**EUROPEAN UNION**

**Annual Review of SBT Fisheries for the Extended Scientific Committee**

## 1. Introduction

- Background

The EU fleet does not target SBT. Any incidental catches of SBT by EU vessels are the result of by-catches of long-liners catching swordfish in association with sharks (notably in the IOTC Convention Area). EU Purse Seiners do not harvest SBT as they fish in tropical tunas fishing grounds. EU tuna and tuna like fisheries in the southern hemisphere are manly in the Indian Ocean. Activities in South Atlantic and Southwest Pacific, in areas where SBT bycatch could occur are very low and therefore information provided is general and according to reports provided to ICCAT and WCPFC.

| | | |
|---|---|---|
| Indian Ocean | 2000 | 0 |
| Indian Ocean | 2001 | 0 |
| Indian Ocean | 2002 | 0 |
| Indian Ocean | 2003 | 3 |
| Indian Ocean | 2004 | 22 |
| Indian Ocean | 2005 | 0 |
| Indian Ocean | 2006 | 3 |
| Indian Ocean | 2007 | 18 |
| Indian Ocean | 2008 | 14 |
| Indian Ocean | 2009 | 2 |
| Indian Ocean | 2010 | 11 |
| Indian Ocean | 2011 | 3 |
| Indian Ocean | 2012 | 4 |
| All | 2013 | 0 |
| All | 2014 | 0 |
| All | 2015 | 0 |
| All | 2016 | 0 |

Table 1. Total EU bycatch of SBT.

- Summary of historical developments in the fishery

Indian Ocean

At the beginning of 2016, 26 long-liners were fishing for swordfish in IOTC in which interaction with SBT has taken place in the past (vessels from UK, Portugal and mainly from Spain). The average size of the long-liners is roughly 35 meters, ranging from 21 to 47 meters. The long-liners vary their activity in various oceans covered by different RFMOs. There are also 35 small longliners active in La Reunion EEZ, mainly fishing Albacore but not operating in areas of SBT distribution (i.e. not interfering with SBT fisheries).

The trend of the EU long-line fleet targeting swordfish and operating in various oceans is as follows (table 2):

| Year | Number of vessels |
|---|---|
| 2013 | 31 |
| 2014 | 30 |
| 2015 | 25 |
| 2016 | 26 |

Table 2. Number of EU LL vessels operating in IOTC.

Atlantic Ocean

In 2016 there were 27 Spanish Longliners (same characteristics than those fishing in IOTC) authorized to operate in all ICCAT area but the large majority of their activities where out of the zone where encounters with SBT could occur.

There were also 2 Portuguese long liners fishing (same characteristics than those fishing in IOTC) in the southwest Atlantic Ocean.

West Pacific

In 2016 there were 3 Spanish longliners (201-500 GT) and 1 Portuguese longliner (same characteristics than those fishing in IOTC) operating in the Southwest Pacific Ocean.

- Overview of the most recent fishing season

No by-catch of SBT for 2016 was reported by the EU fleets, including data provided by observers, operating in all oceans in areas where incidental catch of SBT could occur.

## 2. Catch and Effort

- Trends by gear type (only longline operating in areas where SBT encounters could occur)
- Trends by area and season

*(Table should include: catch & effort for above strata as well as totals for the entire history of the fishery)*

Indian Ocean

Catch and effort of the EU longline fleet targeting swordfish in association with sharks is mainly distributed in the South Indian Ocean, between latitudes 20°S and 40°S, the Mozambique Channel and at the south of Madagascar at the longitude of 100°E.

The nominal effort – number of hooks - for all longliners targeting swordfish in association with sharks is decreasing since 2013. These fleets (Spain, Portugal and UK flags) mainly operate in IOTC high seas.

**Table 3**. Nominal efforts (number of hooks) and catches in tonnes of live weight of the EU longliners in IOTC area targeting Swordfish in association with sharks.

| Year | Effort | Catches (t) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | ($10^6$ Hooks) | SWO | BSH | SMA | TUS | BIL | NEI | Total |
| **2011** | 5,353 | 4.682 | 4.459 | 612 | 159 | 52 | 259 | **10.223** |
| **2012** | 5,941 | 5.770 | 4.559 | 750 | 110 | 51 | 146 | **11.385** |
| **2013** | 8,324 | 6.692 | 1.765 | 887 | 224 | 84 | 164 | **9.816** |
| **2014** | 7,665 | 5.285 | 5.794 | 1.026 | 324 | 45 | 100 | **12.574** |
| **2015** | 6,312 | 5.240 | 5.166 | 692 | 402 | 69 | 126 | **11.696** |

From a total of 12 574 t in 2014 and 11 696 t in 2015, swordfish catches were 5 285 t and 5 240 t, respectively (42 % and 45 % of total catches). Sharks (mainly blue shark - *Prionace glauca*) represented 50 to 54 % of the total catches.

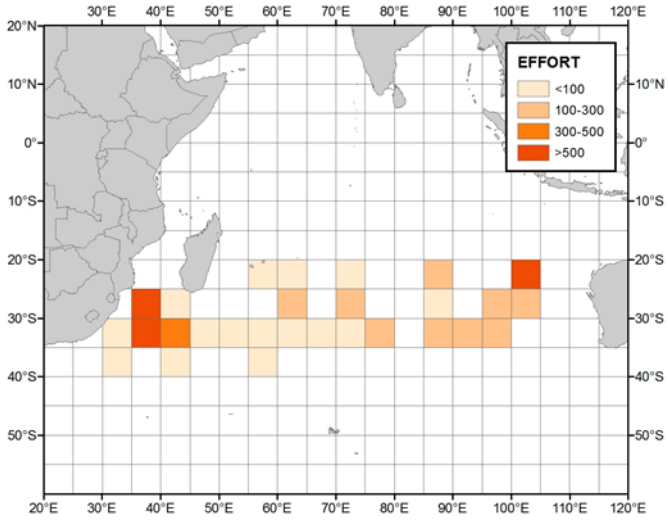



Figure 1a. Distribution of the nominal fishing effort (thousands hooks) carried out by the Spanish surface longline fleet in the Indian Ocean during the year 2015.

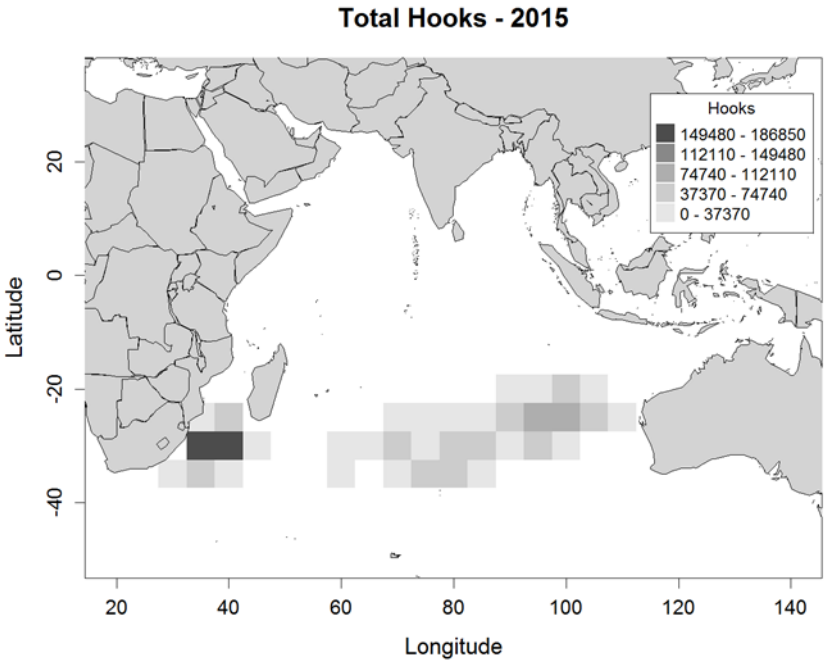



Figure 1b. Map of the distribution of fishing effort (number of hooks deployed), by the Portuguese longline fleet operating in the IOTC area of competence during 2015.

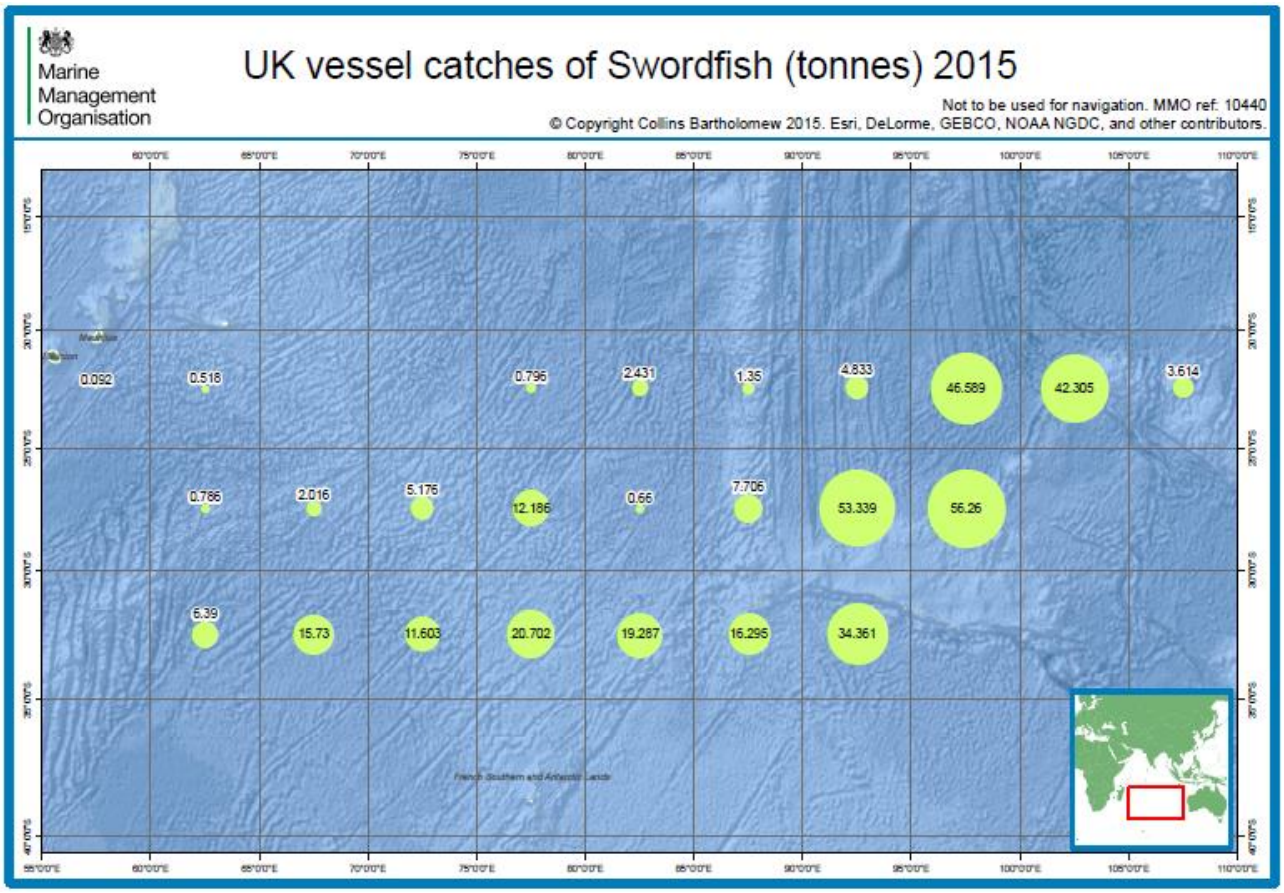



Figure 1c: Map showing UK (EU) catches of swordfish (tonnes) in 2015 by 5˚ area

Atlantic Ocean

The EU fleet targets three different stocks of swordfish in the Atlantic Ocean: Northern Atlantic (longliners from Spain and Portugal, Irish and French fleets targeting albacore), Southern Atlantic (longliners from Spain and Portugal) and Mediterranean (mainly longliners from Spain, France, Italy, Greece, Malta, Cyprus and Croatia and purse seiners from Croatia and Italy, harpoon fishery from Italy).

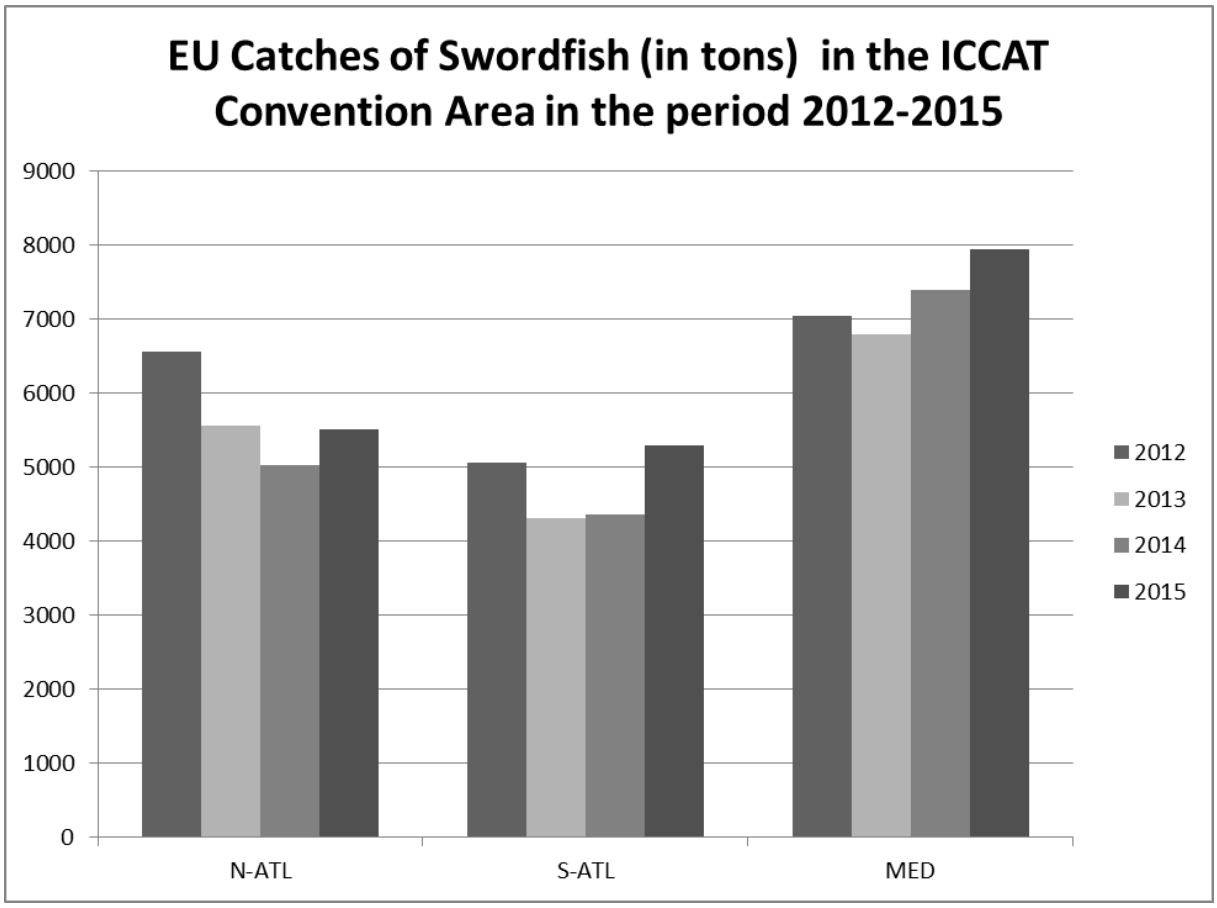
Table 4 below represents the provisional catches of the EU fleet by swordfish stocks in 2015.

Table 4: Provisional EU Catches (in tons) of Swordfish in 2015

| | N-ATL | S-ATL | MED |
|---|---|---|---|
| CY | 0 | 0 | 45 |
| ES | 4013 | 5059 | 2283 |
| FR | 65 | 0 | 154 |
| GR | 0 | 0 | 691 |
| HR | 0 | 0 | 10 |
| IRE | 15 | 0 | 0 |
| IT | 0 | 0 | 4272 |
| MT | 0 | 0 | 489 |
| PT | 1420 | 236 | 0 |
| UK | 0 | 0 | 0 |
| **Total** | **5513** | **5295** | **7944** |

Globally the EU swordfish catches increased in 2015 by 12 % compared to 2014. On a stock by stock basis, the most important increase in EU catches corresponds to the Spanish vessels operating in the Southern Atlantic (+21 %), while for the Northern Atlantic and the Mediterranean stocks the increases were 10 % and 7.5 % respectively.

Table 5:




The EU longline fleet also catches sharks in the ICCAT Convention Area mainly by Spanish and Portuguese longliners operating in the Northern and Southern Atlantic.

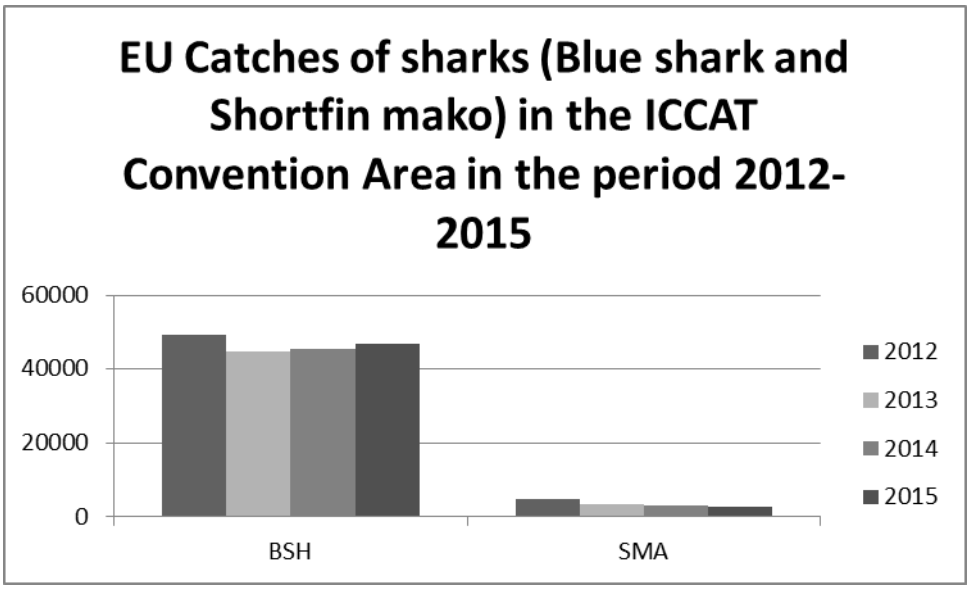
The most important species are the Blue Shark and the Shortfin mako (*Isurus oxirynchus*). Small quantities of Blue shark are also reported by France (Atlantic and Mediterranean). Catches for these two species in 2015 amounted to 46895 tons for Blue Shark and 2604 tons for Shortfin mako.

Compared to the EU catches for these two species in 2014, the figures above represent a slight increase (3%) for Blue shark and a decrease of 10 % for Shortfin mako.

Table 6:

| EU Catches of Blue Shark and Shortfin mako in 2015 | | |
|---|---|---|
| | BSH | SMA |
| ES | 40277 | 2223 |
| FR | 274 | 1 |
| IT | 48 | 0 |
| MT | 5,17 | 0 |
| PT | 6279,3 | 379,5 |
| UK | 12,16 | 0 |
| Total | 46895 | 2604 |

Table7:




West Pacific

*Spanish fleet:*
The Spanish long line fleet is composed by 3 longliners. The activity of the fleet commenced in 2004, and it has been targeting swordfish since then. The data hereby included have been obtained from mandatory electronic logbooks for 2016 activity. All Spanish flagged longliners process the swordfish on board in dressed weight (eliminating the head, viscera and fins) and keep it frozen.

Annual catch by primary species and gear in the WCPFC Convention Area were (tonnes): 1024 of Blueshark, 471 of Shortfin Mako and 1.650 of Swordfish. Estimated total catches of non-target, associated and dependent species in the Pacific Ocean South of the Equator were reported to WCPFC.

It has to be noted that the catches included the total amount as result of the activity of these vessels in the WCPFC area, overlapping area and IATTC area, since these vessels may operate in the IATTC area as well.

*Portuguese fleet:*
Once the fish is caught, the fish is eviscerated with heads off and hanged in the freezer tunnel where it is exposed to a temperature of minus 50 degrees during 12 hours and packed afterwards in plastic bags duly tagged with the information of the lot/specie/scientific name/type of production/catch area. The fish is then stowed in the holds were it is kept at minus 35 degrees.
In the case of sharks (Shortfin Mako shark and Blue Shark) the fins are sliced and folded against the carcass of the shark, as foreseen in the EU Legislation, namely Regulation 605/2013.

Table 8 - Total catches for the Portuguese fleet in the Pacific in 2016 were as follows:

| FAO | COMMON NAME | LIVE WEIGHT(tons) |
|---|---|---|
| **SWO** | **SWORDFISH** | **167,5** |
| **SMA** | **SHORTFIN MAKO** | **84,8** |
| **BSH** | **BLUE SHARK** | **218,8** |
| **BET** | **BIGEYE TUNA** | **10** |
| **YFT** | **YELLOWFIN TUNA** | **5,5** |
| **ALB** | **ALBACORE** | **0,2** |
| **BLM** | **BLACK MARLIN** | **18** |
| **LEC** | **ESCOLAR** | **4,6** |
| **DOL** | **COMMON DOLPHINFISH** | **0,8** |

Catches of SWO, BSH and SMA represented 92% of the total catches.

During the observation period (23/09/16 until 14/12/16) a total number of 67 hauls were made, using chub mackerel and squid. The total catches retained onboard were as follows:

| **Table 9 - Total catches (kg)** | | | |
|---|---|---|---|
| **FAO** | **COMMON NAME** | **LIVE WEIGHT** | **PROCESSED WEIGHT** |
| **SWO** | **SWORDFISH** | **99.564** | **74.860** |
| **SMA** | **SHORTFIN MAKO** | **41.842** | **30.994** |
| **BSH** | **BLUE SHARK** | **68.552** | **33.440** |
| **BET** | **BIGEYE TUNA** | **1.985** | **1.527** |
| **YFT** | **YELLOWFIN TUNA** | **4.030** | **3.100** |
| **ALB** | **ALBACORE** | **137** | **105** |
| **BLM** | **BLACK MARLIN** | **15.645** | **12.035** |
| **LEC** | **ESCOLAR** | **1.262** | **971** |
| **DOL** | **COMMON DOLPHINFISH** | **841** | **647** |
| **TOTAL** | | **233.858** | **157.679** |

Table 10 – Effort of the Portuguese fleet in WCPFC

| GEAR | YEAR | MONTH | FISHING_DAYS | NUM_VESSELS |
|---|---|---|---|---|
| LLD | 2016 | 6 | 12 | 1 |
| LLD | 2016 | 7 | 29 | 1 |
| LLD | 2016 | 8 | 18 | 1 |
| LLD | 2016 | 9 | 3 | 1 |
| LLD | 2016 | 10 | 26 | 1 |
| LLD | 2016 | 11 | 24 | 1 |
| LLD | 2016 | 12 | 16 | 1 |

**3. Nominal CPUE**

where appropriate:

- Trends by gear type (longline)
- Trends by area and season

*(Table should include: nominal CPUE for above strata as well as totals for the entire history of the fishery)*

No SBT fisheries. Information also included in Catch and Effort (see also information and tables in point 7).

*Indian Ocean*

*Spanish fleet:*
A total of 3,421 t of swordfish (round weight) were caught during 2015. The overall nominal catch rate was 759 kg (round weight) per thousand hooks. All the species caught are dressed, frozen and stowed on board.

*Portuguese fleet:*
The Portuguese fleet has swordfish as the target species. After a peak on the catches of swordfish in 2007 of 1,956 MT, the mean catches during the last 5 years were of 988 mt. In 2015, a total of 1454 mt of swordfish were caught. Pelagic sharks and tropical tunas are the primary by-catch species. Pelagic sharks showed a peak on the catches in 2006, while tuna reached a peak in 2007. After a sharp decrease on the catches in 2008, both species groups followed a slightly increasing trend up to 2010, and more sharp increases in recent years. Among the pelagic sharks, the blue shark is the dominant species, followed by the shortfin mako. During the last five years, their mean catches were of 939 and 165 mt, respectively.

*UK fleet:*

Overall, a total of 745 tonnes were caught in the IOTC area in 2015. This figure includes 8.5 tonnes of albacore, 215.3 tonnes of blue shark, 7.9 tonnes of blue marlin, 30.5 tonnes of snake mackerel, 1.2 tonnes of Indo-Pacific sailfish, 26 tonnes of short fin mako, 365 tonnes swordfish, 1.7 tonnes of wahoo, 85.4 tonnes of yellowfin tuna, and 4 tonnes of yellowtail amberjack. UK (EU) uses logbook information in order to gather statistical data.

Atlantic Ocean
Information provided to ICCAT through data reporting.

West Pacific

*Spanish fleet:*
The total amount of catches is based on logbook data of longliners authorized in WCPFC area. Catches are referred to FAO major fishing areas, and all of them are referred to Pacific Ocean South Equator, it has been included FAO fishing areas corresponding to IATTC areas because in some cases it was difficult to differ if the position of the vessel was under one RFMO or under the other.

*Portuguese fleet:*
The gear utilized by the Portuguese vessel was longline, using circle hooks. The number of hooks between buoys was 84. The targeted specie was SWO and BSH.

**4. Size composition**

- Trends by gear type (longline)
- Trends by area and season

*(Figures should include: average size frequency distributions by gear type for each 10 year period, as well as individually for each of the last 5 years)*

As mentioned the EU has no SBT catches to report and therefore no size frequencies to be transmitted to the secretariat or referred in this report. Notwithstanding, size frequencies for other species caught by EU vessels in ICCAT, IOTC and WCPFC have been transmitted to their respective secretariats according to the mandatory data requirements of these organisations.

**5. Fleet size and distribution**

- Trends by season

- Trends by area

*(Maps should include: historical catch and effort by gear type for the entire history of the fishery, as well as individually for each of the last 5 years)*

Indian Ocean

*Spanish fleet:*
The 18 longliners deployed a total of 4,509 thousand hooks during year 2015.

*Portuguese fleet:*
The number of vessels licensed increased from the beginning of the fishery in 1998 (five vessels) until 2009 (24 vessels). The number of active vessels followed a similar trend, with a peak in 2006 (17 vessels). However, during the last years, the active vessels in the convention area decreased to as low as three (in 2009 and 2012). One of the main reasons for this decreasing trend on the number of active vessels is piracy in the Mozambique Channel, which traditionally was a major fishing area for the Portuguese fleet operating in the IOTC Convention area. In more recent years, specifically in 2013 and 2014, the number of active vessels increased again to 7, and in 2015 it decreased to 6.
Traditionally, these fishing vessels range in size from 35 to over 50m, with a GT from 220-760. In recent years the mean vessel size was 45 m (total length), with a mean GT of 531 MT. The fishing operations are surface pelagic drifting longlines, set in shallow waters with night setting and targeting mainly swordfish.

*UK fleet:*
For the year 2015 there were two active UK (European Union) pelagic longliners, mainly catching swordfish, sharks and tunas fishing in the IOTC area. The vessels ranged in size from 40.35 metres to 46.9 metres and operated mostly in the south western and central areas of the Indian Ocean on high seas.

Atlantic Ocean
Information provided to ICCAT through data reporting (see point 1 and 2).

West Pacific

*Spanish fleet:*
Spanish longline vessels in the Western and Central Pacific operate in the temperate area south of 20º south and the mostly work south of 30º south. The port of Papete (French Polynesia) is the main hub for landings and supply activities. Long distances toward south are usually covered before starting fishing activites.
The vessels carry on lengthy trips lasting for 2 to 3 months. The main catches are swordfish and blue shark. They do not catch tropical sensitive shark species such as oceanic whitetip shark or silky shark. They displayed an average of 1.169 10*6 hooks per vessel in 2016. They usually deploy wire leathers, since catches of blue shark and shorfin mako are significant for this fleet.

*Portuguese fleet:*
During 2016 the activity of the Portuguese longline in WCPFC encompassed international waters of FAO major areas 81 and 71. During the observation period all fishing activities occurred in FAO major area 81. In 2016 three fishing trips took place in WCPFC.

**6. Development and implementation of scientific observer programs[1]**

- **Provide a report containing the information specified in Annex 1 on the sampling scheme and arrangements for collecting data from the Member's/CNM's observer program.**

[1] Section 11 and Attachment 2 of the CCSBT Scientific Observer Program Standards.

Indian Ocean

*Spanish fleet:*
The sampling at sea programme started at the beginning of the fishery in 1993. A total of 45,733 hooks were observed during the year 2015 from March to April (table 11). The observed area was between 25º-30ºS and 40ºE. These observations were restricted to areas with regular commercial activity. Two swordfish have been tagged and released during 2015.

The main tasks of the at-sea samplers are recording catch and effort data as well as sampling the size of the target species, the species composition of catches to the more detailed taxonomic level possible and to observe the interaction with bycatch and incidental-bycatch species. Moreover, information about fishing operations and fishing gear configuration is also gathered. All samplers are formed by Spanish Institute of Oceanography staff before the start of their duties at sea. The working protocol for scientific purposes of sampler is based on recording of catches of the target species, biological and obtaining biometric information and sampling to various studies. They also record the number of individuals affected by the false killer whale attacks and possible sightings of cetaceans. In the case of sharks, sometimes reproductive factors and presence-absence of embryos is also studied. Moreover, general information related to general characteristics of the boat, trip and fishing gear configuration is obtained. The information obtained and verified in the laboratory is integrated to contribute to the preparation of the annual tasks that are routinely submitted to the IOTC as well as to assess the interaction with marine turtles and seabirds. The risk of piracy continues affecting to some extend this program.

A total of 450 swordfish and 700 pelagic sharks were measured, where 95.25% of the sharks were keep on board. 116 tunas and 10 billfish were also measured, with retention of the total catch on board. Also 236 individuals of lower economic value species and species that were eventually released/discarded were measured.

| Year | Hooks obs. |
|---|---|
| 2008 | 173725 |
| 2009 | 73140 |
| 2010 | 106619 |
| 2011 | 63139 |
| 2012 | 7451 |
| 2013 | 180921 |
| 2014 | 70750 |
| 2015 | 45733 |

Table 11. Yearly number of hooks observed at sea in the Spanish surface longline fishery

*Portuguese fleet:*

Since 2011 an observer program was fully implemented by IPMA. The current budget is approved until 2020. The program aims to cover a minimum of 10% of the fishing effort on the IOTC convention area

Table 11a - Annual observer coverage of the Portuguese pelagic longline fleet, measured as a percentage of the total effort in number of hooks and sets, for the period 2011–2015.

| Year | Gear | Observer coverage | | Size data coverage |
|---|---|---|---|---|
| | | Hooks (%) | Sets (%) | |
| 2011 | Pelagic longline | 17.9% | 16.3% | All retained specimens and dead discards |
| 2012 | Pelagic longline | 10.7% | 10.9% | |
| 2013 | Pelagic longline | 11.0% | 9.9% | |
| 2014 | Pelagic longline | 7.3% | 5.7% | |
| 2015 | Pelagic longline | 11.1% | 8.2% | |

Three observers have received the necessary training to collect a wide range of fisheries data, to fulfil all fields covered by the IOTC Observer Trip Report. Furthermore, starting in 2011, the observers started collecting information on all specimens caught, which includes: ID to the most detailed taxonomic possible level; size; sex; the condition at-haulback (alive / dead); fate (retained/discarded); and, condition if discarded (alive/dead). Finally, biological samples were collected for some of the major shark and bony fish species, aiming a number of studies focusing on: life history issues (ages, growth and reproduction); genetics (population structure and paternity; and, morphometrics (weight:length, length:length, weight:weight relationships). During 2015 observers were onboard one fishing vessel for 135 days, covering a total of 107 pelagic longline sets, which corresponded to 11.1% and 8.2% of the total fishing effort in terms of number of hooks and sets, respectively (Figure 2; Table 11a). The corresponding trip report was sent to the IOTC Secretariat in due time.

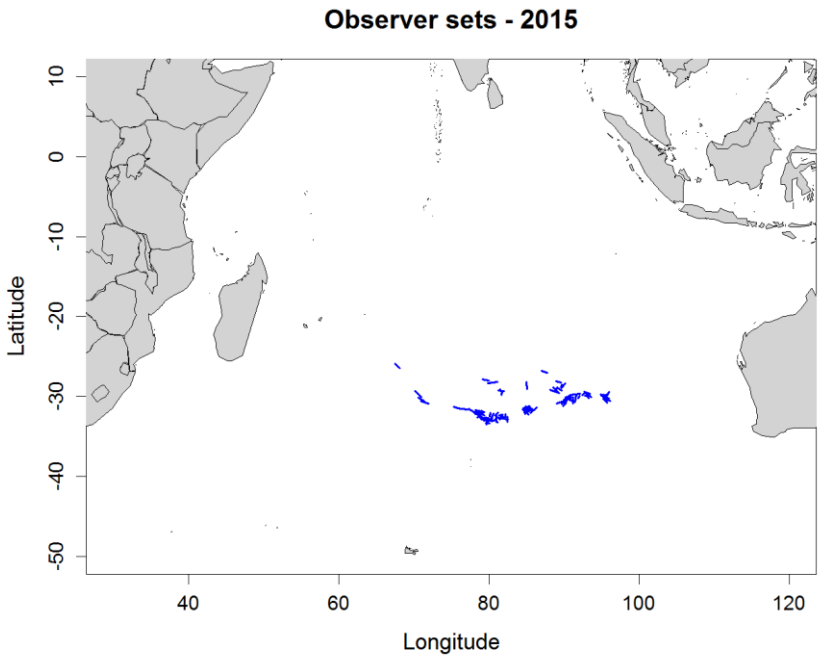



Figure 2 - Map showing the spatial distribution of longline sets covered by the observer program in 2015.

Size data were recorded for more than 5,500 specimens during 2015 (Table 12). Most of the records corresponded to swordfish (35.1%) the target species of the fisheries, followed by the blue shark (25.4%), and to a much lower level the other species that are bycatch of the fishery. It is worth noting that in the past years (until 2013), skippers used to self-report size data for the major target species, as well as additional information on discards. However, since the new EU regulation (June 2013) that obliges sharks to be landed with fins naturally attached became mandatory (fishermen are no longer allowed to cut off shark fins at sea, while in the past some vessels had special permits that allow shark fin removal on board vessels), the level of self-reporting has decreased dramatically. Specifically, for

2015 almost no self-reporting size data was provided, and as such all the measurement reported come from the fishery observer program (Table 12).

Table 12 - Number of specimens caught by pelagic Portuguese longline that were measured during 2015 in IOTC.

| FAO code | Species name | Size measurements |
|---|---|---|
| ALB | *Thunnus alalunga* | 119 |
| BET | *Thunnus obesus* | 605 |
| BLM | *Makaira indica* | 1 |
| BSH | *Prionace glauca* | 1407 |
| BTH | *Alopias superciliosus* | 23 |
| BUM | *Makaira nigricans* | 2 |
| DOL | *Coryphaena hippurus* | 378 |
| GES | *Gempylus serpens* | 14 |
| LEC | *Lepidocybium flavobrunneum* | 376 |
| MLS | *Tetrapturus audax* | 14 |
| OCS | *Carcharhinus longimanus* | 1 |
| OIL | *Ruvettus pretiosus* | 14 |
| POR | *Lamna nasus* | 1 |
| SFA | *Istiophorus platypterus* | 1 |
| SKJ | *Katsuwonus pelamis* | 1 |
| SMA | *Isurus oxyrinchus* | 463 |
| SPZ | *Sphyrna zygaena* | 5 |
| SSP | *Tetrapturus angustirostris* | 32 |
| SWO | *Xiphias gladius* | 1949 |
| WAH | *Acanthocybium solandri* | 63 |
| YFT | *Thunnus albacares* | 30 |
| BRA | *Brama spp* | 1 |
| LAG | *Lampris guttatus* | 6 |
| POA | *Brama brama* | 14 |
| PSK | *Pseudocarcharias kamoharai* | 20 |
| LMA | *Isurus paucus* | 7 |
| MOX | *Mola mola* | 1 |
| | **Total** | **5548** |

*Port sampling programme*

All Portuguese vessels operating in the IOTC convention area are landing their catches in foreigner countries. Furthermore, the catches are transhipped to containers in IO ports and shipped to non-Portuguese ports (mostly Vigo, Spain). Thus, the current port sampling program for the Portuguese longline fleet does not cover those vessels operating in the IOTC conventional area.

*UK fleet:*
There is work being undertaken on this programme. UK will start its observer programme in IOTC 2017.

*Port Sampling programme*

All UK vessels operating in the IOTC Convention area land their catches in third countries. The catches are usually loaded into containers and shipped to non-UK ports. The UK's port sampling programme does not cover these vessels but regular contact is made with the competent authorities of countries where fish is landed. Port sampling is therefore carried out occasionally.

When the UK formalises an observer programme routine sampling will take place.

Atlantic Ocean

An EU-wide framework for the collection of fisheries data (DCF) is in place since the early 2000s. Under this Framework, implemented by the relevant research institutes and ministerial departments in each EU coastal Member State, a complete set of information pertaining to the fleets (catch, effort and economic indicators) is compiled. In order to ensure a harmonised and coherent collection of the information, scientists of the different EU Member States concerned by ICCAT fisheries hold every year a coordination meeting during which sampling schemes are fine-tuned and, where possible, some tasks are shared. Such data is regularly made available to scientists in order to run their researches and constitute the basis for the EU contribution to the stock assessment processes undertaken by the ICCAT SCRS. In 2015, the EU sampling activities concerning species under the competence of ICCAT targeted the main species and fleets. The table below presents the number of individuals of each species sampled.

**Table 13. Sampling intensity (nb of individuals measured per species) by EU observer programs in 2015**

| | BFT | SWO | ALB | YFT | BET | SKJ | SMALL |
|---|---|---|---|---|---|---|---|
| Nb of individuals | 4922 | 31458 | 53628 | 120900 | 72897 | 85316 | 49116 |

*Observers:*

The EU national scientific observers cover the main fisheries in which the EU is involved such as E-BFT (purse seiners, long-liners, traps and bail-boats), N-ALB (pelagic trawlers), SWO (long-liners) and tropical tunas (purse seiners). These observers follow appropriate training courses including data validation training. The information collected concerns all target and not-target species and, where possible, the collection of data is extended to cover turtles, seabirds and marine mammals. The type of data collected refer to catch, discards, by-catch, vessels and fishing gear characteristics as well as biological parameters such as length, weight, sex, maturity and growth.

Detailed information on by-catch is provided to ICCAT.

West Pacific

EU longliners have observers onboard according to the rules and coverage rate adopted in WCPFC.

Vessels are equipped with two VMS systems, one installed by the national authorities (MONICAP), in accordance with the EU legislation, providing VMS information every two hours, and the other installed in accordance with WCPFC's VMS requirements, transmitting to the WCPFC's Secretariat. The vessel is equipped with an electronic logbook (ERS), as required with the EU legislation, allowing for the electronic registration and communication of catches. Both systems were fully operational during activity in WCPFC. The functionality of both systems was confirmed by the observer.

## 7. Other relevant information (Ecologic related species provided in the scientific reports to IOTC, ICCAT and WCPFC)

IOTC (2015 data)

*Spanish fleet*

Preliminary data of by-catch data obtained during 2015 is also included on this report. The catches of the by-catch by species since the beginning of this fishery in 1993 have been described in several scientific papers previously presented and also provided via reports of the National Fishing Authority. Total catch of sharks in 2015 was estimated as 4,143 t, 123 t for billfish, 974 t for tunas and 299 t for other species. Basic statistical tasks and the monitoring of the swordfish fishery as well as some research was conducted to find out which species are captured as by-catch or incidental interactions and their respective catch levels.

*Sharks*

The profitable use of the different parts of the sharks is regularly better than that most of the teleost species. The sharks (trunks or carcass) with their respective fins naturally attached are retained, frozen and stowed on board and landed for human consumption. By-catch data has been reported for year 2015 (table 14). Due to the low coverage of these by-catch species it was not feasible to robustly estimate the global catch of those species by area-time stratification.

Table 14 Preliminary scientific estimation of shark, by species, of the by-catch annual landings (kg round weight) obtained by the Spanish longline fleet in the Indian Ocean for the 2008-2015 period.

| **SPECIES** | **2008** | **2009** | **2010** | **2011** | **2012** | **2013** | **2014** | **2015** |
|---|---|---|---|---|---|---|---|---|
| Carcharhinus spp. | 236902 | 223975 | 281021 | 145803 | 25625 | 565 | 0 | 0 |
| *Galeocerdo cuvieri* | 600 | 437 | 260 | 241 | 0 | 0 | 0 | 0 |
| *Isurus oxyrinchus* | 474305 | 334761 | 349959 | 439784 | 561690 | 620973 | 823549 | 441013 |
| *Isurus paucus* | 3944 | 2009 | 289 | 228 | 250 | 791 | 171 | 0 |
| *Lamna nasus* | 1263 | 2710 | 0 | 0 | 0 | 0 | 0 | 0 |
| *Prionace glauca* | 3880295 | 3101372 | 2422054 | 3290769 | 3686452 | 414948 | 4657270 | 3701847 |
| Other sharks | 45203 | 52689 | 289 | 228 | 0 | 0 | 0 | 0 |

*Seabirds*

A total of 45,733 hooks were scientifically observed with an incidental interaction on 4 seabirds in surface longliners during the year 2015. Table 15 shows the incidence and mortality rates of seabirds after analyzing a total of 721,478 hooks during the combined 2008-2015 period. More complete studies of sea birds interaction with the surface longline gear have been presented for the period 2011-2015 to IOTC (Fernández-Costa et al., 2016 -IOTC/2016-WPEB12-29).

Table 15 - Observed annual interactions rates of Spanish surface longline gear on seabirds for the 2008-2015 period and total number of individuals observed

| | Year | Interaction rate | Mortality rate | Number |
|---|---|---|---|---|
| SEABIRDS | 2008 | $2.30E^{-05}$ | $2.30E^{-05}$ | 4 |
| | 2009 | 0 | 0 | 0 |
| | 2010 | 0 | 0 | 0 |
| | 2011 | 0 | 0 | 0 |
| | 2012 | 0 | 0 | 0 |
| | 2013 | $7.19E^{-05}$ | $7.19E^{-05}$ | 13 |
| | 2014 | $2.83E^{-05}$ | $2.83E^{-05}$ | 2 |
| | 2015 | $8.75E^{-05}$ | $8.75E^{-05}$ | 4 |

*Marine Turtles*

There was scientifically observed incidental interaction on 2 marine turtles in surface longliners on 45,733 hooks observed during the year 2015, all of them were released alive. Table 16 shows the incidence and mortality rates of marine turtles after analyzing 721,478 hooks during the combined 2008-2015 period.

Table 16 - Observed annual interactions rates of the Spanish surface longline gear on marine turtles for the 2008-2015 period and total number of individuals observed.

| | Year | Interaction rate | Mortality rate | Number |
|---|---|---|---|---|
| TURTLES | 2008 | $9.21E^{-05}$ | $1.15E^{-05}$ | 16 |
| | 2009 | 0 | 0 | 0 |
| | 2010 | 0 | 0 | 0 |
| | 2011 | 0 | 0 | 0 |
| | 2012 | 0 | 0 | 0 |
| | 2013 | $1.49E^{-04}$ | $2.76E^{-05}$ | 27 |
| | 2014 | $7.07E^{-05}$ | 0 | 5 |
| | 2015 | $4.37E^{-05}$ | 0 | 2 |

*Portuguese fleet*
*Ecosystem and bycatch issues:*
All IOTC Resolutions and Recommendations concerning Sharks, Seabirds and Marine Turtles are broadly publicized among fishermen operating in the IOTC convention area. IPMA (Portuguese Research Institute) prepared and distributed among the fleet ID sheets for all major species usually caught in the fishery. These ID sheets include photos, FAO and scientific names for target, by-catch and accidentally species caught (including marine turtles and seabirds). The recently IOTC ID guides translated to Portuguese and/or Spanish have been also made available.

Sharks

Major shark species catches are reported annually. Fishermen are encouraged to release by-catch species that are alive at-haulback, as well as juvenile specimens. EU regulation on shark finning is enforced and no shark finning is taking place onboard Portuguese fishing vessels. Moreover, shark fins are no longer removed from the trunks, as the fleet has no more special permissions. Blue shark belly have been observed as being occasionally used as bait, particularly in areas/seasons when high shark bycatch occur. Accordingly, an increase use of wire traces has also been observed. Since 2013 a strong increase on shark catches was reported in comparison to previous years, due to the overall increase on fishing effort, as several vessels have returned to the Indian Ocean after a few years fishing in the Atlantic (Table 17).

Table 17 Total weight (MT) of sharks, by species, retained by the national fleet in the IOTC area of competence during the period 2011-2015.

| FAO code | Species name | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|
| BSH | *Prionace glauca* | 847.5 | 554.0 | 1160.4 | 885.0 | 1248.8 |
| CWZ | Carcharhinidae | | | | | |
| FAL | *Carcharhinus falciformis* | 4.5 | 6.6 | | | |
| LMA | *Isurus paucus* | | | | | |
| OCS | *Carcharhinus longimanus* | | | | | |
| SBL | *Hexanchus griseus* | | | | | |
| SMA | *Isurus oxyrinchus* | 112.4 | 118.1 | 219.7 | 148.0 | 225.1 |
| SPN | *Sphyrna* spp. | | | | | |
| SPZ | *Sphyrna zygaena* | | | | | |
| SKH | Not elsewhere included | | | | | |
| | **Total** | 964.4 | 678.7 | 1380.1 | 1033.0 | 1473.9 |

Table 18 summarizes the observed number of sharks, by species, released/discarded in the IOTC area of competence in 2015, including their life status at haulback and upon released/discarded. However, these figures should be regarded carefully, as they are based on the observer coverage with represent only a fraction (11.1%) of the total fishing effort and are limited both geographically and seasonally.

Amongst the prohibited shark species, it's worth noting that 5% of the bigeye threshers (BTH) and 67% of the oceanic whitetip (OCS) were released alive. Stress of capture and handling is usually assumed to cause additional mortality, therefore these percentages are minimum mortality values as post-release mortality is not taken into consideration (Table 18).

Table 18: Observed number of sharks, by species, released/discarded in 2015 by the EU-Portugal longline fleet in the IOTC area of competence, including life status at haulback and upon released/discard. Note: Information represents only 11.1% of the total EU-Portugal fishing effort and is limited in terms of geographical and seasonal distribution of the fishing effort in the Indian Ocean.

Table 18

| FAO code | Species name | Status at release | | Total no. sharks released/discarded |
|---|---|---|---|---|
| | | Dead | Alive | |
| BSH | *Prionace glauca* | 43 | 30 | 73 |
| BTH | *Alopias superciliosus* | 21 | 1 | 22 |
| OCS | *Carcharhinus longimanus* | 1 | 2 | 3 |
| PLS | *Pteroplatytrygon violacea* | 0 | 19 | 19 |
| POR | *Lamna nasus* | 0 | 1 | 1 |
| MAN | Myliobatidae (family) | 0 | 1 | 1 |
| SPZ | *Sphyrna zygaena* | 4 | 0 | 4 |
| PSK | *Pseudocharcharias kamoharai* | 2 | 18 | 20 |
| SMA | *Isurus oxyrinchus* | 32 | 14 | 46 |
| LMA | *Isurus paucus* | 5 | 0 | 5 |
| | **Total** | 108 | 86 | 194 |

*Seabirds*

IOTC recommendations on seabirds have been made available to the fishermen operating with longline gear. Skippers are encouraged to adopt mitigation measures, namely the use of *tori* lines, line weights and to conduct night gear setting with minimum deck lights, when fishing south of $25^0$ South or whenever interaction with seabirds is foreseen. Moreover, within the scope of the EU data collection framework (EU-Portugal mainland component), skippers are encouraged to report the incidental catches of seabirds. The recently IOTC ID guide has not yet been distributed as translations into Portuguese and/or Spanish of these guides are not yet printed and made available. During 2015, no seabirds were accidentally captured in the sets covered by the fishery observer program (Table 19). In 2015 the fishery observer program covered 11.1% of the total fishing effort.

EU-Portugal fully complied with the Data Call for seabirds according to IOTC circular 2016/043 and submitted the requested data within the established deadlines (full datasets from 2011-2015). The full data, which is more complete than the data proposed to be submitted in the tables according to the instruction for the 2016 IOTC National Report, has therefore already been submitted to the IOTC Secretariat earlier in the year.

*Marine Turtles*

Fishermen are encouraged to carefully handle marine turtles accidentally caught, and immediately release them after gear removal. IPMA has provided guidance on how to safely handle and release the turtles, as well as ID guides. The recently IOTC ID guide has not yet been distributed as a printed translations into Portuguese and/or Spanish of these guides have not yet been made available. Within the scope of the EU data collection framework (EU-Portugal mainland component), skippers are encouraged to report the incidental catches of marine turtles. During 2015, six sea turtles were accidentally captured in the sets covered by the fishery observer program, and all those sea turtles were released alive. (Table 19). In 2015 the fishery observer program covered 11.1% of the total fishing effort.

*Other ecologically related species (e.g. marine mammals, whale sharks)*

The accidental catch of other species such as marine mammals and whale sharks are considered extremely rare. Whenever such animals are caught, fishermen are encouraged to immediately and safely release them. In 2015 there was one interaction with a marine mammal in the sets covered by the fishery observer program, which was immediately released alive (Table 19). In 2015 the fishery observer program covered 11.1% of the total fishing effort.

Table 19. Observed catches of species of special interest (marine turtles, seabirds and marine mammals) in 2015, for the EU-Portugal longline fleet operating in the IOTC area of competence. Observer coverage: 11.1% of total fishing effort.

| Taxa | FAO Code | Scientific name | Status | | Total no. specimens released/discarded |
|---|---|---|---|---|---|
| | | | Dead | Alive | |
| **Sea birds** | No sea birds were captured in the observer program in 2015 | | | | |
| | **Total sea birds** | | **0** | **0** | **0** |
| **Marine turtles** | TTL | *Caretta caretta* | 0 | 5 | 5 |
| | DKK | *Dermochelys coriacea* | 0 | 1 | 1 |
| | **Total marine turtles** | | **0** | **6** | **6** |
| **Marine mammals** | MIW | *Balaenoptera acutorostrata* | 0 | 1 | 1 |
| | **Total marine mammals** | | **0** | **1** | **1** |

*UK fleet:*

- Sharks

Shark catches are reported by species and the vessels are encouraged to release bycatch species that are caught alive. In 2010 the UK revoked the finning permits for all vessels and therefore on-board finning is prohibited.

- Turtles

No incidental interactions reported in 2016.

- Seabirds

No incidental interactions reported in 2016.

- Orcas

No incidental interactions reported in 2016.

Atlantic Ocean

Data on interactions with ecologic related species has been provided to the ICCAT.

Pacific Ocean

Data on interactions with ecologic related species has been provided to the WCPFC.

*Other relevant information (tables) - IOTC*

*Spanish fleet:*

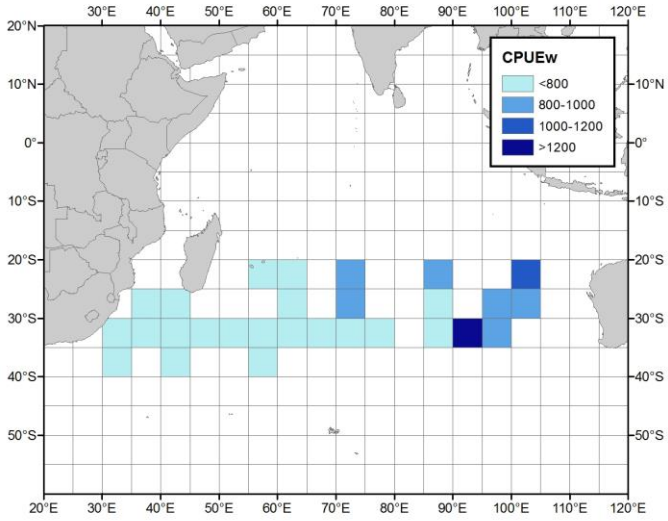



Figure 3a. Historical annual swordfish catches (tons RW) of the Spanish longline fleet in the Indian Ocean since the beginning of the Spanish fishery in 1993

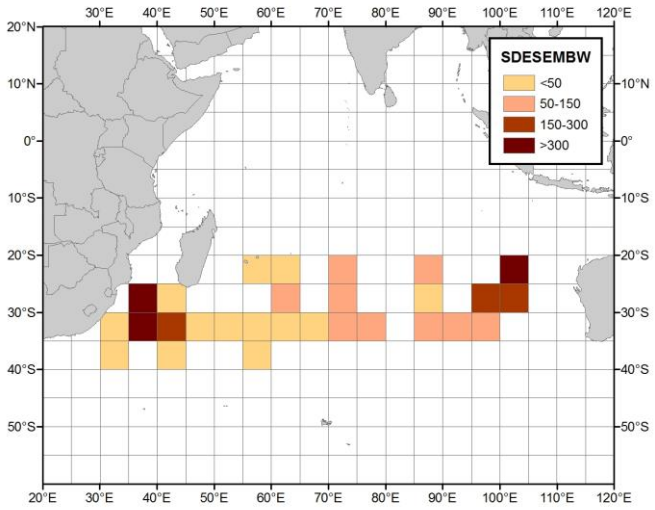



Figure 3b. Map of the distribution of swordfish catch (tons round weight) by 5ºx5º squares of the Spanish surface longline fleet in 2015.

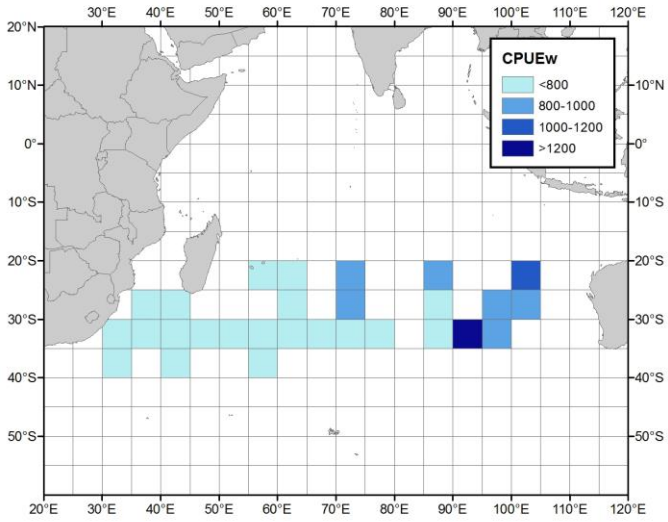



Figure 3.c. LL. Distribution of the nominal CPUEw in kg (round weight) of swordfish landed per thousand hooks set by 5ºx5º degrees, carried out by the Spanish surface longline fleet in the Indian Ocean during the year 2015.

*Portuguese fleet:*

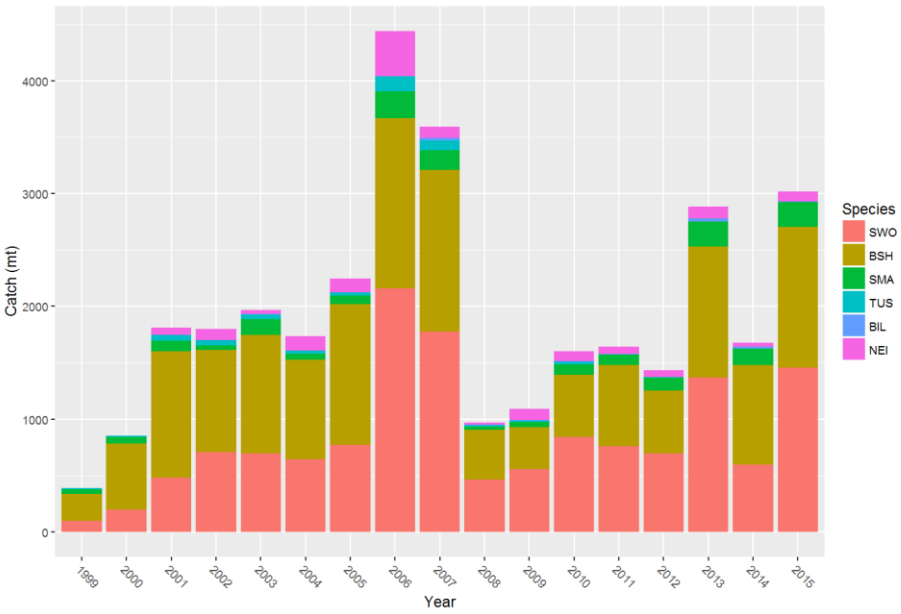



Figure 4. Historical annual catch for the Portuguese longline fleet, by primary species (or groups of species), for the IOTC area of competence for the entire history of the fishery (1998-2015). SWO – swordfish; BSH – blue shark; SMA – shortfin mako; TUS – tuna; BIL – billfishes; NEI - category for all other species combined.

Figure 5 below shows the spatial distribution of the catches (MT) by major species in the IOTC area of competence in 2015: SWO (swordfish) – *Xiphias gladius*; BSH (blue shark) – *Prionace glauca*; and SMA (shortfin mako) - *Isurus oxyrinchus*). Note: different catch scales.

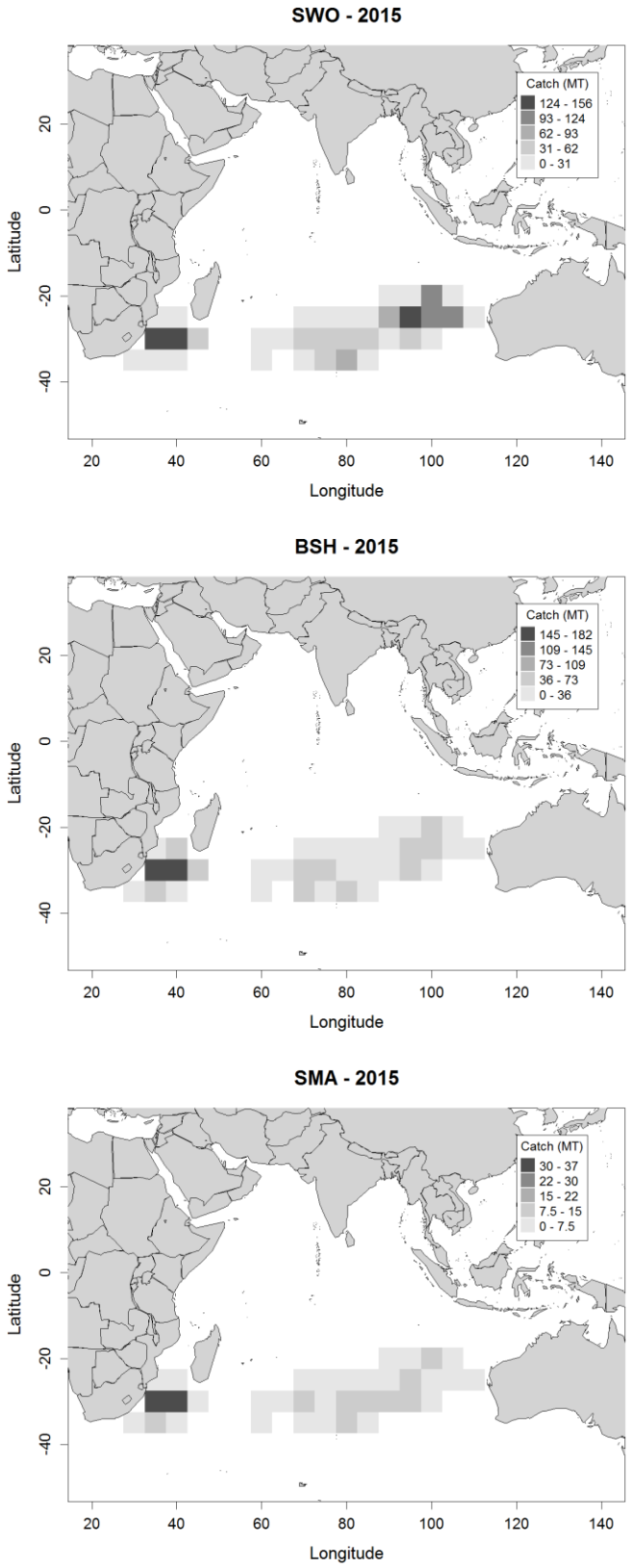
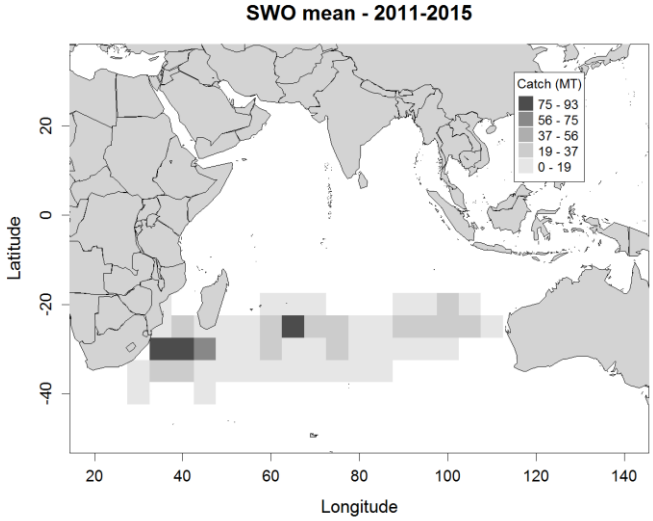
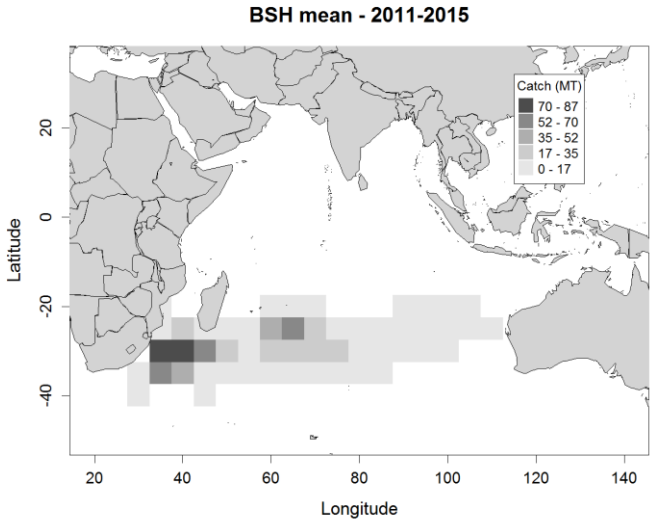
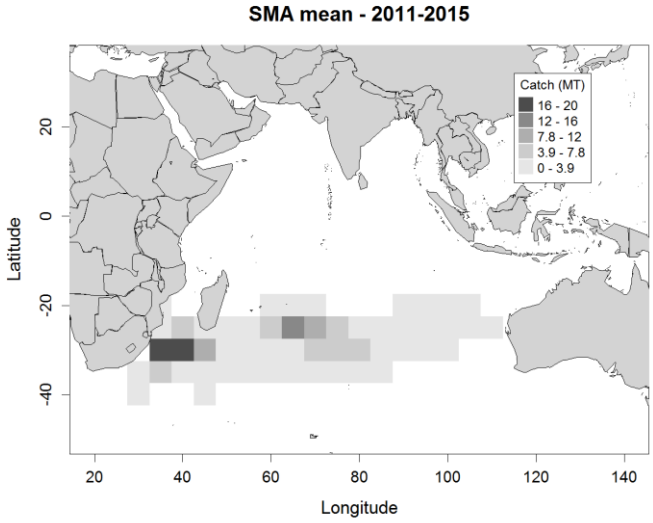



Figure 6 - shows the geographical distribution of the catch (mT) for the major species in the IOTC area of competence during the period 2011-2015: SWO (swordfish) – *Xiphias gladius*;

BSH (blue shark) – *Prionace glauca*; and SMA (shortfin mako) - *Isurus oxyrinchus*). Note: different catch scales.



*UK fleet:*

Figure 7- Map showing UK (EU) catches of blue shark (tonnes) in 2015 by 5˚ area

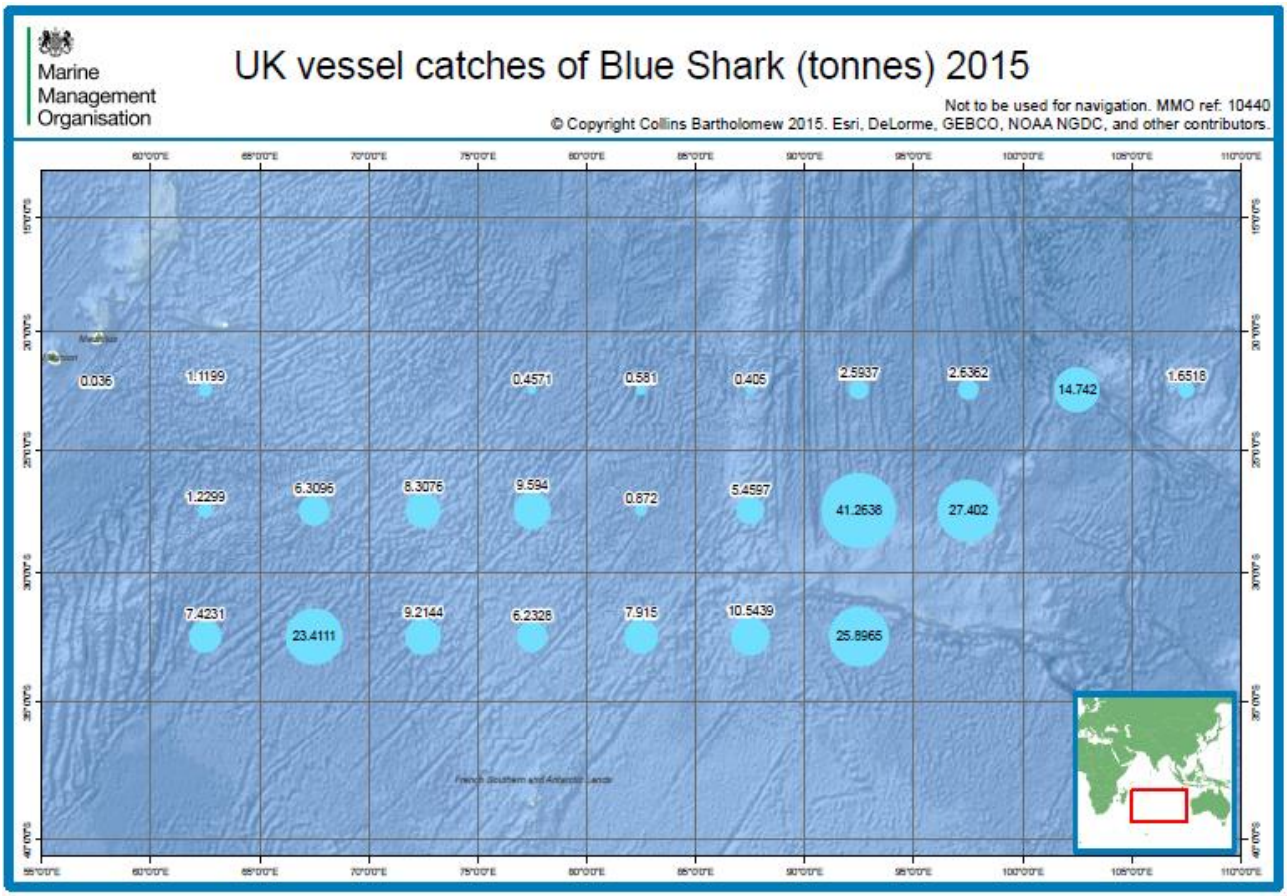



Figure 8 -- Map showing UK (EU) catches of short fin mako (tonnes) in 2015 by 5˚ area

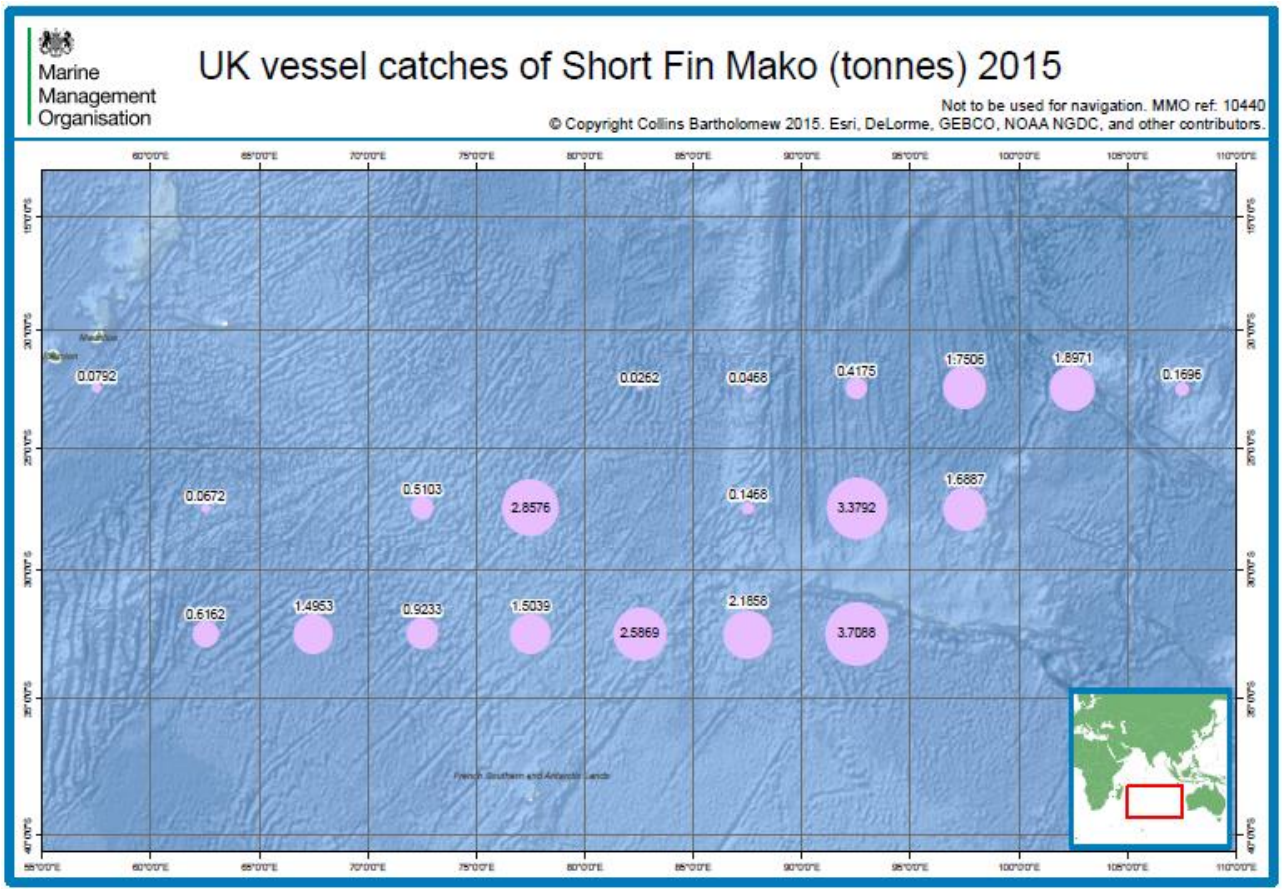
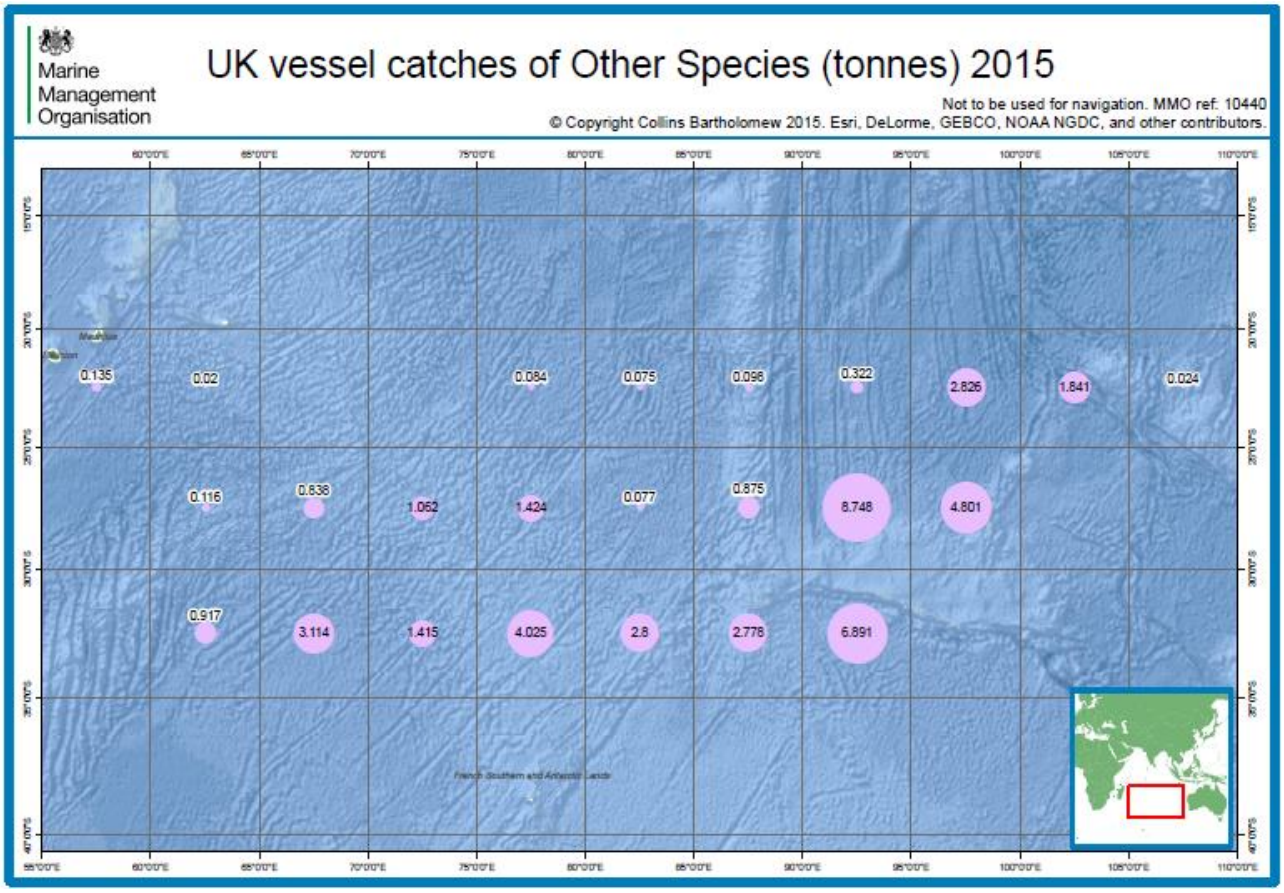



Figure 9 - Map showing UK (EU) catches of other species (tonnes) in 2015 by 5˚ area



*Notes:*

- *Data on catches should be presented by both calendar year and fishing year.*
- *Weight data should be reported as whole weight, conversion factors used should be specified.*
- *Nominal CPUE, particularly for longline fisheries, should be expressed in standard units (eg, number of SBT per 1000 hooks).*
- *State where estimates are scaled from sample data.*
- *Where appropriate measures can be calculated.*

**Annex 1**

**FORMAT OF NATIONAL REPORT SECTIONS ON DEVELOPMENT AND IMPLEMENTATION OF SCIENTIFIC OBSERVER PROGRAMS**

*(from the CCSBT Scientific Observer Program Standards)*

**REPORT COMPONENTS**

The observer program implementation report should form a component of the annual National Reports submitted by members to the Scientific Committee. This report should provide a brief overview of observer programs for SBT fisheries, and is not intended to replace submitted papers containing proper analyses of collected observer data. This observer program report should include the following sections:

**A. Observer Training**

An overview of observer training conducted, including:

- Overview of training program provided to scientific observers.
- Number of observers trained.
- Summary of qualifications / training and years of experience of the observers deployed in SBT fisheries during the past year.
- A copy of the latest version of relevant manuals in their original language for reference

No observer program for SBT fisheries.

**B. Scientific Observer Program Design and Coverage**

Details of the design of the observer program, including:

- Which fleets, fleet components or fishery components were covered by the program.
- How vessels were selected to carry observers within the above fleets or components.
- How was observer coverage stratified: By fleets, fisheries components, vessel types, vessel sizes, vessel ages, fishing areas and seasons.

Details of observer coverage of the above fleets, including:

- Components, areas, seasons and proportion of total SBT catch, specifying units used to determine coverage.
- Total number of observer employment days, and number of actual days deployed on observation work.

No observer program for SBT fisheries.

**C. Observer Data Collected**

List of observer data collected against the agreed range of data set out in Attachment 1. In broad structure this would include:-

- Effort data: Amount of effort observed (vessel days, sets, hooks, etc), by area and season and % observed out of total by area and seasons
- Catch data: Amount of catch observed of SBT and other species (if collected), by area and season, and % observed out of total estimated SBT catch by area and seasons
- Length frequency data: Number of fish measured per species, by area and season.
- Biological data: Type and quantity of other biological data or samples (otoliths, sex, maturity, Gonosomatic index, etc) collected per species.
- The size of sub-samples relative to unobserved quantities.

In IOTC area observers covered nearly 5% of the hooks in 2015.

**D. Tag Return Monitoring**

Number of tags returns observed, by fish size class and area.

N/A

**E. Problems Experienced**

- Summary of problems encountered by observers and observer managers that could affect the CCSBT Observer Program Standards and/or each member's national observer program developed in the light of the Standards.

N/A