Scientific, Technical and Economic Committee for Fisheries (STECF) -European data for North Atlantic and Mediterranean albacore (STECF-17-03)

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HAL Id: hal-03130900

https://hal.science/hal-03130900

Submitted on 3 Feb 2021

Abstract

Commission Decision of 25 February 2016 setting up a Scientific, Technical and Economic Committee for Fisheries, C(2016) 1084, OJ C 74, 26.2.2016, p. 4–10. The Commission may consult the group on any matter relating to marine and fisheries biology, fishing gear technology, fisheries economics, fisheries governance, ecosystem effects of fisheries, aquaculture or similar disciplines. This report deals with the current status of European data for North Atlantic and Mediterranean albacore.

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**SCIENTIFIC, TECHNICAL AND ECONOMIC COMMITTEE FOR FISHERIES (STECF) -
European data for North Atlantic and Mediterranean albacore (STECF-17-03)**

The report of the Expert group held during 13-16 March 2017 was reviewed during the STECF plenary meeting held in Ispra, Italy, 27-31 March 2017.

Request to STECF
STECF is requested to review the report of the STECF Expert Working Group meeting, evaluate the findings and make any appropriate comments and recommendations.

STECF response

STECF comments

The European Union is the main producer of albacore tuna in the Mediterranean and the North Atlantic, catching 90% and 80% of the total catch of each of the stocks during the last decade, respectively. Thus, the EU has a particular responsibility for the provision of good quality data for these stocks.

However important data gaps, concerns on data quality and a lack of relative abundance indices exist for the Mediterranean albacore. In consequence, the stock assessment relies on data poor methods and is the only major tuna stock at ICCAT that currently lacks an estimate of MSY (ICCAT, 2016). In addition, scientists from the main EU fishing countries do not participate in the stock assessment process, making it difficult for the group to interpret the data available in ICCAT datasets and to make decisions around those.

Regarding the North Atlantic albacore, data gaps are minor. The main issue is that the available indices of abundance are noisy and often show opposite trends.

The ICCAT albacore tuna working group as well as the Standing Committee for Research and Statistics have drafted many recommendations to try to improve the situation. The last assessment of the Mediterranean stock was conducted in 2011, and the next stock assessment will take place between 5th to 9th of June 2017, so it is important to address these ICCAT recommendations by then, to the extent possible.

The EWG 16-19 on European albacore tuna data met in March 2017 in order to (i) review the completeness of EU data in ICCAT datasets, (ii) identify available Mediterranean data not submitted to ICCAT, (iii) review the new abundance index for the French mid water trawl fleet, (iv) explore additional data sources to improve the situation regarding indices of abundance and (v) identify available information on bycatch species in albacore fisheries.

The STECF considers that all ToRs were properly addressed by the EWG, which achieved some significant outcomes. Regarding the Mediterranean stock, the EWG focussed mostly on data from Italy (which caught around 60% of the total catch during the last decade) and identified additional information, mostly biological data, that would be useful for the ICCAT working group.

The STECF plenary compiled a more complete set of information regarding the data collected by Italy under DCR/DCF during 2003-2015 (Table 1). The STECF noted that in the ICCAT database there is no effort information before 2009. The data identified in Table 1 should thus be submitted to ICCAT to fill in this data gap between 2003 and 2008. At the same time, it is desirable to explore additional sources of information to cover data holes prior to 2003. The identified dataset would also allow for a complete revision of the Task 2 data (catch, effort and size) that exists in ICCAT, with special focus on the size distribution for the year 2003 that has a size range beyond biological expectations (>150cm).

Table. Data availability for *Thunnus alalunga*, DCF - Italy.

Source: Italian Annual Reports on the activities performed under the National Data Collection Programs.

Year	Landings by month and by gear*	Effort by month, by gear and by GSA**	Number of sampled individuals for:				
			Length	*Weigth*	*Age*	*Sex*	*Maturity*
2003	x		1093				
2004	x	x	728				
2005	x	x	1785				
2006	x	x	819				
2007	x	x	278	278			
2008	x	x	3079	3079			
2009	x	x	1077	1077			
2010	x	x	2486	2486	263		
2011	x	x	366	366			
2012	x	x	252	252			
2013	x	x	72	72	352	352	352
2014	x	x	638	638			
2015	x	x	169				

* Landings data are available by month, at fleet segment level and at métier level 6. Landings data refer to the métier and they are not species - specific.

**The following effort variables are available for longliners by month and by GSA from 2004:

Effort: Days, GTDays, KWDays, GTHours, Hours, KWHours, number of vessels, number of hooks. 2003 data available by fleet segment (prevalent fishing technique) and not by gear. Effort data refer to the métier and they are not species - specific.

ICCAT also recommended splitting the catch assigned to "unclassified" gears (mostly for Italy and Greece). The identified dataset for Italy will also be helpful for this task. According to the EWG, unfortunately there is no data for Greece in the past on gear specific landings, but expert knowledge could be used to accomplish this task.

The STECF acknowledges the availability of biological data for Italy that might allow to substantially improve the biological parameters (growth, maturity and length weight relationship) used by the ICCAT albacore tuna working group. However, STECF notes that similar data are also available in other countries (e.g. Spain, Cyprus, Greece). The STECF considered therefore most appropriate to conduct a joint analysis of all the datasets, to estimate a maturity ogive, a growth model and a length weight relationship that represents the whole stock.

Regarding the North Atlantic stock, the STECF welcomes the catch and effort data collected for the French mid water trawl fleet (one of the main fisheries targeting the stock, with 15% of the total catch during the last years), and the derived relative abundance index. The new data are already submitted to ICCAT and incorporated into the datasets. The new index is comparable to the baitboat index (the only EU index used in the last assessment), and the STECF recommends to present it in the next albacore meeting, for its consideration in future assessments. The STECF also welcomes the efforts made by Portuguese scientists to use swordfish targeting longline fishing operations as a potential source of albacore relative abundance information. Given the wide geographic extension of these longline operations, substantially overlapping with the North Atlantic albacore tuna distribution, the STECF encourages that efforts continue to standardize these data. Moreover, and considering the low amount of albacore caught by this fleet, it would be desirable to extend these efforts to the Spanish longline fleet.

STECF conclusions

The STECF recommends DGMARE to make sure that, in order to improve the EU data and participation issues identified by ICCAT for Mediterranean albacore, the following actions are taken by Member states before the next stock assessment to be conducted between 5th and 9th of June:

- Submit to ICCAT, following official formularies, the Italian Task 2 data (catch, effort and size disaggregated in time and space) collected under the DCF and DCR, for the missing years. This involves primarily effort data for the period 2004 to 2008. However, a complete revision of all the Italian Task 2 data series is also recommended to address ICCAT concerns on data quality.
- Disaggregate the task 1 (total annual catch) data associated to "unclassified" gears for Italy (2003-2015) and Greece (1996-2002), and submit a gear specific Task 1 revision to ICCAT.

Additionally, STECF encourages the following actions

- To conduct a joint biological analysis for Mediterranean albacore, using data collected through DCR/DCF by the different Member States on maturity, growth and length-weight relationship, to update the biological parameters used for this stock at ICCAT.
- Assure participation of EU scientists from the most relevant Member States in albacore landings (Italy, Greece, Spain and Cyprus) in the forthcoming stock assessment, providing standardized cpues for their fisheries and contributing to the understanding of the fisheries and stock dynamics.

Regarding the North Atlantic albacore stock, the STECF acknowledges the recent improvements regarding task 2 data for the French mid water trawl fishery and supports that the newly developed relative abundance index for this fishery is presented to the ICCAT albacore working group. Likewise, in the longer term, the STECF suggests to continue exploring the possibility to obtain relative abundance of albacore tuna using swordfish oriented longline fishing operations by Portugal and Spain.

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REPORT TO THE STECF

Report of the Expert Group on European data for North Atlantic and Mediterranean albacore (EWG-16-19)

Ispra, Italy, 13-16 March 2017

1   EXECUTIVE SUMMARY

The scientific bodies of the International Commission for the Conservation of Atlantic Tunas (ICCAT) have in the past noted shortages and problems with the data on the activities of the European fleets on the stocks of North Atlantic and Mediterranean albacore, *Thunnus alalunga*, (Anon. 2011, 2012a, 2012b, 2014a, 2014b, 2014c, 2016a, 2016b).

Given the upcoming session of ICCAT Working Group on Albacore (WGA), which is scheduled to attempt an evaluation of the status of the stock of Mediterranean albacore, and the results of last year's stock assessment of North Atlantic albacore (Anon. 2016b), this EWG was tasked with investigating possible solutions for the problems that have been identified.

Under the current CFP, EU member countries must collect data of the activities of their fishing fleets, as well as that necessary for the estimation of biological parameters of the stocks under exploitation. Furthermore, the Data Collection Framework establishes the overarching mechanism by which coverage and precision levels on data collection are to be achieved.

At the same time, contracting parties of the International Commission for the Conservation of Atlantic Tunas (ICCAT) must report data on the activities of fleets under their flag to allow its Scientific Committee of Research and Statistics (SCRS) to conduct the necessary analyses and evaluations of stock status, to then be able to provide sound scientific advice for the management of those fisheries. The two stocks considered by EWG 16-19, North Atlantic and Mediterranean albacore (Thunnus alalunga), are under the remit of ICCAT's mandate. In both cases, most of the catches are taken by fleets operating under EU flags, so the EU has a particular responsibility for the provision of good quality data for these stocks.

The EWG was asked to work on a number of issues on data quantity and quality that had been identified by the relevant bodies of ICCAT: the Working Group on Albacore (WGA), and the SCRS. In summary, for the North Atlantic the data gaps are minor, but the available relative abundance series are noisy and sometimes controversial, while in the case of the Mediterranean, there are important information gaps, as well as lack of relative abundance indices appropriate for stock assessment.

A new dataset of catch and effort for the French pelagic trawl fleet, according to the requirements of ICCAT Task 2 database, has been assembled through an specific contract for this meeting and then reviewed by the group. This dataset is in the process of being submitted to ICCAT for incorporation to the Task 2 (T2CE) dataset. The standardized CPUE time series for this fleet was reviewed as a potential index of abundance for North Atlantic albacore and recommended for consideration by WGA.

Previously identified shortages and absences of data from EU fleets were reviewed and possible sources of information that could be used to complete and ameliorate them have been identified and listed. The work required to carry out these corrections will need to be conducted by scientists with the necessary knowledge of the fisheries involved and of the specific arrangement under which the data has been collected.

A particular issue has been identified with biological data collected by Italy under the current DCF. While biological data (age, length-weight, maturity and sex ratio) appears to have been collected and reported back to the relevant authority, it is not being made available for interested scientists, nor presented to ICCAT scientific bodies. Data has been collected in 2010, 2013 and 2016, although the later is still to be submitted. The EWG considers that an appropriate mechanism (e.g., an specific data call followed by an analysis of the data by a qualified scientist) needs to be considered to make all data on the biology of Mediterranean albacore collected under the DCF quickly available so it can be used to inform the upcoming stock assessment of Mediterranean albacore by WGA, scheduled for June 2017. This analysis should try to utilize the full these dataset to obtain a better estimate of biological parameters for the stock.

In the longer term, a data-mining exercise on data collected on Mediterranean albacore on behalf of the Italian authorities in the past should be considered. Data collected under the Data Collection Regulation (DCR) was submitted and stored by the national administration, and should have also been kept at each of the seven operational units along the Italian coast in charge of this task at that time. Additional data collected under a range of national or European research

projects could be available, and could also be assembled through this exercise. Some Italian data presented in the past to ICCAT meetings has been partly incorporated to the ICCAT datasets, but it would be necessary to fully review this process. The feasibility of the exercise could be first assessed through contacts with the relevant authorities and scientists, so as to get an indication of the quantity of data and the storage format in which it could be found. Such a study, together with a review of published sources of information, some of it having originated from the same data collection programs, has the potential of assembling a much richer dataset for this stock and fishery.

Given the relative scarcity and dispersion of information for the Mediterranean albacore stock, it appears reasonable that greater integration of data could improve our knowledge on its biology and dynamics. Particularly, biological parameters are being estimated at several locations from limited sampling efforts and analysed in isolation. The organization of a network of relevant scientists could help ameliorate this problem.

The discrepancy between the data submission requirements of various Regional Fisheries Management Organizations, such as ICCAT, and those contemplated in the European data collection regulations was noted by the EWG. Some of the European fleets catching albacore are not currently collecting data on, for example, the size distribution of the catches, which ICCAT requires, given that they are responsible for a low percentage of the total catches of the stock.

The use of data, specially catch rates, from fleets operating in the North Atlantic, which catch albacore in small numbers, but which have a large spatial coverage, was indicated as a possibly relevant source of information on trends in abundance for the stock. A preliminary analysis of one such fleet, Portuguese longliners targeting swordfish, was reviewed, and found to be potentially useful at providing some context for the analysis of changes in spatial distribution of the stock and the effect this process might be having on other CPUE series, but also for obtaining an abundance index covering a larger proportion of the area occupied by the stock. Unfortunately, the coverage of the observer program is limited, which might compromise the standardization of the CPUE, but further analysis will be required, including a possible comparison with similar fleets, to really assess the utility of these data.

In relation to the information available on by-catch obtained by the European fleets targeting North Atlantic and Mediterranean albacore, the currently available sources of information have been listed and reviewed. Although there is at least some information for the main gears, it is mostly limited to the by-catch and discards of commercial species, and there is limited information to understand spatio-temporal patterns of by-catch in the European fisheries targeting albacore tuna.

2 INTRODUCTION

The meeting of STECF Expert Working Group 16-19 took place at the European Commission Joint Research Centre (JRC), in Ispra, Italy, between the 13 and 16 March 2017, and was attended by ten experts (nine on site and one remotely).

3 TERMS OF REFERENCE TO THE EXPERT GROUP

The ToRs for this EWG were set as follows:

- Review the current completeness and quality of the European data for the North Atlantic and Mediterranean albacore stock in ICCAT datasets, particularly focusing on data required for stock assessment and provision of advice.
- Compare data quantity and quality with what could be expected to be submitted given the current data collection requirements for both stocks under the DCF.
- Review the newly assembled dataset of catch and effort of North Atlantic albacore by the French mid-water trawl fleets, and assess its use as an index of abundance in the next stock assessment for the stock.
- Assess the availability and information content of data on catches of North Atlantic albacore by fleets not targeting the species, such as European swordfish longliners, and evaluate their spatial and temporal coverage in comparison with those of existing CPUE series.
- Discuss other sources of relevant information currently available which may help scientists to better interpret fisheries-dependent indices of abundance, particularly on the geographical distribution of the fishing activities and on possible historical changes in fishing patterns or fishing strategies in EU albacore fisheries of the North Atlantic and the Mediterranean Sea.
- Identify European sources of data on Mediterranean albacore of interest to the upcoming stock assessment (catch, length sampling, indices of abundance), including those from fleets not targeting albacore, and propose strategies for the compilation, analyses and evaluation of those data sets prior to ICCAT's Albacore species group inter-sessional meeting (June 2017).
- Review the available information and identify data gaps for the evaluation of by-catches in the European fleets targeting North Atlantic and Mediterranean albacore.

4   **REVIEW THE COMPLETENESS AND QUALITY OF EUROPEAN DATA FOR NORTH ATLANTIC AND MEDITERRANEAN ALBACORE STOCKS**

The EWG revised the completeness and utility of the EU data in ICCAT, as highlighted in ICCAT data catalogues for North Atlantic and Mediterranean stocks, as well as the recommendations related to EU statistics that the Working Group on Albacore and the SCRS have made since 2010 (Anon. 2011, 2012a, 2012b, 2014a, 2014b, 2014c, 2016a, 2016b). The work plan for 2017 of the Working Group on Albacore also includes issues related to EU data, which were identified as key tasks to be conducted within this year (Anon. 2016a).

ICCAT contracting parties, and by extension the relevant EU member countries, are requested to submit two main sources of data:

- Task 1 (T1) total nominal catch per year.
- Task 2 (T2) divided in T2CE, catch and effort, and T2SZ, size information, both of them disaggregated by 1ºx1º or 5ºx5º geographical squares, and month or quarter.

The ICCAT data catalogues rank each fishery according to the proportion of the total catch they take, and then analyse the coverage of Task 2 data, which can be used to identify the most relevant data gaps.

North Atlantic albacore

The North Atlantic data catalogue shows that nearly 90% of the total yield is caught by only seven fleets (EU-Spain BB and TR fleets, Chinese Taipei LL, EU-France TW and GN, EU-Portugal BB, and EU-Ireland TW). Six of them are EU fleets, and their T2CE and T2SZ series are almost complete for the last 15 years. EU-France TW data has recently been submitted to ICCAT. According to the 2017 work plan of the ALB WG, and following standard protocols, there is a need to document the changes with respect to previous submissions, so that it is clear what needs to be replaced in the ICCAT database. There are some minor gaps in T2CE and T2SZ series (EU-France TW, EU-Portugal BB and, EU-Ireland TW), however the EWG identified that size data is actually being submitted, albeit in a different format, with the agreement of ICCAT. The data catalogue should reflect this in future editions.

The EU-Ireland gillnet fleet is not operating currently, but used to be a major fishery before 2002, and lacks most of the T2 data during the time series. The EWG found that these data are probably not available.

Other less important fisheries with important gaps include EU-Spain longline fisheries targeting swordfish, for which effort and size information remains unavailable for the 1998-2015 period. The EWG noted that some observer information might be available to fill this gap.

Given the lack of fisheries independent information, relative abundance series based on standardized CPUE are essential for the stock assessment. The current base case, based on a surplus production model, includes a single EU index (by Spanish baitboats), and four other longline indices by non-EU fleets. The French troll and Irish mid water trawl indices are relatively short and noisy and are not considered in the assessment. The French MWT index produced becomes a new candidate for the next assessment.

s FlagName	GearGrp	DSet	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Rank	%	%cum
	T1 Total		36881	27931	30851	38135	35163	38377	28803	29023	25746	34551	33124	26253	22741	25567	25960	35318	36989	21991	20483	15375	15909	20039	25680	24634	26660	5954			
EU.España	BB	t1	15442	8267	10814	12277	11041	9953	9640	9401	7346	8448	10774	4929	4712	7325	7893	10067	14182	8375	7403	4940	5841	4676	7753	4473	4740		1	29.6%	30%
EU.España	BB	t2	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	ac	ac	ac	ac		1		
EU.España	TR	t1	10342	8955	7347	6094	5952	10225	6649	7864	5834	6829	5013	4245	3976	5193	7477	10165	10277	6089	5233	4437	7009	3564	5833	5864	6651		2	23.5%	53%
EU.España	TR	t2	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	ac	ac	ac			2		
Chinese Taipei	LL	t1	1651	4318	2209	6300	6409	3977	3905	3330	3098	5785	5299	4399	4330	4557	4278	2540	2357	1297	1107	863	1587	1367	1180	2394	948	2857	3	11.6%	65%
Chinese Taipei	LL	t2	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	ab	ab	ab	ab			3		
EU.France	TW	t1	1032	463	2459	1706	1967	2904	2570	2874	1178	4723	3466	4740	4275	3252	2194	6743	5878	2842	2806	773	1216	3249	3126	4327	6699		4	10.9%	76%
EU.France	TW	t2	abc	abc	abc	a	ab	ab	ac	abc	ac	ac	ac	ac	ac	a	abc	abc	abc	abc	abc	abc	abc	ac	ac	ac			4		
EU.France	GN	t1	2268	3660	4465	4587	3967	2400	2048	1717	2393	1723	1864	1150	13								2	1		21			5	4.5%	80%
EU.France	GN	t2	abc	abc	ab	a	ab	ac	ac	ac	a	ac	ac	ac	a									1		1			5		
EU.Portugal	BB	t1	3182	700	1622	3369	926	6458	1622	393	76	281	255	1137	1913	516	224	391	21	80	517	54	179	855	1063	502	2601		6	4.1%	84%
EU.Portugal	BB	t2	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	a	abc	abc	abc	abc	abc	abc	abc	abc	abc		6		
EU.Ireland	TW	t1								57	319	80	634	1100	594	172	258	505	586	1514	1997	785	3595	3551	2231	2485	2390		7	3.2%	87%
EU.Ireland	TW	t2								b		a	a		abc	a	abc	abc	abc	abc	abc	abc	abc	abc	abc	ab	ab		7		
EU.Ireland	GN	t1	40	60	451	1946	2534	918	874	1913	3639	4523	3374	1430															8	3.0%	90%
EU.Ireland	GN	t2	-1	-1	-1	ab		-1	-1	c	c	c		bc	ab	ab													8		
Japan	LL	t1	737	691	466	485	505	386	466	414	446	425	688	1126	711	680	893	1336	781	288	402	288	525	336	400	1745	274	331	9	2.2%	93%
Japan	LL	t2	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab				9		
St. Vincent and Grenadines	LL	t1											703	1370	300	1555	82	802	76	263	130	134	174	329	305	286	327		10	1.0%	94%
St. Vincent and Grenadines	LL	t2											-1	-1	a	a	a		a	a	a	a	ab	a	ab	a			10		
U.S.A.	RR	t1	175	251	103	224	324	23	309	335	601	90	251	122	323	334	500	356	284	394	125	23	150	171	145	340	137		11	0.9%	94%
U.S.A.	RR	t2	ab	ab	ab	ab	ab	ab	b	ab	ab	ab	ab	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc			11		
U.S.A.	LL	t1	148	201	116	192	230	373	123	184	179	192	146	191	146	106	120	108	103	127	127	158	160	240	261	255	310		12	0.6%	95%
U.S.A.	LL	t2	ab	ab	ab	ab	ab	ab	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	abc	ab	ab			12		
Venezuela	LL	t1	93	75	51	18	0	0	52	49	16	36	106	35	67	135	116	111	155	146	138	290	242	247	292	274	437	344	13	0.5%	96%
Venezuela	LL	t2	b	b	ab	ab	b	ab	ab	ab	b	b	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	ab	a	a	a			13		
Venezuela	PS	t1	1	221	139	228	278	278	263	26	91	55	191	260	93	211	341	63	162	198	70	84	16		21		27		14	0.5%	96%
Venezuela	PS	t2	a	b		-1	ab		ab		b		a		ab	a		ab	a		ab		ab		ab				14		
Vanuatu	LL	t1											414	507	235	95	20	140	187	196	172	228	195						15	0.3%	96%
Vanuatu	LL	t2											a	a	a	a	a	a	a	a	ab	a	ab						15		
EU.España	LL	t1	8	11	13	8	5	19	35	30	105	86	214		264	12	10	216	80	118	89	240	111	117	133	159	216		16	0.3%	97%
EU.España	LL	t2	ab	ab	ab	ab	ab	ab		-1	-1	-1	-1		-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	b		16		

Figure 1: SCRS catalogue on statistics (Task-I and Task-II) for north Atlantic albacore by major fishery (flag/gear combinations ranked by order of importance) and year (1995 to 2015). Only the most important fisheries (representing ±97.5% of Task-I total catch) are shown. For each data series, Task I (DSet= "t1", in tonnes) is visualised against its equivalent Task II availability (DSet= "t2") scheme. The Task-II colour scheme, has a concatenation of characters ("a"= T2 catch/effort exists; "b"= T2 size exists; "c"= Catch at size exists) that represents the Task-II data availability in the ICCAT database.

Overall, the available EU indices are quite noisy, with some year to year inconsistencies (e.g. within mid water trawl fleets, or between baitboat and midwater trawl indices). In terms of trends, baitboat and MWT data show somewhat upward trends during the last years, unlike the troll index that shows a slightly downward trend. The WGA acknowledged that, for migratory species like albacore, CPUE series very often reflect local abundance, and as such, discrepancies among them can be expected, but overall they should reflect general trends of the whole stock. However, in the EU case, although these indices come from a similar but not completely equivalent area, they do not appear to provide a clear picture of the relative abundance trends in the NE Atlantic (Anon. 2016b).

Figure 2. Standardized CPUE series available for EU fleets, namely French troll (1975-1987),

French midwater trawl (1991-2016), Irish midwater trawl (2003-2011), Spanish baitboat (1981-2015) and Spanish troll (1981-2015), scaled to their respective means.
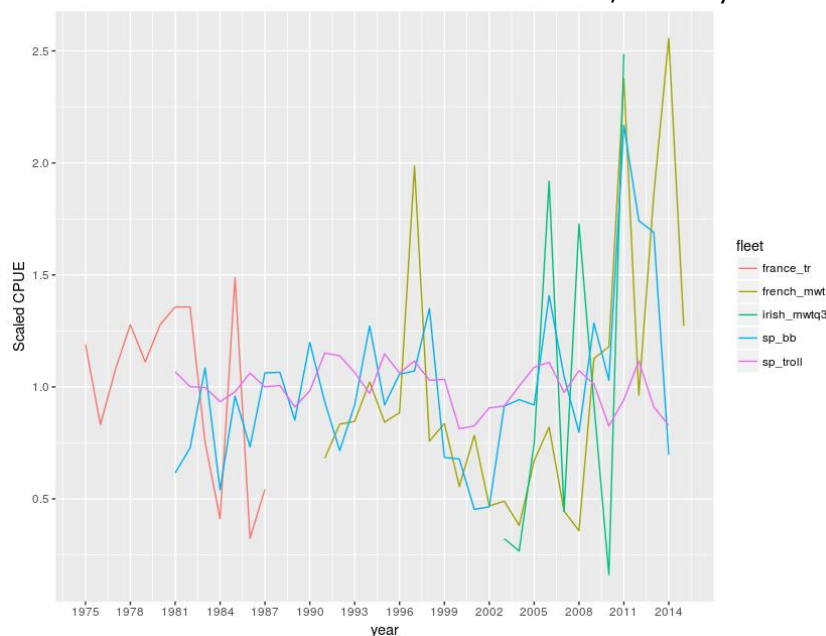
Mediterranean

The data catalogue of Task 1 versus Task 2 for Mediterranean albacore shows that Task 2 information is really sparse and incomplete for both, catch & effort and size data (Figure 3). With the exception of the Spanish BB, LL and TR fleets, and the Cyprus LL in recent years, very little and usually highly sparse information exists for the main Italian fleets (LL, PS, GN) and Greek fleets (LL, HL). The WG identified some EU albacore catch, effort, and size data, available from scientific reports and grey literature, which do not seem to be included in the ICCAT database. These include Marano et al., (2005) that has size information for the Italian drift longline fleet fishing in the Adriatic (for 1990 and 2000), and SCRS document SCRS/2010/089 (Di Natale et al., 2011) that reports on the Italian albacore catches in the Tyrrhenian Sea (2003 to 2007) and in the Central-Southern Mediterranean (2004 to 2007) with information of catch, size, age and sex ratios. The WGA recommended a revision of Task 1 data by fleet and gear. Moreover, a cause of great concern is the high percentage of gear unclassified (UN) catches reported by Greece and Italy along the time series, which need to be revised and discriminated by fleet and gear. The WGA also detected some datasets with, for example, too large (>150cm) individuals reported (e.g. in 2003 for Italy, with an exceptional total catch reported, there is a high proportion of unclassified gear catch, some of it assigned to sizes that are beyond what is expected for this species).

Table3. ALB-M stock

						1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015			
				T1 Total		1587	3150	2541	2698	4856	5577	4870	5608	7897	4874	3529	5965	6567	2970	4021	2124	4621	2047	1503	2373	3370			
Species	Stock	Status	FlagName	GearGrp	DSet	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Rank	%	%cum
ALB	MED	CP	EU.Italy	LL	t1	81	368	172	172	307	2712	2445	3631	3786	1555	1189	1995	2739	2083	919	1109	1625	1117	605	1342	1356	1	37,8%	38%
ALB	MED	CP	EU.Italy	LL	t2						ab	b		b	b	b	b	b	bc	abc	abc	abc	abc	abc	abc	abc	1		
ALB	MED	CP	EU.Italy	GN	t1	1027	1381	1222	1222	2254	916	379	397				2585	1220								0	2	15,2%	53%
ALB	MED	CP	EU.Italy	GN	t2						ab	b			b												2		
ALB	MED	CP	EU.Greece	UN	t1		952	741	1152	1950	1735	1786	1304														3	11,6%	65%
ALB	MED	CP	EU.Greece	UN	t2																						3		
ALB	MED	CP	EU.Italy	UN	t1	1					2	2	4	3125	2115	1057		0	1780		837		0	4	201		4	11,0%	76%
ALB	MED	CP	EU.Italy	UN	t2								b		b	b											4		
ALB	MED	CP	EU.Cyprus	LL	t1									17	243	337	451	695	204	220	206	247	321	357	358	505	5	5,0%	81%
ALB	MED	CP	EU.Cyprus	LL	t2									a	a	a	ab	abc	abc	abc	abc	abc	ab	a	ab	a	5		
ALB	MED	CP	EU.España	LL	t1	6	25	176	22	74	51	112	37	1	109	148	322	421	208	204	277	338	385	238	270	52	6	4,2%	85%
ALB	MED	CP	EU.España	LL	t2	ab	ab	ab	ac	ac	ab	ac	ac		a	a	a	abc	abc	abc	a	abc	ab	abc	abc		6		
ALB	MED	CP	EU.Greece	LL	t1					35	33	40	36	445	427	323	242	257	191	116	125	126	126	165	287	485	7	4,2%	89%
ALB	MED	CP	EU.Greece	LL	t2								a	a	ab	ab							b	b	a		7		
ALB	MED	CP	Turkey	GN	t1													208	631	402	1396						8	3,2%	92%
ALB	MED	CP	Turkey	GN	t2													a	a	ab	ab						8		
ALB	MED	CP	EU.Greece	PS	t1									478	326	287	1411	123									9	1,6%	94%
ALB	MED	CP	EU.Greece	PS	t2																						9		
ALB	MED	CP	Turkey	PS	t1										27	30	73	852									10	1,3%	95%
ALB	MED	CP	Turkey	PS	t2																	62	71				10		
ALB	MED	CP	EU.España	TR	t1	306	119	202	45	73				117								2					11	1,0%	96%
ALB	MED	CP	EU.España	TR	t2	abc	abc	abc	abc	abc			abc								a			a			11		
ALB	MED	CP	Turkey	UN	t1																				706		12	0,9%	97%
ALB	MED	CP	Turkey	UN	t2																						12		
ALB	MED	CP	EU.España	BB	t1	163	205		33	96	88	77	29			0		0									13	0,8%	98%
ALB	MED	CP	EU.España	BB	t2	ac	ac		ac	ac	a		a		a		a										13		
ALB	MED	CP	EU.España	SU	t1			80	2	24	41	5	12	26		29	40	60	94	31	0		6	3	6	8	0	14	0,6%	99%
ALB	MED	CP	EU.España	SU	t2		a	a	a	a	a	a	a		a	a	a	a	a		a	a	a	a	a		14		
ALB	MED	CP	EU.Greece	HL	t1					20	18	14	12	27	20	13	18	68									15	0,3%	99%
ALB	MED	CP	EU.Greece	HL	t2							a		a													15		
ALB	MED	CP	EU.Malta	LL	t1												16	1	4	1	2	5	14	29	59	37	16	0,2%	99%
ALB	MED	CP	EU.Malta	LL	t2					a	a				a			a	a	a	a	a	a	a	a		16		
ALB	MED	CP	EU.Italy	PS	t1													58	15	25		32		10	7	10	17	0,2%	99%
ALB	MED	CP	EU.Italy	PS	t2									b													17		

Figure 3: SCRS catalogue on statistics (Task-I and Task-II) for Mediterranean albacore by major fishery (flag/gear combinations ranked by order of importance) and year (1995 to 2015). Only the most important fisheries (representing ±97.5% of Task-I total catch) are shown. For each data series, Task I (DSet= "t1", in tonnes) is visualised against its equivalent Task II availability (DSet= "t2") scheme. The Task-II colour scheme, has a concatenation of characters ("a"= T2 catch/effort exists; "b"= T2

There are only three standardized CPUE indices for this stock, namely the ones derived from the Greek and Spanish longline targeting albacore and the Greek swordfish fishery with albacore bycatch. These series are generally short, fragmented, and often contradictory (Figure 4). In this situation, the WGA also considered nominal CPUE series (from two Italian longline and one Spanish sport fisheries) as potential sources of information in its last analysis of this stock (Anon. 2012b). As part of the work plan for 2017, where the stock status will be updated, it is required to update all six indices and, if possible, enlarge the time series or produce new ones.
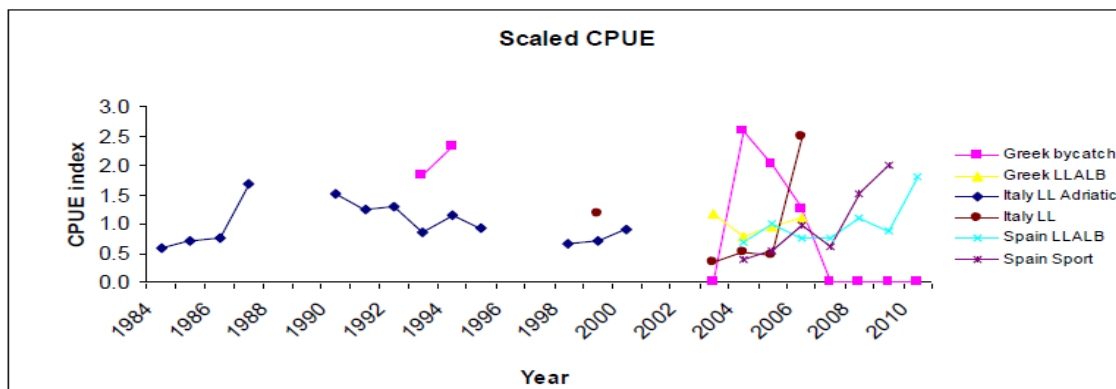
Figure 4: Available CPUE series scaled to the mean of each series, for the Mediterranean albacore stock. The two Greek series as well as the Spanish longline index are standardized, while the rest are nominal series.

The information about basic biological parameters (such as growth, length/weight relationship and maturity) is also fragmented, with different studies that have been carried out throughout the Mediterranean, generally with limited samples sizes (Anon., 2012a). Thus, the EWG recommends integrating the various biological studies for Mediterranean albacore, and performing joint analyses on the original datasets from the various studies that have been published so far. Considering that biological data have been likely collected in different data collection programs (e.g. DCR, DCF, research studies) and thus under different methodologies, it is recommended that a concerted effort be made to consolidate these data in an appropriate form for analyses.

Last, participation in the stock assessment process of Mediterranean albacore from countries with important fisheries has been poor. This has limited the ability of the WG to interpret the data and conduct the analyses. Thus, the ALB WG has reiterated the need for experts from countries with important fisheries to participate in the stock assessment process of ICCAT. The EWG encourages STECF to request that the presence of European scientists with knowledge on these fisheries at the ICCAT WG meetings is facilitated.

5 ASSESSMENT OF THE QUANTITY AND QUALITY OF DATA AS EXPECTED UNDER CURRENT DCF REQUIREMENTS

Considering the current data shortages detected in the ICCAT catalogue, especially in the Mediterranean stock for the Italian and Greek fleets, the EWG considered alternative data sources that could help alleviate these problems.

In the case of Greece, it is considered feasible to use expert knowledge for the allocation of unclassified gear catch into specific gears. However, the DCF was not operative in Greece for several years and the EWG was unable to identify DCF data that might be useful to improve the Task 2 (CE) situation for Greece. The only data source the EWG was made aware of is a dataset compiled in the MAREA Project – MEDPEL (Catches of pelagic (drifting) longline fisheries in the Mediterranean, SC No 6 (SI2.635542)MARE/2009/05-Lot 1), where size and effort information for the longline fishery targeting albacore were collected for Greece in the Eastern Mediterranean for the years 2004-2006.

In the case of Italy, the EWG was unable to identify scientific data sources that would allow separation of the *unclassified* catch, or to eventually correct the extraordinary large sizes of fish reported in 2003, although it is not clear if this information might exist in some format in the central repository of the Italian *Ministero delle politiche agricole alimentari e forestali* (MIPAAF).

In addition to this, and for the Italian Task 2 (CE and SZ) data, the EWG identified the following potential data sources:

- Research projects funded by Italian Ministry on Large pelagics in the framework of Fishery multiannual plans: 1985 -1989, 1990-1993, 1994-1995, 1997-2000, 2001-2004, 2004-2006 and DCR. The Operational Units for these projects[1] or the central authority should be able to provide the data thus collected.

- Data collection under the DCF for the period 2007-2016. The Operational Unit is UNIMAR.

- 2015 - Scientific bases to support management plans in the framework of the Common Fishery Policy (MIPAAF) – Operational Unit: UNIMAR. Title: *Description of fishing activities of albacore* (*Thunnus alalunga*) *to identify reference parameters for the stock management*

- Study *Characterization of large pelagic stocks* (*Thunnus thynnus* L., *Thunnus alalunga* Bonn, Sarda sarda Bloch, Xiphias gladius L.) *in the Mediterranean*", funded by the EU. Includes data for the years 1992-1995, with many files collected that need to be worked out before being translated into ICCAT statistics.

- MAREA Project – MEDPEL *Catches of pelagic (drifting) longline fisheries in the Mediterranean* (SC No 6 (SI2.635542)MARE/2009/05-Lot 1). Includes effort and size information for albacore targeting Italian longlines for the period 1995-2009 (with certain gaps).

Finally, in order to conduct comprehensive growth, length weight relationship and maturity studies throughout the Mediterranean, the EWG identified the DCF data as the most immediate way to gather the available data collected on biology every three years. A data call is suggested as a mechanism to assemble these data that would then need to be analysed by scientists before being presented to ICCAT WG on albacore, ideally in time for the upcoming stock assessment.

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[1] University of Genoa, University of Bari, University of Cagliari, Aquastudio, Laboratorio di Biologia Marina e Pesca di Fano (University of Bologna), Laboratorio provinciale di Biologia Marina of Bari, and University of Messina.

6 REVIEW THE NEW CATCH AND EFFORT DATASET OF NORTH ATLANTIC ALBACORE CAUGHT BY FRENCH MID-WATER TRAWL FLEETS

The EWG reviewed the report of an ad-hoc contract titled *Preparation of new data from the North Atlantic albacore French mid-water trawling fisheries* (Background document EWG-16-19 Doc 01) which presented a revised data series of catches at length and effort for this fleet.

New catch and effort dataset

A new dataset of catch and effort for this fleet has been extracted from the HARMONIE database system, covering the 1991 to 2015 period. It integrates data from various sources, including logbooks, observers, auction data and the French Fisheries Information System.
The dataset has first been corrected for a number of errors and omissions, as summarized in Table 1.

Data	Details of corrections	Number of corrections
Date of the fishing operation	Trip date and fishing operation date was inversed and hence corrected to be consistent.	10,944 lines
Latitude and Longitude	Latitude and longitude are unknown (NA) for error typing, unknown or uncertain spatial statistical rectangles (e.g. 8.00; 7000; 8000; 007H00; 007J00; 007K00; 008A00; 008B00; 008C00; 008D00).	10 spatial statistical rectangles for a total of 354 lines
Catch per fishing operation	Inconsistent catches such as those above 36,000 Kg performed in a single fishing operation were removed from the database.	5 lines
Fishing times (hours)	Fishing times (hours) reported on 24 hours for one fishing operation were corrected. The catches are never on 24 hours but 4 to 6 hours in average per night. Hence, these inconsistent fishing time were replaced with an average value known to limit the analysis errors.	32 lines
Latitude and Longitude	Geographic points were on land and corrected from original files.	42 lines

Table 1: Corrections executed to the French mid-water trawl albacore fishery dataset (1991-2015).

This new dataset has now been assembled according to ICCAT's requirements and is in the process of being submitted for revision and incorporation into ICCAT Catch and Effort (Task 2) dataset.

CPUE series

A CPUE series for this fleet has also been produced through this contract that could be considered by ICCAT WG on albacore as an input for the next stock assessment of the stock. The nominal CPUE (Figure 5) appears to be influenced by the nature of this fishery, in which boats are driven to target albacore more strongly if fishing conditions for other stocks are not favourable. For example, the number of vessels of this fleet catching albacore went from 28 in 2004 to 121 in 2005, probably due to the closure of the Bay of Biscay anchovy fishery.
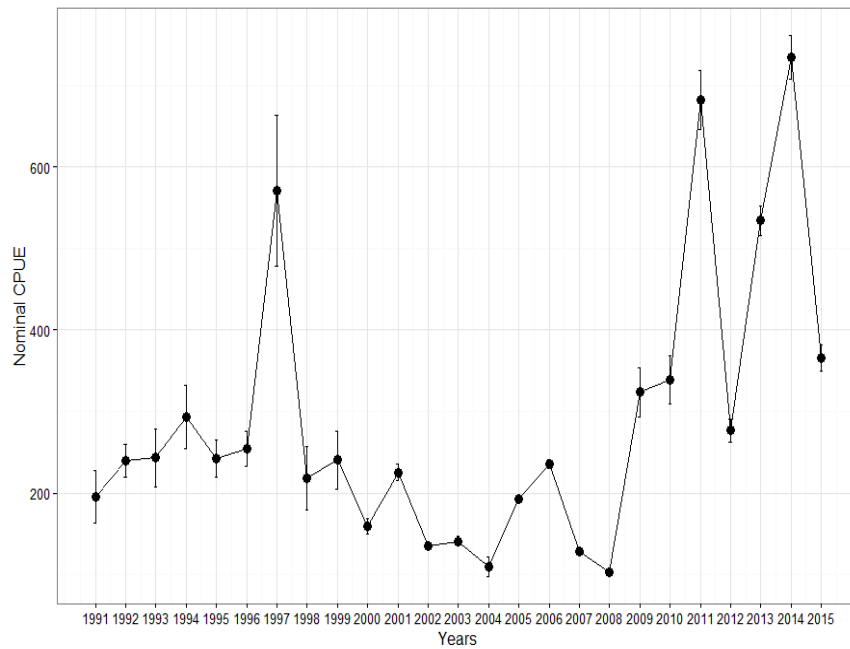
Figure 5: Nominal albacore CPUE (catches of albacore, Kg / vessel fishing time, hours) series for the French pelagic trawl fishery in the North Atlantic

A preliminary standardization of the series has been carried out, considering the effects of year, month, area, Sea Surface Temperature (SST) and depth. A set of four models was assembled and compared (Table 2). Diagnostic scores, like AIC, were all very similar, and the simplest model (Mod1) was tentatively selected (Figure 6).

	Model	AIC	R^2
Mod1	fYear+fMonth+fArea+fSST	318345.6	15.11
Mod2	fYear+fMonth+fArea+fSST+fDepth	318063.3	15.92
Mod3	fYear+fMonth:fArea+fSST	318276.5	15.32
Mod4	fYear+fMonth:fArea+fSST+fDepth	318004.4	16.10

Table 2: Standardized CPUE models considered and fit diagnostics.

22
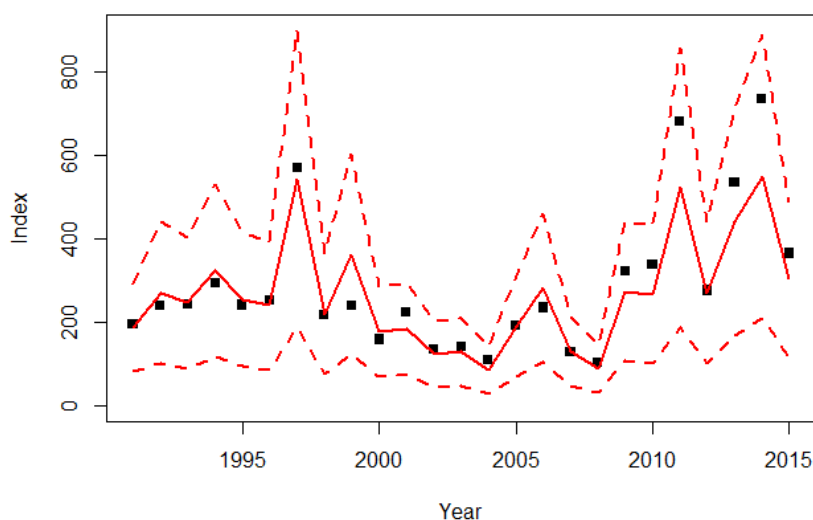
Figure 6: Standardized albacore CPUE (catches of albacore, kg / vessel fishing time hours) index for the 1991-2015 data period of the French mid-water trawl fishery, considering the catches on all regions combined. The black points represent the nominal CPUE, the solid red lines the standardized CPUE and the dotted red lines the 95% confidence intervals.

The presented index (Figure 6) makes use of the entire time series of data available (1991 to 2015). The spatial distribution of catch rates (Figure 7) shows the known pattern of catches being higher in areas closer to the coast and along the continental shelf. The figure also shows the areas used in the CPUE standardization. The EWG considered that the effect of alternative area definitions could be explored in the future, maybe by looking at changes in the time series of the center of the distribution of catch rates. These could be expected to be related to the number of vessels operating in the fishery, which is highly variable by year.

The EWG considered this dataset to be a very useful addition to the set of indices of abundance for this stock, especially given the relatively large area covered by this fleet when compared with others currently used in the stock assessment. Although the next stock assessment for this stock is only scheduled to be carried out by ICCAT in 2020, the EWG encouraged the author of the report to present these findings and the CPUE series to be next session of ICCAT Working Group on albacore tuna for discussion and further refinement.
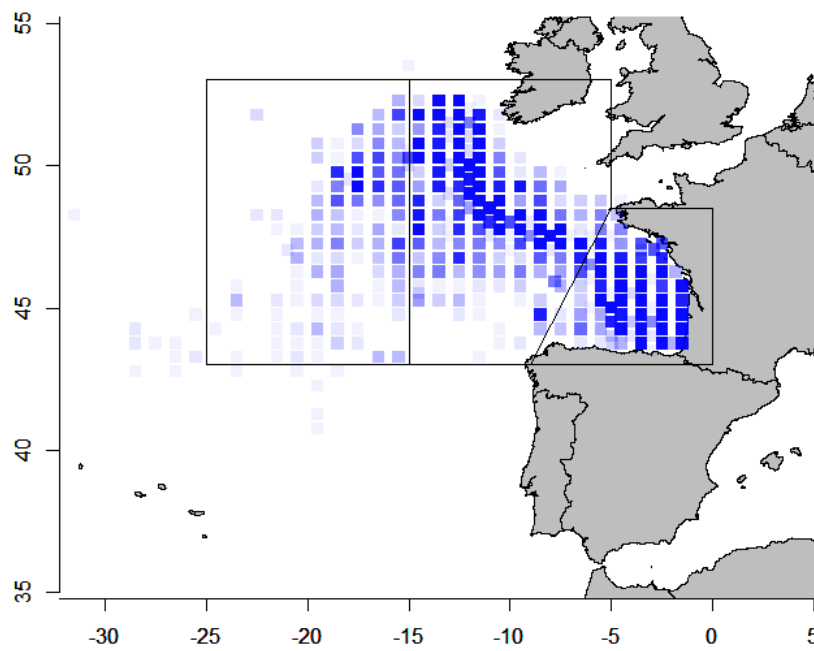
Figure 7: Map of albacore CPUE represented in 1x1 degree grids. The boxes indicate the three main regions of operation of the fleets, used in the CPUE standardization.

7   ASSESS AVAILABILITY AND USEFULNESS OF DATA ON CATCHES OF NORTH ATLANTIC ALBACORE BY OTHER FLEETS

The EWG considered the suggestion by ICCAT Working Group on albacore tuna that catch and effort data for certain fleets not targeting albacore, but for which this stock is a by-catch, should be explored with a view at generating indices of abundance from standardized CPUE series. The interest if the WG focused on fleets covering a larger proportion of the potential area of distribution of North Atlantic albacore that those from which the current CPUE series are extracted. These series could potentially be less sensitive to changes in catch rates due to shifts in the spatial distribution of the stock being interpreted as changes in abundance, or could at least provide an indication of trends in spatial distribution under which to interpret the current indices of abundance. A document was reviewed by the EWG (Background document EWG-16-19 Doc 05), that included a preliminary CPUE series for the Portuguese longline fleet targeting swordfish.

The spatial coverage of this fleet (Figure 8) initially makes it a good candidate, although the catch of albacore tuna has generally been as low as 6.5 t in 2014.
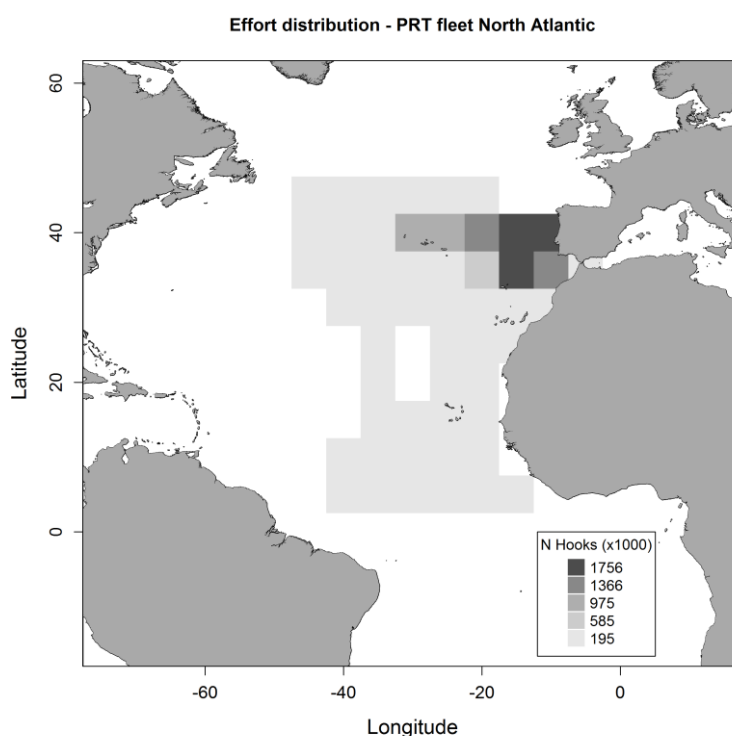
Figure 8: Effort distribution of the Portuguese pelagic longline fleet sampled in the North Atlantic used in this study, for the period 1999-2015. The effort is represented in number of hooks (x1000) in 5x5 degree grids.

The spatial distribution of the catches of albacore from this fleet appears to concentrate on a handful of spots when observed across the whole time series (Figure 9).

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ALB nominal CPUE distribution - North Atlantic
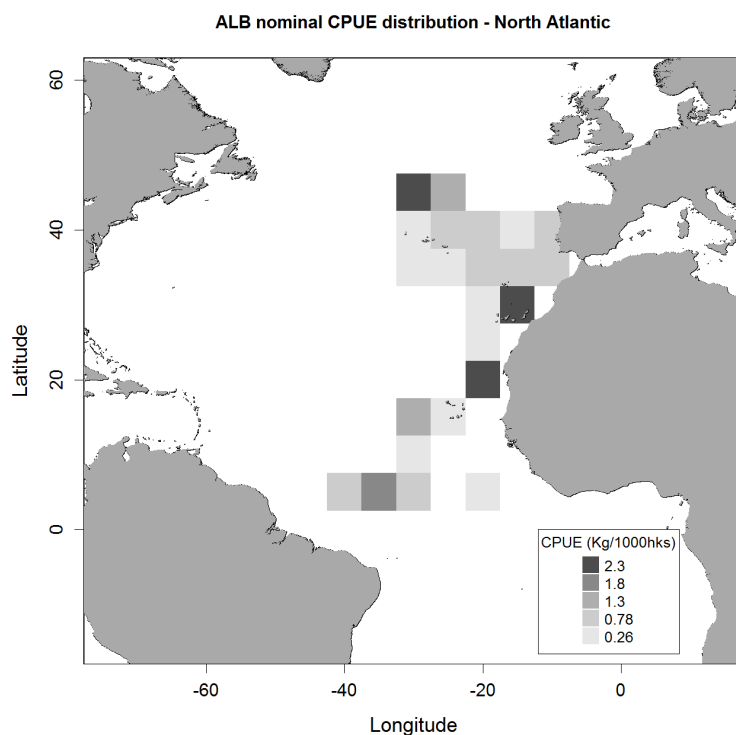
Figure 9: Spatial distribution of the nominal CPUEs of albacore tuna in the North Atlantic captured by the Portuguese pelagic longline fleet, 1999-2015. The CPUE is represented in biomass (kg/1000 hooks) in 5x5 degree grids.

The corresponding CPUE series must obviously interpreted with caution (Figure 10)
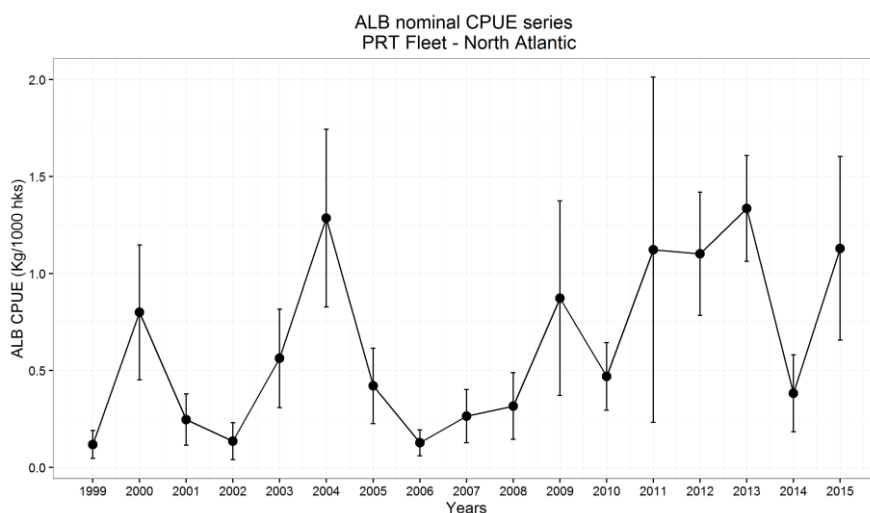
Figure 10: Nominal CPUE series (kg/1000 hooks) for albacore tuna captured by the Portuguese pelagic longline fishery in the North Atlantic targeting swordfish between 1999 and 2015. The error bars show the standard errors.

The EWG thanked the Portuguese researchers for their work and welcomed the analysis provided. It is clear that the low level of observer coverage, from which the spatial location of the catches is inferred, is likely to affect the observed patterns. In some years, sets covered by on-board observers accounted for as little as 0.1% of the albacore catch. The EWG recommended that the

spatial distribution of observed sets is used to assess possible biases in the estimates of spatial distribution of albacore catch rates. The extension of this exercise to other fleets operating in this area should still be considered, to better understand the amount of information that these dataset might contain on albacore stock and CPUE dynamics.

8   DISCUSS SOURCES OF INFORMATION ON CHANGES IN SPATIAL DISTRIBUTION OR FISHING PATTERNS

The EWG revised the different standardized indices of abundance generated from the CPUE series of different EU fleets (Figure 2).

On the Spanish troll CPUE index, the group considered the information available to support the hypothesis that the catchability of this fleet might have decreased in time, as a result of less area being covered, affecting the detectability of the schools. Although there has been a decrease in the number Spanish TR boats in some regions of Spain, numbers have remained generally stable (Figure 11). It is not possible at this stage to infer clearly what effect these changes might have brought to the effective catchability of this fleet, where searching for schools tends to be improved by the number of areas and the area covered. Support for the hypothesis of decreasing catchability through time in this fleet, and its effect on the CPUE trends, remains open.
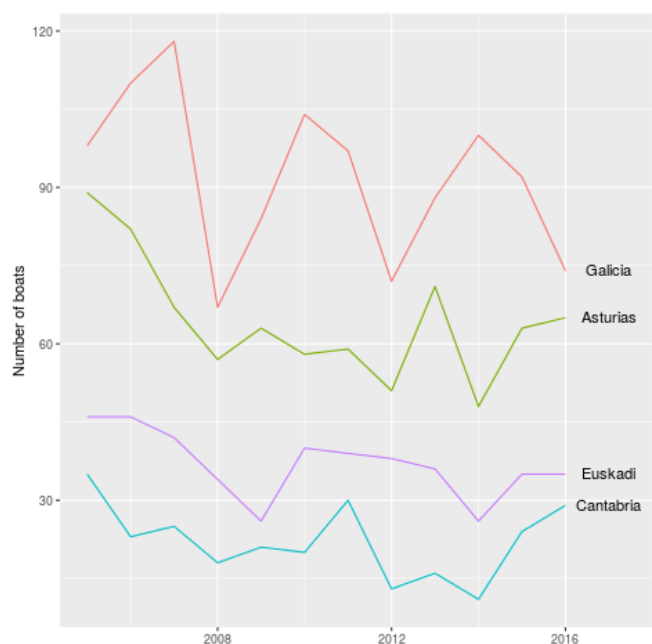
Figure 11 *Number of Spanish trolling (TR) boats with at least one positive albacore trip by year and region.*

Ortiz de Zárate and Perez (2016, SCRS/2015/025) showed the spatial distribution of the fleet through time (Figure 12). However, in this database the trips are assigned to a single statistical rectangle where most of the activity of that trip took place, thus it is just an approximation to the real spatial distribution of the fishing activity. Alternative, daily logbook based information is available in Santiago (2004) and Arrizabalaga et al (2010). However, this only represents the Basque fleet, a fraction of the Spanish fleet represented in the CPUE index. Moreover, the dataset is obtained through sampling, with varying number of boats per year providing logbook data.

On the other indices (including the new French MWT index) the group noted that the general trends observed for the Spanish baitboat and the French MWT are similar, and coincide with the stock trend estimated in the assessment (partially influenced by the Spanish baitboat index), showing an increasing trend toward the end of the series. The Irish MWT index is very noisy, with no clear trend.

The main issue between these indices is the sometimes opposite inter-annual variations between them, e.g. low CPUE for baitboat coinciding with large CPUE for Irish MWT (e.g. in 2008), which could just reflect different availability in their respective fishing areas, linked (or not) to environmental variability. The EWG could not detect any clear pattern on the inter-annual correlation between these and the newly developed French MWT index.

These issues could be further understood, and eventually resolved, with a fine scale analysis including operational spatial distribution data, in a joint GLM. However, some potential problems for this were noted, such as the likely partial overlap of their spatial distributions, and mostly the different effort units used by different fleets, as well as the statistical distributions and properties of the catch per unit of effort. However, this joint analysis is likely to be feasible for the two MWT fleets, the Irish and the French. Still, the EWG noted that resolving inter-annual variation was not as high priority as the general trends showed by the indices, and that the French MWT index was in itself a good candidate to be presented to the WGA for future assessment of the North Atlantic albacore stock.

Further work was presented to the group in relation to environmental information (STECF EWG-16-19 Doc. 6). This study presents a habitat model for North Atlantic albacore, incorporating information from the Basque troll logbook information for the period 1987-2006. The authors noticed a northward trend of both the historical and the future preferred habitat of albacore tuna, which might affect the long term trends in catchability. Besides, the authors proposed that yearly habitat predictions can be analysed together with the yearly spatial distribution of the fleets to have some insight regarding the relative availability of the response to different fleets, and help resolve the inter-annual discrepancies observed for different indices.

A presentation was made to the EWG on the spatial distribution of albacore catches caught by surface Spanish fleets in 2015 in the North East Atlantic and the Bay of Biscay. Data from monitored trips at main fishing landing ports were presented as monthly spatial distribution in relation to SST differences between the two fishing areas: Bay of Biscay and offshore waters of the North East Atlantic, for both the troll and bait boat fleets operating in these fishing grounds.

In 2015, the overall SST ranged from 16°C to 22°C. However there are differences concerning the strategy of the bait boat fleet confined to the Bay of Biscay, where a higher SST (19-22 C) were observed and the troll fleet operating on the offshore waters in North East Atlantic area, where lower temperature were observed. Juvenile albacore (age 1 group) entering the Bay of Biscay plays an important role (i.e. years 2011, 2012 and 2015) in the yield of bait boat fleet. The abundance of this age group should be a good indicator of a strong cohort in any given year. But our ability to interpret the trends in catch rates for this age group is limited by our understanding of the reasons behind both the dynamics of the migration of juvenile albacore, and of the operational decisions of this fleet. Both are likely to have strong impact in the quantity of information on stock dynamics contained in the CPUE series, and could introduce a biased view on abundance of the stock in the stock assessment model.
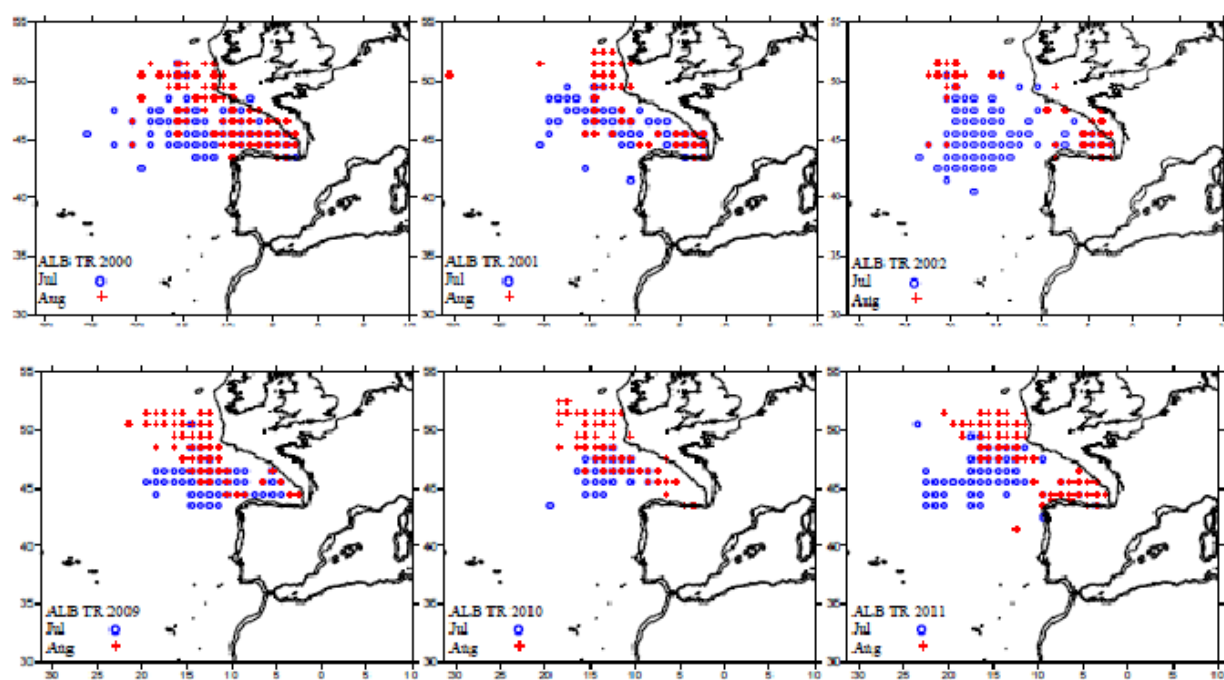
Figure 12: Yearly spatial distribution of the trolling fleet for years 2000-2002 and 2009-2011 derived from interviews to skippers (Ortiz de Zarate and Perez, 2016).

9 IDENTIFY SOURCES OF DATA ON MEDITERRANEAN ALBACORE OF USE FOR THE NEXT STOCK ASSESSMENT

The EWG considered the data-related problems found in the last stock assessment session on Mediterranean albacore carried out by ICCAT in 2011 (Anon., 2011; Anon., 2012), that have limited the ability of ICCAT to carry out a quantitative evaluation of the status of this stock.
A presentation was made to the EWG on the results of an ongoing study commissioned by the Italian MIPAAF titled "Scientific bases to support management Plans in the framework of the Common Fishery Policies"- UO "Description of fishing activities of albacore (*Thunnus alalunga*) to identify reference parameters for the stock management". Information on the activities of the longline fleets potentially targeting albacore was collected in 2015, including spatial and temporal distribution of effort, configuration of the gears being used, and definition of the fleet segments that more actively catch albacore. Scientific observers were also placed on a total of 30 trips, concentrated on four months of 2015, specifically dedicated to detect the presence of discards and by-catch species in the albacore fishery.

The data collected indicate that a limited number of vessels, around 20 boats from the Sicilian fleet, are responsible for approximately 70% of the Italian catches of albacore tuna. These boats follow albacore movements in the months between April/May and August/September, and it is in this period that the bulk of the Italian catches is concentrated.

The EWG considered this information to be of great value to better understand the dynamics of this fleet, responsible for a large share of the catches of this stock. It would desirable that the information collected is presented to the relevant scientific body of ICCAT once the project is completed.

Biological data

The results on some recent studies on the reproductive biology of albacore from the Western Mediterranean Sea were presented to the EWG (STECF EWG-16-19 Doc. 9). The size frequency, sex ratio, gonad reproductive stages, spawning season, minimum length at maturity and gonadosomatic indexes were examined.
Only 5.4% of the 16,104 fish measured fell outside the length range of 60 to 90 cm fork length (FL). The sex ratio was female biased in fish <70 cm FL and male biased in those >75 cm FL. Histological analysis of the ovaries and the monthly variation of the gonadosomatic index for both sexes showed that spawning occurred from June to August. Only four immature individuals were found. The minimum length at maturity for albacore was 56 cm FL. Batch fecundity estimates ranged from 0.42 to 2.16 million oocytes (mean ± SD =0.98 ± 0.40), with a mean relative batch fecundity of 136 oocytes per gram of body weight. The relationships between batch and relative fecundity estimates and the associated biological metrics (length, body weight and ovary weight) were also investigated.

The EWG acknowledged the need for updated information on the reproductive and growth biology of albacore in the Mediterranean Sea, and encouraged the authors to present their findings to the next session of WGA.

The EWG followed a presentation on catches of albacore in the Ligurian Sea (STECF EWG 16-19 Doc. 8) There has never been a fishery targeting albacore, except for a short period in the early 60s, carried out during the summer months (July to September) and for only 6-7 years. There are no official estimates of those catches. After this period the resource was not available and fishing activities addressed to albacore were no longer present. All albacore catches nowadays are by-catch of gears targeting other species such as swordfish or Bluefin tuna.

A growth study was presented, carried out using all the available Ligurian Sea samples (n = 66), together with a good number of samples from the Ionian Sea (n = 228) for the smaller sizes. The parameters of the von Bertalanffy growth curve obtained are as follows: Linf = 95.71, k = 0.23 and t0 = -1.93. This curve is similar to those found in the literature for the same stock, even to

those obtained using different methods (especially analysis of spines and scale). These results will be presented to the upcoming ICCAT stock assessment meeting in June 2017.
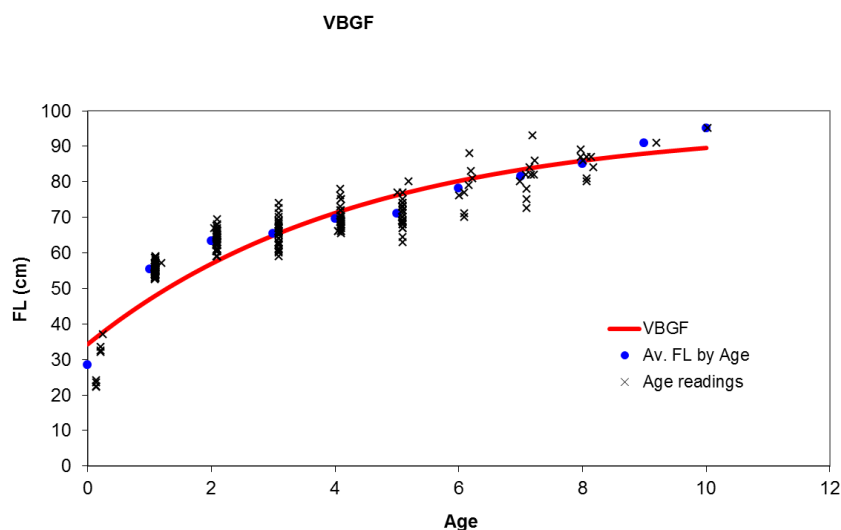

Figure 13: Fit of the von Bertalanffy growth model to age and length (cm) readings of otoliths from the Ligurian and Ionian seas.

The EWG welcomed this additional study and considered that a more robust growth curve for the Mediterranean albacore stock could be obtained by integrating and comparing the various studies that have been carried out over the years. The possibility of a workshop involving scientists from all countries involved in data collection for this stock, to progress along these lines, should be considered and possible mechanisms for funding this activity could be explored.

Recovery of Italian data on albacore fisheries and biology

The EWG explored what other sources of information on catches, length samples in the catch, effort and biological sampling could be realistically be added to ICCAT datasets from the European fleets exploiting Mediterranean albacore. It appears that the greatest benefit would be obtained by an exercise directed at recovering data collected by the Italian authorities and not currently available to scientists nor present in ICCAT datasets.

A first step would entail making available to scientists the complete set of samples on biology on albacore that have been collected in 2010, 2013 and 2016 under the DCF. The samples taken inside the Italian national plan, later amended by the decisions of the MED planning group, should provide an important dataset on which to build a better understanding of the stock biology, and possibly of changes over time.

Some of the data collected under the DCR, has been presented to ICCAT scientific bodies during various meetings, both of the WGA and the SCRS. It appears some of those data submissions were incorporated in part into the ICCAT T2SZ datasets. But the precise knowledge on which data has been added, which one has not, and the reasons, is not clear to EWG. Contacts carried out with the ICCAT Secretariat indicated that a good deal of information that was put in their hands was not incorporated in the dataset due to problems with format, or the need for clarification on what data they should substitute.

The EWG considers that a complete analysis of the status of the Italian data for Mediterranean albacore tuna in the ICCAT datasets could be carried out by scientists with experience in this fishery and knowledge of the Italian data collection regime.

This analysis would be followed by an evaluation of the expected quantity and, if possible, likely quality of the data collected by the Italian authorities the Multiannual Fishery Plans (1986-2006) and DCR for the 2002-2009 period. Exploring the expected number of samples and methods used for data collection should be complemented by some evaluation of the status and location of these data. Although expected to be centrally stored, whether this files can be accessed and in what format will be found (most likely as paper copies) will have a clear impact on the feasibility of any recovery exercise. The information could also be expected to have remained at the various institutions tasked with collection, which might in some cases make recovery simpler or less arduous.

Finally, this fact-finding exercise should inform a decision on whether a full-blown data mining and recovery exercise should be carried out given the data likely to be unearthed and the importance of the data gaps that this information could fill compared with others.

10 REVIEW AVAILABLE INFORMATION FOR EVALUATING BY-CATCHES OF EUROPEAN ALBACORE FLEETS

The EWG attempted to provide a first enumeration of available data on the by-catch exercised by fleets targeting albacore tuna in the North Atlantic and Mediterranean. Many of these fleets have albacore as a primary target species for a period of the year and when operating in certain areas, so the denomination of by-catch for some other stocks might not be fully appropriate.

It should be noted that most of the information currently available originates from a number of studies financed totally or partly by DG MARE, and although some of them contain data that might not be reflective of the current situation, little information appears to be collected at the moment on this issue. It is likely that current and future changes in the management of these fisheries (e.g. the temporal closure for the protection of swordfish juveniles in the Mediterranean) will likely impact the behaviour of the fleets including their by-catch.

The Specific Contract for the provision of advice on the management of discards in EU fisheries beyond EU waters (Specific Contract No. 3 under Framework Contract No. MARE/2012/21) provides information on bycatch of other commercially important fisheries (i.e. bluefin tuna, bigeye tuna, yellowfin tuna and swordfish) for ICCAT metiers. The group used this information and filtered the metiers that catch albacore to characterize the available bycatch information from this source. The metiers that target albacore are:

- **_ICCAT_01_** Mid-water trawl fisheries for northern albacore taking place in Northeast Atlantic by French and Irish vessels.

- **_ICCAT_02_** Hand and pole line (or bait boat) fisheries for northern albacore and eastern bluefin tuna taking place in ICCAT area Northeast Atlantic and Mediterranean by Cypriot, French, Greek, Italian, Maltese, Portuguese, and Spanish vessels.

- **_ICCAT_04_** Traditional small scale drifting pelagic and bottom longline targeting bluefin, albacore or swordfish taking place in the Mediterranean by Cypriot, Croatian, French, Greek, Italian, Maltese, Portuguese, and Spanish vessels.

- **_ICCAT_06_** Drifting pelagic longline targeting bluefin/albacore taking place in the East Atlantic by Portuguese and Spanish vessels, and drifting pelagic longline targeting bluefin/albacore taking place in the Mediterranean by Cypriot, French, Greek, Italian, Maltese, Portuguese, and Spanish vessels.

- **_ICCAT_07_** Trolling lines fisheries for albacore in ICCAT East Atlantic and Mediterranean Sea by Greek, Italian, Maltese, Portuguese, Spanish and United Kingdom vessels.

- **_ICCAT_11_** Trammel nets fisheries for albacore in the Mediterranean by Italian and Maltese vessels.

- **_ICCAT_12_** Set gillnets fisheries, which are prohibited by ICCAT, for bluefin/albacore in the Mediterranean.

- **_ICCAT_13_** Recreational fisheries for albacore/bluefin in the Atlantic and Mediterranean by Cypriot, French, Greek, Italian, Maltese, Portuguese, and Spanish should they discard bluefin tuna.

The EWG noted that metiers ICCAT_11 and ICCAT_12 were not operating currently, so were not further considered.

The EWG noted that, according to this report, in the North Atlantic, some characterization of the bycatch of the principal commercial species was available for the main metiers involving midwater trawl, baitboat and trolling gears (metiers 1, 2 and 7 respectively). In the Mediterranean, this was also the case for metiers 4 and 6 (longline gear). Metier 13 (Sport fisheries both in the Atlantic and the Mediterranean) was the only one not having any characterization of the species and quantities of other commercially important species.

Beyond the comercially important species covered in the previous report, bycatch of other commercial or non-commercial species can be characterized using observer data. The group

collected information on the availability of observer data for the main fleets targeting albacore in the Atlantic and Mediterranean (Table 3). In summary, in the Atlantic there is observer data, as well as some projects and studies, to characterize the bycatch of MWT. Regarding baitboats, there is only qualitative information (i.e. there are scientific observations of different trips but no specific design for studying bycatch, since the species they bycatch are target species that are landed, and these are studied with landing data, and reported to ICCAT). There is no scientific observation of Spanish troll trips. The bycatch of trollers seems also limited to target species, which is characterized through landings and submitted to ICCAT).

In the case of the Mediterranean, there is at least some observer information on longlines from Italy, Greece and Spain targeting albacore tuna. No studies are known for the Cyprus fleet.

North Atlantic

A presentation was made (STECF EWG-16-19 Doc. 11) summarizing the information available from the observer programme OBSMER (2016), that includes data on bycatch in the French fleets targeting albacore from 2006 to 2016.

The report revealed (Figure 14) that albacore is the main target species and it accounts 86% of catches and 89% of landings. The discarded fraction is fairly low (4.9% of the catch) and is composed of bluefin tuna (45%), albacore tuna (43%), and other species (12%). From the total catch, its represents 2.1% (= 64.1 tons) for albacore and 2.2% (= 66.8 tons) for bluefin tuna. Albacore is the main target species and it accounts 86% of catches and 89% of landings. Bluefin tuna is mostly discarded and represents only 9% of the landings and 11% of catches.
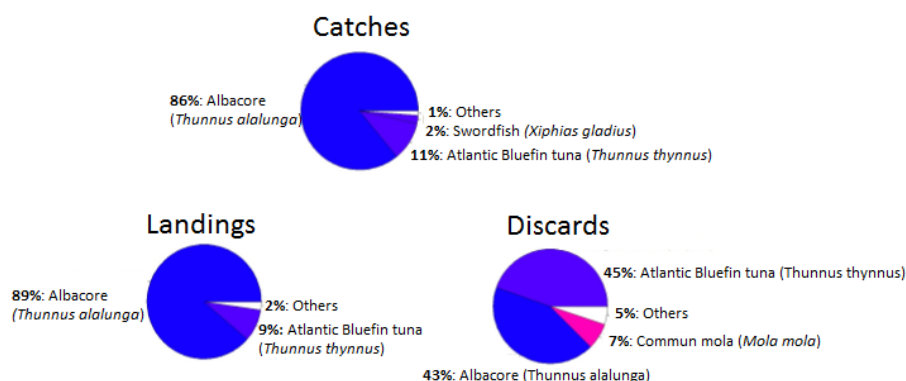

Figure 14: Specific composition by weight of catches (top), landings (left) and discards (right) in 2015 observations for Pelagic trawl targeting the large pelagic species in Atlantic Ocean (modified from Obsmer report 2016).

Table 3: Summary of availability of bycatch information from observer data for each main fleet/gear targeting albacore.

Region	Fleet/gear	Available information
Atlantic	French MWT	- Obsmer dataset (France): 2006-2016
		- Morizur et al (1999): 1994
		- Morizur et al (1996) Study Bioeco-93-107 EC DGXIV C1: 1994 (http://archimer.ifremer.fr/doc/1996/rapport-1236.pdf)
		- EU Study (Ifremer-IEO): 1989-1990.
	French Driftnets	- EU Study (Ifremer-IEO): 1989-1990.
	Irish MWT	- Pilot observer program EC 812/2004: 2011.
	Spanish baitboat	- EU Study (Ifremer-IEO): 1989-1990.
		- Sparse survey and observer data with qualitative information on bycatch (AZTI): 2009, 2011, 2016
	Spanish troll	- EU Study (Ifremer-IEO): 1989-1990.
Mediterranean	Italian ALB longline	- MEDPEL project: 1995-2009 with gaps.
		- Italian Ministry program: 2015
	Italian Gillnet	- Identified during MEDPEL project (Univ. Bari): 1998-2006 with gaps.
	Greek ALB longline	- MEDPEL project: 2004-2006
	Spanish ALB longline	- Spanish observer program (IEO): 2006-2016 (except 2014)
	Cyprus ALB longline	None known

Mediterranean fleets

Results of the *MEDPEL* project, financed by DG MARE (SC No 6 (SI2.635542) MARE/2009/05-Lot 1), revealed that Greek and Italian longline fisheries targeting albacore are in general less selective that those targeting swordfish and bluefin tuna and, depending on the area and season, they may have relatively high by-catch of undersized swordfish and/or bluefin tuna individuals. Such by-catches are sometimes higher than the albacore catch itself in weight.

It should be noted that the available data from fisheries targeting albacore were temporarily fragmented and covered both Greek and Italian fleets exploiting different geographical sub-areas (GSA) of the Mediterranean. Table 3 presents the time and area coverage of the examined CPUE data.

Area	Years
GSAs 20,22,23	2004-2006
GSAs 19,21	1995-2003 (except 1997)
GSAs 10,11,12,15,16,19	1999 and 2003-2008 (except 2007)

Table 4: Areas (GSA) and years for which the MEDPEL project has compiled information on by-catch from the Greek and Italian albacore fleets.

Regarding our current ability to estimate the by-catch levels of the European fleets targeting albacore tuna in the North Atlantic and Mediterranean, the EWG considers that the information exists that would allow an evaluation of what species are being caught, as well as a qualitative indication of the importance of this by-catch. A more precise evaluation of the catches being taken by species, or of the impact that retaining this catch on-board, as required under the Landing Obligation regulation, is only feasible for certain fleets and commercial species.

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12 CONTACT DETAILS OF EXPERT GROUP PARTICIPANTS

[1] - Information on EWG participant's affiliations is displayed for information only. In any case, Members of the STECF, invited experts, and JRC experts shall act independently. In the context of the STECF work, the committee members and other experts do not represent the institutions/bodies they are affiliated to in their daily jobs. STECF members and experts also declare at each meeting of the STECF and of its Expert Working Groups any specific interest which might be considered prejudicial to their independence in relation to specific items on the agenda. These declarations are displayed on the public meeting's website if experts explicitly authorized the JRC to do so in accordance with EU legislation on the protection of personnel data. For more information: http://stecf.jrc.ec.europa.eu/adm-declarations

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13 LIST OF BACKGROUND DOCUMENTS

Background documents are published on the meeting's web site at
http://stecf.jrc.ec.europa.eu/web/stecf/ewg1619.

- STECF EWG-16-19 Doc. 1 - Data issues for the North Atlantic and Mediterranean albacore (Presentation). H. Arrizabalaga, J. Ortiz de Urbina, V. Ortiz de Zarate, J. Santiago, G. Merino.
- STECF EWG-16-19 Doc. 2 - A brief review on the availability of Mediterranean albacore data in the context of updating stock assessments. D. Damalas, G. Tserpes.
- STECF EWG-16-19 Doc. 3 - Preparation of new data from the North Atlantic albacore French mid-water trawling fisheries. N. Nikolic.
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- STECF EWG-16-19 Doc. 7 – North Atlantic albacore (*Thunnus alalunga*, Bonaterre, 1788): catch of Spanish surface fishery and SST in 2015 (Presentation). V. Ortiz de Zarate, P. Quelle.
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- STECF EWG-16-19 Doc. 9 - Reproductive biology of *Thunnus alalunga* Western Mediterranean Sea (Presentation). S. Saber, D. Macias, J. Ortiz de Urbina.
- STECF EWG-16-19 Doc. 10 – Scientific basis to support management plans in the framework of the Common Fisheries Policy – UO Description of fishing activities of albacore (*Thunnus alalunga*) to identify reference parameters for the stock management. Some preliminary results (MIPAAF, Triennial national programme of fishing and aquaculture, 2015) (Presentation). A. Mariani.
- STECF EWG-16-19 Doc. 11 - Catches of North Atlantic albacore by fleets not targeting the species: OBSMER data (Presentation). N. Nikolic.

STECF

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