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THE SOUTH PACIFIC COMMISSION TUNA AND BILLFISH ASSESSMENT PROGRAMME

(Paper Prepared by the Skipjack Programme)

The Tuna and Billfish Assessment Programme is a three year programme designed to provide a better understanding of the stocks of tunas and billfish throughout the region and to determine the status of the stocks of the commercially important species. It will provide information on the distribution and availability of exploitable concentrations of these species and document recent changes in yields and harvesting techniques. It will also provide data as a basis for the assessment of optimum yields and will provide governments with information on which sound fisheries development and resource management can be based.

Much of the information necessary will be obtained from co-ordination of national statistical programmes and in the centralized accumulation of all available fisheries statistics from both coastal states and distant-water fishing nations. These figures and relevant biological data will be analysed and presented in a format readily usable by fisheries planners.

Specific topics to be covered by the Programme have already been set in priority order by the fisheries officers of the Island countries of the region at the Twelfth Regional Technical Meeting on Fisheries, held in Noumea in November 1980. These are as follows:

(a) Development of a regional statistical programme.

It has for many years been accepted that the south Pacific requires a regional fisheries statistical programme, but uncertainty over the roles and functions of existing regional organisations had delayed the establishment of such a programme. Following the acceptance that the South Pacific Commission is responsible for fisheries survey and assessment work in this region, the Twelfth Regional Technical Meeting on Fisheries recommended that:

"the South Pacific Commission develop a regional fisheries statistics programme to obtain and analyse catch and effort and other scientific data as the base for the approved research programme on highly migratory species."

Software and programming for this task have already been organised, but some additions to the Skipjack Programme computer facilities will be required to allow the statistical programme to be fully operational.

- (b) 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.

A good deal of the information required for these studies can be taken from the results of the Skipjack Programme, but because of time constraints it will not be possible for Programme staff to approach this problem before 30 September 1981. Additional data will be required from the statistics accumulated from the distant-water fishing nations. It is possible that a new data generation programme may be necessary but modification of existing or proposed national observer programmes may be all that is required to generate the additional data.

There is no doubt that an assessment of the interaction between the two principal types of surface fishing gear is urgently required, because management decisions, often restricting purse seine fishing in favour of pole-and-line fishing, are already being implemented.

- (c) 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.

There is an urgent need for the assessment of the status of the stocks of the major highly migratory species in the region. The staff and the facilities of the existing Skipjack Programme are considered to be ideal for undertaking the study of other species after the completion of the Skipjack Programme in September 1981.

Specific tasks will include the assessment of the validity and accuracy of all available (published and unpublished) biological data and other information required for the assessment of the dynamics of the populations or stocks of the numerous tuna and billfish species. The resulting assessments will be presented to the fisheries officers of the countries of the region and subsequently published and distributed. Assessment of billfish stocks was considered as priority three.

- (d) Continued analyses of the data generated by the Skipjack Programme and evaluation of the impact of this data on resource assessment.

Tag recovery information will continue to be accumulated until well into 1983. The assessments of the skipjack resources of the region made by the Skipjack Programme will need to be updated in the light of this additional information.

Some of the tagging data accumulated by the Skipjack Programme before October 1981 will not be able to be fully utilized because the catch and effort statistics necessary for migration and mortality studies are not available from distant-water fishing nations until

approximately two years after catches are made. It is therefore unavoidable that some of the Skipjack Programme's analyses must be carried over into 1982 and 1983 if the full value of the data is to be realized.

- (e) Assessment and monitoring of the levels of exploitation of the stocks of the commercially important tuna species, especially yellowfin tuna, bigeye tuna and albacore.

This item is covered under item (c) above. Assessment of tuna stocks was considered as priority five.

- (f) Assessment of the biological information necessary for the study of population dynamics of the dominant species.

There is not at this time any centralized repository for biological data on tunas and billfishes in this region. It is not as yet known what biological data is necessary to assist with the assessment of the stocks of species other than skipjack, nor is it known how much of this data already exists. In the short term it is necessary to collate the available information and assess if additional data gathering programmes are necessary, for example additional length frequency data from commercial catches may be required.

It is likely that after an initial evaluation of the biological data, inadequacies will be identified and new data collection programmes could be proposed. It is possible that further tagging may be required to elucidate migration and growth patterns of species other than skipjack, but at this time tagging does not appear to be necessary.

- (g) Studies of the biology and ecology of the most important baitfish species used for catching tunas.

Adequate supplies of suitable bait are essential for any viable large pole-and-line fishery. Lack of bait or irregularities in supply are the major problems limiting the development of sizeable skipjack fisheries in many countries of the western Pacific. For some countries, comprehensive research programmes will be required to ensure that optimum utilisation of the baitfish resources can be obtained, and that alternative sources of bait can be identified where appropriate. All of the scientific staff of the present Skipjack Programme have had extensive experience with baitfish capture and research, and the Programme is already providing information and advice to governments on these issues. It is anticipated that the Tuna Programme will continue to serve this function.

- (h) 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.

The necessary oceanographic data will be accumulated and evaluated and the physiological requirements of each species being studied will be reviewed. The combination of this information with the knowledge of the biology of the species will involve a major study. It is likely that co-operative projects with organisations with major oceanographic programmes will need to be instigated.

It is not known if the study will enable reliable predictions of abundance to be made, but it should at least increase the understanding of why fish aggregate in the areas which they do.

- (i) Evaluation of the use of anchored rafts as tuna aggregating devices.

Anchored rafts are being used increasingly as tuna aggregation devices. While there is no doubt that skipjack and other tunas do congregate in the vicinity of these rafts, little is known of the possible impact of their increased use. For example, it is strongly suspected that the average size of tuna captured in association with these rafts is significantly smaller than those taken on the open sea; an evaluation of this phenomenon and its implications on yield per recruit management is urgently required. Detailed data on species and size composition of catches made near rafts will need to be collected and evaluated.

The impact of the increased availability and vulnerability of tuna which occurs when they associate with rafts also needs evaluation, particularly with regard to effects on long-term abundance.

- (j) 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.

It is possible that the expansion of surface fisheries for tuna in the western Pacific could have adverse effects on the catches in the longline fisheries. The surface fisheries account for almost all of the juveniles of the principal tuna species taken in this region; longlining exploits adults of all three species. This item is of great importance to all countries with an interest in either type of fishing, that is, all of the countries of the region.

Some of the information required to assess this type of interaction is available in the published statistics and scientific literature. However, it is probable that additional data sampling programmes will need to be established or modifications made to existing data collection schemes and proposed observer programmes.

- (k) Co-ordination of observer programmes on distant-water fishing vessels.

It is essential to the Tuna Programme that national observers assist in the collection of biological information as part of their duties while on board foreign vessels. A common format for this

information would be highly desirable and it is felt that a workshop with regional participation might be required.

The Twelfth Regional Technical Meeting on Fisheries passed a separate recommendation on this topic:

"The meeting recommended that the South Pacific Commission convene an appropriate workshop to consider fishery observer programmes to harmonize the transfer to scientific and technical fisheries knowledge among member states and to help assure the development of an adequate statistical sampling effort throughout the region. The South Pacific Commission should endeavour to solicit from national and international fisheries organizations, relevant input and background documents."

While the placement of observers on foreign fishing vessels will probably remain a national prerogative, the Tuna Programme could play an integral role in evaluating the regional significance of the data accumulated and advising additions or modifications to the type of information accumulated by observers.

- (l) 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.

In recent years an increasing number of longline vessels have begun using deep longline gear in order to improve landings of bigeye tuna and large albacore. As this is the most revolutionary change in longlining which has occurred in the last 25 years, assessment of its impact is of high priority.

It is probable that more accurate statistics on the type of gear used and the manner in which it is fished will be required. Additionally, oceanographic data relevant to the vertical distribution of the major commercial species will need to be accumulated and interpreted.

- (m) Evaluation of alternative fish attraction devices.

Several fish attraction devices, additional to anchored rafts, have been proposed for use in the western Pacific; the most notable probably being sonic attractants. Critical evaluation of the feasibility of using such devices to increase tuna catches is required.

While the staff of the Programme will provide basic analyses on all 13 major topics, it is intended that the assistance of all other appropriate regional and national bodies be obtained when necessary to carry out these tasks. This close co-operation with other organisations has been a feature of the Skipjack Programme and its continuation is embodied in Recommendation No.9 from the Twelfth Regional Technical Meeting on Fisheries:

"The meeting recommended that the South Pacific Commission through its Tuna Programme, should continue its policy of close co-operation with countries and organisations involved in the study of tuna and billfish."

Organisations with which co-operative studies are envisaged include all of the Fisheries Departments in the area of the South Pacific Commission, the Forum Fisheries Agency, the Inter-American Tropical Tuna Commission, the International Commission for the Conservation of Atlantic Tuna, the Japanese Fisheries Agency, National Marine Fisheries Service (USA), the Commonwealth Scientific and Industrial Research Organization (Australia), the Ministry of Agriculture and Fisheries (New Zealand), and the Office de Recherches Scientifiques et Techniques Outre-Mer (France).

The budget for the Programme is US\$517,750 for the first year with a predicted increase of nine percent per annum for inflation. Contributions for funding the Programme have been sought from Australia, the European Economic Community, France, Japan, New Zealand and the United States of America. The governments of Australia, France and New Zealand have already confirmed support for the Programme and negotiations with the European Economic Community, Japan and the United States of America are continuing.

The staffing of the Tuna Programme will be at the same basic level as the Skipjack Programme, that is a Programme Co-ordinator, two Senior Scientists, one Computer Systems Manager, up to five Scientists or Experimental Officers and up to four Research Assistants. The Skipjack Programme has been run slightly under establishment levels and it is possible that the new position of Statistician could be incorporated within existing staff levels.