

REPORT ON THE BETYP ACTIVITIES FROM OCTOBER 2001 UP TO SEPTEMBER 2002

ABSTRACT

This is a report of the BETYP activities from October 2001 to September 2002.

RÉSUMÉ

Ce document constitue le rapport des activités du BETYP d'octobre 2001 à septembre 2002.

RESUMEN

Este documento es un informe de las actividades del BETYP desde octubre de 2001 hasta septiembre de 2002.

1 INTRODUCTION

The Bigeye Tuna Year Program (BETYP) was proposed by the SCRS to the Commission in 1966 due to its concern by the increase of catches and uncertainties on the status of the stock. The Commission approved the recommendation but activities started only in 1999 when funds were made available. The BETYP is an ambitious program including conventional and Pop-up tagging, improvement of bigeye statistics, studies on genetics, growth and natural mortality, the development of a comprehensive integrated modeling program and at the same time encouraging the National Laboratories of the Member Countries to undertake expanded research on reproductive biology, ethology and technology.

From October 2001 up to September 2002, conventional tagging was carried out only in the Gulf of Guinea and Canary Islands, pop-up tagging was conducted in Azores, improvement in Fisheries Statistics in Ghana, genetic and hard parts studies as well as development of the integrated modeling program continued during this period.

2 CONTRIBUTIONS

The contributions requested and/or received from January to September 2001 are shown on **Table 1**, totaling US\$ 475.210.

3 EXPENDITURES (TABLE 2)

3.1 Salaries

The salary of the Coordinator and the accounting assistant are included in this line item in **Table 2**.

3.2 Coordination

This line item includes office supplies, telephone, eventual secretarial and translation services and the external auditing services

3.3 Travel

The Coordinator traveled a total of 146 days: 11 days to Azores, 8 to Basque Country, 28 to Ghana, 92 to Sao Tome and 7 to Chinese Taipei to visit the National Laboratories in order to coordinate and carry out the BETYP activities.

3.4 Meetings

The Coordinator and F.X. Bard met personnel of MFRD in Ghana from January 21 to 25, 2002 in order to propose a solution to the improvement of sampling methods in Tema. The resulting document, "BETYP Suggested methodology for actualization of sampling of tunas in Tema, Ghana" (see Annex 1), was delivered to the Director of Fisheries on January 25.

On September 18, 2002 Pilar Pallares, Naozumi Miyabe and João Gil Pereira (Joseph Powers was not in Madrid at the time), members of the BETYP Committee, met in Madrid with The ICCAT Executive Secretary, Victor Restrepo and the BETYP Coordinator to define the date and format of the BETYP Symposium. (see annex 2). The selected dates were March 8, 9, 10 and 11 of 2004, it was decided to select the main themes to be covered at the symposium and to appoint a scientist from the National Laboratories to be responsible for each theme. It was also decided to invite special guests with expertise in the themes and to encourage members of other Tuna Commissions to attend the Symposium. It was recommended to continue, subject to funds availability, with genetic studies, conventional tagging in Azores, Canary Islands and Madeira, and other activities of the BETYP.

The conclusions were presented to the Bigeye Tuna Assessment Group on January 19, 2002 and were accepted without comments regarding the date and general guidelines for the organization of the Symposium. A proposal was made to enlarge the Symposium to become a World Bigeye Tuna Meeting with the participation of the Tuna Commissions of the Pacific and Indian Oceans. The Chairman of the SCRS reminded that the BETYP Symposium should be an independent event as closing of the program. It was suggested that during each appropriate session of the Symposium, other Regional Organizations present a synthesis of their comparable activities in their area of responsibility. In the final Symposium Plenary the basis for future joint work would be established.

3.5 Conventional tagging operations

The total tuna tagged from October 2001 till September 2002 was 7,615 as it is shown in **Table 3**.

The Summary of BETYP conventional tagging activities since June 1999 up to September 2001 is shown in **Table 4**. The recapture results are encouraging as 14.6% of all tagged species were recaptured and in particular, 30% of bigeye. Most of the bigeye were recaptured near the tagging sites, however two recaptures of bigeye tagged in Senegal in 1999 should be noted: one was recovered 80 miles north of the Island of Faial, Azores and one in the Windward Passage between Cuba and Haiti.

3.5.1 Azores

Due to the lack of fish, no conventional tagging activities were held in Azores during 2001. One conventional tag was applied during the electronic tagging cruise in June 2002.

3.5.2 Madeira

Due to the lack of fish, no conventional tagging activities were held in Madeira during 2001.

3.5.3 Canary Islands

During the months of June and July 2002, two opportunistic tagging cruises were carried out, tagging a total of 816 Bigeye Tunas.

3.5.4 Gulf of Guinea, São Tome

A dedicated tagging cruise took place between June 1 and August 30, 2002 on board the Portuguese flagged chartered vessel Agiã. The tagging team headed by Paul Bannerman included personnel from MFRD, Tema Ghana. Head of cruise was Guillermo Fisch. The chartering cost was € 275,000. During this trip, 492 bigeye, 1,761 yellowfin and 4,545 skipjack were tagged. (See SCRS/2002/156)

3.6 Pilot study using electronic tags

As follow up to the one held in 2001 project, with the collaboration of AZTI, DOP, Dr. M. Lutcavage from the New England Aquarium and the financial assistance of the Basque Government, a project was established for tagging with electronic tags large bigeye from Azores during the 2002 fishing season. This project was carried out between May and June, 2002. During this project, 7 Pop-up tags were deployed out of Faial Island, Azores. One tag was not deployed due to bad weather. (See Annex 3)

The Tags were scheduled to pop-up in August and November 2002. The information obtained up to September 15 indicating local movements of about 450 miles, vertical movement to 1250 meters and water temperature for a bigeye followed for 30 days, is included in Annex 4

3.7 Statistics improvement, Tema, Ghana

Extensive work has been carried out at MFRD regarding support to improve the sampling, statistics and tagging operations. This work has been done by Paul Bannerman with the assistance of Xavier Bard who is stationed at IRD. See also meetings and Annex 1.

3.8 Otoliths and hard parts

As a result of the agreement signed between the BETYP and IRD, with the purpose of carrying out a program to study the growth of bigeye, Jean-Pierre Hallier, Bernard Stequert and François Xavier Bard presented document SCRS/2002/157 that indicates that otolith readings shows a faster growth than tag-recapture data.

3.9 Genetic studies

The Final Report presented by Rafael Zardoya San Sebastian of the Museo Nacional de Ciencias Naturales, Madrid, Spain, (See document SCRS/2002/159) based on the analysis of 177 samples collected in Côte d'Ivoire, Islas Canarias, Azores and Canada, indicate that three clades are present in the Atlantic Ocean Bigeye stock. Further sampling and studies are recommended.

3.10 Printing and publications

There has been no activity regarding this item, as publication of the final report will occur at the termination of the project.

4 PROPOSED BETYP ACTIVITIES FOR 2003

4.1 Conventional tagging

Continue conventional tagging activities as in the four previous years in Azores, Canary Islands, Ghana and Madeira, as well as opportunistic tagging in Venezuela, subject to funds availability.

4.2 Archival and pop-up tagging

Deploy one remaining Pop-up tag from 2002 in Azores during the 2003 fishing season.

4.3 Otoliths and hard parts

Continue the program in collaboration with IRD.

4.4 Genetic studies

Subject to funds availability, continue the program in collaboration with the Museo Nacional de Ciencias Naturales.

4.5 Tema statistics improvements

Continue assisting MFRD.

4.6 Integrated model

Continue development of the model.

5 BUDGET

The proposed budget for 2003, is shown in **Table 5**. In accordance with Chapter 7 of the Report of the Coordinating meeting of the ICCAT Bigeye Year Program (SCRS/1999/22), the funds for this budget, including the costs associated with the Symposium and publication of the final report, will be held from the 2002 funds.

Table 1. Contributions received and requested from January to September 2002

European Commission (20% from 2001)	US\$ 38,900
European Commission (80% from 2002)	US\$ 155,470
Japan (requested)	US\$ 230,945
Azores	US\$ 4,895
Peoples Republic of China	US\$ 25,000
AZTI	US\$ 20,000
Total income	US\$ 475,210

Notes:

(1) The exchange rate of the month when the contribution was received was used for the Peseta/Dollar conversion.

Table 2. BETYP budget 2002 and situation on September 19, 2002

ITEM	2002 Budget	Expenses to 9/19/02*
Salaries	\$115,000	\$78.564
Coordination Expenses	\$15,000	\$11.675
Travel	\$15,000	\$12.148
Meetings	\$25,000	\$1.749
Tagging activities, conventional tags		
Azores	\$20,000	0
Madeira	\$20,000	0
Canary Islands	\$20,000	\$19.067
Tema/ Gulf of Guinea	\$250,000	\$232.711
Tagging strategy research		0
Tag materials	\$5,000	0
Tag rewards	\$10,000	0
Various	\$15,000	0
Pilot study, electronic tags	\$50,000	\$6.456
Statistic improvements Tema	\$5,000	0
Sampling for growth hard parts	\$5,000	0
Printing and Publications	\$0	0
Contingencies	\$15,000	0
Total expenses	\$585,000	\$362.370

*Some expenses are best estimates

Table 3. Total tagged tuna from October 2001 till September 2002

Bigeye	1,309
Yellowfin	1,761
Skipjack	4,545
Total	7,615

Table 4. Summary of BETYP tagging activities, June 1999-September 2002

Location	BET	SKJ	YF	Totals
Azores	45	217		262
Madeira				
Canarias	2418	45	64	2527
Senegal	946	1404	105	2455
Ghana	1024	2056	1419	4499
São Tomé	824	8197	3645	12666
Total	5257	11919	5233	22409

Year	BET	SKJ	YF	Totals
1999	1035	507	110	1652
2000	496	65	10	571
2001	11	141	27	179
2002	45	621	190	856
Unknown	4	3	4	11
Total	1591	1337	341	3269
Percentages	30.26%	11.22%	6.52%	14.59%

Table 5. Proposed budget for the year 2003.

Salaries	\$115.000
Coordination	\$15.000
Travel	\$20.000
Meetings including symposium	\$50.000
Publications	
Tagging	\$105.000
Azores	\$20.000
Madeira	\$20.000
Ghana/Gulf of Guinea	\$20.000
Canary Islands	\$20.000
Rewards	\$10.000
Various	\$15.000
Tag materials	0
Archival and Pop-up tags continuing study	0
Tema statistics improvement	\$5.000
Hard parts	\$1.000
Contingency	\$15.000
Total expenses	\$326.000

BETYP Suggested methodology for actualization of the sampling of tunas in Tema, Ghana

Introduction: The relatively recent introduction of new multi-gear fishing strategies in Ghana, including the association or catch sharing between bait-boats and purse seiners and the catch transfer at sea from purse seiners and bait-boats to refrigerated carriers for final transportation to unloading ports, have rendered ineffectual the present port sampling methodology.

During the week of January 21 to 25, 2002, a meeting was held at the offices of the MFRD in Tema, Ghana to address this situation and this report summarizes the recommendation of the group. Present at the meeting were Dr. K. A. Koranteng, Director, and Paul Bannerman from MFRD, Dr. F.X. Bard from IRD as technical consultant to BETYP and Guillermo Fisch, BETYP Coordinator.

1. Review of present situation

1.1 Sampling:

During the landing of the catch of every bait-boat and purse seiner in the port of Tema, 100 fish are randomly sampled before the catch is sorted in commercial categories individual containers. It should be noted that there is no sampling by size or species at sea, although there is mixing of schools for safe loading of the vessel and for optimization in the use of freezing facilities on board.

MFRD counts with 2 permanent trained samplers and 2 occasional ones. The available sampling tools are: one 5m tape for round length; two 1m calipers for measuring LD1 and four 100cm measuring boards used for measuring FL. It should be noted that the type of measuring device is not indicated in the sampling form.

The result of each sampling is entered into an MS EXCEL spreadsheet and then summarized per month and per year prior to its presentation to ICCAT.

1.2 Task I

The information of catch per species, gear, month and size categories (using the Starkist specifications, see table 1) is delivered to MFRD by the fishing companies, that then presents them to ICCAT.

1.3 Task II

The information is obtained by MFRD from the logbooks. Under the present situation approximately 50% of the vessels deliver their logbooks and these are not always completely filled up. The digital recompilation of this information is complete for the years 2000 and 2001, and is on paper for the years 1997 to 1999.

2. Inconveniences with the present situation:

The present sampling system does not fully and accurately describe the species, size and gear of the landings in Tema, and this is due to:

The mixing of YFT and BET is likely to occur in the small size categories.

¹ Meeting participants decided that a formal report of the informal meeting would not be needed. This document summarizes key aspects of the discussions held and recommendations made. A working document by Maury and Restrepo (An age-size and time-space structured statistical model for the assessment of tuna populations) contains more detailed information on the structure desired by participants for the bigeye model.

The associations of purse seiners with baitboats, considering that among other things, during the sharing of the catch at sea the purse seiners tend to pick the larger fish.

The space/time origin of the catch is lost due to the mixing in the holds at sea and the sharing of the catch, aggravated by the use of carriers.

Large purse seiners are seldom sampled due to the fact that most of them do not land their catches in Tema.

3. Proposed methodology

Considering that all tuna landed in Tema is sorted by the industry at ship-side in containers with a capacity of 1500 to 2000 kg, following the Starkist codification (see table 1), and that a bait-boat or small purse seiner is unloaded in approximately 4 or 5 days, a large purse seiner is unloaded in approximately 10 days and a large carrier in approximately 20 days, the following is proposed:

3.1 Sampling will take place each day of unloading of every vessel (bait-boat, purse seiner and carrier).

3.2 Not less than one container per Starkist category will be sampled per day, including Market size fish.

3.3 The sampling will start by randomly identifying not less than 30 fish per container for species identification

3.4 Subsequently no less than 10 fish randomly selected will be measured per container. The measuring method (Fork length (FL), Round length (RL) or Pre-dorsal (D1)) will be clearly identified on the sampling form.

3.5 Results will be entered per category and vessel landing in an MS Excel spreadsheet and then consolidation per month and per year will be performed.

4 Other considerations

It is estimated that two teams of 3 samplers each, under the direction of a team leader will be necessary.

It is suggested that this methodology is followed for a period of three months starting if possible on March 1 and at the end of this period the system will be evaluated alongside the present system.

MFRD estimates that the cost of this pilot sampling program will be US\$ 2,700.

Table 1. Starkist sorting size categories per species and weight in kg.

Category	YFT	BET	SKJ	Other
GG	>13.6	>13.6	NA	NA
Jumbo	NA	NA	>3.4	NA
R1	3.2 to 13.6	3.2 to 13.6	1.8 to 3.4	1.8 to 3.4
R2	1.8 to 3.2	1.8 to 3.2	1.4 to 1.8	1.4 to 1.8
R3	<1.8	<1.8	<1.4	<1.4
R4	To verify	To verify	To verify	To verify

Notes
Other: Specify species
NA= non applicable

**BETYP Committee Meeting
Madrid, 18 September, 2002**

The members of the BETYP Committee Pilar Pallares, Nazumi Miyabe and João Gil Pereira, the ICCAT Executive Secretary, Victor Restrepo and the BETYP Coordinator met to define general guidelines for the BETYP Symposium and 2003 activities.

The recommendations were as follows:

1. Hold the Symposium in a location to be determined on March 8, 9,10 and 11, 2004. The date was selected to avoid calendar conflicts, increase the number of recaptures and to allow enough time for the organization of the Symposium and the elaboration of the expected scientific papers to be presented.
2. Select the main themes from the BETYP for development at the Symposium
3. Appoint a scientist from the National Laboratories of the member countries to be responsible for each theme.
4. Special guests with expertise in specific themes of the Symposium should be invited to attend.
5. Members of the different oceans Tuna Commissions should be encouraged to attend the Symposium.

According to funds availability, continue with genetic studies and conventional tagging in the Canary Islands, Azores and Madeira.

Pop-up tagging activities, Azores, 2002
By João Gil Pereira

Two bigeye pop-up tagging cruises were conducted in the Azores during 2002, within the framework of the BETYP. A sport-fishing type vessel “Aguas Vivas”, owned by the Azores University was used for the operations, using as fishing gear rod and reel, trolling with 4 or 5 lines.

Eight pop-up tags manufactured by Microwave Telemetries were available for the experiment. After testing the pop-up tags for the correct functioning of the release mechanism and transmission, the anchoring devices were installed, four double barb nylon darts from Floy Tags and four titanium plates from Wildlife Computers. The connecting lines between the anchoring devices and the pop-up tags was monofilament with stainless steel crimps and sheaved with thermoplastic shrink plastic tubing. The length of the connecting line had a length of 17cm from the tip of the anchoring device to the attachment to the pop-up tag. The depth of insertion was regulated to be 7.5 cm from the tip of the anchoring device.

Following the experience acquired in the previous year campaign, a tagging cruise was scheduled to take place around São Miguel Island in early May, which is the traditional season for large bigeye tuna. A total of eleven daily trips were made between April 30 and May 10, covering the South of São Miguel Island. During this period, only one bigeye of 95 cm was tagged using a conventional tag. Bigeye as well as other tuna species were absent from the Azores area and no catches were done either by the recreational or the professional fleets. The tagging team in this campaign was Guillermo Fisch, the BETYP Coordinator, João Gil Pereira from the Azores University, Haritz Arrizabalaga and Luis Alberto Martín from AZTI, and two crew members.

A second campaign was carried out off of Faial Island, from 3 to 8 June. During these 6 days, seven bigeye tuna ranging between 20 and 40 Kg were tagged with pop-up tags. Due to bad weather conditions the trips were suspended after this campaign. Two more daily trips were carried out on June 17 and July 6, but without success. The tagging team in this campaign was Joao Gil Pereira from the Azores University, Luis Alberto Martín from AZTI, and two crew members.

Explanation of Reports, Pop-up tag information

An Area Map:

Contains five different line types:

- The green line is an outline of the continents.
- The yellow line is the Argos real time data track after the tag had reached the surface and was drifting across the ocean surface.
- The light blue line is the estimated fish track based on positions calculated from the sunrise and sunset times.
- The purple line is the track of the fish based on a five day moving average of the estimated fish track (blue line). The average is calculated from two days before to two days after the current day.
- The end points are the start and end points of the track from the tagging location and the first Argos position.

List of Sunrise and Sunset Times:

A list of the times of sunrise and sunset used to determine latitude and longitude, included for your reference.

List of Latitude and Longitude points by day:

Our estimated latitude and longitude points which are at best accurate to plus or minus one degree. Latitude points are inaccurate two weeks before and two weeks after the fall and spring equinoxes because day lengths are very similar at different latitudes during these periods.

List of Argos Data points by day:

A list of latitude and longitude points that track the location of the tag after the tag has detached itself from the fish and is at the ocean surface.

Chart of Longitude:

A graph of longitude vs. date, representing the change in longitude over the tracked period.

Chart of Latitude:

A graph of latitude vs. date, representing the change in latitude over the tracked period.

Chart of Temperature:

A graph of temperature in degrees C. vs. date, used to track the change in temperature over the tracked period. Change in depth is the primary cause of short-term changes in temperature.

List of Temperature:

A list of all the temperature data collected.

List of Pressure:

A list of all the pressure and depth data collected

Chart of Depth:

This feature is only available in tags with pressure sensors. It is a graph of depth in feet vs. date, illustrating the change in depth of the tag over the tracked period.

The following illustrations are for Pop-Up tag number **26273**

