

“On the Med Tuna Trail”

2011 BLUEFIN TUNA TAGGING EXPEDITION



The '*Sardineta*' in combat off Roses (NW Mediterranean), September 2011.

WWF MEDPO
May 2012

This study was carried out within the framework of the ICCAT Atlantic-wide Research Programme for Bluefin Tuna (GBYP), as a contribution in-kind by WWF-MedPO

1. ABSTRACT

The number of tags deployed in 2011 has been more than double compared to the year 2010. Our findings are now robust enough to define some clear residence areas and movement patterns. In addition an internal tag was recovered after nearly 3 years in the wild – the first of this kind ever recorded in the Mediterranean. Quite unexpected patterns for fish tagged in a Moroccan tuna trap are being uncovered and our activities in the Adriatic have been strengthened. Actually, the best indicator of the success of this year's tagging season is that for the first time since we started this project in 2008 we were able to deploy all our stock of tags.

2. METHODOLOGY

In 2011, 11 tagging trips covering Morocco (a tuna trap in Larache), Western Mediterranean (Moraira, Roses - Llançà and Mallorca), Adriatic Sea (San Benedetto del Tronto, Italy) and Strait of Gibraltar have occurred (Figure 1). During this season a total of 22 pop-up tags and 5 archival tags have been deployed (Table 1), of which 2 were real giants: one was 199 cm and the other 240 cm.



Figure 1. BFT tagging trips for 2011 season.

Overall, 83 electronic tags have been deployed so far since the start of the project in 2008 (51 pop-up tags + 32 archival tags).

Table 1. Summary of 2011 BFT tagging. Note: Days at liberty in orange show the tags that have been released and how long they lasted attached to the fish. Days at liberty in gray are those tags still attached (as for 'Current day 22/5/2012').

		Current day		10/11/2011							
	Date	Pop-off	Pop-up ID	Time	GMT	Area	Latitude (N)	Longitude (E)	Length (cm)	Vessel	Days at liberty
1	26/05/2011	27/09/2011	08A0406	16:40	15:40	Larache	35°18'10"N	06°11'40"W	2.3	Trap	124
2	26/05/2011	19/07/2011	10P0044	16:54	15:54	Larache	35°18'10"N	06°11'40"W	2.6	Trap	54
3	26/05/2011	29/05/2011	08A0386	17:05	16:05	Larache	35°18'10"N	06°11'40"W	2.33	Trap	3
4	27/05/2011	02/06/2011	10P0041	8:31	7:31	Larache	35°18'10"N	06°11'40"W	2.43	Trap	6
5	27/05/2011	22/03/2012	10P0035	8:53	7:53	Larache	35°18'10"N	06°11'40"W	2.1	Trap	300
6	27/05/2011	05/06/2011	10P0050	9:10	8:10	Larache	35°18'10"N	06°11'40"W	2.32	Trap	9
7	27/05/2011	18/07/2011	08A0395	9:21	8:20	Larache	35°18'10"N	06°11'40"W	2.37	Trap	52
8	27/05/2011	29/05/2011	10A0433	9:33	8:33	Larache	35°18'10"N	06°11'40"W	2.42	Trap	2
9	29/05/2011	25/08/2011	10P0398	11:55	9:55	Moraira	39° 06 184	0° 29 245 E	1.30-1.40	Peskator	88
10	26/07/2011	02/09/2011	10P0406	13:35	11:35	Adriatic	43°01'00,45"N	14° 09'49,51"E	1.55	Cucciolo	38
11	26/07/2011		10P0040	10:04	8:04	Adriatic	43°01'00,45"N	14° 09'49,51"E	1.43	Cucciolo	301
12	26/07/2011	30/09/2011	10P0400	16:50	14:50	Adriatic	43°01'00,45"N	14° 09'49,51"E	1.36	Cucciolo	66
13	06/08/2011	05/04/2012	10P0038	9:40	7:40	Adriatic	42°57' 28"N	14°16'81" E	1.25	Cucciolo	243
14	06/08/2011	09/02/2012	10P0401	10:35	8:35	Adriatic	42°56' 480"N	14°17'367" E	1.34	Cucciolo	187
15	12/08/2011	30/09/2011	08A0389	16:30	14:30	Mallorca	40°03'53"N	3°08'32"E	1.77	FreeWilly	49
16	13/08/2011	30/10/2011	10P0259	15:45	13:45	Mallorca	40°02'00"N	3°09'78"E	1.8	Storm Angel	78
17	31/08/2011		10P0402	11:50	9:50	Roses	42°21'13"N	3°19'65"E	1.44	Estram	265
18	01/09/2011		10P0546	11:25	9:25	Roses	42°20'61N	3°09'88"E	1.35	Rifo	264
19	01/09/2011	29/09/2011	10P0547	14:20	12:20	Roses	42°20'62"N	3°20'16"E	1.49	Mariona	28
20	01/09/2011	03/11/2011	08A0388	16:00	14:00	Roses	42°20'7"N	3°20'02"E	2.4	Mojito II	63
21	03/09/2011	26/09/2011	09P0412	10:55	8:55	Llança	42°20'7"N	3°20'2"E	1.99	Mojito II	23
22	10/09/2011	27/09/2011	10P0399	20:44	18:44	Strait	35°59'291"N	5°27'175"W	1.56	Ciscar	17

ARCHIVALS 2011

Date	ID	Time	GMT	Area	Latitude (N)	Longitude (E)	Length (cm)	Vessel
11/07/2011	890130	14:29	13:29	Roses	41°55'05"	3°49'29"	0.86	WWF Columbus
12/07/2011	890127	13:34	12:34	Roses	41°57'26"	3°47'21"	0.54	WWF Columbus
15/07/2011	890150	14:56	13:56	Roses	41°51'45"	3°36'46"	0.82	WWF Columbus
16/07/2011	890157	10:40	09:40	Roses	41°54'20"	3°28'01"	0.6	WWF Columbus
16/07/2011	890148	10:45	09:45	Roses	41°53'62"	3°28'09"	0.62	WWF Columbus

Note that the trajectories presented in the following figures are from those tags that lasted more than 30 days attached to the tuna (i.e. more than 30 days at liberty).

3. RESULTS AND CONCLUSIONS

W MEDITERRANEAN TAGGING

The 2011 provisional results support and reinforce the outcome found from 2008-2010 campaigns (see Cermeño *et al.*, 2011.SCRS/2011/159), where a stable seasonal residence area (most probably for feeding) is observed for both adults and juveniles in the NW Mediterranean (Catalan Sea and off Gulf of Lions), during at least late summer and autumn (Figure 2). From that moment (autumn) a migration occurs to either the southwest (towards the Atlantic, but to date never leaving the Mediterranean) of some of the adults associated to the Balearic spawning ground, or to the southeast of adults and juveniles to possibly spend the winter in the southern Tyrrhenian Sea and around the Strait of Sicily.

The most striking result from these tags is the observed strong residence in the western Mediterranean (for both juveniles and adults) of an important part of the BFT population which never leave the western Mediterranean basin.

The fish tagged on May 25 2011 in Moraira (45-55 kg) (Figure 3), which is the first one that we have been able to tag prior their reproductive season, is, for the first time ever, showing evidence of the already known spawning occurring south of the Balearic Islands. Looking at Time at Depth figure (Figure 4), we can see a clear preference for shallower waters (2-10 m depth) from the 6 June to 13 July 2011, corresponding to the well-known spawning area south of the Balearic Islands (Figure 3). Furthermore if we look at the depth pattern for the 1-12 August – when the fish is more or less in the same area as the initial spawning area (i.e. in early-mid June) - we can observe a very different use of the water column, this time is much deeper and the time at depth is more homogeneously distributed, probably indicating feeding. This result, therefore, reinforces the idea that the strong attachment to the western Mediterranean applies to both juveniles and some reproductive adults.

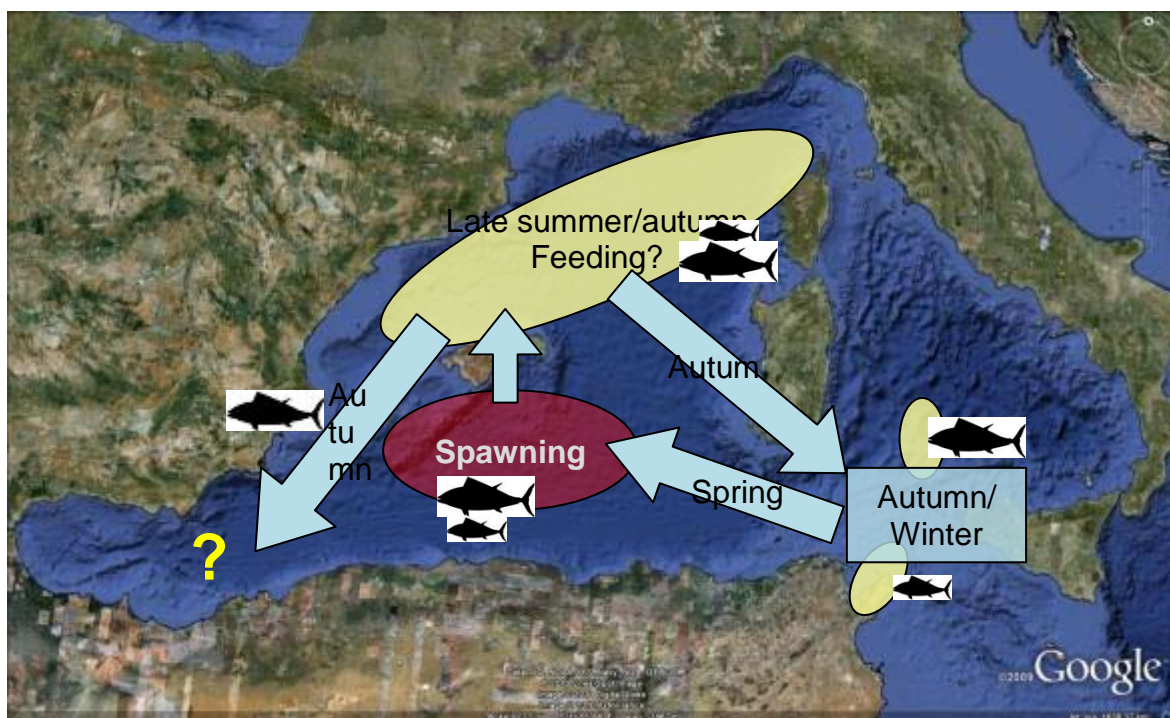


Figure 2. Schematic representation of some behavioral patterns found so far for W Mediterranean BFT.

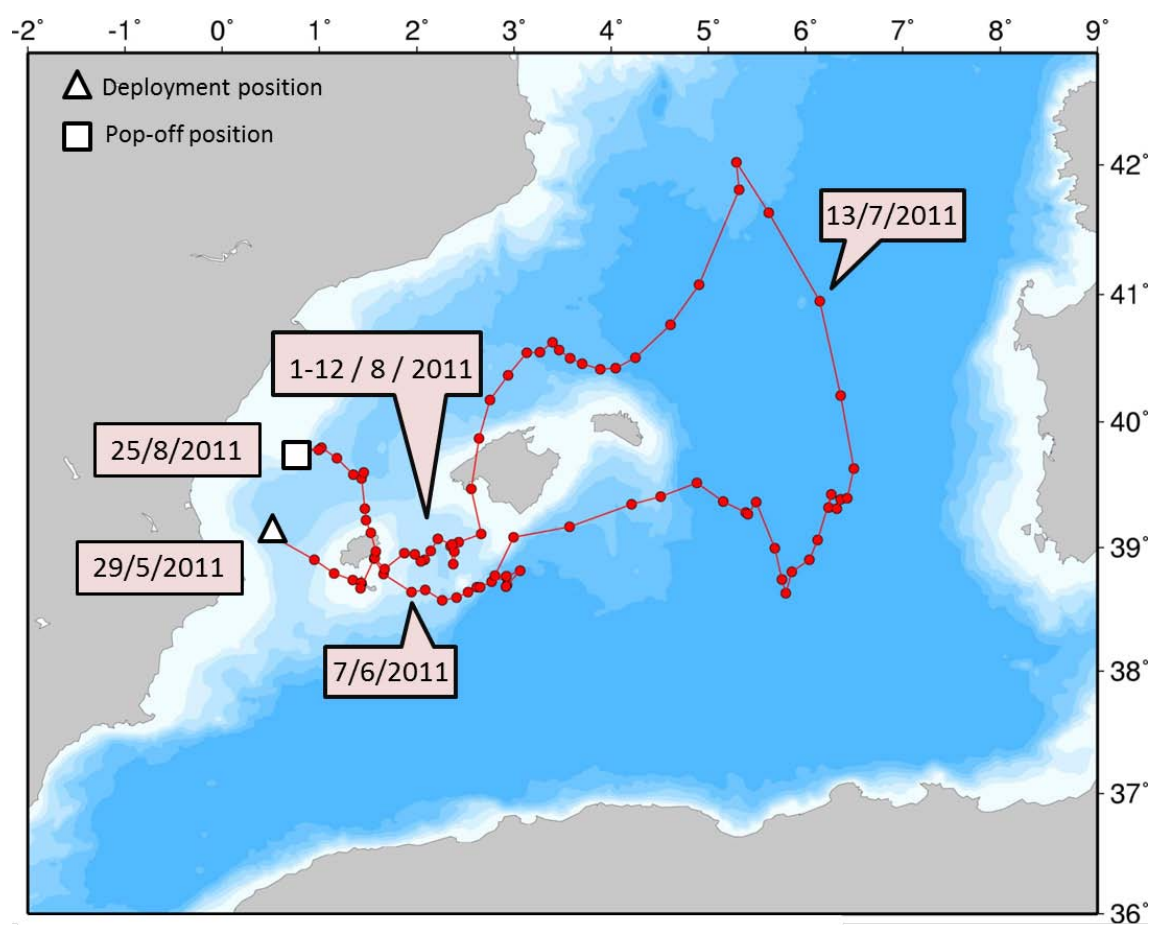


Figure 3. Trajectory of BFT tagged off Moraira (W Mediterranean).

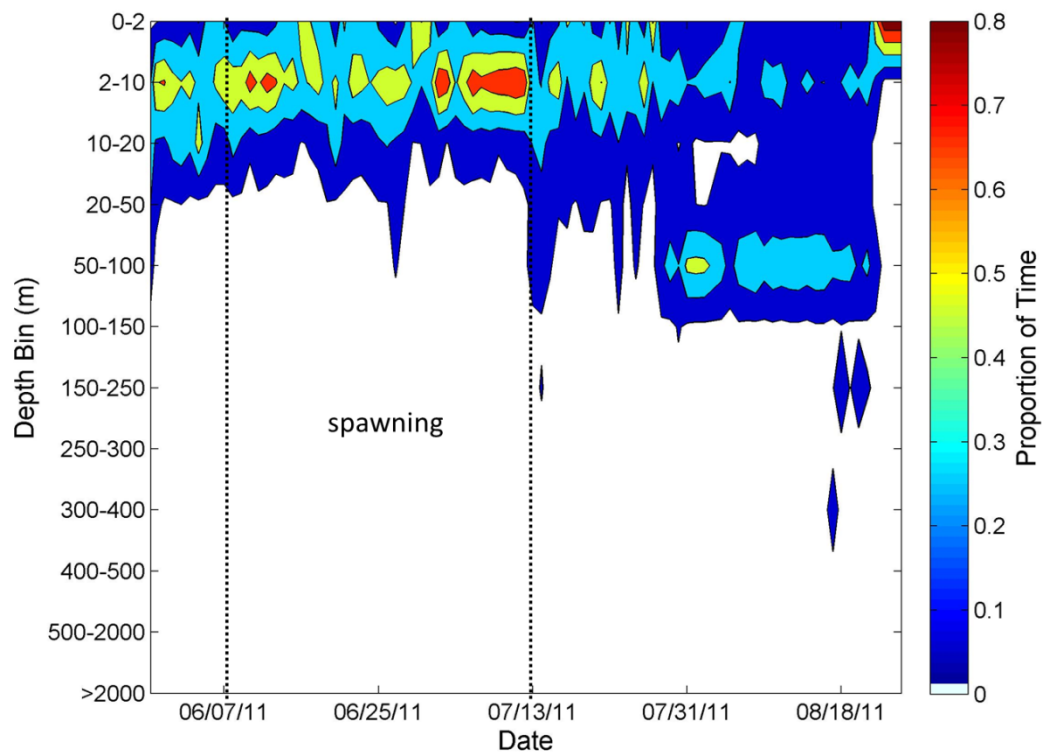


Figure 4. Time at Depth of the BFT tagged off Moraira (W Mediterranean).

ADRIATIC TAGGING

Two of the tunas tagged in the Adriatic have shown (similarly to the results from 2009 and 2010) the strong residence in that basin, at least during autumn, winter and spring, as well as confirming the already observed pattern of attachment to deeper areas, particularly Jabuka Pit/Fossa di Pomo and South Adriatic Pit (Figure 5). On the other hand, two further tags that recently released have shown a different pattern from the one observed to date, i.e. they both left the Adriatic towards the end of September to go to the NW Mediterranean (Figure 6).

MOROCCAN TRAP TAGGING

For the first time ever in the BFT tagging history, fish were tagged in a Moroccan trap, and in collaboration with ICCAT GBYP. Some unexpected results have appeared from the released tags (Figure 7). As we can observe, only one of the fish tagged entered the Mediterranean Sea (ID# 97462). The other two, however, moved to the Canary Islands and one even continued to the Azores.

Worth noting that the tag ID# 97462 holds the record of lasting attached to a tuna for the whole 300 days that was programmed for (from May 2011 to March 2012).

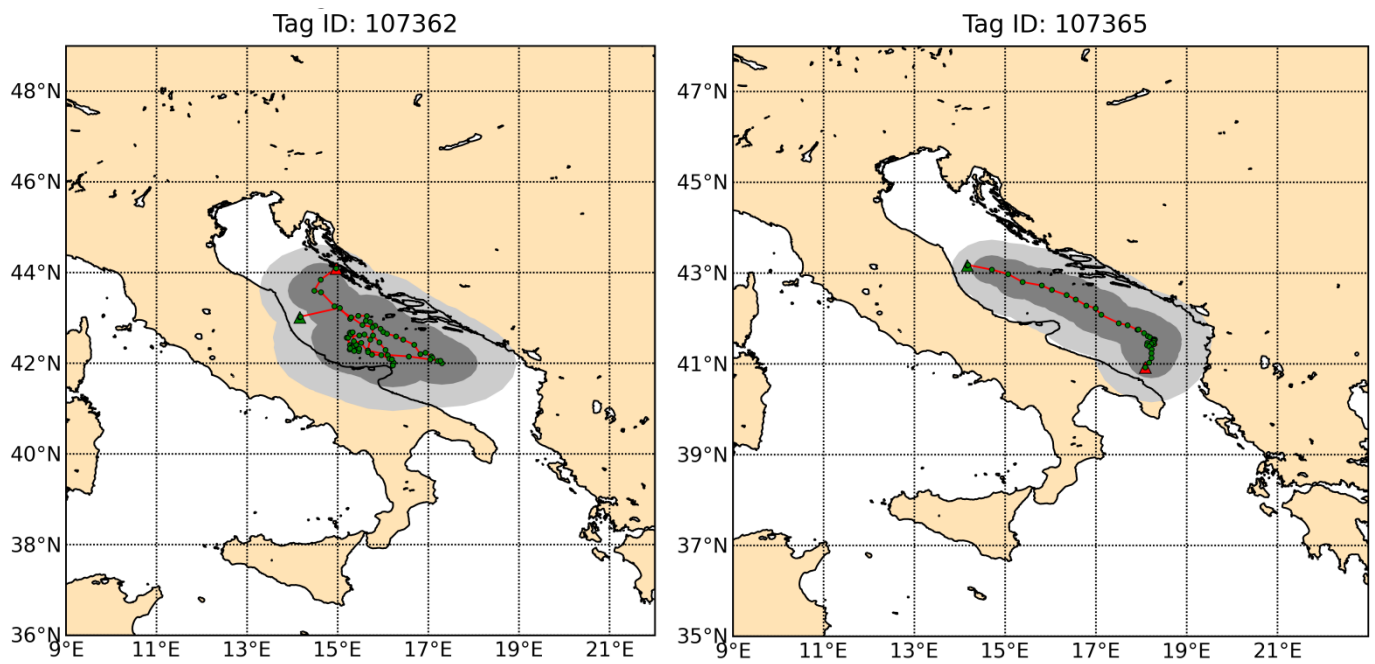


Figure 5. Trajectories of the two BFTs that were tagged (in 2011) and remained in the Adriatic Sea.

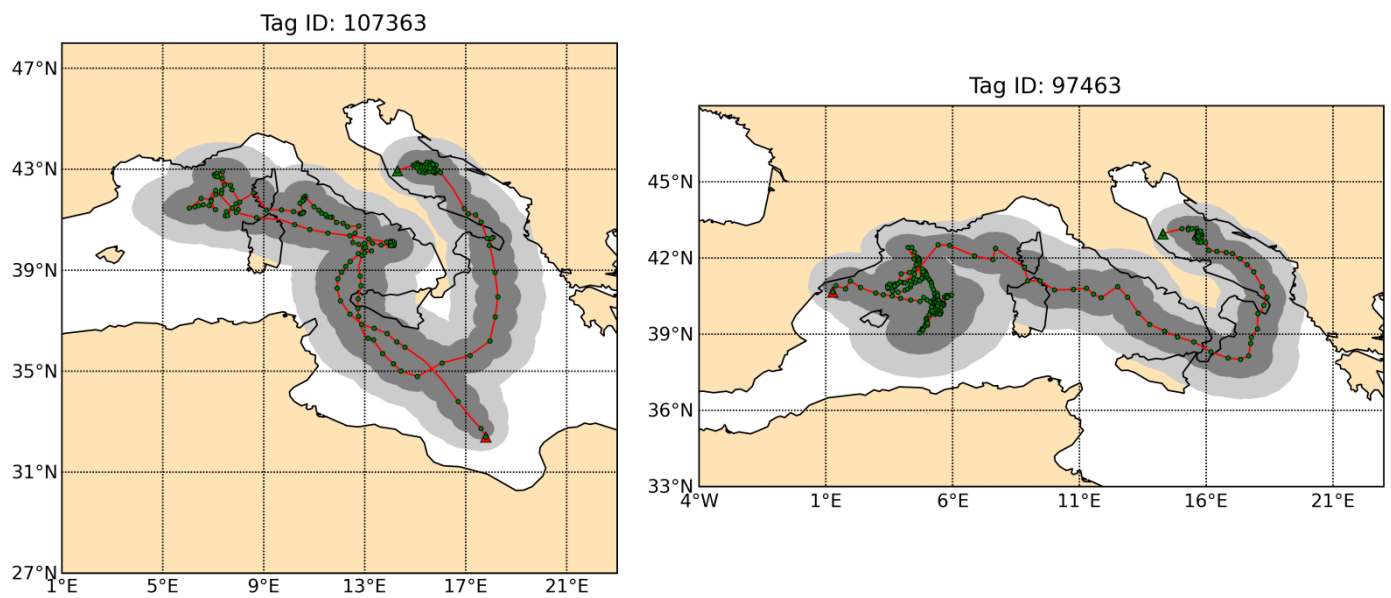


Figure 6. Trajectories of the two BFTs that were tagged (in 2011) and left the Adriatic Sea.

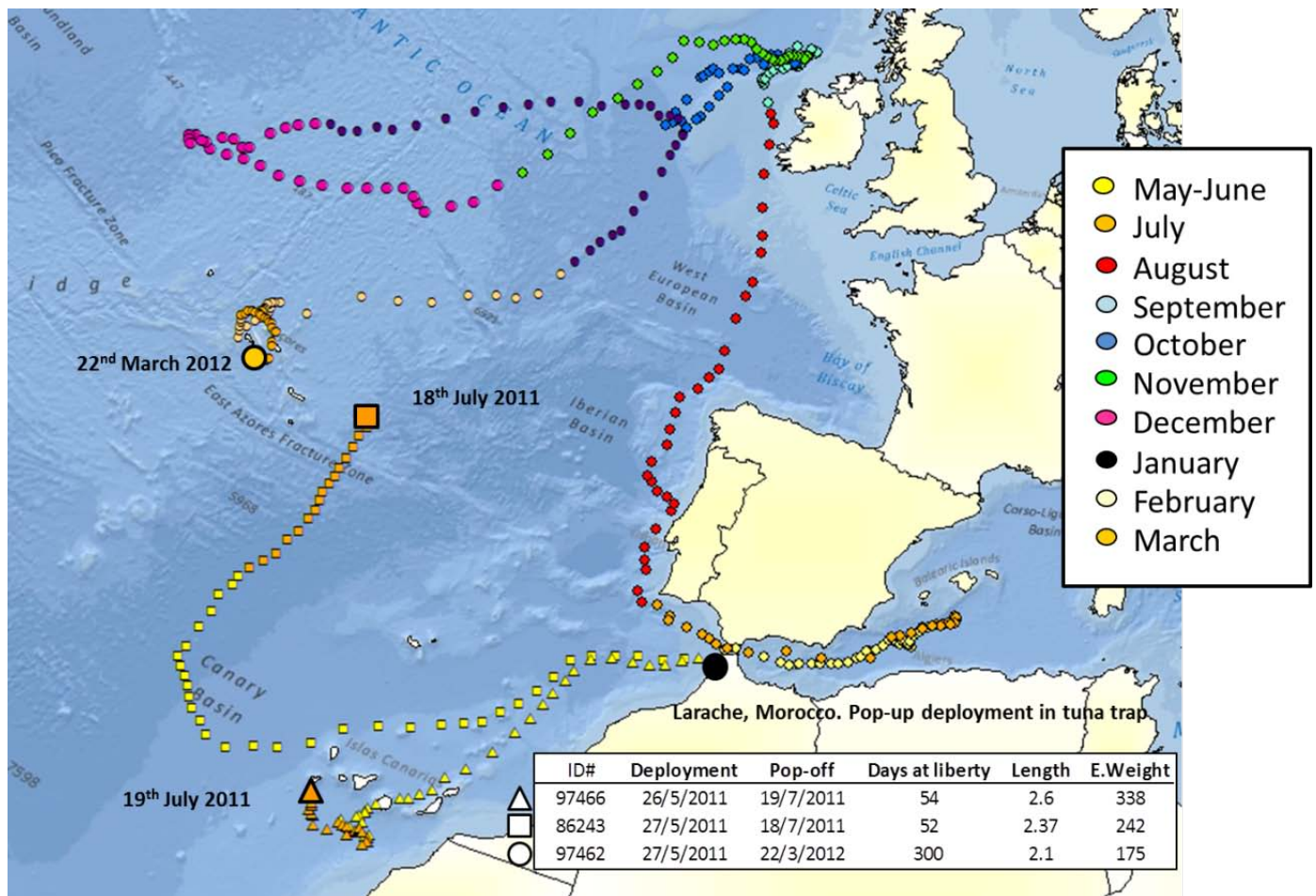


Figure 7. Trajectories of BFT tagged in Moroccan trap in Larache.

ARCHIVAL TAGS UPDATE

In addition this year an archival tag was recovered after nearly 3 years in the wild, being the first of this kind ever recorded in the Mediterranean (Figure 8). The juvenile tuna was tagged on 31st August 2008 off Roses (NW Mediterranean), with a weight of 13.5 kg and was recovered 963 later in April 2011 in the Strait of Sicily with an approximate weight of 35-40 kg.

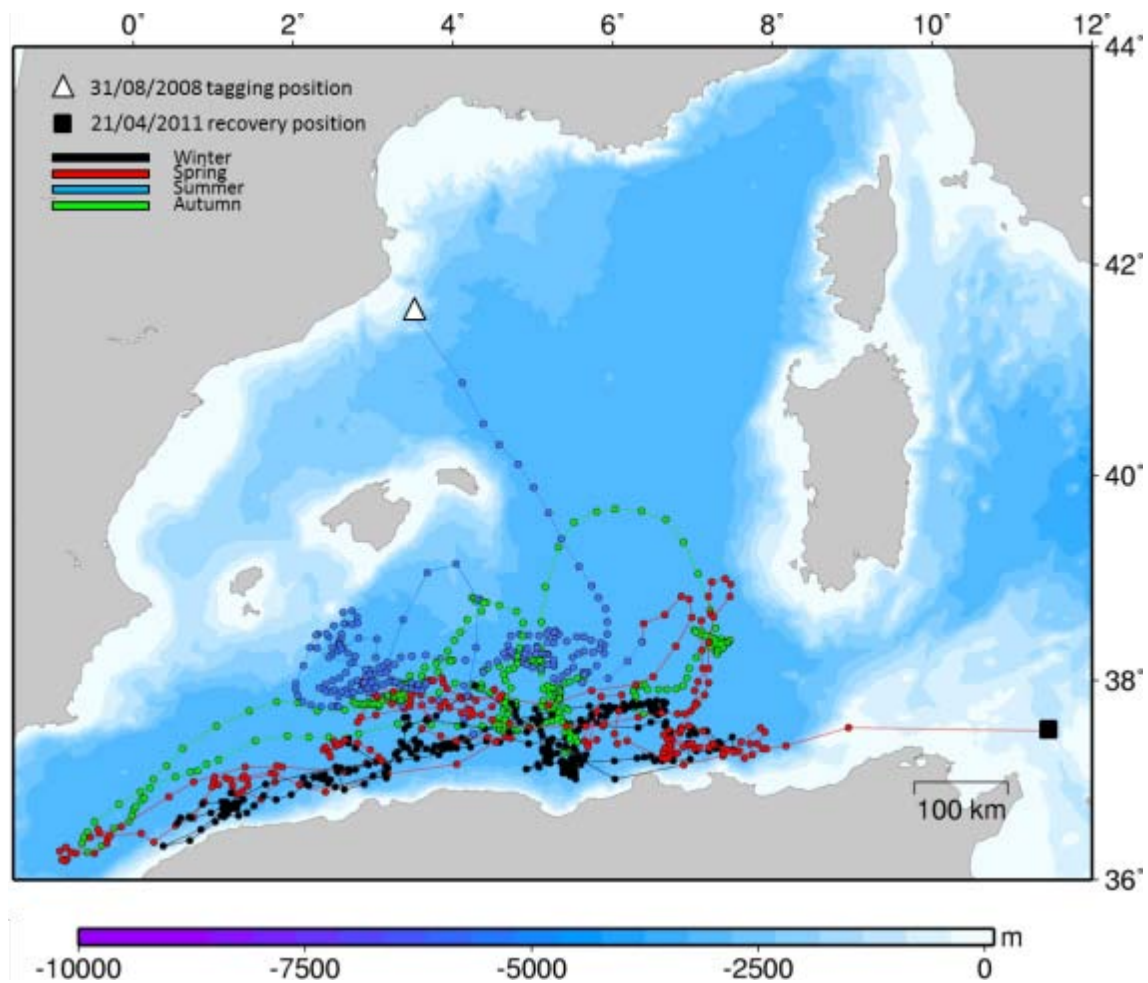


Figure 8. Trajectory of juvenile tagged off Roses (NW Mediterranean) at the end of August 2008 and recovered 963 days later in 2011.

Not only we observed that the spatial distribution pattern was similar to the one revealed by its twin archival tag (deployed the same date and in the same place) which was recovered in 2009 after 391 days 100 miles from deployment (Figure 9); but we have also uncovered a permanent residence area for juveniles (> 2.5 years) in the southern Balearic Sea and offshore Algeria (Algerian Current system) (Figures 8 and 9).

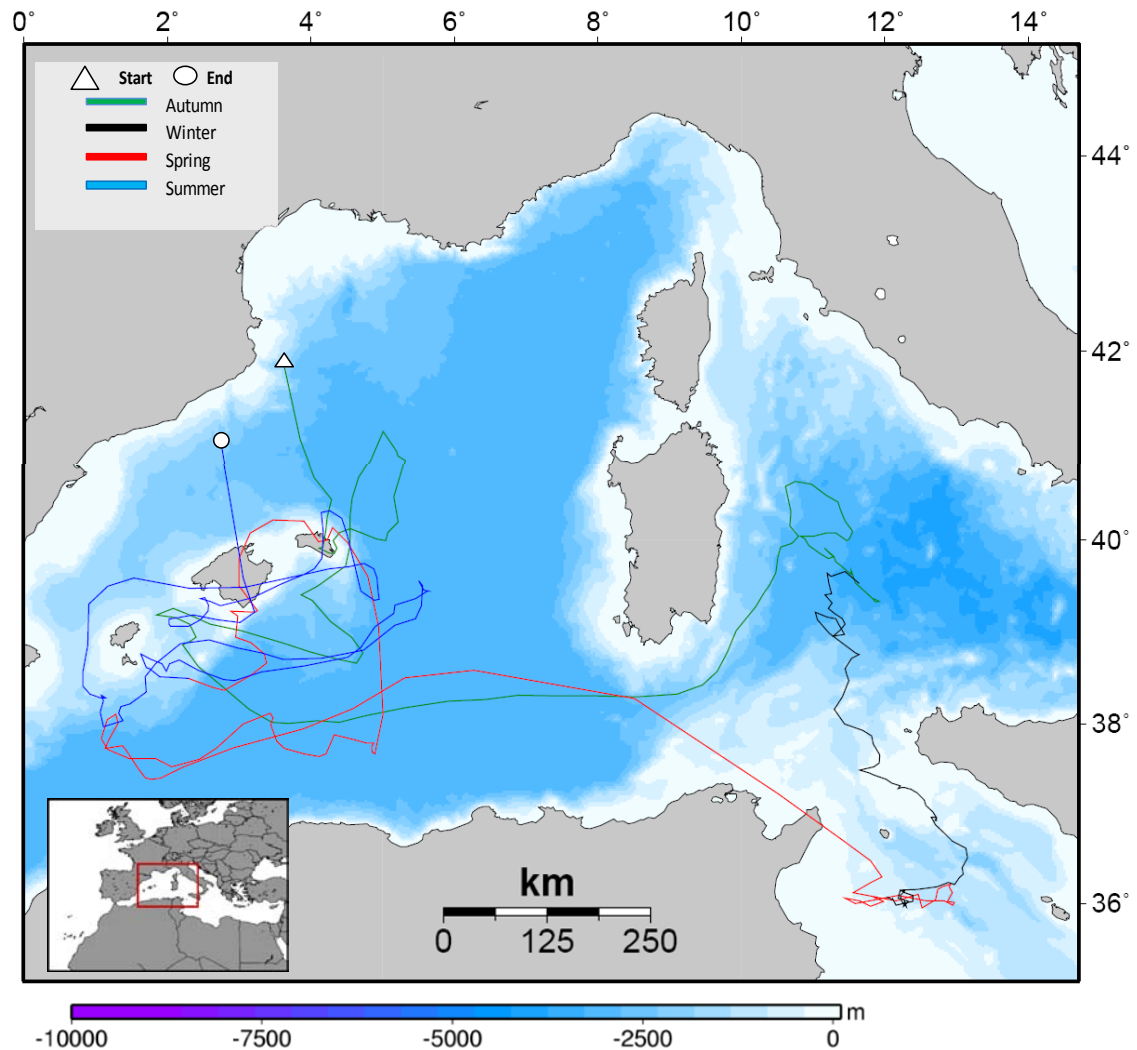


Figure 9. Trajectory of juvenile tagged off Roses (NW Mediterranean) at the end of August 2008 and recovered 391 days later in 2009.

4. FUTURE ACTIVITIES

In the past few years we have been able to build a strong partnership with recreational fishermen, moreover the team is increasingly expert and efficient, and after the successful tagging at the trap in 2011, in May 2012 we were able to repeat our work in collaboration with ICCAT. The prospects for the year 2012 are therefore very promising.

On the scientific side, we are working on a formal first scientific publication coupling trajectories and oceanographic data, to be submitted to a peer reviewed journal towards the end of the year.