

ICCAT GBYP TAGGING PROGRAMME 2024

Atlantic-Wide Research Programme for Bluefin Tuna (GBYP)

*Tagging of Atlantic bluefin tuna with ICCAT tags in
the Bay of Biscay*



MEMBER OF
BASQUE RESEARCH
& TECHNOLOGY ALLIANCE

FINAL REPORT

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1. Executive Summary

Six GBYP miniPAT tags were obtained after signing the MoU during the past July 2023. Four of those tags were successfully deployed in Atlantic bluefin tuna, ABFT (*Thunnus thynnus*) during spring and summer in fish ranging from 156 to 250 cm CFL, both tagging from sportfishing vessels and professional fishing vessels, inside and outside the water. Hence, we manage to develop a tagging procedure to tag large fish inside the water with two anchors, without having to lift them onboard (when no big boats are available to do so). To date, the tags are supposedly still on the fish and no tagging induced mortality was known.

2. Introduction

The Bay of Biscay has historically been an important feeding ground for juvenile and sub-adult bluefin tuna, showing interannual high fidelity (Arregui et al, 2018). However, in the past years there has been an increase in the abundance of medium sized and large sized individuals during fall, winter and spring. These fish have been observed feeding on mackerel (*Scomber scombrus*) quite near shore and are believed by the professional fishermen to have a negative impact on their winter mackerel fishery. Therefore, Fundación AZTI has tried to tag these individuals using 8 miniPAT tags (as part of a project founded by the Basque Government) to understand the factors that affect their distribution, ecology, population structure and dynamics along the Bay of Biscay. In addition, given the interest of the ICCAT GBYP group of tagging medium sized individuals to examine the first entry to the Mediterranean (for supposed first spawning), and AZTI's capability of tagging these fish not only with PSAT tags but also internal archival tags (IATs), 6 GBYP miniPAT tags were required to GBYP to deploy during these tagging operations.

2.1 Project objectives

The overall objective of the project was to tag and sample medium-large sized ABFT in the Bay of Biscay to: 1) explore the detailed migration routes used by ABFT that come to the Bay during winter and spring, 2) identify the drivers that affect their distribution along the Bay interannually, 3) determine the population of origin of the tagged ABFT, 4) investigate long-term and

larger-scale movements, and how these might be overlapped with the mackerel fishery during winter.

3. Methods

Four GBYP tags for bluefin tuna were deployed using two different methodologies. On the one hand, daily departures were made from the port of Hondarribia to target large tuna during the winter and spring months. On the other hand, tagging was carried out from the professional fishing vessel “Nuevo Rober” during the development of the BFT Index 2024 acoustic campaign in June.

3.1 Tagging from a sportfishing vessel

These were carried out in the months of February and March on the private sportfishing boat “Crazy Mackerel” (Figure 1). The fishing technique used was chumming and drifting, for which sardine was used as dead bait and Atlantic chub mackerel (*Scomber colias*) or horse mackerel (*Trachurus trachurus*) as live bait. VMC Circle hooks were used to reduce harm to the fish, always hooking on the corner of the mouth, and all of them were captured using 80 pound stand up gear. The time spent since the fish was hooked up, brought aside the boat, dehooked, tagged, measured, sampled (for genetics) and released was less than 60 minutes in all cases. As the fish encountered were large and there was no suitable boat to take them on board, the tagging was carried out in the water, which made it easier for the fish to survive the tagging operation (Figure 2). However, this made it not easy to place the tag’s anchors in the desired spot as the boat was kept forward at 2 knots to oxygenate the gills of the fish and therefore ensure its good condition. The tagging operation lasted between 2 and 5 minutes.



Figure 1. Crazy Mackerel sportfishing boat used for tagging



Figure 2. Tagging of bluefin tuna for GBYP on board the Crazy Mackerel

Once the fish was brought to the side of the boat, it was held with a boga grip in the front part of the lower jaw, which allowed the fish to be handled without damage and to be able to carry out both the removal of the hook and the tagging process (Figure 3). Once tagged, the same clamp was used to hold the fish while reoxygenation was taking place. To do so, fish were towed with

the head pointing forward until the fish was deemed fit for release (1-3 minutes).

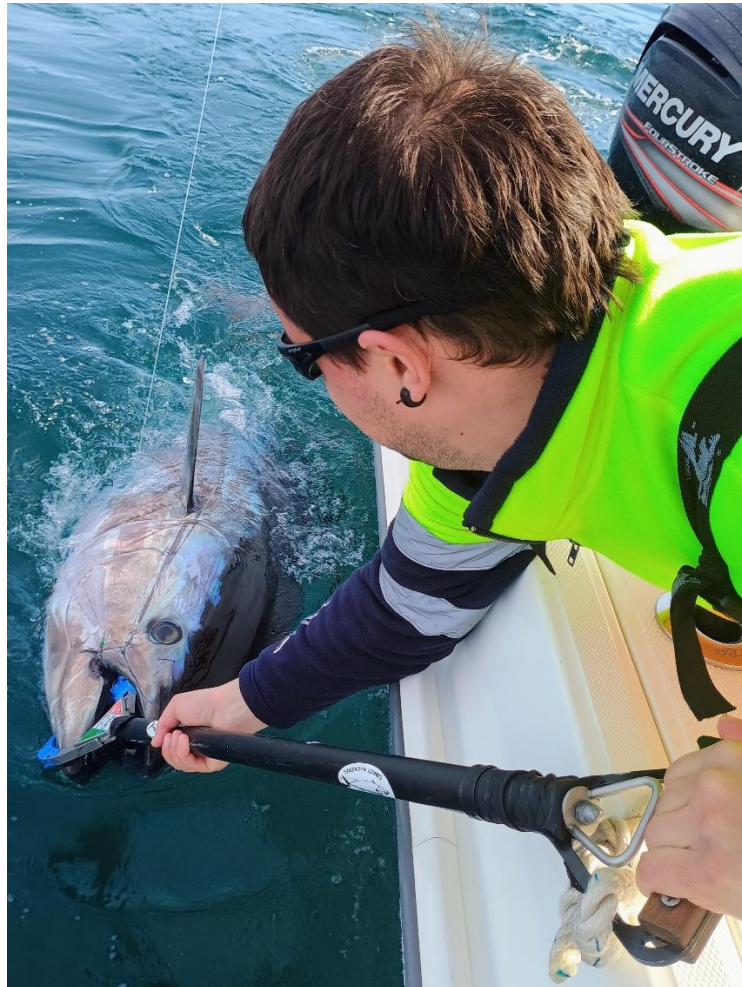


Figure 3. Holding the fish with the boga grip in the water

The two tags deployed using this technique were attached using two large Domeier anchors with 15-centimeter 500-pound monofilament tethers covered with silicone tubes. The main anchor was placed at the base of the second dorsal fin (aiming the pterygiophores) while the secondary anchor was placed intramuscularly, perpendicular to the tag. To do so, we designed a T shape tagging pole to tag the tunas in the water (Figure 4) and used elastic rubbers to pre-attach the tether to the tagging pole (this way we prevented the tag from slipping out of the tagging pole while submerged in the water). We selected a large Domeier as secondary anchor because with the fish in the water it is quite complex to correctly insert the stainless-steel dart head commonly used to tag fish onboard. The fish were measured using a specific metric tape designed for measuring bluefin tuna in the water (Figure 5).



Figure 4. Tagging pole designed to insert the anchors with the fish inside the water

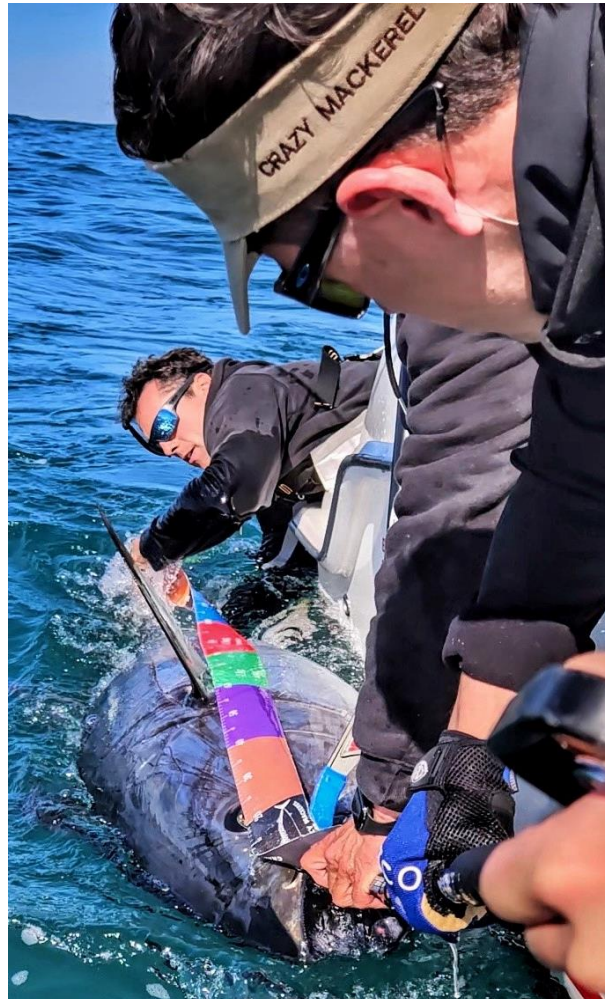


Figure 5. Metric tape designed to correctly measure the fish inside the water

3.2 Tagging in the BFT Index 2024 campaign

The main objective of the project is to monitor biomass trends of bluefin tuna in the Bay of Biscay to have an abundance index independent of the fishery. Therefore, this index can be used for stock assessment, progressively completing and replacing the current abundance index based on catch data per unit of effort. Specifically, the method chosen to estimate the biomass of bluefin tuna present in the Bay of Biscay is active acoustic surveying, together with fishing to confirm species identification and size sampling. In order to reflect interannual variations, it must be done each year in a comparable way, so a specific route is proposed based on systematic transects.

Based on these conclusions, AZTI has been carrying out BFT index summer campaigns uninterruptedly since 2015, where aggregations of bluefin tuna are detected and measured to estimate a density value for the presence of tunas in the Bay of Biscay, as well as estimations of abundance by class of age (ages 1 to 5+). The first results were presented at the 2023 ICCAT BFT annual meeting, where they were well received, and the group's recommendation was to continue and, to the extent possible, increase or even double, the campaign at different times of the year.

Another objective of the project is the opportunistic tagging of individuals of ABFT and albacore tuna (*Thunnus alalunga*). For this, different types of tags were used, among which are the GBYP miniPAT tags.



Figure 6. “Nuevo Rober” trolling fishing vessel

In this case, since it was carried out on a professional fishing vessel (Figure 6), the height of the boat did not allow tagging from the water, so the tunas were brought on board. To do this, after the tuna had been hooked up using horse mackerel as live bait with a hand line, the fish was brought beside the boat and held by the lower jaw using the mouth clamp described before. Immediately, the fish was brought on board using a stretcher designed to avoid lifting them by the hook, which would imply severe damage due to the size of the individuals (Figures 7-8). Once on board, the fish was placed on a V-shape padded mat, its eyes covered with a wet rubber towel and a pipe with a strong water flow inside the mouth (Figure 9). After dehooking, measuring, tagging and sampling, the fish was launched headfirst towards the water from the top of the boat, sliding it along the V-shape mat.

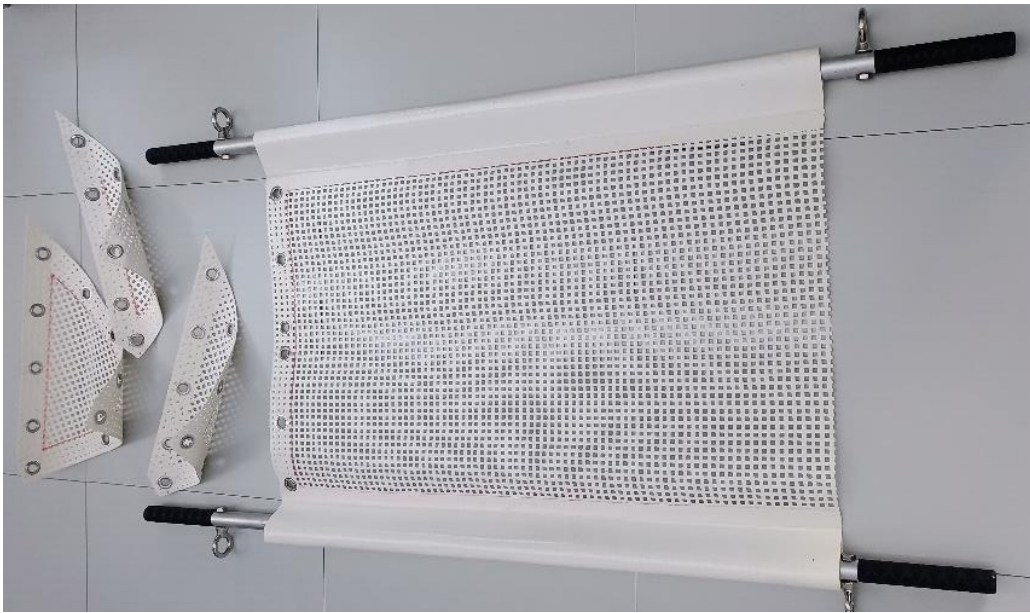


Figure 7. Stretcher used to lift the tuna



Figure 8. Moment in which the fish is uploaded for tagging



Figure 9. Once onboard, the tuna is placed in the V-shape mat with water inside its mouth and the eyes covered

The two tags deployed using this technique were attached using a main large Domeier anchors with a 13-centimeter 200-pound monofilament tether covered with silicone tube. As the fish were tagged on board, the second anchor was a large stainless steel dart head with a 150-pound monofilament loop tether (Figure 10).

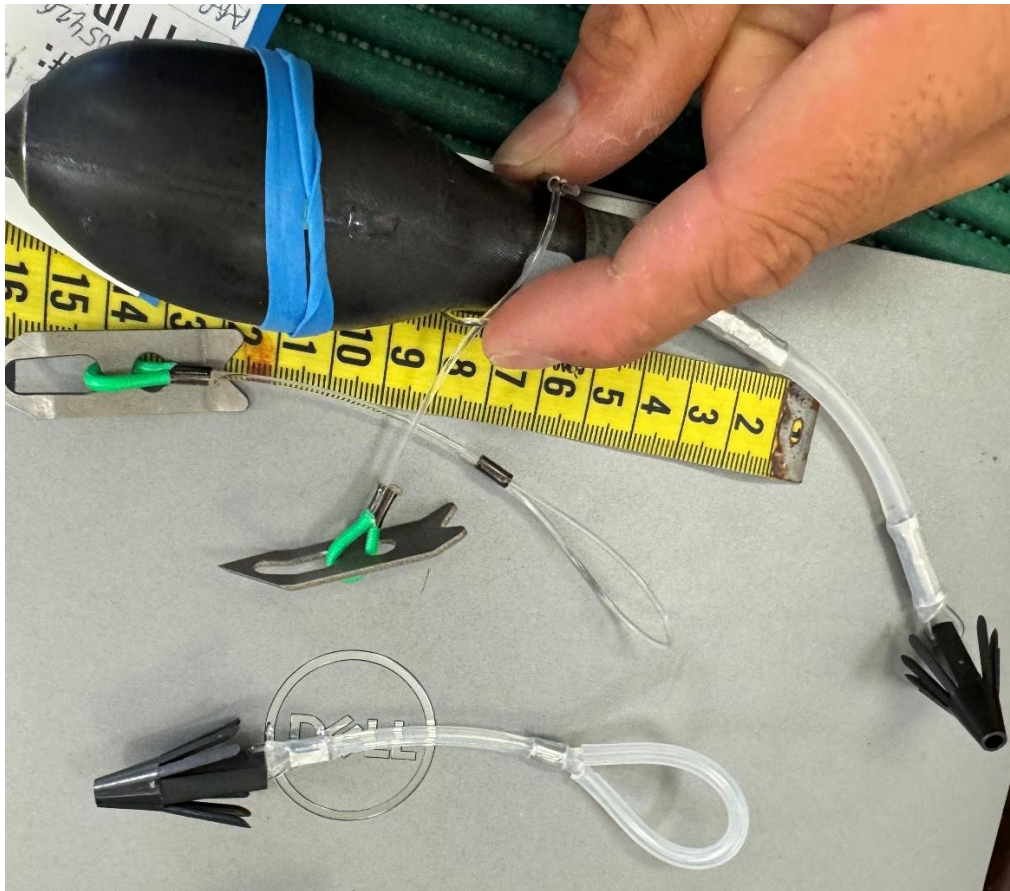


Figure 10. MiniPAT tag with the two types of secondary anchors used in the project (left: stainless steel dart head for fish tagged onboard, right: large Domeier anchor with loop for the fish tagged inside the water)

4. Results

A total of four ABFT were tagged with GBYP miniPAT tags (Table 1), which had been programmed by ICCAT to surface after 365 days. All ABFT were measured, sampled (fin-clips for genetical determination of origin) and the hook was removed, and a second conventional yellow tag placed for identification. All tags were deployed following ICCAT GBYP protocols, and the individuals were returned in good condition. The anchors and applicators were bathed with a mixture of four different medical creams including antiseptic, antibiotic, a local anesthetic and a wound healing booster. The remaining two tags were not deployed because the appropriate individuals for them were not found. In addition, the watch of one of the two remaining tags was broken and the battery of the other tag seemed unstable, so they will be both sent to ICCAT for revision as soon as possible. Finally, the team is still active with tagging operations as part of the Albacore Year Research

Program and could have chance to deploy further tags on bluefin tuna as it is easy to encounter them during the albacore tagging campaigns in late summer and fall. Moreover, the plan is to continue the tagging campaigns next year during winter and spring with PSAT tags, as well as with IAT tags in medium sized fish in summer.

Table 1: Summary of tags deployed

| SN | PTT | Conventional tag | CFL (cm) | Deployment | | | | | |
|---------|--------|------------------|----------|------------|-------|----------|-----------|-------------|------------|
| | | | | Date | Hour | Latitude | Longitude | Vessel type | Fight time |
| 23P0894 | 250438 | AAB005424 | 170 | 3/18/2024 | 10:02 | 43.654 | -1.868 | SPOR | 30' |
| 23P0897 | 250439 | AAA005240 | 250 | 3/18/2024 | 14:35 | 43.641 | -1.871 | SPOR | 55' |
| 23P0898 | 234151 | AAB005426 | 159 | 6/21/2024 | 21:15 | 44.109 | -2.375 | BB | 10' |
| 23P1035 | 250431 | AAB005427 | 156 | 6/21/2024 | 21:45 | 44.111 | -2.382 | BB | 15' |

5. Acknowledgements

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