

THE ATLANTIC-WIDE RESEARCH PROGRAMME FOR BLUEFIN  
TUNA (GBYP)

ELECTRONIC TAGGING OF ATLANTIC BLUEFIN TUNA IN  
BALFEGO'S CAGES IN THE BALEARIC SEA

(Final report)

**Grup Balfego**

L'Ametlla de mar

25 April 2023



This project is co-funded  
by the European Union

The Atlantic-Wide Research Programme for Bluefin Tuna was officially adopted by the ICCAT Commission in 2008, endorsing the SCRS Chair's report on Bluefin Tuna Research Priorities and Potential costs. In 2009 the SCRS advised the Commission that, in order to substantially improve the scientific advice, such program would focus on the improvement of basic data collection through data mining, understanding of key biological and ecological processes and assessment models and provision of scientific advice on stock status.

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 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 populations structure and spatial patterns.

Since 2020 a new strategic approach was implemented to achieve the GBYP e-tagging program objectives, based on taking advantage of synergies with ongoing CPCs national e-tagging programs developed in the area. To this end ICCAT GBYP sought for experienced national research teams willing to collaborate with GBYP tagging programme.

Within the framework of this initiative, GBYP and Grup Balfegó signed on 6 September 2022 a MoU to develop a tagging programme in fish released from farming facilities. The aim of MOU was 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 and biological sampling of bluefin tuna.

The immediate objective was to improve the knowledge of the spatial patterns of fishes released from cages due to excess of capture weeks after the fishing operations.

Balfego provided 5 pop up tags of model MiniPAT-348K manufactured by Wildlife Computers, as well as required infrastructure and human resources. ICCAT GBYP took care of data transmission costs and data analysis.

These 5 electronic tags (Table 1) were deployed on 5 fish in Balfego's installations on 21 September 2022 (40°51,888'N 00°51,545E). Fish were released one a day after, on 22 September 2022, approximately ten nautical miles far from the farm location (40°49'66" N 1°2'9" E).

Tagged fish had been captured on 2 of June 2022, during the usual purse seine fishing season, weeks before releasing. The coordinates of the corresponding fishing operation are 39°02N 02°05E.

The release sequence of the tags was programmed to be activated 365 days after the first day of deployment. (Fig 1)

Table 1. List of deployed tags.

Tag Type	Serial Number	PTT Id	Tagware Version
MiniPAT	<a href="#">21P2410</a>	235319	2.4z
MiniPAT	<a href="#">21P2392</a>	235318	2.4z
MiniPAT	<a href="#">21P2386</a>	235315	2.4z
MiniPAT	<a href="#">21P2389</a>	235316	2.5b
MiniPAT	<a href="#">21P2390</a>	235317	2.4z

▼ Tag Release Sequence ⓘ

Release my tag  days after deployment start, or on this given date .

The tag will set its Archive Sample Interval to 5 second(s) based on a 365 day deployment.

Auto-Detect Tag Detachment ⓘ  ON

Auto-Detect Mortality ⓘ  ON

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Activate auto-detection after the first dive below  meter(s).

Start tag release sequence if:

- tag is floating at the surface
- tag is at a constant depth
- (optional) tag is deeper than  meter(s)

for longer than  day(s).

Use a depth variance of  meter(s). ⓘ

Release tag if it is at a depth below 1,700m.

When released and trying to transmit, ignore the wet/dry sensor after 45 days.

Enable Homing Pinger - Interval:  second(s).

Use an external release device.

Fig 1.Tag release sequence

Tagging operation inside the farm was considered risky for divers by Balfego’s Department of risks prevention at work. A report with the possible risks was communicated to the GBYP and a decision was made to tag the fish using harpoons (Fig 2). Tagged fish weight was estimated to be about 200 kg.



Fig.2 a Diver tagging fish with harpoon.

Tags recovery:

Two tags were released prematurely, one of them was recovered in the coast of southern Portugal.

Tag with number 21P2386 was prematurely released on 21/11/2022 near the Canary Islands in the Atlantic Ocean.

Tag with number 21P2389 was released prematurely and was recuperated in a beach of the south of Portugal, near Faro city. The coordinates of localisation communicated by the person who found it are 36.9740667, -7.8645892. Data transmission started on 12/01/2023 after finding it. It was sent to the manufacturer for evaluation and data recovery. The programming feature “When released and trying to transmit, ignore the wet/dry sensor after 45 days” was enabled. The tag released just slightly after 45 days and began to attempt transmissions on 12 of January 2023.

Owner: <input type="text" value="gby_p_team@iccat.int"/> Show Deployments: <input type="text" value="All"/> Filter: <input type="text" value="Filter by Prog #, PTT Id, Serial, Type, or Metadata"/>								
⚠ Collaborators: click Owner dropdown to view shared data								Showing 1 to 2 of 2 en
<input type="checkbox"/>	Prog #	PTT	Serial	Decoded As	First Uplink Date	Last Uplink Date	First Data Date	
<input type="checkbox"/>	5222	235315	21P2386	MiniPAT	21-Nov-2022 18:19	11-Dec-2022 05:47	21-Sep-2022 11:00	
<input type="checkbox"/>	5222	235316	21P2389	MiniPAT	12-Jan-2023 18:47	09-Feb-2023 18:31	21-Sep-2022 11:00	