SOUTH AFRICAN NATIONAL REPORT TO THE SCIENTIFIC COMMITTEE OF THE INDIAN OCEAN TUNA COMMISSION, 2018

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INFORMATION ON FISHERIES, RESEARCH AND STATISTICS

In accordance with IOTC Resolution 15/02, final scientific data for the previous year was provided to the IOTC Secretariat by 30 June of the current year, **for all fleets other than longline** [e.g. for a National Report submitted to the IOTC Secretariat in 2017, final data for the 2015 calendar year must be provided to the Secretariat by 30 June 2017)	YES 26/06/2018
In accordance with IOTC Resolution 15/02, provisional **longline data** for the previous year was provided to the IOTC Secretariat by 30 June of the current year [e.g. for a National Report submitted to the IOTC Secretariat in 2017, preliminary data for the 2017 calendar year was provided to the IOTC Secretariat by 30 June 2017). **REMINDER:** Final longline data for the previous year is due to the IOTC Secretariat by 30 Dec of the current year [e.g. for a National Report submitted to the IOTC Secretariat in 2017, final data for the 2017 calendar year must be provided to the Secretariat by 30 December 2017).	YES 26/06/2018
If no, please indicate the reason(s) and intended actions:	

EXECUTIVE SUMMARY

South Africa has two commercial fishing sectors that target tuna – the Large Pelagic Longline and the Tuna Pole-Line (baitboat) sectors. The latter sector mainly targets (*Thunnus alalunga)* and to a lesser degree yellowfin tuna (*Thunnus albacares*) and rarely operates in the IOTC Area of Competence. The Large Pelagic Longline sector comprises two fleets with different histories: the South African-flagged Large Pelagic Longline vessels that traditionally used swordfish (*Xiphias gladius*) targeting methods, and the Japanese-flagged vessels that operate under joint-ventures and fish for South African Rights Holders. The Japanese-flagged vessels typically target tropical tunas and southern bluefin tuna (*Thunnus maccoyii*) with their effort focused in the Indian Ocean. In 2017, 16 longline vessels were active in the IOTC Area of Competence, which is less than that in 2016. However, effort has remained constant and the number of hooks set in 2017 (1 284 160) is remarkably similar to that in 2016 (1 284 756). Despite constant effort, catches increased from 2016 for southern bluefin tuna (163%), albacore (33%) and bigeye tuna (29%). The substantial increase in southern bluefin tuna catch is a result of South Africa's longline fleet actively targeting this species due to the increased nominal TAC from 40 tons in 2015 to 150 tons in 2016/2017. For the same period, decreases in catch were observed in swordfish (39%), blue shark (39%), yellowfin tuna (25%) and shortfin mako shark (23%). The high inter-annual variability in catches for species can largely be attributed to a high proportion of longline vessels fishing across the IOTC/ICCAT boundary line. Observer coverage exceeded all RFMO requirements and 73% (939 835) of hooks set in the IOTC Area of Competence were set while an observer was onboard, of which approximately 42% of hooks set were actively observed. In 2017, only a single Tuna Pole-Line vessel fished in the Indian Ocean for 12 hours – this vessel was likely searching for tuna and crossed the ICCAT/IOTC boundary temporarily. Negligible catches of yellowtail (S*eriola lalandi*) were made by this vessel.

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1. BACKGROUND/GENERAL FISHERY INFORMATION

1.1. Large Pelagic Longline fishery

The South African Large Pelagic Longline fishery was commercialized in 2005. The fishery was initially split into swordfish and tuna-directed sub-sectors due to the drastic declines in swordfish catch and CPUE experienced during the period of the experimental fishery from 1997 to 2005. South Africa amended its Large Pelagic Longline fishery policy in 2008 after only 9 swordfish-directed longline vessels operated in 2006, resulting in the lowest annual catch since 2001.

The current domestic longline catch composition is split between swordfish and tropical tunas (bigeye and yellowfin tunas). The general method and gear is predominantly used to target swordfish and involves setting lines at night (to reduce seabird mortality) with squid bait using buoy - and branch lines of 20 m length. Depending on the vessel size, 700 – 1500 hooks are set per line. Stainless steel hooks are prohibited and as of 2017 wire traces are also prohibited. In addition, there is a precautionary upper catch limit (PUCL) of 2000 t for pelagic sharks. Once the PUCL is reached, no pelagic sharks are landed and fishing is only allowed with the presence of an onboard observer. The larger vessels that target tropical tuna are able to fish further offshore and differ in their methodology. These vessels set up to 3000 hooks per set with a combination of fish and squid bait, using deeper branch lines and varying hook numbers per basket to influence the setting depth. The smaller longline vessels carry ice whereas the larger vessels have freezers. Fish are dressed at sea and no further at-sea processing is conducted. Swordfish are targeted in the north east of the South African EEZ and beyond in the Mozambique Channel, whereas tropical tunas are caught along the entire continental shelf edge.

South Africa submitted a bigeye tuna fishing plan (CoC 07/13) to the Commission meeting of the IOTC, thereby notifying the Commission of South Africa's intention to exceed 1000 t of bigeye tuna in future as the fishery develops. Prior to 2002 most of longline fishing effort was concentrated in the Atlantic Ocean. Fishing effort started increasing in the Indian Ocean from 2001 with the development of ice and processing facilities at Richards Bay, which is situated on the east coast of South Africa. The targeting and catching of tropical bigeye and yellowfin tunas has proven more successful in the Indian Ocean, resulting in a sizeable amount of the longline fishing effort being concentrated in the Indian Ocean. This fishery is now the most important South African tuna fishery operating in the Indian Ocean in terms of tonnage landed.

In 2005 the shark longline sector was split into a demersal shark longline component, which predominantly targets soupfin (*Galeorhinus galeus*) and hound sharks (*Mustelus mustelus*), and a pelagic shark longline component (seven vessels), which predominantly targets shortfin mako and blue sharks. The latter catches tunas and swordfish as bycatch. This fishery was split as a precursor to phase out the targeting of pelagic sharks due to the concern over the local stock status of some species. The pelagic shark fishery operated under exemptions from 2005 until March 2011, when South Africa incorporated the pelagic shark fishery into the tuna/swordfish longline fishery. Six of the seven shark exemption holders were issued with tuna/swordfish Rights in March 2011. These vessels are undergoing a phase-out period to reduce shark catch and improve tuna and/or swordfish catch performance. Pelagic sharks are now considered bycatch in the Large Pelagic Longline fishery. Several permit conditions have also been introduced to reduce shark bycatch, such as the prohibition of wire traces.

In 2015 the decision was taken to no longer refer to the fleet as two different fishing strategies, tuna-directed and swordfish-directed, since the fishing behaviour of the local fleet has been shifting from exclusive swordfish targeting to include tunas and sharks. The fishery is now referred to as the Large Pelagic Longline fishery and includes vessels that target tunas, swordfish and sharks as by-catch. The 10-year long-term Rights granted in 2005 expired in February 2015, and 15-year fishing Rights have subsequently been allocated to 60 Rights holders. The fishery is allowing an interim period for foreign vessels to be chartered in this sub-sector to expedite skills development and as a means of acquiring suitable vessels. Foreign vessel owners in the tuna-directed sub-sector are encouraged to reflag their vessels.

Foreign vessels, mainly from Japan and Chinese-Taipei, fished in South African waters through the issuing of bi-lateral agreements in the 1970s, and re-negotiated these agreements in the 1990s until 2002 (Sauer *et al*., 2003). Joint-venture agreements with Japan have been underway since 2005, whereby these foreign-flagged vessels are permitted to fish for a South African Rights Holder. The vessel is required to adhere to South African legislation, including but not limited to, the Marine Living Resources Act (Act No. 18 of 1998) and Regulations promulgated thereunder, including Large Pelagic Longline sector specific policy. Importantly, each foreign vessel is required to carry an observer onboard every trip. The catch, and observer coverage from these vessels accrues to South Africa.

1.2.Pole and Line fishery, commercial linefishery

Fishing for tunas using rod and reel and/or pole and line dates back to the 1970s in South Africa when they were caught in minimal quantities as bycatch in other fisheries. Interest sparked in 1979 when yellowfin tuna (*Thunnus albacares*) became available close inshore off Cape Point (Shannon, 1968). Operators from other sectors converted their vessels to ice vessels to fish for yellowfin tuna using pole and line or purse-seine nets, resulting in catches of over 4 500 t (Penney and Punt, 1993). By 1980 the yellowfin tuna was no longer available close inshore, resulting in these vessels targeting albacore (*Thunnus alalunga*) instead on the south-west and west coasts of South Africa. Albacore catches peaked at 6000 t in 1989, although these catches were under-reported and were probably closer to 10 000 t (Penney and Punt, 1993). The sector has continued to exploit juveniles and sub-adult albacore of between 2 and 3 years old (average of 86 cm FL) and larger yellowfin tuna (average of 133 cm FL). Catches of albacore have remained relatively stable over the last decade, averaging approximately 3 500 t per year, but have recently decreased to below 2000 t. Yellowfin tuna are periodically available inshore with a frequency of 5 to 7 years and the fleet harvests this species opportunistically. In 2014 and 2015 yellowtail were available to the fishery around the Cape of Good Hope region which might have resulted in lower catches in the IOTC region.

The sector operates along the south-west and west coasts of South Africa in the Atlantic Ocean where albacore is available close inshore from October to May, but vessels make forays into the Indian Ocean depending on target species distribution. Traditionally the South African fleet has been characterized into three different categories (1) Skiboats, (2) Pole and Line and (3) Freezer vessels (Leslie *et al.*, 2004). Skiboats are less than 25 GRT and are mostly confined to day trips within a range of 50 nm. Pole and Line boats, which represent the bulk of the fleet, are mainly older displacement-type vessels converted from other fisheries. These vessels can undertake multiday trips of limited duration and range, as the catch is kept on ice. Freezer vessels are mainly vessels up to 30 m and 230 GRT. Due to their large size and freezing facilities, these vessels can stay out at sea for long periods and reach the farthest fishing grounds (West *et al.*, 2013). In more recent years, improvements in navigational gear, the use of live bait and sonar equipment has improved the performance of these vessels (West *et al*., 2013).

This sector is effort controlled, limiting the number of vessels and crew. Prior to 2006, the pole and line fishery was managed under the bracket of commercial linefishing. During the long-term Rights allocation process in 2005, the commercial linefishery was divided into three separate sectors consisting of the traditional linefishery (452 vessels and 3 450 crew), the hake-handline sector (130 vessels and 785 crew) and the pole and line fishery (200 vessels and 3 600 crew) (Mann, 2013). Of the 200 vessels and 3 600 crew allocation available for 8 years, only 198 vessels and 2961 crew were allocated in 2005 (TAC/TAE, 2015). The reallocation of long-term Rights in 2013 resulted in 164 fishing Rights and a total of 165 vessels. This reduction was in response to the 2013 ICCAT albacore stock assessment outcome of large uncertainty around the estimates of albacore stock status in the south Atlantic. ICCAT has issued South Africa with a 4 400 t per annum albacore allocation for the period 2014 to 2018 (ICCAT, 2013), 90% of which is caught by the Tuna-Pole Line sector. The Tuna Pole-Line TAE for the 2017 fishing season was maintained at 165 vessels.

Since vessels are small and the nature of the operation requires the vessel to maximise on crew (who work in pairs to catch and haul albacore), scientific observers are currently not accommodated on the vessels and instead monitor catches in port during offloading.

In 2014, after 6 years of experimental fishing, live-bait purse-seining was incorporated in the sector, allowing a limited number of vessels to cast a net and all vessels to hold live-bait. The live-bait are mostly anchovy (*Engraulis encrasicolus*) with sardine (*Sardinops sagax*) considered as accidental catch and are stored alive in tanks for up to 3 months. The vessels are authorised to use purse-seine nets that do not exceed 210 m in length and 35 m in depth.

The tuna Pole-Line fishery is largely based in Cape Town and the fleet operates in the Atlantic Ocean along the west coast as far north as Namibia and as far west as Valdivia and Vema seamounts. The fleet has access to albacore and yellowfin tuna in these areas.

South Africa also has a boat-based commercial Linefishery which opportunistically catches yellowfin tuna and eastern little tuna (*Euthynnus affinis*) (Everett, 2014), in addition to king mackerel and shark species in the Indian Ocean using rod and reel when other linefish species such as yellowtail (*Seriola lalandi*), snoek (*Thyrsites atun*), kob (*Argyrosomus spp*), geelbek (*Atractoscion aequidens*) and slinger (*Chrysoblephus puniceus*) are not available. These catches usually only contribute a negligible percentage of the total catch of the Linefishery due to the multispecies nature of this fishery.

2. FLEET STRUCTURE

South Africa has two commercial fishing sectors which target tuna and tuna-like species in the Indian Ocean – the Large Pelagic Longline and the Tuna Pole-line. The Tuna Pole-line sector, which operates mainly in the Atlantic Ocean from September – May each year, only occasionally crosses over into the Indian Ocean in search of yellowfin tuna. These vessels are relatively small (< 24m), have a limited range and the duration of trips is short (< 16 days). In 2017 only a single Pole-Line vessels fished in the Indian Ocean for a total of twelve hours – we assume this vessel was searching for tuna on the ICCAT/IOTC boundary. This effort is negligible, and only 40 kilograms of yellowtail (*Seriola lalandi*) were caught.

In contrast, 16 longline vessels were active in the IOTC area of competence, which is less than that in 2016. Three of these vessels were Joint-venture agreements with Japan permitted to fish under a South African Rights Holder.

South Africa currently has a commercial linefishery (artisanal) that is regulated through a TAE of 154 permits in the IOTC area of competence, and a recreational skiboat fishery open access (a recreational permit can be purchased).

South Africa submitted a Fleet Development Plan (FDP) in 2007 and is yet to provide information on the implementation of the initial FDP and to consult with stakeholders to provide an updated FDP.

Table 1. Number of vessels operating in the IOTC area of competence, by gear type and size, for the period 2010 - 2017.

	Fleet Structure in 2017			Fleet Structure 2010 - 2016		
Fishing Sector	No. Active Permits	Vessel size range (m)	Trip duration (days)	No. Active Permits	Vessel size range (m)	Trip duration (days)
Large Pelagic Longline	16	20 - 49	1-123	2016: 19 2015: 19 2014: 15 2013: 22 2012: 24 2011: 29 2010: 21	2016: 20 - 49 2015: 20 - 49 2014: 20 - 49 2013: 20 - 50 2012: 22 - 50 2011: 22 - 50 2010: 21 - 50	4 - 93
Pole & Line	1	16 – 19	1	2016: 2 2015: 3 2014: 0 2013: 0 2012: 6 2011: 6 2010: 2	2016: 16 - 19 2015: 16 - 19 2014: N/A 2013: N/A 2012: 14 - 20 2011: 13 - 22 2010: 13	2 - 15
Commercial Linefishery	154	4 - 10	1 - 2			
Recreational Linefishery	Unknown	4 - 10	1			

3. Catch and effort (by species and gear)

In 2017, 16 longline vessels were active in the IOTC area of competence, which is less than that in 2016. However, effort has remain constant (Table 2a) and the number of hooks set in 2017 (1 284 160) is remarkably similar to that in 2016 (1 284 756). Despite constant effort, catches increased from 2016 for southern bluefin tuna (163%), albacore (33%) and bigeye tuna (29%) as shown in Figure 1a. The substantial increase in southern bluefin tuna catch is a result of South Africa's longline fleet actively targeting this species due to the increased nominal TAC from 40 tons in 2015 to 150 tons in 2016/2017. For the same period, decreases in catch were observed in swordfish (39%), blue shark (39%), yellowfin tuna (25%) and shortfin mako shark (23%). The high inter-annual variability in catches for species can largely be attributed to a high proportion of longline vessels fishing close to the IOTC/ICCAT boundary line. Skipjack catches continue to be negligible (0.5 metric tons) and the catch of all other species (NEI) also declined from 2016 to 2017. In 2017, a single Tuna Pole-Line vessel fished in the Indian Ocean for 12 hours – this vessel was likely searching for tuna and crossed the ICCAT/IOTC boundary temporarily (Table 2b). Negligible catches of yellowtail (*Seriola lalandi*) were made by this vessel (Figure 1a).

Table 2a. Annual Large Pelagic fishery catch (tons round weight excluding sharks and NEI) and effort (number of hooks) of primary species in the IOTC area of competence for the period 2010 - 2017. NEI indicates all other catch.

Year	Total number of hooks	Bigeye tuna	Yellowfin tuna	Albacore	Southern bluefin tuna	Swordfish	Skipjack	Shortfin mako	Blue shark	NEI
2010	44 52 420	794.9	1207.3	60.3	7.8	467.6	0.7	41.9	90.9	98.8
2011	5 235 123	781.2	1063.2	254.7	60.2	488.2	3.0	341.1	193.8	180.5
2012	3 816 271	759.2	590.1	161.7	109.1	395.1	2.6	221.3	171.7	136.4
2013	3 872 846	590.4	1029.4	177.5	53.3	305.0	3.6	304.4	169.8	101.6
2014	1 828 671	339.2	383.0	28.2	15.3	102.8	0.8	249.3	102.9	38.2
2015	1 614 724	256.0	422.1	18.5	10.7	122.7	0.3	290.6	128.9	47.4
2016	1 284 756	203.6	331.5	19.9	17.8	93.4	0.1	543.6	171.7	28.7
2017	1 284 160	261.7	247.5	26.5	46.8	57.3	0.5	421.1	105.4	22.9

Table 2b. Annual catch and effort (number of days) of primary species from the Tuna Pole-Line in the IOTC area of competence for the period 2010 - 2017. NEI indicates all other catch.

Year	Total number of catch days	Albacore	Yellowfin tuna	Skipjack	Bigeye tuna	Snoek	Yellowtail	NEI
2010	3	3.5	0	0	0	0	0	0.26
2011	25	45.7	0.69	0.002	0	0.02	0.88	0.85
2012	31	15.3	0.16	0.04	0.12	0.32	0.01	0.09
2013	2	0.06	0.01	0.01	0	0	0	0
2014	0	0	0	0	0	0	0	0
2015	3	0.13	0.11	0	0	0	0	0
2016	25	5.78	0	0	0	6.52	0	0
2017	1	0	0	0	0	0	0.04	0

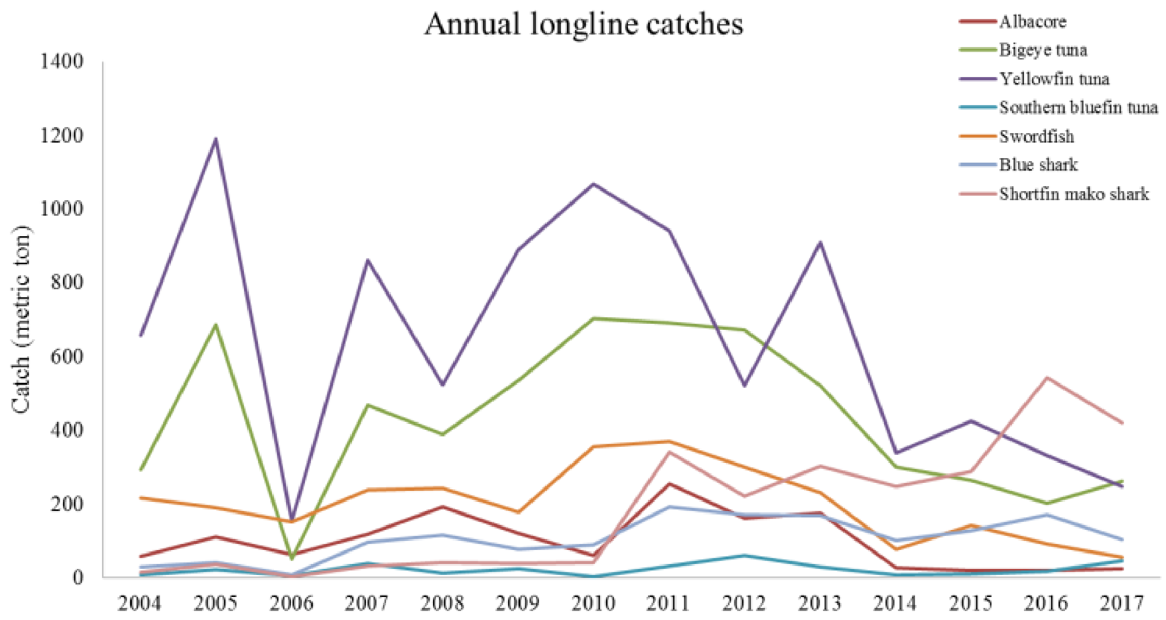

Figure 1a. Historical annual catch for the South African Large Pelagic Longline fleet for the IOTC area of competence of the period 2004 – 2017.

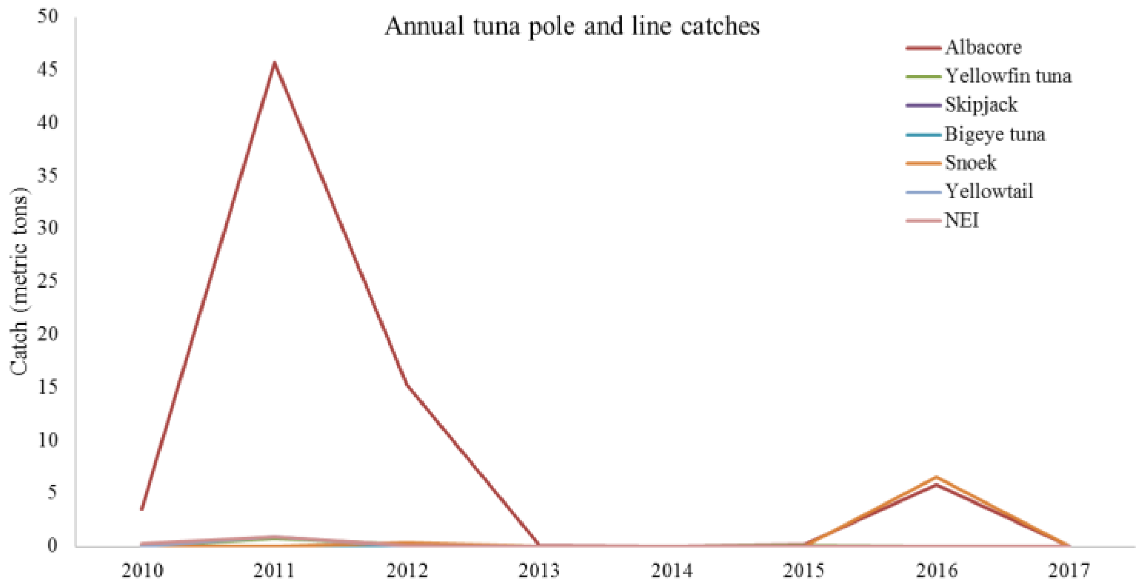

Figure 1b. Historical annual catch for the South African Tuna Pole-Line fleet for the IOTC area of competence for the period 2010 – 2017.

There are three areas of concentrated longline effort by the national fleet in the IOTC Area of Competence (Figure 2a): the Agulhas Bank (~ 20-23 degrees longitude), Algoa Bay (~ 25-27 degrees longitude) and offshore of Richards Bay (~32 degrees longitude). The average spatial distribution of the fleet for the period 2013 to 2017 is shown in Figure 2b and annual distribution of sets (2012-2017) in Figure 2c. The spatial distribution of species-specific catches is illustrated in Figure 3a, and the average species specific catch distribution for the period 2013 to 2017 in shown in Figure 3b. in 2017, most species had high catches in all three areas of high fishing pressure, except shortfin mako sharks which were predominantly caught on the Agulhas Bank in close proximity the IOTC/ICCAT boundary. All other species commonly caught species have a wide distribution in the IOTC area of competence, with high catches on the western boundary (IOTC/ICCAT) and to the east on the boundary of South African and Mozambique.

The annual national fleet longline effort for the period 2012 to 2017 is illustrated in Figure 2c. While the distribution is relatively evenly spread along the South African coast, there is a definitive trend of effort moving nearshore. A vast amount of effort was further offshore in the past (2012 – 2015), particularly on the border of Mozambique. The current effort has subsequently decreased, and has been focused closer to the mainland or on the Agulhas Bank.

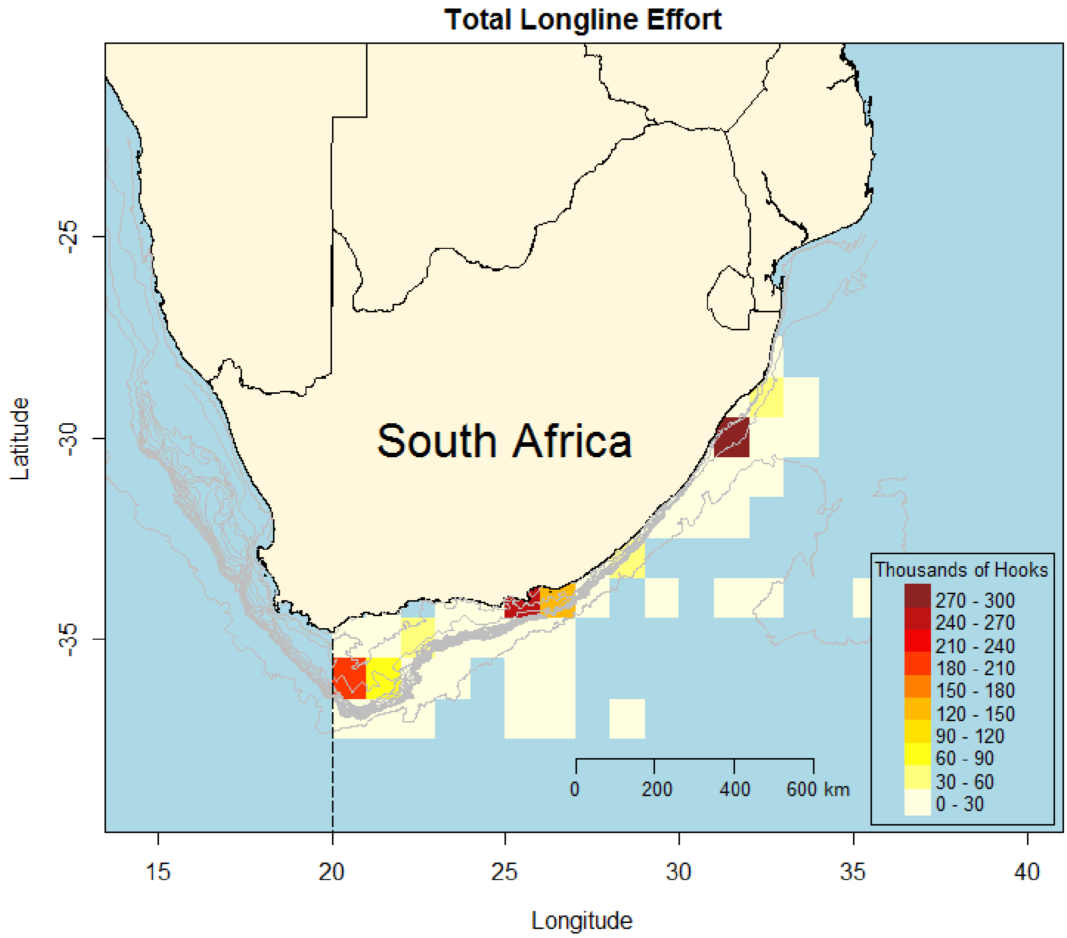

Figure 2a. Map of the distribution of effort of the South African Large Pelagic Longline fishing fleet in the IOTC area of competence for 2017.

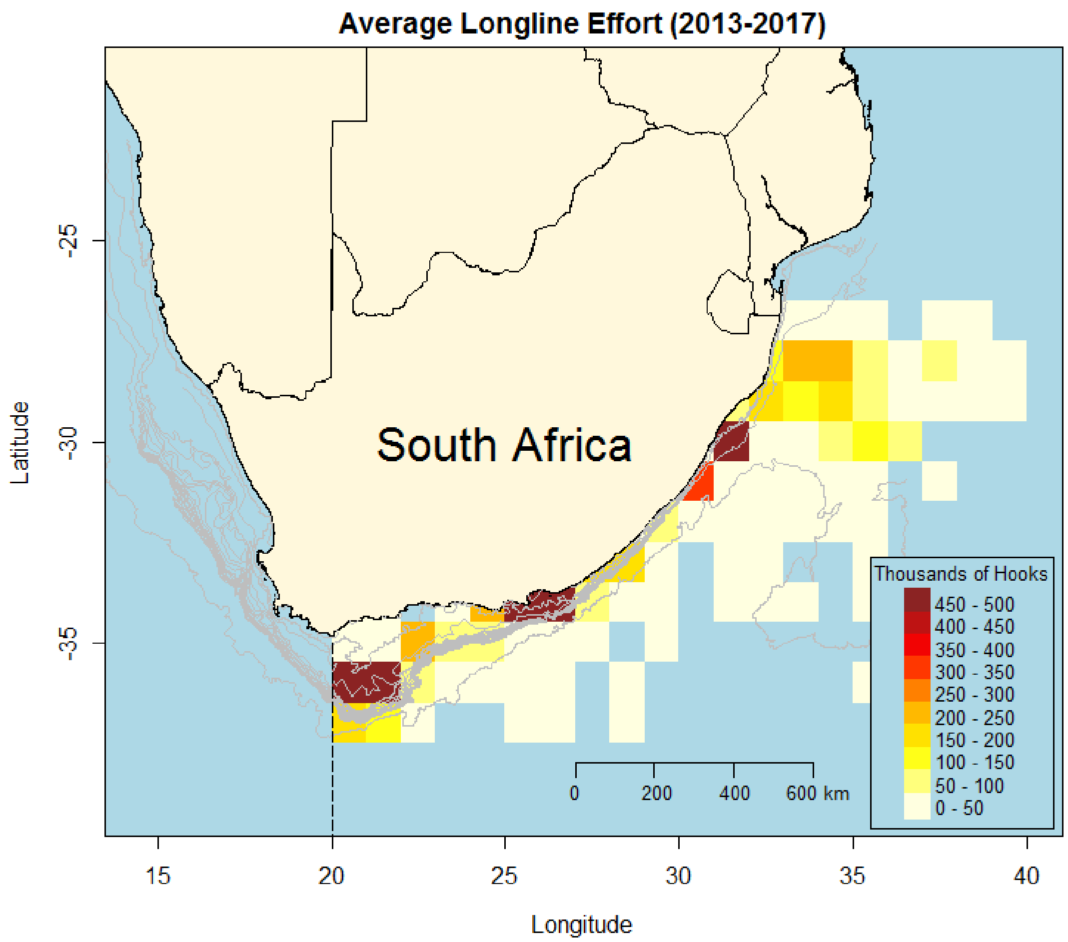

Figure 2b. Map of the distribution of average effort of the South African Large Pelagic Longline fishing fleet in the IOTC area of competence for the last 5 years (2013 – 2017).

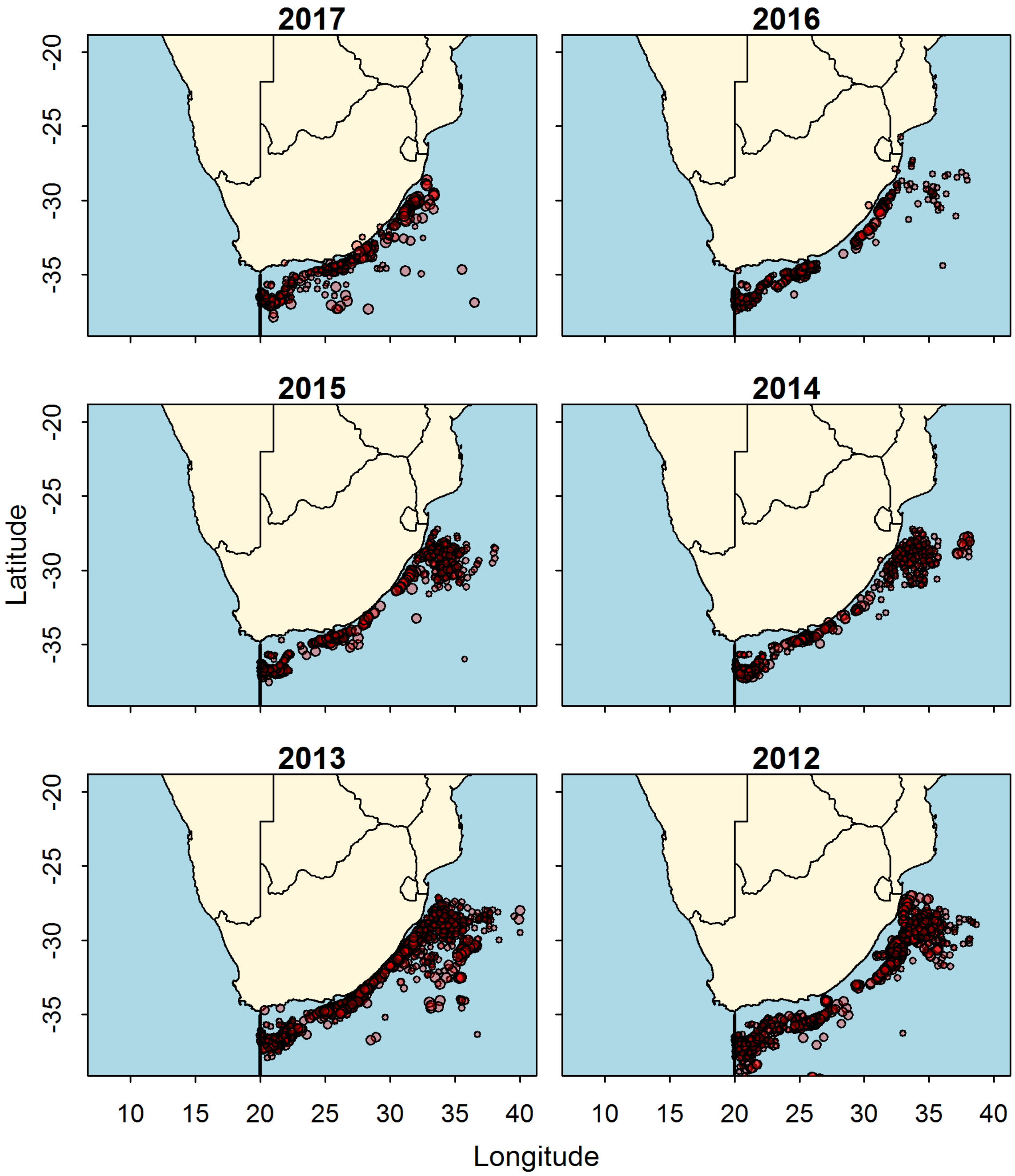

Figure 2c. Map of annual distribution of pelagic longline relative effort for the period 2012 - 2017 in the IOTC area of competence. The black line indicates the IOTC/ICCAT boundary

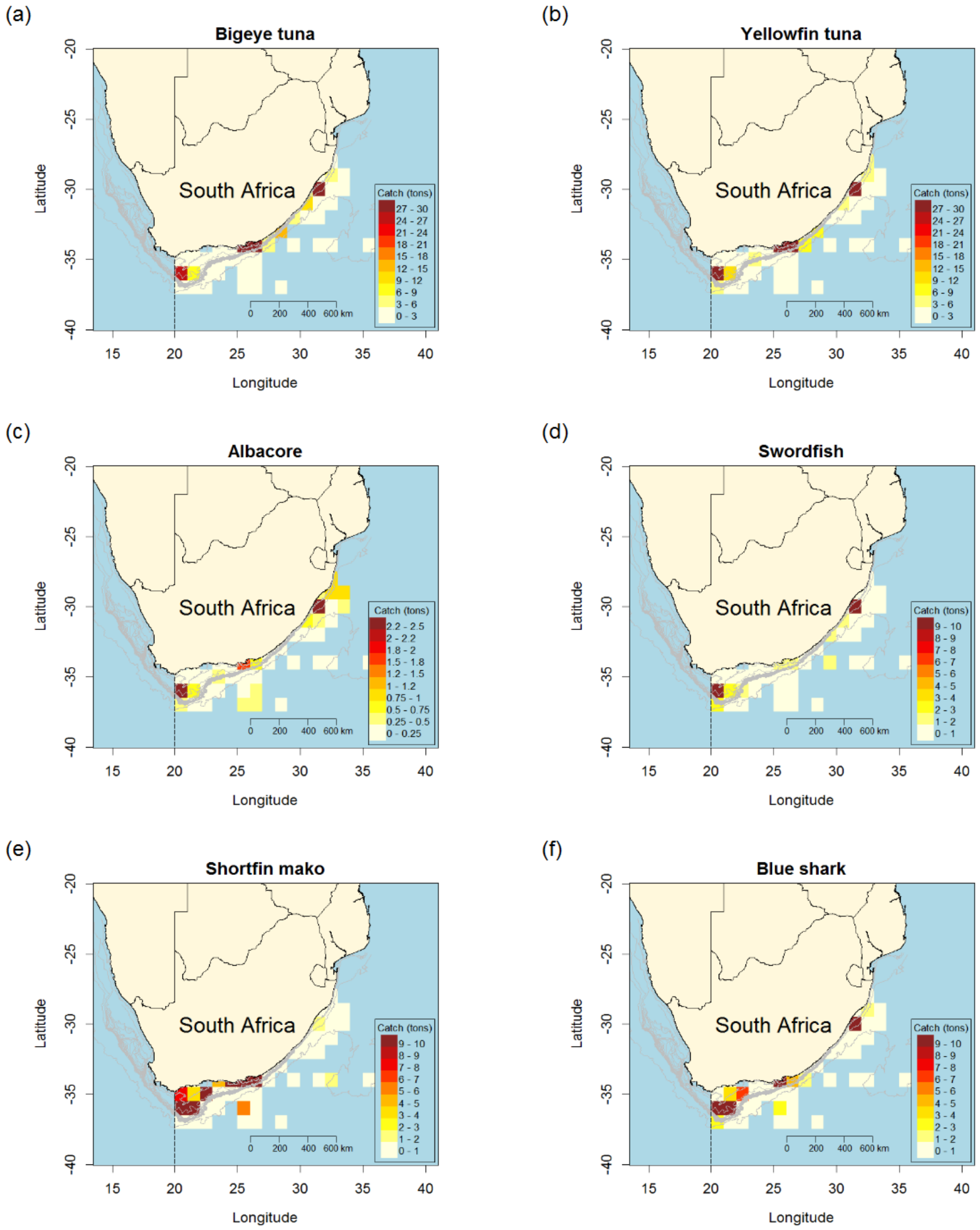

Figure 3a. Map of distribution of fishing catch (metric tons), for a) yellowfin tuna, b) bigeye tuna, c) albacore, d) swordfish, e) blue shark and f) shortfin mako shark for pelagic longline in South Africa, in the IOTC area of competence in 2017.

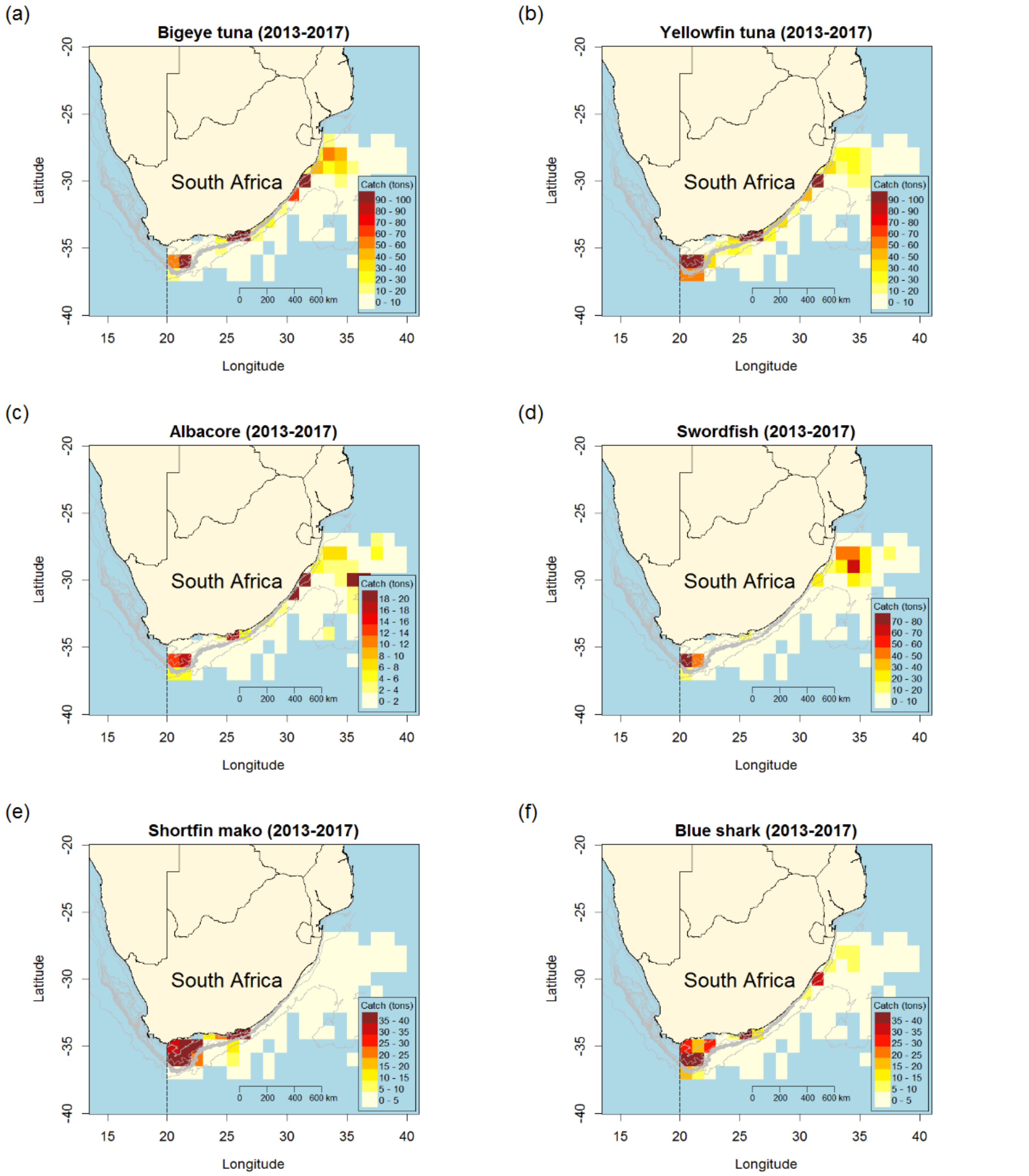

Figure 3b. Map of distribution of average fishing catch (metric tons), for a) yellowfin tuna, b) bigeye tuna, c) albacore, d) swordfish, e) blue shark and f) shortfin mako shark for pelagic longline in South Africa, in the IOTC area of competence for the last 5 years (2013 – 2017).

4. RECREATIONAL FISHERY

The boat-based recreational fishery, including informal charter and sport fisheries using rod and reel and spear guns, also targets albacore, yellowfin, skipjack, bigeye tuna and marlins (blue marlin *Makaira nigricans* and black marlin *Makaira indica*), from small fishing vessels (on average 4 – 10 m in length). All recreational fishers are required to purchase a permit and are restricted to a bag-limit of 10 tuna, 5 swordfish and 5 billfish per day, with the sale of catch strictly prohibited. There are further minimum weight restrictions of 3.2 kg for yellowfin and bigeye, 6.4 kg for southern bluefin and 25 kg for swordfish caught. As there are no reporting requirements for this fishery, catch and effort data are not consistently available. The angling associations have regular tuna and billfish competitions every year where they promote research (e.g. tagging), catch-and-release and responsible fishing. Most recreational fishing takes place in nearshore waters during holidays and relatively few anglers are equipped to target tuna.

The impact of the recreational fishing sector on South African large pelagic resources has resulted in a number of data collection initiatives being implemented. These are largely driven by NGOs, Government Research Institutes and Universities. One such initiative FishforLife (http://fishforlife.co.za/) is a citizen science initiative aimed at gathering relevant fisheries data in the recreational fishing sector via their online portal CatchReport (http://www.catchreport.co.za/). These projects also aim to collate all angling club and angling tournament catch and effort data which will be accessible for scientific research purposes.

5. ECOSYSTEM AND BYCATCH ISSUES

The World Wildlife Fund-South Africa (WWF-SA) Responsible Fisheries Programme, now the WWF Sustainable Fisheries, has worked since 2007 to facilitate the implementation of an Ecosystem Approach to Fisheries management (EAF) in Southern Africa. An Ecological Risk Assessment (ERA) was conducted in 2007 to identify the issues (e.g. ecological wellbeing, human wellbeing and ability to achieve) in the pelagic longline, shark longline and Tuna Pole-Line fisheries (Petersen, 2007). The Performance Report identified the gaps amongst research, management, compliance and industry and has been used – and has continued relevance – as a tool to guide work plans and the implementation of EAF considerations in permit conditions.

5.1.Sharks

South Africa has one of the most diverse shark faunas in the world and many species are caught in appreciable quantities in directed and non-directed shark fisheries. South Africa has well developed fisheries management systems for most of its fisheries and many challenges with regard to the sustainable management and conservation of sharks have already been identified and addressed in individual fisheries policies and management measures. The South African National Plan of Action for sharks (NPOA-Sharks) was finalised in 2013 and provided information on the status of chondrichthyans in South Africa and examined structure, mechanisms and regulatory framework related to research, management, monitoring, and enforcement associated with shark fishing and trade of shark product in the South African context. This information was used to identify, group and prioritize issues particular to South African chondrichthyan resources that require intervention in the forms of specific actions, associated responsibilities and time frames. It provides a guideline for identifying and resolving the outstanding issues around management and conservation of sharks to ensure their optimal, long term, sustainable use for the benefit of all South Africans.

Integral to the NPOA for Sharks -South Africa was the list of issues to be addressed in terms of improving sources of data, addressing scientific knowledge on common and cryptic species and thereby improving the management of chondrichthyan fisheries. In 2018, DAFF updated and reviewed the NPOA which was presented at the IOTC WPEB14 (da Silva *et al*., 2018). The review indicated that progress was made in six of the seven "Issue Clusters" and within most 22 issues highlighted in the NPOA Sharks SA. Most notable progress was made within the *optimum use* (100% of listed actions completed) and *classification and assessment of species* (84% of listed actions completed) issue clusters. The least progress was made in the *data and reporting* and *regulatory tools* issue clusters.

The permit conditions are amended regularly to include shark mitigation measures. As of 2017, the use of wire traces has been banned in the South African Large Pelagic Longline fishery.

In addition, a precautionary upper catch limit (PUCL) of 2000 t dressed weight of Chondrichthyans was enforced since 2012. Joint venture (foreign-flagged) vessels may not land Chondrichthyans that exceed 10% of the total dressed weight of tuna species per season.

South African-flagged vessels are limited by the aforementioned PUCL. When the PUCL has been reached the entire fishery will close.

Thresher sharks belonging to the genus *Alopias*, hammerhead sharks (belonging to genus *Sphyrna*), oceanic whitetip sharks, porbeagle sharks, dusky sharks and silky sharks shall not be retained on board any vessel and all releases of these species are noted on the logbooks.

Furthermore, manta- and mobulid rays shall not be retained on board any vessel and all releases of these species are noted on the logbooks.

Shark fins must be naturally attached to the body when landed as of 2017.

The trade of shark and ray products, including fins, fillets, gill rakers and other products should be carefully monitored to ensure CITES Appendix II listed species are not traded without the necessary permits.

The total number of sharks, by species, released/discarded by the national fleet in the IOTC area of competence for the period 2009 to 2017 is provided in Tables 4a – 4i. These tables quantify the state of released individuals from 2011 onwards.

Table 3. Total number and dressed weight (metric tons) of sharks retained by the South African national fleet in the IOTC area of competence for the period 2010 - 2017.

Year	Blue shark no.	Blue shark tons	Shortfin mako shark no.	Shortfin mako shark tons
2010	4 424	90.9	2 066	41.9
2011	10 844	193.8	14 734	341.1
2012	11 021	171.7	8 184	221.3
2013	11 588	169.8	11 620	304.4
2014	7 544	102.9	8 720	249.3
2015	10 609	128.9	10 856	289.4
2016	15 636	171.7	20 117	543.6
2017	7 017	105.4	14 704	421.1

Table 4a: Total number of sharks, by species, released/discarded by the national fleet in the IOTC area of competence in 2009.

	Discarded
Mobula spp.	2
Manta spp.	6
Pelagic stingray *Pteroplatytrygon violacea*	445
Blue shark *Prionace glauca*	494
Bronze whaler shark *Carcharhinus brachyurus*	11
Crocodile shark *Pseudocarcharias kamoharai*	55
Hammerhead shark *Sphyrna* spp	8
Shortfin mako shark *Isurus oxyrinchus*	416
Thresher shark *Alopias spp*	110
Big eye Thresher *Alopias superciliosus*	14
Shark unidentified	13
Ray and skate unidentified	17

Table 4b: Total number of sharks, by species, released/discarded by the national fleet in the IOTC area of competence in 2010.

	Discarded
Mobula spp.	1
Pelagic stingray *Pteroplatytrygon violacea*	188
Blue shark *Prionace glauca*	207
Bronze whaler shark *Carcharhinus brachyurus*	4
Crocodile shark *Pseudocarcharias kamoharai*	24
Dusky shark *Carcharhinus obscurus*	2
Hammerhead shark *Sphyrna* spp	7
Shortfin mako shark *Isurus oxyrinchus*	339
Thresher shark *Alopias spp*	133
Big eye Thresher *Alopias superciliosus*	10
Shark unidentified	11

Table 4c: Total number of sharks, by species, released/discarded by the national fleet in the IOTC area of competence in 2011.

	Alive and in good health	Alive, condition unknown	Alive, life-threatening injuries, unlikely to survive	Alive, minor injuries, stressed, high probability of survival	Dead	Unknown	Total
Bigeye thresher *Alopias superciliosus*	7	36		2	5		50
Blue shark *Prionace glauca*	70	287	3	79	68		507
Bronze whaler shark *Carcharhinus brachyurus*					3		3
Crocodile shark *Pseudocarcharias kamoharai*	6	25		8	3		42
Dusky shark *Carcharhinus obscurus*		7	1	1	5		14
Hammerhead sharks *Sphyrna* spp		11			4		15
Longfin mako *Isurus paucus*	1		1				2
Manta and *Mobula* spp		1					1
Oceanic whitetip shark *Carcharhinus longimanus*	1	3			1		5
Pelagic stingray *Pteroplatytrygon violacea*	62	230	12	80	69		453
Porbeagle shark *Lamna nasus*		2		3			5
Skates and rays unidentified		4					4
Shortfin mako shark *Isurus oxyrinchus*	118	202	8	183	141	1	653
Silky shark *Carcharhinus falciformis*					1		1
Smooth hammerhead shark *Sphyrna zygaena*	1	26			9		36
Thresher shark *Alopias vulpinus*	21	119		1	11	2	154
Tope shark *Galeorhinus galeus*				1	2		3

Table 4d: Total number of sharks, by species, released/discarded by the national fleet in the IOTC area of competence in 2012.

	Alive and in good health	Alive condition unknown	Alive, life-threatening injuries, unlikely to survive	Alive, minor injuries, stressed, high probability of survival	Discard reason unknown	Discard, dead	Discard dead, depredated	Discard, dead, finned	Discard, dead, no commercial value	Discard, dead, undersized	Total
Bigeye thresher *Alopias superciliosus*	5	21				3					29
Blue shark *Prionace glauca*	38	80	13	98	8	4	4	10		15	270
Bronze whaler shark *Carcharhinus brachyurus*				1							1
Crocodile shark *Pseudocarcharias kamoharai*	6		1	26				1			34
Dusky shark *Carcharhinus obscurus*	1	3		2	1	3					10
Great hammerhead shark *Sphyrna mokarran*		2									2
Manta and *Mobula* spp		4									4
Pelagic stingray *Pteroplatytrygon violacea*	53	3		97		2			2		157
Pelagic thresher shark *Alopias pelagicus*		2									2
Porbeagle shark *Lamna nasus*				6							6
Scalloped hammerhead shark *Sphyrna lewini*		4				2					6
Shortfin mako shark *Isurus oxyrinchus*	44	52	7	133	5	13	7	7		27	295
Smooth hammerhead shark *Sphyrna zygaena*	3	14		3		3	1				24
Thresher shark *Alopias vulpinus*	15	23		6		4	1	2			51
Tiger shark *Galeocerdo cuvier*		1									1

Table 4e: Total number of sharks, by species, released/discarded by the national fleet in the IOTC area of competence in 2013.

	Alive and in good health	Alive condition unknown	Alive, life-threatening injuries, unlikely to survive	Alive, minor injuries, stressed, high probability of survival	Discard reason unknown	Discard, dead	Discard, dead depredated	Discard, dead, finned	Discard, dead, no commercial value	Discard, dead, undersized	Total
Bigeye thresher *Alopias superciliosus*		2	1	8	1				1		13
Blue shark *Prionace glauca*	39	59	47	53	3	12	19			34	266
Crocodile shark *P.kamoharai*	7	4	2	16							29
Dusky shark *Carcharhinus obscurus*				1		1				1	3
Great hammerhead shark *Sphyrna mokarran*	6		2		3	3					14
Manta and *Mobula* spp	2	2									4
Oceanic whitetip shark *Carcharhinus longimanus*	1	2		2							5
Pelagic stingray *Pteroplatytrygon violacea*	34	16	6	27					2		85
Pelagic thresher shark *Alopias pelagicus*		3		1							4
Porbeagle shark *Lamna nasus*	1	8			1			1	1		12
Scalloped hammerhead shark *Sphyrna lewini*				2							2
Shortfin mako shark *Isurus oxyrinchus*	30	31	17	42	3	10	10	6	1	17	157
Silky shark *Carcharhinus falciformis*	3	2	1	1							7
Smooth hammerhead shark *Sphyrna zygaena*				1	1						2
Thresher shark *Alopias sp*	12	20	3	12	14						61
Tiger shark *Galeocerdo cuvier*				1							1

Table 4f: Total number of sharks, by species, released/discarded by the national fleet in the IOTC area of competence in 2014.

	Alive and in good health condition	Alive conditions not determined	Alive, life threatening injuries unlikely to survive	Alive, minor injuries / stressed high probability of survival	Discard reason unknown	Discard, dead	Discard, dead, depredated	Discard, dead, no commercial value	Discard, dead, undersize	Total
Bigeye thresher *Alopias superciliosus*	2			5		1				8
Blue shark *Prionace glauca*	73	26	20	98	2	47	27		35	328
Bronze whaler shark *Carcharhinus brachyurus*				2		1				3
Crocodile shark *Pseudocarcharias kamoharai*	5			7		1		1		14
Hammerhead sharks *Sphyrna* spp	1			1						2
Manta and *Mobula* spp				2						2
Pelagic stingray *Pteroplatytrygon violacea*	10	8	3	27		5		2		55
Pelagic thresher *Alopias pelagicus*			2	7						9
Shortfin mako *Isurus oxyrinchus*	24	13	2	64		13	5		25	148
Silky shark *Carcharhinus falciformis*						1				1
Thresher shark *Alopias* spp	18	7		6		5				36

Table 4g: Total number of sharks, by species, released/discarded by the national fleet in the IOTC area of competence in 2015.

	Alive and in good health condition	Alive conditions not determined	Alive, life threatening injuries unlikely to survive	Alive, minor injuries / stressed high probability of survival	Discard reason unknown	Discard, dead	Discard, dead, depredated	Discard, dead, no commercial value	Discard, dead, undersize	Total
Bigeye thresher *Alopias superciliosus*	6									6
Blue shark *Prionace glauca*	144	12	70	64	1	34	18	2	20	365
Bronze whaler shark *Carcharhinus brachyurus*	8		1	4		5				18
Crocodile shark *Pseudocarcharias kamoharai*	3		1	2		2				8
Hammerhead sharks *Sphyrna* spp	10		2	4		5				21
Oceanic whitetip shark *Carcharhinus longimanus*	2					3				5
Pelagic stingray *Pteroplatytrygon violacea*	73		5	8		7		20		113
Scalloped hammerhead shark *Sphyrna lewini*	6					1				7
Shortfin mako *Isurus oxyrinchus*	54	1	19	33	1	25	14		15	162
Silky shark *Carcharhinus falciformis*	9	5				19	1			34
Smooth hammerhead shark *Sphyrna zygaena*	1			1		1				3
Thresher shark *Alopias* spp	33	3	4	9		5				54
Tiger shark *Galeocerdo cuvier*	2									2

Table 4h: Total number of sharks, by species, released/discarded by the national fleet in the IOTC area of competence in 2016.

	Alive and in good health condition	Alive conditions not determined	Alive, life threatening injuries unlikely to survive	Alive, minor injuries / stressed high probability of survival	Discard reason unknown	Discard, dead	Discard, dead, depredated	Discard, dead, no commercial value	Discard, dead, undersize	Total
Bigeye thresher *Alopias superciliosus*		25	4						6	35
Blue shark *Prionace glauca*	22	160	48	23	1	13			29	296
Bronze whaler shark *Carcharhinus brachyurus*		3							1	4
Crocodile shark *Pseudocarcharias kamoharai*	3	10	13							26
Pelagic stingray *Pteroplatytrygon violacea*	9	50	4				3			66
Scalloped hammerhead shark *Sphyrna lewini*	1	2								3
Shortfin mako *Isurus oxyrinchus*	9	42	9	2	16	4			8	90
Thresher shark *Alopias* spp		25	4						6	35
Tiger shark *Galeocerdo cuvier*		4								4

Table 4i: Total number of sharks, by species, released/discarded by the national fleet in the IOTC area of competence in 2017.

	Alive conditions not determined	Alive and in good health condition	Alive, life threatening injuries unlikely to survive	Alive, minor injuries / stressed high probability of survival	Discard reason unknown	Discard, dead, undersize	Discard, dead, depredated	Discard, dead, no commercial value	Discard, dead	Total
Blue shark *Prionace glauca*	4	14	6	4		3	4		6	41
Bronze whaler shark *Carcharhinus brachyurus*	3						1			1
Crocodile shark *Pseudocarcharias kamoharai*		1	3							4
Pelagic stingray *Pteroplatytrygon violacea*		9	4	1				4	1	19
Scalloped hammerhead shark *Sphyrna lewini*		1								1
Shortfin mako *Isurus oxyrinchus*		10	8	3		3	2		4	30
Thresher shark *Alopias* spp		6	4	1				2	1	14
Tiger shark *Galeocerdo cuvier*			1							1

5.2.Seabirds

South Africa has been collecting data on seabird interaction with its longline fishery since 1998. South Africa published its NPOA for seabirds in 2008 (NPOA-Seabirds, 2008). The NPOA-Seabirds specifies a maximum mortality rate of 0.05 birds/1000 hooks, and lays out bycatch mitigation measures for use in longline fishing.

South Africa has introduced a number of bird mitigation measures through permit conditions since the start of its fishery, including the compulsory flying of tori-lines, no daylight setting, and the use of thawed bait to improve sink rates, in the tuna fishery. South Africa does not consider the use of line shooters or offal discard management to be useful in reducing seabird incidental mortality. Furthermore, South Africa (with the Albatross Task Force of BirdLife South Africa) developed a management plan in 2008 to reduce seabird by-catch in its longline fishery. This plan includes two seabird bycatch limits per vessel per year. The first limit stipulates that once a vessel reaches 25 birds killed in a year, it must adopt additional mitigation measures; it has to fly a second tori line and it has to place additional weights on to each branchline. If the vessel reaches the second limit of 50 seabird mortalities, the Department will review compliance with mitigation measures before deciding whether to permit further fishing by that vessel.

Table 4i: Summary of amendments to seabird bycatch mitigation measures in South African permit conditions for Foreign-flagged and South African within the South African EEZ.

Mitigation measure	2010	2011	2012	2013	2014	2015	2016	2017
Foreign-flagged vessels								
Night setting only	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bird-scaring line	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Line weighting (achieving 0.3 $m.s^{-1}$)	No	No	No	No	No	No	No	No
Line weighting (60 g < 2m of hook)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Thawed bait before setting	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Reduced lighting	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Offal management	No	No	No	No	No	No	No	No
25 bird bycatch limit per year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
South African vessels								
Night setting only	No	No	No	No	No	No	Yes	Yes
Bird-scaring line	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Line weighting (achieving 0.3 $m.s^{-1}$)	No	No	No	No	No	No	No	No
Line weighting (60 g < 2m of hook)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Thawed bait before setting	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Reduced lighting	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Offal management	No	No	No	No	No	No	No	No
25 bird bycatch limit per year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Since the implementation of seabird mitigation measures and the stringent monitoring thereof, seabird mortality has been reduced by more than an order of magnitude. For South Africa's entire coastline, the seabird mortality rate has declined from a maximum of 1.85 seabirds/1000 hooks^{-1} in 2011 to a catch rate of 0.051 seabirds/1000 hooks^{-1} in 2016, which is a vast improvement. In 2017 the catch rate increased to 0.072 seabirds/1000 hooks^{-1}. The implementation of mitigation measures remains high priority for DAFF, the South African fisheries management authority. All South African vessels, or vessels operating under a bi-lateral agreement with South Africa, are required to employ a combination of bird scaring lines, line weighting and night setting as bird bycatch mitigation measures. Vessels are encouraged to use 'hook shielding devices' (as approved by the Agreement on the Conservation of Albatross and Petrels), which in 2018 are limited to Smart Tuna Hooks® and Hookpods®. If either method is chosen, each hook set shall have the chosen device attached.

1. How many vessels operated south of 25˚S in the period covered by this report?
   - 100% of vessels operations reported in 2017 were south of 25˚S.

2. How many of those vessels used bird scaring lines (as a proportion of total effort)?
   - 100% of vessels flew tori lines. This is a mandatory regulation in South African waters.

3. How many of those vessels used line weighting (as a proportion of total effort)?
   - 100% of vessels employed line weighting.

4. How many of those vessels used night setting (as a proportion of total effort)?
   - 100% of vessels employed night setting. This is a mandatory regulation in South African waters.

South African researchers have collaborated extensively with numerous NGOs, including BirdLife South Africa, to improve estimates of seabird mortality as a result of large pelagic longliners. Specifically, the Seabird Bycatch Small Working Group held a meeting in Cape Town in May 2018 with the sole aim of developing the most reliable methods of determining seabird mortality using catch statistics from numerous countries that access large pelagic resources in the southern Atlantic and Indian Oceans (Rice 2018).

5.3.Marine Turtles

The South African government has worked closely with WWF to educate skippers on release procedures for turtles. Skippers are provided with guidelines/instructions in their permit conditions on how to safely handle and release caught turtles. The use of circle hooks is encouraged as stated in the permit conditions, as well as the release of turtles using a de-hooker. As of 2014, skippers were required to record interactions with turtles, including the fate of the turtle, in the catch statistic logbooks on board the vessel. There is high awareness among skippers on turtle handling protocols and release mortalities are thought to be low. In 2017, 2 turtle interactions were recorded with loggerhead turtles, both of which were released alive (Table 5).

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

South Africa encourages vessels to take cognizance of sustainable fishing practices and impacts of tuna longline operations on the ecosystem. Given that South Africa does not allow purse-seine fishing tuna fishing and large pelagics are solely targeted by longliners and baitboats, interactions with marine mammals are negligible. However, a specific concern is the impact of lost "strops" (cords used to hang fish during freezing) during discharge procedures. Marine animals subsequently become entangled in these strops, resulting in mutilation and potential mortality of entangled animals. In order to solve this problem the Permit Holder is to ensure that "strops" used during freezing and discharge do not exceed the stipulated 80 mm stretched length. In 2017, a single interaction with a bottlenose dolphin was recorded (Table 5).

Table 5. Observed annual catch of seabirds, marine turtles and marine mammals in the national pelagic longline fleet from 2011 - 2017 in the IOTC area of competence.

	2011		2012		2013		2014		2015		2016		2017	
	Dead	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead	Alive
Seabirds														
Atlantic yellow-nosed albatross *Thalassarche chlororhynchos*	187	42	12	5	8	2	34		14	4	4	2	1	1
Black-browed albatross *Thalassarche melanophris*	64	62	4	1	10		4	2	4	2				
Grey-headed albatross *Thalassarche chrysostoma*		99	4											
Indian yellow-nosed albatross *Thalassarche carteri*	1950	34	11		80	1	26		14	2				
Shy albatross *Thalassarche cauta*	350	814	4	7	1	11	1	6	1	1			6	
Albatross unidentified	387	465	1		6	4	2	1		1				
Cape gannet *Morus capensis*	180		1		5		19		4					
White-chinned petrel *Procellaria aequinoctialis*	319	8326	9	66	9	131	16	78	6	38	3	25	21	1
Petrel unidentified	172	2870		1							1			
Cape petrel *Daption capense*	32													
Great skua *Stercorarius skua*	11													
Marine turtles														
Leatherback turtle *Dermochelys coriacea*	227		1		1		2		5	1				
Loggerhead turtle *Caretta*	202		1				2		5		3		2	
Green turtle *Chelonia mydas*	32		1		1									
Hawksbill turtle *Eretmochelys imbricata*			1											
Turtle unidentified	154				3				2		2			
Marine mammals														
Common dolphin *Delphinus* spp														
Dolphin unidentified									1		1			
Bottlenose dolphin *Tursiops truncatus*														1

6. National data collection and processing systems

6.1. Logsheet data collection and verification (including date commenced and status of implementation)

Vessels in the Large Pelagic Longline fishery and Tuna Pole-Line fishery have been required to complete daily logs of catches since 1997 and 1985, respectively. The data are verified by comparing logs of catches with landing declarations that are overseen by South African Fisheries Compliance Officers and Fisheries Monitors. Rights Holders are required to submit these logsheets on a monthly basis.

6.2. Vessel Monitoring System (including date commenced and status of implementation)

The Vessel Monitoring System (VMS) was implemented in 1998 for Large Pelagic Longline vessels and was subsequently followed by the Tuna Pole-Line vessels. All longline and pole-line vessels are required to have a functional VMS system on board that transmits directly to the Department's VMS OPS Room. It is the Permit Holder's responsibility to ensure that the VMS transmits data continuously and uninterruptedly prior to and throughout the duration of the trip.

6.3. Observer programme (including date commenced and status; number of observers, include percentage coverage by gear type)

The observer program was established in 1998, at the start of the experimental phase of the pelagic longline fishery, and a minimum 20% observer coverage was stipulated. The Offshore Resources Observer Programme (OROP) began in March 2002 and to date it still requires 100% observer coverage on foreign-flagged vessels. Up until March 2011, 11-20% observer coverage was achieved on local vessels per year based on the total effort (number of hooks) deployed. The observer programme contract expired in March 2011. Since then the continuation of the observer coverage has been ensured by introducing measures within the fishing regulations that prescribe a minimum coverage per vessel and an overall coverage by fleet in order to meet the 5% observer coverage as specified by IOTC on the domestic longline vessels, whilst re-establishing the national observer programme by developing the specifications for the tender process. The observer programme for joint-venture (Japanese-flagged) vessels has continued with 100% of fishing trips observed.

There were 4 observers actively observing on the three Japanese foreign-flagged joint-venture vessels in 2017 in the IOTC region, with a combined total of over 250 observer days. A single trip from a local longline vessel was observed; the trip was 10 days. There are no observers stationed on pole-line vessels; however, increased inspections and sampling of pole-line vessels is conducted during offloading in port by South Africa Fisheries Compliance Officers and Fisheries Monitors.

Table 6. The number of hooks observed (local and foreign-flagged joint-venture vessels) per year from 2010 to 2017 in the IOTC region.

Year	Total number of hooks set on vessels that carried an observer	Percentage hooks observed on vessel that carried an observer	Percentage hooks observed of total hooks set in IOTC region (of which foreign-flagged coverage)
2010	2 297 122		
2011	3 126 357	48.4	29 (100%)
2012	2 615 568	37.5	26 (100%)
2013	2 235 366	43.7	25 (100%)
2014	1 263 727	43.0	30 (100%)
2015	1 037 222	62.5	64 (100%)
2016	680 000	52.9	28 (100%)
2017	939 835	41.5	30 (100%)

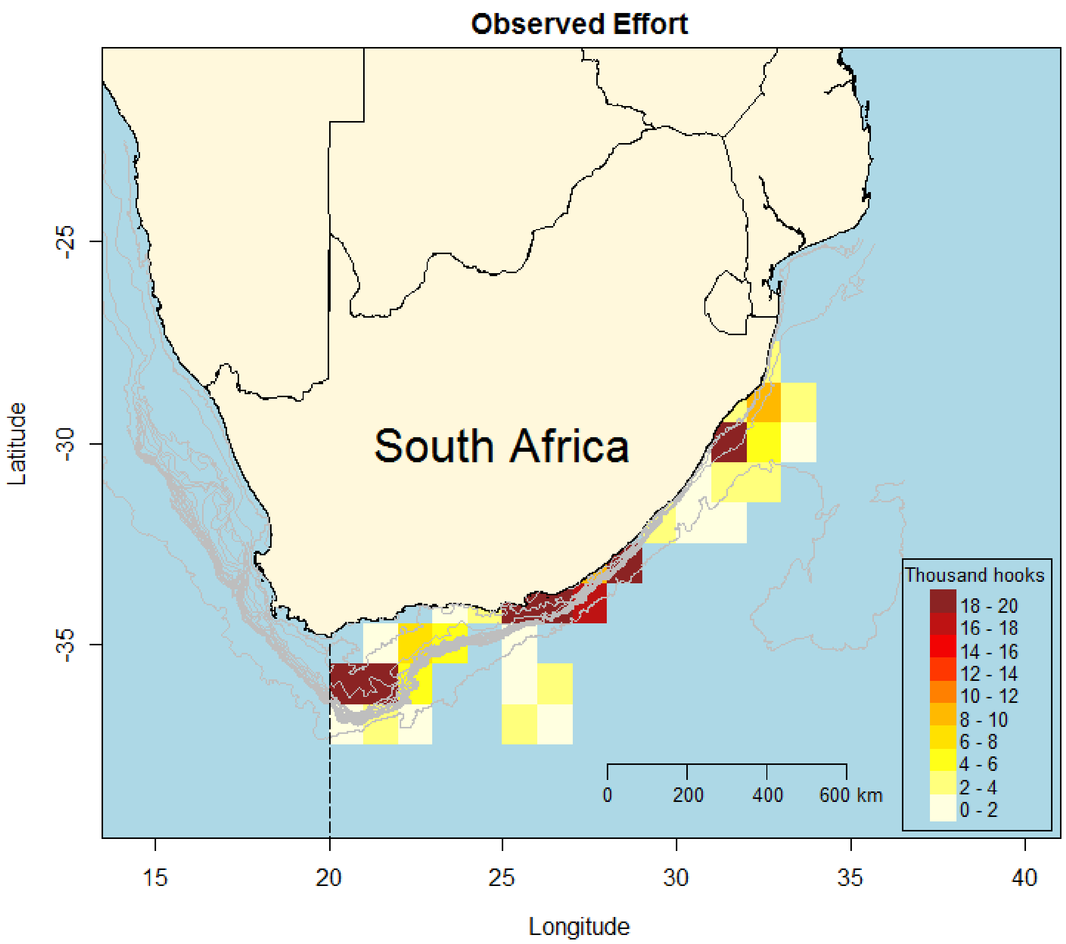

Figure 4. Map showing the spatial distribution of observer effort coverage for the IOTC area of competence in 2017.

The observers collect all operational, catch (retained and discard), effort and length frequency data, and will collect biological material when required. The observers record data on the following forms:

- Form 1: Vessel and trip information sheet (IOTC Form I-GEN)
- Form 2D: Pelagic longline gear and operation information (IOTC Form 2-LL)
- Form 3D: Fishing effort pelagic long-line (IOTC Form 4-LL)
- Form 4: Marine mammal, sea turtle, and seabird incidental take form
- Form 6: Depredation
- Form 7: Fish biological sampling

6.4. Port sampling programme [including date commenced and status of implementation]

Port sampling for tuna, swordfish and related species began in 1973 in the IOTC region. The collection of albacore length-frequency data through port sampling of Pole-Line vessels has been undertaken by employees of the Department of Agriculture, Forestry and Fisheries since 2011. The skippers are encouraged to collect yellowfin tuna length frequency measurements onboard Pole and Line vessels prior to dressing the catch. All length frequency data on the pelagic longline vessels are collected at sea by observers prior to the fish being dressed.

6.4. Unloading/Transhipment [including date commenced and status of implementation]

Unloading or discharging of fish from a longline vessel can only be undertaken in the presence of a monitor or a South African Fisheries Control Officer. Transhipment of fish is not permitted at sea. Transhipments of fish in port requires pre-authorisation. Tuna Pole-Line discharges in port are monitored. These measures have been in place since 1998.

Table 7. Number of individuals measured by observers on pelagic longline vessels in the IOTC area of competence for the period 2012 - 2017. These fish are not necessarily retained.

English name	Scientific name	2012	2013	2014	2015	2016	2017
Albacore	*Thunnus alalunga*	6002	4211	1037	311	324	655
Atlantic pomfret	*Brama*	15	3	571	45	89	793
Atlantic sailfish	*Istiophorus albicans*			2			
Bigeye tuna	*Thunnus obesus*	8138	4812	3134	3046	1948	2624
Big-scale pomfret	*Taractichthys longipinnis*	7					
Black marlin	*Makaira indica*	16	15	12	26	19	21
Blue marlin	*Makaira nigricans*	7	9	6	12	16	10
Blue shark	*Prionace glauca*	2199	1572	967	1142	514	686
Brilliant pomfret	*Eumegistus illustris*			1			
Butterfly kingfish	*Gasterochisma melampus*	7					
Common dolphinfish	*Coryphaena hippurus*	101	227	35	83	40	93
Copper shark	*Carcharhinus brachyurus*			1	4	9	15
Crocodile shark	*Pseudocarcharias kamoharai*			7	1		
Dorado	*Salminus brasiliensis*				9		
Escolar	*Lepidocybium flavobrunneum*	1978	1547	844	747	353	304
Indo-Pacific sailfish	*Istiophorus platypterus*	8	7	4	3		7
Long snouted lancetfish	*Alepisaurus ferox*			8			
Longfin mako	*Isurus paucus*		4				
Mako sharks	*Isurus* spp	62	6	68			
Moonfish	*Mene maculate*		1				
Ocean sunfish	*Mola*		2	2	2		
Oceanic whitetip shark	*Carcharhinus longimanus*				1		
Oilfish	*Ruvettus pretiosus*	2452	772	545	418	140	300
Opah	*Lampris guttatus*	231	524	124	51	13	24
Pelagic stingray	*Dasyatis violacea*				3		
Pomfrets, ocean breams nei	*Bramidae*	1507	1656	127	133	307	342
Porbeagle	*Lamna nasus*		1	6			
Rudderfish/Black ruff	*Centrolophus niger*	2		15			
Shortbill spearfish	*Tetrapturus angustirostris*	1	8		7	3	9
Shortfin mako	*Isurus oxyrinchus*	664	625	303	517	368	1170
Silky shark	*Carcharhinus falciformis*			1	7		
Skipjack tuna	*Katsuwonus pelamis*	826	253	113	38	8	41
Southern bluefin tuna	*Thunnus maccoyii*	411	161	35	66	132	195
Striped marlin	*Tetrapturus audax*		6	1	2	6	13
Swordfish	*Xiphias gladius*	672	339	114	239	83	257
Wahoo	*Acanthocybium solandri*	23	173	18	17	7	7
Yellowfin tuna	*Thunnus albacares*	12741	12912	7666	8814	1871	3998

7. NATIONAL RESEARCH PROGRAMS

The management boundary that separates the ICCAT from the IOTC region at 20° east divides the South African pelagic marine environment in two approximately equal zones. As such, studies which take place in the ICCAT area of competence have bearing on IOTC stocks and will likely be implemented in the IOTC region in the future, if not already. Given the ecological flexibility of this management boundary, research from the ICCAT area of competence is also listed below.

7.1.Current research projects

7.1.1. Stock Assessment software

7.1.1.1. JABBA

South African scientists (DAFF) in collaboration with CPC scientists from NOAA are leading the development and implementation of the new, open-source modelling framework JABBA (Just Another Bayesian Biomass Assessment). JABBA is a generalized Bayesian State-Space Surplus Production Model (SPM) and represents the next generation of biomass dynamic modelling. The motivation for developing JABBA was to provide a unified approach to SPM-based assessments that is reproducible, well-documented, and easily implemented for a variety of fisheries. By hosting JABBA in the open-source platform GitHub, the JABBA-Project provides a means for fisheries scientists to share, document, and improve assessment procedures in a standardized manner, greatly reducing time spent constructing redundant models, and democratizing modelling approaches across nations. Hosting such tools in a globally-accessible repository also increases transparency in the assessment workflow; enables rapid, continuous modification of the code not limited to a single developer; and acts as an archive of model improvements over time. JABBA originates from a continuous development process of a Bayesian State-Space SPM software that has been rigorously tested that has been applied in the following RFMO assessments:

- IOTC Indian Ocean Blue Shark Assessment (Winker 2017)
- ICCAT Mediterranean albacore assessment (ICCAT, 2017a; Winker and Parker 2017)
- ICCAT North and South Atlantic shortfin mako shark assessments (ICCAT, 2017b; *Winker et al.*, 2017a; Winker and Parker 2017a; Winker and Carvalho 2017)
- ICCAT South Atlantic swordfish assessment (ICCAT, 2017c; Winker and Parker 2017b).
- IOTC Indian Ocean striped marlin (*Tetrapturus audax*) assessment (Parker *et al.*, 2018 - IOTC-2018-WPB16-16).
- IOTC Indian Ocean black marlin (*Makaira indica*) assessment (Parker *et al.*, 2018 - IOTC-2018-WPB16-15).
- ICCAT Assessment of Atlantic bigeye tuna (*Thunnus obesus*) stock SCRS/2018/110
- ICCAT Blue Marlin Assessment for the Atlantic Ocean stock SCRS/P/2018/042

A JABBA manuscript has also been published in a peer reviewed journal (Winker *et al.*, 2018).

7.1.1.2. JARA - A Red Listing support tool applied on sharks, rays, and chimaeras (chondrichthyans) abundance indices from South African demersal trawl surveys

JARA represents a Bayesian state-space tool designed for trend analysis of abundance indices for IUCN Red List assessment purposes. The name 'Just Another Red List Assessment' is a reference to JAGS (Just Another Gibbs Sampler, Plummer, 2003), which is the Bayesian software that is called from R to run the Bayesian state-space model application. The name reference, together with user-friendly R interface and modulated coding structure of JARA also follows suit the example of the new open source fisheries stock assessment software 'Just Another Bayesian Biomass Assessment' (JABBA; Winker et al. 2018). This project conducted trend analyses for 19 Chondrichthyan species off the south and west coasts of South Africa using the new Bayesian state-space framework 'JARA' (Just Another Redlist Assessment; Winker et al. in prep). The Bayesian state-space framework models are provide a powerful tools for time series analysis, as they can allow accounting for both process error (environmental year-to-year variation) and observation (or reporting) error simultaneously. Moreover, the Bayesian posterior for the estimated population reduction decline provides a natural way to assign probabilities of that the rate of size reduction decrease falling falls within each of the Red Listing categories. For this purpose, we developed an easy to interpret graph, in which the posterior of the reduction estimates is plotted against the IUCN Red List criteria for each threat category. One of the main motivations for developing JARA was to provide a generalized and widely applicable tool that allows incorporation of both process and uncertainty into Red Listing assessment process based on population decline.

The project report is available: *Winker H, Sherley R, da Silva C, Leslie R, Attwood C, Sink K, Parker D, Fairweather T (2018). A Red Listing support tool applied on sharks, rays, and chimaeras (chondrichthyans) abundance indices from South African demersal trawl surveys. Grahamstown, South Africa.*

7.1.2. CPUE standardization

In 2016, South Africa has made significant progress in developing standardized CPUE indices by applying a General Additive Mixed Modelling approach for Tuna Pole-Line and longline catch and effort data. For the IOTC region, South African CPCs presented standardized CPUE indices for swordfish (da Silva *et al.*, 2017). In addition, South African CPCs presented standardized CPUE indices in the ICCAT region for albacore (Winker *et al.*, 2017b) and yellowfin tuna (Parker *et al.*, 2017a) from the Tuna Pole-Line fleet as well as swordfish (Parker *et al.*, 2017b), shortfin mako (Winker *et al.*, 2017c) and bigeye tuna (Parker *et al.*, 2017c) from the longline fleet. The suitability of these standardized indices for use in stock assessments were reviewed during the 2017 Albacore Intersessional meeting ICCAT, 2017a), the 2017 Tropical Tuna Intersessional meeting (ICCAT, in press), the 2017 Shortfin Mako Stock Assessment ICCAT, 2017b) and the 2017 Swordfish Stock Assessment (ICCAT, 2017c), respectively. As a result, the South African swordfish CPUE index was used in final South Atlantic swordfish assessment model and the Tuna Pole-Line albacore CPUE index was considered as input for the South Atlantic albacore assessment. Yellowfin tuna and bigeye tuna CPUE indices were not deemed suitable as direct stock assessment inputs due to the small spatial representation of the catch area and high variability, respectively. Similarly, it was suggested that shortfin mako CPUE index should currently not be included in stock assessment models because the majority of available catch and effort records occur in an area that straddles the ICCAT/IOTC 20 degree boundary, which is a known juvenile aggregation area that is associated with high uncertainty regarding regional assignment of this boundary stock. South Africa seeks to further improve the standardization of CPUE indices for the Tuna Pole-Line fleet and tuna/swordfish longline fleet for contribution in future stock assessment sessions of tunas, swordfish and sharks.

7.1.3. Biology and Ecology

The management boundary that separates the ICCAT from the IOTC at 20° East divides the South African pelagic marine environment in two approximately equal zones. Stocks of pelagic species with large ranges and a widespread larval disposal often straddle this boundary, which has implications for South Africa's research, reporting and assessment regimes. Biologically meaningful stock boundaries need to be investigated and considered for each species. The level of intermixing, the degree of reproductive isolation and a biologically and genetically defined boundary needs to be determined and considered when South African catch data is included in regional stock assessments. Studies that aid in resolving stock boundary issues are encouraged and much welcomed in South Africa.

7.1.3.1. South Africa is a collaborator of the project, "Population structure of IOTC species in the Indian Ocean: Estimation with next generation sequencing technologies and otolith micro-chemistry". The overall aim of the project is to develop a better understanding of the stock structure of tuna, billfish and sharks of the Indian Ocean using two independent, complementary techniques: genetics and otolith (or vertebrae) chemistry. The project intends to determine the degree of population structure and connectivity of the priority species of tuna, billfish and shark over a wide geographical range. Furthermore, the project aims also to develop and extend research networks among partners and to contribute to technical capacity building in participating coastal states. To date, South Africa has provided the following samples for this project:

- 58 Albacore pairs of otoliths and 57 tissue samples
- 55 Yellowfin tuna pairs of otoliths and 55 tissue samples
- 60 Blue shark vertebrae samples and 60 tissue samples

7.1.3.2. Movement of juvenile shortfin mako sharks (*Isurus oxyrinchus*) and blue sharks (*Prionace glauca*) around the Agulhas Bank shelf edge. This PhD project aims to investigate the horizontal and vertical movement shortfin mako blue sharks around the Agulhas Bank shelf. Furthermore, this project aims to investigate the hypothesis that the Agulhas shelf acts as a nursery ground for shortfin mako sharks. To date 19 shortfin mako and 8 blue sharks have been tagged with PSAT and SPOT tags in collaboration with DAFF, DEA (Department of Environmental affairs) and SWIOFP (South West Indian Fishery Project). One of the key research priorities involves investigating the movement of large pelagic sharks and fish between the Indian and Atlantic Ocean.

7.1.3.3. Albacore has been studied mainly in the North Atlantic and the North Pacific, and little is known about this species in the southern regions and tropics. In the Pacific and Atlantic oceans there is a clear separation of southern and northern stocks associated with the oceanic gyres. The Indian Ocean population is thought to comprise of a single stock distributed from 5°N to 45°S, but this link between Indian Ocean and South Atlantic stocks needs to be investigated. In South African waters, mainly juveniles are caught but the links with the adult populations are still not completely understood. South Africa is a collaborator on the GERMON project led by Institut français de recherche pour l'exploitation de la mer (IFREMER) and Institut de recherche pour le développement (IRD) to better understand the stock structure of albacore between the Indian and Atlantic Oceans. Genetic, morphological and biological sampling was concluded in July 2014 and a publication is currently under review.

7.1.3.4. "World without borders- genetic population structure of a highly migratory marine predator, the blue shark (*Prionace glauca*)". This study proved insights into the genetic population structure of blue sharks, by sampling the least mobile component of the populations, i.e., the young-of-year and small juveniles (<2 year; N = 348 individuals), at three reported nursery areas, namely, western Iberia, Azores, and South Africa. Samples were collected in two different time periods (2002–2008 and 2012– 2015) and were screened at 12 nuclear microsatellites and at an 899-bp fragment of the mitochondrial control region. Results show temporally stable genetic homogeneity among three Atlantic nurseries at both nuclear and mitochondrial markers, suggesting basin-wide panmixia. In addition, comparison of mtDNA CR sequences from Atlantic and Indo-Pacific locations also indicated genetic homogeneity and unrestricted female-mediated gene flow between ocean basins. These results are discussed in light of the species' life history and ecology, but suggest that blue shark populations may be connected by gene flow at the global scale. The implications of the present findings to the management of this important fisheries resource are also discussed. The findings have been published.

7.1.3.5. The Department, with the assistance of NGOs (e.g. Birdlife SA), assesses the impact of longline fisheries on seabirds, turtles and sharks and to investigate various mitigation and management measures. A National Plan of Action for seabirds (NPOA-seabirds) was published in 2008, which aimed to reduce seabird mortalities below 0.05 seabirds.1000 hooks^{-1}. Good collaboration with the fishing industry, researchers and managers, continual refining of mitigation measures, the implementation of stringent management measures through permit conditions, and close monitoring through the observer programme has resulted in decreased seabird mortalities and the mortality rate in 2012 was less than 0.05 seabirds per thousand hooks, reaching the goal identified in NPOA-seabirds.

7.1.4. Bycatch

7.1.4.1. Collaborative work to assess seabird bycatch in pelagic longline fleets (South Atlantic and Indian Oceans)

This project is a collaborative work to assess seabird bycatch in the pelagic longline fleets operating in the South Atlantic (SAO) and Indian (IO) Oceans from an entirely scientific perspective was conceived by researchers from several national fleets during the Inter-sessional Meeting of the Sub-committee on Ecosystems of ICCAT, in September 2016. The objectives of this process are 1) to determine the spatio-temporal patterns of seabird bycatch, 2) to estimate the seabird bycatch (at the lowest possible taxonomic level) and data permitting, 3) to gain knowledge on the performance of mitigation measures. South Africa provided spatially disaggregated bird bycatch data for analyses and contributed to the subsequent project report: *Collaborative work to assess seabird bycatch in pelagic longline fleets (South Atlantic and Indian Oceans)* - 16 to 20 of April 2018, Montevideo, Uruguay.

7.1.4.2. *The Seabird Bycatch Small Working Group Meeting. Using alternative techniques to estimate bird encounters and overall captures.*

The Seabird Bycatch Small Working Group focussed on further refining the model options and methodology for calculating N, along with comparing and contrasting the results of methods that account for the variation in space and time of the catch rates, as well as take into account the different levels of information content in disparate data sets. The meeting brought together data from Brazil, the Republic of Korea, and South Africa. The combined dataset was used to develop estimates of Bycatch Per Unit Effort (BPUE) and N. Here BPUE is defined as the total seabird bycatch per 1000 hooks fished, including both live releases and mortalities. Specific outcomes include the development of analytic tools (code) that can be utilised with any aggregation of data and for any spatial area to estimate seabird bycatch. Prior to the start of the SWGM, the following meeting goals were identified:

1) Organise seabird bycatch data from three observer programs; i) South Africa, ii) Republic of Korea and iii) Brazil

2) Examine spatial models and compare estimates of these models with ratio-based estimators

3) If time permitted, consider approaches on simulated datasets to investigate the effect of non-uniform observer coverage

The meeting results and report are available: Report of the Seabird Bycatch Small Working Group Meeting - Using Alternative Techniques to Estimate Bird Encounters and Overall Captures. Cape Town, May 28-June 1 2018.

7.2.Previous research projects

7.2.1. The heavy metal contamination of commercially important large pelagic species (blue shark (*Prionace glauca*), shortfin mako (*Isurus oxyrinchus*) and yellowfin tuna (*Thunnus albacares*) has been investigated by a PhD student in the Meat science, Processing & Product Development research team (Department of Animal Sciences) at Stellenbosch University. Levels of Mercury in South African caught mako sharks are a cause for concern as the maximum allowable limit was exceeded in 100% of samples. The findings have been published.

7.2.2. Genetic stock structure and estimation of abundance of swordfish (*Xiphias gladius*) in South Africa". This study examined the stock structure of swordfish around South Africa and developed the initial CPUE standardization process currently used to estimate indices for swordfish for both IOTC and ICCAT. South Africa straddles two ocean basins, the Indian and Atlantic Ocean and currently the jurisdictions of the IOTC and ICCAT are separated by a management boundary at 20°E. This study examined the origin of SA caught swordfish. Eleven microsatellite loci were included in this study of the fine scale population structure of swordfish caught relatively close inshore. Despite the poor quality of the DNA samples, muscle material of 267 swordfish caught in 2005 around the entire range of South Africa's coastline was utilised. A posterior predictive map of admixture proportions produced a potential admixture zone between 14°E and 27°E. There is evidence of gene flow and migration in this area in both directions, though the evidence for weak differentiation suggests that the Indian Ocean and Atlantic Ocean contain separate stocks and that swordfish stocks coexist around South Africa but return to their ocean of origin to reproduce. Due to passive drift of larvae and active dispersal of adults that have wide environmental parameter limits that extend across this area, swordfish would be prone to admixture and genetic homogenisation. The MSc student has graduated and the research has been concluded.

7.2.3. Distribution patterns and population structure of the blue shark (*Prionace glauca*) in the Atlantic and Indian Oceans." The blue shark is the most frequently captured shark in pelagic oceanic fisheries, especially pelagic longlines targeting swordfish and/or tunas. As part of cooperative scientific efforts for fisheries and biological data collection, information from fishery observers, scientific projects and surveys, and from recreational fisheries from several nations in the Atlantic and Indian Oceans was compiled. Data sets included information on location, size and sex, in a total of 478,220 blue shark records collected between 1966 and 2014. Sizes ranged from 36 to 394 cm fork length. Considerable variability was observed in the size distribution by region and season in both oceans. Larger blue sharks tend to occur in equatorial and tropical regions, and smaller specimens in higher latitudes in temperate waters. Differences in sex ratios were also detected spatially and seasonally. Nursery areas in the Atlantic seem to occur in the temperate south-east off South Africa and Namibia, in the south-west off southern Brazil and Uruguay, and in the north-east off the Iberian Peninsula and the Azores. Parturition may occur in the tropical north-east off West Africa. In the Indian Ocean, nursery areas also seem to occur in temperate waters, especially in the south-west Indian Ocean off South Africa, and in the south-east off south-western Australia. The distributional patterns presented in this study provide a better understanding of how blue sharks segregate by size and sex, spatially and temporally, and improve the scientific advice to help adopt more informed and efficient management and conservation measures for this cosmopolitan species. This project was a global initiative and was conducted by several CPCs with data and input provided by SA. This project was published.

7.2.4. South Africa's involvement in the South West Indian Ocean Fisheries Programme (SWIOFP) through Component 4: Assessment and sustainable utilization of large pelagic resources has provided momentum to our research programme. The primary focus is to understand the distribution and movement of swordfish, bigeye and yellowfin tuna within the SWIO region, to which end 15 pop-up satellite archival tags (PSATs) were provided for deployment on swordfish, yellowfin and bigeye tunas as well as hook monitors and time depth recorders for deployment of an instrumented longline.

7.2.5. The Department's national research cruise in 2011 was a momentous achievement during which 11 swordfish were successfully PSAT tagged in the South West Indian Ocean (SWIO) region with SWIOFP tags. Swordfish have proven to be very sensitive to handling and South Africa is the first country to achieve PSAT tagging of swordfish in this region. Tags have been programmed for either 90 or 180 days. Of the 11 tags, 4 remained on the swordfish for more than 2 months. The results of this study were presented at the IOTC Working Party for Billfish in 2012 (Document number IOTC-2012-WPB10-16). South Africa aims to conduct further research on the movement of large pelagic species between the Indian and Atlantic Oceans by placing more satellite (PSAT and SPOT) tags on animals. Coupled with movement data, genetic studies on the differences between swordfish from the two Ocean basins are currently being explored. There are no formal scientific programmes for billfish in South Africa (*Rec 06-09*).

7.2.6. South Africa has collected instrumented longline data (Time Depth Recorders and Hook Timers) from 29 sets (of between 259 – 300 hooks per set) obtained on the dedicated research cruises on the Ellen Khuzwayo research vessel, though more data is required for analysis for a target and bycatch study.

7.2.7. Two bigeye tuna (*Thunnus obesus*) and one southern bluefin tuna (*Thunnus maccoyii*) were successfully PSAT tagged on research cruise on the RV Ellen Khuzwayo in August 2015. These fish were tagged at 36S, 19E with tags setup to pop off after 90 (2 tags) and 180 days (1 tag). Data from these tags will reveal horizontal movement patterns between the Atlantic and Indian Oceans. Additional sampling is subject to the availability of funding.

7.2.8. Aspects of the biology and fishery of the blue shark (*Prionace glauca*) in South African waters". This project examined the blue shark fishery in South Africa as well as examining aspects of their biology. Spatio-temporal analyses on nominal CPUE, as well as a standardised CPUE series revealed seasonality in blue shark abundance with a high abundance during summer and autumn off the west coast of South Africa. Annual standardised CPUE revealed that blue shark abundance has remained relatively stable from 1998 to 2008, contradictory to previous findings. The findings from this study suggested that the blue sharks from South Africa are not being overfished, corroborating the findings of the 2008 ICCAT stock assessment. This study resulted in an MSc thesis, publication and IOTC document.

7.2.9. "The current status and management of South Africa's chondrichthyan fisheries". The impact of all South African fisheries on chondrichthyans was investigated. In South Africa's diverse fishery sectors, which include artisanal as well as highly industrialised fisheries, 99 (49%) of 204 chondrichthyan species that occur in southern Africa are targeted regularly or taken as bycatch. A total reported dressed catch for 2010, 2011 and 2012 was estimated to be 3 375 t, 3 241 t and 2 527 t, respectively. Two thirds of reported catch were bycatch. Regulations aimed at limiting chondrichthyan catches, coupled with species-specific permit conditions, currently exist in the following fisheries: demersal shark longline, pelagic longline, recreational line and beach-seine and gillnet. Limited management measures are currently in place for chondrichthyans captured in other South African fisheries. This research has been published.

7.2.10. "First documented southern transatlantic migration of a blue shark *Prionace glauca* tagged off South Africa". This project aimed to describe the first documented recapture of a South African-tagged juvenile blue shark off

Uruguay lending weight to the hypothesis of a single blue shark population in the South Atlantic. Furthermore, this project aimed to identify a nursery area off Cape Town. The presence of neonate blue sharks with umbilical scars and females with post-parturition scars, as well as the high frequency of small juveniles in research longline catches, confirm the existence of a parturition and nursery area off South Africa. The final positions of three tagged sharks suggest that large-scale movement patterns in the South Atlantic are a mirror image of movements in the North Atlantic, with sharks using the north-westerly Benguela Drift to migrate into the tropics and ultimately across into South American waters. The confirmed existence of a parturition and nursery area off the south coast of South Africa and the movement of sharks into both adjacent ocean basins suggest that the southern African blue sharks are part of a single stock that straddles the South Atlantic and Indian oceans, and possibly the entire Southern Hemisphere. This project was published.

8. Implementation of Scientific Committee Recommendations and Resolutions of the IOTC relevant to the SC.

Table 9. Scientific requirements contained in Resolutions of the Commission, adopted between 2005 and 2017.

No.	Resolution	Scientific requirement	CPC progress
16/01	On an Interim Plan for Rebuilding the Indian Ocean Yellowfin tuna Stock in the IOTC area of competence	Paragraphs 1-9	South Africa does not allow the use of purse seine vessels gillnets or supply vessels to target Large Pelagics in its EEZ. Furthermore, longline catches of Yellowfin reported for 2014 were, and remain far below 5000 MT as of 2017.
15/03	On the vessel monitoring system (VMS) programme	Paragraphs 1-8	All longline and Tuna Pole-Line vessels shall be fitted with a functional vessel monitoring system (VMS). The permit holder shall ensure the VMS is fully functional and continues to transmit to the Department's Operations room. Whilst at sea, the VMS shall report without interruption.
15/01	On the recording of catch and effort by fishing vessels in the IOTC area of competence	Paragraphs 1–10	All longline and Tuna Pole-Line vessels are required to complete a logbook of catch and effort and submit this on a monthly basis to the Department.
15/02	Mandatory statistical reporting requirements for IOTC Contracting Parties and Cooperating Non-Contracting Parties (CPCs)	Paragraphs 1–7	South Africa submits nominal catch data and catch and effort data for surface and longline fisheries. Size data are collected through the observer program and port sampling. Fleet characteristics are submitted annually.
15/05	On conservation measures for striped marlin, black marlin and blue marlin	Paragraph 4	Marlin species (striped, blue and black) are caught in minimal quantities and are considered secondary species. Marlins less than 120 cm LJFL may not be retained. No discarding of dead marlins is permitted.
13/04	On the conservation of cetaceans	Paragraphs 7-9	There have been minimal encounters (i.e. incidental captures) with cetaceans by the longline vessels. South Africa will endeavour to have all skippers and onboard observers collect data on all encounters with cetaceans.
13/05	On the conservation of whale sharks (*Rhincodon typus*)	Paragraphs 7-9	There have been no recorded encounters (i.e. incidental captures) with whale sharks by the longline vessels. South Africa will endeavour to have all skippers and onboard observers collect data on all encounters with whale sharks.

No.	Resolution	Scientific requirement	CPC progress
13/06	On a scientific and management framework on the conservation of shark species caught in association with IOTC managed fisheries	Paragraphs 5-6	South Africa's NPOA-Sharks (2013) has grouped issues facing each fishery into clusters with proposed actions, responsibilities, priorities and timeframes (Pg 19-30 of the NPOA-Sharks, 2013)
12/09	On the conservation of thresher sharks caught in association with fisheries in the IOTC area of competence	Paragraphs 4-8	Thresher sharks are not permitted to be retained, this is stated in the permit conditions.
12/06	On reducing the incidental bycatch of seabirds in longline fisheries.	Paragraphs 3-7	The start and completion of line setting has to be conducted at night, defined by the period between nautical dusk and nautical dawn. Vessels have to fly a bird-scaring line (tori line) during the setting of each longline. • Instruction on the method of tori line construction and deployment is provided to each vessel to ensure that correct specifications and procedures are followed. Deck lighting is to be kept to a minimum. The beams of deck lights have to be directed towards the deck. All bait has to be appropriately thawed, and where necessary, the swim bladder punctured to ensure rapid sinking of the bait. All birds caught have to be brought onboard and, with the use of the release instructions provided, live birds are to be released. • The release instructions clearly outline the procedures to follow to ensure that a seabird has a good chance of survival after release. The NPOA-Seabirds was gazetted in 2008. The NPOA-SEABIRDS (2008) specifies a maximum bycatch rate of 0.05 birds/1000 hooks. Within this plan an initial seabird

No.	Resolution	Scientific requirement	CPC progress
			bycatch limit of 25 birds killed per year is set per vessel. Once the vessel reaches this limit then: • a second tori line has to be flown and, • branch lines (snoods) have to be weighted by placing 60 g weights within 2 m of the hook to ensure optimal sinking rates. Where multiple weights are used then the first weight should be within 2 m of the hook and the last weight within 3 m of the hook. If a vessel reaches 50 birds killed in a year then the vessel has to stop fishing immediately. If the vessel has complied with all mitigation measures 100% of the time then it will be allowed to fish on condition that a trained onboard observer has to be present to investigate the nature of the high seabird mortality and that instructions given by the observer will be followed.
12/04	On the conservation of marine turtles	Paragraphs 3,4,6-10	The use of circle hooks is encouraged as stated in the permit conditions. The South African government has worked closely with WWF to educate skippers on release procedures for turtles. According to the handling and release instructions provided to vessels in their permit conditions, vessels are required, amongst others, to: • Remove the hook using a long-handled de-hooker on turtles too large to bring onboard and a de-hooker on turtles brought onboard. • Use a line-cutter when a de-hooker is not possible and to cut the line as close to the hook as possible. • Use net to bring the turtle onboard and to avoid pulling on the line. • Handle the turtle with gentle care. Release the turtle headfirst and away from fishing gear once it has recovered onboard. Trained observers are present on all foreign-flagged

No.	Resolution	Scientific requirement	CPC progress
			longline vessels and they record all interactions with marine turtles during the fishing operation. Since 2013, all vessels have been required to record interactions with marine turtles in their logbooks, and each vessel has been given a species guide to aid identification of turtles to species level.
11/04	On a regional observer scheme	Paragraph 9	100% observer coverage is achieved on foreign flagged vessels. The observer programme for domestic vessels expired in 2011 and the Department is currently in the process of re-establishing the programme which would require at least 5% coverage of domestic longline (at-sea observer coverage) and Tuna Pole-Line (port observer coverage) fishing trips.
05/05	Concerning the conservation of sharks caught in association with fisheries managed by IOTC	Paragraphs 1-12	South Africa has provided all its historic shark data to IOTC. The fins and trunks of all sharks caught must remain attached to the trunk naturally. A precautionary upper catch limit (PUCL) for sharks is set at 2000 t dressed weight for the entire South African longline fishery. Furthermore, the use of wire traces has been banned from the Large Pelagic Longline fishery as of 2017. Joint venture vessels are restricted to a 10% shark by-catch limit. Thresher sharks belonging to the genus Alopias, hammerhead sharks (belonging to genus Sphyrna), oceanic whitetip and silky sharks shall not be retained on board the vessel.

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