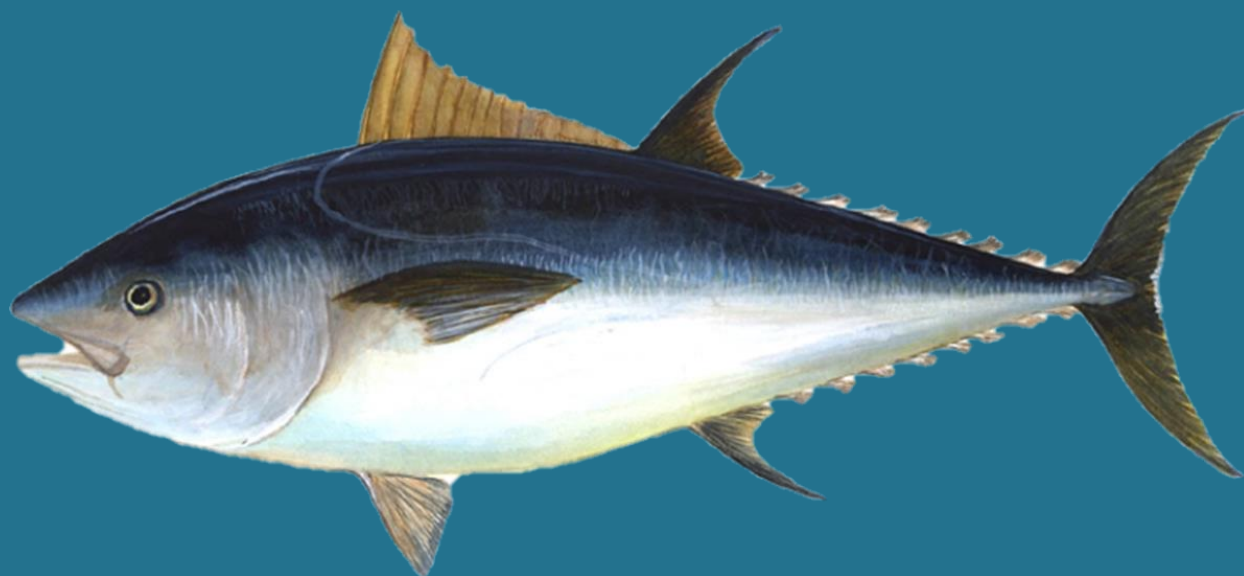


TAGGING PROGRAMME 2020  
OF THE ATLANTIC-WIDE RESEARCH  
PROGRAMME FOR BLUEFIN TUNA  
(ICCAT GBYP Phase 10)  
Final report on tagging activities in the Celtic  
Seas Area 2020



Bluefin Tuna (*Thunnus thynnus*)

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Barbara Block, Robbie Schallert, Michael Castleton.



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*Foras na Mara*



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by the European Union

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## **1. Executive Summary of Bluefin Tuna Satellite Tagging in Ireland, 2020**

In 2020, the Marine Institute submitted an Expression of Interest to participate in GBYP Phase 10 e-tagging programme in collaboration with Dr. Barbara Block's team of Stanford University, for Area B of the Atlantic Wide Research programme for Bluefin Tuna (GBYP). This EoI was positively evaluated by the GBYP Steering Committee. The Marine Institute were awarded 17 LOTEK satellite tags (Appendix I).

Satellite tagging of Atlantic bluefin tuna was successfully carried out between August and November 2020 with 27 individuals tagged and released with either Wildlife Computers, pop-off satellite archival tags or Lotek PSATGEO pop-off archival tags (Table 1) in conjunction with number coded floy (spaghetti) tags. All tagging was carried out under a project licence from the Irish Health Products Regulating Authority (HPRA) with licenced and trained personnel. A Research Mortality Allowance (RMA) was obtained from ICCAT who also supplied ICCAT coded floy tags for identification of fish if recaptured at a later stage. The Irish Sea Fisheries Protection Agency (SFPA) were made aware of the programme and identities of the participating vessels, skippers and scientific personnel and a derogation was obtained for scientific research fishing for a specified area and period. An Invitation to Tender for the Supply of a Commercial Vessel to tag Bluefin Tuna off the Coast of Ireland for the Marine Institute was issued in June 2020. Appendix IV contains ICCAT's Electronic Tagging Record Table (TG03-EleTReRc\_Ireland\_BFT\_2020) containing all the electronic tagging information for the 2020 tagging campaign.

## **2. Introduction**

Electronic tagging using archival tags reported by Block et al. (2005) highlighted the potential importance of the coast of Ireland and the UK as migratory routes for Atlantic bluefin tuna. A 191 cm fish tagged in waters off North Carolina showed trans-Atlantic migrations to the Mediterranean Sea and multi-annual site fidelity to waters off Ireland and the UK. This single track suggested that after a juvenile foraging period in the west, Atlantic bluefin foraged in the waters of the east Atlantic off Ireland and then undertook migrations to the Balearics and other known Mediterranean spawning areas. The only dedicated electronic tagging activity off Ireland was conducted in 2003 and 2004 by a scientific team from Stanford University and an Bord Iascaigh Mhara - Irish Sea Fisheries Board (Cosgrave et al, 2008; Stokesbury et al. 2007). Tagging of fish in Irish waters demonstrated that Atlantic Bluefin released in Irish waters travel between European foraging grounds, known eastern breeding regions (Mediterranean Sea; Malta) and western Atlantic waters. These data also highlighted a tentative link between bluefin caught off Ireland and western management regions. In addition, recent electronic tagging of ABFT off Scotland has shown local movements of Atlantic bluefin tuna around Scottish waters (Neat et al. 2014), to the north of Ireland, and further south. Given these insights it is important that stock origin, habitat utilisation and large-scale movement patterns of these Atlantic bluefin are characterised in more detail to ensure that the population models and concepts used in Atlantic bluefin tuna stock assessment and Management Strategy Evaluation (MSE) are parameterised as accurately as possible.

Investigation of the distribution and movements of Atlantic bluefin tuna in Irish waters is now a research priority for Ireland. The ocean waters off south Donegal are currently regarded by the International Commission for the Conservation of Atlantic Tuna (ICCAT) as an important area for Atlantic bluefin tuna and indications are that significant numbers arrive in the area over the period August to November each year. The Department of Agriculture Food and the Marine (DAFM) requested that the Marine Institute carry out a bluefin tagging programme in autumn 2016 to support the International Commission for the Conservation of Atlantic Tuna (ICCAT) Grand Bluefin Year Programme (GBYP) Atlantic research programme for Bluefin tuna.

ICCAT is an inter-governmental fishery organization responsible for the conservation of tunas and tuna-like species in the Atlantic Ocean and its adjacent seas. ICCAT compiles fishery statistics from its members and from all entities fishing for these species in the Atlantic Ocean, coordinates research, including stock assessment, on behalf of its members, develops scientific-based management advice, provides a mechanism for Contracting Parties to agree on management measures, and produces relevant publications. The Atlantic-wide research programme for Bluefin tuna was officially adopted by the ICCAT Commission in 2008 with a key priority being to improve understanding of key biological and ecological processes through electronic tagging experiments to determine habitat and migration routes. GBYP was adopted as official acronym of the research, which was initiated at the end of March 2010.

(ICCAT) manage Atlantic bluefin stocks under a two stock hypothesis for management and assessment i.e.

- Eastern Atlantic Ocean and Mediterranean Sea stock, that spawns in the Mediterranean Sea
- Western Atlantic Ocean stock, that spawns in the Gulf of Mexico, with a boundary line dividing the stocks at 45 W longitude.

Results of Block et al. (2005) as well as tagging research by others including ICCAT and their collaborators indicates that movement across the currently assumed east-west boundary in the Atlantic, does occur. Scientists have used the spatial data to improve management models (Taylor et al. 2011, Kerr et al. 2016). ICCAT now recognises the need to develop quantitative knowledge of mixing rates and integrate this knowledge into the current assessments, as well as new models to improve the multiple stock evaluation processes.

The Mediterranean and Eastern Atlantic bluefin tuna (considered a single stock) is a highly regulated species with annual catch limits set by the International Commission for the Conservation of Atlantic Tunas (ICCAT) based on scientific advice.

The EC became a Contracting Party to ICCAT (the International Commission for the Conservation of Atlantic Tunas) in 1997. EU TACs and quotas for Bluefin Tuna were set by Council for the first time at the December, 1997 meeting in order to implement ICCAT catch limits/TACs for these species. Ireland did not have a track record of targeting bluefin

tuna and does not have a quota. Ireland has access to a by-catch “others” quota for MSs without a quota share to cover by-catches of BFT in commercial fisheries subject to certain conditions.

In 2016, the Marine Institute obtained expert guidance from Stanford University (USA), University of Acadia (Nova Scotia, Canada) to successfully tag and release 16 Atlantic bluefin tuna off the coast of Donegal with satellite tags to identify spawning stocks and the level of mixing of stocks in Irish waters. Training in application of satellite tags to bluefin was provided to staff of the Marine Institute by these international tagging experts as direct experience in handling and tagging these extremely large fish is essential for future Irish tuna research work. A consortium continued to tag Bluefin tuna off the Donegal coast over the period September to October 2017 and was expanded to include Queens University, Belfast to investigate early behaviour and swim responses of bluefin tuna post capture and tagging. In total 9 fish were tagged with satellite tags and 3 fish tagged with accelerometer tags. The consortium works closely with ICCAT.

In 2018, the Marine institute continued bluefin tuna tagging of the coast of Donegal over the period of October and November whilst continuing the partnership with Queens University Belfast as well as Trinity College Dublin to investigate post tagging behaviour of bluefin tuna. In total 24 tuna were tagged with satellite tags and a further four with accelerometers.

In 2019, the Marine Institute responded to a call for a short term contract or the tagging programme 2019 (Area B) of the Atlantic Wide Research programme for Bluefin Tuna (ICCAT GBYP 16/2019-B Phase 9) and were successful in this bid. 12 PSAT tags were successfully deployed by the Marine Institute in North Western Ireland (Donegal Bay, County Donegal) with the aim to improve the knowledge of the BFT spatial patterns.

In 2020, the Marine Institute submitted an Expression of Interest offering to participate in GBYP Phase 10 e-tagging programme in collaboration with Dr. Barbara Block team of Stanford University, which was positively evaluated by the GBYP Steering Committee.

The Marine Institute agreed under Article 4 of the June 2020 MoU (Appendix I) to provide the following to ICCAT:

- a) The Marine Institute shall submit to ICCAT GBYP a first short report on the development of the field tagging activities before September 2020.
- b) The Marine Institute shall submit to ICCAT GBYP a draft final report by 26th November 2020, including
  - a) Full description of the work carried out for the tagging activities,
  - b) Detailed description of the methodology and protocols;
  - c) Data input official ICCAT tagging forms, including the definitive number of tagged specimens by area, size and type of tag (archival+ conventional spaghetti tag);
  - d) Any possible recommendations for adjusting the tagging strategy for tagging in future Phases of ICCAT GBYP;
  - e) An Executive Summary.

c) The final report , to be prepared taking into account any comments provided by ICCAT GBYP, shall be submitted by 4 December 2020, at the latest.

### **2.1 Legislative/formal preparation:**

Tagging was carried out under an Animal Welfare Licence (Project AE19121/P003 as required under Directive 2010/63 /EU and S.I. No. 543 of 2012).

ICCAT included the Marine Institute in the International Research Mortality Allocation (RMA) in 2020 (Appendix II).

A derogation of fishing for Bluefin Tuna fishing for the purposes of research was reviewed and granted for 2020 from the Irish Sea Fisheries Protection Authority (Appendix III).

### **2.2 Financial preparation:**

Satellite tracking tags (17) were made available to the Marine Institute to tag BFT between August and October 2020. Funding was provided under the European Monetary Fund for Fisheries (EMFF) to provide reports on tagging, tagging data, vessel charter, technical and travel support of Marine Institute staff.

An Official call and open tender (ETender) process for Vessel Charter and formal evaluation of tenders was implemented. Vessel charter was by open advertised competition and was awarded to skippers of the Leah C and the Silver Dawn. The Leah C vessel which had previously been used for tagging bluefin tuna in 2019, 2018, 2017 and 2016 and the Silver Dawn which was being used for the first time in 2020 for tagging off the South West coast of Ireland.

## **3. Tagging Locations and Methods**

Pop-up Satellite Archival Transmitting Tags (PSATs) are designed to track the large scale movements and behaviour of pelagic fish and other animals. Depth, temperature and light-level data are used to estimate location. At a user-specified date and time, a pin is corroded, releasing the PSAT to float to the surface and transmit summarised information via the Argos satellite system. Daily longitude of the migration track, is calculated onboard the PSAT using geo-location by light level techniques. Daily latitude can be calculated from transmitted light level curves using software provided by the tag manufacturer. The results provide the migration path and depth and temperature preferences of the study animal, as well as oceanographic data, in the form of depth-temperature profiles.

In association with the satellite tags, a total 3 accelerometer tags were also applied to three BFT in order to measure acceleration in three spatial axes and when attached to an animal, provide very high resolution measurements of relative activity levels and behaviour of the tagged animal. For fish, accelerometers can provide powerful measurements of swimming effort including tail-beat frequency and amplitude, and can identify burst events

associated with predation attempts. Since they index gravity, accelerometers can also reveal orientation of the animal in space (e.g. pitch and roll angles); important information for identifying abnormal swimming behaviour. The accelerometer devices are typically coupled with additional sensors including swim speed, water depth, and water temperature as well as a camera system for recording video images.

20 fish were tagged off the Donegal coast (Figure 1) within sight of shore and a further 7 off the coast of South-West Cork (Figure 2). Seventeen LOTEK tags were provided by ICCAT while the Marine Institute provided ten more (Wildlife Computers). Two vessels were used during the tagging period i.e. the Leah C (Co. Donegal) and Silver Dawn (Co. Cork). These vessels are equipped with transom doors to bring fish on board with specialized gear, fighting chairs to land the fish.

All 27 fish were captured using angling methods and squid spreader bar lure setups with up to 11 separate plastic squid lures per rig. Only the last in the train bears a hook. Once the lure is taken the fish are played to the boat as quickly as possible and landed through the transom door via a ramp using a lip hook technique developed by the Block lab. (Block et al. 2001). On board, the team performed individual tasks e.g. placing of wet cloth over the eyes of the fish to keep the fish calm, constant irrigation of the gills with a high pressure hose pumping fresh saltwater, insertion of the PSAT into the dorsal musculature using a titanium tag dart with retention loop. Two other numbered marker floy tags (spaghetti tags) were also applied to aid in recovering information from tagged fish. Small samples of tissue and a tail clip were removed for genetic analyses. As quickly as possible the fish were then released back into the water. The on-board procedure takes approximately 3 to 5 minutes. A length and girth were recorded as well as comments on the fish appearance in general, the landing, tagging and release condition of the fish upon release. The position of hook-up and release is noted and recorded. Details of tagging for satellite tags are given in Table 1. All fish caught were larger than 170 cm with the largest being 238cm. The average curved fork length for the 27 fish caught was 213 cm.

Owing to the Covid-19 pandemic, tagging operations in 2020 were carried out under Covid Operating Procedures (C.O.P.). This included reduced numbers of scientists and personnel aboard the tagging vessels. Additionally no anglers were permitted aboard during tagging trips with the vessels deckhand carrying out all fishing and set-up of fishing gear. Nonetheless, no significant problems were encountered during tagging operations and no modifications were made to the tagging protocols as outlined in the HPRA project licence. All 27 fish were released alive with satellite tags and conventional tags attached (Table 1). ICCAT data sheets containing tagging details are included in Appendix IV.



#### **4. Results and possible recommendations for adjusting the tagging strategy in future Phases of ICCAT GBYP**

Since tagging, 3 tags have prematurely popped off: these were Marine Institute Wildlife Computer PSAT tags 20P1298 (205462) on the 23/09/2020 (9 days after tagging) and 20P1297 (205461) on the 02/10/2020 (10 days after tagging) and 20P1341 (205469) on the 29/11/2020 (50 days after tagging). The latter was recovered on a beach in South-West France (Mimizan Plage) 8 days after it released from the BFT (Table 1). Programming and design of tags will need to be considered if this problem persists in other tags deployed. A further 3 tags correctly released at the programmed time: these were ICCAT LOTEK PSAT tags L330-2958 (199923) on the 12/12/2020, 120 days after tagging, L330-2959 (199924) on the 12/12/2020, 120 days after tagging and finally L330-2963 (199928), 24/12/2020, 240 days after tagging (Table 1). No other tags have detached up to December 2020.

Long term retention of satellite tags is essential to obtain the best value for money as well as the most complete information on the migration and behaviour of bluefin tuna. It is essential to have operators who have tagged bluefin tuna with satellite tags on board at all times. Training of new taggers operators should be under strict control and be supervised by experts with at least two years of tagging bluefin tuna experience. Only limited numbers of tags should be placed by newly trained taggers.

Fish for satellite tagging should be brought to the boat as quickly as possible to avoid exhausting the fish. Handlining or retrieving the fish with the rod in the rod holder can assist with bringing the fish in quickly (Figure 3 & 4). Tagging of the fish while still in the water alongside the boat would be advantageous in terms of eliminating much of the stress associated with tagging on board, provided the tag could be deployed quickly and easily. However, it is not possible to do this in all sea conditions and therefore, the presence of a transom door and ramp on the vessel is essential in order to avoid lifting the fish excessively onto the boat. Sufficient space is needed to be able to turn the fish and release it head first after tagging. Liphooking and bringing the fish on-board is also an operation which needs to be taught by experienced operators.

Types of anchor and tethering materials are crucial. Titanium anchors should not be too sharp or flexible to avoid them pulling out of the muscle too quickly. The use of a retention loop and a second anchor is highly recommended.

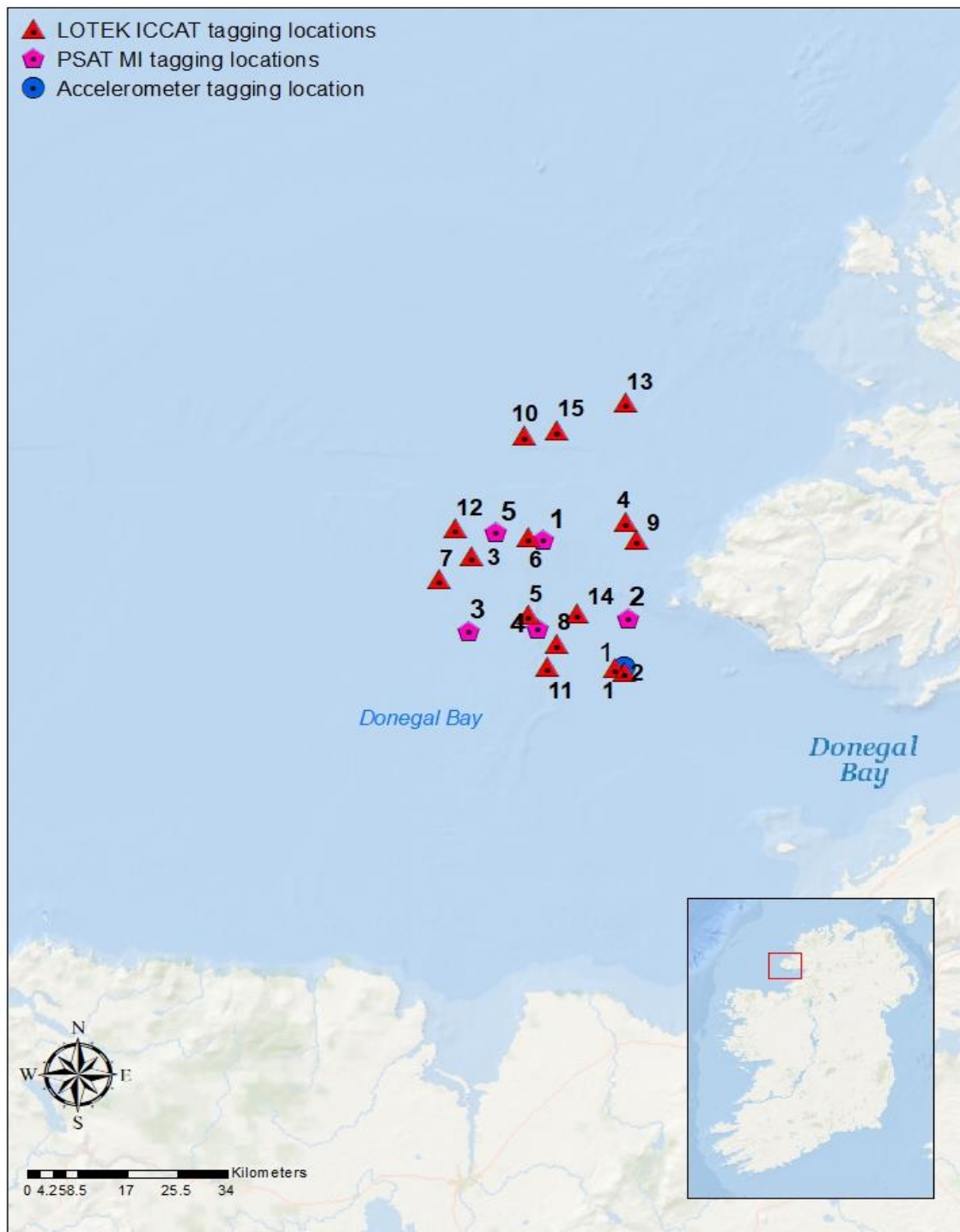


Figure 1. Donegal Bay (N-W Ireland) tagging locations of ABFT in 2020 – PSAT tags provided by ICCAT and MI. Accelerometers provided by Trinity College Dublin.

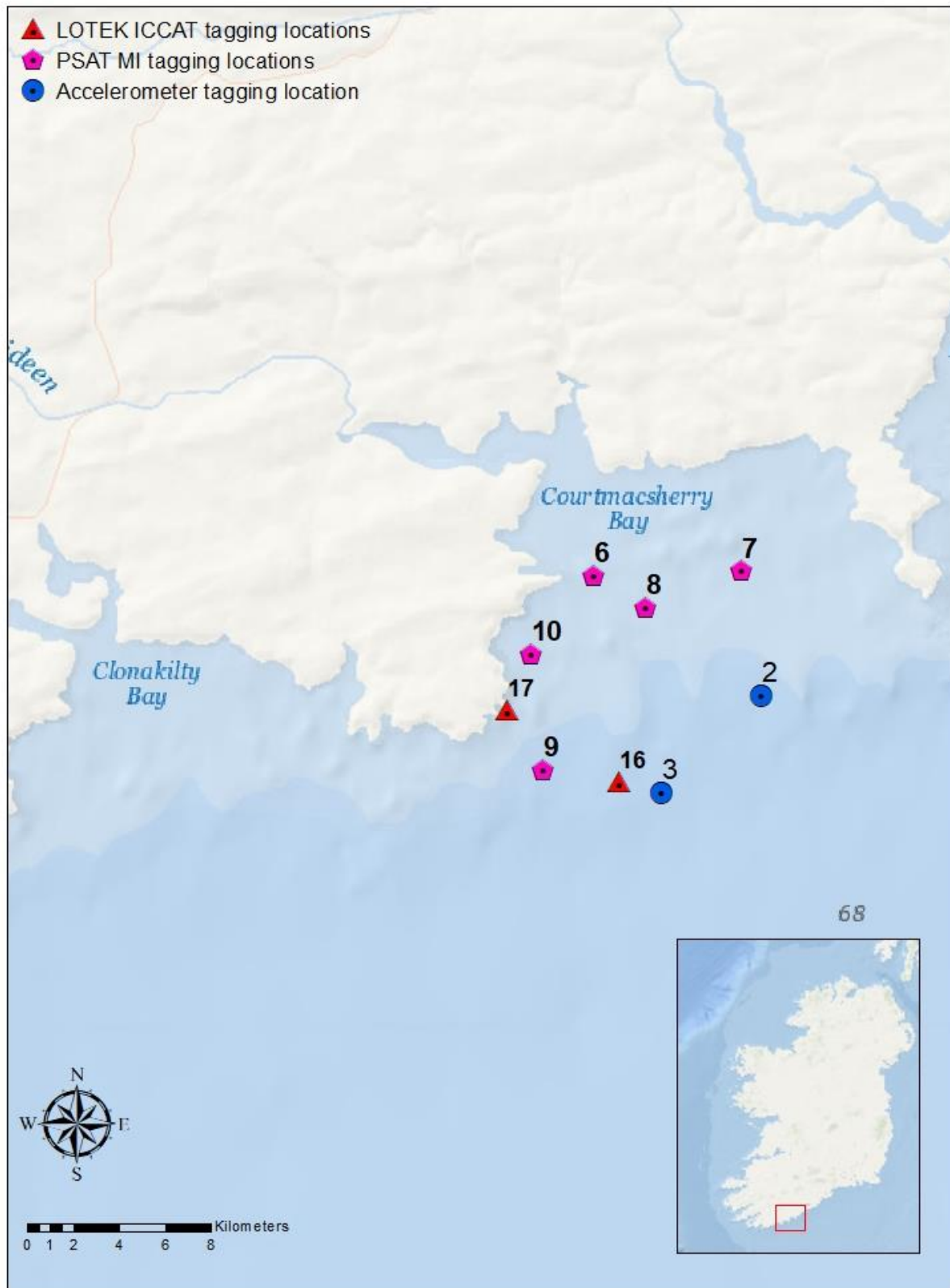


Figure 2. Courtmacsherry Bay (S-W Ireland) tagging locations of ABFT in 2020 – PSAT tags provided by ICCAT and MI. Accelerometers provided by Trinity College Dublin.

Table 1. Condensed data and associated details for 2020 electronic tagging

Tag Code	Manufacturer	Tag Owner	1st Floy tag	2nd Floy Tag	Tagging Date	Tagging Time	Latitude	Longitude	Area	Length (cm)	Release	Release date	Days on Fish
L330-2958	Lotek PSATGEO	ICCAT	BYP079091	BYP27629	14/08/2020	10:20	54 35.59	8 53.77	Donegal, Ireland	205	programmed release	12/12/2020	120
L330-2959	Lotek PSATGEO	ICCAT	BYP079092	BYP27639	14/08/2020	09:05	54 35.72	8 54.68	Donegal, Ireland	196	programmed release	12/12/2020	120
L330-2962	Lotek PSATGEO	ICCAT	BYP079145	BYP030808	27/08/2020	08:49	54 39.211	8 56.733	Donegal, Ireland	231			
L330-2960	Lotek PSATGEO	ICCAT	BYP079140	BYP030805	27/08/2020	10:39	54 35.566	8 54.008	Donegal, Ireland	226			
L330-2976	Lotek PSATGEO	ICCAT	BYP079142	BYP30806	27/08/2020	12:59	54 36.191	8 56.428	Donegal, Ireland	210			
L330-2963	Lotek PSATGEO	ICCAT	BYP079093	BYP027626	27/08/2020	13:31	54 38.335	8 57.366	Donegal, Ireland	221	programmed release	24/12/2021	240
L330-2965	Lotek PSATGEO	ICCAT	BYP079094	BYP027627	27/08/2020	16:04	54 38.191	8 58.795	Donegal, Ireland	238			
L330-2977	Lotek PSATGEO	ICCAT	BYP079136	BYP030801	28/08/2020	12:13	54 37.034	8 51.567	Donegal, Ireland	222			
L330-2973	Lotek PSATGEO	ICCAT	BYP079143	BYP030807	28/08/2020	14:08	54 36.445	8 50.193	Donegal, Ireland	231			
20P1296	Wildlife Computers	MI	BYP079130	BYP027592	15/09/2020	12:59	54 34.563	8 49.763	Donegal, Ireland	170			
Accelerometer 1	Trinity College Dublin	Trinity College Dublin	BYP079130	BYP027592	15/09/2020	12:59	55 34.563	9 49.763	Donegal, Ireland	170			
20P1298	Wildlife Computers	MI	BYP079127	BYP027632	16/09/2020	13:35	54 35.240	8 53.055	Donegal, Ireland	231	Premature. Pin intact	23/09/2020	9d 7h 33m 45s
20P1337	Wildlife Computers	MI	BYP079132	BYP027648	16/09/2020	14:23	54 35.197	8 53.933	Donegal, Ireland	210			
20P1338	Wildlife Computers	MI	BYP079133	BYP027647	16/09/2020	16:54	54 36.142	8 56.371	Donegal, Ireland	214			
20P1299	Wildlife Computers	MI	BYP079128	BUP027640	20/09/2020	09:56	54 33.651	8 56.606	Donegal, Ireland	214			
L330-2969	Lotek PSATGEO	ICCAT	BYP079139	BYP030804	20/09/2020	11:24	54 34.918	8 54.566	Donegal, Ireland	212			
L330-2972	Lotek PSATGEO	ICCAT	BYP079099	BYP027577	20/09/2020	11:58	54 35.74	8 55.380	Donegal, Ireland	242			
L330-2961	Lotek PSATGEO	ICCAT	BYP079138	BYP030803	20/09/2020	16:43	54 34.604	8 55.886	Donegal, Ireland	220			
L330-2966	Lotek PSATGEO	ICCAT	BYP079095	BYP027644	20/09/2020	18:31	54 35.967	8 39.907	Donegal, Ireland	232			
L330-2967	Lotek PSATGEO	ICCAT	BYP079096	BYP027637	21/09/2020	10:30	54 38.075	8 56.159	Donegal, Ireland	202			
L330-2970	Lotek PSATGEO	ICCAT	BYP079137	BYP030802	21/09/2020	17:00	54 35.875	8 47.807	Donegal, Ireland	207			
20P1297	Wildlife Computers	MI	BYP079126	BYP27643	29/09/2020	09:37	51 34.967	8 38.143	Cork, Ireland	212	Premature. Pin intact	02/10/2020	10d 3h 44m 32s
20P1300	Wildlife Computers	MI	BYP079129	BYP027646	29/09/2020	11:36	51 34.518	8 35.080	Cork, Ireland	217			
20P1340	Wildlife Computers	MI	BYP079134	BYP027638	29/09/2020	17:08	51 33.906	8 38.034	Cork, Ireland	232			
20P1336	Wildlife Computers	MI	BYP079131	BYP027634	12/10/2020	08:50	51 33.764	8 37.762	Cork, Ireland	202			
20P1341	Wildlife Computers	MI	BYP079135	BYP027587	12/10/2020	09:32	51 33.757	8 37.399	Cork, Ireland	200	Premature. Pin intact	29/11/2020	50d 9h 15m
Accelerometer 2	Trinity College Dublin	Trinity College Dublin	BYP079135	BYP027587	12/10/2020	09:32	51 33.757	8 37.399	Cork, Ireland	200			
L330-2968	Lotek PSATGEO	ICCAT	BYP079097	BYP027628	12/10/2020	10:31	51 32.705	8 38.757	Cork, Ireland	222			
L330-2971	Lotek PSATGEO	ICCAT	BYP079098	BYP027630	12/10/2020	17:15	51 33.240	8 38.805	Cork, Ireland	205			
Accelerometer 3	Trinity College Dublin	Trinity College Dublin	BYP079098	BYP027630	12/10/2020	17:15	51 33.240	8 38.805	Cork, Ireland	205			



Figure 3. Squid spreader bar being fished with up to four sets operating close to the surface (orange circles) – note proximity to land during some fishing operations in 2017.

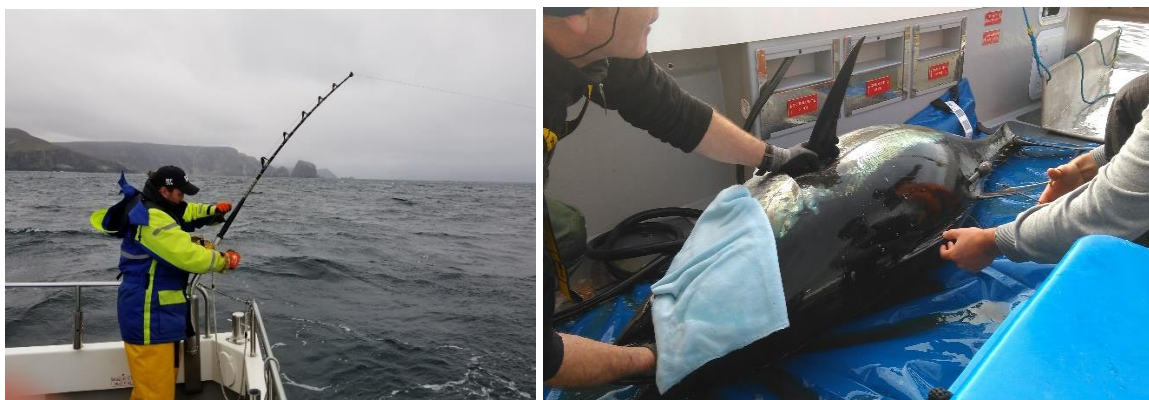


Figure 4. Bluefin tuna being played into the boat quickly using the rod rest to avoid stress; tagging procedure on board. Note constant irrigation of gills with fresh seawater during tagging and subsequent sampling of tissues for genetic stock identification. (Figure not to be reproduced without permission)

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## 1. Acknowledgements

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## APPENDIX I: MEMORANDUM OF UNDERSTANDING BETWEEN ICCAT AND THE MARINE INSTITUTE

### Memorandum of Understanding

#### Between

International Commission of the Conservation of Atlantic Tunas (ICCAT) / Atlantic-Wide Research Programme for Bluefin Tuna (GBYP), with headquarters at C/Coraz6n de Maria, 11°8,28002, Madrid, Spain, represented by the Executive Secretary, Camille Jean Pierre Manel.

#### And

The Marine Institute, with headquarters at Oranmore, Galway, H91 R673 Ireland, represented by Patricia Orme.

As used in this Memorandum of Understanding (MOU), "Party" means either ICCAT/GBYP or THE MARINE INSTITUTE, "Parties" shall mean both ICCAT/GBYP and THE MARINE INSTITUTE.

#### Preamble

The main objectives of the ICCAT Atlantic-Wide Research Programme for Bluefin Tuna (GBYP) are to improve: (a) the understanding of key biological and ecological processes, (b) the current assessment methodology, (c) the management procedures, and (d) the advice. The achievement of these objectives requires the generation and analysis of huge amounts of data, both from fisheries-dependent and fisheries independent sources, and because of that GBYP main activities are oriented to this end.

Among the main knowledge gaps detected at the beginning of GBYP Programme can be pointed out those on stock structure and spatial patterns, which are crucial for conducting a reliable stock assessment, since many assumptions on these issues used in previous bluefin tuna stock assessments had been called into question by studies showing that the mixing between the bluefin tuna management units and the hypothetical existence of meta-populations were important issues to be considered.

To address this gap of knowledge, GBYP has implemented a large, wide and intensive scientific tagging programme to address several important biological and ecological topics regarding Atlantic bluefin tuna, aiming at improving knowledge on its population's structure and spatial patterns.

Within the current GBYP Phase 10, developed along 2020, the GBYP Steering Committee has proposed a work-plan for GBYP e-tagging activities consisting on the deployment of archival and pop-up electronic tags in the North Atlantic taking advantage of synergies with ongoing CPCs national e-tagging programs developed in this area. To implement this plan ICCAT GBYP sought for experienced national research teams willing to collaborate with this GBYP tagging programme through a Circular (0510/2020) submitted by the ICCAT Executive Secretary to all the CPCs Head Delegates and Head Scientist. In its turn THE MARINE INSTITUTE, being aware of this Circular submitted an Expression of Interest offering to participate in GBYP Phase 10 e-tagging programme in collaboration with Dr. Barbara Block team of Stanford University, which was positively evaluated by the GBYP Steering Committee.

The Parties, both accrediting a long and well-established reputation in the field of marine sciences, consider international collaboration important to improve strategical research areas in order to generate the best scientific advice for ameliorating the stocks evaluation and support the management decisions aiming at ensuring the sustainability of fishery resources and recognize that significant synergies could result from the collaboration between



both institutions in the field of Bluefin tuna research . Consequently, they have agreed in signing this MOU to define the conditions under which this specific collaboration in the field of BFT electronic tagging activities will take place.

#### Article 1. Objectives

The aim of this MOU is to facilitate the cooperation between the Parties in the field of bluefin tuna research in the ICCAT Convention area, including:

Electronic and conventional tagging of bluefin tuna  
Biological sampling of bluefin tuna

Its immediate objective is to improve the knowledge of the BFT spatial patterns.

The added value of the foreseen collaboration aims to reach the following outcomes and results: Development of unique expertise and knowledge

Minimizing operational costs of the respective research activities

Generation of data directly applicable to the modelling of BFT stocks dynamics  
Production of sound scientific publications, including high ranked scientific papers

#### Article 2. General conditions

In order to achieve the aforementioned objective, ICCAT GBYP will provide THE MARINE INSTITUTE with 10 archival tags of the model LOTEK LAT2310 and 17 LOTEK pop up tags of the model PSAT flex, assuming shipment costs, to be deployed on Atlantic bluefin tuna in Irish waters from August to November 2020. The tags will be deployed following the GBYP tagging protocols detailed in [https://www.iccat.int/GBYP/Docs/Tagging\\_Manual.pdf](https://www.iccat.int/GBYP/Docs/Tagging_Manual.pdf). THE MARINE INSTITUTE will deploy all these tags in collaboration with Dr. Barbara Block team (Stanford University) and will provide the infrastructure required, as well human resources, including experienced scientific personnel in deployment of pop-up tags in BFT, to successfully conduct such bluefin tuna tagging operations. The deployment of archival tags should be performed by members of the Dr. Barbara Block team. In the case that any member of Dr. Barbara Block team with direct credited experience in archival tags deployment could not join the aforementioned MI tagging surveys or MI contracted vessel charter time runs out the archival tags will be not deployed, and sent back to ICCAT GBYP as soon as possible, besides any other pop-up tag that for any reason could not be deployed, assuming GBYP the shipment costs.

Any data produced by these pop-up and archival tags will be property of ICCAT GBYP, but will be immediately shared with THE MARINE INSTITUTE and Dr. Barbara Block team, which will be allowed to make preferential use of this information for scientific purposes.

In case of incidental mortality THE MARINE INSTITUTE will follow the protocols for reporting the GBYP Research Mortality Allowance. Biological sampling, including specimens size (Fork Length) and collection of tissue samples (fin clips) for genetic analysis, shall be carried out during the tagging activities. Such biological sampling shall be conducted according to the protocols for biological and genetic sampling detailed in [https://www.iccat.int/GBYP/Docs/Biological\\_Studies\\_Phase\\_8\\_Sampling\\_Protocol.pdf](https://www.iccat.int/GBYP/Docs/Biological_Studies_Phase_8_Sampling_Protocol.pdf). The samples shall be shipped to the laboratory in charge of analysis indicated by GBYP. In addition to electronic tagging, a conventional tag shall be implanted following ICCAT GBYP protocols. Such protocols, conventional tags and applicators will be provided by ICCAT GBYP if required.

#### Article 3. Reporting

- a) THE MARINE INSTITUTE shall submit to ICCAT GBYP a first short report on the development of the field tagging activities before September 2020.



- b) THE MARINE INSTITUTE shall submit to ICCAT GBYP a draft final report by 26th November 2020, including
  - a) Full description of the work carried out for the tagging activities,
  - b) Detailed description of the methodology and protocols;
  - c) Data input official ICCAT tagging forms, including the definitive number of tagged specimens by area, size and type of tag (archival+ conventional spaghetti tag);
  - d) Any possible recommendations for adjusting the tagging strategy for tagging in future Phases of ICCAT GBYP;
  - e) An Executive Summary.
- c) The final report, to be prepared taking into account any comments provided by ICCAT GBYP, shall be submitted by 4 December 2020, at the latest.

#### Article 4. Publication of results and intellectual property rights

The scientific results achieved under this MOU shall be presented to ICCAT SCRS meetings at the first opportunity, and will be available for publication following the ICCAT GBYP publication rules.

The Parties shall be obliged to give credit to each other, but shall assume full responsibility for any statement on which there is a difference of opinion. Intellectual property rights shall reflect the contribution provided by each party to the project. The Parties agree that Background Intellectual Property which a Party makes available for the conduct of the Project will remain the property of that Party. Each Party grants to the other Party a non-exclusive royalty-free licence to use that Party's Background Intellectual Property for use under the framework of the activities carried out in relation to this MOU. No other use is permitted without the prior written consent of the owner of the Background Intellectual Property.

#### Article 5. Secrecy

The Parties agree that the information, including business information and research results, transmitted during the term of this MOU and five years thereafter shall be deemed confidential and shall not, without the prior written consent of the disclosing Party or Dr. Barbara Block team be used or disclosed to third parties.

Exceptions to the aforesaid are the following:

- information used by ICCAT SCRS for stock assessment and MSE purposes information, which are already public,
- information, which have been made available to the public by ICCAT GBYP or THE MARINE INSTITUTE,
- information which will be made available to the public by ICCAT GBYP or THE MARINE INSTITUTE or other third parties.,
- Information which are otherwise public or have been made available to the public.

#### Article 6. Liability

Under this MOU, ICCAT will not have any responsibility of what may happen during the implementation of the tagging operations. Any use of the results of this research shall be made without prejudice of both parties. Any problem which may arise from the misuse of the outcomes of this project shall be solved by mutual understanding of both parties.

#### Article 7. Settlement of disputes

Any dispute arising out of the interpretation or execution of this MOU shall be settled by mutual agreement.

#### Article 8. Amendments

Any amendments to this MOU shall be made only on the basis of written mutual consent by ICCAT and THE MARINE INSTITUTE.

#### Article 9. Entry into force

- a) The present MOU will enter into force upon signature of both ICCAT and THE MARINE INSTITUTE.

b) Two copies will be signed by ICCAT and THE MARINE INSTITUTE.

#### Article 10. Commencement and duration

This MOU will be valid for a period of 1 year from its date of signature. This MOU may be renewed by mutual consent between the Parties. Each year, the Parties will meet for an evaluation of the work performed.

This MOU will be signed in two originals, both of equal validity.

Date **26 July 2020**

Camille Jean Pierre Manel ICCAT Executive Secretary  
For ICCAT



### Annex 2

#### LIST OF PARTICIPANTS IN ICCAT GBYP TAGGING ACTIVITIES AND BIOLOGICAL STUDIES IN 2019

##### Third list

1. Alleanza Pescatori Ricreativi (APR), Genova - EU-Italy (conventional tagging)
2. AquaBioTech Ltd. - EU-Malta (biological sampling)
3. Arrain-Denok Club, EU-Spain (conventional tagging)
4. Asociación Catalana per una Pesca Responsable (ACPR), Barcelona - EU-Spain (conventional tagging)
5. Asociación Mallorquina para una pesca responsable (AMPR) - EU-Spain (Conventional and electronic tagging)
6. AZTI Fundazioa - Fundación AZTI — EU-Spain (biological sampling, conventional tagging)
7. Balfegó & Balfegó S.L., EU-Spain (biological sampling)
8. Centre for Environment, Fisheries and Aquaculture Science (Cefas) - EU-United Kingdom (tagging)
9. Centro de Estudios Avanzados de Blanes (CEAB-CSIC) - EU-Spain (tagging)
10. FIPSAS-CIPS, Roma - EU-Italy (conventional tagging)
11. Department of Aquatic Resources, Institute of Marine Research, Swedish University of Agricultural Sciences (SLU) - EU-Sweden (tagging)
12. IFREMER - EU-France (FishNchip project; tagging)
13. INRH - Morocco (biological sampling)
14. Institut za oceanografiju i ribarstvo (IZOR) - EU-Croatia (biological sampling)
15. Institute of Marine Research - Norway (tagging, sampling)
16. Instituto Español de Oceanografía (IEO) - EU-Spain (biological sampling, conventional tagging)
17. Instituto Mediterráneo de Estudios Avanzados (CSIC) - EU-Spain (Conventional and electronic tagging)
18. Instituto Português do Mar e da Atmosfera (IPMA) - EU-Portugal (biological sampling, tagging)
19. Large Pelagics Group, St. Andrews Biological Station (SABS) - Canada (tagging)
20. Marine Institute — EU-Ireland (tagging)
21. National institute for Aquatic resources, Technical University of Denmark (DTU Aqua) - EU Denmark (tagging)
22. National Institute of Fisheries Sciences - Republic of Korea (tagging)
23. Pelagos Net Farma d.o.o., EU-Croatia (biological sampling)
24. TAXON Estudios Ambientales S.L. - EU-Spain (biological sampling)
25. Tunipex, S.A. Empresa de Pesca de Tunídeos - EU-Portugal (biological sampling, tagging)
26. Universidad de Cádiz, Departamento de Biología - EU-Spain (biological sampling)
27. Università di Genova (UNIGE) - EU-Italy (tagging)
28. University of Exeter - EU-United Kingdom (tagging)
29. WWF Mediterranean Marine Initiative - EU-Italy (tagging)

## Appendix III Derogation to conduct scientific research fishing 2020



SEA-FISHERIES  
PROTECTION  
AUTHORITY

Headquarters, Park Road,  
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Co. Cork, Ireland

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28<sup>th</sup> July 2020

DSR 05/2020

Dr Niall Ó'Maoileidigh  
Marine Institute  
Ireland

### DEROGATION TO CONDUCT FISHING FOR SCIENTIFIC RESEARCH

#### "LEAH C" & "DEEP BLUE"

Dear Dr Ó'Maoileidigh

Please note that the Sea-Fisheries Protection Authority is pleased to agree to your request for a specific derogation to conduct fishing for scientific research subject to compliance with the terms outlined below:

**Type of survey:** 'A research consortium has been formed comprising the Marine Institute, Stanford University (USA) and Trinity College Dublin. The consortium will aim to tag up to 30 Atlantic bluefin tuna (ABFT) with electronic /satellite archive tags (PSATS) and conventional tags in the coastal waters of the South and North West of Ireland between August and November 2020. The tags are supplied by the International Commission for the Conservation of Atlantic Tunas ICCAT and the Marine Institute. The consortium will also undertake biological sampling of fin and muscle tissue. All fish will be released back to the water'.

**Vessel Details Area 1:** Name: Leah C and Deep Blue (Angling charter vessels).

Area Coverage: ICES Areas VIIa & VIIb & VIIc

Vessel master(s): Either of Mr Michael Callaghan or Mr. Adrian Molloy

Period: Between 1<sup>st</sup> August and 30<sup>th</sup> November 2020.

**Vessel details Area 3:** Name: Silver Dawn (Angling charter vessels).

Area Coverage: ICES Areas VIIj & VIIg & VIIb.

Vessel master(s): Mr David Edwards

Period: Between 1<sup>st</sup> August and 30<sup>th</sup> November 2020.

**Target Species:** Bluefin Tuna (*Thunnus thynnus*)

**Scientific Staff:** Scientific staff: Dr. Niall Ó Maoileidigh and Marine Institute staff along with colleagues from Stanford University (Robbie Schallert) and Prof. Nicholas Payne Trinity College Dublin (at least two scientific personnel on board at all time during tagging). Please be advised that a copy of this document should be retained onboard the vessel whilst engaged in the scientific work.

Finally, I would like to wish you and your team every success with the project.

Christopher Hally  
Sea-Fisheries Operations Manager  
cc. [Naval Service, SFPA-SMT, SFPA-Senior Port Officers, European Commission]

Appendix IV ICCAT’s Electronic Tagging Record Table (TG03-EleTReRc\_Ireland\_BFT\_2020)

Specimen identifier (unique)			Tagging	Electronic 1				Electronic 2				Conventional 1			Conventional 2			Time strata		Geographical strata			Fishing operation					Specimen characteristics																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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