it is unmatched by any other similar data base in the world';
- regret that the data holdings are still seriously deficient, i.e. less than 50% of actual catches in the region;
- concern that the system was, initially, poorly designed so that 'rudimentary' errors (e.g. accepting duplicate log sheets) were made;
- noted with satisfaction that considerable effort had in recent months gone into 'cleaning up the data base';
- concerned that the SPC confidentiality policy seemed to benefit DWFN rather than the member states, namely that ATA benefitted from SPC confidentiality agreement;
- concerned at the departure of both the TBAP Statistician and Assistant Statistician and the consequent question mark over the satisfactory ongoing management of the data base;
- concerned at the duplication of function resulting from the FFC decision to establish a data base capability within the FFA;
- consider the data base function should pass to the FFA;
- concerned at apparent moves in the region to transfer the data base function to FFA which does not properly represent the interests of all South Pacific islanders and cannot be expected to do a better job than the SPC/TBAP;
- concern that the content of the data base is reliant on information supplied by DWFN without any independent check as to its accuracy.

4.15 The **information service function**, with particular reference to economic/management needs, which was not originally included in TBAP priorities but which has now assumed major importance for a number of states, is the area where most of the criticisms of the TBAP seem to have occurred. The strong dissatisfactions reported below comes only from two states contacted — states, however, where a large quantity of tuna is caught both by DWFN and the national fleet:

- constant inaccuracies in the information returned by the TBAP, failure to improve despite constant communications and poor performance in meeting deadlines have proved a major annoyance so much so that in the the case of one major state, no reliance is now placed on the TBAP information and an independent data handling capability has had to be established, a cost they would have not incurred had the SPC/TBAP service been adequate;
- because of the poor service, in future log sheets will be sent directly to the FFA. One state will not send long sheets to the SPC, but will not object if the FFA on-forwards copies to the SPC;
- FFA should assume responsibility for the data base and associated information service function, as the SPC/TBAP is not suited to meeting this requirment.

4.16 On the other hand two states from which a significant proportion of the DWFN vessel log sheets come, although they feel that the TBAP returns could be presented in a more useful format (better summaries, graphical presentation) and in a quicker time-frame, stress that the current TBAP information service is of critical importance to them, is on the whole satisfactorily performed, and that the continuity of the service should not be threatened.

4.17 Other states reliant on the information service function for management negotiation purposes, report some irritation relating to earlier instances of inaccuracy and tardiness but not the extent of inclining them to the tough stance indicated for the first group. They would not initiate any institutional changes for these reasons because they believe the TBAP is improving its performance. On the other hand they would probably not oppose a move to transfer the data base and information service function to the FFA because they generally regard it as more responsive than the SPC for whom fisheries is only one of many functions.

4.18 The **training activities** have been given increased emphasis recently. Grouping the Observer Programme, Artisanal Statistics and Training under this general heading, approximately 14% of the time of the professional staff is devoted to this activity. Member countries' attitudes appeared to be:

- almost universal acknowledgement of value of the activities and high praise for the quality of the TBAP officers involved;
- regret, on the part of some smaller island states, that much greater effort is not given to these activities;
- the comparatively token efforts both distract from what ought to be the main thrust of the TBAPs work and reduce the prospects for a major initiative in the training field.

4.19 In regard to the expectations of **responsive communications** there was fairly widespread criticism of the perceived slow and/or unsatisfactory response from the SPC generally and the TBAP in particular, yet at the same time praise from almost every country for particular pieces of work. Some criticisms made were:

- TBAP staff do not spend enough time in the countries where they could learn country needs and communicate the value of TBAP work;
- dealing with SPC is cumbersome both from the point of view of the client state and the response of SPC. Often a formal request from Foreign Affairs is necessary which involves preparation of a submission by Fisheries, consideration by Foreign, referral to SPC before a response. As rapid and useful response without the need for time-consuming red tape may be obtained from FFA, dealing with the latter is usually preferred;
- SPC does not seem sufficiently dynamic, in regard to its fisheries services, to meet the needs of fisheries R & D in the region at this time of rapid change in South Pacific fisheries;
- some written reports of the TBAP are difficult to understand and their practical value to island countries is doubtful;
- presentations by TBAP staff in fisheries meetings were not sufficiently detailed or convincing. Perceived acquiescence in the face of strongly expressed reservations in the RTMF was perplexing.

4.20 It is stressed that the above comments are the perceptions of the officials as relayed to the consultant. While they may seem to present an unduly negative picture this should be balanced by the appreciation that the terms of reference were phrased in a way that elicited more complaints than affirmations. It will also be appreciated that many of the criticisms contradict each other. A number of the criticisms and comments, it was revealed after questioning, had never been referred to the TBAP for corrective action, a factor which tends to undermine the force of the criticisms. It will also be recalled that there were many positive comments made about the program. Certainly it is the consultant's assessment that the program has been an enormous asset to the region.

4.21 In summary, however, it can be said that:

(a) The aspirations of island countries have changed significantly in the last few years in that increased emphasis is now being given by the 'tuna' states and the 'inshore' states respectively to either:

— the information service function with respect to data required for negotiation/management/economic purposes; or to

— meeting the inshore fisheries needs of smaller island states.

(b) The TBAP is not perceived by some states, both large tuna states and smaller island states, as satisfactorily meeting these aspirations

(c) SPC and the TBAP is perceived as relatively unresponsive by many island states, particularly when compared to the performance of the FFA, in meeting the fisheries needs of member countries.

5. EVALUATION OF THE PROGRAM

5.1 The terms of reference require an evaluation of the 'program as a whole as well as its various activities'. The following section deals with the current program activities as listed above, paragraph 2.8.

Data Base

5.2 The management of the regional data base, i.e. the collection and storing in computer files of catch and effort and associated data from primarily the DWFN vessel log sheets in a form that can be readily used for research and management purposes, is the major task of the TBAP.

5.3 It is estimated that since 1982 approximately 10 man-years of effort have gone into the development of the data base. The annual cost, as it represents over 50% of the programs activities, presumably exceeds US$200 000. A new computer system costing about $100 000 has recently been installed in the SPC partially in response to the needs of the Oceanic Fisheries Data Base.

5.4 In May 1986 the Forum Fisheries Committee decided that the FFA should 'handle the logsheets' from the DWFN vessels. The wording of the decision was:

> Project 7.1: Data Development
>
> Following a substantial discussion on the handling of catch and effort logsheets, the Committee agreed that logsheets could be handled by both FFA and SPC, at least for a review period. This would be aimed at meeting the Member Governments' different needs in respect of the two organisations. It was seen as important to preserve the provision of data to SPC to encourage the fishing nations to supply data through SPC which could not otherwise be obtained. It was also seen as important to secure a timely flow of dat a to FFA for purposes such as access negotiations, surveillance and economic studies requested by FFA Member Governments. There was a concern to see that national needs for data were advanced under this project'.

5.5 The project approved by this decisior. involves:

> 'The development and operation over a five year period of a regional data base for the conservation and management of the offshore tuna resources of the region. Data will be drawn from these sources:
>
> (i) vessel activity reports filed by radio and telex by foreign fishing vessels while at sea;
> (ii) daily logsheet data on fishing catch and effort submitted at the end of each trip by foreign vessels under fishing access agreements and by local tuna vessels;
> (iii) vessel data from FFA Regional Register of Foreign Fishing Vessels;
> (iv) landing data submitted at the end of each trip;
> (v) port sampling data, including length and weight measurements;
> (vi) licensing data; and
> (vii) market data.
>
> (i) monitoring and negotiating access agreements;
> (ii) resource conservation, including the development of strategies for limited fishing effort on the tuna resources;
> (iii) resource protection including the development and deployment of surveillance capacity and the identification of fishing grounds which need protection for local fishing operations;
> (iv) scientific research, including stock assessment; and
> (v) economic studies on tuna industry development.
>
> The project will include funding for four positions; Statistical Co-ordinator, Data Base Officer and two Data Entry operators.' Reference: 'Computer Information Services at the FFA, November 1986' FFA Report 86/87.

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5.6 It would appear that the scope and source of the data, the purposes for which it would be used and the resources required to manage the system mirror the TBAP data base management function. Obviously the decision to approve such a project complicates the assessment of the SPC/TBAP data base function.

5.7 The FFC decision has disturbed the TBAP Co-ordinator. He has formally complained to the Secretary-General of SPC about what he regards as costly duplication and also the risk to credibility of the region in having two data bases for the one subject area. Competition between SPC and FFA and claims of superior accuracy will be inevitable, he considers. Further more he feels there is a real risk that the quality of the data will suffer because the FFA, with its prime thrust being economic, may not be able to apply the standards necessary to underpin scientific research. He has requested formal direction on whether TBAP should proceed with its data base work or not. He recommends that the issue be discussed at senior level between the two organisations. While the matter has been discussed by the Heads of SPC, SPEC and FFA no specific direction has been forthcoming. The formal situation is that the development/management of the data base remains as an approved subject of both the FFA and the TBAP.

5.8 The FFC decision may have been influenced by the negotiation of a Fisheries Treaty between the South Pacific Forum States and the United States Government due to be signed in April 1987. The treaty provides for data on catch, effort, transhipment, port unloadings, vessel movements and observer reports for the 40 US flag vessels to be passed directly to the FFA. The consequent Agreement among Pacific Island States concerning the Implementation and Administration of the US Treaty requires to Director of the FFA, as the Administrator of the Treaty, to maintain confidentiality of all data he receives. He may be authorised by a member state party to the Agreement to release information relating to fishing activity in waters under that parties jurisdiction.

5.9 Under the Treaty SPC will not have access to the US treaty data except via the FFA and with the permission of the member states. While it might be supposed that Forum States will give permission for data to be passed to the SPC/TBAP, the procedures by which this may be done and the time frame in which the data would be provided are as yet uncertain. These new restrictions on access to data do not help the SPC's claim that it is the appropriate data base management organisation for the region. Prior to the US treaty, SPC/TBAP was able by various means, including the use of the fact that the US is a member of the SPC, to obtain a wider data coverage than the Forum. Ironically the successful negotiation of the US treaty has weakened SPC/TBAP access to US data.

5.10 As the member Governments who approved the SPC/TBAP Data Base function as its highest priority are substantially the same as those who approved the FFA Data Development project, it would appear that the duplication of the Data Base management function is intended. However, no justification for this unusual situation appears to have been documented. Possible reasons are:

A. The needs of the FFA and the TBAP in use of the data are significantly different and neither organisation can rely on the other in terms of maintaining a satisfactory quality of data or obtaining the necessary output from its sister organisation's data base in the time-frame required for its own purposes.

B. It is the intention of member governments to create the Data Base management function in the FFA, but with the SPC continuing its existing Data Base function as an insurance against failure of the FFA system or as a check against the accuracy of its output.

C. It is the intention of member government, not yet explicit, to combine all oceanic tuna management and information service functions in one organisation, thus certain of the functions of the TBAP would transfer to the FFA which would be responsible for both the economic/management/surveillance function it has at present and the collection and storage of all data required for both its current function and also for longer term scientific research directed at stock assessment and related matters. The one data base managed by FFA would serve the needs of both functions.

5.11 Whatever the rationale behind the FFC decision, it would appear necessary for the SPC to consider, as a matter of priority, the relationship of the TBAP data base functions with the FFA initiative and what modifications, if any, should be made to the TBAP program.

5.12 As far as the evaluation of the data base function itself is concerned, the first observation is that the TBAP is still well short of achieving the objective of establishing a reasonably comprehensive data base. As the Program Co-ordinator reported to RTMF 18, in August 1986, even though the data holdings increased substantially in the preceeding 12 months:

> 'Serious gaps in data coverage from DWFNs persist. Tuna Programme staff calculate that catches reported to the SPC may be as low as about 50% of the actual total catches in the region (SPC/Fisheries 18/WP.5). Not only is data coverage incomplete, the existing reporting system does not permit accurate estimation of either the percent coverage or of a 'raising factor'. This situation impedes the Programme's ability to rigorously assess trends in the fishery. The most significant known gaps are lack of information on Japanese catches in international waters, United States catches prior to 1984, and United States catches in some high seas areas. Naturally, illegal and unlicensed fishing are usually not reported. The situation has not improved during the last year despite numerous appeals from the SPC to both Japanese officials and the American Tunaboat Association. It is hoped that better progress in this area can be achieved through the work of the Standing Committee on Tuna and Billfish.'

5.13 Nevertheless the consensus of experts is that the data base that has been compiled represents a major achievement. The reluctant of the DWFN particularly the Japanese to provide data, the main factor in the deficiency in the data base, is beyond the control of TBAP staff. The current system does provide a satisfactory framework for receiving all DWFN data. Hopefully recent breakthroughs in obtaining US data will lead to a more cooperative response from all DWFNs.

5.14 Initial difficulties with the design and operation of the TBAP system appear to have been rectified and the capability to respond promptly to requests for data particularly from the FFA, has been enhanced through computer communication links and development of compatible systems in member states. It is suggested that special efforts should be made by TBAP staff to communicate with those states which still have major reservations about the TBAP capability in this area.

5.15 The TBAP is the only regional data base of daily catch and effort information. Until such time as an alternative data base is established and producing information needed for management, there appears to be no choice but to continue to support the TBAP function. To the extent that member states attach importance to preserving such a regional facility, it would seem to be in the interests of all states to ensure prompt referral of all data and generally offer full support to the TBAP.

5.16 Whatever the outcome of the review of the TBAP Data Base function by the SPC in the light of the FFC intiative (refer to paragraph 5.11 above), it is suggested the TBAP extends maximum assistance to the FFA as it develops its system. This would ensure the benefits of TBAP experience are not lost and that maximum compatibility between the two systems is maintained. In the event that some transfer of function is decided by member governments, such cooperation will have proved invaluable. However, in the current circumstances—as yet no decision has been taken on the funding or timing of the FFA Data Base Development Project—it would appear that no decision to either phase out the TBAP function or substantially modify it, is possible.

Assessment of Interaction between Fisheries for Oceanic Species

5.17 In addressing this question TBAP have been breaking new ground as no data had been previously collected with the explicit purpose of addressing interaction problems. Valuable work has been completed within the TBAP on the appropriate theoretical frame work and the type of data needed has been identified. A major tagging program has been proposed and funds are expected in 1987. However in the absence of the necessary data and as the existing data holdings cannot lead to reliable conclusions, no definitive responses can be given to the basic interaction questions initially asked by the island countries, namely how will fishing in one

country affect fishing in another and how will industrial fishing affect local traditional and small scale fishing.

5.18 This issue has been constantly affirmed by the RTMF as a high priority activity but although this has been the case since 1981 no statement beyond identification of the main factors involved in interaction studies has been possible. As the absence of any findings has not hampered fisheries managers, it is not surprising that the importance and relevance of the research should be questioned.

5.19 While the scientific rationale for the TBAP fisheries interaction work is doubtless sound, the question arises whether it might not be more appropriately located in an institution better suited to carrying a long term complex research program than the SPC which is more extension/development oriented, and from which 'practical' short term output is expected.

Stock Status—Assessment of Levels of Exploitation

5.20 A 'state of the art' assessment was given by the Program Co-ordinator in February 1986. He concluded that 'skipjack stocks are lightly exploited and could support increased exploitation. Yellowfin stocks are more heavily exploited and increased exploitation should be conducted with caution. Bigeye stocks also appear to be in good condition. Longline fisheries for albacore appear to be fully exploited but there is possibility for expansion in more southerly fisheries.' This was qualified with the advice that the data base is seriously deficient (refer 5.12 above). Until such time as 'missing' Japanese and US data are incorporated it will not be possible, using traditional stock assessment methodology, to be more definitive about the state of the stocks.

5.21 Again this situation raises the institutional question of the creation of a mechanism or organisation through which all relevant data will be available for analysis. The SPC has not been able to obtain access to anywhere near sufficient data to achieve its objective. If current initiatives such as the possible re-creation of the TBAP Standing Committee are not successful in broadening the data coverage, it would seem sensible to put stock assessment work 'on hold'. Presumably an on-going capability would need to be maintained, possibly involving investigation of new methodologies for stock assessment, requiring less extensive or different types of data. This might be the subject of specific proposal from TBAP. In the meantime maximum effort should be directed, in conjunction with senior management, at securing co-operation from DWF nations regarding provision of data.

Studies on Biology and Ecology

5.22 Using the services of a scientist seconded from ORSTOM, a beginning has been made to correlating monthly CPUE by 1 degree square data with oceanographic data (surface temperature, salinity, temperature profile, chlorophyll content) along a line from New Caledonia to Japan. It is not possible to assess the usefulness of the work so far. It has potential application to predicting the occurrence of fish and relating catch rates to climatic conditions. While clearly a valid component of a tuna program, there is a need to publicise its value to the coastal states rather than being primarily of interest to catching nations or scientific organisations. One consideration in this regard is that it would appear to be in the interest of the coastal state to give maximum assistance to licensed foreign vessels in its EEZ to conduct fishing campaigns at minimum cost.

Observer Program

5.23 This involves undertaking observer duties, training observers from island countries, development of observer programs and preparation of observer manuals in co-operation with the FFA. The work is universally regarded as effective and important. It is in the mainstream of the TBAP's mission, playing a potentially important role in ensuring high quality of data is supplied by fishing vessels. 50% of the time of a professional officer is involved.

FADs—Monitoring Schooling Dynamic of Fish Aggregation Devices

5.24 This activity is still in the planning phase. The widespread practice of purse seiners fishing logs has directed attention to the factors that cause tuna to gather round floating objects and the relationship of this with abundance of tuna. Again this is a mainstream activity but limited resources have meant that very little time—3% of TBAP time—has been devoted to it.

Monitoring Artisanal and Subsistence Fisheries

5.25 This activity is outside the charter of an oceanic tuna program. TBAP resources were diverted because of insistence from countries where growing pressure on reef fish and other inshore stocks was causing concern. The necessary skills existed in the TBAP to help set up local data bases. The work done was considered valuable although the view was expressed in some quarters that it was just a token effort—4% of TBAP time—which reduced the likelihood of an adequate program being approved. While it is appreciated that financial constraints cause SPC management to adopt a frugal line in allocating resources, in hindsight it may have been better to have developed an independent proposal for this activity and seek funding on its own merits. As it is, it has side-tracked resources needed for tuna work without satisfactorily meeting all the artisanal needs.

Training in Quantative Method

5.26 Approximately 4% of the TBAP time was devoted to conducting a number of workshops aimed at equipping island fisheries officers to use microcomputers for fisheries statistics purposes. This would also appear to have been a 'fringe' activity of the TBAP although there is no doubt it was needed. In the view of many states, training should be accorded much higher priority than the more 'research' oriented activities of the TBAP. Participants in the courses reported them to be very useful. Nevertheless, in view of the limited achievement in some other high priority areas, this activity might have been better carried out by an external consultant as it is an area of activity where it should not be difficult to find a suitable instructor.

Evaluation of the Program as a Whole

5.27 There is no doubt that the achievements of the TBAP have been outstanding in that a large and valuable data base has been established. It is regarded by experts as a model exercise for this type of undertaking. Paradoxically, the coverage of the data, for reasons beyond the control of the TBAP staff, is inadequate for its main purpose which is to make definitive assessments of the state of the stocks. The prospects for improving on this situation in the near future are uncertain.

5.28 Further progress on the next main priority item, fishery interaction, depends on new developments; either, 1) initiation of a yellowfin tagging project, or 2) increases in fishing pressures in some fisheries to see if impacts can be detected in other fisheries. The program has determined the very weak interaction of fisheries between countries, but has been unable to reliably determine the interaction between commercial gears and artisanal fisheries. As to the other mainstream activities, namely, biological/ecological studies and investigations relating to FADs, to which relatively little time has been devoted, achievement is minimal. It therefore seems fair to say that the TBAP is still well short of its long term objectives in all the main priority areas.

5.29 The observer program—not research in the same sense as the above activities—has been successful, limited resources notwithstanding. Similarly other lower priority items (artisanal statistics, training) have proved successful.

5.30 The competence of the staff is of the highest order. The limited progress on priority areas is a comment not on their efficiency but on the complexity of the issues, availability of resources and a number of external constraints. In regard to the scientific soundness of the TBAP methodologies, the normal standard for such an assessment, namely scientific publication in the recognised literature in the field, is difficult to apply because of the SPC policy of restricting publication of scientific papers. A 'scientific' review of TBAP was carried out by R.L. Allen, R.F. Francis and J.A. Wetherall in 1983 which found that the procedures and analytical techniques used by the TBAP were sound and in a number of respects better than those previously practiced.

5.31 The program has suffered from the absence of a clear mission statement and mechanism for peer review, as mentioned earlier. The role of the RTMF has not been helpful as it has added to the directional uncertainty of the program and allocation of its resources to activities outside it's main thrust. Again in hindsight it may have been better not to have presented the TBAP for annual approval of the RTMF, rather simply reported on achievements against the 'corporate plan'.

5.32 The program is due to conclude in 1991 and the future of the program is not due to be considered until March 1989. However there have been a number of recent developments that may give new urgency to review, such as the intended new role of the FFA in managing a data base, the reservations of some states regarding co-operation with SPC in data handling, the US Treaty and its data handling provisions and the imminent departure of the most of the TBAP professional staff.

Long Term Research Needs of the Region

5.33 The Terms of Reference suggest a difference between island country needs on the one hand and long term research needs of the region on the other. This presented some difficulty in interpretation, in that the needs of the region, long or short term, should not differ from the needs of the countries of the region.

5.34 The long term research needs of the region would be best served, according to the Shepard/ Fakahau Report by developing the capability of island staff to work at the same level of sophistication as the experts in the regional organisations. As to collection of the necessary information and the particular analyses which should be given priority, they refer to the data base and the stock assessment work of the TBAP. It seems reasonable to suppose, then, that the directions set for the TBAP as contained in the existing list of priorities are reasonably sound as far as long term research needs are concerned.

5.35 Two important long term weaknesses of the TBAP identified in consultations with member countries are the extent to which they involve islanders in the program and limitations on their data coverage which affects the confidence with which pronouncements about the state of the stocks may be made. The question of relationships with island fisheries officers will be taken up in chapter 6 above. The following comments relate to the limited data coverage and how that might be addressed.

5.36 The suggestion is that a major new effort be made to establish a basis for ongoing co-operation between the coastal and the DWF states. The time may now be right to consider a Western Pacific Tuna Management Conference out of which new co-operative directions could emerge. The historic shift in the US position embodied in the recent Treaty and also in moves to establish 150 mile fisheries protection zones around US territories in the Pacific, the now established acceptance by Japan of coastal state fisheries jurisdiction and the coming of age of the FFA as a capable Pacific fisheries management body, taken together, suggest such an initiative might be timely.

5.37 There is the further long term question of whether the TBAP/SPC is the appropriate body for the conduct of long term research in this area. While the question is outside the terms of reference of this study, it is difficult to avoid making some observations. As already noted the TBAP's performance has been called into question in a unmistakable way by the May 1986 decision of the

FFC regarding the data base. In addition the SPC as a large aid/development organisation with a wide range of interests has some disadvantages in regard to the conduct of high level research, as the stream of departing senior scientists would seem to indicate.

5.38 There would appear to be two 'institutional' options; a) Take a decision now to transfer, as soon as practicable, the TBAP activities to another organisation, for example attach it to the University of the South Pacific, Suva, where it would be in a suitable research environment and might be made responsive to the FFC; or b) remain at the SPC on the basis that the recent problems experienced by the program can be corrected by a new senior management approach and a new communication intiative by the TBAP which will restore any lost confidence on the part of member states.

5.39 No clear answer is apparent. Remaining at SPC carries with it the real risk that the loss of momentum that has occurred and will be exacerbated most probably by the staffing problem, may never be satisfactorily regained. If ever there is to be a new beginning, now may be the time. On the other hand it appears to be essential for TBAP to carry on with the data base at least until FFA is capable of assuming the function satisfactorily. This will take at least a year and probably more. If this premise is correct, the most reasonable course would be to continue the existing operation, with some appropriate management reforms, until the March 1989 review.

6. PROBLEM AREAS AND PROPOSALS FOR IMPROVEMENT

6.1 Problems have occurred over the years in relation to SPC and TBAP administration, management of the program, and relationships with member countries.

Administration

6.2 Removal of the special salary structure (para 2.3) gave rise to tensions which never completely disappeared. It does seem that salary reductions are an important factor in the spate of departures of professional staff. As the new salary scales achieve uniformity throughout the whole organisation, it is impractical to suggest a further review at least until such a time as it is demonstrated that recruitment of the right calibre officer is impossible under the new salary arrangements. Whether it will be too late then to retrieve the situation is another question.

6.3 The very limited autonomy of the TPC (para 2.18) is a real problem. He should at least be given some financial delegations and be able to decide whether a piece of work should be submitted for publication in the literature. It is noted his duty statement (para 2.14) refers to a role in this regard.

6.4 Where it is necesesary for management to retain decision making authority, ground rules should be drawn up which would eliminate long internal delays and provide for real input from the TPC. An example of this would be flexibility with the staff establishment to cover important needs. An example given was the refusal to permit recruitment of a programmer against a vacant position which would, it was claimed, have gone a long way to forestalling criticisms of alleged poor service which has aggravated some member states. As will be noted from the table para 2.11 there have been vacancies that could have been used for this purpose.

6.5 Concerning travel, if decisions in this regard are to be retained at upper management level, it would appear some review of travel philosophy may be needed. Both member states and TBAP staff say that program effectiveness is seriously undermined by the fact that TBAP staff are rarely seen outside Noumea.

6.6 It would appear over the last two years there was an accumulation of irritations between the TBAP and senior management about issues referred to in the preceeding three paragraphs. A fresh approach to internal communication should correct most of the problems and it is understood that the current management is committed to making improvements in this regard.

6.7 In regard to increasing TBAP autonomy, a review of administrative arrangements across the board would seem to be necessary to avoid the problem, previously experienced by the TBAP, of working under a special set of rules. In the context of an overall administrative review it is suggested that in-house courses by a time management consultant might be valuable.

6.8 A review of the publications policy, as suggested in para 6.3, should take into account the importance to any research organisation of being able to test its conclusions and the rationale underlying scientists work with their peers throughout the world. This is achieved by submitting articles for publication in the recognised literature. Further, from the point of view of attracting top staff—now particularly important in the light of further salary cuts—ability to be able to publish could well make the difference between recruiting the right person for the job or not.

6.9 Genuine support by top management is essential. TBAP staff felt at times senior management was intent on curbing their activities. Initiatives from within the program, it was claimed, scored a high knockback rate which dampened enthusiasm at both senior and middle professional levels.

6.10 It is considered that the current Program Co-ordinator is uncomfortable with the 'public relations' component of his job. Consideration might be given to the appointment of a Fisheries Director responsible for both the Inshore and Oceanic programs. He would have both the necessary technical background and also the management and public relations skills to communicate the value of programs, attract funds etc, leaving scientists free to concentrate on the work for which they were primarily engaged.

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Management of the Program

6.11 Probably the main failing of the TBAP lies in the area of 'customer relations'. After the high profile style of the Skipjack Survey days, the program entered an analysis phase, but in so doing lost sight of the importance of constant communications with member states. Indeed the more theoretical the work, the greater the effort that should have been devoted to explanation of it's relevance and importance to the island countries. The following practices might be adopted to overcome the communication gap;

- immediate acknowledgement of any complaint or any type of contact reasonably calling for a quick response
- commitment to fixing problems raised by member states
- special alertness to member country dissatisfaction
- preparedness to travel at short notice
- regular Newsletter reports on TBAP work
- publication of a half yearly TBAP report
- avoiding 'red tape' delays by ensuring early and ongoing contact at the working level while official channels are working
- effective explanations of the value of so called 'esoteric' research such as mathematics, modelling
- interesting presentations of work at SPC meetings, particularly at the RTMF
- preparation of briefings and speech notes for senior management to assist in selling the value of the program.

6.12 Greater efforts should have been made to involve islanders in the work of the program. Fellowships in Noumea, taking fisheries officers on visits to Japan, North America etc, involving them in studies, are possible mechanisms. Soliciting such involvement is not desirable, but positive communication of available benefits is reasonable and should evoke interest from fisheries officers. The recommendations of the Shepard/Fakahau report relating to training of island officers are relevant in this regard.

6.13 A revised approach to setting priorities is needed. Initially a 'Mission Statement' should be prepared, as suggested in para 2.7. This should be drafted in consultation with the peer review group (para 2.21) and be submitted to the RTMF. Identification of program priorities should involve careful consultation with member countries. The Shepard/Fakahau suggestion for a special working group for this purpose seems reasonable. Once the Mission Statement is approved it should not be too readily subject to change.

Relationship with Member Countries

6.14 While a great deal of criticism has been levelled at the TBAP for communication failures, it does seem on the other side of the coin, that much greater feedback from countries to the TBAP would be valuable and would not have been unreasonable to expect. Needless to say there are instances when the feedback has been loud and clear but this tends to be the exception rather than the rule.

6.15 The RTMF has not been effective as a steering group. The dynamics of the group militate against initiatives from the floor and decisions are often reached on a compromise or 'no objection basis'. A joint approach by a peer review group and the RTMF as suggested in 2.21 may improve the situation.

SUMMARY OF RECOMMENDATIONS

1. Prepare a 'mission statement' for the program, setting out objectives, strategies and priorities (para 2.7 and 6.13).

2. Establish a peer review group that will not be susceptible to undue influence of the program staff. A 'board of directors' approach is suggested. (para 2.21)

3. SPC consider as a matter of priority the implications of the FFC decision on the FFA data base project. (para 5.11)

4. SPC, by offering the services of the TBAP, extend maximum assistance to the FFA in establishing its data base. (para 5.16)

5. The TBAP data base function continue as at present, at least until the FFA system is satisfactorily established. (para 5.16, 5.39)

6. TBAP make immediate contact, by personal visit, with those states which are seriously disappointed by the perceived failure in adequate provision of information. (para 5.14)

7. The TBAP not be distracted to activities (e.g. artisanal stock assessment) outside its main charter. While the importance of such activities is t nquestioned they should be separately funded. (para 5.25)

8. Investigate new methodologies for stock assessment which rely less on extensive log sheet data from fishing vessels. (para 5.21)

9. Embark on a major new effort to secure co-operation from the DWF nations regarding access to data. Consider convening a conference for this purpose. (para 5.36)

10. Retain the TBAP function at the SPC, with review in March 1989 based on performance in recovering lost ground and in the light of the level of achievement attained by the FFA in data base management. (para 5.39)

11. Give the Program Co-ordinator (or the Fisheries Director, see para 6.10) greater autonomy in regard to financial delegation, scientific publications and staff appointments. (para 6.4)

12. Review travel policies to ensure more time of TBAP staff is spent in the region. (para 6.5)

13. Review internal communications to avoid delays and conflicts that have occurred in the recent past. Consider use of Time Management consultants to help improve staff efficiency. (para 6.6)

14. Review the Scientific Publications Policy bearing in mind value to the organisation of peer review of the program's work. (para 6.8)

15. Ensure TBAP receives positive support from top management. (para 6.9)

16. Consider appointment of a Fisheries Director with responsibilities for all SPC fisheries activities. (para 6.10)

17. Institute a range of measures to improve communication between the TBAP and member states. (para 6.11)

18. Involve islanders in the work of the program to the extent that a full understanding of the work of the program is imparted. (para 6.12)

19. Revise the approach to the setting of program priorities including use of the Review Group and more effective canvassing of island views. (para 6.13)

20. Encourage increased feedback to the TBAP from member governments. (para 6.14)

COUNTRIES AND ORGANISATIONS VISITED

Vanuatu	Mr R. Kaltongga Director, Department of Fisheries
	Dr D. Aaron Second Secretary Agriculture Forests & Fisheries
	Mr R. Stevens Fisheries Adviser, Dept. of Fisheries
Solomon Islands	Mr P. Nichols Senior Fisheries Officer Ministry of Natural Resources
	Miss J. Behulu Ministry of Foreign Affairs
Kiribati	Mr M. Irata Acting Secretary, Nat. Resource Develop.
	Mr B. Onorio Chief Fisheries Officer
	Mr T. Tikai Senior Fisheries Officer
	Mr R. Hastings Fisheries Statistician
	Dr C. Mees Fisheries Research Officer
Marshall Islands	Mr S. Muller Secretary Foreign Affairs
	Mr D. Capelle Secretary Resources and Development
	Mr R. Carpenter Chief Fisheries Officer Resources and Development
FSM	Mr P. Sitan Executive Director Micronesian Maritime Authority
	Mr M. Gawel Chief, Maritime Resources Dept. of Resource and Development
	Mr J. Movick Deputy Chief, Multilateral Affairs Dept. of External Affairs
	Mr I. Akapito Deputy Chief, South Pacific Dept. of External Affairs

Western Samoa	Mr U. Faasili Chief Fisheries Officer Dept. of Ag. Forests and Fisheries
	Miss T. Hellesoe Head, Pacific Division Ministry of Foreign Affairs
	Mr M. McCoy Fisheries Adviser Dept. of Ag. Forests and Fisheries
American Samoa	Mr R. Tulafono Director Office of Marine and Wildlife Resource
	Mr W. Emmsley Deputy Director Office of Marine and Wildlife Resource
Tonga	Mr S. Fakahau Principal Fisheries Officer Min. of Ag. Fisheries and Forests
Fiji	Mr T. Caviluati Chief Fisheries Officer Ministry of Primary Industries
	Mr T. Lewis Principal Fisheries Officer Ministry of Primary Industries
PNG	Mr L. Aitsi Acting First Assistant Secretary Dept. of Fisheries and Marine Resources
	Mr L. Rodwell Acting Chief Planner
	Mr N. Omeri Chief Resource Development Officer
	Mr J. Oponai Chief Biologist
	Mr L. Aisi Executive Officer
	Mrs A. Kali Head, Economic Relations Branch Department of Foreign Affairs
	Miss L. Bogari Mutual Assistance Branch Dept. of Foreign Affairs
ORSTOM, Noumea	Dr R. Grandperrin Director, Research
FFA, Honiara	Mr P. Muller Director
	Mr L. Clarke Deputy Director
	Mr C. Wilkinson Statistician

U.S. Agency for International Development, Suva	Mr W. Paupe Senior Representative, Suva
	Mr R. Nishihara Agriculture Development Officer
South Pacific Commission	Mr P. Tuiososopo Secretary General
	Mr T. Pierre Director of Programs (to Jan. 1987)
	Mr J. Jonassen Director of Programs (from Jan. 1987)
	Mme H. Courte Deputy Director of Programs
	Dr J. Sibert Tuna Program Co-ordinator
	Dr R. Hilborn Senior Fisheries Scientist
	Mr B. Smith Fisheries Adviser
	Mr J. Ianelli Fisheries Research Scientist
	Mr R. Farman Fisheries Research Scientist
	Mr B. Moore Assistant Fisheries Statistician

LIST OF ABBREVIATIONS

ALB	Albacore
ATA	American Tunaboat Owners' Association
BET	Bigeye Tuna
B-F	Billfish
BFT	Bluefin Tuna
CPUE	Catch per Unit Effort
CRGA	Committee of Representatives of Governments and Administrations
DWFN	Distant Water Fishing Nation
FAD	Fish Aggregating Device
FFA	Forum Fisheries Agency
FFC	Forum Fisheries Committee
FSTATS	Fisheries Statistician
LL	Longline
ORSTOM	Office de la recherche scientifique et technique outre-mer
PL	Pole and Line
PS	Purse Seine
PFO	Principal Fisheries Officer
RTMF	Regional Technical Meeting on Fisheries
SJT	Skipjack Tuna
SPC	South Pacific Commission
SSAP	Skipjack Survey and Assessment Program
TBAP	Tuna and Billfish Assessment Program
TPC	Tuna Program Co-ordinator
USP	University of the South Pacific
YFT	Yellowfin Tuna

EVALUATION OF THE TUNA AND BILLFISH ASSESSMENT PROGRAMME OF THE SOUTH PACIFIC COMMISSION: PHASE II

by
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Ministry of Agriculture and Fisheries
Fiji

Noumea, July 1987

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SUMMARY OF RECOMMENDATIONS

Work Programme

1. A mission statement be prepared for the TBAP setting out its goals and scope of operation.

2. A work programme with specific objectives be prepared for the TBAP. This programme should have a time scale and expected output, and the relationship of its objectives to the mission statement should be clearly indicated.

3. SPC consult urgently with FFA and member countries to resolve the likely duplication of effort concerning the collection and processing of tuna log sheet data resulting from the Forum Fisheries Committee decision to establish a data base at FFA, and to define the roles of the two data bases.

4. A Fisheries Co-ordinator responsible for all SPC activities in fisheries, including the TBAP, be appointed.

5. Responsibility for priority activity 7 (dealing with artisanal statistics) be transferred from the TBAP to the inshore research project of SPC.

6. Responsibility for priority activity 8 (dealing with training) be transferred from the TBAP to the SPC Fisheries Training Officer.

7. The work programme and priority activities of the TBAP be set by the RTMF.

8. A scientific committee on tuna be appointed to act as a technical review body to the TBAP and assist it in its work.

Information services and communications

9. SPC review its policy on publications of the TBAP and permit publication of scientific results in outside journals where appropriate.

10. Summaries be produced in non-technical language of all major TBAP scientific reports.

11. Following important work done on behalf of countries and on publication of the report, the TBAP staff member responsible visit the country concerned to discuss the results with government officials.

12. The SPC Fisheries Co-ordinator make regular visits to member countries to ascertain their needs and discuss ways in which the SPC fisheries programmes can assist them.

Staffing and finance

13. Staffing requirements of the TBAP be reviewed taking into account planned future activities and any reorganisation of SPC fisheries projects as a whole. In this review new job descriptions should be prepared for each post relating each of them to the priority activities of the TBAP.

14. Consideration be given to appointing TBAP staff on contracts of 3 years.

15. Provision of funds for attachment fellowships to the TBAP be made as a regular part of its budget.

16. Sufficient funds be allocated from the SPC budget to meet the cost of the core functions of the TBAP for its scheduled duration.

17. Increased funds be allocated within the TBAP budget for travel by Programme staff.

EVALUATION OF THE TUNA AND BILLFISH ASSESSMENT PROGRAMME OF THE SOUTH PACIFIC COMMISSION : PHASE II

1. PROCEDURE

1.1 Introduction

1.1.1 The evaluation of the Tuna and Billfish Assessment Programme (TBAP) was requested by the 1986 Committee of Representatives of Governments and Administrations (CRGA) of the South Pacific Commission (SPC) and approved by the South Pacific Conference of that year.

1.1.2 This evaluation was carried out by Mr T.B. Curtin in early 1987 and the report of his study was considered by the May 1987 CRGA.

1.1.3 Due to time constraints Mr Curtin was not able to visit all Pacific Island countries which are members of SPC. On receiving his report the 1987 CRGA directed SPC to extend the study to include those countries not previously covered.

1.1.4 This report covers the second phase of the evaluation of the TBAP.

1.2 Terms of Reference

1.2.1 The terms of reference for the second phase were identical to those for the Curtin report, namely:

(1) Evaluate the Programme as a whole, as well as its various activities and assess how these activities have met with island country aspirations and Programme priorities.

(2) Assess whether the Programme priorities meet island country needs on the one hand and the long term research needs of the region on the other.

(3) Given (1) and (2) above, assess the efficiency and effectiveness of Programme staff in carrying out project activities and comment on the adequacy of Programme staff, division of duties and working methodologies.

(4) Identify problem areas and make proposals for improvement.

1.3 Consultants

1.3.1 The consultants for the second phase of the evaluation were Mr James Crossland, a private fisheries consultant from Auckland, New Zealand and Mr S.T. Cavuilati, Chief Fisheries Officer, Fisheries Division, Fiji.

1.4 Timing and scope

1.4.1 Mr Crossland commenced the study on 20 June and was joined by Mr Cavuilati on 8 July. Field work was completed on 24 July and the week following was spent finalising the report which was to be tabled at the Regional Technical Meeting on Fisheries (RTMF) beginning at SPC headquarters on 3 August 1987.

1.4.2 Countries consulted and visited during the second phase were: New Caledonia, French Polynesia, Cook Islands, Tuvalu, Northern Marianas, Guam, Palau and Nauru. The views were sought of representatives of Pitcairn Islands, Wallis and Futuna, Tokelau and Niue. Taking advantage of travel routes which passed through countries visited during the first phase, informal discussions were held in Western Samoa and Marshall Islands.

1.4.3 Discussions were also held with staff from the Forum Fisheries Agency (FFA), the regional fisheries programme of the Food and Agriculture Organization (FAO) and the Office de la recherche scientifique et technique outre-mer (ORSTOM).

1.4.4 A list of persons consulted is given in Appendix 1.

2. EVALUATION

2.1 Introduction

2.1.1 The origins of the TBAP and the evolution of its work programme have been well described in the Curtin report and will not be repeated in detail here. However, because they will frequently be referred to in this study, the current list of TBAP activities is given below.

(1) Collection and evaluation of fisheries data and maintenance of the regional oceanic fisheries assessment data base.

(2) Assessment of interaction between fisheries for oceanic species.

(3) Assessment and monitoring of the levels of exploitation of stocks of commercially important tuna and billfish species.

(4) Studies on the biology and ecology of commercially important tuna, billfish and bait species.

(5) Provision of fisheries observers and advice on development of observer programmes.

(6) Monitoring the use of fish aggregating devices.

(7) Provision of assistance to countries in the implementation of appropriate systems to monitor artisanal and subsistence fisheries.

(8) Provision of assistance to countries in training fisheries biologists in various aspects of quantitative fisheries methods.

2.1.2 This section of the report begins with the activities of the TBAP, follows on with its operation and management. Section 3 concludes the evaluation with the views and aspirations of island member countries. This sequence does not imply that any one part is more important than another but follows the order in which the study was conducted. It was also necessary to prepare parts of the report along the way because of the tight schedule to have it complete in time for the RTMF beginning on 3 August 1987.

2.2 Publications

2.2.1 One way of looking at the performance of the TBAP is through an evaluation of its written output. This is of course only one aspect of the Programme's work, but it is a useful starting point.

2.2.2 The full list of publications and other documents produced by the TBAP from its beginning up to June 1987 is given in Appendix 2. Publications total 106 and are summarised by type in Table 1.

TABLE 1. Publications and other documents produced by the Tuna and Billfish Assessment Programme, 1981–June 1987.

Final country reports (SSAP)	20
Technical reports	17
Working papers (RTMF)	31
Conference papers	18
Fisheries Newsletter articles	9
Handbooks	3
Other articles	8
TOTAL	106
Internal reports (TBAP)	9
Unpublished country reports	8

2.2.3 By any measure the publication output by the TBAP is a major achievement. The documents cover a wide range of topics from purely scientific to records of the Programme's activities. An outstanding feature of the TBAP is the meticulous attention to detail in its reports and the full descriptions of its methods.

2.2.4 The first major task of the TBAP was to prepare the 20 final country reports relating to the work of the Skipjack Survey and Assessment Programme (SSAP). Bearing in mind the magnitude of the task, their production over a three year period is timely. Each document contains within its covers the fullest and most up-to-date record of information on skipjack and baitfish in the country concerned at that time. The amount of this information varies greatly from country to country, depending not only on the amount of time spent there, but also the state of development of the fishery. Having made the commitment to visit every SPC country it was inevitable that for some the results which could be reported would be meagre.

2.2.5 It has been observed that some countries have been disappointed in these reports because they did not provide the hard figures on how much skipjack was in their zones, or how much could be harvested. This can in part be put down to a misconception of what the SSAP could achieve and a failure in communicating what output was possible, and what was not. In addition, there appears to have been little attempt made by the TBAP to visit countries when their reports were published to explain the results in detail to government officials.

2.2.6 The technical report series contains the most important of the scientific work of the TBAP. For example, Technical Report No.8 contains the overall assessment of skipjack stocks in the Pacific. It uses mathematical symbols to develop a model to estimate standing stock, fishing rate, attrition rate, and a number of other factors. Only through the use of the model could the huge accumulation of data from the tagging programme be used to provide the actual numbers. This report and others with a strong scientific content were sent to outside experts for comment before publication. This effort by TBAP staff to check the soundness of their scientific work is to be commended.

2.2.7 There has been criticism from countries concerning documents containing mathematical models. It is the consultants' view that this is unfair to TBAP staff. It is considered that future criticism of this kind could be avoided through a revised publications policy. This is discussed in more detail in 4.7.

2.2.8 Other documents of the TBAP are concerned with information about the Programme and items of general interest (working papers at meetings, conference papers and Fisheries Newsletter articles). It is pleasing to note that TBAP staff have increased their contribution to the Fisheries Newsletter in recent issues. The working papers prepared for the 1987 RTMF contain a detailed account of TBAP activities during the previous year and valuable analysis on the present state of tuna stocks and their fisheries in the region.

2.2.9 From this brief review it is clear that the Programme has made consistently strong efforts to write up its results and to publicise its activities to member countries and elsewhere. Some further evaluation of the TBAP written output in relation to its list of activities is given in 2.3.42 - 2.3.46 below.

2.3 Priority activities

2.3.1 The analysis carried out by Curtin showed that 52% of Programme effort was spent on the data base. If the balance were equally divided amongst the seven other activities this would only allow 7% for each. As some activities are considered significantly more important that others they are allocated more effort. It does not necessarily follow that only a token effort is being made on the lower priority activities because they receive 3 or 4% of TBAP effort. What should be of more concern is the number of vacancies in the Programme, the high turnover of staff, and the effect this has on the total effort.

Data base

2.3.2 The establishment of a regional data base was the first priority of the TBAP since its beginning in 1981. The maintenance, operation and improvement of the data base has continued to constitute the Programme's core function.

2.3.3 The setting up of the data base proved to be a much larger task and to be more difficult than was anticipated. Early work was carried out by TBAP staff not specifically trained in this specialised field, and as a result some of its systems were unsatisfactory. Any major development on this scale supported by limited resources can expect to encounter problems in its early stages and it would be unreasonable to expect otherwise. Because of these difficulties it was not easy to alter programs to accept different kinds of data, and in addition many dirty data were entered into the system.

2.3.4 It is easy to be critical with hindsight of the way the system was set up but this is unduly hard on Programme staff of that time. Furthermore, at the same time as the data base was being established, the TBAP was under heavy pressure to complete the final country reports and the scientific findings of the SSAP.

2.3.5 Recently the data base capability has been significantly upgraded with the installation of a new computer system. Major efforts have been made to clean up the data, which are reported to be much improved.

2.3.6 Problems of achieving full coverage of tuna catches in the region continue, and there are major gaps in the data from distant water fishing nations (DWFNs). The SPC as a non-political organisation has limited power to improve this situation.

2.3.7 The TBAP relies on member countries sending in the regionally uniform log sheets. Out of 23 island member countries log sheets have been received from 12 of them. Not all of the others have statistics to record, but some have collected data which have not been forwarded to SPC. When the decision to set up the data base was made it was agreed that all countries would forward the standard regional log sheets to SPC for processing. Whether all who agreed to do so had the power to do this or had considered the full implications is not clear.

2.3.8 The proposal for the FFA to establish its own data base which was approved by the 1986 Forum Fisheries Committee has been covered extensively in the Curtin report. We concur that this will result in a major duplication of effort. Such duplication as well as being expensive brings a number of problems. In particular, it is most unlikely that the two data sources will coincide because of differences in collecting data, different sources and data input variation.

2.3.9 To try to resolve this problem it is useful to consider the purposes for which statistics are collected. The principal uses for such data are for management (setting catch levels, etc.), for economic purposes (setting fees, etc.), or for scientific purposes (fisheries or biological research).

2.3.10 Often statistics are collected and used for a mixture of purposes. In the case of the TBAP data base it appears that it was originally set up for scientific purposes and that data from it were later used by states for economic reasons (e.g. during access negotiations). As a result some DWFNs which originally supplied data for a scientific programme now no longer do so.

2.3.11 It would seem preferable to collect statistics firstly for economic purposes and then make them available for research studies. The vessels of countries supplying the data can then be under no illusions concerning their purpose, nor disagree with their subsequent use. At the same time there is no reason why these statistics should not be suitable for research use, particularly if the standard log sheets continue to be used.

2.3.12 When collected for economic or regulatory purposes the statistics in most cases will be required under a bilateral access agreement or the multilateral treaty recently signed between FFA states and the U.S. In such cases the supply of statistics will be obligatory and the state or agency collecting them will have considerable leverage in ensuring that they are supplied, and in consequence they will be more comprehensive than those presently supplied to SPC.

2.3.13 It has been impossible to carry out the evaluation of the TBAP data base without also considering the effects on it of the new data base proposed for FFA. A solution to the duplication of effort, which appears to be imminent, is vital. This matter is discussed further in 4.3 and possible solutions suggested.

2.3.14 We would not like to conclude the review of the data base activity without recording that we consider that its establishment and operation, despite some difficulties, has been a major achievement of the TBAP.

Fisheries interactions

2.3.15 An important reason for giving this activity first priority after the data base at the inception of the TBAP was because it was thought the interaction between the rapidly developing purse seine fishery for skipjack and the traditional pole-and-line fishery could be detrimental to the latter, and possibly also to artisanal fisheries.

2.3.16 The continued decline in the share of the skipjack catch taken by pole-and-line and rise in catches by purse seiners because of their greater efficiency and economy has reduced the need for this work. This conclusion was also affected by the findings that the skipjack population was very large and that the proportion taken by fishing was only a small part of the total attrition.

2.3.17 Never explicitly stated as one of the original 13 priorities of the TBAP but nevertheless studied was the possible interaction between skipjack fisheries in different countries or areas.

2.3.18 The finding that the proportion of skipjack which made long distance movements was small and that there was only limited mixing between areas showed that national fisheries, particularly in countries with large EEZs, were largely independent of one another.

2.3.19 These conclusions, which now seem to be taken for granted, were at the time a major breakthrough in knowledge on the biology and fisheries for skipjack.

2.3.20 Interactions between surface and longline fisheries for yellowfin has received some study through analysis of catch statistics. Results so far are inconclusive, although not indicating cause for alarm. Significant progress cannot be expected until the proposed tagging programme has been started. The theoretical work on interactions reported in Technical Report No.13 has proved valuable in the planning for this activity.

2.3.21 During the past 18 months exploratory troll fishing for albacore on the southern fringes of the SPC area has shown promising results. It is possible a significant fishery may develop and interactions with existing longline fisheries may occur. The TBAP organised a workshop on southern albacore in June 1986, and amongst other agreed activities, the above situation is being monitored.

Stock assessment and fishing levels

2.3.22 It is assumed because of work done by the TBAP that the third priority activity includes assessment of stocks as well as the level of their exploitation, although the wording for this activity (see 2.1.1) does not indicate so.

2.3.23 The assessment of skipjack stock size and its level of exploitation have already been covered in this report. A similar assessment for yellowfin from SSAP tag data was not possible because of the low number of fish tagged and few returns. However, TBAP staff have continued to work on this subject through data analysis and monitoring of fishing activities. A summary of TBAP conclusions on yellowfin (and skipjack) is given in the paper "Is international management of tuna necessary?" by R. Hilborn and J. Sibert (no.72 in Appendix 2). The authors consider that under current economic conditions unregulated fisheries will not overexploit skipjack, nor seriously overexploit yellowfin. While these conclusions may well be correct there does not appear to be much data on yellowfin, and this is an area requiring further work. However, it is noted in this respect that the future tagging programme does not specifically include amongst its objectives stock assessment for yellowfin or exploitation rate estimates.

2.3.24 TBAP staff, while noting that data coverage is incomplete and that it has so far not been possible to validate the accuracy of log sheets, appear not to give much weight to these factors when making their assessments.

2.3.25 In the case of albacore the TBAP has only recently begun to include directed studies on this species in its work programme. The workshop convened by the TBAP is to be commended for its timeliness although it was largely at the prompting of member countries. The future role of the TBAP is presently seen as low key coordination of field work carried out by other organisations. In view of the need to study tunas on a regional basis and the importance of albacore fisheries to many SPC member countries (an importance which is increasing), a more decisive role would appear to be needed, as well as a stepped-up research effort.

Biological studies

2.3.26 Early work by the TBAP was outstanding in providing major increases in knowledge on the biology of skipjack. Much valuable work was also done on baitfish, including the production of a detailed handbook on baitfish species of the region. This is likely to remain a standard reference for many years.

2.3.27 Most of the TBAP's biological work has derived from data collected by the SSAP. Since these results have been written up the lack of a new field programme has reduced its output under this heading.

2.3.28 However, several studies have been carried out on baitfish following specific country requests. Not all of this work has been biological but has involved development of fishing techniques and statistical services. This form of assistance has proved of much practical value.

2.3.29 Current biological studies on tuna concern the relationship between tuna concentrations and oceanographic and environmental factors, but no results have so far been published. Bearing in mind that most tuna are caught by purse seiners fishing around floating objects, it is difficult to see the practical value of this work.

2.3.30 Biological studies on billfish have not been undertaken by the TBAP.

Fisheries observers and observer programmes

2.3.31 This activity is one in which much useful work has been done, and which has been well received by member countries.

2.3.32 TBAP staff have made observer trips on purse seiners from the US and Japan and a longliner from Tonga. These trips have enabled the TBAP to make direct biological observations on tunas and billfishes, and on vessel and fishing gear operation. Such information is a valuable additional tool when making scientific assessments and planning data collection through log sheets.

2.3.33 The TBAP has also organised observer training and produced a detailed observers handbook. This activity has been useful to member countries in training staff for the monitoring of fishing activities, validation of log sheets and collecting scientific data. In this activity the TBAP has collaborated closely with FFA as many aspects of an observer programme relate to enforcement and other activities not falling within the scope of a scientific programme.

FAD studies

2.3.34 There appears to be some confusion about the work to be undertaken in regard to this activity – whether it involves research or monitoring, a study of fish in relation to FADs or of the devices themselves. This may explain why minimal progress has been made.

2.3.35 A proposal for a FAD study was made to the 1985 RTMF but has not proceeded. A new draft proposal has since been prepared and is awaiting action. A small number of skipjack and yellowfin were tagged around a FAD in Kiribati by a TBAP scientist during 1987. This was apparently on an opportunistic basis.

2.3.36 FADs are very important to tuna fisheries in the SPC region – nearly all purse seine sets are made around floating objects and they are vital to many artisanal fishermen. The lack of positive action under this activity is disappointing, although the reasons for this may not all be under the control of the TBAP, including the fact that it has a wide ranging programme and several staff vacancies.

Monitoring artisanal fisheries

Training in quantitative methods

2.3.37 The last two priority activities will be treated together because they overlap in many areas, and neither activity relates directly to a tuna and billfish programme. These activities were included at the request of member countries which considered that the TBAP as a whole lacked output with practical application to their own fisheries needs. The 1986 RTMF recommended that these activities be transferred to the proposed inshore fisheries research project.

2.3.38 A considerable number of requests for assistance with artisanal statistics have been received and several field visits made by TBAP staff. There appears to be considerable demand for these services which are not being fully satisfied.

2.3.39 In training the TBAP has achieved a useful output, conducting two training courses on statistics and a workshop on stock evaluation. Parts of the observer training course also relate to this activity.

2.3.40 Fisheries staff from island countries have received attachment training with the TBAP, sometimes working on data brought with them and relating to their own fisheries. This training is considered valuable both for the skills transferred and for providing an insight to the work of the TBAP.

2.3.41 Considering that TBAP staff were not recruited for the specific activities under this heading they have performed creditably.

Publications relating to TBAP activities

2.3.42 In concluding the evaluation of TBAP activities an analysis of its written output is given in Table 2, which categorises this in relation to the list of priority activities. An additional three categories have been included to cover publications not directly attributable to separate activities.

2.3.43 The number of publications in each category partly reflects the historical evolution of the Programme. Activities recently added are under-represented. Despite these limitations, several observations can be made from the table.

2.3.44 Publications on the data base are almost entirely descriptive: its main output is provided on a bilateral basis in the form of data summaries. A summary of output for 1985 and 1986 is given in Table 3.

2.3.45 Most publications occur in the categories stock assessment, and biology. The biology category was subdivided into tuna and baitfish. There were no publications relating to billfish.

2.3.46 The number of publications on fisheries interactions are few, although important work has been done. Until further field work (such as the planned tagging programme) much additional output cannot be expected. A similar situation applies to the FAD category.

TABLE 2. Publications and articles of the TBAP in relation to its work programme and priority list of activities.

Category or activity	*Publication number**
Data base	7,20,25,26,39,48,50,51,59,80,82
Fisheries interactions	10,44,46,64
Assessment	15,16,19,23,24,27,30,34,36,55,63,67,68,75,76
Biology - tuna	1,9,10,11,12,21,27,28,38,45,71
- baitfish	2,6,13,14,23,24,37,52,53,84
Observers	42,67,69,70,85,86
FADs	65
Artisanal statistics	(several country reports, not published)
Training	58,77
TBAP	4,8,17,22,33,40,47,49,61,62,66,79,81
Tuna fisheries (general)	3,5,18,31,32,35,41,43,56,57,60,72,73,78,83
Other	29,54,77

Notes: This table does not include the 20 final country reports.
Publications may occur under more than one category.

* Refer to Appendix 2 for list of publications.

TABLE 3. Output from the data base of TBAP on behalf of individual countries, 1985 and 1986.

		TYPE OF SUMMARY			
Country	*Gear Type*	*Catch/ Effort*	*Trip*	*Port*	*Map Sets*
New Caledonia	LL	9	8	2	2
	PL	9	8	1	
Cook Islands	LL	4	4	1	1
Fiji	LL	7	7	2	1
	PL	4	4	1	
	PS	5	5	1	1
FSM	LL	8	10	2	2
	PL	6	7	1	2
	PS	22	22	7	4
Kiribati	LL	6		3	3
	PL	8		4	5
Marshall Islands	LL	5		1	2
	PL	5	4	1	2
	PS	6	5	1	
Palau	LL	7	8	2	3
	PL	4	4	1	
	PS	4	4	1	2
Papua New Guinea	LL	6	4	1	
	PL	5	5	1	
	PS	48	43	11	
Solomon Islands	LL	21	22	8	1
	PL	4	4	1	
Tonga	LL	5	5	1	
Tuvalu	LL	7	7	2	
Vanuatu	LL	4	4	1	1
TOTALS		219	215	58	37

LL longline
PL pole-and-line
PS purse-seine

50x

Overview of TBAP activities

2.3.47 The TBAP followed on from the high profile SSAP with its major programme of field activities which included visits to every country in the SPC area. In comparison, the work programme of the TBAP has been less glamorous, but nevertheless important in different ways.

2.3.48 The knowledge and skills developed within the TBAP represent a repository of expertise available to the region which no individual country could provide for itself. This has enabled research into topics which would otherwise be impossible, and has made the results available to all countries. Unfortunately, as will be discussed in the next section, much of this expertise is being lost to the region because deterioration in the conditions of service for TBAP staff has caused a number of them to leave the Programme.

2.3.49 The major achievements of the TBAP have been the final country reports and analysis of tagging data, and the establishment of the data base.

2.3.50 While other parts of the Programme have individually been well carried out, there has been little achieved in the way of new research initiatives. The TBAP has latterly tended to drift along collecting few new data or making scientific advances.

2.3.51 The lack of a major field programme has been a major disappointment because new knowledge cannot be achieved without research data. This has also tended to isolate the TBAP from member countries and their needs. To try to remedy this situation activities have been added to its work programme which are not compatible with its original aims.

2.4 Staffing, operation and management

2.4.1 Since its beginnings the TBAP has been able to recruit high calibre, dedicated staff. In recent times the Programme has not been able to retain these staff; there is serious doubt that it will be able to recruit at its previous high levels in the future.

2.4.2 There are 15 positions in the TBAP (Table 4) of which 11 are at the professional level and 4 are support staff. Out of the 11 professional positions, 6 are currently vacant (July 1987). One of these vacancies is covered by a consultant on attachment from ORSTOM. One of the positions has been vacant for 5 years and another for more than 3 years.

2.4.3 Various reasons have been put forward as to why some positions have been vacant for long periods; these include lack of active recruitment and the use of salary savings to pay for equipment. One of the vacant positions will be transferred to the inshore fisheries research project.

2.4.4 During 1987 two senior staff have left 22 months and 16 months respectively before the end of their contracts. The Programme Co-ordinator will be leaving during August 1987, 14 months before his contract expires.

TABLE 4. Staff of the TBAP, July 1987.

Designation of Established Position	*Grade*	*Post Status*	*Needed 1987*	*Contract Expires*	*Salary CFP Francs Per Month*	*Name*
Co-ordinator	P Special	Filled	Yes	30.09.88	559324	Dr J.R. Sibert
				(Departing Aug. 1987)		
Senior Fisheries Scientist	P1	Vacant	Yes	(Last occupied May 1987 by Consultant)		
Senior Fisheries Scientist	P1	Vacant	Yes	(Last occupied March 1987)		
Senior Fisheries Scientist	P1	Vacant		(Last occupied in 1984)		
Fisheries Statistician	P1	Vacant	Yes	(Last occupied Nov. 1986)		
Research Scientist	P2	Filled	Yes	08.02.88	334151	Mr J. Ianelli
Research Scientist	P2	Vacant		(Last occupied in 1982)		
Research Scientist	P3	Filled	Yes	30.09.88	339625	Mr R.S. Farman
Assistant Fisheries Statistician	P2	Vacant	Yes	(Last occupied May 1987)		
Computer Systems Manager	P2	Filled	Yes	23.06.89	316651	Mr J. Stander
Programmer Research Assistant	P4	Filled	Yes	17.01.89	259982	Mr S. Taufao
Research Project Assistant	AT4	Filled	Yes	30.09.88	193651	Ms V. van Kouwen
Data Entry Technician	AT5	Filled	Yes	30.01.88	144228	Mlle H. Hnepeune
Data Entry Technician	AT6	Vacant	Yes			
Programme Secretary	S3	Filled	Yes	04.01.89	182294	Mme H. Wolfgramm

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2.4.5 One of the support staff positions (data entry technician) is also vacant. This is an area where current workload is heavy.

2.4.6 The above situation is indicative of serious problems which have affected the ability of the TBAP to carry out its functions as effectively as it would have liked and to meet the requirements of SPC member countries.

2.4.7 Discussions with present and past staff have revealed a long list of problems which they see as contributing to this situation.

2.4.8 Within the TBAP there is seen to be a lack of leadership and direction, little team work and poor communications between staff.

2.4.9 Difficulties with the management structure of SPC and lack of support by past management have been repeatedly cited as contributing problems. These include: uncertainty about the budget; lack of delegation for financial and travel planning; lack of support staff; no continuity of employment or notice of contract renewal; publication of scientific papers outside SPC not permitted; reduction in salaries and downgrading of senior positions.

2.4.10 Another significant problem area is seen as being a lack of understanding of the long term research role of the TBAP within a large organisation whose main role is development and technical assistance and not research.

2.4.11 It is considered that several of the problems referred to above are real and have worsened during the latter years of the Programme. The cumulative effect is now such that the TBAP faces a crisis of confidence, both within itself, and as will be discussed in the next section, in the eyes of a number of the countries it serves.

3. ISLAND COUNTRY ASPIRATIONS AND NEEDS

3.1 Introduction

3.1.1 The countries visited during this study have been listed in section 1.4. None of them has a large domestic tuna fishery and only a few have significant DWFN activity within their zones. The views recorded in this section apply to the countries visited, which may not be representative of the full SPC membership. However, they are generally in agreement with those reported in phase one.

3.1.2 The aspirations and needs of island countries and how they have changed since the TBAP began its work have been fully described in the Curtin report. Findings during the second phase of the evaluation concur with his conclusions. In particular, the evolution from a generalised interest in stock assessment and fisheries interactions into the need for practical, development-oriented activities was apparent.

3.1.3 A difficulty encountered during the field studies was that not all of the countries were regular users of TBAP services or aware of the extent of its work programme. Some of them were therefore not able to comment in detail on the list of priority activities.

3.1.4 In a few cases countries had had almost no contact with the TBAP and had attended the RTMF only rarely in recent years. Despite this lack of contact, the consultants' visit revealed that there was an interest in the Programme and identified areas where its services were required.

3.1.5 Country views were obtained through interviews and question sessions. These covered not only the priority activities of the TBAP but also related issues on which countries may have had a strong interest. This sometimes included the full range of SPC fisheries activities. Views varied from country to country. Sometimes this variation was large resulting from different aspirations and the wide range of country size and level of economic development. In all cases government representatives were frank and helpful in putting their views across.

3.2 Operation of the data base

3.2.1 Out of 12 countries officially covered in this evaluation only 4 were supplying log sheets to the data base (Cook Islands, New Caledonia, Palau and Tuvalu).

3.2.2 Some of the countries viewed the data base from the perspective of its long term use for the scientific analysis of historical catches and stock assessment. Others viewed it as a source of information for economic or development purposes. One country mentioned the requirement under its fisheries law to monitor catches so that they did not overexploit the stocks, and the need for the data base to provide the figures which would be used in this analysis.

3.2.3 In the countries where US tuna policy applies no licencing of tuna vessels had taken place and no recording of catches is required. Despite this, the need was seen for a regional data base and the supplying of data to it was considered desirable.

3.2.4 The performance of the TBAP in handling the log sheet data and providing summaries and other analyses was considered satisfactory by two of the countries supplying data. The other two countries expressed disappointment about the timeliness of data summaries received but otherwise were happy with the quality of the output from it.

3.2.5 Further enquiries revealed that there were sometimes delays in despatching log sheets from countries; postal delays were another factor affecting timeliness. It also became apparent that there was a lack of knowledge on the amount of time which normally could be expected in log sheet processing.

3.2.6 The question of possible data duplication and whether the processing of log sheets should be transferred to FFA was commented on by most countries. There was a wide appreciation of the different purposes for which the data could be used - economic or scientific - and how this would affect the choice of location of initial processing.

3.2.7 Two countries felt that log sheets should be handled firstly by FFA; two considered that they should continue to be sent to the TBAP (one of these was strongly opposed to any move of the data base function to FFA). Three countries considered that the log sheets could go to either the TBAP or FFA (with full exchange of data) and the remaining countries had no view.

3.2.8 One non-Forum country felt that it would be severely disadvantaged if the data base were transferred to FFA. However, this country had supplied no data to the TBAP and had made little use of its services.

3.2.9 In another country the agency responsible for collecting log sheet data expressed the view that these were collected by its own scientists and that it was unreasonable to expect the results of their work to be handed over to another organisation (in fact no log sheets had been received from this source).

3.2.10 One important result from the country visits was that three countries which had not been involved with the data base previously indicated that they had data which they wished to contribute; another country already supplying log sheet data had historical landings data which could be added to the data base.

3.3 Fisheries interactions and stock assessment

3.3.1 Interest in these two TBAP activities is still paramount in the majority of countries visited.

3.3.2 Of particular importance are the effects of large-scale commercial fishing (purse seining was most frequently mentioned) on small-scale fishing at the artisanal, subsistence and recreational levels.

3.3.3 Although no data were produced to substantiate their arguments, two countries strongly felt that based on observations and reports from local fishermen depletion of stocks had occurred in their waters.

3.3.4 In another country fears were expressed of deleterious interactions even though no licensed tuna fishing was authorised in its waters.

3.3.5 In general, although countries were concerned about interactions they had received little or no information that was practically useful on this matter. The complexity of possible interactions was recognised, but the difficulty of providing a quantitative measure of them was not often appreciated.

3.3.6 Concerning stock assessment, countries were generally aware of the estimate of the stock size of skipjack for the whole region, but not of the extent of the resources in their own zones. Three countries expressed disappointment at not receiving in their final country reports hard figures on resource sizes and potential catch levels. The expectation that these figures would result from the SSAP tagging programme and have not, was identified as a reason for disenchantment with the TBAP, when it succeeded the SSAP.

3.3.7 Much has been written and is known about skipjack following the completion of the data analysis from the SSAP. However, little is perceived as being known about yellowfin, albacore or billfishes. Almost all countries visited had a collective desire to see further work done on stock assessment and monitoring the levels of exploitation of these stocks.

3.3.8 Particular mention was made of the need for information on billfish from four countries. This need encompassed both basic biology and exploitation levels.

3.3.9 The absence of an active field programme was highlighted by one country as a reason for the current lack lustre performance of the TBAP. Another country recalled with appreciation its involvement with field work during the SSAP and expressed the wish to be involved again when new field programmes begin.

3.3.10 Little mention was made by countries of stock assessments and catch levels produced by the TBAP from its data base. These are frequently presented at the RTMF in the review of the Programme's activities for the past year. As previously mentioned, not all countries have regularly attended this meeting which has undoubtedly contributed to this information gap.

3.4 Other priority activities

3.4.1 As mentioned in 3.1.3, some countries were not aware in detail of the TBAP's priority activities. This has not necessarily arisen because the activities are not relevant but may be due to a lack of communication. This matter will be taken up in the next section (3.5).

3.4.2 Knowledge of TBAP work on the biology and ecology of commercially important tuna and billfishes was scanty. However, two countries were appreciative of the Programme's involvement in their baitfish studies. Another country noted its desire for a baitfish survey to be carried out there.

3.4.3 Studies on billfish biology as already mentioned was another area where work was needed. More information on other by-catch species was identified as necessary by one country.

3.4.4 Of the countries that commented on observer programmes, all agreed on the need for them and their importance as an information gathering mechanism. The lack of suitable staff to undertake observer duties was seen as a barrier to utilising the training and assistance provided by the TBAP. Some concern was also expressed on the limited extent of the TBAP programme and disappointment that it had not included a particular country.

3.4.5 The forthcoming implementation of the multilateral treaty between Forum countries and the US is seen as requiring an increased input to this priority item and close collaboration between the TBAP and FFA.

3.5.6 The study of FADs in general is considered important in the pursuit of increased catches. Four countries commented in some detail on this activity and interest centred on the effective design of devices and the need for an understanding of the schooling behaviour of fish around FADs. The first of these topics was considered the more important. One country was anxious to find out the results of an earlier workshop on FAD construction, while another's programme had been affected by the existence of strong currents within its waters.

3.4.7 Provision of assistance in monitoring artisanal statistics was commented on by four countries. Two of them had used the services of the TBAP in setting up their data collection systems.

3.4.8 Both were appreciative of this assistance. However, one country became disenchanted with a requested follow-up review when this involved what were considered unnecessary procedural complications required by the SPC system.

3.4.9 A third country requested and received technical assistance for monitoring its subsistence fishery through the FAO regional fisheries programme.

3.4.10 A further country requested assistance from the TBAP for statistical advice relating to its research programme on molluscan resources. This request does not appear to be directly related to the TBAP work programme. However, the country concerned looked to the TBAP as its first source of assistance and was strongly disappointed in what it considered was a less than helpful response.

3.4.11 Training in quantitative methods was considered by almost all countries to be an important priority item. A few of the small countries had not participated in the training opportunities offered because they did not have anyone to send to them.

3.4.12 The statistics training course was viewed by one country as being at too low a level, while another considered it too advanced. Other countries were satisfied with its level and content.

3.4.13 Concerns were expressed at the utilisation of courses and workshops co-ordinated or sponsored by SPC, which were felt by one country to have been restricted to Noumea or the southern part of the SPC region. To improve this situation and ensure fuller participation by its own sub-region, the country concerned was prepared to host future courses.

3.5 *Communications and information services*

3.5.1 The outstanding feature of the country visits was the demonstration of the extent of the lack of adequate communication between countries and the TBAP (and other SPC activities). This situation was recorded in country after country.

3.5.2 Responsibility for this situation lies jointly with the TBAP, the SPC system and with countries themselves.

3.5.3 Almost all the countries expressed the need for visits by TBAP staff at least on an annual basis. This is particularly important for small countries where fisheries staff are few. When few staff have many responsibilities they can be reluctant to go through the lengthy procedural channels required for SPC visits.

3.5.4 Attendance at the RTMF has been difficult for some of the countries where the US budgetary system is in force. The end of the fiscal year occurs close to the time when RTMF is held (August). Available funds are frequently exhausted by then.

3.5.5 Several countries compared the contacts made by SPC staff unfavourably with those from other fisheries organisations working in the region (FAO, FFA). Staff from these agencies are seen as readily available when assistance is required, and able to come with a minimum of protocol. These staff also make informal visits to bring countries up-to-date with their activities and discuss country requirements.

3.5.6 In contrast, one country stated that SPC responses were timely and the procedures satisfactory.

3.5.7 The need for TBAP staff to travel to the member countries much more frequently is seen as the major finding of the field studies.

3.5.8 Reports and other documents from the TBAP were generally well received by countries but some criticism was made of the technical nature of research papers. Such documents were not well understood in places where there are no fisheries scientists. Because of this, their relevance was questioned.

3.5.9 It was considered by several countries that technical reports should be summarised into non-technical language and their significance explained in terms understandable to non-scientists.

3.5.10 A repeatedly expressed wish was for TBAP staff to visit countries following the publication of important studies relating to it. Such visits would give the opportunity to go through the results with fisheries and other government personnel.

3.5.11 As a result of such visits, the justification for the TBAP and its cost (which some considered high) could more easily be made at the political level.

3.5.12 The publication of selected research papers in established scientific journals was strongly encouraged by three countries. It was considered that this was appropriate because of the subject matter, and that it could bring international attention to the scientific work of the TBAP.

3.5.13 Problems were commented on in the receipt of communications and documents from SPC. This appears to be a matter for member countries' internal systems to rectify where it occurs. The results of the recent information needs study, which will be reported to the 1987 RTMF, may provide assistance in guiding fisheries staff to better cataloguing and use of printed material.

3.6 Management and personnel matters

3.6.1 All countries which had contact with TBAP staff commented favourably on their expertise and professionalism. In four countries which had peer group scientists, the standards of Programme work were highly commended.

3.6.2 A few negative comments were received about an apparent lack of leadership and drive, particularly in the inability of the TBAP to obtain the funds necessary for the yellowfin tagging programme.

3.6.3 The high rate of staff turnover concerned a number of countries and was blamed as a contributing factor in the TBAP's declining effectiveness.

3.6.4 Some concern was expressed in the reduction in salaries experienced by the TBAP and the downgrading of certain positions. A differing view was that future work by the TBAP may not require as many scientists and that some of its activities could be performed by staff with other qualifications.

3.6.5 It was suggested by one country that a reorganisation of duties and responsibilities within the TBAP and the SPC fisheries programmes as a whole may be a way to realign the situation.

3.6.6 Another suggestion to improve staff conditions was to consider a variable contract length. In cases where field programmes were undertaken, e.g. the proposed yellowfin tagging project which has a time scale of three years, the contract length could be the same as that for the project. This would be contingent on the funding being approved for the same period.

3.6.7 An annual technical revision of the TBAP by a small group of scientists was considered desirable by three countries. This should be carried out prior to the RTMF, and a report submitted to it for consideration. One country offered to provide a member for the scientific review team.

3.6.8 The RTMF itself was not considered to be a suitable forum for the technical review by two countries. One country felt that the RTMF was no longer a purely technical meeting as it used to be, and hoped that every effort would be made to return to its original purpose.

3.7 Benefits of the TBAP and its relevance to country needs

3.7.1 The major benefit of the TBAP to island countries is generally recognised as being the establishment of the regional data base. This frees administrations from the burden of processing and analysing a large amount of data for which they may have neither the computer facilities nor trained staff to handle. Furthermore, the standardised data forms and centralised processing system increases the cost effectiveness of data handling.

3.7.2 This benefit and its relevance to country needs is widely accepted, even by those members not presently providing information to the data base or with no foreign fishing vessels operating in their waters.

3.7.3 Other activities of the TBAP are frequently considered less relevant or practical. Two countries specifically stated that the Programme was not meeting thei. needs. This appears to be due to the way activities are carried out (or not carried out) and the way their results are communicated rather than the lack of relevance of the activities themselves.

3.7.4 From the lack of contact between some countries and the TBAP it could be assumed that there is no interest by these countries in the Programme, and that it is irrelevant to their needs. In a few cases this would appear to be true.

3.7.5 However, because a few countries do not use TBAP services does not make it of less benefit to other countries, or to the region as a whole. As one country spokesman put it, his country was a small player in the tuna game but he could see the importance of the TBAP to those others in which tuna fishing was a major industry.

3.7.6 To conclude this section we would like to record another view, expressed by a senior fisheries officer with scientific training. It was his view that the work of the TBAP forms the basis on which many of the present developments and initiatives in tuna fisheries by island countries have been founded.

4. CONCLUSIONS AND RECOMMENDATIONS

4.1 Introduction

4.1.1 One of the terms of reference for this study was to "identify problem areas and make proposals for improvement". The previous sections have identified a number of problem areas. This section sets out proposals for improvements. During the country visits valuable suggestions were received from many people and a number of them are incorporated here. However, the responsibility for the final conclusions and recommendations remains that of the consultants.

4.1.2 Problem areas have been found in staffing and conditions of service, programme direction, programme content, relationships with member countries, and with management and efficiency. It is considered that improvements are needed in all rather than some of these areas, and the recommendations have been framed to form an integrated package.

4.1.3 The proposals in this section assume that the TBAP will remain at SPC until the end of its present period of operations in October 1991.

4.1.4 Of critical importance in achieving improvements is acceptance of the need for change.

4.2 Long term research needs

4.2.1 The value of long term tuna research is difficult to measure. It is much less obvious than the tangible evidence of development projects, such as vessels, equipment and infrastructure, increased catches or employment. The problem of justification faces many fisheries research programmes, as it does the TBAP. It can be reduced by careful planning of goals, objectives and work programmes.

4.2.2 Country attitudes to the need for long term research appear to be contradictory. On the one hand the quick results of short term projects are desired, and the TBAP has been criticised for not providing them. At the same time none of the countries consulted disputed the need for long term research, and all but one positively recognised its importance.

4.2.3 The reason for this contradiction appears to be the expectation that the TBAP combine research, advisory, training and development functions. It is considered that the principal role of the TBAP should be research, and that the other functions, which are no less important, should be carried out through other parts of the SPC fisheries programme.

4.2.4 The need for long term research is perceived as important because of the value of tuna resources to the region, even if for some countries this value is only a potential one at this time. In addition to acknowledging this research requirement, countries also considered that it should be carried out by an organisation responsive to their needs and representative of all of them.

4.2.5 To assist in defining long term research needs we agree with Curtin that the TBAP should have a mission statement which describes its overall goals.

4.2.6 It has been stated by SPC (CRGA 7 WP.8) that the TBAP already has a mission statement in the form of the project summary which accompanies the TBAP budget proposals as presented to the CRGA. It has been further stated that the TBAP's primary mission is "to conduct biological research". If this is so, then the activities of the Programme do not match its goals since the TBAP's own analysis of staff time shows only 15% is spent on biological research. The compiling and maintenance of a regional data base of fisheries statistics is not conducting biological research (52% of staff time), nor are many of its other activities.

4.2.7 To resolve the above contradiction, which is indicative of confusion in Programme direction, a new mission statement should be prepared for the TBAP. This should be framed to take into account its expected future activities, including any changes which may result from the extensive review procedures, of which this evaluation is part.

4.2.8 A number of research areas were identified during this evaluation. Many of them are included in some form within the present list of activities. What is needed is for these generalised ideas to be translated into a programme of research. Finite objectives and a time scale are required.

4.2.9 Important research areas identified which require long term study include the following:

(1) Tagging studies – yellowfin and albacore (stock assessment, movements, fishing rates, biology, interactions between surface and longline fisheries);

(2) Tagging studies – skipjack (effects of purse seine fishing);

(3) Monitoring of catches, catch rates and fishing patterns (including use of scientific observers);

(4) FAD studies;

(5) Billfish research (use of scientific observers to monitor catches, collect biological data);

(6) Re-evaluation of skipjack tagging and biological data (particularly movements and stomach content analysis).

4.2.10 Concerning the yellowfin tagging programme, progress has been made and it appears likely that funding will be available, although timing is still unclear. The need for this project was frequently emphasised during the field work for this report. Also noted were some reservations about the operation and likely results of the project as presently planned. Doubts were raised about the ability to tag the required number of fish for meaningful results to be obtained. Not only are yellowfin less abundant in catches during surface fishing than skipjack, but the recovery rate is expected to be lower than during the SSAP. This is because the major part of the surface catch is now taken by purse seiners (where many tags pass unnoticed), whereas during the SSAP pole-and-line fishing was the main fishing method.

4.2.11 A new Programme Co-ordinator and Senior Scientists will have to be recruited before the yellowfin tagging project begins. To be fair to these new staff, who will be responsible for the implementation of a major project, it is thought advisable that an opportunity is given to review and modify if necessary its proposed methods and operational plan.

4.2.12 Much of the past scientific work of the TBAP has been of more value to the countries of the western central Pacific than other parts of the SPC region. The yellowfin tagging project will be centred in this area too. To counterbalance this it is suggested that an albacore research programme based on tagging should be considered. There are a number of countries in the eastern and southern parts of the SPC region (and also Australia and New Zealand) which would benefit from such a programme and have expressed interest in one.

4.2.13 The current co-ordination of research efforts on albacore which was mentioned in 2.3.25 is to be commended but cannot be considered sufficient to meet research needs. It is considered that a co-ordinated tagging project on a sub-regional basis carried out by the TBAP is more likely to provide the results required.

4.2.14 Because of the likely increase in surface fishing for albacore in the near future an early start to an albacore project seems desirable. However, funding and staffing requirements will need to be evaluated as well as the capability of the TBAP to handle such a project concurrently with its yellowfin tagging.

4.2.15 The major changes to the skipjack fishery since the time of the SSAP suggest that further tagging would be useful to detect changes in exploitation rates or fishing patterns, and interactions with small-scale fisheries. The reported (but unsubstantiated) reduction in skipjack abundance and average size in the north-western part of the SPC region since the introduction of purse seining is an area where studies are indicated.

4.2.16 Monitoring of catches will be an ongoing activity of the TBAP. There are major gaps in data from high seas areas and zones where US tuna policy is in force. It has already been recommended by Curtin that a meeting with DWFNs be called to improve this situation. It would seem desirable that this meeting be delayed until there is a resolution of the roles of the SPC and FFA data bases. If the FFA takes over the primary handling of the log sheets and SPC is provided with processed data for scientific purposes this may assist the TBAP in obtaining high seas data, when it is clear they will be used only for scientific purposes.

4.2.17 It is suggested that the TBAP produce on an annual basis maps showing summaries of catches for the SPC region for the principal tuna and billfish species.

4.2.18 The use of FADs and other floating objects in conjunction with tuna fishing is so important in the SPC region that some kind of research or involvement by the TBAP is likely on a long term basis. This has been indicated by several member countries. In addition to field studies, which may be carried out by the TBAP, the Programme could also play a role in information exchange.

4.2.19 Several workshops have been organised by SPC on the construction and deployment of FADs. A related workshop bringing together scientists, fisheries personnel and fishermen, and devoted to an exchange of ideas on how FADs attract fish, where they should be placed in relation to depth or to each other, and how frequently they can be fished, etc., would provide useful guidelines for any field work to be undertaken.

4.2.20 Research on billfish was a topic raised on several occasions by member countries. It was originally included in the list of priorities because of concern at the level of catches taken by longliners. For a number of years after this it seemed as if longline catches (particularly by albacore vessels) were in a permanent decline and pressure on billfish stocks was reducing. More recently longline catches have increased again and at the same time purse seiners have been recording an incidental catch of billfish.

4.2.21 The TBAP has never been actively involved with research on billfish and unless a specific programme is formulated it appears that this situation is likely to continue. It is suggested that after consultation with interested parties, some research priorities and a programme of field work be drawn up.

4.2.22 Research on billfish is likely to be of interest also to scientists in Australia and New Zealand where there are established gamefish industries based on what are probably shared stocks with the southern parts of the SPC region. A comparable situation exists in the northern areas.

4.2.23 A further area of ongoing research which has been suggested is a re-evaluation of the skipjack tagging data. This does not in any way imply that there are shortcomings in previous work. However, it is possible that fresh analyses of tag return data may enable more understanding to be gained of the nature and patterns (if any) of skipjack movements, which were never convincingly resolved in earlier published reports.

4.2.24 Before concluding this consideration of long term research needs we wish to emphasise that studies undertaken by the TBAP should be aimed at providing outputs of practical value to SPC countries and should not be research of an academic nature.

4.2.25 To summarise this section, two recommendations are proposed:

Recommendation Number 1

It is recommended that a mission statement be prepared for the TBAP setting out its goals and scope of operation.

Recommendation Number 2

It is recommended that a work programme with specific objectives by prepared for the TBAP. This programme should have a time scale and expected output, and the relationship of its objectives to the mission statement should be clearly indicated.

4.3 Data base

4.3.1 The problems over the data base – the extent of future duplication of effort – whether the log sheets should be processed by the TBAP or FFA, or some combination of the two – will continue to cloud the future of the TBAP until satisfactorily resolved.

4.3.2 The data base function was originally assigned to the TBAP because there was no regional organisation outside SPC which could at that time have handled the task. Since then, FFA has established itself as a dynamic and effective body. If the site of the data base were to be decided today there is a choice of location not previously available.

4.3.3 When the FFA data base becomes operational, the likely situation for handling the log sheets will be unsatisfactory. It appears that the TBAP data base will receive log sheets from all member countries (which presently supply them) except for two that have indicated that they will forward them to FFA. These log sheets will cover domestic vessels, and foreign vessels excluding US vessels. The FFA data base will receive log sheets from all its member countries where US vessels fish, and in addition, all log sheets from two countries. Thus each data base will be incomplete unless there is a full exchange of data.

4.3.4 As discussed previously, the use of data from the log sheets by member countries is now primarily for economic purposes. It follows from this that there are good reasons for making the organisation responsible for economic matters (FFA) the one which receives and processes the source documents.

4.3.5 A possible solution to the looming duplication problem would be for FFA to handle all log sheets, landings and observer data, and produce summaries as required on behalf of member countries. This would be dependent on FFA being capable of handling the greatly increased volume of data that would be involved, and being willing to do so. The data would require to continue to be collected in a suitable form for scientific analysis and made available to the TBAP for that purpose.

4.3.6 Inputs to the two data bases could then be:

FFA	SPC(TBAP)
Log sheets	Processed log sheet and landings data (from FFA)
Landings records	Tagging data
Observer records	Research cruise data
	Biological, effort data from scientific observer or landings studies
	Historical data
	High seas data

4.3.7 Under this division FFA would hold all the data relating to catches and values of catches within the EEZs of its member. The TBAP would also hold these data in agreed processed form plus additional research data collected through its own activities. It would in addition collect available data on high seas catches.

4.3.8 The position of the island members of SPC, who are not members of FFA, should also be considered in relation to the above scheme. Until now only one of the seven has supplied any data to the TBAP. As the vast majority of log sheets comes from Forum countries, the practical effects of any change in data base processing are likely to be small. Furthermore, the TBAP could continue to receive log sheets from non-Forum members of SPC.

4.3.9 The output from the two data bases under the above scheme would be complementary. From the FFA data base would come summaries of catches, catch values and economic analyses. These would frequently be required quickly and mostly for individual countries. Output from the TBAP data base would include stock evaluations, analyses of fisheries interactions, catch/effort trends, and other fisheries and biological analyses. These outputs would meet long term research needs and be largely regional in application.

4.3.10 Discussions with FFA indicated that its facilities would be able to process all log sheets within an 18-month to 2-year period from now.

4.3.11 Although any change to the present situation is some time away, we consider that the data base question needs to be dealt with urgently. This is necessary to resolve the present uncertainty and enable forward planning for computer and staff requirements which will directly affect recruitment by both organisations.

4.3.12 We have set out the situation as we see it and put forward our assessment. However, because the matter does not lie directly within the terms of reference for this study, we do not think it appropriate to make a specific recommendation, other than:

Recommendation Number 3
It is recommended that SPC consult urgently with FFA and member countries to resolve the likely duplication of effort concerning the collection and processing of tuna log sheet data resulting from the Forum Fisheries Committee decision to establish a data base at FFA, and to define the roles of the two data bases.

4.4 Integration of SPC fisheries programmes

4.4.1 The TBAP's predecessor, the SSAP, started off as an extra-budgetary project attached to SPC. This was at a time when almost all SPC programmes were funded from the core budget. The funding situation set the SSAP somewhat apart from other parts of the SPC work programme. This situation continued during the early years of the TBAP. The TBAP is still funded from extra-budgetary sources but from general funds made available to SPC, and not specific to the TBAP.

4.4.2 The integration of the TBAP into the mainstream of SPC activities has now been achieved, but has not yet been accompanied by a similar integration of all the component activities in the SPC fisheries programme.

4.4.3 Over recent years there has been major growth in the fisheries programmes, which in addition to tuna and billfish, include coastal fisheries development, training, fish processing, and information services. A further component will shortly be added with the inshore fisheries project. As a result of these developments, it is considered that the appointment of a Fisheries Co-ordinator responsible for all SPC fisheries activities is needed.

4.4.4 The functions of the Fisheries Co-ordinator would be to provide overall co-ordination and direction to the fisheries programmes and through on-going liaison with island countries ensuring that the programmes are responsive to their needs. He would also be responsible for identifying and obtaining funds for fisheries projects.

Recommendation Number 4
It is recommended that a Fisheries Co-ordinator responsible for all SPC activities in fisheries, including the TBAP, be appointed.

4.4.5 The appointment of a Fisheries Co-ordinator would permit the present position of Tuna Programme Co-ordinator to be redesignated Chief Tuna Scientist. This would remove some of the conflicting demands apparent in the present role expected of the Tuna Programme Co-ordinator and which have become a problem area.

4.4.6 Together with the appointment of a Fisheries Co-ordinator some reorganisation of the activities of the TBAP is needed. It is considered that priority 7 (Provision of assistance to countries in the implementation of appropriate systems to monitor artisanal and subsistence fisheries) be transferred to the inshore research project. This has already been recommended by the 1986 RTMF.

4.4.7 Despite its low rating on the original priority list this activity has frequently been raised as an important one, particularly by the small island states. Its attachment to a project working in the same resource area is more appropriate than to the TBAP. This change should enable increased effort and priority to be achieved in relation to this activity.

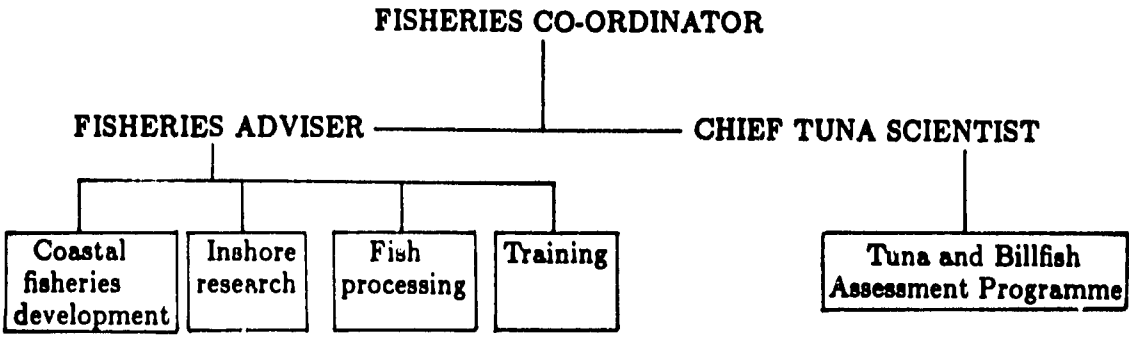
Recommendation Number 5
It is recommended that responsibility for priority activity 7 (dealing with artisanal statistics) be transferred from the TBAP to the inshore research project of SPC.

4.4.8 Another activity considered to be more appropriately located elsewhere is priority 8 (Provision of assistance to countries in training fisheries biologists in various aspects of quantitative methods).

4.4.9 The organisation of this activity should be the responsibility of the SPC Fisheries Training Officer as part of the wider programme of training in the field of fisheries. That is not to say that TBAP staff would have no role to play in this activity as they could well be involved as lecturers or in other technical areas.

Recommendation Number 6
It is recommended that responsibility for priority activity 8 (dealing with training) be transferred from the TBAP to the SPC Fisheries Training Officer.

4.4.10 A summary of the proposed changes is given in the organisational chart below.



4.4.11 The work areas and priorities of the TBAP have for a number of years been decided by the RTMF. It is considered that this is the correct procedure and should be continued.

Recommendation Number 7
It is recommended that the work programme and priority activities of the TBAP be set by the RTMF.

4.4.12 To assist this process it would be helpful if countries were consistent in their attendance at the RTMF and were represented by senior level staff.

4.4.13 The length of the RTMF has not changed for many years while the size and scope of the SPC fisheries programmes have increased greatly. This leads to a crowded agenda and frequently a shortage of time to discuss matters fully.

4.4.14 It does not seem practical to increase the length of the meeting. To assist countries in reviewing the many projects to be discussed, it would be helpful if working papers on the TBAP include detailed accounts of its activities and are circulated several weeks in advance of the RTMF.

4.4.15 In reviewing TBAP activities at the RTMF, account should be taken of the long term nature of some of them, and that it is not desirable to make major changes at short notice. This is not to say that redirection of the Programme may not be necessary from time to time.

4.4.16 A second level of input to the work of the TBAP is proposed through the establishment of a scientific committee on tuna (SCOT). The functions of the committee would be to review and guide the scientific work of the TBAP and to report to the RTMF.

4.4.17 The reasons why such a committee is considered necessary include the following:

(1) SPC is not a research organisation with its own system of peer review;

(2) TBAP scientists are a small, relatively isolated group;

(3) TBAP has a high turnover of staff;

(4) With the reduction in salaries and grading it is likely more junior staff will be recruited in future years;

(5) Input from tuna scientists from other places will benefit the work of the TBAP.

4.4.18 It is considered that the composition of the committee should be restricted to scientists as it is a technical review body, and not a policy-making one. A suggested make up of the committee is as follows:

SPC Fisheries Co-ordinator (or Tuna Programme Co-ordinator*)
Chief Tuna Scientist (or Senior Fisheries Scientist*)
(3) SPC island country scientists
FFA Research Co-ordinator
FAO (tuna fisheries expert)
(3) Invited experts

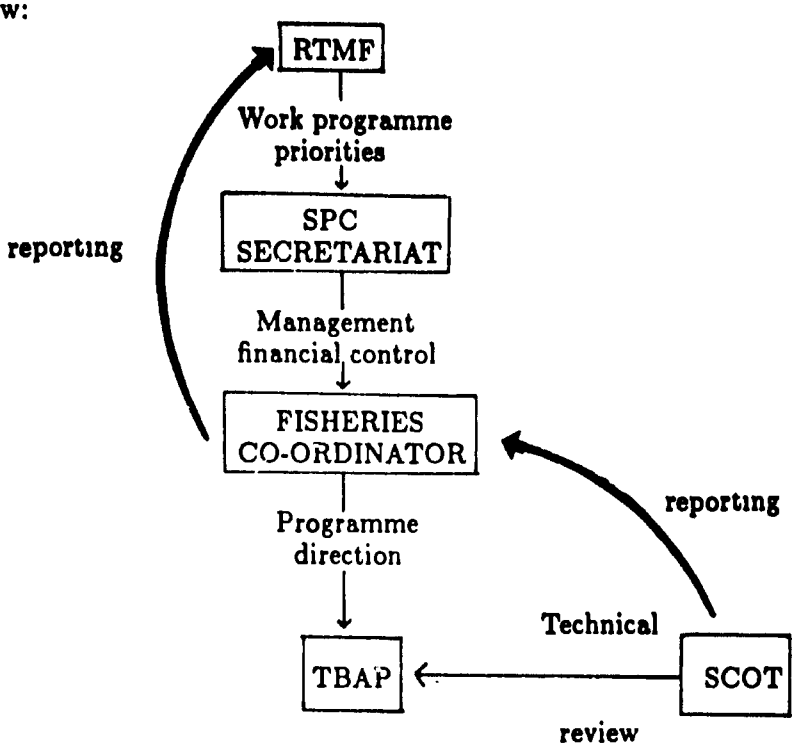
* Depending on whether Recommendation Number 4 is accepted

4.4.19 It is considered that the committee should be kept small (maximum 10 persons and appointed for a period of 2 or 3 years and be chaired by the SPC Fisheries Co-ordinator (or Tuna Programme Co-ordinator).

4.4.20 Nominations to the committee would be made by member countries or the TBAP. One of the island country scientists should be from a French-speaking country. The invited experts could be from research institutions of SPC member countries or from tuna organisations elsewhere in the world. Funding should be budgetted specifically for SCOT.

Recommendation Number 8
It is recommended that a scientific committee on tuna be appointed to act as a technical review body to the TBAP and to assist it in its work.

4.4.21 The proposed inputs to the TBAP would then be as shown in the organisational chart below:



4.4.22 The above organisational system will fit in the usual way within the overall control of CRGA and the South Pacific Conference.

4.5 Communications, advisory and information services

4.5.1 The communication of the results of the TBAP to member countries through its publications will continue to be an essential part of its output. It is considered that although past standards have been high there are areas where changes could be made which would benefit both TBAP staff and the users of its publications.

4.5.2 The SPC policy on scientific publications by the TBAP has in the past effectively amounted to a prohibition on publication outside its own system. This policy has been good neither for the TBAP and its staff nor for SPC as an organisation. Among the disadvantages of the present system are that it:

(1) Results in scientific papers appearing in an inappropriate format (e.g. as part of a technical report series);

(2) Targets the wrong audience with resulting negative feedback (e.g. when fisheries officers receive papers on population modelling);

(3) Misses many of the audience to which it should be directed (copyrighting of publications further reduces the flow of scientific information);

(4) May result in lower standards;

(5) Does not protect the career aspirations of the TBAP scientists (who must within six years resume their scientific work elsewhere).

4.5.3 To overcome these problems it is suggested that a more flexible policy be adopted which better suits the needs of SPC, the TBAP and member countries. The suggested policy is:

(1) Country reports, data reports, observer trip reports, descriptions of methods, etc., continue to be published in the Technical Report series;

(2) Scientific papers be published in appropriate journals (such as the marine science or fisheries journals of the donor countries);

(3) A scientific bulletin series be started to publish important scientific works which are too long for journal publication. This series would be published under the name of SPC but would be contracted out for editing and printing. Bulletins would be refereed externally;

(4) Budgetary provision be made for publication costs in the funding for the TBAP.

4.5.4 The advantages of the proposed policy are perceived as:

(1) Enabling the appropriate audience to be targeted for by the different types of publications produced by the TBAP;

(2) Encouraging the publication of scientific results and the highest possible standards;

(3) Enhancing the reputation of the TBAP in the scientific community and the reputation of SPC as a centre for tuna research.

4.5.5 Nothing in the foregoing is meant to suggest that writing scientific papers should be the main aim of the TBAP, or reduce its output in other areas.

4.5.6 If the above policy is adopted, the great majority of publications would still be produced by SPC. From the list given in Appendix 2, only six technical reports (nos. 8-13) have been identified as suitable for publication in scientific journals or as bulletins.

Recommendation Number 9

It is recommended that SPC review its policy on publications of the TBAP and permit publication of scientific results in outside journals where appropriate.

4.5.7 There is also the important need for scientists to communicate the results of their work to fisheries managers in a language they understand, as was specifically mentioned during country visits.

4.5.8 It is considered that for each major technical or scientific document produced by the TBAP a summarised version in non-technical language is required.

Recommendation Number 10
It is recommended that summaries be produced in non-technical language of all major TBAP scientific reports.

4.5.9 Such summaries could be included in the Fisheries Newsletter or sent direct to countries. It is also suggested that each edition of the Newsletter should contain a list of all fisheries publications occurring since the previous issue.

4.5.10 Also important in communicating the results of TBAP activities are follow-up visits after the completion of field studies or other major work on behalf of countries. At the time that the report is published, the staff member responsible should visit the country to explain and discuss its results with fisheries and other government personnel. This is considered an essential part of the whole exercise and should be included in the project budget.

Recommendation Number 11
It is recommended that following important work done on behalf of countries and on publication of the report, the TBAP staff member responsible visit the country concerned to discuss the results with government officials.

4.5.11 It is also suggested that each project done on behalf of a country should be costed in terms of salary, travel, and other expenses. This information should be supplied to the country on completion of the work.

4.5.12 Another area which needs to be addressed is the general communications between the TBAP (and other SPC fisheries projects) and countries. For those countries making good use of SPC services, there is regular contact through different programme officers. In other cases this is not so, and there are real barriers to communication in some places.

4.5.13 The following discussion (4.5.14) assumes that a Fisheries Co-ordinator will be appointed by SPC (Recommendation Number 4).

4.5.14 It is considered essential that the Fisheries Co-ordinator should make regular visits (perhaps annually) to most member countries. The purpose of these visits would be to consult with countries on the range of SPC services in fisheries, provide advisory services and assist local fisheries staff in preparing applications or project documents for requesting SPC services. At the same time, the Fisheries Co-ordinator could be appraised of local fisheries activities or problems.

Recommendation Number 12
It is recommended that the SPC Fisheries Co-ordinator make regular visits to member countries to ascertain their needs and discuss ways in which the SPC fisheries programmes can assist them.

4.5.15 If a Fisheries Co-ordinator is not appointed, it is suggested that the same recommendation apply, but that the Tuna Programme Co-ordinator carry out these functions in relation to the TBAP only.

4.6 Staffing, management and financial issues

4.6.1 Staffing requirements of the TBAP need to be reviewed and reassessed in light of changing circumstances and its future work programme and direction.

4.6.2 Factors to be taken into account include: any changes to TBAP work activities (e.g. if Recommendations Numbers 5 and 6 are adopted); the nature of new long term research work undertaken (e.g. requirements for field staff); any reorganisation of fisheries activities within SPC (appointment of a Fisheries Co-ordinator); any change in responsibility in relation to the regional data base function.

Recommendation Number 13
It is recommended that the staffing requirements of the TBAP be reviewed taking into account planned future activities and any reorganisation of SPC fisheries projects as a whole. In this review new job descriptions should be prepared for each post relating each of them to the priority activities of the TBAP.

4.6.3 Concern has been expressed both from countries and by TBAP staff about the effects of decreased salaries and down-grading of posts. The suggested review above will give an opportunity to consider this and could also take note of the success or otherwise of recruiting suitable people for the current vacancies.

4.6.4 In the event that unfilled positions occur because of salary problems, the Secretary-General has the power to make necessary adjustments under existing SPC regulations.

4.6.5 Another area which could help to improve staff conditions and reduce turnover in the TBAP is to appoint new staff for a period of three years. Since the TBAP is scheduled to continue at SPC until October 1991 this would provide increased security to staff and at the same time remain within the project time scale.

Recommendation Number 14
It is recommended that consideration be given to appointing TBAP staff on contracts of 3 years.

4.6.6 The involvement of island country fisheries staff in the work of the TBAP is an area where a lot of progress has been made in recent years, and the Programme is to be commended for this.

4.6.7 It is considered that the aspect of TBAP work should be strengthened by formalising it in some way so that it is an integral part of the Programme rather than an *ad hoc* one. This could be done by making budgetary provision through the TBAP or by arrangement with organisations, such as FAO, to fund a fellowship position on a regular basis.

Recommendation Number 15
It is recommended that provision of funds for attachment fellowships to the TBAP be made as a regular part of its budget.

4.6.8 It is suggested that attachment fellowships should target two levels. Firstly, short term attachments of 3–6 months for technical officers. The aim would be to familiarise them by hands-on experience with TBAP activities on the data base, statistical programmes, etc.

4.6.9 At a different level it is considered that island country scientists should also be attached to the TBAP. This attachment should be for a longer period, perhaps one year, with the aim of providing post-graduate experience in a research environment.

4.6.10 The suggestion above assumes that suitable personnel would be available for this attachment. A common concern expressed by many countries was difficulty in interpreting scientific results. In the longer term it would be in the interest of countries in their pursuit of self reliance to plan for the recruitment of fisheries scientists for their own government fisheries services. SPC may have a role in assisting this process.

4.6.11 Strong support by the SPC management for the TBAP and a close working relationship with it through the Fisheries Co-ordinator (or Tuna Programme Co-ordinator) is essential for the TBAP to successfully meet the many challenges which confront it.

4.6.12 Concern was expressed in the Curtin report about the lack of financial delegation to the Tuna Programme Co-ordinator in respect of the Programme budget. However, it appears neither practical or desirable that existing SPC procedures be changed in this regard. If the close co-operation mentioned above is maintained, no difficulties over financial control are likely to occur.

4.6.13 This process would be assisted by the preparation of a detailed annual budget by the TBAP and discussion and approval of it in principle by management.

4.6.14 On a wider scale, the continued work and credibility of the TBAP requires the assurance of the allocation of the necessary funds from the SPC budget for its core functions over its scheduled duration. Included in this should be an increased provision for duty travel (see Recommendations Numbers 11 and 12). Special projects, such as the yellowfin tagging programme, would continue to be funded on an individual basis.

4.6.15 To conclude this section, two recommendations are proposed:

Recommendation Number 16
It is recommended that sufficient funds be allocated from the SPC budget to meet the cost of the core functions of the TBAP for its scheduled duration.

Recommendation Number 17
It is recommended that increased funds be allocated within the TBAP budget for travel by Programme staff.

4.7 Assistance from countries and organisations

4.7.1 The results of this evaluation clearly show that much is expected of the TBAP. Many countries depend on the effective execution of its activities to meet their needs and aspirations in tuna fisheries development.

4.7.2 It is heartening in this regard to note the resolve by SPC management to adopt schemes and approaches which will have the flexibility to make effective and timely responses to the needs of its members.

4.7.3 It appears, however, that the above attempt would be incomplete without the corresponding support of member countries. The TBAP served countries well when they were groping in the dark for answers to their fisheries problems. It can continue to do so with their renewed assistance.

4.7.4 Ways through which countries can assist the TBAP include timely input of data, improved communications, constructive criticism and release of staff to work with the Programme.

4.7.5 Organisations can assist through proper co-ordination of their work programmes, avoidance of duplication and free exchanges when required. The overall aim would be to assist the region as a whole.

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APPENDIX 1: PERSONS CONSULTED

New Caledonia

Mr Philippe du Coedic de Kergoaler, Chef de la Marine Marchande et des Pêches Maritimes
Mr Max Palladin, Service des Pêches
Mr Bernard Viu, Service des Pêches

South Pacific Commission

Mr P. Tuiososopo, Secretary-General
Mr Jon Jonassen, Director of Programmes
Mrs Hélène Courte, Deputy Director of Programmes
Dr John Sibert, Tuna Programme Co-ordinator
Mr Richard Farman, Research Scientist
Mr James Ianelli, Research Scientist
Mr Brian Moore, Assistant Fisheries Statistician
Mr Bernard Smith, Fisheries Adviser
Mr Garry Preston, Assistant Fisheries Officer
Mr Robert Powell, Assistant Finance Officer

ORSTOM (Noumea)

Mr Renaud Pianet, Research Scientist (attached to TBAP)

French Polynesia

Mr Bruno Ugolini, Chef, Département de Pêche
Mr Pierre Marchesini, Directeur Général, POMAFREX S.A.

ORSTOM (Tahiti)

Mr Jacques Chabanne, Acting Director

Cook Islands

Mr Julian Dashwood, Secretary, Ministry of Marine Resources
Mr Neil Sims, Senior Fisheries Research Officer
Mr Colin J. Brown, Director of Fisheries Management

Western Samoa

Mr Mike McCoy, Fisheries Adviser

Tokelau

Mr Foua Toloa, Director of Agriculture and Fisheries (at Apia)

Pitcairn Islands

Dr Nick Willoughby, Fisheries Adviser, British Development Division in the Pacific (at Suva)

Fiji

Dr Antony D. Lewis, Principal Fisheries Officer

FAO (Suva)

Mr Robert Gillett, Fisheries Development Adviser

Tuvalu
Mr Elisala Pita, Chief Fisheries Officer

Marshall Islands
Mr Steve Muller, Director, Maritime Authority

Northern Mariana Islands
Mr Arnold I. Palacios, Chief, Division of Fish and Wildlife
Mr Patrick Bryan, Fisheries Biologist
Mr Nicolas Guerrero, Director, Department of Natural Resources
Mr Ray Guerrero, Special Assistant to the Governor for Administration

Guam
Mr William Fitzgerald, Chief, Division of Economic Development and and Planning, Department of Commerce
Mr Harry Kami, Chief, Division of Aquatic and Wildlife Resources
Dr Steven Amesbury, Associate Professor of Biology, University of Guam
Dr Paul Callaghan, Associate Professor of Economics, University of Guam
Mr Jerry Perez, Economist, Division of Economic Development and Planning

Palau
Mr Victorio Uherbelau, Special Assistant to the President, Director of Bureau of Foreign Affairs
Mr Toshio G. Paulis, Chief, Marine Resources Division
Mr Marhence Madranchar, Executive Director, Palau Maritime Authority

Nauru
Mr Pochon Lili, Senior Project Officer (Fisheries), Department of Island Development and Industry

Forum Fisheries Agency
Mr Philipp Muller, Director

Niue
Mr John Barnes, Fisheries Officer

APPENDIX 2: LIST OF PUBLICATIONS BY THE TBAP

A. Final Country Reports (SSAP)

C1 KEARNEY, R.E. (1982). An assessment of the skipjack and baitfish resources of Fiji. Skipjack Survey and Assessment Programme Final Country Report No.1, South Pacific Commission, Noumea, New Caledonia, viii + 47 pp.

C2 LAWSON, T.A. and R.E. KEARNEY (1982). An assessment of the skipjack and baitfish resources of the Cook Islands. Skipjack Survey and Assessment Programme Final Country Report No.2, South Pacific Commission, Noumea, New Caledonia, vii + 28 pp.

C3 ARGUE, A.W. and R.E. KEARNEY (1982). An assessment of the skipjack and baitfish resources of Solomon Islands. Skipjack Survey and Assessment Programme Final Country Report No.3, South Pacific Commission, Noumea, New Caledonia, x + 73 pp.

C4 ARGUE, A.W. and R.E. KEARNEY (1982). An assessment of the skipjack and baitfish resources of Pitcairn Islands. Skipjack Survey and Assessment Programme Final Country Report No.4, South Pacific Commission, Noumea, New Caledonia, vii + 39 pp.

C5 KLEIBER, P. and R.E. KEARNEY (1983). An assessment of the skipjack and baitfish resources of Kiribati. Skipjack Survey and Assessment Programme Final Country Report No.5, South Pacific Commission, Noumea, New Caledonia,vii + 49 pp.

C6 ARGUE, A.W. and R.E. KEARNEY (1983). An assessment of the skipjack and baitfish resources of New Zealand. Skipjack Survey and Assessment Programme Final Country Report No.6, South Pacific Commission, Noumea, New Caledonia, ix + 68 pp.

C7 GILLETT, R.D. and R.E. KEARNEY (1983). An assessment of the skipjack and baitfish resources of French Polynesia. Skipjack Survey and Assessment Programme Final Country Report No.7, South Pacific Commission, Noumea, New Caledonia, ix + 81 pp.

C8 ELLWAY, C.P., R.S. FARMAN, A.W. ARGUE and R.E. KEARNEY (1983). An assessment of the skipjack and baitfish resources of Tuvalu. Skipjack Survey and Assessment Programme Final Country Report No.8, South Pacific Commission, Noumea, New Caledonia, vii + 47 pp.

C9 TUNA PROGRAMME (1983). An assessment of the skipjack and baitfish resources of the Republic of Vanuatu. Skipjack Survey and Assessment Programme Final Country Report No.9, South Pacific Commission, Noumea, New Caledonia, vii + 41 pp.

C10 TUNA PROGRAMME (1983). An assessment of the skipjack and baitfish resources of Tokelau. Skipjack Survey and Assessment Programme Final Country Report No.10, South Pacific Commission, Noumea, New Caledonia, vii + 41 pp.

C11 TUNA PROGRAMME (1983). An assessment of the skipjack and baitfish resources of the Kingdom of Tonga. Skipjack Survey and Assessment Programme Final Country Report No.11, South Pacific Commission, Noumea, New Caledonia, viii + 53 pp.

C12 TUNA PROGRAMME (1984). An assessment of the skipjack and baitfish resources of Papua New Guinea. Skipjack Survey and Assessment Programme Final Country Report No.12, South Pacific Commission, Noumea, New Caledonia, x + 91 pp.

C13 TUNA PROGRAMME (1984). An assessment of the skipjack and baitfish resources of Nauru. Skipjack Survey and Assessment Programme Final Country Report No.13, South Pacific Commission, Noumea, New Caledonia, vii + 29 pp.

C14 TUNA PROGRAMME (1984). An assessment of the skipjack and baitfish resources of Western Samoa. Skipjack Survey and Assessment Programme Final Country Report No.14, South Pacific Commission, Noumea, New Caledonia.

C15 TUNA PROGRAMME (1984). An assessment of the skipjack and baitfish resources of Niue. Skipjack Survey and Assessment Programme Final Country Report No.15, South Pacific Commission, Noumea, New Caledonia.

C16 TUNA PROGRAMME (1984). An assessment of the skipjack and baitfish resources of Eastern Australia. Skipjack Survey and Assessment Programme Final Country Report No.16, South Pacific Commission, Noumea, New Caledonia.

C17 TUNA PROGRAMME (1984). An assessment of the skipjack and baitfish resources of American Samoa. Skipjack Survey and Assessment Programme Final Country Report No.17, South Pacific Commission, Noumea, New Caledonia.

C18 TUNA PROGRAMME (1984). An assessment of the skipjack and baitfish resources of Northern Mariana Islands, Guam, Palau, Federated States of Micronesia and Marshall Islands. Skipjack Survey and Assessment Programme Final Country Report No.18, South Pacific Commission, Noumea, New Caledonia.

C19 TUNA PROGRAMME (1984). An assessment of the skipjack and baitfish resources of Wallis and Futuna. Skipjack Survey and Assessment Programme Final Country Report No.19, South Pacific Commission, Noumea, New Caledonia. (In press).

C20 TUNA PROGRAMME (1985). An assessment of the skipjack and baitfish resources of New Caledonia. Skipjack Survey and Assessment Programme Final Country Report No.20, South Pacific Commission, Noumea, New Caledonia. (In press).

B. Other publications (* indicates publications using data from the SSAP)

1981----

*1 ANON. Report of the second Skipjack Survey and Assessment Programme workshop to review results from genetic analysis of skipjack blood samples. Technical Report No.6.

*2 ELLWAY, C.P. & R.E. KEARNEY. Changes in the Fijian baitfishery, 1974-1980. Technical Report No.5.

3 KEARNEY, R.E. Some economic aspects of the development and management of fisheries in central and western Pacific. Fisheries Newsletter No.22.

4 KEARNEY, R.E. A brief description of the South Pacific Commission Tuna and Billfish Assessment Programme. Forum Fisheries Agency, Regional Research and Development Programme Meeting, 4-8 May 1981, Honiara, Solomon Islands.

5 KEARNEY, R.E. A brief review of the state of the stocks of highly migratory species of fish in the central and western Pacific. Forum Fisheries Agency, Regional Research and Development Programme Meeting, 4-8 May 1981, Honiara, Solomon Islands.

*6 KEARNEY, R.E. & M.L. RIVKIN. An examination of the feasibility of baitfish culture for skipjack pole-and-line fishing in the South Pacific Commission area. Technical Report No.4.

*7 SKIPJACK PROGRAMME. Fishing effort and catch by the longline fleets of Japan (1962-77) and Taiwan (1967-77) within 200 miles of the countries in the area of the South Pacific Commission. Technical Report No.3.

13th Regional Technical Meeting on Fisheries

8 TUNA PROGRAMME. The South Pacific Commission Tuna and Billfish Assessment Programme. SPC/Fisheries 13/WP.6.

*9 TUNA PROGRAMME. Effects of skipjack tagging procedures on subsequent tag recoveries. SPC/Fisheries 13/WP.8.

*10 TUNA PROGRAMME. Skipjack migration, mortality and fishery interactions. SPC/Fisheries 13/WP.9.

*11 TUNA PROGRAMME. An appraisal of the genetic analysis of skipjack blood samples. SPC/Fisheries 13/WP.10.

*12 TUNA PROGRAMME. An overview of results from analyses of data on growth of skipjack. SPC/Fisheries 13/WP.11.

*13 TUNA PROGRAMME. An assessment of baitfish resources in the South Pacific Commission area. SPC/Fisheries 13/WP.12.

*14 TUNA PROGRAMME. Further observations on fishing performance of baitfish species in the South Pacific Commission area. SPC/Fisheries 13/WP.13.

1982----

*15 KEARNEY, R.E. (ed.). Methods used by the South Pacific Commission for the survey and assessment of skipjack and baitfish resources. Technical Report No.7.

*16 KEARNEY, R.E. SPC tagging shows big increase in skipjack tuna catch possible. Australian Fisheries 41(2).

17 KEARNEY, R.E. South Pacific Tuna and Billfish Programme. ICLARM Newsletter (1).

18 KEARNEY, R.E. Development, management key issues in fisheries of Pacific Island nations. Australian Fisheries 41(8).

*19 KLEIBER, P., A.W. ARGUE & R.E. KEARNEY. Investigation of skipjack stock and population structuring in the western and central Pacific. Prepared for the Annual Meeting of the Standing Committee on Research and Statistics, ICCAT, 1-10 November 1982, Funchal, Madeira Islands.

20 WILLIAMS, M.J. The establishment of a regional catch and effort database. Paper presented at Workshop on the Harmonisation and Co-ordination of Fisheries Regimes and Access Agreements. SPEC Headquarters, 22 February-5 March 1982, Suva, Fiji.

14th Regional Technical Meeting on Fisheries

*21 TUNA PROGRAMME. Update on the study of parasites as skipjack population markers. SPC/Fisheries 14/WP.5.

22 TUNA PROGRAMME. Review of progress with priority items of the Tuna and Billfish Assessment Programme. SPC/Fisheries 14/WP.10.

*23 TUNA PROGRAMME. Update of assessment of skipjack and baitfish resources. SPC/Fisheries 14/WP.11.

*24 TUNA PROGRAMME. An assessment of baitfish resources in the South Pacific Commission area. SPC/Fisheries 14/WP.12.

25 TUNA PROGRAMME. Sample statistical summaries. SPC/Fisheries 14/WP.17.

26 TUNA PROGRAMME. Alternative forms for the catch efforts of longline vessels and as part of the regional statistical programme. SPC/Fisheries 14/WP.18.

1983----

*27 ARGUE, A.W., P. KLEIBER, R.E. KEARNEY & J.R. SIBERT. Evaluation of methods used by the South Pacific Commission for identification of skipjack population structure. In Proceedings of the ICCAT Conference of the International Skipjack Year Programme, 21-29 June 1983, Tenerife, Spain.

*28 ARGUE, A.W., F. CONAND & D. WHYMAN. Spatial and temporal distributions of juvenile tunas from stomachs of tunas caught by pole-and-line gear in the central and western Pacific Ocean. Technical Report No.9.

29 GILLETT, R.D. A glossary of Japanese fishing terms. Fisheries Newsletter No.25.

*30 KEARNEY, R.E. Assessment of the skipjack and baitfish resources in the central and western tropical Pacific Ocean: a summary of the Skipjack Survey and Assessment Programme. Special Publication.

31 KEARNEY, R.E. Fishery potentials in the tropical central and western Pacific. Paper presented at the Fifteenth Pacific Science Congress, Dunedin, New Zealand.

32 KEARNEY, R.E. The requirements for conservation of the tuna resources of the western and central tropical Pacific. Planning and Evaluation Committee Meeting 1983.

33 KEARNEY, R.E. Review of progress by the Tuna and Billfish Assessment Programme. Paper presented at Forum Fisheries Committee Meeting, 2-6 May 1983, Apia, Western Samoa.

34 KEARNEY, R.E. Skipjack assessment: ongoing requirements. In Proceedings of the ICCAT Conference of the International Skipjack Year Programme, 21-29 June 1983, Tenerife, Spain.

35 KEARNEY, R.E. The development of tuna fisheries and the future for their management in the tropical, central and western Pacific. In E.L. Miles & S. Allen (eds). The Law of the Sea and Ocean Development Issues in the Pacific Basin. Law of the Sea Institute.

*36 KLEIBER, P., A.W. ARGUE & R.E. KEARNEY. Assessment of skipjack (Katsuwonus pelamis) resources in the central and western Pacific by estimating standing stock and components of population turnover from tagging data. Technical Report No.8.

37 LEWIS, A.D., B.R. SMITH & C.P. ELLWAY. A guide to the common tuna baitfishes of the South Pacific Commission area. Handbook No.23.

*38 SIBERT, J.R., R.E. KEARNEY & T.A. LAWSON. Variation in growth increments of tagged skipjack (Katsuwonus pelamis). Technical Report No.10.

39 WILLIAMS, M.J. Statistical database for tuna fisheries in the central and western Pacific. SPC/Statisticians 6/WP.3.

15th Regional Technical Meeting on Fisheries

40 TUNA PROGRAMME. Review of progress with priority items within the Tuna and Billfish Assessment Programme. SPC/Fisheries 15/WP.4.

41 TUNA PROGRAMME. Regional requirements for resource assessment and conservation and some alternative institutional arrangements. SPC/Fisheries 15/WP.5.

42 TUNA PROGRAMME. Observer programmes. SPC/Fisheries 15/WP.10.

1984----

43 KEARNEY, R.E. The implication of present resource evaluations to national fisheries development. Paper presented to FFA Workshop on National Tuna Operations, 28 May-2 June 1984.

*44 KLEIBER, P., A.W. ARGUE, J.R. SIBERT & L.S. HAMMOND. A parameter for estimating potential interaction between fisheries for skipjack tuna (Katsuwonus pelamis) in the western Pacific. Technical Report No.12.

*45 LAWSON, T.A., R.E. KEARNEY & J.R. SIBERT. Estimates of length measurement errors for tagged skipjack (Katsuwonus pelamis) from the central and western Pacific Ocean. Technical Report No.11.

46 SIBERT, J.R. A two-fishery tag attrition model for the analysis of mortality, recruitment and fishery interaction. Technical Report No.13.

Meeting on Coastal States and Distant-Water Fishing Nations

47 TUNA PROGRAMME. Review of progress with priority items within the Tuna and Billfish Assessment Programme. SPC/Coastal-DWFNS/WP.2.

48 TUNA PROGRAMME. The Tuna Programme fisheries statistical system. SPC/Coastal-DWFNS/WP.3.

16th Regional Technical Meeting on Fisheries

49 TUNA PROGRAMME. Review of progress with priority items within the Tuna and Billfish Assessment Programme. SPC/Fisheries 16/WP.2.

50 TUNA PROGRAMME. The Tuna Programme fisheries statistical system. SPC/Fisheries 16/WP.4.

51 TUNA PROGRAMME. Some alternative mechanisms for obtaining additional input into the work of the Tuna and Billfish Assessment Programme. SPC/Fisheries 16/WP.9.

1985----

52 GILLETT, R.D. Tuvalu baitfish survey and development project. Technical Report No.14.

53 GILLETT, R.D. Cardinalfish and fusiliers: an alternative baitfish resource in Tuvalu. Fisheries Newsletter No.32.

54 GILLETT, R.D. Traditional tuna fishing in Tokelau. Topic Review No.27, SPREP.

55 GILLETT, R.D. & S.T. TAUFAO. The incidence of tuna schools suitable for purse seining in the central and western Pacific from Skipjack Programme records. Fisheries Newsletter No.33.

56 HILBORN, R. Spatial models of tuna dynamics in the western Pacific: is international management necessary? Paper presented at the Second Workshop of Renewable Resource Management (9-12 December 1985), Honolulu, Hawaii.

57 HILBORN, R. & J. SIBERT. Management strategies for newly developing fisheries. Fisheries Newsletter No.35.

58 HODGKINSON, P.W. & M.J. WILLIAMS. Fisheries Statistics Training Course - Lecture Notes. Handbook No.26.

59 POLACHECK, T. An overview of the statistical programme of the TBAP of the South Pacific Commission. Ad Hoc Consultation on Global Tuna Statistics (6-7 December 1985), Columbo.

60 PRESTON, G.L. & R.E. KEARNEY. The South Pacific Commission and the development of South Pacific fisheries. INFOFISH Marketing Digest No.2.

17th Regional Technical Meeting on Fisheries

61 TUNA PROGRAMME. Review of progress, problems and opportunities within the Tuna and Billfish Assessment Programme. SPC/Fisheries 17/WP.3.

62 TUNA PROGRAMME. Revised priority items for the Tuna and Billfish Assessment Programme. SPC/Fisheries 17/WP.4.

63 TUNA PROGRAMME. Yellowfin tuna catch rates in the western Pacific. SPC/Fisheries 17/WP.5.

64 TUNA PROGRAMME. Analysis of interaction between tuna fisheries in the central and western Pacific Ocean. SPC/Fisheries 17/WP.6.

65 TUNA PROGRAMME. Optimisation of FAD deployment and management for commercial exploitation. SPC/Fisheries 17/WP.7.

66 TUNA PROGRAMME. Continuation of the Tuna and Billfish Assessment Programme. SPC/Fisheries 17/WP.18.

1986----

67 FARMAN, R.S. An investigation of longlining activities in the waters of Tonga (24 April-19 May 1985). Technical Report No.17.

68 FARMAN, R. & J.R. SIBERT. A review of southern albacore catch data from the South Pacific Commission region. Paper presented at the First South Pacific Albacore Research Workshop (9-12 June 1986), Auckland, New Zealand.

69 GILLETT, R.D. Observer trip on United States purse-seine vessel (November-December 1984). Technical Report No.15.

70 GILLETT, R.D. Observations on two Japanese purse-seining operations in the equatorial Pacific. Technical Report No.16.

*71 HILBORN, R. Movement analysis of skipjack tuna tags. Paper presented at the Thirty-seventh Annual Tuna Conference (18-21 May 1986), Lake Arrowhead.

72 HILBORN, R. & J.R. SIBERT. Is international management of tuna necessary? Fisheries Newsletter No.38.

73 SIBERT, J.R. Skipjack fisheries of the southwest Pacific. Paper presented at the Aku Workshop, NMFS, Honolulu Laboratory (30 April-1 May 1986), Honolulu, Hawaii.

74 SIBERT, J.R. The Hawaiian Aku fishery: a lesson to be learned. Fisheries Newsletter No.37.

75 TUNA PROGRAMME. 8000 skipjack and yellowfin tagged in Micronesia. Fisheries Newsletter No.37.

76 TUNA PROGRAMME. Albacore tagged in southern fishery. Fisheries Newsletter No.37.

77 WALTERS, C.J. & R. HILBORN. A syllabus for tropical fisheries stock assessment. Preliminary report for Stock Assessment Workshop. (DRAFT)

18th Regional Technical Meeting on Fisheries

78 SIBERT, J.R. Tuna stocks of the southwest Pacific. SPC/Fisheries 18/WP.1. (Paper presented at the INFOFISH Tuna Trade Conference, 25-27 February 1986, Bangkok, Thailand).

79 TUNA PROGRAMME. Review of Tuna and Billfish Assessment Programme. SPC/Fisheries 18/WP.2.

80 TUNA PROGRAMME. Proposed revision of the regional daily catch report forms. SPC/Fisheries 18/WP.3.

81 TUNA PROGRAMME. Standing Committee on Tuna and Billfish. SPC/Fisheries 18/WP.4.

82 TUNA PROGRAMME. A review of SPC's DWFN catch coverage in the SPC region. SPC/Fisheries 18/WP.5.

83 TUNA PROGRAMME. Proposal for an integrated SPC inshore resource assessment project. SPC/Fisheries 18/WP.19.

----1987----

84 ARGUE, A.W., M.J. WILLIAMS & J.P. HALLIER. Fishing performance of some natural and cultured baitfish used by pole-and-line vessels to fish tunas in the central and western Pacific Ocean. Technical Report No.18.

85 FARMAN, R.S. South Pacific Commission Fisheries Observer Manual. Handbook No.27.

86 FARMAN, R.S. Report on observer activities on board a Japanese group purse-seining operation (24 March - 20 April 1985). Technical Report No.19.