ICCAT ATLANTIC OCEAN TROPICAL TUNA TAGGING PROGRAMME - EVIDENCE BASED APPROACH FOR SUSTAINABLE MANAGEMENT OF TUNA RESOURCES IN THE ATLANTIC.

Reporting Period 3

AOTTP Coordination Team

aottp@iccat.int

CONTENTS

LIST OF ACRONYMS USED IN THE REPORT

AOTTP	Atlantic Ocean Tropical tuna Tagging Programme
AZTI	Centro Tecnologico Experto en Innovacion Marina y Alimentaria
BET	Bigeye tuna (*Thunnus obesus*)
BOT	British Overseas Territory
CEFAS	Centre for Environment Fisheries and Aquaculture Science
CIPA	Centro de Investigacao Pesqueira Aplicada (CIPA) de Bisseau
CLPA	Comite Local de la Peche Artisanale (Senegal)
CRO-CI	Centre Recherches Oceanologiques (Cote d'Ivoire)
CRODT	Centre Recherches Oceanologiques de Dakar (Senegal)
CSIRO	Commonwealth Scientific and Industrial Research Organisation (Australia)
DAFF	Department of Agriculture Forestry and Fisheries (South Africa)
DEPAq	Departamento de Pesca e Aquicultura (Brazil)
DG-DEVCO	Directorate General for International Cooperation and Development
DG-MARE	Directorate General for Maritime Affairs and Fisheries
EEZ	Exclusive Economic Zone
FADURPE	Fundacao Apolonio Salles de Desenvolvimento Educacional
FSSD	Fisheries Scientific Survey Division (Ghana)
FM	Fausses marques (tag-seeding)
IATTC	Inter American Tropical Tuna Commission (USA)
ICCAT	International Commission for the Conservation of Atlantic Tunas
IEO	Instituto Espanol de Oceanografia
IFAN	Institute fondamental Afrique noire Cheikh Anto Diop
IMAR	Instituto do Mar
IMROP	Institute Mauritanien de Recherches Oceanographiques et des Peches (Sao Tome and Principe)
INDP	Instituto Nacional para Desenvolvimento das Pescas (Cabo Verde)
IRD	Institute de recherche pure le developpment
ISRA	Institute Senegalais de Recherches Agricoles
LATEP	Laboratorio de Tecnologia Pesqueira (Brazil)
LPRC	Large Pelagic Research Center (USA)
LTA	Little tunny (*Euthynnus alletteratus*)

MFRD	Marine Fisheries Research Division (Ghana)
MFV	Motor Fishing Vessel
MSE	Management Strategy Evaluation
NOAA	National Oceanic and Atmospheric Administration
PAD	Port Autonome de Dakar (Senegal)
PROBITEC	Proyectos Biologicos y Tecnicos (Spain)
RV	Research Vessel
SC	Steering Committee
SCRS	Standing Committee on Research and Statistics
SKJ	Skipjack tuna (*Katsuwonus pelamis*)
SPC	Pacific Community (New Caledonia)
tRFMO	Tuna Regional Fisheries Management Organizations
TRO	Tag Recovery Officer
UPV	Universidad Politecnica de Valencia (Spain)
UFERSA	Universidade Federal Rural de Semiarido (Brazil)
UFPRE	Universidade Federal de Pernambuco (Brazil)
UPV	Universidad Politecnica de Valencia (Spain)
WAH	Wahoo (*Acanthocybium solandri*)

DESCRIPTION

NAME OF COORDINATOR OF ICCAT CONTRACT

Douglas Beare (**doug.beare@iccat.int**).

NAME AND TITLE OF CONTACT PERSON

Jean-Pierre Manel (Executive Secretary of ICCAT).

NAME OF BENEFICIARY(IES) AND AFFILIATED ENTITY(IES) IN THE ACTIVITY

International Commission for the Conservation of Atlantic Tunas.

TITLE OF THE ACTION

Evidence based approach for sustainable management of tuna resources in the Atlantic – Atlantic Ocean Tropical tuna Tagging Programme (AOTTP).

CONTRACT NUMBER

DCI-FOOD/2015/361-161

START DATE AND END DATE OF THE REPORTING PERIOD:

29 June 2017 to 28 June 2018.

TARGET COUNTRY(IES) OR REGION(S):

Atlantic Ocean coastal states.

FINAL BENEFICIARIES AND/OR TARGET GROUPS (IF DIFFERENT) (INCLUDING NUMBERS OF WOMEN AND MEN)

The final beneficiaries of the project are fishing communities and operators depending on the exploitation of tuna resources plus consumers of tuna fish.

COUNTRY(IES) IN WHICH THE ACTIVITIES TAKE PLACE (IF DIFFERENT FROM 1.7):

They are not different.

ASSESSMENT OF IMPLEMENTATION OF ACTION ACTIVITIES

EXECUTIVE SUMMARY OF THE ACTION

ICCAT-AOTTP made substantial progress towards its targets during Reporting Period 3 (June 2017 to June 2018). Fourteen contracts (35 since the project began) were awarded with a total value of 2.6 million euros. Since the project began, 1233 days at sea have been spent on 139 tagging trips throughout the Atlantic. Tagging targets (120,000) will be reached within budget by the end of the first quarter 2019. Currently *ca* 83,000 fish (70% of the target) have been tagged with conventional tags in the EEZs of 19 different countries, in addition to the High Seas, and contracts have been signed to tag approximately 35,000 more. More than 400 electronic tags (pop-ups and internals) have been deployed, and are already providing new scientific information on tuna migrations. Scientists and technicians, including women, from developing countries have tagged over two-thirds of all the fish. Formal tag-recovery and awareness raising infrastructures are now in place in 13 countries, with less formal arrangements in another 5 locations, including Japan and the People's Republic of China. Nearly 13,000 tags have been recovered (overall Recovery Rate is 15%) for which incentives and rewards (t-shirts, caps, lottery entry, cash, and mobile phone top-ups) have been distributed. Tag-seeding experiments are ongoing with our extensive network of observers throughout the Atlantic, and Reporting Rates for the most important purse-seine fleets are 84% for BET and 71% for YFT against a target of 80%. Nearly 14,000 fish have been double-tagged allowing tag-shedding rates to be estimated, and over 6,000 chemically tagged (60% of the target) which

improves our ability to age recaptured fish. AOTTP Contractors from Brazil and Senegal are currently creating a pan-Atlantic Otolith Reference Set to standardise age-determination of tropical tunas. All AOTTP data are uploaded rapidly into relational databases using smartphones, while applications such as WhatsApp and Telegram are used very effectively to maintain communication between AOTTP and the many field operatives around the Atlantic Ocean. Training in all aspects of tagging at sea, tag-recovery, and data transmission methodologies continued this year, building on the foundations already made. Taggers trained during the AOTTP first phase have now gone on to win their own contracts and train local teams (eg. in Cote d'Ivoire and Sao Tome and Principe). ICCAT-AOTTP organized three capacity-building workshops during the Reporting Period 3, which were very successful. The first focused on the organisation of the conventional tag-recapture data within the database, the second on estimating the growth and mortality of tropical tuna from tag-recapture data, and the last on algorithms for estimating tuna movement from electronic tags.

RESULTS AND ACTIVITIES

The AOTTP Programme is divided into the following five Phases: 1. Inception (6 months); 2. Tagging-Recovery 1 (18 months); 3. Tagging Recovery 2 (12 months); 4. Recovery and Analyses; and 5. Analyses and Symposium. AOTTP progress to date against Indicators described in the orginal Grant Contract is summarized below.

ER1. TAG-RECAPTURE AND ASSOCIATED DATA FROM THE THREE MAIN TROPICAL TUNA AND ON NERITIC TUNA SPECIES IN THE ATLANTIC ARE STORED IN A DATABASE AT THE ICCAT SECRETARIAT

AOTTP tagging activity began six months late at the end of June 2016 around the Azores Archipelago (EU Portugal). ICCAT-AOTTP has since tagged tuna: around the Canary Islands; around Madeira; off Senegal/Cabo Verde/Mauritania; in the Gulf of Guinea; in the territorial waters of the USA; off South Africa, and off Brazil and Uruguay. Tagging is currently ongoing in the EEZ of Cote d'Ivoire, at five locations off Brazil, around the island of Saint Helena (BOT), in the seas of the Caribbean/USA using sport fishers, and most recently around Sao Tome and Principe (**see Figure 1**).

There are two objectively Verifiable Indicators for Expected Result 1 (ER1) and the progress made by AOTTP on each is summarized below (means of verification in parentheses).

NUMBER OF TAGGED TUNAS: A MINIMUM OF 120,000 TUNAS ARE TAGGED (AOTTP & SCRS REPORTS, AOTTP-ICCAT DATABASES)

A total of 83,397 tropical tuna across species have now been tagged and released in the EEZs of 19 countries since the programme began (see **Figure 1**, **Table 1, Appendix 1**), and 12,263 of the tagged fish have been recovered in 21 different EEZs (**Appendix 2**). All the data sent are immediately checked, and then stored (updated weekly) in a relational database at ICCAT HQ. The total number tagged this reporting period (*ca* 33,000) is less than achieved during the previous year (50,666). This was due to: (i) the problems faced in Venezuela; (ii) the fact that AOTTP has been working to

distribute tagging effort more widely in both time and space; and (iii) has also been (deliberately) using smaller artisanal vessels which cannot catch fish as quickly as their larger, more industrial counterparts.

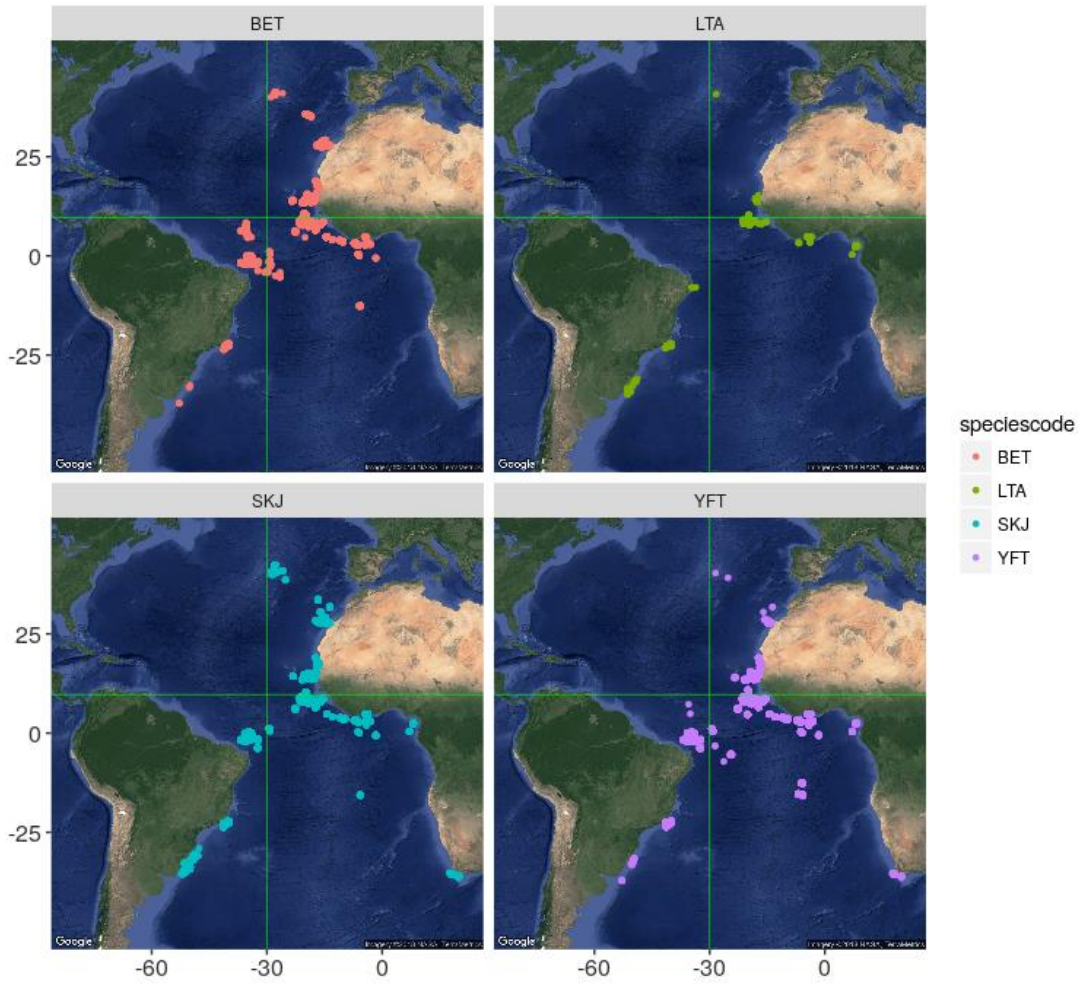


Figure 1. Distribution of tropical tuna tagged and released (conventional tags only) by ICCAT-AOTTP between July 2016 and June 2018

AOTTP has now achieved 69% of its overall tagging target. The distribution between the three main tropical species has become less balanced than observed last year due to the relative scarcity of BET (BET at *ca* 22%; SKJ at *ca* 44%; and YFT at *ca* 31%). Accordingly, ICCAT-AOTTP Tagging Contractors are minimizing (where possible) the numbers of SKJ tagged, and target more BET and YFT.

Table 1. R1,R2,R3 total AOTTP releases by species and release stage code

	R-1	R-2	R-3	Total Releases
BET	17926	124	1	18051
LTA	2247	9	0	2256
SKJ	36707	43	0	36750
WAH	73	0	0	73
YFT	26159	104	4	26267
Total Releases	83112	280	5	83397

Table 2. Double-Tagged releases by species

	BET	LTA	SKJ	WAH	YFT	Total
Double Totals	3322	229	6388	6	3756	13701
Single Totals	14729	2027	30362	67	22511	69696
Double Tag %	23	11	21	9	17	20

AOTTP will double-tag 20% (24,000) of the 120,000 tuna targeted so that 'tag-shedding' rates can be calculated, which is an important parameter in mortality estimation. To date, 13701 tuna have been double-tagged, translating to 57% of the target (**Table 2**). Size-ranges, or length frequencies, of individuals tagged and released are satisfactory overall (**Appendix 3**), although very large BET and YFT have been difficult to catch and tag.

Two neritic species (LTA and WAH) are being targeted for tag and release by ICCAT-AOTTP. To date, 2256 LTA and 73 WAH have been tagged against an overall combined target of 10000. LTA and WAH are of particular interest to West African coastal communities, since they are preferred for eating, and tagging teams are being encouraged to search for them and tag them. In the coming months many more of these two species will be tagged; particularly in the Gulf of Guinea and off northern Brazil.

Table 3. Electronic tag releases by species

	ARCGEO-9	DS-SeaTag-3D-PSAT	Lotek-2810	MiniPAT-348C
BET	27	19	106	22
SKJ	0	0	9	0
YFT	1	4	188	54
Totals	28	23	303	76

The project is also using electronic tags to study the movement and migrations of tropical tuna. Two different brands of pop-up type tag (Desert Star and Wildlife Computers) were used during phase 1, and two types of Lotek archival tags (ArcGeo 9s and Lat 2810s). In total, 23 Desert Star pop-up tags,

28 ArcGeo 9 internals, 303 Lat 2810 internals, and 76 Wildlife computers have been deployed by AOTTP (**Table 3**).

Table 4. Electronic tag mean retention times by species

	BET	YFT
Desert Star pop-ups	52	36
LOTEK LAT2810 internals	191	172
Wildlife Computers pop-ups	44	26

Retention times of the pop-up tags have generally been disappointing with an average of around 35 days (**Tables 4 and 5**). The maximum so far recorded for a Desert Star tag was 192 days (on a BET), and 116 days on a Wildlife Computers tag (also on BET).

Pop-up tag retention rates achieved by the LPRC team in USA were relatively high, and new information showing the migration of bigeye tuna in the NW Atlantic is emerging (**see Figure 2**). Due to the generally poor performance of both Desert Star and Wildlife Computers satellite tags, ICCAT-AOTTP opted to try Microwave Telemetry tags during the second phase, 30 of which have been sourced, and will be deployed in the last half of 2018.

Table 5. Electronic maximum retention times by species

	BET	YFT
Desert Star pop-ups	192	44
LOTEK LAT2810 internals	341	375
Wildlife Computers pop-ups	116	91

Recovery Rates of the internal/archival tags have been low with only a handful of tags recovered so far, although one was recently returned in South Africa with over 12 months of data (at 15 second intervals) 'on board'.

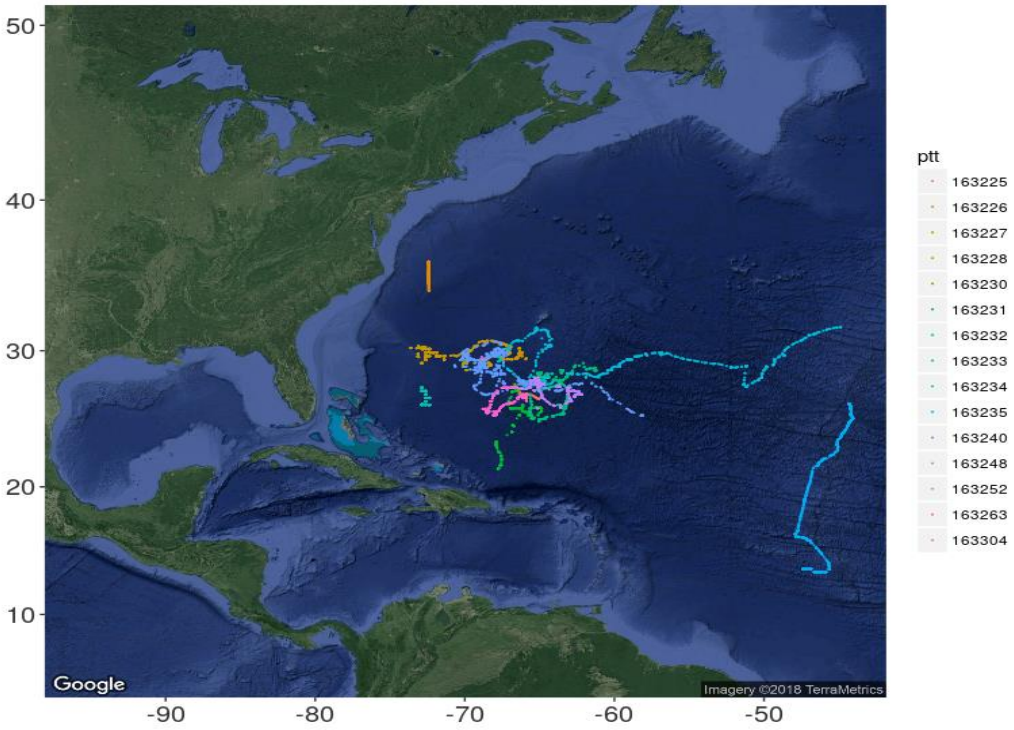


Figure 2. Migrations of BET tagged off USA in late 2017 and early 2018

The ICCAT Secretariat has a well-developed database infrastructure for storing tag-recapture data (**https://www.iccat.int/en/Tag-Desc.htm/**), which the AOTTP programme is exploiting and developing. The key element is to transfer the data collected at diverse locations to ICCAT. Android Applications for smartphones for data entry and transfer were developed in 2016 using Memento (**http://mementodatabase.com/**) which all teams involved in AOTTP data collection (tagging at sea and recovery) continue to use. Feedback is constantly acknowledged and improvements made. In particular, it can be difficult to use the smartphones at sea when light levels are high and/or weather conditions poor. Advantages of the smartphone system, such as accurate determination of location and time-stamp, are obvious however. The short time between data-submission and upload means that data can be checked quickly for accuracy, and that our teams in the field are a position to respond quickly to queries.

REPORTING RATES: A MINIMUM REPORTING RATE BY GEAR WITHIN THE RANGE OF THOSE OBTAINED IN SIMILAR TUNA TAGGING PROGRAMMES IN OTHER OCEANS (E.G. PURSE SEINE FLEETS ABOVE = 80%)

AOTTP must estimate Tag Reporting Rates (an important parameter in population assessment from tagging data) which is done using 'tag-seeding experiments'. The objective of this activity is to assess the efficacy of AOTTP awareness-raising activities in all geographic areas. A target Tag Reporting

Rate of 80% for the purse-seine fleet has been set. Tag Reporting Rates are quantified by 'tag-seeding experiments', whereby scientific observers, captains and crews of fishing vessels surreptitiously insert 'false' tags into fish that have been caught, at all points along the value chain. The recovery of these 'false' tags then allows Reporting Rates to be estimated.

Table 6. Tag-seeding 'releases' of false tags by species and gear/location

Species	BB	CACL	FISM	LL	PS	TRAN	UNKN
BET	7	0	0	0	38	18	3
LTA	1	0	0	0	1	6	0
SKJ	66	3	5	0	108	67	4
WAH	0	0	0	0	0	0	0
YFT	29	2	6	1	62	102	9

So far, 538 fish have been tagged with false tags in a range of different locations including: on board fishing boats (baitboats BB; long-liners LL; and purse-seiners PS); during transshipment (TRANS); at fish markets (FISM); and at canneries (CACL), **see Table 4**. Of those 103 fish were false tagged on baitboats, 1 on a long-liner, and 209 on purse-seiners. The focus of the tag-seeding work is the purse-seine fleet, which catches the majority of tropical tunas in the Atlantic. For purse-seiners Tag Reporting Rates for BET, SKJ, and YFT are 84.2%, 67.6% , and 71% respectively.

The target for BET is being met for purse-seiners, but rates for the other two species are too low and AOTTP will, therefore, continue to develop and improve awareness-raising activities until the end of the project.

A1.1. TAGGING OF TROPICAL TUNAS (ACTIVITY 1.1)

There are three Verifiable Indicators for Activity 1.1 and progress is summarised as follows (means of verification in parentheses).

FISHING VESSELS WILL BE HIRED FOR A TOTAL PERIOD OF 1800 TAGGING DAYS OVER 30 MONTHS (NUMBER OF TUNA TAGGED & RELEASED, AOTTP REPORTS)

Over 25 different boats have now been used by ICCAT-AOTTP to tag fish in the Atlantic: including the Levana (**Figure 3a**), the Transmar I (**Figure 3b**), and the Tuburao Tigre (**Figure 3c**).

Figure 3a: Levana - baitboat chartered by AOTTP-ICCAT to tag in the Territorial waters of Cote d'Ivoire

Figure 3b: Transmar I - baitboat chartered by AOTTP-ICCAT to tag in the Territorial waters of Brazil

Figure 3c: Tuburao Tigre - baitboat chartered by AOTTP-ICCAT to tag in the Territorial waters of Brazil

Vessels chartered by ICCAT-AOTTP have done 86 tagging trips or cruises over the tropical Atlantic during this reporting period, and 139 since the project began. Tagging teams have spent 1,233 days at sea corresponding to 68% of the 1800 day target set at the project start.

TAGGING TEAMS WILL BE DEPLOYED ON BOARD THE HIRED VESSELS (NUMBER OF TAGGING CAMPAIGNS, CRUISE REPORTS)

Between June 2016 and now, ICCAT-AOTTP has completed 139 tagging campaigns or cruises and all 139 corresponding cruise reports are available on request (**Table 7**). For additional details of the tagging cruises see **Appendix 4**.

Table 7. Tagging campaigns by location

Location	Number of trips
Azores/Madeira	17
Brasil/Uruguay	45
Canary Islands	11
Gulf of Guinea	43
Saint Helena	6
Mauritania/Guinea	4
South Africa	11
USA	2

In summary, 17 tagging trips have been organised in the Azores/Madeira, 11 in the Canary Islands, 43 in the Gulf of Guinea region, 4 in the Mauritania/Guinea region, 11 off South Africa, and 45 off Brazil and Uruguay.

TAGS (CONVENTIONAL, CHEMICAL, ELECTRONIC, SONIC) AND TAGGING EQUIPMENT WILL BE PROCURED.

All the conventional and electronic tags needed for the entire AOTTP Programme have now been sourced and procured (*ca* 150,000 tags), including those needed for the tag-seeding experiments. The electronic tags were procured by International Call for Tender. Desert Star supplied phase 1 with 40 Seatag-3Ds, Wildlife Computers with 95 Mini PAT-348C pop-up tags, while Lotek Wireless provided 400 (LAT 2810) and 40 ARCGEO-9 internal archival tags. After reviewing the performance of all the electronic tags during the first phase (**Table 5**) 30 Microwave Telemetry (**http://www.microwavetelemetry.com/**) pop-up satellite tags were bought for the second phase (**Figure 4**). Note that 13 additional Mini PAT-348C pop-up tags (replacements for 'pin-breakages' in the first phase and 'good will' tags) have been sent to ICCAT by Wildlife Computers, and will be deployed during the second phase.

Figure 4: Microwave Telemetry pop-up satellite tag

A1.2. AWARENESS CAMPAIGNS AND RECOVERY SCHEMES

ICCAT-AOTTP now has tag-recovery and awareness activities in all of the most important Atlantic Coastal States. The AOTTP verifiable indicators for the awareness campaigns and recovery schemes are as follows:

AWARENESS AND PUBLICITY CAMPAIGNS WILL BE DESIGNED AND IMPLEMENTED IN ATLANTIC COASTAL STATES AND DISTANT WATER FISHING NATIONS (NUMBER OF COUNTRIES WITH PUBLICITY CAMPAIGNS, REPORTING RATES, AOTTP REPORTS)

Awareness and publicity campaigns are ongoing in the following thirteen countries: (1) Açores Islands (Portugal), (2) Madeira (Portugal); (3) Canary Islands (Spain); (4) Mauritania; (5) Senegal; (6) Cabo Verde; (7) Ghana; (8) Cote d'Ivoire; (9) Sao Tome and Principe; (10) South Africa; (11) Brazil; (12) Ghana; and (13) Uruguay, see **Figure 5**. Tagging and tag recovery activities are also starting in the USA, and Caribbean.

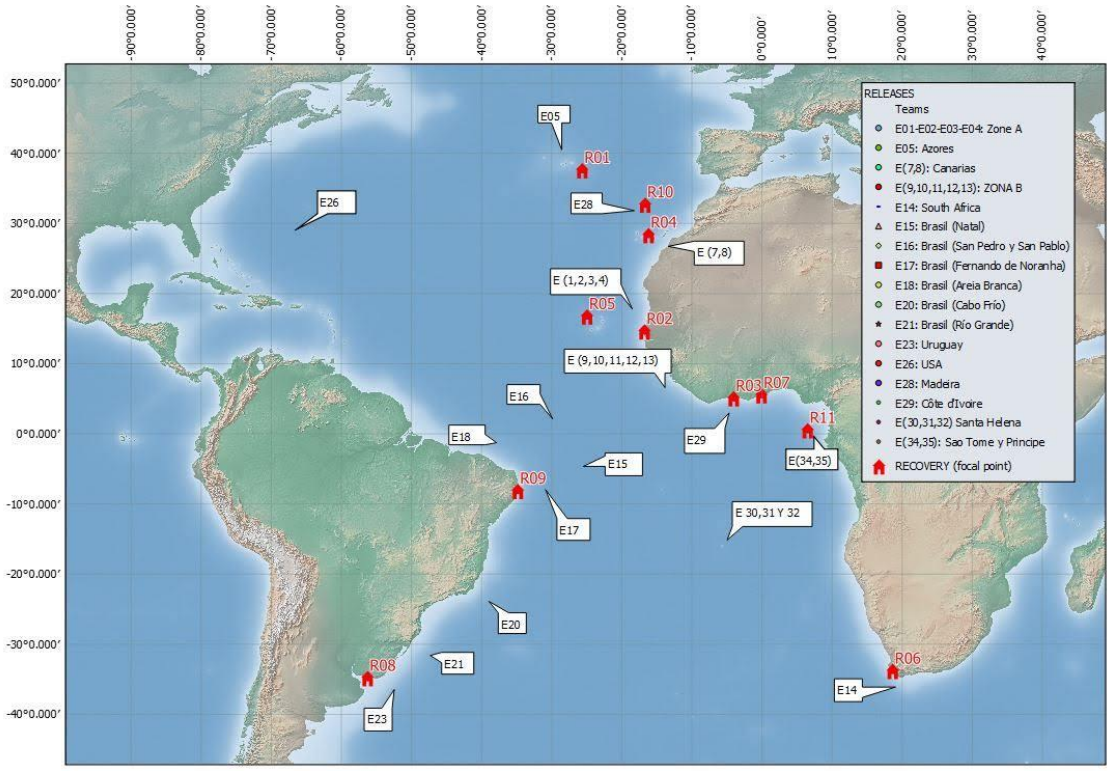


Figure 5: Summary of the distribution of AOTTP tag teams (E*) and Recovery Teams (R*) around the Atlantic Ocean

Specific officers and staff in each location are responsible for developing and implementing the activities (**Figure 6**). Each tag recovery team drafts a quarterly report summarizing awareness-raising activities, and the numbers of tags recovered during that period (available on request to AOTTP Coordination). The quantity of information in these reports cannot sensibly be summarised here. Instead typical exerpts from two such two TROs are presented for Brazil (**Appendix 5**) and South Africa (**Appendix 6**) enabling the reader to appreciate the amount of work that is being done by our colleagues. Between 1 January and the end of March 2018, for example, six Brazilian cities (Areia Branca-RN, Natal-RN, São Gonçalo do Amarante-CE, Itarema-CE, Rio Grande- RS and Barra de Sirinhaém-PE) were visited by the TROs and 83 people informed about the project. Similarly, the

EIGHTY-FIVE separate awareness-raising activities done by the TRO during the same period in South Africa are described in **Appendix 6**.

Less formal arrangements are in place in the British Overseas Territories of Ascension Island and Saint Helena, Trinidad and Tobago, and in Japan (**Figure 7**), Chinese Taipei, and the People's Republic of China (**Figure 8**).

Figure 6: Awareness-Raising among artisanal fishers in West Africa in 2017

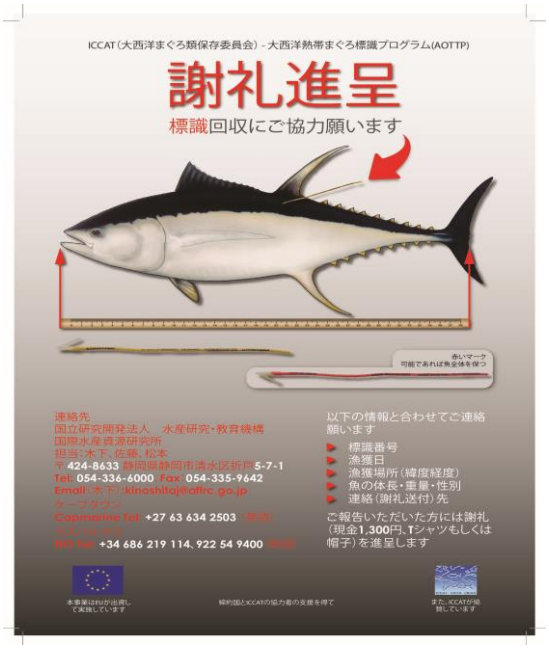


Figure 7. AOTTP poster in Japanese

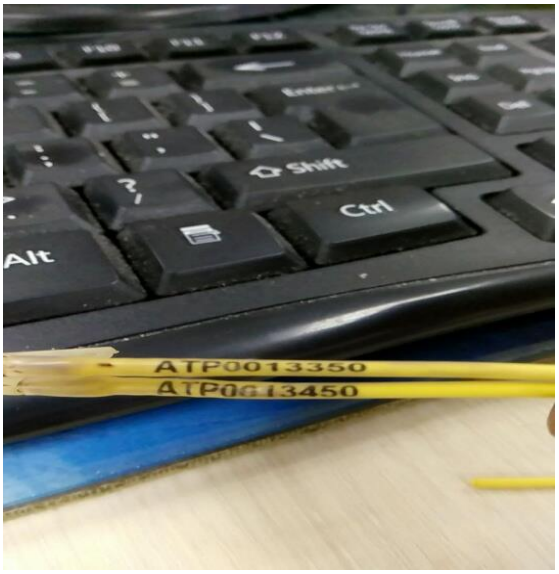


Figure 8. AOTTP tags (double-tagged BET) returned by colleagues from the People's Republic of China.

AWARENESS AND PUBLICITY CAMPAIGNS WILL TARGET FISHERMEN AND CREW, STEVEDORES AND OTHER FISHING FLEET SERVICE PROVIDERS, PROCESSORS AND WORKERS, ETC.

Awareness campaigns focus on those persons involved in different aspects of the fisheries sector, although some activities are directed at the general public. The design and production of the awareness material acknowledges the specific characteristics of those most directly involved, e.g fishermen, stevedores, traders, and fish processors. Bright-coloured t-shirts and caps with ICCAT and EU logos were designed in the official languages of each location during the first reporting period. Posters with clear messages highlighting the "Reward", the minimal required recovery information (e.g. fish length and capture location) and the mobile phone contact number, are continually being distributed and modified. Posters are water-proof and hard-wearing so they last when pinned up on fishing vessels, and around fish landing and auction facilities. Meetings and visits to artisanal fisheries communities, processing plants, landing areas are complemented by the distribution of this material (**e.g. see Figures 6,7 & 9**).

Figure 9: Awareness-Raising in Brazil in 2017

The general public are also targeted by AOTTP. Standard press release templates have been distributed to every Recovery Office and have been adapted to the specific characteristics of the

region. Many of the awareness-raising activities have also been recorded as videos on mobile phones and uploaded to youtube channels, **https://www.youtube.com/watch?v=K10UfPFIRUw**

REWARD SCHEME WILL BE DESIGNED AND DEVELOPED FOR THE DIFFERENT TARGET GROUPS

Reward schemes for tag and data recovery take into account: cultural nuances (e.g. English speaking Ghanaian fishing communities in Cote D'Ivoire); AOTTP budget constraints; and the incentives most valued in different countries by different sectors of the fishing business. All conventional tag-recoverers receive a cash reward of 10€, either a t-shirt or a cap, and are entered into the ICCAT Annual Lottery which offers substantial prizes. A reward of 500€ is paid to recoverers of electronic tags. In the three Recovery Offices with the highest landings of tropical tunas and hence tag-recoveries (Dakar, Abidjan and Tema) a small mobile phone credit top-up is paid. This, in addition to being very popular, compensates tag-finders for the cost of phone calls to report the discovery of the tag and metadata (**see Figure 10**).

Figure 10: Colleagues distributing AOTTP Rewards and Incentives

Staff involved in the recovery of tags also have continuous access to a simple website (http://aottp.iccat.int/index2017.php?option=search) which tracks all released tags, enabling their status to be checked. It is important, for example, that the TROs are able to tell the tag-recoverer where and when the fish was released which is often of great interest. Similarly, the TROs can verify the information provided by the tag-finders, avoiding duplications, fraud, and double payment of rewards.

A1.3. RECOVERY OF TAGS AND TRANSMISSION OF DATA TO ICCAT SECRETARIAT

TROs are at work for ICCAT-AOTTP in all strategic tuna landing ports of the Atlantic. The AOTTP verifiable indicators for this activity are as follows:

TAG RECOVERY OFFICERS (TRO) TEAMS WILL BE DEPLOYED IN STRATEGIC PORTS TO COLLECT RECOVERY DATA (NUMBER OF TROS DEPLOYED AND COUNTERPARTS, NUMBER OF RECOVERIES, AOTTP REPORTS, TAG SEEDING OPERATIONS ON PS FLEETS)

Data collected and sent to ICCAT so far attest to the efficacy of these activities (**see Figures 11, 12 and Table 8**).

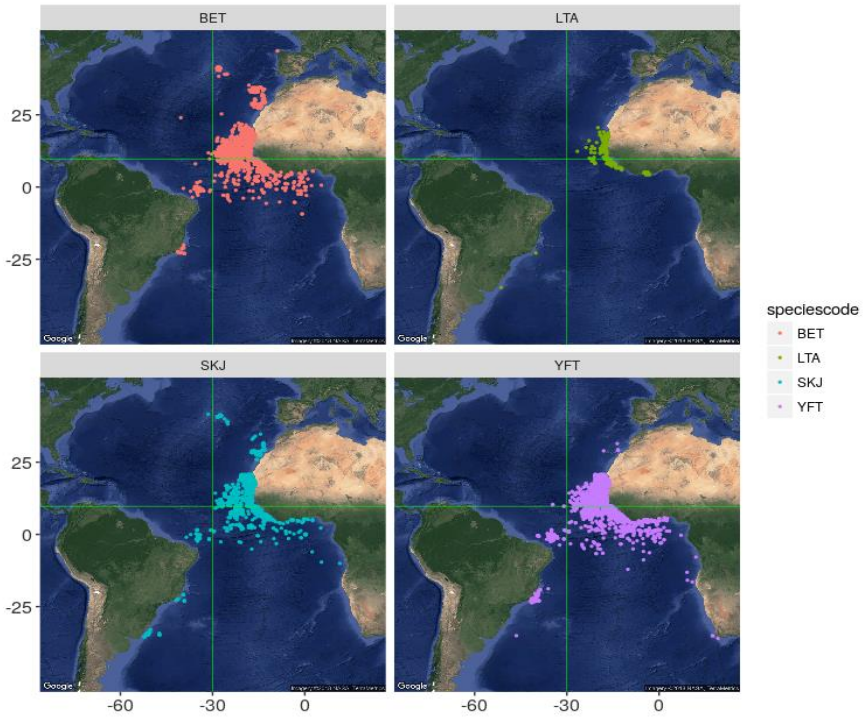


Figure 11. Spatial distribution of tropical tuna recovered by ICCAT-AOTTP between June 2016 and 2018

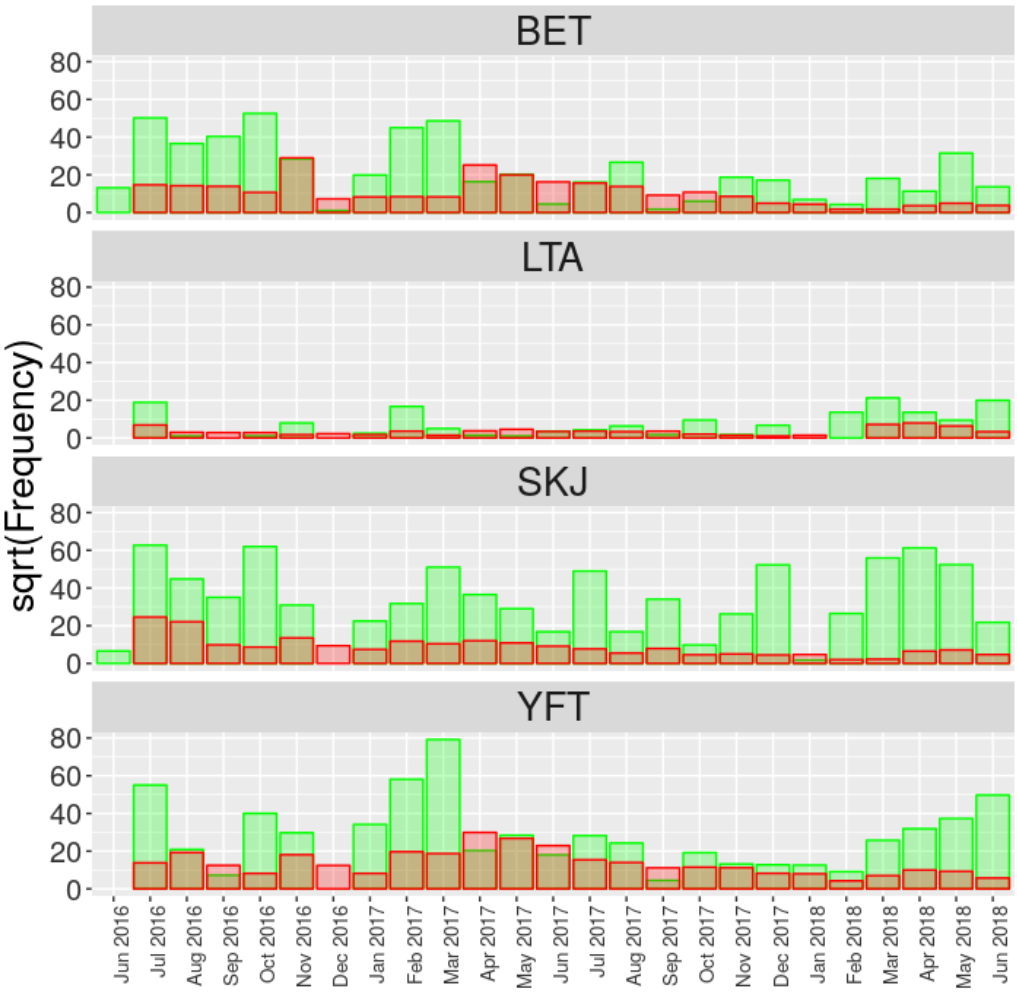


Figure 12: Total ICCAT-AOTTP releases (green) and recoveries (red) over time by species. Note that numbers have been square-root transformed so they can be seen on the same axis

The total number of valid tag recoveries (not including tag-seeding) is now (June 2018) 12,263 (**Table 8**) corresponding to an overall Recovery Rate of 15% which is much more that the rate originally predicted (10%) for the project. Indeed, Recovery Rates for BET and YFT are both above 20%.

Table 8. Total recoveries of tagged fish by species (tag-seeding not included)

	BET	LTA	SKJ	WAH	YFT	Total
Total Releases	18051	2256	36750	73	26267	83397
Total Recoveries	3925	356	2543	1	5438	12263
Recoveries %	22	16	7	1.4	21	15

Table 9. Chemically tagged release and recovery totals by species

	BET	LTA	SKJ	WAH	YFT
Total Releases	1729	32	1759	2	2546
Total Recoveries	323	0	152	0	430
Recoveries (%)	19	0	9	0	17

The total number of fish tagged chemically by AOTTP is 6068, or 61% of the 10,000 target set at the start of the project. Of those 1729 are BET, 32 LTA, 1759 SKJ, 2 WAH and 2546 YFT (**Table 9**). Recoveries rates of the chemically tagged fish have been satisfactory; especially for BET and YFT, at around 19% (**Table 9**).

A LARGE NETWORK OF COUNTERPARTS WILL BE DEVELOPED TO ENSURE RECOVERY DATA COLLECTION AND TRANSMISSION TO ICCAT

A large network of counterparts at diverse locations around the Atlantic is maintained using the Telegram Application which enables continuous communication and exchange of information (**see Figure 5**) between AOTTP Coordination and between both tagging and tag-recovery teams. An "AOTTP Tag Recovery Group" (25 Members) is used by the tag-recovery personnel around the Atlantic to upload data to ICCAT-AOTTP. The system facilitates the rapid correction of data and helps avoid coding mistakes. It also allows immediate feedback between AOTTP Coordination and the recovery officers.

QUALITY OF THE RECOVERY DATA ON BOARD PURSE-SEINERS IS ASSESSED (TAG-SEEDING OPERATIONS ON PURSE-SEINE FLEETS)

Tag-seeding experiments to estimate Reporting Rates are being implemented by observers organised by TROs in Senegal, Cote d'Ivoire, Ghana, South Africa, and Brazil. So far, 538 fish have been tagged with false tags throughout the tropical Atlantic.

REVISED LOG-FRAME

The log-frame was revised last year and no further revisions are needed.

Table 10. List of contracts (>60,000 euros) awarded by ICCAT during third Reporting Period

Date	SUPPLIER	AWARD PROCEDURE	OBJECTIVE	Value (euros)
6/7/2017	FLUTUANTODISSEIA LDA	International Call for Tender	Tagging activities in the Autonomous Regions of the Azores and Madeira	311,400.00
26/2/2018	FADURPE LED CONSORTIUM 2ª Phase	International Call for Tender	Tagging activities in the West Atlantic	850,000.00
26/2/2018	KAMAYA BUSINESS SARL	International Call for Tender	Tagging activities economic zone of Ivory Coast	542,082.00
16/3/2018	MICROWAVE TELEMETRY	Quotation request	Supply of electronic tags	114.020,00
11/4/2018	CENTRE FOR ENVIRONMENT FISHERIES & AQUACULTURE SCIENCE (CEFAS)	International Call for Tender	Tagging activities in South - East Atlantic	382,296.44
14/5/2018	FISHERIES DIRECTORATE OF SAO TOMÉ & PRINCIPE	International Call for Tender	Tagging activities in Sao Tome e Principe	249,993.30

UPDATED ACTION PLAN

OVERALL

An updated overall workplan by AOTTP Activity identical to that presented in Appendix 2 of the original Grant Contract is provided in **Table 11**. The project started about 6 months late due to administrative issues. Activities A1.1, A1.2, A1.3, A2.1, A3.1, and A3.2 (**Table 11**) all started more or less on schedule and are all now progressing well. The exceptions are A1.1 and A1.3 because tagging activities (and therefore recovery) did not start until Quarter 3 2016.

Table 11. AOTTP Workplan by Activity

Year	'15		2016				2017				2018				2019				'20	
Quarter	*3*	*4*	*1*	*2*	*3*	*4*	*1*	*2*	*3*	*4*	*1*	*2*	*3*	*4*	*1*	*2*	*3*	*4*	*1*	*2*
A1.1-Tagging of tunas																				
A1.2-Awareness campaigns & recovery schemes																				
A1.3-Tag recovery & transmission to ICCAT																				
A2.1-Reading of hard parts																				
A2.2-Tagging data analyses																				
A2.3-AOTTP Symposium																				
A3.1-Training in tagging techniques and data collection																				
A3.2-Data collection and sampling at recovery																				
A3.3-Training in data analysis																				

TAGGING AT SEA

AOTTP has now (30 June 2018) tagged 83,397 tropical tuna (target = 120,000).

In February 2017 ICCAT signed a contract to tag 9500 fish in the territorial waters of Venezuela as part of the phase 1 target but the political situation in Venezuela led to a cancelation of the contract. The Call for Tender to tag tropical tuna in the NW Atlantic was thus launched in October 2017 and a contract with the University of Maine to tag 5000 fish using sport fishers in the waters of the USA and Caribbean was recently signed by the Executive Secretary of ICCAT.

Table 12. AOTTP Tagging Update

	BET	LTA	SKJ	WAH	YFT	Contracted	*Total*
A (Mauritania/Guinea)	3714	357	3695	1	3453	*4000*	15220
B (Gulf of Guinea)	6749	1588	6940	7	14817	*14000*	44101
C (Canary Islands)	3367	0	3146	0	76	*4000*	10589
D (Azores/Madeira)	338	1	5595	0	5	*1250*	7189
E (Caribbean)	0	0	0	0	0	*2500*	2500
F (Brazil/Uruguay)	3826	310	17244	60	7403	*2500*	31343
G (South Africa)	0	0	108	0	120	*0*	228
I (USA)	20	0	0	0	0	*2300*	2320
J (St Helena)	28	0	22	5	354	*5200*	5609
Total	18051	2256	36750	73	26267	*35750*	119147

AOTTP has currently tagged nearly 84,000 tuna (Table 12), and has signed contracts committing to tag a further 35,750 by the first quarter of 2019 making a total of *circa* 119,000 which would leave another 1000 or so fish to tag. We are currently discussing this issue with the AOTTP steering committee, ICCAT SCRS, and a final decision where to tag the remaining fish will be taken soon.

CAPACITY BUILDING

Training and capacity development in all aspects of tagging data analyses began in partnership with the CPCs and SCRS during Reporting Period 3 although this work was not scheduled to start until Quarter 4 2018 (see also **Table 12**) in the original AOTTP Grant Contract. AOTTP Coordination, however, believed that by then it would have been too late for a successful Final Symposium (A2.3) and three capacity building workshops were, therefor organized between July 2017 and June 2018; one in Q4 2017; one in Q1 2018 and one in Q2 2018.

Table 13. AOTTP plan (year 4)

Year	2018						2019					
Month	**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**	**M**	**A**	**M**	**J**
A1.1-Phase 2 Tagging												
A3.1-Training taggers (data collection protocols etc.)												
A1.1-Calls for tender for phase 2 tagging												
A1.2-Awareness raising in other CPCs and fleets (longliners)												
A2.1-Reading of hard parts (otoliths)												
A3.3-Tagging Data Analyses capacity building workshops												
A2.2-Calls for tender for scientists to analyse data												
AOTTP Steering Committee Meeting												
EU newsletter												

R2. KEY PARAMETERS SUPPORTING STOCK ASSESSMENTS ARE ESTIMATED ON THE BASIS OF DATA COLLECTED THROUGH THE PROGRAMME AND INTEGRATED IN STOCK ASSESSMENTS

The new scientific information represented by the tag-recapture data collected during AOTTP will be used to support the population assessments of BET, SKJ, and YFT. The verifiable indicators for this 'Expected Result 2' are as follows:

BIOLOGICAL PARAMETERS ARE MADE AVAILABLE TO THE SCRS BY THE END OF THE PROGRAMME, AND INTEGRATED STOCK ASSESSMENTS ARE UNDERTAKEN FOR THE THREE SPECIES OF TROPICAL TUNAS (ANALYSES, REPORTS AND PUBLICATIONS, SCRS DOCUMENTS AND REPORTS, PUBLICATIONS IN PEER-REVIEWED SCIENTIFIC JOURNALS, AOTTP REPORTS)

AOTTP now has a rich dataset which can be used to estimate growth rates, mortality (including gear selectivity), and migration rates. Basic statistics and observations (e.g. number of releases, numbers of recoveries) were presented at the SCRS Species Group Meeting between 4-8 September 2017 (Beare et al. 2017; Guemes, Garcia, and Beare 2017; Goñi et al. 2017; Onandia et al. 2017) and again at the SCRS Plenary in early October 2017 (AOTTP Coordination Team 2017). Preliminary observations of AOTTP tag-recapture data for LTA were presented at the 2017 Small Tunas Intersessional Meeting by the ICCAT Secretariat in Miami in April 2017 (Neves dos Santos 2017).

During AOTTP Workshop 2 in Abidjan in January 2018 our invited experts (Daniel Gaertner and Lisa Ailloud) successfully demonstrated how growth can be estimated with non-linear models (e.g. **Figure 13**) and how natural mortality (***M***) can be estimated using Brownie models. In order to calculate ***M*** using Brownie models, a binary 'capture history' dataset must first be created. An example - by year - is shown in **Table 15**. At the time of the workshop, 15459 BET had been tagged and released by AOTTP. The relevant 'capture history' data (aggregated by year) shows that only 5

outcomes are possible (**Table 14**) at this (temporal) resolution. For example, 6795 BET were released in 2016 and were not yet recaptured ('1000'), while 1616 BET were released in 2016, and also recaptured the same year ('1100'). By applying a simple Brownie model to these data using the software RMark, a tentative estimate of natural mortality (0.81) was made for BET. This, however, will be subjected to further critical appraisal when more data (both releases and recoveries) become available, and when the temporal (quarterly) and spatial resolution is increased.

Table 14. AOTTP BET 'capture history' data for Brownie Models (as of December 2017)

Capture history	Frequency
0010	5032
0011	1390
1000	6795
1001	626
1100	1616

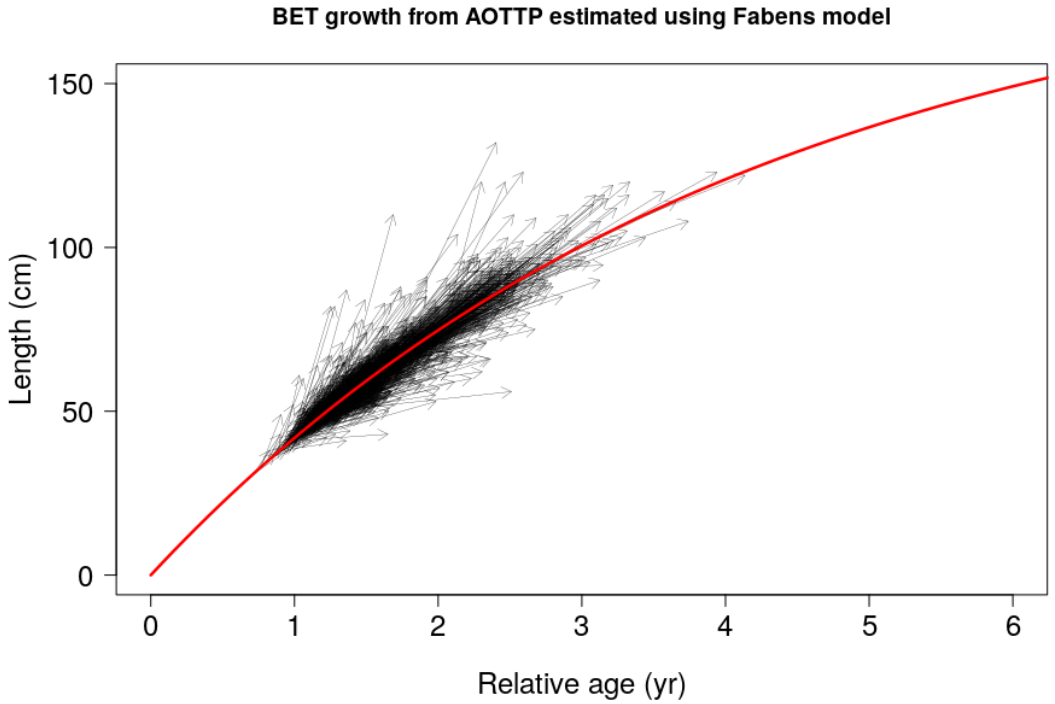


Figure 13: AOTTP BET Growth

AOTTP activities have already stimulated the production of a number of scientific articles. In particular the capacity building workshops allowed CPC scientists to familiarise themselves with the AOTTP tag-recapture data. At the subsequent BET data preparation meeting in April 2017 in Madrid AOTTP tag-recapture data for BET were first summarized by AOTTP Coordination (Beare 2018), and then various participants of the capacity building workshops presented their analyses on for

example: BET growth (Arregui et al. 2018); BET gear selectivity (Gaertner, Goñi, et al. 2018); and BET tag-shedding rates (Gaertner, Pascual Alayon, et al. 2018).

As per the AOTTP Grant Contract, formal analyses of targeted research questions should have started in March/April 2018. Due to the delay in the initial project implementation these are now scheduled to begin in Quarter 3 2018 after consultation with the SCRS.

INDICATORS ARE DEVELOPED FOR NERITIC TUNAS (STOCK STRUCTURE, GROWTH, MIGRATIONS)

At the 2016 Small Tunas Species Group meeting the issue of indicators for neritic (coastal) tunas was discussed. There are many potential neritic tuna species that could be studied, but the Group agreed that it would be better for AOTTP to focus on only two species: WAH (*Acanthocybium solandri*) and LTA (*Euthynnus aletteratus*). The tagging teams, therefore, will tag only these species (in addition to the three tropical species). In this way, AOTTP ensure that plausible indicators are developed for two neritic species without effort being spread to thinly.

As of writing 2256 LTA, and 73 WAH have been tagged with 356 and 1 recoveries recorded respectively (**Tables 1 and 3**). While providing useful information the numbers of neritic tunas tagged by AOTTP are yet too few to permit the development of any sophisticated 'indicators'. The data for LTA, however, can certainly now yield useful information on growth rates and movement around the coast of West Africa. AOTTP is currently targeting neritic tunas more vigorously, particularly in the Gulf of Guinea, and around the Brazilian St. Peter and St. Paul Islands.

A2.2. READING OF HARD PARTS

Relevant Verifiable Indicators for this activity are:

HARD PARTS (OTOLITH, VERTEBRAE, SPINES) WILL BE SAMPLED ON RECOVERED TUNAS (NUMBER OF READINGS OF HARD PARTS, AOTTP REPORTS)

AOTTP is targeting 10,000 fish for 'chemical tagging', which means they will be injected with a chemical marker that allows their otoliths (or other hard parts) to be 'read', and aged more easily. Chemically tagged fish always also have a red spaghetti tag (**Figure 14**), marked with 'KEEP WHOLE FISH'. When a fish with a red tag is found, and reported, tag recovery teams arrange to buy the fish, pay any reward etc. take, store and process the biological samples, and ultimately determine the age of the fish from the hard-parts.

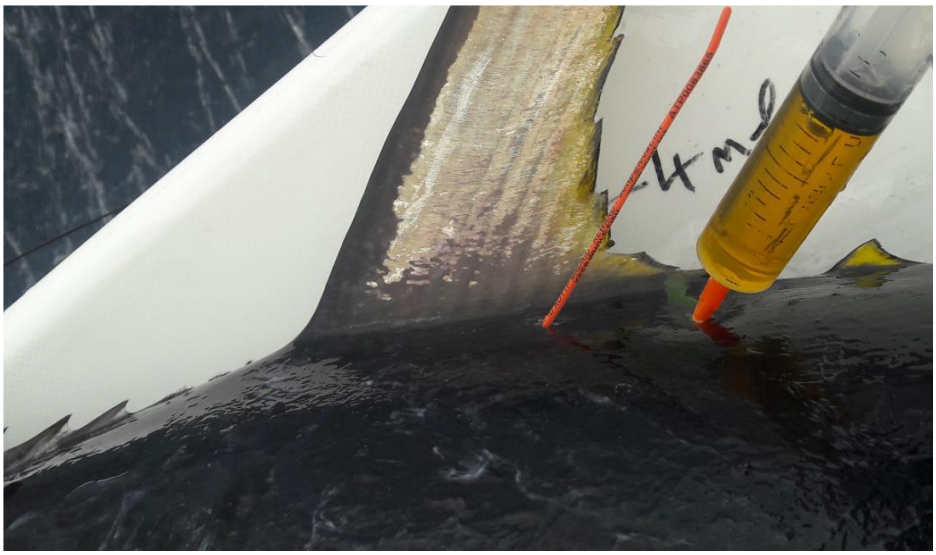


Figure 14: Chemically tagging a tuna

Thus far AOTTP has purchased and taken biological samples from 469 chemically marked fish (red tags) representing all size classes, 3 species, and both sexes (**Table 5**). Other biological information like body-weight, state of sexual maturity, and stomach contents have also been collected to complement eventual analyses.

Table 15. Biological samples collected

	F	M	U
BET	53	79	1
SKJ	46	59	0
YFT	68	163	0
Total	167	301	1

READING OF THE HARD PARTS WILL BE UNDERTAKEN BY SPECIALISTS

An Otoliths Expert Group with specialists from Senegal, Cote d'Ivoire, France, Spain, USA, Australia and South Africa was set up by AOTTP during the last reporting period with ICCAT SCRS approval. The aim was to establish the procedures and protocols for the collection, preservation and reading of otoliths. Activities began at a workshop in Abidjan (1-2 March 2017).

The Otolith Expert Group recommended that AOTTP create a Reference Collection of Otoliths for 'calibrating' the age-readings. A Call for Tender to create the Reference Collection was thus launched on 22 June 2017, and five proposals received. Ultimately two contracts were awarded in late 2017: one to FADURPE (Brazil, West Atlantic); and the other to IFAN (Senegal, East Atlantic). Two contracts were awarded for this work because an otolith reference set with specimens from both sides of the Atlantic will be more useful in improving our scientific understanding of tropical tuna growth than a single reference set from only the eastern or western part of the Atlantic would

have been. The coordination necessary between both groups (IFAN and FADURPE), ICCAT-AOTTP and between the Otolith Expert Group created last year, is also contributing to the capacity building objectives of AOTTP.

Twenty five pairs, by length categories, of otoliths (also other hard parts) for BET, SKJ and YFT are being collected in Brazil (FADURPE with Guelson Batista da Silva as the main contact) and another 25 pairs in West Africa (IFAN with Khady Diouf as the main contact). Note that recent progress reports from each side of the Atlantic are available on request to ICCAT-AOTTP. Images/photos of the hard parts are circulated (digitally) among the Expert Group who read and calibrate them, see middle bottom panel in **Figure 15**. When the reference sets and calibrations are done, a Workshop will be held in April 2019 to train future otolith/hard part age-readers around the tropical Atlantic based on the Reference Set.

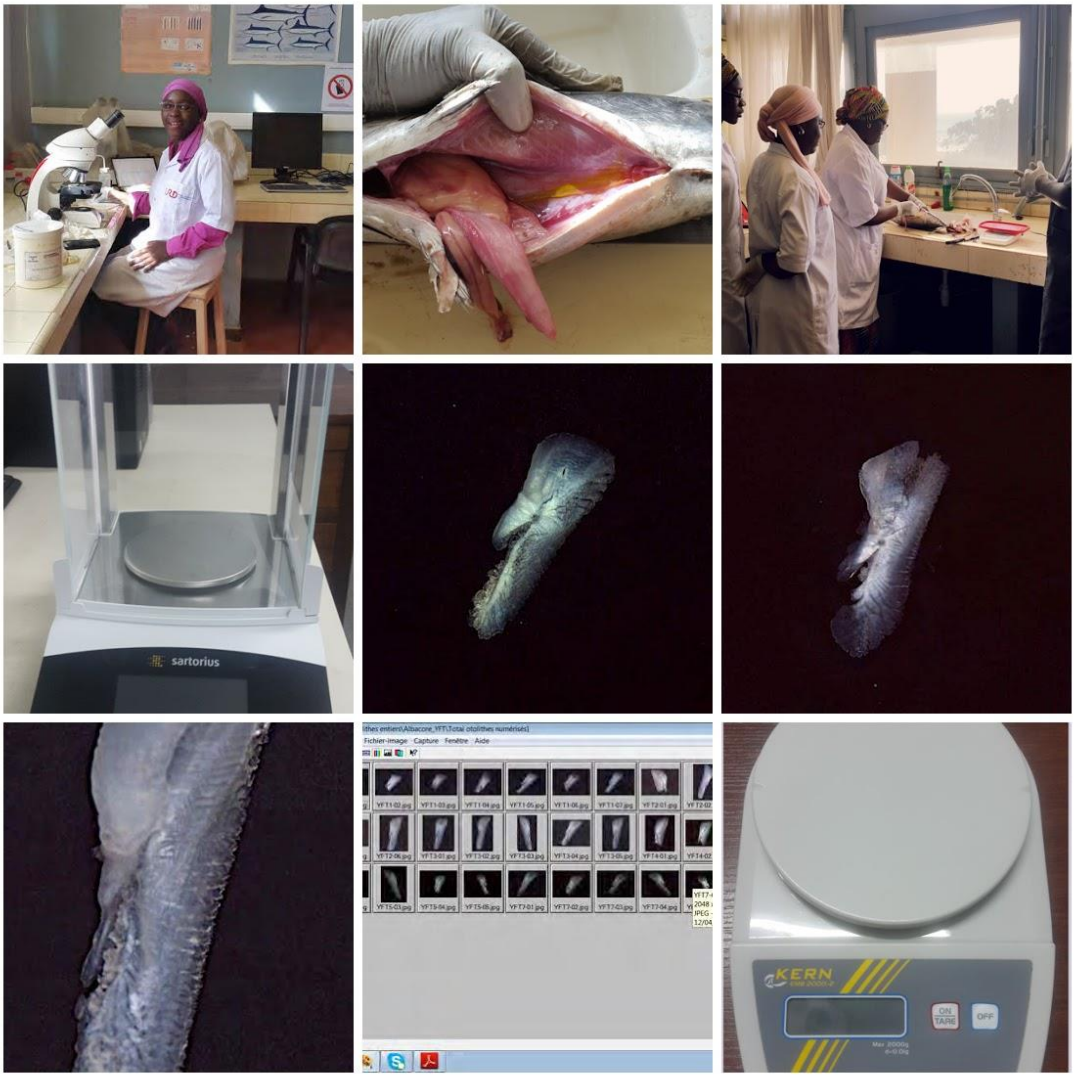


Figure 15. The creation of an Otolith Reference set in Dakar, Senegal.

A2.2. TAGGING DATA ANALYSES

The relevant Verifiable Indicator for Activity 2.2 is:

TAG-RECOVERY DATA COLLECTED DURING THE AOTTP WILL BE ANALYSED BY SCIENTIFIC CONSULTANTS BEFORE THE END OF THE PROGRAMME TO ESTIMATE MISSING KEY PARAMETERS FOR STOCK ASSESSMENTS (NUMBER OF ANALYSES UNDERTAKEN, REPORTS FROM CONSULTANTS, SCIENTIFIC PUBLICATIONS, AOTTP REPORTS)

As discussed above ICCAT-AOTTP has already generated a large dataset comprising: (i) mark-recapture data from spaghetti tags; (ii) tag-seeding data; (iii) data from electronic tags; and (iv) biological samples such as otoliths.

BET data were made available to the Capacity Building Workshops discussed below (Activity 3.3). At the BET Data Preparation meeting in April 2018 the following recommendations were made.

Recommendations regarding use and access to AOTTP data

1. All data use and publications derived from AOTTP data will have to follow the publication policy included in the AOTTP webpage (**http://new.iccat.int/AOTTP/en/aottp-about.html**).
2. AOTTP conventional tagging data should be shared according to the following conditions:
    - raw data (not yet quality controlled) can be released to AOTTP capacity building working groups and tropical tuna working group meetings
    - raw data will be periodically updated (every six months) and quality controlled before widely released
    - quality controlled data will be made available publically through the ICCAT webpage. The process of quality control will be described in the webpage and data sets made available will have information on individual fish data quality that can facilitate a broad set of analyses.
    - users of data will be encouraged to try to involve scientists from developing countries in their analysis of the AOTTP data. This will be facilitated by providing, in the ICCAT AOTTP webpage, a list of interested scientists from developing countries that have requested to participate in these analyses and by listing all scientists that have participated in the AOTTP training workshops.
3. Access to other data collected by AOTTP (otolith reference sets, electronic tagging data) will have to be requested directly to the AOTTP coordinator and access and use of these data will be governed by the following rules:
    - The AOTTP steering committee will decide on the release of such data considering, first the objectives of the AOTTP program, second the priority research needs established by the tropical tuna working group in their work plan and third the state of progress in the collection of these data sets.
    - Requesters of such data should make sure their request for use of such data is consistent with such objectives and such research needs. The AOTTP webpage provides the list of

research objectives for the program. The the annual workplan of the group in the annual SCRS report provides the list of research priorities for the tropical tuna working group.

- Requests for data analysis that do not fulfill such priorities and objectives will only be considered if the use of the data does not compromise, in any way, the ability of the AOTTP to fulfill its objectives.

The webpage for dissemination of the 'raw' has been set up and data are now available to the participants in the capacity building workshops and the participants of the BET Data Preparation meeting (**http://new.iccat.int/AOTTP/en/aottp-about.html**). Metadata describing the data themselves and the quality control system are also available. Procedures for transferring the 'quality-controlled data', which will be made available publically through the ICCAT-Secretariat webpage, have also been developed and tested.

The data will be used for a wide range of important scientific analyses resulting in reports, SCRS Working Documents, and peer-reviewed scientific papers. This work will be coordinated by the Chair of the SCRS (Dr David Die) and the associated SCRS scientific community.

A2.3. INFORMATION FROM STAKEHOLDERS

AN INTERNATIONAL SYMPOSIUM WILL BE ORGANISED TOWARDS THE END OF AOTTP IN ORDER TO PRESENT AND PUBLICISE THE RESULTS OF THE AOTTP AND THE ANALYSES OF THE TAGGING DATA (NUMBER OF PARTICIPANTS AND PRESENTATIONS TO THE SYMPOSIUM, AOTTP REPORTS)

This activity relates to the organisation of the Symposium planned for the final months of the AOTTP project, ie. between April and June 2020.

R3. SCIENTISTS FROM DEVELOPING COUNTRY CONTRACTING PARTIES OF ICCAT ARE TRAINED IN TAGGING, DATA COLLECTION, AND TAGGING DATA/STOCK ASSESSMENT ANALYSIS (EXPECTED RESULT 3)

The indicators relevant to this result are as follows:

TAGGING TECHNIQUES: 20 SCIENTISTS/TECHNICIANS FROM DEVELOPING ICCAT STATES ARE TRAINED ON BOARD THE TAGGING VESSELS (NUMBER OF SCIENTISTS/TECHNICIANS TRAINED ON BOARD THE TAGGING VESSELS, NUMBER OF FISH TAGGED BY SCIENTISTS/TECHNICIANS FROM DEVELOPING ICCAT MEMBER STATES, AOTTP REPORTS)

To date, substantially more than 20 scientists/technicians from developing countries have been trained in tagging techniques at sea, including 2 from Cabo Verde, 7 from Cote d'Ivoire, 7 from Ghana, 5 from Senegal, 8 from Brazil, 2 from Uruguay, and 5 from Sao Tome and Principe.

DATA COLLECTION AND SAMPLING AT RECOVERY: 30 SCIENTISTS/TECHNICIANS FROM DEVELOPING COASTAL STATES TRAINED IN DATA COLLECTION AND SAMPLING AT RECOVERY

This indicator has been exceeded. Up to June 2018, at least 50 scientists/technicians have received training in tag recovery in: Azores Islands (Portugal), Madrid (Spain), Dakar (Senegal), Abidjan (Cote d'Ivoire), Tema (Ghana), Mindelo (Cabo Verde), Brazil, Uruguay, Cape Town (South Africa) and Sao Tome and Principe.

TAGGING DATA ANALYSIS AND INTERPRETATION: 80 PARTICIPANTS FROM DEVELOPING COASTAL STATES TO WORKSHOPS

A3.1. TRAINING IN TAGGING TECHNIQUES AND DATA COLLECTION

Progress in this activity has been continuous and substantial. It has one component summarised below.

SCIENTISTS FROM DEVELOPING ICCAT CPCS WILL BE INVITED AND TRAINED TO PARTICIPATE TO TAGGING ACTIVITIES ON BOARD THE TAGGING VESSELS (NUMBER OF SCIENTISTS/TECNICIANS TRAINED ON BOARD THE TAGGING VESSELS, NUMBER OF FISH TAGGED BY SCIENTISTS/TECHNICIANS FROM DEVELOPING ICCAT MEMBER STATES)

During the first tagging phase, at least 46 individuals (from Senegal, Cabo Verde, Côte d'Ivoire, Hawaii, EU-Spain, EU-France, EU-Portugal, São Tomé and Principe, and Ghana) attended training courses run by AZTI in conventional, chemical and electronic tagging, and associated data collection. Having scientists on board was a condition for gaining access to the territorial waters of Mauritania, Guinea Bissau, and São Tomé and Principe and the following individuals came on board the tagging vessel:

- Ahmed DIAGNE (IMROP, Mauritania) in the 2nd trip zone A, as observer
- Mario Abel NBUNDE (CIPA, Guinea Bissau) in the 3rd trip of zone A, as observer
- Mirian GOMES CRAVID (Fisheries Directorate, São Tomé and Principe) in the 4th trip of zone B, as tagger

Similarly other AOTTP-ICCAT Contractors organised training in Capetown (South Africa) between 23 and 27 January 2017, while in Brazil initial tagger training sessions for 8 people were held between 2 and 4 April 2017, and have since been ongoing. For the second phase, AOTTP Coordination organised tagger training in Madrid with CEFAS (contracted to tag 5600 fish around St Helena) on 16 April 2018, and with Ilair Concepcao (Tagging Coordinator responsible for tagging 6000 fish around Sao Tome and Principe) between 24 and 25 May 2018 (**Figure 16**). Our colleague Inigo Onandia, an expert who tagged with AZTI under the first phase, visited Madeira between 11 and 20 June 2018 to demonstrate electronic tagging protocols and procedures (fish care etc.) to the team there.

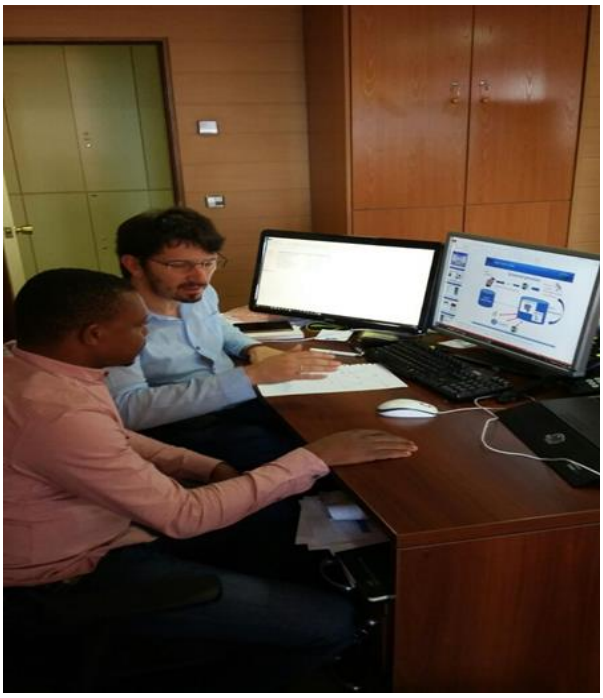


Figure 16: Demonstrating AOTTP tagging protocols to Ilair Concepcao (Sao Tome and Principe) in Madrid May 2018

AOTTP has clearly satisfied this indicator. What is particularly encouraging is that people that worked on the first phase tagging, and attended training courses, are now teaching tagging during the second phase. Our colleague Prof Guelson da Silva, for example, ran tagging cruises off Northern Brazil in 2017 as part of the FADURPE Consortium, and has now organised and taught tagger training in Sao Tome and Principe, see **Figure 17** below. Similarly Dr Justin Monin Amande (after receiving training in tagging from AZTI in May 2016) has now won a contract on behalf of CRO-CI (AOTTP second phase) to tag 11000 fish in the EEZ of Cote d'Ivoire during 2018, for which he is also now training his own staff. On 26 February 2018, for example, two Ivorian technicians (M. MONIN Edmond and M. BARRIGAH Simeon) were trained at sea in tagging and data transmission protocols by Justin.

Figure 17: AOTTP Tagger Training in Sao Tome and Principe on 4 and 5 June 2018

The numbers of fish tagged during the AOTTP programme by scientists from all countries is summarised in **Table 16**. It shows that over two-thirds (67%), have been tagged by scientists/technicians from developing countries, and it is thus clear that AOTTP has satisfied these indicators.

Table 16. Numbers of fish tagged by scientists/technicians by nationality

Country	Number of fish tagged
Brasil	29168
Cape Verde	422
Côte D'Ivoire	8195
EC.España	19822
EC.France	25
EC.Portugal	4543
EC.United Kingdom	215
Ghana	7775
S. Tomé e Príncipe	576
Senegal	9570
South Africa	227
UK.Sta Helena	194
Uruguay	25
Total	**80757**

A3.2. DATA COLLECTION AND SAMPLING AT RECOVERY (ACTIVITY 3.2)

The verifiable indicator is as follows:

INDICATOR 1. TRO TEAMS AND OTHER COUNTERPARTS WILL BE TRAINED IN RECOVERY DATA COLLECTION AND SAMPLING PROTOCOLS TO ENSURE THE GOOD QUALITY OF THE DATA (NUMBER OF TROS AND COUNTERPARTS TRAINED, AOTTP REPORTS)

All TROs and their supporting teams have received training in the ICCAT-AOTTP protocols for collecting tag-recovery information. This includes procedures for introducing data into the AOTTP smartphone application, the subsequent submission of data to ICCAT-AOTTP, and the resolution of any problems via the AOTTP Recovery Telegram group. Training sessions were done in the facilities of each partner. Sessions include visits to likely important tag-recovery locations such as, landing sites, tuna vessels, processing plants, artisanal fisheries communities.

A3.3. TRAINING IN DATA ANALYSIS

The verifiable indicator for this activity is as follows:

DEDICATED WORKSHOPS WILL BE ORGANISED TO REINFORCE THE CAPACITY OF ICCAT DEVELOPING MEMBER STATES IN DATA ANALYSES, INTERPRETATION OF THE SCIENTIFIC RESULTS AND DEVELOPMENT OF THE SCIENTIFIC ADVICE.

This activity started earlier than was planned in the original Grant Contract and workplan (**Table 11**). Three weeklong workshops were organised during this reporting period to promote the involvement of the ICCAT SCRS scientific community in the analysis, and scientific interpretation of AOTTP tag-recapture data. The workshops are aimed at scientists actively involved in the provision of management advice on tuna fisheries among ICCAT CPCs. Recognized experts in each work/research sub-component, i.e. relational databases, tuna growth, mortality, and movement were invited to lead activities and discussions. The workshops included fisheries science theory and worked examples. 'Hands on' activities relating to the visualization (mapping, graphing etc.), analysis, and scientific interpretation of the tagging data were, however, the focus. Detailed syllabuses, tutorials and presentations are available on request to AOTTP-Coordination.

The first workshop took place at the ICCAT Secretariat in Madrid in December 2017 (**Figure 18**) Activities focused on improving the understanding of ICCAT-AOTTP relational databases and data structures among participants. The AOTTP database structure was described, and useful applications of various Open Source softwares to the tag-recapture data were demonstrated (e.g R, QGIS, LibreOffice and PostgreSQL) by the AOTTP Coordination team, and the ICCAT Secretariat.

The second workshop was kindly organised by our colleagues in Abidjan in January 2018. Work this time concentrated on tuna growth and mortality estimation, and two internationally recognised experts (Daniel Gaertner and Lisa Ailloud) guided the activities (**Figure 19**). In April 2018 a third workshop was held at the ICCAT Secretariat where Tim Lam (Large Pelagic Research

Centre) demonstrated how to calculate geographic positions from the electronic tags using specialised algorithms he has developed (**Figures 20 & 21**). Please see the following links for detailed Agendas and Syllabuses: Workshop 1 (**https://drive.google.com/open?id=1wpkZVGQWrMYBMYVfmNH6IZFO0lWCN9DBxWHePMuQdJY**); Workshop 2 (**https://drive.google.com/open?id=1bUW3P0dtpT-B9hbcRAGv6zQq4ldDh4vgzmTCQ5TRUIw**); and Workshop 3 **https://drive.google.com/open?id=1KiwXHHJVJtiJYr1AtACL83Mn4XOLMQckJ664K6S60T8**).

Figure 18: Workshop 1 - December 2017 in Madrid

Figure 19: Workshop 2 - January 2018 in Abidjan

Table 17. Participants at AOTTP Workshops 1,2, and 3.

First Name	Last Name	Primary Email	Country
Abascal	Francisco	francisco.abascal@ieo.es	Spain
Aboubacar	Soumah	soumahaboubacar032@gmail.com	Republic of Guinea
Agnissan	Roseline	agnissanroseline@gmail.com	Cote d'Ivoire
Akia	Sosthene	akiasosthene@gmail.com	Cote d'Ivoire
Anibal	Olavio	etybi@yahoo.fr	Sao Tome e Principe
Austin	Wehye	austinwehye@yahoo.com	Liberia
Badai	Yannick	yannick.badai@gmail.com	Cote d'Ivoire
Catarina	Santos	catarina.santos@ipma.pt	Portugal
Constance	DIAHA	diahaconstance@yahoo.fr	Cote d'Ivoire
Daniel	Gaertner	daniel.gaertner@ird.fr	France
Diagne	Ameth	diagne_ameth@yahoo.fr	Senegal
Ebenezer	Adinortey	addiebenezer@yahoo.com	Ghana
Fambaye	Ngom	famngom@yahoo.com	Senegal
Guelson	Silva	guelson@ufersa.edu.br	Brazil
Justin	Amande	monin.amande@yahoo.fr	Cote d'Ivoire
Lassana	Djimera	djimeral2001@gmail.com	Mauritania
Lisa	Ailloud	lailloud@vims.edu	USA
Mas	Federico	federico.mas@cicmar.org	Uruguay
Matthew	Lauretta	matthew.lauretta@noaa.gov	USA
Mirian	Cravid	miriangomescravid@gmail.com	Sao Tome e Principe
Natalia	Priscilla	natalia_pab@hotmail.com	Brazil
Ndiaga	Thiam	ndiagathiam@hotmail.com	Senegal
Nicolas	Goni	ngoni@azti.es	Spain
Pedro	Pascual	pedro.pascual@ca.ieo.es	Spain
Philip	Miller	philip.miller@cicmar.org	Uruguay
Priscilla	Ankamah	adomapretty20@yahoo.com	Ghana
Rodrigo	Claudino	claudino.rodrigo@gmail.com	Brazil
Ruben	Lechuga	ruben.lechuga@ipma.pt	Portugal
Tim	Lam	tagtuna@gmail.com	USA

All the workshops were relaxed and fun, and AOTTP Coordination received positive feedback on the general organisation and material covered, e.g. **https://www.surveymonkey.com/results/SM-5T6TJQS2L/**. A total of 29 people attended the workshops (**Table 8**) representing 13 countries.

Figure 20: Workshop 3 - Madrid in April 2018

Outcomes of the AOTTP workshops included: improved understanding of relational databases; increased capacity to work with ICCAT-AOTTP in the development of the mark-recapture databases; increased ability to connect with the remote databases using plotting and statistical software (R, QGIS, Excel); increased confidence to work with AOTTP data to develop and submit scientific articles to SCRS and peer-reviewed literature; and increased involvement in SCRS Working groups, particularly in relation to population assessment. The workshops thus provided a 'sandbox' environment for working with the tag-recapture data, developing research ideas and output, which will ultimately contribute to the AOTTP Science Symposium in 2020.

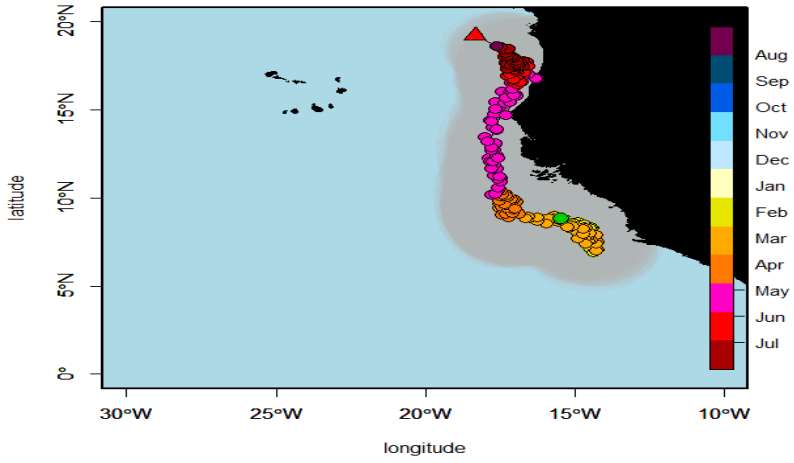


Figure 21: Movement pathways of YFT off West Africa estimated during Workshop 3 using data from an archival tag deployed and recovered by AOTTP

BENEFICIARIES/AFFILIATED ENTITIES AND OTHER COOPERATION

HOW WOULD YOU ASSESS THE RELATIONSHIP BETWEEN YOUR ORGANISATION AND STATE AUTHORITIES IN THE ACTION COUNTRIES. HOW HAS THIS RELATIONSHIP AFFECTED THE ACTION ?

The AOTTP Action, together with the ICCAT Secretariat, maintains good relationships with the State Authorities in the target countries. AOTTP is working directly with State Authorities in Spain (Canary Islands), Portugal (Azores, Madeira), Cote d'Ivoire, Mauritania, Senegal, Brazil, USA, Ghana, Uruguay, Sao Tome and Principe, Cabo Verde, UK (CEFAS, British Overseas Territories of St Helena and Ascension Island) and South Africa. AOTTP Contractors (e.g. CRODT, CEFAS & CRO-CI) are 'state authorities' themselves. Note also that, during phase 1, permission was granted to AOTTP contractors to catch bait, and tag tuna in the territorial waters of 15 countries, demonstrating the interest in, and support for, the project. Having government representatives on board tagging vessels has also often been a condition for gaining access to territorial waters for tagging, e.g. Mauritania, Guinea Bissau, and São Tomé and Principe.

ICCAT CPCs and Cooperators have also contributed funds to the AOTTP programme, including the People's Republic of China, USA, Canada, and Chinese Taipei. The Uruguayan Research Vessel has also been made available to AOTTP, without cost, to tag tuna.

WHERE APPLICABLE, DESCRIBE YOU RELATIONSHIP WITH ANY OTHER ORGANISATIONS INVOLVED IN IMPLEMENTING THE TAGGING ACTIVITIES.

AOTTP maintains good working relationships with all its Contractors: communication with tagging teams and TROs around the world being effected using a range of modern media, including WhatsApp, Telegram and E-mail.

During Reporting Period 2 ICCAT-AOTTP worked with a Consortium, led by AZTI (Spain), to tag tuna in the Azores, the Canary Islands, and West Africa. This Consortium involved CRO-CI, CRODT, FSSD, IEO, IMAR, and MFRD/FSSD. More recently, and in other areas of the Atlantic we are working, or have worked, with: the FADURPE Consortium (Brazil); CEFAS (UK); LPRC (USA); University of Maine (USA); NOAA (USA); Directorate of Fisheries (Sao Tome and Principe); and Capmarine (South Africa) to tag fish at sea. In awareness-raising and tag-recovery activities, AOTTP is also working directly, and successfully, with many of the same organizations (e.g. CRO-CI, CRODT, MFRD/FSSD, IEO, and IMAR).

AOTTP has also recently started working with the Saint Helena Government (BOT). The Contractor (CEFAS) responsible for tagging in the island's EEZ met with members of the St Helena Fishing Association on 18th April 2018 on the island; specifically with Adrian Duncan (Extractor), Waylon Thomas (Chair of Fishermen's Association and skipper of Catfish), Gavin Maggot (Ocean Spray), Duffy Caswell (John Melliss) and Gavin Benjamin (Amalia).

In the USA, LPRC wrote in their Final Report that, *"Our relationship with commercial fishermen tagging partners, all US Atlantic longliners, has been strengthened by this partnership, and the vessel crews have gained additional tagging and research experience and remain excited about future research opportunities"*.

From Trinidad and Tobago we recently received the following email about tagging opportunities (which are being followed up) with sport fishers there:

"Hi Doug, My name is Mark de Verteuill from Trinidad and Tobago. I am writing to you to discuss potential participation in the ICCAT's Atlantic Tuna Tagging program. I am a member of the TT Game Fishing Association and this September 7th & 8th I am hosting a Recreational Fishing Tournament in conjunction with some friends out of St. George's in Grenada. Grenada has some of the best Yellow Fin Tuna fishing around, not too mention the diverse and abundant billfish species. Anyhow, the event is structured towards an all release format for Billfish and a Catch limit of two Yellow Fin Tuna per boat per day. To encourage the anglers to release any extra Tuna they catch I would like to implement a point system for verified releases of their Tuna. Here's where the tagging program comes in, If you guys would be willing to supply us with some tags I'm sure our anglers would be more than happy to try and deploy as many as possible to aid in the research. This is the first year I'm hosting the event and want to make it something really special. We already plan to donate 50% of the catch to local charities and we would be happy to work with their fisheries department to supply you with data from the catches that do come to scale. Would love to hear your thoughts?? Best Regards, Mark de Verteuil".

Similarly, AOTTP is taking up an offer from Dr Rui Coelho from the Division of Modelling and Management of Fishery Resources at IMAR in mainland Portugal to tag tuna in traps there (free of charge). Training in data submission will be provided by AOTTP Coordination.

For tag supply we have worked with Hallprint Ltd (Australia) who supplied AOTTP conventional tag, while Desert Star Systems, Wildlife Computers, and Microwave Telemetry (all USA) are supplying the pop-up electronic tags, and Lotek Wireless (Canada) the internal/archival tags.

We also work with Argos CLS (France) who operate the satellite system for collecting data from the pop-up tags. Given the complexity of tethering tags to live fish, programming the electronic tags, and estimating tracks, we have regularly sought help, feedback and advice from these companies.

AOTTP has so far worked with the skippers and crews of more than 25 commercial fishing vessels and feedback with respect to the relationships between the scientific and technical teams and the fishing crews has been routinely positive, according to both verbal and cruise reports from our Contractors. The fishers are usually extremely engaged, enthusiastic about the tagging work, and delighted to help in all possible ways.

AOTTP has an agreement with IATTC to pay rewards on its behalf and collect metadata from tags where possible. The TROs in Abidjan work closely with personnel from IRD and IEO to gain access to log-book data, essential for ascertaining where and when a tagged tuna was actually caught.

The AOTTP SC is regularly consulted on AOTTP progress and plans, and members have been involved in evaluating contracts. Members of the ICCAT SCRS are enthusiastic about AOTTP, and are looking forward to undertaking research with the data.

FINAL BENEFICIARIES AND TARGET GROUPS

The ‘Final Beneficiaries’ of the Action are: (i) Fishing communities and operators depending on the exploitation of tuna resources; and (ii) Consumers (of tuna).

The Action has already had an impact on the ‘Final Beneficiaries’. AOTTP TROs have now recovered nearly 13,000 tags. Both Recovery Rates and Reporting Rates are high, compared with similar oceanic tagging campaigns. These statistics indicate strong ‘buy-in’ to the project from fishers, dockers, stevedores and the tuna canning industry. More than 100 scientists and technicians from developing countries have benefited directly from the employment AOTTP is generating, and less directly from the training and capacity building activities they have received. Thousands of euros of cash rewards, substantial lottery prizes, and t-shirts have been distributed to many diverse fishery stakeholders.

The Target Groups are: (i) Scientists of the developing coastal states, and scientist members of the ICCAT SCRS; (ii) Fisheries authorities in the different Member States of ICCAT; and (iii) the ICCAT Secretariat.

The SCRS and its scientists benefited substantially from the training, coaching, and mentoring provided by AOTTP and the ICCAT Secretariat during the capacity building workshops. The publication of reports and peer-reviewed papers will boost careers. The fisheries authorities in many ICCAT CPCs are aware of the project and their staff have benefited from training aboard the tagging vessels. Indeed scientists from Cote d'Ivoire (CRO-CI) and Sao Tome and Principe have now gone on to win and manage tagging contracts of their own. Two of the tagging contracts, recently awarded by ICCAT-AOTTP (one to tag 11,000 fish of Cote d'Ivore and the other to tag 6000 fish around Sao Tome and Principe) are being managed by African nationals who received training in phase 1 within the AZTI Consortium.

The ICCAT Secretariat itself is also benefiting from the publicity and goodwill the AOTTP project is generating. Its scientist will, in the future, have a highly useful dataset for informing policy, and ascertaining the efficacy of management measures (e.g. spatial closures) which will result in better management of the tropical tuna fisheries in ICCAT's mandate.

OTHER THIRD PARTIES INVOLVED (INCLUDING OTHER DONORS, OTHER GOVERNMENT AGENCIES OR LOCAL GOVERNMENT UNITS, NGOS)

The FADURPE Consortium in Brazil is organizing tagging at sea and awareness-raising and tag-recovery activities. It comprises a large network of organizations and NGOs including; DEPAq, LATEP, UFPRE, and UFERSA. In Cabo Frio an NGO called Projeto Albatroz (**http://projetoalbatroz.org.br/**) is working closely with AOTTP tagging and tag-recovery teams, providing logistical support.

AOTTP works extensively with the Observer Programs in the target countries.

In Abidjan, Dakar, and Tema the TROs must liaise daily with the Port Authorities to gain access to harbors and fishing vessels. They have also done awareness-raising activities at the tuna canning factories building relationships with their staff.

WHERE APPLICABLE, OUTLINE ANY LINKS AND SYNERGIES YOU HAVE DEVELOPED WITH OTHER PROJECTS, ESPECIALLY THOSE FUNDED BY THE EUROPEAN UNION.

We have not developed any synergies with any other EU funded Actions.

IF YOUR ORGANISATION HAS RECEIVED PREVIOUS EU GRANTS IN VIEW OF STRENGTHENING THE SAME TARGET GROUP, IN HOW FAR HAS THIS ACTION BEEN ABLE TO BUILD UPON/COMPLEMENT THE PREVIOUS ONE(S) ? (LIST ALL PREVIOUS EU GRANTS).

ICCAT receives funding for GBYP from the European Union, and there are synergies in view of strengthening the same target groups. ICCAT, AOTTP, SCRS and GBYP Coordination collaborate to coordinate effort and activities where possible.

VISIBILITY

The EU logo and funding statement are always clearly visible on all AOTTP communication materials including websites, flyers, pamphlets, posters, reports, newsletters, t-shirts, and caps. The materials can be seen at harbours, at fishing beaches, and on board fishing and recreational vessels throughout AOTTP target countries.

AOTTP, together with the ICCAT Secretariat, has developed a website packed with regularly updated information about the project (**https://www.iccat.int/AOTTP/en/aottp-about.html**). A Training Manual/Handbook is available here: **https://www.iccat.int/aottp/AOTTP-Document-Library/Manuals/AOTTP-Tagging-Handbook-EN.pdf**

AOTTP Coordination publishes quarterly newsletters about the project which, in addition to being available on the website (**https://www.iccat.int/AOTTP/en/aottp-documents.html**), are also sent by email to all our partners working on the project.

AOTTP has been presented at many different fora around the Atlantic Coastal States, including:

- ICCAT WG Stock Assessment Methods (Doug Beare, Madrid, 19 February 2016)
- ICCAT WG Yellowfin Data Prep (Doug Beare, Pasaia, 11 March 2016)
- ICCAT Small Tuna Intersessional Meeting (Doug Beare, Madrid, 6 April, 2016)
- ICCAT SCRS Plenary (Doug Beare, Madrid, 24 September, 2016)
- Fisheries Forum (Pedro Guemes, Azores, 6 July 2016)
- AOTTP summary presentation (Doug Beare, Universidade Veiga de Almeida, Brazil, 3 April 2017)
- AOTTP summary presentation (Doug Beare, Recife, 5 April 2017)
- AOTTP summary presentation (Miguel Neves dos Santos, Doug Beare, Brussels, 19 June 2017, **http://ec.europa.eu/europeaid/news-and-events/atlantic-ocean-tropical-tuna-tagging-programme-aottp_en**)
- AOTTP summary presentation on Small Tunas (ICCAT Secretariat, Miami, 27 April 2017)
- AOTTP presented to POPA Observers (Miguel Machete, Faial Island (Azores), April 2017)
- AOTTP summary presentation (Doug Beare, Madeira, 13 July 2017)
- ICCAT WG on Tropical Tunas Species Group (Doug Beare, 7 September 2017)
- ICCAT SCRS Plenary (Doug Beare, Madrid, 6 October, 2017)
- Maio Island Fishermans Forum (Albertino Martins, Cabo Verde, December 2017)
- AOTTP summary presentation on Small Tunas (ICCAT Secretariat, Miami, 5 April 2018)
- ICCAT WG BET Data Preparation (ICCAT Secretariat, Miami, 25 April 2018)
- AOTTP summary presentation (Doug Beare, Sao Tome, 13 June 2018)

ICCAT/AOTTP is directing its communication activities/materials/products at the following three main target groups or audiences:

- Direct stakeholders who actually work in the commercial fishing, recreational fishing, and fish-processing industries. This group depends most directly on tuna resources in the Atlantic and is most likely to actually find and report the discovery of a tagged fish
- Marine/fisheries scientists (includes ICCAT CPC representatives at the SCRS, and AOTTP Steering Committee) who will analyze and interpret the AOTTP tagging data, using them to make improved estimates of stock abundance.
- Policy/decision-makers concerned with the actual management (population assessment, quota-setting etc.) of tropical tuna fisheires.
- NGOs, donors, and the general public primarily concerned with sustainable exploitation, socio-economic issues and conservation.

Each of these three four audiences is clearly very distinct from the other, and each will require different communication and messaging strategies. These are outlined in detail in the Communication Plan available on request.

AOTTP has already been published widely on the internet, e.g.:

- **http://www.tribunadasilhas.pt/index.php/component/k2/item/11855-6000-atuns-dos-acores-marcados**
- **http://www.laopinion.es/sociedad/2016/08/10/instituto-oceanografia-marcara-6500-atunes/696665.html?utm_source=rss**
- **http://www.dw.com/es/el-at%C3%BAn-tropical-conocerlo-m%C3%A1s-para-pescarlo-mejor/a-39319958**
- **http://ec.europa.eu/europeaid/news-and-events/atlantic-ocean-tropical-tuna-tagging-programme-aottp_en**
- **http://www.africanangler.com/sb_article.asp?id=1063#**
- **http://www.anglerstalk.co.za/Magazine/Mar17/mobile/index.html#p=81**
- **http://fis.com/fis/worldnews/worldnews.asp?l=e&country=0&special**=&monthyear=&day=&id=86263&ndb=1&df=0
- **http://www.isra.sn/index.php/88-news/latest-news/232-programme-de-marquage-des-thonides-tropicaux-de-l-atlantique-aottp-l-isra-crodt-recompense-les-meilleurs-equipages**
- **https://www.simplyscience.ch/teens-liesnach-archiv/articles/volkszahlung-bei-den-thunfischen.html**
- **http://www.ieo.es/documents/10640/38594/NP_marcado_AOTTP_en_canarias.pdf/737841fe-98f8-4b00-aa56-d1b5145643a5**
- **https://www.gomeratoday.com/2016/08/24/el-cabildo-insular-se-suma-a-la-campana-de-marcado-de-atunes/**
- **http://www.fao.org/3/a-i7244e.pdf**
- **https://assecom.ufersa.edu.br/2017/05/03/equipe-da-ufersa-participa-de-programa-internacional-de-marcacao-e-recaptura-de-atuns/**

- http://mz.skanplatform.org/posts/1449
- http://www.fishingindustrynewssa.com/2017/08/31/tuna-tagging-positive-feedback-to-programme/
- http://pecnordestefaec.org.br/2017/wp-content/uploads/2017/07/O-estado-da-arte-da-pesca-do-atum-no-Brasil-e-no-mundo.pdf
- https://www.lagomera.es/cabildo-insular-se-suma-la-campana-marcado-atunes/
- http://www.fomentosansebastian.eus/donostiainn/es/ecosistema-de-innovacion/noticias-de-innovacion/1896-azti-consigue-un-contrato-internacional-de-4-m-y-lidera-una-de-las-campanas-de-marcado-cientifico-de-atun-mas-importantes-de-las-realizadas-en-el-atlantico
- http://www.lavanguardia.com/local/canarias/20160824/404168466987/la-gomera-se-suma-a-la-campana-de-marcado-de-atunes.html
- https://www.eldiario.es/agricola/pesca/Cabildo-Gomera-campana-marcado-atunes_0_551545265.html
- http://nordinfo.info/node/1724
- https://www.undercurrentnews.com/2016/06/13/azti-wins-iccat-tagging-contract/

Many of our partners have made videos and uploaded them to YouTube, eg. :

- Senegal (AZTI) https://www.youtube.com/watch?v=l9lzrqMI0lo&t=1s
- Northern Brazil (FADURPE) https://www.youtube.com/watch?v=YBm68tGOtRc&t=81s
- Central Brazil (FADURPE) https://www.youtube.com/watch?v=K10UfPFIRUw&t=51s
- Senegal (CRODT) https://www.youtube.com/watch?v=K10UfPFIRUw&t=51s

AOTTP video Training Tutorials etc. can be found here:

- https://www.youtube.com/watch?v=BKEZKf4Vya0
- https://www.youtube.com/watch?v=EXx5Yf0NHBI&t=70s
- https://www.youtube.com/watch?v=8UF2Vp-XFKw&t=21s

REFERENCES

AOTTP Coordination Team. 2017. “Report of the Atlantic Ocean Tropical Tuna Tagging Programme (AOTTP) (Evidence Based Approach for the Sustainable Management of Tuna Resources in the Atlantic). Year 1 and 2 Results and Activities.” Plenary Report. Madrid, Spain: ICCAT. https://www.iccat.int/Documents/Meetings/Docs/2017_SCRS_REP_ENG.pdf.

Arregui, I., N. Goñi, F. Ngom-Sow, E. Addi, M.J. Amande, J. Pereira, P. Pascual Alayon, D. Gaertner, and H. Murua. 2018. “Do Atlantic Bigeye Tuna Tag-Recapture Data Support a Two-Stanza Growth Model ? An Exploration Incorporating Recent Data from ICCAT/AOTTP.” 46. Madrid, Spain: SCRS. https://meetings.iccat.int/index.php/s/1ICejfF8DcVyZ8V?path=%2FDocuments.

Beare, D.J. 2018. “Tag-Recapture Data for Bigeye Tuna from the Atlantic Ocean Tropical Tuna Tagging Programme (AOTTP).” Madrid, Spain.

Beare, D.J., P. Guemes, J. Garcia, and N. Kebe. 2017. “Summary of Activities Conducted Within AOTTP in 2016 and 2017.” *Collect. Vol. Sci. Pap. ICCAT.* 74 (5): 1975–98. **https://www.iccat.int/Documents/CVSP/CV074_2017/n_5/CV074051975.pdf**.

Gaertner, D., N. Goñi, J. Amande, P. Pascual Alayon, F. N’Gom, J. Pereira, E. Addi, and D.J. Beare. 2018. “First Estimate of Tag-Shedding for Bigeye Tuna in the Atlantic Ocean from AOTTP Data.” 40. Madrid, Spain: SCRS. **https://meetings.iccat.int/index.php/s/1ICejfF8DcVyZ8V?path=%2FDocuments**.

Gaertner, D., P. Pascual Alayon, J. Amande, N. Goni, F. N’Gom, J. Pereira, E. Addi, and D.J. Beare. 2018. “Using AOTTP Conventional Tags to Inform Selectivity for Bigeye Tuna in the Eastern Atlantic Ocean.” 038. Madrid, Spain: SCRS. **https://meetings.iccat.int/index.php/s/1ICejfF8DcVyZ8V?path=%2FDocuments**.

Goñi, N., J. Diatta, K.J. Konan, E. Addi, A. Salgado, M. Chifflet, I. Onandia, and I. Arregui. 2017. “First Massive Tagging of Tropical Tunas Around the Sierra Leone Rise.” *Collect. Vol. Sci. Pap. ICCAT.* 74 (5): 2074–81. **https://www.iccat.int/Documents/CVSP/CV074_2017/n_5/CV074052074.pdf**.

Guemes, P., J. Garcia, and D.J. Beare. 2017. “Tropical Tuna Growth and Migration Rates: AOTTP and ICCAT’S Historical Tagging Data.” *Collect. Vol. Sci. Pap. ICCAT.* 74 (5): 1999–2012. **https://www.iccat.int/Documents/CVSP/CV074_2017/n_5/CV074051999.pdf**.

Neves dos Santos, Miguel. 2017. “AOTTP-Preliminary Observations on Little Tunny.” Miami, United States. **https://www.iccat.int/Documents/Meetings/Docs/2017_SMT_REP_ENG.pdf**.

Onandia, I., N. Goñi, J. Santiago, L. Godoy, J. Pereira, A. Salgado, M. Chifflet, and I. Arregui. 2017. “On the Dialogue Between Knowledge Backgrounds Involved in Tagging Programs.” *Collect. Vol. Sci. Pap. ICCAT.* 74 (5): 2096–2100. **https://www.iccat.int/Documents/CVSP/CV074_2017/n_5/CV074052096.pdf**

APPENDICES

Appendix 3. AOTTP Tag Releases by Exclusive Economic Zones

	BET	LTA	SKJ	WAH	YFT
Brazilian EEZ	2922	310	15688	60	6733
Cape Verdean EEZ	1709	0	212	0	269
Equatorial Guinean EEZ	0	219	19	3	321
Ghanaian EEZ	10	0	8	0	140
Guinea Bissau EEZ	163	62	78	0	592

Guinean EEZ	538	49	660	0	1088
High Seas	6095	247	7097	0	10690
Ivory Coast EEZ	383	894	766	4	2047
Liberian EEZ	179	0	112	0	336
Mauritanian EEZ	455	0	2006	0	1033
Portuguese EEZ (Azores)	181	1	2255	0	2
Portuguese EEZ (Madeira)	158	0	1200	0	1
Sao Tome and Principe EEZ	0	117	33	0	160
Senegalese EEZ	1590	357	1499	1	2157
Sierra Leonian EEZ	304	0	69	0	116
South African EEZ	0	0	108	0	127
Spanish EEZ (Canary Islands)	3331	0	4918	0	78
St. Helena EEZ	28	0	22	5	354
Uruguayan EEZ	4	0	0	0	22

Appendix 4. AOTTP Tag Recoveries by Exclusive Economic Zones

	BET	LTA	SKJ	WAH	YFT
Angolan EEZ	0	0	1	0	4
Ascension EEZ	1	0	0	0	0
Beninese EEZ	2	0	3	0	8
Brazilian EEZ	45	2	93	1	153
Cape Verdean EEZ	393	8	75	0	166
Gambian EEZ	14	3	1	0	29
Ghanaian EEZ	13	1	8	0	28
Guinea Bissau EEZ	33	13	31	0	148
Guinean EEZ	175	26	178	0	523
High Seas	1553	30	488	0	2299
Ivory Coast EEZ	10	82	8	0	118
Liberian EEZ	35	1	23	0	75
Mauritanian EEZ	612	26	844	0	824
Nigeria - Sao Tome and Principe Joint	0	0	1	0	0
Portuguese EEZ (Azores)	72	0	64	0	0
Portuguese EEZ (Madeira)	78	0	4	0	0
Sao Tome and Principe EEZ	1	0	0	0	3
Senegalese EEZ	137	85	322	0	343
Sierra Leonian EEZ	121	14	65	0	284
South African EEZ	0	0	0	0	3
Spanish EEZ	1	0	0	0	0
Spanish EEZ (Canary Islands)	353	0	163	0	5

Appendix 3. Releases (R-1) length-frequencies by species

	20-30cm	30-40cm	40-50cm	50-60cm	60-70cm	70-80cm	80-90cm	90-100cm	100-110cm	110-120cm	120-130cm	130-140cm	140-150cm	150-160cm	160-170cm	170-180cm
BET	61	1698	5430	5355	4002	780	239	223	75	39	11	12	13	9	9	7
LTA	13	751	1199	250	15	9	3	0	0	0	0	0	0	0	0	0
SKJ	9	5665	16631	12723	1663	28	0	0	0	0	0	0	0	0	0	0
WAH	0	0	1	2	1	7	8	3	5	14	14	8	10	0	0	0
YFT	82	7543	9188	5743	2156	613	289	268	92	50	32	41	40	17	8	5

Appendix 4. AOTTP Tagging Cruises/Trips June 2016 to June 2018

In charge	Start	End	Days at sea	Zone
Goñi	2016-07-07	2016-07-20	13	Mauritania/Guinea
Goñi	2016-07-26	2016-08-01	6	Mauritania/Guinea
Goñi	2016-08-04	2016-08-13	9	Mauritania/Guinea
Goñi	2016-08-18	2016-08-28	10	Mauritania/Guina
Malan	2018-02-26	2018-02-26	1	Golfo de Guinea
Malan	2018-02-28	2018-02-28	1	Golfo de Guinea
Malan	2018-03-03	2018-03-03	1	Golfo de Guinea
Malan	2018-03-22	2018-03-22	1	Golfo de Guinea
Malan	2018-03-24	2018-03-24	1	Golfo de Guinea
Malan	2018-03-30	2018-03-30	1	Golfo de Guinea
Malan	2018-03-31	2018-03-31	1	Golfo de Guinea
Malan	2018-04-07	2018-04-07	1	Golfo de Guinea
Malan	2018-04-13	2018-04-13	1	Golfo de Guinea
Malan	2018-04-14	2018-04-14	1	Golfo de Guinea
Malan	2018-04-16	2018-04-16	1	Golfo de Guinea
Malan	2018-05-03	2018-05-03	1	Golfo de Guinea
Malan	2018-05-19	2018-05-19	1	Golfo de Guinea
Malan	2018-05-29	2018-05-29	1	Golfo de Guinea
Malan	2018-06-11	2018-06-11	1	Golfo de Guinea
Malan	2018-06-13	2018-06-13	1	Golfo de Guinea
Malan	2018-05-28	2018-05-28	1	Golfo de Guinea
Malan	2018-05-30	2018-05-30	1	Golfo de Guinea
Malan	2018-05-31	2018-05-31	1	Golfo de Guinea
Malan	2018-06-02	2018-06-02	1	Golfo de Guinea
Malan	2018-06-04	2018-06-04	1	Golfo de Guinea
Malan	2018-06-05	2018-06-05	1	Golfo de Guinea
Malan	2018-06-06	2018-06-06	1	Golfo de Guinea

Malan	2018-06-07	2018-06-07	1	Golfo de Guinea
Malan	2018-06-09	2018-06-09	1	Golfo de Guinea
Malan	2018-06-15	2018-06-15	1	Golfo de Guinea
Malan	2018-06-16	2018-06-16	1	Golfo de Guinea
Malan	2018-06-18	2018-06-18	1	Golfo de Guinea
Malan	2018-06-20	2018-06-20	1	Golfo de Guinea
Malan	2018-06-21	2018-06-21	1	Golfo de Guinea
Malan	2018-03-06	2018-03-06	1	Golfo de Guinea
Malan	2018-03-08	2018-03-08	1	Golfo de Guinea
Malan	2018-03-09	2018-03-09	1	Golfo de Guinea
Malan	2018-03-16	2018-03-16	1	Golfo de Guinea
Goñi	2016-10-24	2016-11-04	11	Golfo de Guinea
Goñi	2016-11-07	2016-11-19	12	Golfo de Guinea
Goñi	2017-01-16	2017-01-31	15	Golfo de Guinea
Goñi	2017-02-05	2017-02-15	10	Golfo de Guinea
Goñi	2017-02-17	2017-03-05	16	Golfo de Guinea
Goñi	2017-03-07	2017-03-22	15	Golfo de Guinea
Concepcao	2018-06-06	2018-06-11	5	Golfo de Guinea
Concepcao	2018-06-13	2018-06-17	4	Golfo de Guinea
Concepcao	2018-06-14	2018-06-14	1	Golfo de Guinea
Pascual	2016-08-25	2016-09-04	10	Canarias
Pascual	2016-09-11	2016-09-18	7	Canarias
Pascual	2016-09-22	2016-10-03	11	Canarias
Pascual	2016-10-06	2016-10-17	11	Canarias
Pascual	2016-10-23	2016-10-30	7	Canarias
Pascual	2016-11-05	2016-11-16	11	Canarias
Pascual	2016-09-11	2016-09-18	7	Canarias
Pascual	2016-09-19	2016-09-27	8	Canarias
Pascual	2016-09-29	2016-10-12	13	Canarias
Pascual	2016-10-14	2016-10-24	10	Canarias
Pascual	2016-10-25	2016-11-02	8	Canarias
Gouveia	2017-07-12	2017-07-15	3	Azores
Gouveia	2017-07-17	2017-07-20	3	Azores
Gouveia	2017-07-21	2017-07-26	5	Azores
Gouveia	2017-09-25	2017-09-30	5	Azores
Gouveia	2018-06-14	2018-06-21	7	Azores
Pereira	2016-06-25	2016-06-30	5	Azores
Pereira	2016-09-24	2016-10-03	9	Azores
Pereira	2016-10-06	2016-10-14	8	Azores
Pereira	2016-10-19	2016-11-12	24	Azores
Pereira	2016-07-03	2016-07-05	2	Azores
Pereira	2016-07-09	2016-07-20	11	Azores
Pereira	2016-07-23	2016-07-29	6	Azores

Pereira	2016-07-31	2016-08-04	4	Azores
Pereira	2016-08-11	2016-08-12	1	Azores
Pereira	2016-08-16	2016-08-27	11	Azores
Pereira	2016-08-29	2016-09-01	3	Azores
Pereira	2016-09-07	2016-09-20	13	Azores
Hazin	2017-04-05	2017-04-12	7	Brasil-Uruguay
Hazin	2018-05-08	2018-05-16	8	Brasil-Uruguay
Hazin	2018-06-12	2018-06-25	13	Brasil-Uruguay
Hazin	2017-04-25	2017-05-06	11	Brasil-Uruguay
Hazin	2017-05-23	2017-06-01	9	Brasil-Uruguay
Hazin	2017-06-20	2017-06-28	8	Brasil-Uruguay
Hazin	2017-07-21	2017-07-28	7	Brasil-Uruguay
Hazin	2017-08-22	2017-08-30	8	Brasil-Uruguay
Hazin	2017-09-30	2017-10-09	9	Brasil-Uruguay
Hazin	2018-02-28	2018-03-07	7	Brasil-Uruguay
Hazin	2018-04-03	2018-04-11	8	Brasil-Uruguay
Hazin	2017-04-07	2017-04-27	20	Brasil-Uruguay
Hazin	2017-05-11	2017-05-31	20	Brasil-Uruguay
Hazin	2017-06-22	2017-07-12	20	Brasil-Uruguay
Hazin	2017-08-14	2017-09-04	21	Brasil-Uruguay
Hazin	2017-11-03	2017-11-22	19	Brasil-Uruguay
Hazin	2017-11-28	2017-12-18	20	Brasil-Uruguay
Hazin	2018-03-21	2018-04-11	21	Brasil-Uruguay
Hazin	2018-04-14	2018-05-04	20	Brasil-Uruguay
Hazin	2017-04-12	2017-06-06	55	Brasil-Uruguay
Hazin	2017-10-05	2017-10-19	14	Brasil-Uruguay
Hazin	2018-01-16	2018-02-06	21	Brasil-Uruguay
Hazin	2018-04-30	2018-05-21	21	Brasil-Uruguay
Hazin	2017-05-30	2017-06-15	16	Brasil-Uruguay
Hazin	2017-04-14	2017-05-12	28	Brasil-Uruguay
Hazin	2017-10-20	2017-11-18	29	Brasil-Uruguay
Hazin	2017-11-24	2017-12-11	17	Brasil-Uruguay
Hazin	2017-12-14	2017-12-29	15	Brasil-Uruguay
Hazin	2018-02-22	2018-03-09	15	Brasil-Uruguay
Hazin	2018-03-22	2018-04-17	26	Brasil-Uruguay
Hazin	2018-04-19	2018-05-11	22	Brasil-Uruguay
Hazin	2017-04-07	2017-04-22	15	Brasil-Uruguay
Hazin	2017-06-08	2017-06-22	14	Brasil-Uruguay
Hazin	2017-09-11	2017-09-23	12	Brasil-Uruguay
Hazin	2017-12-17	2017-12-23	6	Brasil-Uruguay
Hazin	2018-01-31	2018-02-08	8	Brasil-Uruguay
Hazin	2018-04-22	2018-04-28	6	Brasil-Uruguay
Hazin	2017-08-15	2017-08-15	1	Brasil-Uruguay

Hazin	2017-09-25	2017-09-27	2	Brasil-Uruguay
Hazin	2017-07-27	2017-08-20	24	Brasil-Uruguay
Hazin	2017-09-21	2017-10-15	24	Brasil-Uruguay
Hazin	2017-11-20	2017-12-15	25	Brasil-Uruguay
Hazin	2018-01-18	2018-02-12	25	Brasil-Uruguay
Hazin	2018-02-17	2018-03-13	24	Brasil-Uruguay
Hazin	2018-03-18	2018-04-12	25	Brasil-Uruguay
Heinecken	2017-02-04	2017-02-09	5	South Africa
Heinecken	2017-04-26	2017-04-28	2	South Africa
Heinecken	2017-05-04	2017-05-05	1	South Africa
Heinecken	2017-02-15	2017-02-18	3	South Africa
Heinecken	2017-02-22	2017-02-24	2	South Africa
Heinecken	2017-03-01	2017-03-04	3	South Africa
Heinecken	2017-03-14	2017-03-17	3	South Africa
Heinecken	2017-03-21	2017-03-23	2	South Africa
Heinecken	2017-03-26	2017-03-30	4	South Africa
Heinecken	2017-04-02	2017-04-04	2	South Africa
Heinecken	2017-04-10	2017-04-12	2	South Africa
Molly Lutcavage	2017-11-27	2017-12-08	11	USA
Molly Lutcavage	2018-01-03	2018-02-17	45	USA
Martin Collins	2018-05-31	2018-05-31	1	Santa Elena
Martin Collins	2018-06-05	2018-06-05	1	Santa Elena
Martin Collins	2018-06-12	2018-06-12	1	Santa Elena
Martin Collins	2018-06-04	2018-06-09	5	Santa Elena
Martin Collins	2018-06-05	2018-06-14	9	Santa Elena
Martin Collins	2018-06-15	2018-06-15	1	Santa Elena

Appendix 5. Quarterly Report describing AOTTP Awareness-Raising activities in Brazil in 2017

003/2018 01/01/2018 - 31/03/2018

AOTTP (Atlantic Ocean Tropical Tuna Tagging Programme)

TRI-MONTHLY PROGRESS REPORT

1. Description

1.1. Name of Focal point contract: Rafael Muniz

1.2. Name and title of the Contact person: Mr. Rafael Muniz

1.3. Name of Beneficiary(ies) and affiliated entity(ies) in the Activity: FADURPE

1.4. Title of the Activity: *Awareness and Tag Recovery Activities*

1.5. Contract number: 014/2017

1.6. Start date and end date of the reporting period: 01 January to 31 March 2018

1.7. Target region(s): Brazil

2. Assessment of implementation of activities

2.1. Executive summary of the activities implemented

From January to March 2018, the action plan for raising the awareness of fishers, fishing entrepreneurs and fishing company employees continued to be successfully carried out throughout the Brazilian coast.

Activities and results

During the months of January to March 2018, six Brazilian cities were visited: Areia Branca-RN, Natal-RN, São Gonçalo do Amarante-CE, Itarema-CE, Rio Grande- RS and Barra de Sirinhaém-PE. A total of eighty-three people were directly informed by the awareness team about the AOTTP Program. Our team paid the reward to fishermen and talked to fishing businessmen and employees of fishing companies. Photos of these activities can be found in the Appendix I.

A1.1. Awareness-raising. Meeting with fishing businessmen and fishermen (11 participants) for 2 days in Areia Branca- RN and Natal- RN, Brazil.

Our team talked with 11 people about the Tag Recovery Program in Areia Branca and Natal, which are important sites for the recapture of tunas in northeast Brazil. The city of Natal has one of the main fish-landing ports in the Northeast. In Areia Branca, awards were also paid to fishermen. Awareness-raising was successfully accomplished in the region. The visits were conducted on January 07th and 08th, 2018.

A1.2. Awareness-raising. Meeting with fishing businessmen and fishing company employees (26 participants) for 2 days in São Gonçalo do Amarante- CE, Brazil.

Our team visited Robinson Crusoe, a large cannery in São Gonçalo do Amarante, in Ceará State. We presented the program to several employees of the fishing company. A total of 26 people were informed about the AOTTP Tag Recovery Program. Awareness-raising was successfully accomplished in the region. The visits were conducted on January 09th and 10th, 2018.

A1.3. Awareness-raising. Meeting with fishing businessmen (15 participants) for 2 days in Itarema- CE, Brazil.

Our team talked with 15 people about the AOTTP Tag Recovery Program in Itarema-CE. On this occasion, we visited small local fishing companies. Awareness-raising was successfully accomplished in the region. The visit was conducted on January 11th and 12th, 2018.

A1.4. Awareness-raising. Meeting with fishing businessmen (6 participants) for 2 days in Natal- RN, Brazil.

Our team visited two important fishing companies in the city of Natal: Transmar and Tuna Brasil. We discussed about the tagging program with the fishing businessman, who have committed themselves to help with the local divulgation. A total of 6 people were informed about the AOTTP Tag Recovery Program. Awareness-raising was successfully accomplished in the region. The visits were conducted on February 10th and 11th, 2018.

A1.5. Awareness-raising. Meeting with skippers, fishing businessmen and local leaders (15 participants) for 4 days in Barra de Sirinhaém -PE, Brazil.

Our team talked with 15 people about the Tag Recovery Program in Barra de Sirinhaém. The city of Barra de Sirinhaém has an important artisanal fishing community. Awareness-raising was successfully accomplished in the region. The visit was conducted from 12 to 15 March, 2018.

A1.6. Awareness-raising. Meeting with fishing businessmen and fishermen (10 participants) for 3 days in Rio Grande- RS, Brazil.

Our team talked with 10 people about the AOTTP Tag Recovery Program in Rio Grande. On this occasion, payment of awards was also made in the spot to Mr. Lamine Ndoye and Mr. Jilsonar Marques. Awareness-raising was successfully accomplished in the region. The visit was conducted from 22nd to 24thMarch, 2018.

A2.1. Tag Recovery Program. Reward payments.

During the last quarter, 71 tags were recovered in Brazil: 32 in January, 36 in November and 3 in December. Of these, 59 were simple, 10 were double and 2 were orange tags in yellowfin tunas.

A3.1. Hard parts and biological samples collected and analysed.

The two collected otoliths (84631 and 84613) were sent to UFERSA, and are awaiting the process of reading that will start at a later stage.

A4.1. Tag seeding.

Tag seeding activities have not started yet, but were scheduled to start from April 2018, on.

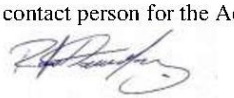
3. Visibility

How will the visibility of the EU contribution be ensured in your Activities?

The European Commission may wish to publicise the results of Actions. Do you have any objection to this report being published on the EuropeAid website? If so, please state your objections here.

No objections

Name of the contact person for the Action: Rafael Ferreira Muniz

Signature: 

Location: Brazil

Date report due: 31/03/2018

Appendix I

Areia Branca – RN

Tag recovery program: Payment of reward.

Itarema - CE

Visit to the fishing technician: Mr. Pedro Pinheiro.

São Gonçalo do Amarante – CE

Mr. Estácio Ferreira and Ms. Roberlene Castro in Robinson Crusoe fishing company.

Natal – RN

Visit to the fishing entrepreneur: Mr. Alceu Alves of the Transmar company.

Visit to the fishing entrepreneur: Mr. Gustavo Burle of the Tuna Brasil company.

Rio Grande – RS

Tag recovery program: Payment of reward to Mr. Lamine Ndoye and Mr. Jilsonar Marques.

Appendix 6. Quarterly Report describing AOTTP Awareness-Raising activities in South Africa

27-Mar	Port Elizabeth	Harbour	Pamphlets	2	Vessel skippers	Craig	
28-Mar	St Francis Bay	Port St Francis	Pamphlets	5	Vessel skippers	Craig	
29-Mar	Plettenberg Bay	Ski boat launch site	Pamphlets	5	Vessel skippers	Craig	
		Commercial fisheries					
16-Feb	CT Harbour	Irvin & Johnson	Posters 3		In bridge on vessel	Craig	
16-Feb	CT Harbour	Viking Fishing Group	Posters 4/Flyers 5		In bridge on vessel	Craig	
16-Feb	CT Harbour	Oceana Group	Posters	3	In bridge on vessel	Craig	
21-Feb	Mossel Bay	SeaVuna Fishing Company	Posters	2	Above freezer	Craig	yes
23-Feb	Gansbaai	Dyer Island Visserye	Pamphlets	5	Vessel skippers	Craig	
23-Feb	Gansbaai	Ichtus Fishery	Pamphlet	1	Manager	Craig	
23-Feb	Hermanus	Tuna Marine	Pamphlets	2	Recreational fishers	Craig	
27-Mar	Port Elizabeth	Talhado Fishing	Pamphlet	1	Director	Craig	
27-Mar	Port Elizabeth	Fisherman Fresh	Pamphlets	3	Secretary	Craig	
27-Mar	Port Elizabeth	Eyethu Fishing	Pamphlets	1	Director	Craig	
Boat/Angling Clubs							
05-Feb	Simonstown	Simonstown Boat Club	Poster	1	Notice board	Alistair	yes
07-Feb	Gordon's Bay	Gordon's Bay Yacht Club	Poster	1	Notice board	Schalk	
08-Feb	Struisbaai	Suidpunt Deep Sea Angling Club	Pamphlets	25	Recreational fishers	Chris	
08-Feb	Hout Bay	Hout Bay Yacht Club	Poster	1	Notice board	Alistair	yes
17-Feb	Simonstown	Cape Boat and Ski Club	Pamphlets	5	Vessel skippers	Schalk	
21-Feb	Mossel Bay	Mossel Bay Boat Club	Poster	1	Notice board	Craig	
21-Feb	Mossel Bay	Mossel Bay Boat Club	Pamphlets	5	Club secretary	Craig	
23-Feb	Saldanha	Club Mykonos marina	Poster	3	Notice board	Chris	
23-Feb	Saldanha	Club Mykonos marina	Pamphlets	5	Vessel skippers	Chris	
27-Mar	Port Elizabeth	PE Deep Sea Angling Club	Posters	3	Notice boards	Craig	yes
28-Mar	St Francis Bay	Port St Francis Ski Boat Club	Posters	2	Notice boards	Craig	yes
28-Mar	St Francis Bay	Port St Francis Ski Boat Club	Pamphlets	30	Club chairman	Craig	
29-Mar	Plettenberg Bay	Plett Ski Boat Club	Posters	2	Notice boards	Craig	yes

Awareness and tag recovery campaign for ICCAT - AOTTP in South Africa
Fiscal Identification Number: N4001546C

Table 1 Distribution of Reward Poster and Awareness material to-date.

Harbours / launching site							
Date	**Geographical Location**	**Display or Distribution Location**	**Awareness Material**	**No.**	**Display Position or Recipients**	**Distributed by:**	**Site Photo yes/no**
03-Feb	Hout Bay	Harbour	Leaflets	30	Vessel skippers	Chris	
07-Feb	Struisbaai	Harbour	Pamphlets	5	Harbour Master and Gate security	Craig	
07-Feb	Hermanus	Harbour	Poster	1	Harbour Master Notice board	Schalk	
07-Feb	Struisbaai	Harbour launching ramp	Pamphlets	25	Vessel skippers	Chris	
08-Feb	Hout Bay	Harbour boat yard	Poster	1	Notice board	Alistair	Yes
08-Feb	Hout Bay	Commercial vessel security office	Poster	1	Notice board	Alistair	Yes
08-Feb	CT Harbour	Collier Jetty	Pamphlets	30	Tuna pole and line vessels	Craig	
17-Feb	Hout Bay	Harbour launching ramp	Pamphlets	10	Recreational vessels	Alistair	
21-Feb	Mossel Bay	Harbour control office	Poster	1	Notice board	Craig	
21-Feb	Mossel Bay	Harbour	Pamphlets	10	Vessel crew	Craig	
22-Feb	Still Bay	Harbour control office	Poster	1	Notice board	Craig	
22-Feb	Still Bay	Harbour control office	Pamphlets	2	Inspectors	Craig	
23-Feb	Struisbaai	Harbour control office	Poster	1	Window	Craig	
23-Feb	Struisbaai	Processing area at harbour	Poster	1	Inside processing area	Craig	
23-Feb	Gansbaai	Harbour control office	Poster	1	Notice board	Craig	
23-Feb	Hermanus	Harbour Control Office	Poster	1	Window	Craig	yes
23-Feb	Hout Bay	Harbour	Pamphlets	10	Vessel skippers	Alistair	
16-Mar	CT Harbour	Collier Jetty	Pamphlets	5	Vessel skippers	Craig	
16-Mar	Hout Bay	Harbour	Pamphlets	10	Vessel skippers + crew	Craig	
16-Mar	Hout Bay	Harbour – Captain Jack's Boat Charters	Poster	1	Office	Craig	yes

Fishing shops							
05-Feb	Cape Town	Big Catch	Poster	1	P.O.S.	Alistair	yes
05-Feb	Cape Town	Fred Tuckers fishing shop	Poster	1	Shop Window	Alistair	
06-Feb	Cape Town	Keith Murison fishing shop	Poster	1	Ceiling	Schalk	yes
06-Feb	Cape Town	Fishing specialist	Poster	1	Freezer	Schalk	yes
06-Feb	Cape Town	Suburban Tackle Shop	Poster	1	Notice board	Alistair	yes
07-Feb	Struis Harbour	Bait shop	Poster	1	Above freezer	Craig	yes
07-Feb	Gansbaai	Fish Fever	Poster	1	Display window	Schalk	yes
07-Feb	Gansbaai	Gansbaai Sport and Tackle	Poster	1	Shop Window	Schalk	
22-Feb	Mossel Bay	Go Fish Charters	Pamphlet	1	Vessel skipper	Craig	
22-Feb	Mossel Bay	Go Fish Fishing Shop	Poster	1	Entrance window	Craig	yes
22-Feb	Mossel Bay	Tackle Shack	Poster	1		Craig	
22-Feb	Mossel Bay	Coral Reef Bait & Tackle	Poster	1	Entrance window	Craig	yes
22-Feb	Still Bay	Xtreme fishing shop	Poster	1		Craig	
22-Feb	Still Bay	Stil Fishing shop	Poster	1	Shop Window	Craig	
23-Feb	Struisbaai	Struisbaai Tackle and Superette	Poster	1		Craig	
23-Feb	Gansbaai	Fish Fever	Poster	1	Display window	Craig	
23-Feb	Gansbaai	Gansbaai Sport and Tackle	Poster	1	Freezer	Craig	
23-Feb	Hermanus	Harbour dive shop	Pamphlet	1	Recreational fisher	Craig	
27-Mar	Port Elizabeth	Commercial Marine, PE harbour	Poster	1	Notice board	Craig	yes
27-Mar	Port Elizabeth	Break Even Supplies	Poster	1	Entrance board	Craig	yes
28-Mar	St Francis Bay	Commercial Marine	Poster	1	Entrance window	Craig	yes
28-Mar	St Francis Bay	H2O Extreme Fishing	Poster	1	Entrance window	Craig	
28-Mar	St Francis Bay	H2O Extreme Fishing	Pamphlets	3	Shop owner/skipper	Craig	

Awareness and tag recovery campaign for ICCAT - AOTTP in South Africa
Fiscal Identification Number: N4001546C

29-Mar	Plettenberg Bay	Yamaha Plett	Pamphlets	3	Shop owner/skipper	Craig	
29-Mar	Plettenberg Bay	Crawford's Sports	Poster	1	Inside window	Craig	
29-Mar	Plettenberg Bay	Plett Sports	Poster	1	Entrance window	Craig	yes
Cold Stores							
23-Feb	Hout Bay	Pescaluna East Coast	Poster	1	Reception	Alistair	yes
23-Feb	Hout Bay	Sea Freeze Fisheries (Hout Bay)	Poster	1	Reception, factory	Alistair	yes
23-Feb	Hout Bay	Kaytrad Fishing Company	Poster	1	Reception	Alistair	yes
23-Feb	Hout Bay	Chapman's Peak Fisheries	Poster	1	Reception	Alistair	Yes

Appendix 7: Results of Questionaire given to participants to evaluate AOTTP Workshop 1 (Introduction, access and use of ICCAT-AOTTP conventional tagging databases)