

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

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LIST OF ACRONYMS USED IN THE REPORT

AOTTP	Atlantic Ocean Tropical tuna Tagging Programme
AZTI	Centro Tecnológico experto en innovación marina y alimentaria
BET	Bigeye tuna (<i>Thunnus obesus</i>)
CIPA	Research Centres. Centro de Investigação Pesqueira Aplicada (CIPA) de Bissau
CRO - CI	Centre Recherches Oceanologiques (Côte d'Ivoire)
CRODT	Centre Recherches Oceanologiques de Dakar (Sénégal)
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 (Brazil)
FSSD	Fisheries Scientific Survey Division (Ghana)
IATTC	Inter-American Tropical Tuna Commission (USA)
ICCAT	International Commission for the Conservation of Atlantic Tunas (Spain)
IEO	Instituto Espanol de Oceanografia (Spain)
IMAR	Instituto do Mar (Azores)
IMROP	Institut Mauritanien de Recherches Océanographiques et des Pêches (Sao Tomé and Príncipe)
INDP	Instituto Nacional para Desenvolvimento das Pescas (Cabo Verde)
IRD	Institute de recherché pour le développement
LATEP	Laboratorio de Tecnologia Pesqueira (Brazil)
LPRC	Large Pelagic Research Center

LTA	Little tunny (<i>Euthynnus alletteratus</i>)
MFRD	Marine Fisheries Research Division (Ghana)
MFV	Motor Fishing Vessel
MSE	Management Strategy Evaluation
PROBITE C	Proyectos Biologicos y Tecnicos (Spain)
RV	Research Vessel
SC	Steering Committee
SPC	Pacific Community (New Caledonia)
SCRS	Standing Committee on Research and Statistics
SKJ	Skipjack tuna (<i>Katsuwonus pelamis</i>)
tRFMO	Tuna Regional Fisheries Management Organizations
TRO	Tag Recovery Officer
UPV	Universidad Politecnica de Valencia (Spain)
UFERSA	Universidade Federal Rural do Semiárido (Brazil)
UFPRE	Universidade Federal de Pernambuco (Brazil)
WAH	Wahoo (<i>Acanthocybium solandri</i>)
YFT	Yellowfin tuna (<i>Thunnus albacares</i>)

DESCRIPTION

NAME OF COORDINATOR OF ICCAT CONTRACT

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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 2016 to 28 June 2017

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

AOTTP has continued to make progress towards its targets during the second reporting period. Nearly 500 days at sea have been spent on 53 tagging cruises throughout the Atlantic. More than 50,000 fish (*ca* 40% of the target) have been tagged with conventional tags in the EEZs of 13 different countries - for which permission was sought and granted - in addition to the High Seas. More than 300 electronic tags (pop-ups and internals) have been deployed providing information on tuna migrations. Scientists and technicians, including women, from developing countries have tagged over half of these fish. Tag-recovery and awareness raising infrastructures have been set up in ten countries, and almost 9,000 tags have been recovered for which rewards have been paid. Tag-seeding experiments are under way. A lottery to promote the project among stakeholders was organized in September 2017 by ICCAT, and a cash prize paid. Posters, t-shirts, and caps have been designed in four languages. An expert group to improve age-determination and build capacity was organized by our partners in Abidjan. Relational databases and smartphone applications for populating them have been designed, developed and implemented. Many colleagues from developing countries have been trained in all aspects of tagging at sea, tag-recovery, and data transmission methodologies. AOTTP coordination is continuing to work with the ICCAT SCRS to build capacity among ICCAT CPCs and make effective use of the tagging data for improving the tropical tuna stock assessments. In spite of the late start the AOTTP is catching up and on course to meet its objectives.

The Overall Objective (OO) of AOTTP outlined in the Grant Contract is to, 'contribute to food security and economic growth of the developing Atlantic coastal states by ensuring sustainable management of tropical tuna resources in the Atlantic Ocean'. The objectively verifiable indicators are:

- OO1. Budget income generated for coastal states in relation to tuna resources is increased
- OO2. Values of exports of tuna products is maintained or increased
- OO3. Share of fish products in protein inputs is maintained or increased
- OO4. The values of B/B_{MSY} are kept over 1 and the values of F/F_{MSY} are kept below 1 according to ICCAT management objectives.

Note these OOs will be difficult to evaluation before the end of the project and, indeed this is acknowledged in the Grant Contract.

The Specific Objective (SO) of AOTTP is to 'provide evidence based scientific advice to developing coastal states, and other Contracting Parties, to support the adoption of effective Conservation and Management Measures in the framework of ICCAT'. There are two qualitative and four quantitative objectively verifiable indicators for the Specific Objective of the Programme:

Qualitative objectives

- SO1.The accuracy in the estimation of reference points is increased and the uncertainty in the formulation of scientific advice is reduced;
- SO2.The probability to achieve the management objectives is increased.

It is yet too early to be able to comment on SOs 1 and 2 but, given the quality and quantity of the data collected thus far by AOTTP there is every possibility that substantial progress will be made towards them.

Quantitative objectives

- SO3.Science-based advices and management measures on the following elements are produced, e.g.: TACs, Reference Points and Harvest Control Rules for main tropical tuna species;
- SO4.Spatial management measures such as time-area closures;
- SO5.FAD moratorium and/or management plans;
- SO6.Development of index for neritic tunas.

Again we cannot yet comment in detail on SOs 3-6. AOTTP, however, did manage to tag ca 3000 tropical tuna in the FAD moratorium area between January and February 2017 and it is likely that the recoveries will produce information useful for assessing Spatial management measures (SO4) and FAD moratoria (SO5). Given the good recovery rate of LTA we are also confident that useful indices will be developed for neritic tunas (SO6).

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 is summarized below.

R1. 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

Expected result 1 is the foundation on which the AOTTP programme will be built. Tagging activity began at the end of June 2016 in EU (Azores, Portugal), and then continued around the Canaries Islands, and off West Africa and South Africa until April 2017. Tagging activities began recently (April 2017) in the territorial waters of Brazil. So far more than 50,000 tropical tuna have been tagged and released in thirteen EEZs (**Appendix 1**) and nearly 9,000 have been recovered. All the data have been checked and stored in a relational

database at ICCAT HQ. The ICCAT Secretariat has a well-developed database infrastructure for storing tagging data (<https://www.iccat.int/en/Tag-Desc.htm/>), which the AOTTP programme is exploiting and developing.

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

Indicator 1. Number of tagged tunas: A minimum of 120,000 tunas are tagged (AOTTP & SCRS reports, AOTTP-ICCAT Databases).

During the current reporting period 50666 tropical tunas, across species and size-ranges have been tagged and released over and already extensive area of the Atlantic Ocean (e.g. **Figure 1** and **Table 1**).

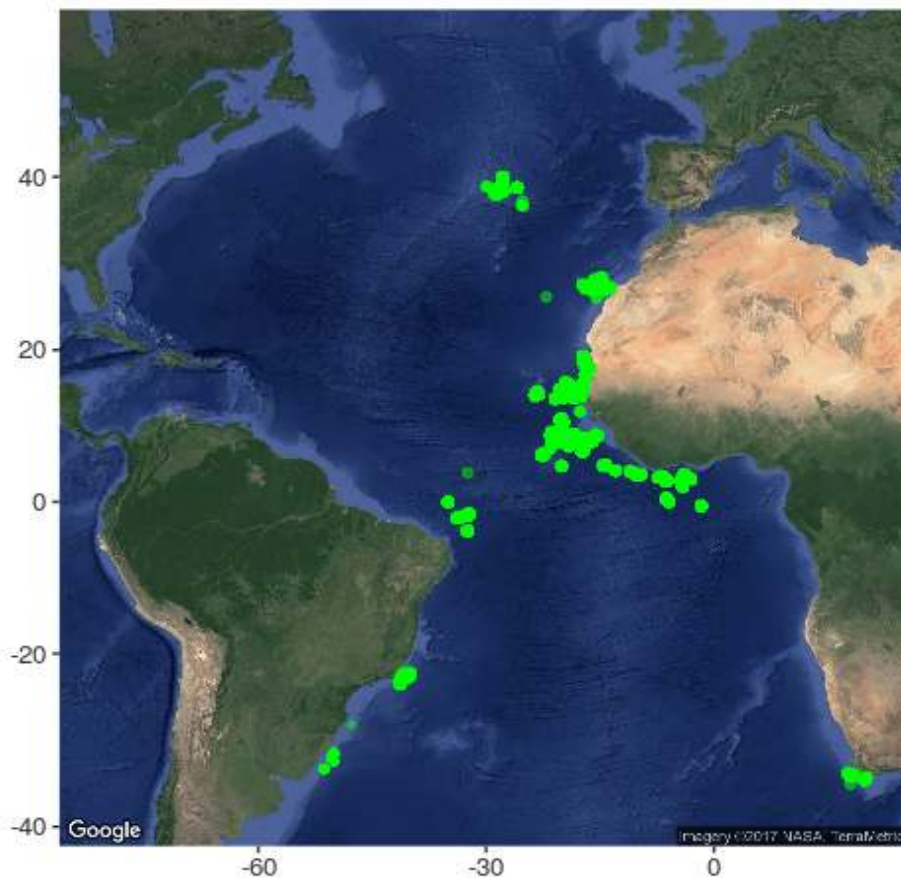


Figure 1. Distribution of tropical tuna (all species) tagged and released by ICCAT-AOTTP between July 2016 and June 2017

One hundred and eighty nine have been released for a second time (R-2) and one for a third (R-3). All the data have been stored in a relational database at the ICCAT Secretariat. AOTTP has thus achieved 42 % of its 120,000 tagging target to date. The overall distribution between the three main tropical species has been well-balanced: BET ca 35%; YFT ca 35%; and BET ca 30%.

Table 1. Total number of releases by species and release stage code

Species	R-1	R-2	R-3
BET	14553	118	1
LTA	730	1	0
SKJ	17371	36	0
WAH	2	0	0
YFT	17814	34	0
Total	50470	189	1

Twenty percent (24,000) of the 120,000 tuna targeted are being double-tagged so that 'tag-shedding' rates can be estimated. So far 8244 have been double-tagged, translating to 34.35% of the target (Table 2). Size-ranges, or length frequencies, of individuals tagged and released have been satisfactory overall so far (**Appendix 2**) although the very large BET and YFT have been difficult to catch. This is probably a function of the baitboat métier that is being used during AOTTP which typically catches smaller or mid-size individuals.

Table 2. Total number of fish double-tagged by species

Species	Number
BET	3009
LTA	108
SKJ	2166
YFT	2960
Total	8244

Two neritic species (LTA and WAH) are being targeted by AOTTP. So far only 731 LTA and 2 WAH have been tagged against an overall target of 10,000. LTA is of particular interest to West African coastal communities and will be more actively sought during phase 2.

Table 3. Chemically tagged totals by species

BET	SKJ	YFT	Total
1397	1261	1666	4324

AOTTP has also tagged a total of 4324 fish chemically (**Table 7**) which is done to help facilitate age-determination if the fish are recovered.

Table 4. Electronic tag releases by species

	BET	YFT	Total
DS-SeaTag-3D-PSAT	24	6	30
Lotek-2810	89	144	233
MiniPAT-348C	3	44	47

AOTTP is also using electronic tags to study the migrations of tropical tuna. Two different brands of pop-up type tag (Desert Star and Wildlife Computers) were purchased, and one make of internal (Lotek). 30 x Desert Star tags, 233 x Lotek internals, and 47 x Wildlife computers tags have so far been deployed (**Table 4**). The pop-up tags were programmed (50:50 mix) to release after 90 days and 180 days. Retention times have been disappointing with an ca 30 day average although useful information is nevertheless being returned.

Retention rates in South Africa have been relatively high and interesting data showing the migration of large YFT between Atlantic and Indian Oceans is emerging (**see Figure 2**). Recovery rates of the internal/archival tags have been low with only a handful of tags recovered so far, although one was returned in Dakar with nearly 3 months of data (at 15 second intervals) 'on board'.

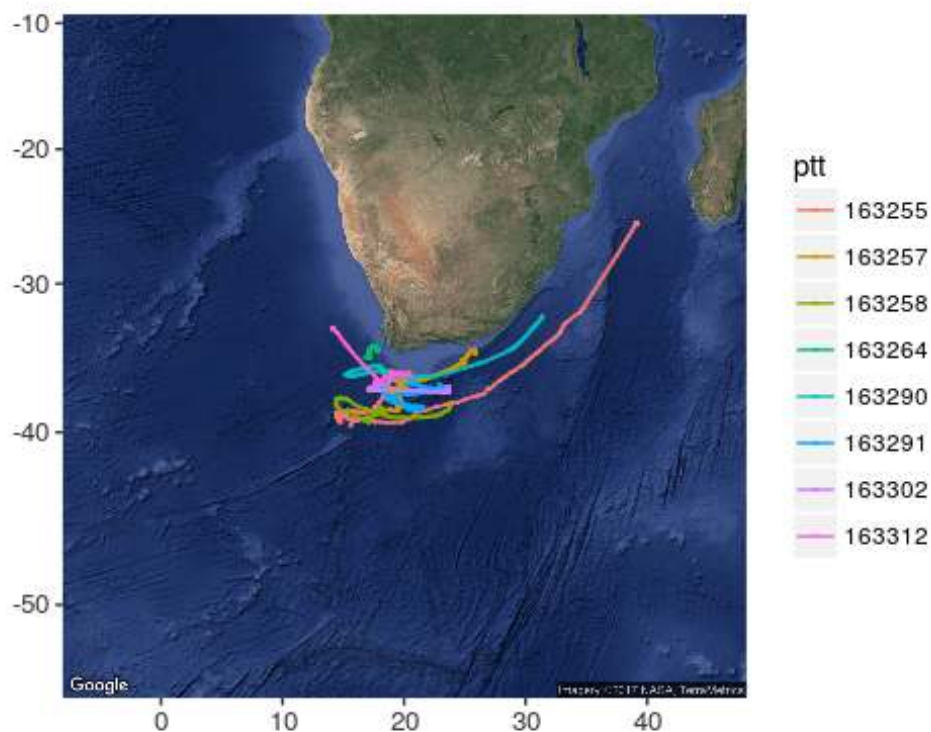


Figure 2. Migrations of YFT tagged off South Africa in February 2017

Indicator 2. 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%)

Reporting rates are estimated by 'tag-seeding' experiments whereby 'false' tags are surreptitiously inserted into tuna by the TROs and other actors at different points in the

value chain. A range of fleets are being targeted including purse-seiners, baitboats, and artisanal. Subsequently everything else remains the same (ie. fishers, dockers find the tags, rewards are paid, and data sent to ICCAT) but it allows an estimate of the number of tags that might have been ‘missed’ between capture and market.

The TROs are running the tag-seeding experiments in West Africa. So far the AOTTP overall reporting rate is nearly 70% for BET and YFT, and 100% for SKJ. In similar tuna tagging programs in other oceans and campaigns reporting rates of: 1% (previous tagging campaigns in the Atlantic); 61% (Western Pacific Ocean); and 95 % (Indian Ocean) have been recorded. It is, however, difficult to compare rates between oceans, fleets, and periods; especially because of pronounced differences in geographical distribution, fishing and landing operations. Nevertheless, even with such considerations the AOTTP reporting rate is average overall and at a similar level to that observed in the Western Pacific Ocean campaigns.

A1.1. TAGGING OF TROPICAL TUNAS

This activity will use most of the AOTTP budget and relates to tagging tropical tuna at sea. There are three main components (means required to implement the activity) to Activity 1.1 and progress on each is summarized as follows (verification indicators 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)

Nine MFVs have so far been used by ICCAT/AOTTP to tag fish in the eastern Atlantic: the Acoriana, the Grand Primero (**Figure 3**), the Macizo, the Aita Fraxku, the TarrynAmy, the Estrela Delva, the Katsushio Maru 8, The Thavisson III, and the Tuburao Tigre.



Figure 3: Grand Primero - baitboat chartered by AOTTP-ICCAT to tag in the Territorial waters of Spanish Canary Islands

Vessels chartered by ICCAT-AOTTP partners have done 53 tagging cruises (**Appendix 3**) over the tropical Atlantic spending 499 days at sea, corresponding to 27% of the 1800 day target. Note this figure is only days actually spent at sea; time looking for bait, effecting repairs, loading and preparing the boat for sea has not been included.

Tagging teams will be deployed on board the hired vessels (Number of tagging campaigns, Cruise reports)

Trained tagging teams (53 different individuals) have been deployed on all vessels. Fifty-three cruise reports, detailing the activities, problems, and recommendations are available from ICCAT. Of the 53 tagging trips organized, twelve took place off the Azores, eleven around the Canary Islands, four off Sénégal, seven in the Gulf of Guinea, eleven off South Africa and eight so far of the coast of Brazil (**Table 5**).

Table 5. Tagging campaigns by location

Location	Number
Azores	12
Brazil (Ariea Branca)	2
Brazil (Cabo Frio)	3
Brazil (Fernando de Noronha Islands)	1
Brazil (Itajai)	1
Brazil (St. Peter & St. Paul Islands)	1
Canarias	11
Golf of Guinea	7
Sénégal	4
South Africa	11

Tags (conventional, chemical, electronic, sonic) and tagging equipment will be procured (Number of tuna tagged and released, AOTTP reports, cruise reports).

The tags themselves were all sourced and purchased by ICCAT. All the conventional tags and applicators needed for the entire AOTTP Programme have been procured (ca 150,000 tags & 7500 applicators), including those needed for the tag-seeding experiments. Electronic tags for the first phase were procured by International Call for Tender. Desert Star and Wildlife Computers will supply AOTTP with 40 Seatag 3D and 95 Mini PAT-348C pop-up tags, respectively, while Lotek Wireless are providing 400 (LAT 2810) and 40 ARCGEO-9 internal tags. The 95 Wildlife Computers Mini PAT-348Cs, however, were found to have a technical problem in July 2016 and were recalled for repairs which has delayed their deployment.

Desert Star tags had then to be deployed in their stead. During October 2016, however, a fault was noted in the Desert Star tags too, which caused them to transmit corrupted data to the satellite and the remaining tags were recalled for replacement. The tags that were successfully deployed, but failed to report adequate data, will be replaced by Desert Star and analyses are ongoing. After a review of the performance of these tags during the first phase a decision will be made on future procurement.

Our tagging contractors (e.g. AZTI, CAPMARINE, FADURPE), were made responsible for procuring ancillary hardware locally such as tagging cradles, mattresses, suturing equipment, antiseptics, voice recorders, computers, and mobile telephones for data upload to ICCAT. This was a much easier way to work since local needs (boat dimensions, etc.) can be matched more quickly and easily to the gear. It also reduces problems with customs, and the expense of couriers.

A1.2. AWARENESS CAMPAIGNS AND RECOVERY SCHEMES

In past oceanic tagging projects, preparation for tag-recovery on land has been inadequate compared to the time and investment dedicated to tagging activities at sea. AOTTP has rebalanced these efforts, and has developed tag-recovery and awareness activities in all of the most important Atlantic Coastal States based on an initial analysis of tropical tuna landings by port.

There are three main components of Activity 1.2. which are described in detail below (verifiable indicators in parentheses):

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 have now been designed and implemented in the following ten countries: Açores Islands (Portugal), Canary Islands (Spain), Mauritania, Sénégal, Cabo Verde, Ghana, Côte d'Ivoire, South Africa, Brazil and Uruguay. Specific officers and staff have been selected in each location to develop and implement the activities (**Figure 4**).

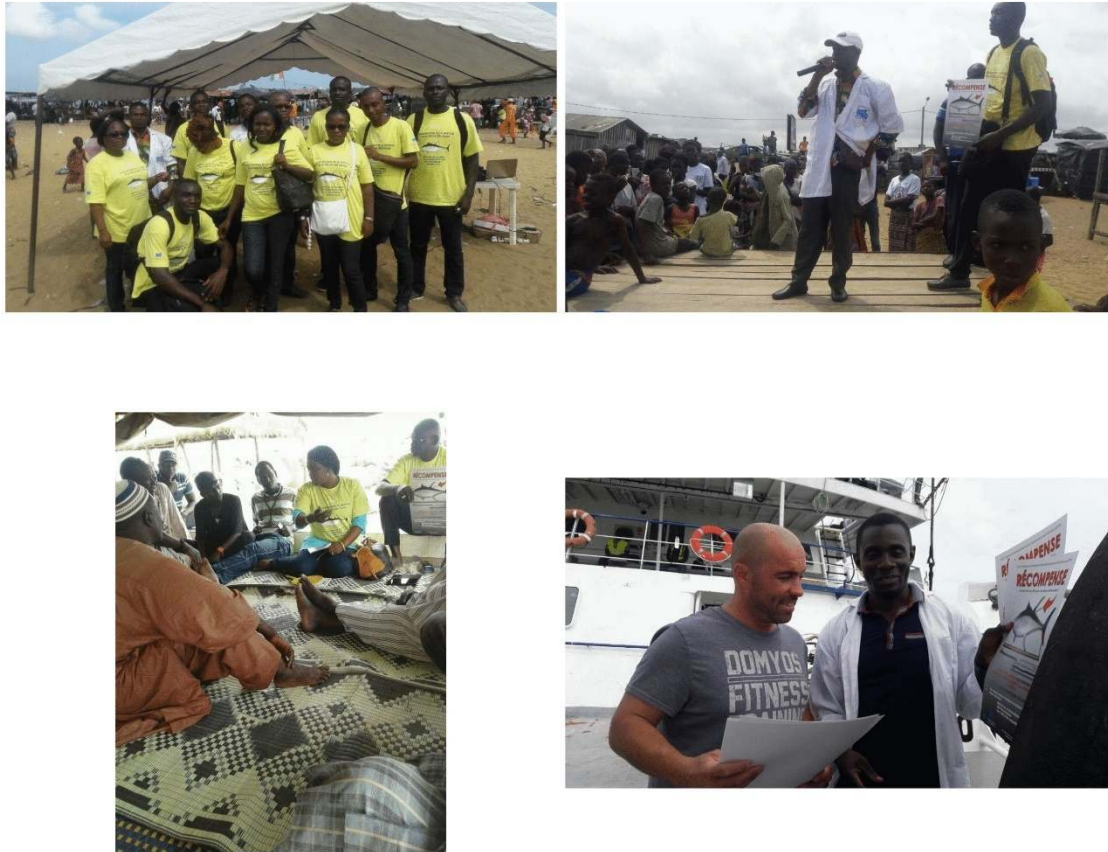


Figure 4: Awareness Raising in West Africa

Awareness and publicity campaigns will target fishermen and crew, stevedores and other fishing fleet service providers, processors and workers, etc. (Reporting rates).

The awareness campaigns focus particularly on those persons involved in different aspects of the fisheries sector, although some activities have also been orientated towards the general public. The design and production of the awareness-raising material have taken into account the specific idiosyncrasies of the fishermen, the crews of the commercial tuna vessels, the stevedores, traders, and fish processors. T-shirts and caps have been designed with bright colors in the official languages of each location. Posters with clear and simple messages highlighting the “Reward”, the minimal required recovery information (e.g. fish length and capture location) and the mobile phone contact number, have also been designed and distributed. The posters are produced in a water-proof material to assure their durability after being pinned up in fishing vessels, and at landing and auction facilities. Meetings and visits to artisanal fishing communities, processing plants, landing areas and messages broadcast by local radio stations have thus been complemented by the distribution of this material (**Figure 4**).

As mentioned, awareness campaigning has also targeted the general public. Standard press release templates have been distributed to every TRO and been adapted to the specific characteristics of the region (**Appendix 4**). The final versions have been reproduced and distributed via many different media; including audio-visual, newspapers, magazines and television.

Many of the awareness activities have also been recorded as videos on mobile phones and uploaded to YouTube channels. In addition to the standard campaigns, each awareness-raising team has been encouraged to develop its own specific activities with very positive results. In Abidjan, for example, we have seen community music concerts and celebrations, while the Senegalese team has elaborated additional posters and pamphlets in the local languages, and our South African colleagues have written articles about AOTTP in sport fishing magazines.

The reporting rates so far achieved from the tag-seeding experiments (*ca* 70%) demonstrate that the message is getting through. The target, however, is to achieve more than 80% so the awareness-raising and reward schemes will continue to be studied and developed.

Reward scheme will be designed and developed for the different target groups (Reporting Rates)

Reward systems have been designed taking into account budget constraints, the individual characteristics of the personnel involved in each fisheries sector, and the incentives most appreciated by relevant stakeholders in the different countries, which varies. Substantial sums of money, provided either to just one fishermen, or to the skipper of the fishing vessel can cause jealousy among the rest of the crew; the ultimate consequence being a lack of interest in reporting new tag recoveries.

So after consultations, AOTTP Coordination decided to provide a cash reward of 10€ for a tag plus data (more symbolic) although the emphasis is really on t-shirts and caps. The reporter of every recovered, tagged, tuna receives a high-quality orange t-shirt, while the crews of the fishing vessels (or the team of stevedores or workers of the plant) receive (only once) medium quality pistachio t-shirts. In this way any potential for jealousy is reduced by rewarding, not only the tag-finder him/herself, but also every other member of the crew with this small additional incentive. In the large TROs with high numbers of recoveries (Dakar, Abidjan and/or Tema), an additional reward of mobile phone credit (10€) is paid. This not only compensates the cost of phone calls by the tag-finders, but is also an extremely popular incentive in that region of West Africa (**Figure 5**).



Figure 5: Rewards and Incentives

TROs also have continuous access to an online system, developed by AOTTP, to track all the released tags so they can instantly ascertain the status of a tag, e.g. has it already been recovered or has the reward has been already paid? Clearly the system is a very useful tool to verify the information provided by the tag-finders, helping avoid mistakes, duplications, and double payments of rewards (see **Figure 6, left panel**).

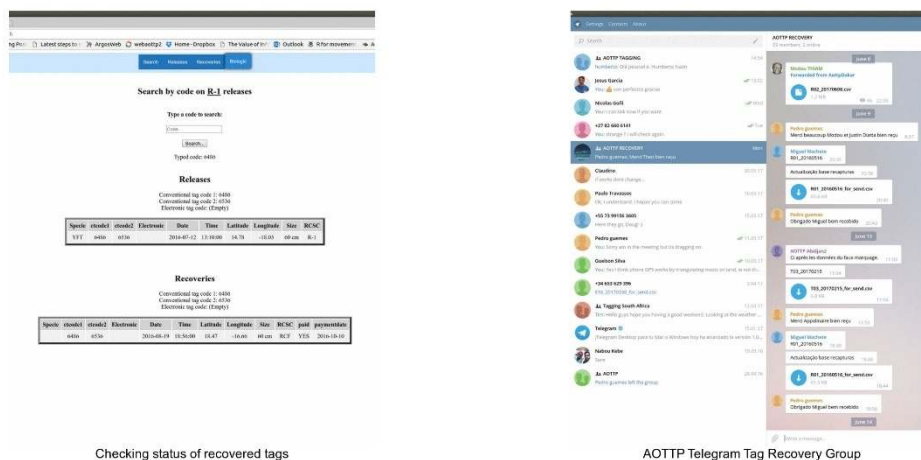


Figure 6: Website for tag-checking (left) and Telegram Recovery Group for data exchange (right)

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

TROs have been set up in most of the strategic tuna landing ports of the Atlantic. Service contracts have been negotiated and signed with: Instituto do Mar of Portugal, with Instituto Español de Oceanografía of Spain, with the Centre de Recherches Océanographiques of Sénégal, with the Centre de Recherches Océanologiques of Côte d'Ivoire, with the Instituto Nacional de Desenvolvimento Pesqueiro of Cabo Verde, with the Fisheries Scientific Survey Division of Ghana, with Capmarine of South Africa, with the FADURPE Foundation in Brazil and is close to finalizing a contract with Direcccion Nacional de Recursos Acuaticos de Uruguay.. Data are collected by the TROs, using the smartphone application developed by

AOTTP, and quickly transmitted to the ICCAT Secretariat for verification and upload to the database.

There are three main components of Activity 1.3. and progress is described in detail below (verifiable indicators in parentheses):

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)

The information collected so far attest to the efficacy of these activities, see **Figure 7** which shows the wide spatial distribution of the recovered tagged fish and **Figure 8** which summarizes the continuous progress during the reporting period in both tagging at sea and recovery work.

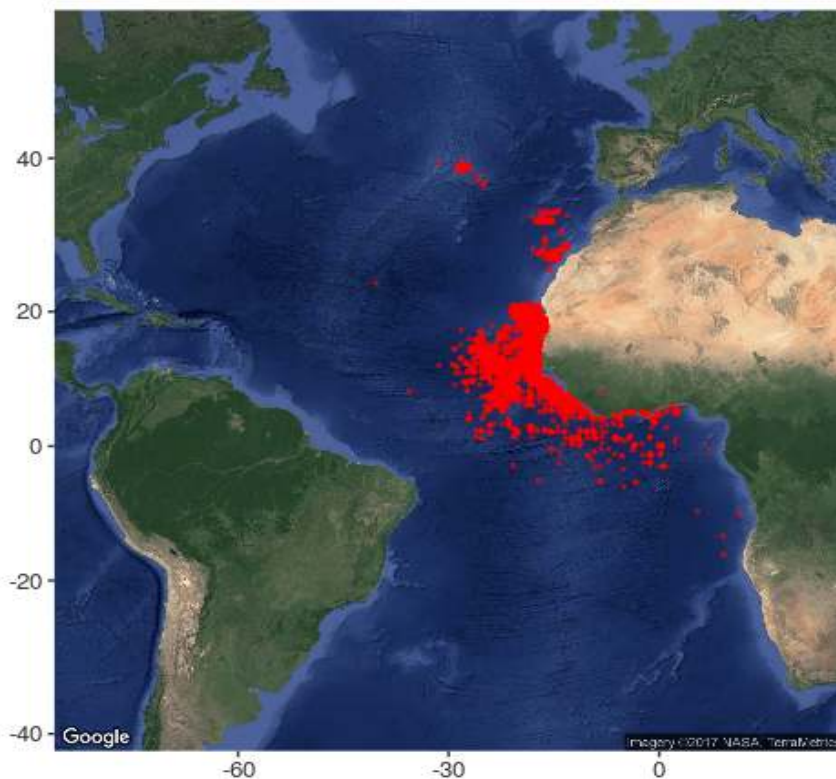


Figure 7. Spatial distribution of tagged, tropical tuna (all species) recovered by AOTTP between June 2016 and 2017

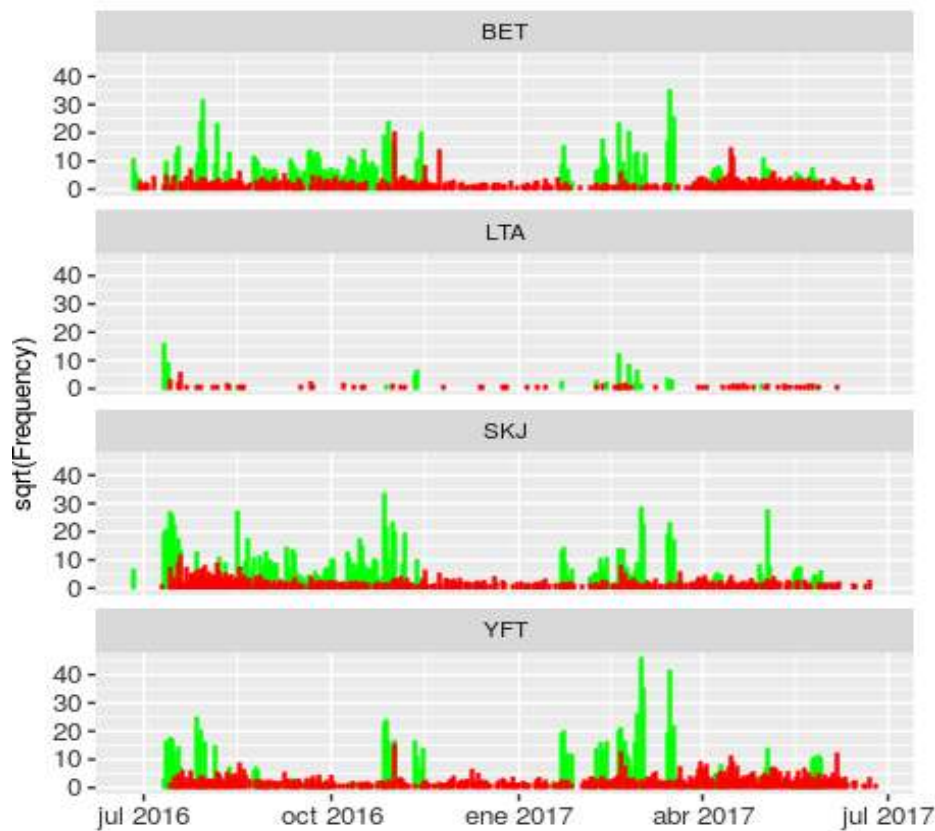


Figure 8: Total ICCAT/AOTTP releases (green) and recoveries (red) during the reporting period by species. The numbers have been square-root transformed so they can be seen on the same axes.

Table 6. Total conventional tag-recoveries by species

BET	LTA	SKJ	YFT	Total
2743	128	2081	3636	8588

Table 7. Tag recovery percentages by species

BET	LTA	SKJ	YFT	Total
18.7	17.5	12	20.4	17

Up to the end of this reporting period, the number of valid recoveries is 8588 (**Table 6**) translating to an overall recovery rate of ca 17% (**Table 7**). The numbers of chemically tagged fish released (red tags) are shown above in **Table 3**. Out of a total of 4324 released, 607 chemically tagged individuals (BET=191, SKJ=122 & YFT=270) have been recovered which is ca 15%.

A large network of counterparts will be developed to ensure recovery data collection and transmission to ICCAT (Number of recoveries)

A *digital* network of counterparts has been developed using the mobile phone Android application Telegram. An “AOTTP Recovery” group in Telegram has been created for submitting information/data collected and for resolving any problems and clarifying any questions. The system allows continuous communication and exchange of information between all the counterparts and ICCAT-AOTTP (**see Figure 6, right panel**).

Additionally, an Android smartphone application, based on the Memento database, has been developed to collect and submit the data. Specific recovery templates have been designed in four languages (French, Spanish, Portuguese and English) to facilitate the immediate, accurate upload and transfer of recovery data (**Figure 9**) to ICCAT. After the introduction and completion of the recovery template, the file produced is immediately uploaded to ICCAT via the Telegram “AOTTP Recovery” group. This system facilitates the rapid correction of data, avoiding mistakes. An important advantage is that it allows immediate feedback with the TRO still in the port and with the presence of the tagged tuna finder to clarify any question or resolve any problem.

The screenshot displays the 'Criar entrada' (Create entry) form in the Memento Application. The form includes the following fields and options:

- Código de marca**: A text input field with a blue cursor.
- Código da espécie**: A dropdown menu currently showing 'SKJ (Bonito)'.
- Comprimento (cm)**: A text input field.
- Localização geográfica**: A text input field.

Below the form fields is a numeric keypad with digits 1-9, 0, and a backspace key. The keypad also includes letter associations for some numbers: 2 (ABC), 3 (DEF), 4 (GHI), 5 (JKL), 6 (MNO), 7 (PQRS), 8 (TUV), and 9 (WXYZ). The bottom of the screen shows the standard Android navigation bar with back, home, and recent apps buttons.

Figure 9: Memento Application screenshot for data upload to ICCAT

Quality of the recovery data on board purse-seiners is assessed thanks to tag-seeding operations (Tag-seeding operations on purse-seine fleets)

Tag seeding experiments to estimate the reporting rates have been implemented in Sénégal and in Côte d'Ivoire which constitute 85% of the recoveries so far. Up to end of June 2017 the reporting rate reached 70% of the recaptured tagged tunas. More work needs to be done but we do see indications of lower reporting rates in artisanal fishery markets, than in industrial tuna vessels and landing sites.

As data accumulate it will be really interesting to evaluate the awareness campaigns, possibly re-orientating them to increase the reporting rates.

Another important statistic in estimating population size from large-scale fish tagging programs is the 'tag-shedding rate'. The number of tags shed after tagging can be estimated for all areas and species since 20% of the tuna being released are double-tagged. So far 1541 recovered tagged tuna were double tagged (**Figure 10**) and tag-shedding percentages for the four species with recovery data are: BET, 2.2 %; YFT, 3.3 %; SKJ, 4 % and LTA, 4.2 %. Again it would be a good idea to evaluate these data in detail against the specific tagging campaigns, since it is possible that a change to the operational tagging protocols could reduce tag-shedding rates.



Figure 10: A double-tagged tuna

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

The AOTTP Coordination is still focusing on organizing tagging at sea, the recovery of those tags, the payment of rewards, and the storage of the data. The verifiable indicators for 'Expected Result 2' are as follows:

Indicator 1. 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)

No confirmed biological parameters from AOTTP data are available as of writing. AOTTP, however, already has a rich dataset which could, even now, be used to estimate growth rates, mortality (including gear selectivity), and migration rates. Basic statistics (e.g. number of releases, numbers of recoveries) will be presented at the SCRS Species Group Meeting between 4-8 September 2017, and again at the SCRS Plenary in early October 2017. Once data are approved for circulation preliminary analyses will begin. Remember, however, that as per the AOTTP Grant Contract, formal analyses of targeted research questions) are not scheduled to begin until Q3 2018.

Indicator 2. Indicators are developed for neritic tunas (stock structure, growth, migrations)

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

As of writing 731 little tunny have already been tagged with 128 recoveries already recorded (**Tables 1 and 6**). These numbers, while providing novel information on, for example, growth are yet too few to permit the development of 'indicators'. During the second phase tagging, AOTTP will target neritic tunas more specifically, building on the numbers tagged during Phase 1.

A2.1. READING OF HARD PARTS.

During the AOTTP programme tuna fish are being targeted for 'chemical tags', 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. This activity is divided into two main components which are discussed below.

Hard parts (otolith, vertebrae, spines) will be sampled on recovered tunas (Number of readings of hard parts, AOTTP reports)

Chemically tagged fish always carry a red spaghetti tag (**Figure 11**), marked with 'KEEP WHOLE FISH'. When a fish with a red tag is reported, TROs 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.

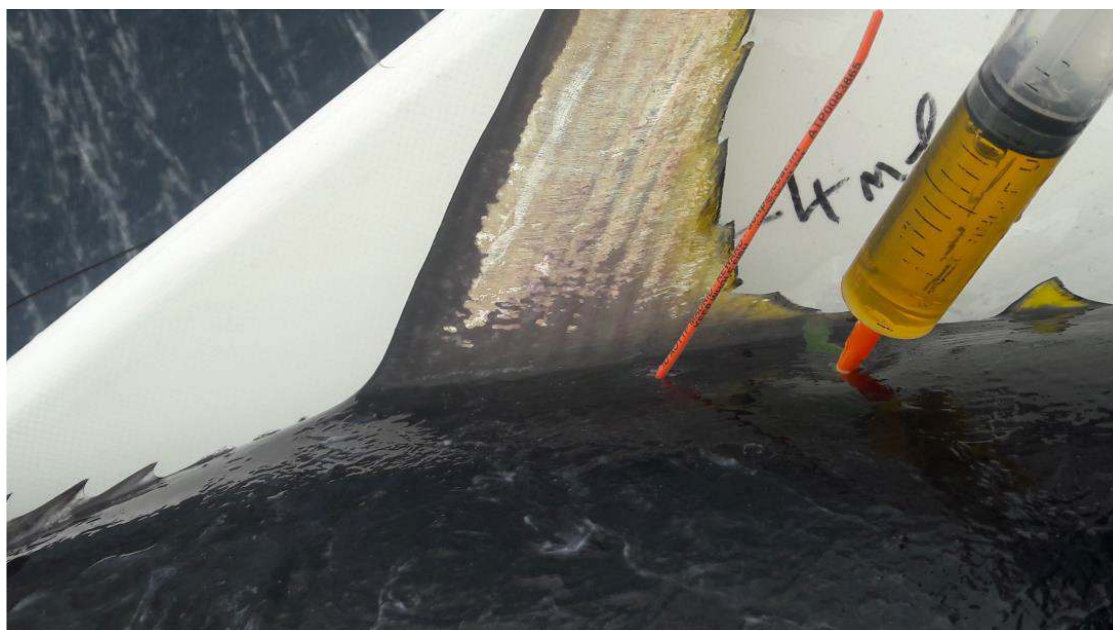


Figure 11: Chemically tagging a tuna

Table 8. Biological samples collected

	<i>F</i>	<i>M</i>	<i>U</i>
BET	31	39	1
SKJ	37	31	0
YFT	33	46	0
Total	101	116	1

AOTTP TROs have already purchased and taken biological samples from 218 chemically marked fish (red tags) representing all size classes, the three species, and both genders (**Table 8**). Other biological information like body-weight, state of sexual maturity, and stomach contents complement the analyses. The samples have all been properly processed, stored, and preserved in the laboratory facilities of the project counterparts.

Reading of the hard parts will be undertaken by specialists (Number of readings of hard parts, AOTTP reports)

An Otolith Expert Group with specialists from Sénégal, Côte d'Ivoire, EU (France and Spain), USA, Australia and South Africa was set up by AOTTP with ICCAT SCRS approval. The specific aim was to establish the procedures and protocols for the collection, preservation and reading of otoliths. A formal workshop was then organized at the CRO-CI (Abidjan) on 1-2 March 2017 to initiate the activities, and to facilitate previous exchanges of ideas and discussions (**Figure 12, Appendix 5**). A draft report with recommendations was produced during the workshop and is available on request from AOTTP. Subsequently additional ideas, improvements and clarifications were incorporated during online discussions with all members of the group. A final document summarizing the procedures and protocols for the analysis of otoliths (age-reading) was then approved and edited in both French and English.



Figure 12: Otolith Expert group meeting March 2017, Abidjan

The first recommendation of the Otolith Expert Group was to create a Reference Collection of Otoliths to orientate and 'calibrate' the age-readings, and to provide the same references to all the participants in the trainings and posterior age-readings. The technical specifications have recently been elaborated and a Call for Tender to create the Reference Collection was launched.

A2.2. TAGGING DATA ANALYSES

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.

Activity 2.2 has a single component (means required for implementation) which is discussed below.

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)

AOTTP data will be officially available for analysis soon. They must first, however, be approved for dissemination by the SCRS which will take place during the autumn of 2017. Once this has happened the AOTTP data will be freely available for analysis by SCRS Working Groups, and we anticipate that they will be used for a 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 and the associated SCRS scientific community.

Work will start in Quarter 3 2018 (see revised workplan section). Targeted research plans will be developed in early Q2, together with the ICCAT Secretariat and SCRS.

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 organization of the Symposium planned for the final months of the AOTTP project, ie. between April and June 2020. The success of this activity will depend on scientists being able to start analyzing the AOTTP data, and gaining experience with them as soon as possible. Plans for this work are outlined, and discussed in the Revised Log-Frame and Updated Action Plan sections.

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

AOTTP is making strong progress in expected result 3. The indicators relevant to this result are as follows:

Indicator 1. 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)

This indicator has been exceeded already, as 31 scientists/technicians from developing countries have been trained in tagging techniques at sea, including two from Cabo Verde, seven from Côte d'Ivoire, seven from Ghana, five from Sénégal, two from South Africa, and eight from Brazil (see Activity 3.1 below for more details). Additionally, five people from Spain, four from the Azores, and four from the Canary Islands have been trained in tagging techniques too.

Indicator 2. Data collection and sampling at recovery: 30 scientists/technicians from developing coastal States trained in data collection and sampling at recovery

Up to June 2017 a total of 40 scientists/technicians have received tag-recovery training in the Azores Islands (Portugal), Madrid (Spain), Dakar (Sénégal), Abidjan (Côte d'Ivoire), Tema (Ghana), Mindelo (Cabo Verde), Cape Town (South Africa) and multiple locations in Brazil. Every Tag Recovery Officer and their supporting teams have received training in the ICCAT-AOTTP protocols for collecting tag-recovery information. This includes the procedures for introducing data into the recovery template of 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 counterpart (**Figs 13 and 14**). The sessions were complemented with visits to key recovery locations like, landing sites, tuna vessels, processing plants, artisanal fisheries communities.



Figure 13: Training in smartphone application for data collection and transmission to ICCAT



Figure 14: Tag recovery training Azores

Indicator 3. Tagging data analysis and interpretation: 80 participants from developing coastal States to workshops

This is an important part of the AOTTP programme. With the research questions being driven by the SCRS, at least three workshops/study visits will be organized during the next reporting period.

A3.1. TRAINING IN TAGGING TECHNIQUES AND DATA COLLECTION

Progress in this activity has been substantial. It has a single component and work is summarized below.

Scientists from developing ICCAT CPCs will be invited and trained to participate to tagging activities on board the tagging vessels (Number of scientists/tecnicos trained on board the tagging vessels, number of fish tagged by scientists/technicians from developing ICCAT Member States)

The first tagging phase in the eastern Atlantic (Azores, Canary Islands, and West Africa) was contracted to a Consortium led by AZTI (<http://www.azti.es/>). All the AZTI Consortium partners (CRO-CI, Côte d'Ivoire; IEO, Spain; CRODT, Sénégal; IMAR, Portugal; and FSSD) supplied personnel for the tagging teams on board the chartered vessels. At least 46 individuals (from Sénégal, Cabo Verde, Côte d'Ivoire, Hawaii, EU-Spain, EU-France, EU-Portugal, São Tomé and Príncipe, and Ghana) attended training courses run by AZTI in conventional, chemical and electronic tagging, and associated data collection.

The number of scientists from African institutes who were trained and took part in the tagging activities organized by AZTI were as follows:

- Sénégal (CRODT – consortium member): 5 persons trained, of which 4 took part in tagging
- Côte d'Ivoire (CRO-CI – consortium member): 7 persons trained, of which 4 took part in tagging
- Ghana (FSSD – consortium member): 2 persons trained directly and 4 indirectly, 3 took part in tagging
- Cabo Verde (INDP – subcontracted by AZTI): 1 person trained who also took part in tagging
- São Tomé and Príncipe (Fisheries Direction – requested to take part): 1 person trained who also took part in tagging

Tagger training courses were run between 17 and 18 May 2016 in Dakar, between 19 and 20 May 2016 in Abidjan, between 15 and 16 June 2016 in the Canary Islands, on August 3rd 2016 in Dakar for the Cabo Verde (INDP) scientist, and on February 2nd 2017 in São Tomé and Príncipe. Similarly, AOTTP-ICCAT Contractors in South Africa organized training in Capetown between 23 and 27 January, while in Brazil training was done between 2 and 4 April 2017 and attended by 8 people (**Figure 15**).



Figure 15: AOTTP Tagger Training in Cabo Frio, Brazil

Table 9. Numbers of fish tagged by scientists/technicians from developing countries

Country	Number
Brazil	2444
Côte D'Ivoire	6668
Ghana	7775
Sénégal	9570
South Africa	215
Total	26672

Numbers of fish tagged during the AOTTP programme by scientists from developing countries is shown in **Table 9**. Over half, 53%, of the fish have been tagged by scientists/technicians from developing countries, so it is clear that AOTTP is making substantial progress towards satisfying these two indicators.

A3.2. DATA COLLECTION AND SAMPLING AT RECOVERY

This activity is progressing very well and we acknowledge the hard work put in by the recovery teams. It has a single component (means required for implementation) and progress is summarized below:

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)

Tag recovery and awareness-raising activities have been set up in the following ten countries: Açores Islands (EU-Portugal), Canary Islands (EU-Spain), Mauritania, Sénégal, Cabo Verde, Ghana, Côte d'Ivoire, South Africa, Brazil and Uruguay (**Figs 12, 13 and 14**). The AOTTP Publicity and Tag Recovery Coordinator has visited the Azores twice this year where training in data collection and sampling at recovery has been provided. Similarly, training was received by the TROs in Dakar (27th to 30th June 2016) and Abidjan (11th and 15th July 2016) and Ghana (29 August 2016 to 1 September 2016).

A3.3. TRAINING IN DATA ANALYSIS

This activity has a single component and work will start soon.

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.

As mentioned above this activity will start earlier than was planned in the original Grant Contract. After the data have been approved for study in September/October 2017 AOTTP will organize activities with scientists from developing CPCs such as study visits and/or working groups, see Table 11 for more details.

REVISED LOG-FRAME

As we have been discussing above, sources of information on the progress of AOTTP are termed, 'verifiable indicators', e.g. 'Number of tuna tagged'. These are all discussed in the current report and progress towards meeting them is described. The majority will not change throughout the project but at this stage, and for a variety of reasons (ie. End Targets were not actually articulated in the original Grant Contract) we propose to revise/update the following for each of the three species (BET, SKJ, and YFT) that are assessed:

- Uncertainty around reference points (B/B_{MSY} and F/F_{MSY}) .

By which AOTTP data will contribute to reductions in uncertainty around the stock assessments by improving the accuracy of biological parameter estimation.

Identifying how knowledge gained under AOTTP can reduce uncertainty will indeed be one of the key outcomes of the project, and can also be thought of as, 'the Value of Information'. This clarification of 'End Targets', together with a clear workplan, will help ICCAT/AOTTP and

DG-DEVCO achieve its objectives. We, therefore, propose to insert the following End Target for all 3 tropical species (**see Table 10**) into the Indicative List of Indicators in the original Log-frame:

- **Reduce ‘cloud’ of uncertainty around the ‘Kobe phase plot’ (see Appendix 6).**

If the uncertainty can be reduced in a meaningful way it means that the stocks can be managed closer to their Maximum Sustainable Yield, meaning that fishery production can be higher with the same level of risk of, say, depleting the stock. [Please note, however, that it is difficult to specify the exact amount by which the uncertainty can be reduced as there are 'subjective' factors which cannot be quantified, such as the particular type of model being used].

Table 10. Indicative List of Indicators highlighted for revision (see p34 AOTTP Grant Contract).

Indicator	Unit		Baseline	Current	End target
Uncertainty around reference points B/B_{MSY} & F/F_{MSY} for YFT	Number	Value	B/B_{MSY} : 0.85 (0.61-1.12) F/F_{MSY} : 0.87 (0.68-1.40) Median (10th-90th percentiles)	B/B_{MSY} : 0.95 (0.71-1.36) F/F_{MSY} : 0.77 (0.53-1.95) Median (10th-90th percentiles)	Reduce ‘cloud’ of uncertainty around the Kobe phase plot by x%
		Date	2011	2016	2021 (next assessment)
Uncertainty around reference points B/B_{MSY} & F/F_{MSY} for BET	Number	Value	B/B_{MSY} : 1.01 (0.72-1.34) F/F_{MSY} : 0.95 (0.65-1.55) Median (10th-90th percentiles) Production model (Logistic) results represent median and 80% confidence limits	B/B_{MSY} : 0.67 (0.48-1.2) F/F_{MSY} : 1.28 (0.62-1.85) Median (10th-90th percentiles)	Reduce ‘cloud’ of uncertainty around the Kobe phase plot by x%
		Date	2010	2015	2018 (next assessment)
Uncertainty around reference points B/B_{MSY} & F/F_{MSY} for SKJ	Number	Value	B/B_{MSY} : likely > 1 (E stock) / probably close to 1.3 (W stock) F/F_{MSY} : likely < 1 (E stock) / probably close to 0.7 (W stock).	B/B_{MSY} : likely > 1 (E stock) / probably close to 1.3 (W stock) F/F_{MSY} : likely < 1 (E stock) / probably close to 0.7 (W stock).	Reduce ‘cloud’ of uncertainty around the Kobe phase plot by x%
		Date	2014	2014	2020

Notes on Table 10: While it is not possible to estimate the reduction of the uncertainty that could be brought by tagging data, improvements in our knowledge on biological parameters, stock structure and movements will improve the estimate of reference points. Also the uncertainty around the reference points for YFT increased between 2011 and 2016. Due to 'pooling' the output of > 1 model.

Table 11. List of contracts (>60,000 euros) awarded by ICCAT during the Reporting Period

DATE	SUPPLIER	OBJECTIVE	BUDGET-LINE	AWARD-PROCEDURE	TOTAL AMOUNT (euros)
8/1/2016	CRO-CI	Recovery activities in the East Atlantic	6.3 Tag Recovery Teams, service contracts	INTERNATIONAL CALL FOR TENDER	264,628
8/1/2016	CRODT	Recovery activities in the East Atlantic	6.3 Tag Recovery Teams, service contracts	INTERNATIONAL CALL FOR TENDER	132,824
10/5/2016	MRFD	Recovery activities in the East Atlantic	6.3 Tag Recovery Teams, service contracts	INTERNATIONAL CALL FOR TENDER	60,150
11/3/2016	HALLPRINT Pty Ltd	Stainless steel head dart tags and applicator tips	3.5 Other (please specify-tagging and recovery equipment)	3 QUOTES REQUESTED	95,079
11/14/2016	SERVIGIS	IT consultant for AOTTP database	6.4 IT Consultant	CALL FOR TENDER	48,370

1/5/2017	FADURPE	Tagging activities in the West Atlantic	6.1 Tagging vessels service contract (s)	INTERNATIONAL CALL FOR TENDER	665,460
1/25/2017	CAPRICORN MARINE ENVIRONMENTAL (Pty) Ltd	Tagging activities in South East Atlantic	6.1 Tagging vessels service contract (s)	INTERNATIONAL CALL FOR TENDER	217,684
2/28/2017	PROBITEC	Tagging activities off North West Atlantic	6.1 Tagging vessels service contract (s)	INTERNATIONAL CALL FOR TENDER	433,400
4/11/2017	LPRC/ TAG ATINY	Tagging activities in North West Atlantic	6.1 Tagging vessels service contract (s)	INTERNATIONAL CALL FOR TENDER	62,688
5/25/2017	FADURPE	Awareness and tag recovery campaign for the Atlantic in Brazil	6.3 Tag Recovery Teams, service contracts	3 QUOTES REQUESTED	70,000

UPDATED ACTION PLAN

BACKGROUND

An updated overall workplan by AOTTP Activity nearly identical to that presented in Appendix 2 of the original Grant Contract is provided for convenience in **Table 12**. Activities A1.1, A1.2, A1.3, A2.1, A3.1, and A3.2 started on schedule and are all now progressing well. The exceptions are A1.1 and A1.3, because tagging activities which (and therefore recovery) did not start until Quarter 3 2016.

Table 12. Overall Summary AOTTP 5 year Workplan by Activity

Year	2015		2016				2017				2018				2019				2020	
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 (actual)																				
A1.2-Awareness campaigns & recovery schemes																				

A1.3-Tag recovery & transmission to ICCAT (actual)																				
A2.1-Reading of hard parts																				
A2.2-Tagging data analyses																				
A2.3-Information of stakeholders (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

For Phase 1 the target was set at 72,500. Contractors began in the Azores at the end of June this year (2775 tagged, target 4500) and followed in a clockwise direction around the Atlantic with tagging taking place in The Canaries (6526 tagged, target = 6500), Mauritania-Guinea (11237 tagged, target = 11000), Gulf of Guinea (26829 tagged, target = 22000), and South Africa (218, target=6500) until the end of April 2017.

Tagging started in Brazil and Uruguay (4000 tagged, target 13500) in April 2017 and is still under way. During 2017 20 fish will also be fitted with miniPATs in the territorial waters of USA. In February ICCAT signed a contract to tag 9500 fish in the territorial waters of Venezuela as part of the Phase 1 targets. Unfortunately, however, the political situation in Venezuela has caused substantial delays and uncertainty. The Contractor has been discussing a change of emphasis to Trinidad and Tobago with ICCAT, but there is yet no news.

AOTTP Coordination began to plan Phase 2 tagging (target=47500) in March 2017 and an outline timetable was then agreed with the AOTTP Steering Committee. Calls for Tender for the eastern Gulf of Guinea and Azores/Madeira were launched in April and May this year with the intention that Phase 2 tagging would begin in summer and autumn 2017. No offers were received for the Gulf of Guinea, while a proposal for the Azores/Madeira Region has very recently been awarded . Given these developments the timetable has been slightly revised (**Table 13**).

Table 13. AOTTP Phase 2 Tagging Proposed Workplan

Region	Conventional	Start	End
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	tags		
A. Mauritania-Guinea	7125	December 2017	February 2018
B. Gulf of Guinea	14250	July 2018	September 2018
C. Canary Islands	4275	July 2018	August 2018
D. Madeira/Azores	4500	July 2017	September 2018
E. Caribbean-Venezuela	5700	?	?
F. Brazil	8550	October 2017	September 2018
G. South Africa-Namibia-St Helena (SE Atlantic)	4275 (to be discussed)	?	?

A Call for Tender for Phase 2 tagging in all areas is now being prepared for publication. The situation in the Caribbean (Venezuela) is a serious concern and we are waiting for news. In Zone G (South Africa), the Phase 1 tagging targets were missed by a long way due to poor fishing and weather. Over the next few weeks AOTTP Coordination and Steering Committee will be carefully re-considering tagging activities for Phase 2, and the remainder of Phase 1.

TAG RECOVERY AND AWARENESS RAISING

A coordination meeting with the TROs will be held in one of the target countries in either the third or fourth Quarter 2017. AOTTP Coordination in Madrid will seek feedback from the TROs and discuss what is working, what is not, and consider strategies for the future.

After having set up tag-recovery activities in most of the important landing ports for tropical tuna, AOTTP will now begin to expand activities into CPCs, areas and fleets which are not yet formally involved. This work will predominantly target awareness-raising and possibly tagging (by observers) among the longline fleet which operates in more central areas of the Atlantic. Longline landings are substantial. The longline fleets are mostly operated by Asian CPCs (Japan, South Korea) and a Concept Note describing the roll-out of activities has been prepared (**see Appendix 7**).

CAPACITY BUILDING

This is a very important component of the AOTTP project. Scientists and technicians, particularly from our developing country partners have already been trained in all aspects of tagging at sea, tag recovery and awareness raising activities. However, now that a rich dataset is beginning to accumulate, training and capacity development in all aspects of tagging data analyses, biological parameter calculation and their eventual incorporation into population assessment models will need to be planned. Activities *A2.2-Tagging-data analyses* and *A3.3-Training in data analyses* are the most relevant.

A2.2 refers to, 'analyses by scientific consultants to estimate missing key parameters for stock assessments' and will start in Quarter 3 2018 (**Table 12**). Calls for Tender for this work will be drafted in early Q2. Activity A3.3 is the capacity building element of the data analytical work whereby, 'dedicated workshops will be organized to reinforce the capacity of

ICCAT developing member states in data analyses, interpretation and development of scientific advice'. Indicators include numbers of workshops organized and participants. This work was not scheduled to start until Quarter 4 2018 (**Table 12**) in the original Grant Contract. AOTTP Coordination, however, believes that by then it will be too late for a successful Final Symposium (A2.3) and proposes instead to arrange three study visits/workshops during the next reporting period (July 2017 to June 2018); one in Q4 2017; one in Q1 2018 and one in Q2 2018 (**Table 14**).

Table 14. AOTTP Year 3 outline

Year	2017						2018					
Month	J	A	S	O	N	D	J	F	M	A	M	J
A1.1 Phase 1 Tagging (complete Caribbean, USA, and Brazil)												
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, capacity building, recruiting consultant, reference collection).												
A3.3-Tagging Data Analyses capacity building (workshops, study visits to be driven by developing country partners)												
A2.2-Finalize plans with SCRS for scientists to analyze data												
A1.3-Tag recovery coordination meeting in West Africa (discuss rewards and visibility protocols)												
AOTTP Steering Committee Meeting												
EU newsletter												

NOTE ON AOTTP COLLABORATION WITH SCRS

The research and data-analytical work, exploiting AOTTP tag-recapture data, will be driven by the priorities of the ICCAT SCRS and Commission. All work will be integrated within ICCAT/SCRS's annual cycle of SCRS Working Groups according to ICCAT's Management Framework. Plans will, therefore, have to be adjusted according to the requirements of the SCRS and ICCAT Commission, which can and will eventually change throughout the program life span. The annual cycle of work can, however, be broadly articulated as follows:

- ICCAT-AOTTP will collect the tag-recovery data, check and validate them, pay rewards, and store them in a relational database at ICCAT.
- ICCAT-AOTTP will present basic summary statistics (tag release and recovery frequencies, tag-shedding rates, times at liberty and reporting rates) from the tag-recapture database to the relevant SCRS Working Groups each year. In 2017 it will be at the Tropical Species Group Intersessional Meeting (4-8 September 2017) and at the SCRS Plenary (2-6 October 2017).
- Based on these statistics the SCRS will take decisions on research, the management of that research, and capacity building priorities within their annual workplans. These will then be facilitated and organized by ICCAT-AOTTP once formally endorsed by the Commission. We would expect the plan to start with studies into growth, migration and mortality, increasing in sophistication as data accumulate.
- Once approved by the Commission, capacity building/training activities will include both the estimation of key biological parameters (growth rates, mortality, and migration) and stock assessment modeling. The activities and training will be implemented gradually and systematically by ICCAT-AOTTP.
- In 2017/2018 the SCRS will identify specific research questions to be addressed and, if necessary, ICCAT-AOTTP will then launch Calls for Tender for relevant scientific data analyses. We anticipate that at least one of these targeted studies will focus on providing a risk analysis framework that identifies the effect of uncertainty on management objectives, evaluating the relative value of the different sources of information being collected by ICCAT-AOTTP.
- Together with SCRS, ICCAT-AOTTP will organize the AOTTP Final Symposium in mid-2020 where all the work will be presented, and written up into a Conference Proceedings Series.

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, Portugal, Cote d'Ivoire, Mauritania, Senegal, Brazil, USA, Ghana, Uruguay, Cabo Verde and South Africa. AOTTP contractors, if not themselves 'state authorities', are in regular contact with the government departments etc. in order to get the work done. Note also that, during the tagging campaigns in West Africa, permission was granted to AOTTP contractors to catch bait, and tag tuna in the territorial waters of 15 countries (**Table 15**), including two that are not even ICCAT Contracting Parties (Benin), demonstrating the interest in, and support for, the project. Having government representatives on board the tagging vessel in West Africa was also often a condition for gaining access to territorial waters for tagging, e.g. Mauritania, Guinea Bissau, and São Tomé and Príncipe. For these three countries 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 Department, São Tomé and Príncipe) in the 4th trip of zone B, as tagger

Table 15. AOTTP permission to work in EEZs

COUNTRY	DATES
Marocco	15 Jun - 20 Oct 2016
Mauritania	15 Jun - 20 Oct 2016
Sénégal	15 Jun - 20 Oct 2016
Guiné Bissau	15 Jun - 20 Oct 2016
Cabo Verde	15 Jun - 20 Oct 2016
Guinée (Guinée Conakry)	20 Oct 2016 - 15 Jun 2017
Sierra Leone	20 Oct 2016 - 15 Jun 2017
Liberia	20 Oct 2016 - 15 Jun 2017
Côte d'Ivoire	20 Oct 2016 - 15 Jun 2017
Ghana	20 Oct 2016 - 15 Jun 2017
Togo	20 Oct 2016 - 15 Jun 2017
Bénin	20 Oct 2016 - 15 Jun 2017
São Tomé e Príncipe, y compris la zone conjointe Nigeria - São Tomé e Príncipe	20 Oct 2016 - 15 Jun 2017
Gabon	20 Oct 2016 - 15 Jun 2017
Angola	20 Oct 2016 - 15 Jun 2017

The relationship between AOTTP and DAFF in South Africa has strengthened due to the tagging program. The recruitment of two stock assessment scientists at DAFF meant that

interest in the AOTTP project grew in the department as a whole. Co-operation with those scientists facilitated the procurement of the Research Permit for tag and release studies in South African waters. (No DAFF employees ventured to sea with the tagging team in South Africa but that was not for lack of invitation).

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 charge to tag tuna.

WHERE APPLICABLE, DESCRIBE YOUR RELATIONSHIP WITH ANY OTHER ORGANISATIONS INVOLVED IN IMPLEMENTING THE TAGGING ACTIVITIES:

This reporting period ICCAT-AOTTP has worked with the AZTI Consortium for tagging activities in the Azores, the Canary Islands, and West Africa. AZTI subcontracted CRO-CI, CRODT, FSSD, IEO, IMAR, and MFRD/FSSD. 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) but also with Capmarine and INDP (Cabo Verde). In other areas of the Atlantic we are working, or have worked, with the FADURPE Consortium (Brazil), LPRC (USA), and Capmarine (South Africa) to tag fish at sea. A contract was also signed in early 2017 with PROBITEC (Spain) to tag fish the EEZ of Venezuela; work which has not started due to the political situation in that country.

Good working relationships have been maintained with all contractors. Regular communication with tagging teams and TROs around the world are effected using a range of modern media, including WhatsApp, Telegram and E-mail.

For tag supply we have worked with Hallprint Ltd (Australia) who supplied AOTTP conventional tags. Desert Star Systems (ran a training course at ICCAT in March 2016) and Wildlife Computers (both USA) supplied the pop-up electronic tags, while Lotek Wireless (Canada) supplied the internals. We are also working 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 who have in general all been helpful.

AOTTP, this year, has also worked with the skippers and crews of nine 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 the cruise reports where this is often described. The fishers are usually extremely engaged, enthusiastic about the tagging work, and delighted to help in all possible ways.

At the otolith workshop (**Appendix 5**) AOTTP was supported by Capmarine (South Africa), CSIRO (Australia), and SPC (New Caledonia) who generously allowed their expert staff (Stewart Norman, Jessica Farley, and Bruno Leroy) to attend the workshop in Abidjan, traveling considerable distances.

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 has also been regularly consulted on AOTTP progress and plans, and members have been involved in evaluating contracts. Members of the ICCAT SCRS are also enthusiastic about the 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).

It is still too early to thoroughly assess the impact of the Action on Final Beneficiaries. The fact that TROs have now recovered nearly 9,000 tags, and that reporting rates are reasonable, indicates 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, a substantial lottery prize, and t-shirts have also 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, including those from developing states, are enthusiastic about AOTTP and the data being collected. When analyses begin at the end of this year they will benefit from training, coaching, and mentoring provided by AOTTP and the ICCAT Secretariat. The eventual publication of reports and peer-reviewed papers will boost careers. The fisheries authorities in many ICCAT CPCs are aware of the project and 3 of their staff, from Mauritania (IMROP), Guinea Bissau (CIPA), and Sao Tomé and Príncipe have directly benefited through invitations on board the tagging vessels and the training. 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, the efficacy of management measures (e.g. spatial closures) all resulting in better management of the 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 ACTIONS.

We have not yet developed any synergies with 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. AOTTP and GBYP Coordination collaborate to coordinate effort and activities where possible.

VISIBILITY

The EU logo and funding statement are always clearly visible on all communication materials including 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 has been formally 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 (Miguel Santos, Miami, 27 April 2017)

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 fisheries.

- 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 requires 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>

The AOTTP Youtube channel with training tutorials etc. can be found here:

- https://www.youtube.com/channel/UCICXmfvKvmxqeZMU4LFa_hQ.

A video on tagging off Sénégal made by our partners, AZTI, can be found here:

- <https://www.youtube.com/watch?v=I9IzrqMI0Io&t=1s>

News and updates have been produced regularly for the AOTTP Steering Groups, and the TROs. Newsletters for DG-DEVCO will also be produced quarterly and the first edition is now available (see **Appendix 8**).

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

'I have no objection to this report being published on the EuropAid website'.

Driss Meski

Signature:

Location: Madrid

Date report due: 29 August 2017

Date report sent: 11 July 2017

APPENDICES

Appendix 1. AOTTP Tagging in Exclusive Economic Zones

Species	Brazilian EEZ	Cape Verdean EEZ	Ghanaian EEZ	Guinea Bissau EEZ	Guinean EEZ	High Seas	Côte d'Ivoire EEZ	Liberian EEZ
BET	652	1709	10	163	538	5190	374	179
LTA	3	0	0	62	49	247	13	0
SKJ	464	212	7	78	660	6023	454	112
WAH	1	0	0	0	0	0	0	0
YFT	851	269	141	590	1088	10137	933	336
Total	1971	2190	158	893	2335	21598	1779	627

Mauritanian EEZ	Portuguese EEZ (Azores)	Senegalese EEZ	Sierra Leonean EEZ	South African EEZ	Spanish EEZ (Canary Islands)
455	180	1589	304	0	3329
0	1	356	0	0	0
2006	2587	1501	69	108	3126
0	0	1	0	0	0
1033	1	2158	115	120	76
3494	2769	5605	488	228	6531

Appendix 2. Tag release (R-1) frequencies by species.

	20-40cm	40-60cm	60-80cm	80-100cm	100-120cm	120-140cm	140-160cm	160-180cm
BET	1307	8860	3891	409	61	7	1	5
LTA	19	709	2	0	0	0	0	0
SKJ	4188	12615	553	0	0	0	0	0
WA	0	1	0	0	0	1	0	0

H								
YFT	4970	10535	1879	323	24	18	47	13

Appendix 3. AOTTP Tagging Cruises

Start	End	Location	Vessel	Days at sea
2016-06-25	2016-06-30	Azores	Acoriana	5
2016-07-03	2016-07-05	Azores	Acoriana	2
2016-07-09	2016-07-20	Azores	Acoriana	11
2016-07-23	2016-07-29	Azores	Acoriana	6
2016-07-31	2016-08-04	Azores	Acoriana	4
2016-08-11	2016-08-12	Azores	Acoriana	1
2016-08-16	2016-08-27	Azores	Acoriana	11
2016-08-29	2016-09-01	Azores	Acoriana	3
2016-09-07	2016-09-20	Azores	Acoriana	13
2016-09-27	2016-10-03	Azores	Acoriana	6
2016-10-06	2016-10-14	Azores	Acoriana	8
2016-10-12	2016-10-19	Azores	Acoriana	7
2016-07-09	2016-07-20	Sénégal	Aita Fraxku	11
2016-07-25	2016-08-01	Sénégal	Aita Fraxku	7
2016-08-04	2016-08-13	Sénégal	Aita Fraxku	9
2016-08-18	2016-08-28	Sénégal	Aita Fraxku	10
2016-10-24	2016-11-04	Golfo de Guinea	Aita Fraxku	11
2016-11-07	2016-11-19	Golfo de Guinea	Aita Fraxku	12
2017-01-16	2017-01-31	Golfo de Guinea	Aita Fraxku	15
2017-02-05	2017-02-15	Golfo de Guinea	Aita Fraxku	10
2017-02-17	2017-02-27	Golfo de Guinea	Aita Fraxku	10
2017-02-28	2017-03-05	Golfo de Guinea	Aita Fraxku	5
2017-03-07	2017-03-22	Golfo de Guinea	Aita Fraxku	15
2016-08-25	2016-09-04	Canarias	El Grand Primero	10
2016-09-11	2016-09-18	Canarias	El Grand Primero	7
2016-09-22	2016-10-03	Canarias	El Grand Primero	11
2016-10-06	2016-10-17	Canarias	El Grand Primero	11
2016-10-23	2016-10-30	Canarias	El Grand Primero	7

2016-11-05	2016-11-16	Canarias	El Grand Primero	11
2016-09-11	2016-09-18	Canarias	El Macizo	7
2016-09-19	2016-09-27	Canarias	El Macizo	8
2016-09-29	2016-10-12	Canarias	El Macizo	13
2016-10-14	2016-10-24	Canarias	El Macizo	10
2016-10-25	2016-11-02	Canarias	El Macizo	8
2017-02-02	2017-02-09	South Africa	TarrynAmy	7
2017-02-15	2017-02-18	South Africa	TarrynAmy	3
2017-02-21	2017-02-24	South Africa	TarrynAmy	3
2017-03-01	2017-03-04	South Africa	TarrynAmy	3
2017-03-14	2017-03-17	South Africa	TarrynAmy	3
2017-03-20	2017-03-23	South Africa	TarrynAmy	3
2017-03-26	2017-03-30	South Africa	TarrynAmy	4
2017-04-02	2017-04-04	South Africa	TarrynAmy	2
2017-04-10	2017-04-12	South Africa	TarrynAmy	2
2017-04-26	2017-04-28	South Africa	TarrynAmy	2
2017-05-02	2017-05-04	South Africa	TarrynAmy	2
2017-04-05	2017-04-12	Brazil (Cabo Frio)	Estrela Delva	7
2017-04-25	2017-05-05	Brazil (Cabo Frio)	Estrela Delva	10
2017-04-07	2017-04-27	Brazil (Ariea Branca)	Thavisson III	20
2017-04-14	2017-05-17	Brazil (Itajai)	Katsushio Maru Eight	33
2017-07-30	2017-08-15	Brazil (Fernando de Norona)	Tuburao Tigre	16
2017-05-23	2017-06-01	Brazil (Cabo Frio)	Estrela Delva	9
2017-05-11	2017-05-31	Brazil (Ariea Branca)	Thavisson III	20
2017-04-12	2017-06-06	Brazil (SP & SP)	Transmar I	55

Appendix 4: Press Release about AOTTP, Dakar, Sénégal

Communiqué de presse

11.000 Albacore, Thon obèse et Listao seront marqués dans les eaux de l'Afrique de l'Ouest dans le cadre du programme de partenariat ICCAT / CRO.

En juillet de cette année, l'ICCAT (Commission internationale pour la conservation des thonidés de l'Atlantique) a déjà commencé les activités du Programme de Marquage de Thonidés Tropicaux dans l'Océan Atlantique (AOTTP), financé par l'Union Européenne et les Parties contractantes de l'ICCAT. L'objectif global vise au marquage de **120.000** spécimens dans l'océan Atlantique au cours des deux prochaines années, dont 11.000 dans les eaux de l'Afrique de l'Ouest. Un réseau de techniciens du CRO (Centre de Recherches Océanographiques Dakar-Thiaroye) est mis en œuvre dans les principaux ports de pêche du Sénégal afin de récupérer des données sur les thons marqués. L'équipe axée sur le bureau du port de Dakar recompilera toutes les informations récupérées au Sénégal au cours des quatre prochaines années. Toute personne qui trouve un thon marqué devrait contacter par message (SMS) au numéro 773021746. Après avoir fourni le code de marque, la longueur du thon et autres données pertinentes, il recevra des T-shirt et une casquette du programme AOTTP, une récompense monétaire du montant de 6000 FCFA et ainsi qu'un crédit téléphonique de 60000 FCFA.

Les résultats du programme AOTTP permettront d'améliorer les connaissances sur la migration, la croissance, la mortalité et l'abondance des espèces marquées, et ainsi permettre une meilleure gestion des stocks de thonidés de l'Atlantique tropical.

Contact:

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Responsable des ressources pélagiques Centre de Recherches
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Dakar-Thiaroye CRODT-

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Appendix 5: Workplan-Expert Group Workshop for otolith reading and capacity building during AOTTP

AOTTP. Age determination: otolith (and other hard parts) processing and analysis Plan 2017-2020.

Background

- AOTTP is chemically marking tropical tuna species at sea, to improve age-determination, and purchasing these fish when they are recovered so that biological data (sex, age etc.) can be determined. Note that the tag recovery teams in West Africa are contracted, ie. it is in their Terms of Reference, to take biological samples.
- As part of AOTTP Activity 3.2 (Data collection and sampling at recovery) AOTTP is committed to providing training/capacity building among scientists from developing countries in the biological sampling of recaptured fish.
- AOTTP scientific objectives are orientated by the SCRS. The SCRS has requested AOTTP to focus on data collection important for the estimation of age-specific natural mortality, and sex-specific growth curves (in addition to other important parameters for stock assessment).
- Clearly an accurate and well-calibrated approach to aging the tuna collected by AOTTP is vital for SCRS/ICCAT objectives.

Activities

1. Collect and preserve otoliths (and other hard parts). This is done routinely by the Tag Recovery Officers, and there is no need to keep whole fish frozen indefinitely.
2. Constitute an Expert Group to establish protocols, procedures, and establish a Reference Collection. This was done between 1-2 March 2017 in Abidjan (see Appendix 1).
3. Launch Call for Tender with relevant Laboratories to process and read a minimal number of otoliths of the three species to establish the Reference Collection for posterior analyses.
4. Ongoing support (expert Consultant will be recruited) to otolith reading activities (e.g. capacity building) in Senegal and Cote d'Ivoire including training, possibly the supply of minimal equipment and follow up of analyses.

Operation

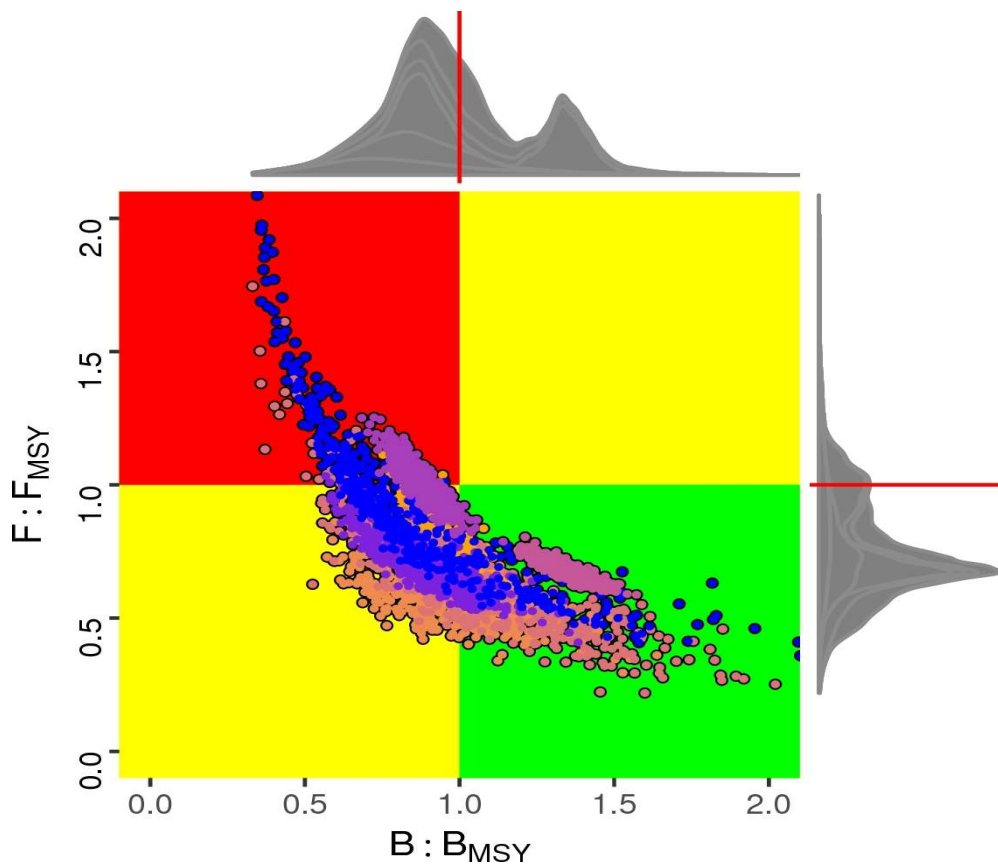
1. The Recovery Office personnel in Dakar and Abidjan have already collected more than 200 otoliths, and biological samples have been prepared to initiate the process of age estimation.

2. Recognised experts with previous experience in processing and reading otoliths from tropical tuna, from around the world, were contacted and four of them attended the Otolith Workshop Expert Group meeting in Abidjan.
3. A Call for Tender for THE CREATION OF A REFERENCE COLLECTION OF OTOLITHS has been prepared, approved, and is being translated. Its publication is anticipated imminently.
4. An Expert (Consultant) is being recruited to monitor the ongoing establishment of the Reference Collection, and provide practical training and support to the posterior analysis process in Dakar and Abidjan.
5. A detailed workplan of the complete technical process (otolith sampling, collection, storage, distribution, and validation) is elaborated in the schedule below.

Schedule

Activities	2017											
	J	F	M	A	M	J	J	A	S	O	N	D
Constitute Expert Group												
Establish protocols and procedures												
Service Contract with a Laboratory												
Practical training												
Monitoring the processing												
Recruitment Consultant (effective time of service)												

Appendix 6: Kobe phase-plot summarizing the YFT assessment 2017. The red area uses the reference points F/F_{MSY} and B/B_{MSY} to characterize combined levels of biomass (B) and fishing pressure (F) that are either, unsustainable (red, or sustainable (green). The different points on the scatterplot relate to different stock assessment models, and the estimated variability around the results of each one.



Appendix 7: Expanding the Atlantic Tropical tuna Tagging Program to longline fleets: Tagging & recovery activities

Concept Note

Expanding the Atlantic Tropical tuna Tagging Program to longline fleets: Tagging & Recovery activities

Objective:

Expand the AOTTP activities to CPCs, areas and fleets operating in the Atlantic Ocean but not yet involved in the programme.

Expected Results:

- 1) Increase tagging and recoveries to areas and fleets not yet covered by AOTTP.
- 2) Increase the size range of tropical tunas currently tagged within AOTTP, by enhancing tagging of larger size fish traditionally caught by longline fleets.
- 3) Increase reporting of recoveries through new development of the AOTTP cellphone applications.
- 4) Engage new CPCs in the AOTTP activities.

Activities:

Set-up awareness and recovery teams focusing on longline landing/transshipment in Uruguay, South Africa and Canaries.
Develop awareness campaigns amongst stakeholders of longline fleets from Japan, Chinese-Taipei, China and Korea.
Ensure correct submission of data through AOTTP platforms (cellphone application).
Establish agreements with Research Institutions of Japan, Chinese-Taipei, China and Korea, and especially with the Onboard Observer Programs aiming at tagging large tropical tunas individuals.
Further develop the current cellphone applications to the particular features of longline fleets (including language) to improve reporting.
Develop communication campaigns explaining the objectives and progress of ICCAT/AOTTP.
Promote the engagement of new CPCs and national Research Institutions in AOTTP activities.
Share progress via reports, Newsletters etc.

Plan of Action/Funding:

- Initiate the first steps making use of the AOTTP budget allocated for Recovery and Tagging activities.
- Prepare a detailed workplan/proposal.
- Develop fund raising activities to increase the co-funding of AOTTP; targeting the governments of Japan, Chinese-Taipei, and USA.

Initiation Date:

- July 2017.

Appendix 8: Newsletter for DG-DEVCO - edition 1 (page 1).

Atlantic Tropical tuna Tagging Programme

ICCAT/AOTTP NEWSLETTER

A quarterly newsletter published by the ICCAT Secretariat

No. 1



Tagging tuna off West Africa in 2016

Overview: The AOTTP Programme (<http://www.iccat.int/AOTTP/en/>) will collect tag-recapture data from Atlantic Ocean tropical tuna fisheries, which will be used to improve their management and enhance food security among developing regional coastal states.

Tagging at sea: The target is to tag 120,000 tuna (bigeye, skipjack, yellowfin, and coastal species) using a range of conventional and electronic tags.

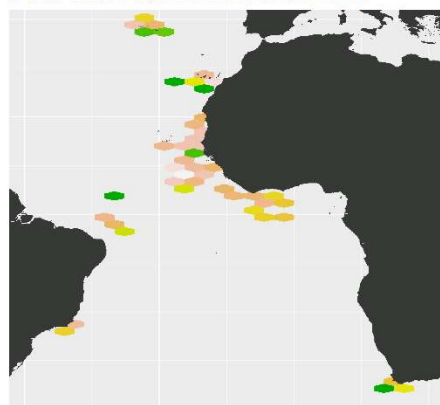
More than 50,000 tuna have now been tagged off the Azores, the Canary Islands, West and South Africa and Brazil.



AOTTP conventional fish tags.



Skipjack tuna.



Release locations of tagged fish



This project is funded by the European Union, ICCAT Contracting Parties and Collaborators

This project is implemented by ICCAT



The views expressed in this publication do not necessarily reflect the views of the Commission.