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South African National Report to the Scientific Committee of the Indian Ocean Tuna Commission, 2015

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INFORMATION ON FISHERIES, RESEARCH AND STATISTICS

In accordance with IOTC Resolution 15/02, final scientific data for the previous year were 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 2015, final data for the 2014 calendar year must be provided to the Secretariat by 30 June 2015)	YES 30/06/2015
In accordance with IOTC Resolution 15/02, provisional **longline data** for the previous year were provided to the IOTC Secretariat by 30 June of the current year [e.g. for a National Report submitted to the IOTC Secretariat in 2015, preliminary data for the 2014 calendar year were provided to the IOTC Secretariat by 30 June 2015). **REMINDER**: Final longline data for the previous year is due to the IOTC Secretariat by 30 December of the current year [e.g. for a National Report submitted to the IOTC Secretariat in 2015, final data for the 2014 calendar year must be provided to the Secretariat by 30 December 2015).	YES 30/06/2015
If no, please indicate the reason(s) and intended actions:	

Executive Summary

South Africa has two commercial fishing sectors which either target or catch tuna and tuna-like species as bycatch in the Indian Ocean, the Large Pelagic Longline and the Tuna Pole-Line sectors. The Tuna Pole-Line sector operates mainly in the Atlantic Ocean from September to May each year to target albacore (*Thunnus alalunga*) and only occasionally crosses over into the Indian Ocean in search of yellowfin tuna (*Thunnus albacares*). In 2014, no tuna pole vessels fished in the Indian Ocean and instead targeted albacore and yellowfin tuna available inshore in the Atlantic Ocean, or opted to target tunas on the high seas at Vema and Valdivia seamounts and in Namibian waters. The South African-flagged pelagic longline vessels have traditionally used swordfish (*Xiphias gladius*) targeting methods in the Indian and Atlantic Oceans, whilst the Japanese foreign-flagged vessels target tropical tunas (yellowfin and bigeye tuna, *Thunnus obesus*) with effort focused in the Indian Ocean. Although the local South African fleet targets swordfish, their catch comprises of only 50-60% swordfish, the remainder being tropical tunas and sharks. It is concerning that swordfish catches remained low in the South West Indian Ocean in 2014. Experimental permits are available to encourage vessels to target swordfish yet the situation has not improved. The 52% reduction in longline effort (number of hooks) from 2013 to 2014 is due to the decline in the number of foreign-flagged vessels operating under joint-venture with South Africa in 2014. This reduced effort resulted in decreased catches of bigeye tuna (42% decrease), yellowfin tuna (62% decrease), swordfish (66% decrease) and albacore (84% decrease, considered bycatch in the longline sector). Blue shark (*Prionace glauca)* and shortfin mako (*Isurus oxyrinchus*) shark catches declined, though not at the scale of the tunas and swordfish, by 39% and 18%, respectively. South Africa was issued with a 40 t quota of southern bluefin tuna (*Thunnus maccoyii*) by the Commission for Conservation of Southern Bluefin Tuna (CCSBT) in 2014, of which 15.3 t was caught in the IOTC region. Research into the stock origin and intermixing of tuna and swordfish populations at the boundary between the Atlantic and Indian Oceans is a research priority in South Africa.

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1. BACKGROUND/GENERAL FISHERY INFORMATION

1.1. Large pelagic longline fishery

The Large pelagic longline fishery was formalized in 2005 with the issuing of 18 swordfish-directed and 26 tuna-directed long term (ten year) fishing rights. The fishery is restricted a Total Allowable Effort (TAE) of 50 permits (one permit per vessel) until quotas are stipulated for the IOTC region. The large pelagic longline fishery was deliberately 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. After only 9 swordfish-directed longline vessels operated in 2006, resulting in the lowest annual catch since 2001, South Africa amended its fishery policy in 2007, allowing foreign vessels to enter into joint ventures in this sub-sector to transfer skills to develop the local industry. Foreign vessel owners in the tuna-directed sub-sector are encouraged to reflag their vessels..

The swordfish CPUE has continued to decline since 2005 despite the reduced effort allocation to decrease the overall fishing pressure. In response, South Africa is encouraging new vessels to partake in exploratory swordfish fishing in new areas further offshore from the current fishing grounds. The current longline vessels have gear configured to catch swordfish although the catch composition is split between swordfish and tropical tunas (bigeye and yellowfin tunas). The general method and gear used to target swordfish involves setting lines at night (to reduce seabird mortality) with squid bait using buoy -and branch lines of 20m length. Depending on the vessel size, 700 – 1500 hooks are set per line. Stainless steel hooks are prohibited and wire traces are allowed on local vessels until 60% of the precautionary upper catch limit (PUCL) of 2000 t for sharks (blue and mako sharks mainly) has been reached. The larger, tropical tuna targeting, vessels are able to fish further offshore. They set up to 3000 hooks per set with a combination of fish and squid bait on deeper branch lines and vary 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 only started increasing in the Indian Ocean since 2001 with the availability of ice and the development of processing facilities at Richard's Bay, which is situated on the east coast of South Africa. Targeting bigeye and yellowfin tunas in the Indian Ocean has proven more successful resulting in a sizeable amount of the longline fishing effort concentrated in this region. 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 (*Mustelus spp*) sharks, and a pelagic longline component (seven vessels), which predominantly targets shortfin mako (*Isurus oxyrinchus*)and blue sharks (*Prionace glauca* and catches tunas and swordfish as bycatch. The shark longline fishery was split as a precursor to phase out the targeting of pelagic sharks due to the concern over the stock status of these species. The pelagic shark

fishery operated under exemptions from 2005 until March 2011 when it was formally incorporated into the tuna/swordfish longline fishery. Six of the seven shark exemption holders were issued with tuna/swordfish rights in March 2011 and are supposed to phase-out shark targeting. Going forward, pelagic sharks are managed as by-product in the tuna and swordfish longline fishery.

In recent years the targeting dynamics of the local fleet have been shifting from exclusive swordfish targeting to include tunas. Consequently in 2014 the decision was taken to merge tuna-directed and swordfish-directed sub-sectors in the upcoming allocation of fishing rights in the large pelagic fishery. The fishery is now referred to as the Large Pelagic Longline fishery and includes vessels that target tunas, swordfish and sharks. The 10-year long term rights granted in 2005 expired in February 2015, and 15-year rights will be allocated in the 2015/2016. The fleet is currently fishing under exemption permits until the long-term rights are granted.

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 have been underway since 1995 with Japan whereby these foreign-flagged vessels are permitted to fish under a South African Rights Holder. The vessel adheres to South African permit conditions and is required to carry an observer onboard every trip. The catch from these vessels accrues to South Africa.

In 2014 the fishing effort was distributed along the entire South African Indian Ocean coastline, mostly along the continental shelf edge. Concentrations of effort in the south, south east and east are attributed to targeting of tunas and swordfish and to the proximity of the vessel to the main ports (Cape Town, Port Elizabeth and Richards Bay, respectively).

1.2. Pole and line fishery, commercial linefishery

Fishing for tuna using rod and reel and pole and line dates back to the 1970's in South Africa when it was caught in minimal quantities as bycatch in other fisheries. Interest in tuna fishing sparked in 1979 when yellowfin tuna (*Thunnus albacares*) became available close inshore off Cape Point (Shannon, 1987). Operators from other sectors converted their vessels to carry ice to fish for yellowfin using pole and line or purse-seine nets, resulting in catches of over 4 500t per year (Penney and Punt, 1993). By 1980 yellowfin tuna was no longer available close inshore, resulting in these vessels targeting albacore (*Thunnus alalunga*) instead along 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 between 2 and 3 year old juvenile and sub-adult albacore (average of 86 cm FL) and adult yellowfin tuna (average of 133 cm FL). Catches of albacore have remained relatively stable over the last 10 years, averaging at around 3 500t per year. Yellowfin tuna is periodically availability inshore and the fleet harvest this species opportunistically. Vessels will catch snoek (*Thyrsites atun*) out of season and yellowtail (*Seriola lalandi*) when available.

The sector operates along the south west and west coast of South Africa in the Atlantic Ocean where albacore is available close inshore from October to May. Traditionally the South African fleet has been characterized into three different categories (1) Skiboats, (2) Poleboats 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 nmi. Poleboats, which represent the bulk of the fleet, are mainly older, displacement type, vessels converted from other fisheries. These

vessels can undertake multi-day trips of limited duration and range, as the catch is kept on ice. Freezer vessels are up to 30m 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 modern 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 as part of the commercial linefishery. During the long-term rights allocation process in 2006, the commercial linefishery was divided into three separate sectors consisting of the traditional linefishery (452 vessels and 3450 crew), the hake-handline sector (130 vessels and 785 crew) and the pole and line fishery (200 vessels and 3600 crew) (Mann, 2013). Of the 200 vessels and 3600 crew allocation available for 8 years, only 198 vessels and 2961 crew were allocated in 2006 (TAC/TAE, 2015). The reallocation of long-term rights in 2013 saw 130 rights (136 vessels) granted and 15% of the available effort reserved for appeals. 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 400t per annum albacore allocation for the period 2014 to 2016 (ICCAT, 2013), 90% of which is caught by the tuna pole-line sector.

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 cannot be accommodated on the vessel. Catches are instead monitored in port during offloading.

In 2014, after 6 years of experimental fishing, purse-seining for live bait was formalised in the permit conditions for the sector, allowing a limited number of vessels to use purse-seine nets that do not exceed 210m in length and 35m in depth and all vessels to hold live bait (mostly anchovy *Engraulis encrasicolus* with sardine *Sardinops sagax* considered as accidental catch) in tanks that can be kept alive for up to 3 months.
In 2014 no Pole and Line vessels fished in the Indian Ocean. This fishery is largely based in Cape Town and the fleet will operate 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 near shore 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, snoek, kob, geelbek and slinger are not available. These catches usually only contribute to a small percentage of the total catch of the Linefishery due to the multispecies nature of this fishery.

2. FLEET STRUCTURE

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, from 2010 - 2014.

Fleet Structure in 2014	Fleet Structure 2010 - 2013

Fishing Sector	Nr Active Permits	Vessel size range (m)	Trip duration (days)	Nr Active Permits	Vessel size range (m)	Trip duration (days)
Large Pelagic Longline	15	20 - 49	7 - 90	2013: 22 2012: 24 2011: 29 2010: 21	2013: 20 - 50 2012: 22 - 50 2011: 22 - 50 2010: 21 - 50	7 - 90
Pole & Line	0	-	-	2013: 0 2012: 6 2011: 6 2010: 2	2013: N/A 2012: 14 - 20 2011: 13 - 22 2010: 13	2 - 14
Rod & Reel (commercial)	370	4 - 10	1 - 2			
Rod & Reel (recreational)	Unknown	4 - 10	1			

3. CATCH AND EFFORT (BY SPECIES AND GEAR)

Table 2 a). 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 from 2010 to 2014. 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	4452420	794.9	1207.3	60.3	7.8	467.6	0.7	41.9	90.9	98.8
2011	5235123	781.2	1063.2	254.7	60.2	488.2	3.0	341.1	193.8	180.5
2012	3816271	759.2	590.1	161.7	109.1	395.1	2.6	221.3	171.7	136.4
2013	3872846	590.4	1029.4	177.5	53.3	305.0	3.6	304.4	169.8	101.6
2014	1828671	339.2	383.0	28.2	15.3	102.8	0.8	249.3	102.9	38.2

Table 2 b). Annual Pole and Line catch (tons dressed weight excluding albacore) and effort (number of days) of primary species in the IOTC area of competence from 2010 to 2014. NEI indicates all other catch.

Year	Total number of catch days	Albacore	Yellowfin	Skipjack	Bigeye	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

Figure 1. Historical combined annual catch (t dressed weight excluding albacore) of primary species for the national Large Pelagic Longline and Pole and Line fleets for the IOTC area of competence for the entire history of the fishery/fleet.

Year	Bigeye tuna	Yellowfin tuna	Albacore	Southern bluefin tuna	Swordfish	Shortfin mako shark	Blue shark	Tuna unidentified
Large Pelagic Longline								
1997	0	0	0	0	49	0	0	
1998	10	50	5	0	363	4	2	
1999	14	127	1	0	64	4	4	
2000	33	231	16	4	26	5	5	
2001	34	138	13	0	319	6	3	
2002	250	176	75	2	878	13	33	
2003	247	615	68	0	835	16	67	
2004	331	744	59	16	284	15	31	
2005	777	1345	112	42	250	37	43	
2006	59	174	63	13	202	4	10	
2007	530	975	118	70	313	32	97	
2008	439	593	194	25	321	41	117	
2009	605	1008	122	46	234	39	78	
2010	795	1207	60	8	468	42	91	
2011	781	1063	255	60	488	341	194	
2012	759	590	162	109	395	221	172	
2013	590	1029	177	53	305	304	170	
2014	339	383	28	15	103	249	103	
Pole and Line								
1989		0.0	16.8					0.0
1990		0.0	11.6					0.0
1991		0.0	0.0					9.5
1992		0.0	0.0					0.0
1993		0.0	0.0					0.0
1994		0.9	0.0					0.0
1995		0.0	2.1					0.0
1996		0.0	0.0					0.0
1997		0.0	0.0					0.3
1998		1.0	6.8					0.8
1999		0.0	0.0					0.0
2000		0.0	0.0					0.0
2001		9.3	6.3					0.0
2002		2.2	0.0					0.0
2003		0.0	1.3					8.5
2004		0.2	4.1					0.5
2005		0.0	4.1					0.0
2006		86.4	13.5					8.1
2007		0.0	0.0					0.0
2008		4.6	4.5					0.0
2009		1.2	0.0					0.0
2010		3.5	0.0					0.0
2011		45.7	0.7					0.0
2012		15.3	0.2					0.0
2013		0.01	0.06					0.0
2014		0.0	0.0					0.0

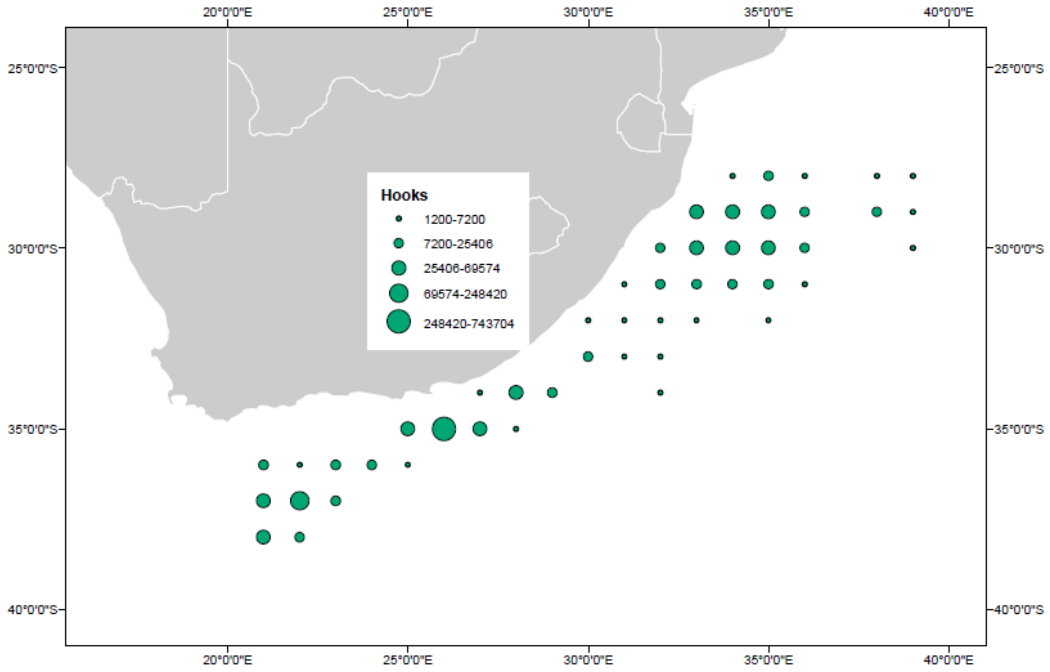

Figure 2a. Map of the distribution of fishing effort for the Large Pelagic Longline (number of hooks) in the IOTC area of competence in 2014. The Pole and Line fleet did not operate in the IOTC area of competence in 2014.

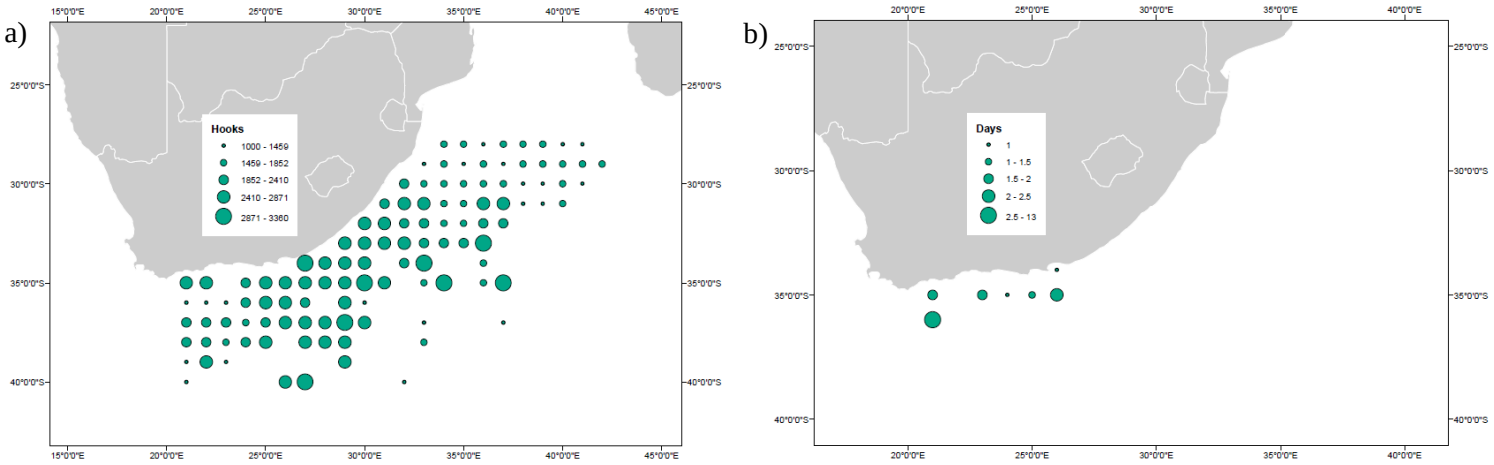

Figure 2b. Map of the distribution of average a) Large Pelagic Longline (number of hooks) and b) Pole and Line (number of days) effort from 2010 to 2014 in the IOTC area of competence.

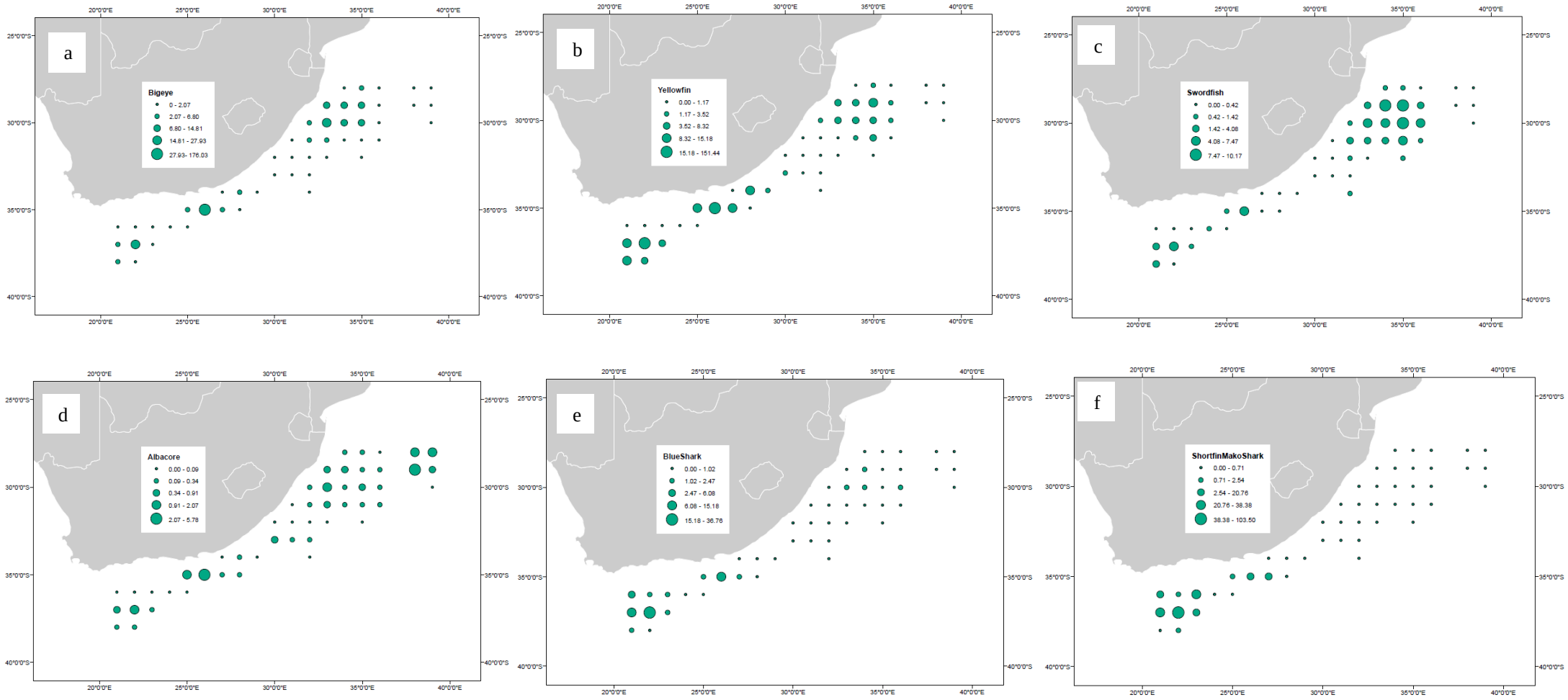

Figure 3a. Map of distribution of fishing catch (tons), for a) bigeye tuna, b) yellowfin tuna, c) swordfish, d) albacore, e) blue shark and f) shortfin mako shark for pelagic longline in South Africa, in the IOTC area of competence in 2014.

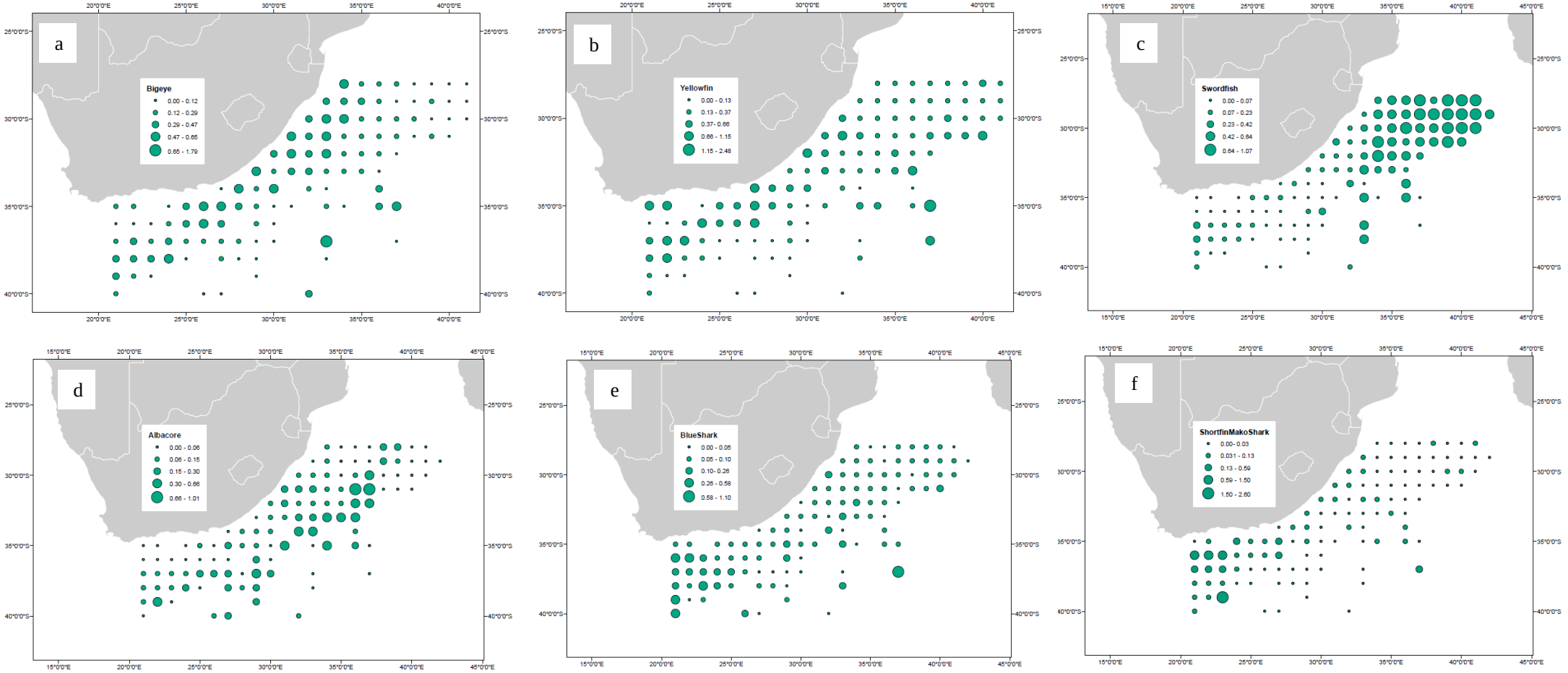

Figure 3b. Map of distribution of pelagic longline average catches (kg) from 2010 to 2014 for a) bigeye tuna, b) yellowfin tuna, c) swordfish, d) albacore, e) blue shark and f) shortfin mako shark in the IOTC area of competence.

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 *Istiompax indica*) from small fishing vessels (on average 7 m in length). Although catch and effort data are not consistently available for this fishery it is estimated that over 100 t of yellowfin tuna and king mackerel and 100 t of albacore tuna are landed annually for the Indian Ocean. 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. The sale of the catch is 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.

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 on the near shore during holidays and relatively few anglers are equipped to target tuna.

5. ECOSYSTEM AND BYCATCH ISSUES

The World Wildlife Fund (WWF)- South Africa Responsible Fisheries Programme, now the WWF Sustainable Fisheries, has worked with the Fisheries Department 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 in research, management and compliance and facilitated implementation of EAF considerations in permit conditions.

Environmental NGOs and fishing companies formed the Responsible Fisheries Alliance (RFA), to work together to ensure that healthy marine ecosystems underpin a robust seafood industry in southern Africa (Responsible Fisheries Alliance, 2011). The RFA has been a valuable initiative driven by the fishing industry to develop skills of fishers and fisheries managers to implement an EAF approach to operations and management. In addition high quality research on the implementation of an EAF is funded.

5.1.Sharks

The National Plan of Action (NPOA) for sharks was finalised and launched at the 2013 ICCAT Commission meeting being held in Cape Town, South Africa. Shark-related issues discussed in the NPOA-sharks have been categorised into clusters with proposed actions by the responsible unit within a time frame (NPOA-Sharks, 2013). A task-team of relevant stakeholders is required to achieve the tasks set out in the NPOA.

The permit conditions are updated regularly to include shark specific management measures. A precautionary upper catch limit (PUCL) of 2000t dressed weight of Chondrichthyans was included in 2012. Chondrichthyan landed catch weight of foreign-flagged fleets may not exceed 10% of the total dressed weight of tuna species per season. South African-flagged vessel catches are limited by the PUCL in the following manner: 1) Once 60% of the PUCL

has been reached, vessels will not be allowed to use steel wire traces on the branch lines; 2) When the PUCL has been reached the entire fishery will close.

Thresher sharks belonging to the genus *Alopias*, hammerhead sharks (belonging to genus *Sphryna*), oceanic whitetip sharks (*Carcharhinus longimanus*) and silky sharks (*Carcharhinus falciformis*) shall not be retained on board any vessel.

Fins may only be landed from shark trunks that are retained on board and both the fins and trunks must be landed together at the first point of landing. If the Permit Holder chooses to remove the shark fins from the trunks then the maximum weight of fins landed or retained on board shall not exceed 13% for blue sharks and 8% of the total weight of all other shark species trunks. If the Permit Holder chooses to keep the fins attached to the specific trunk (either through a partial cut and folded over or tethered to the trunk via a cord) then no ratio shall apply.

Table 3. Total number and dressed weight (in tons) of sharks retained by the national fleet in the IOTC area of competence from 2010 to 2014. Requiem sharks is a total of bronze whaler (*Carcharhinus brachyurus*), dusky (*Carcharhinus obscurus*) and silky sharks (*Carcharhinus falciformis*).

Year	Blue shark no.	Blue shark tons	Shortfin mako shark no.	Shortfin mako shark tons	Requiem sharks no.	Requiem sharks tons
2010	4424	90.9	2066	41.9	5	0.094
2011	10844	193.8	14734	341.1	325	15.21
2012	11021	171.7	8184	221.3	456	16.795
2013	11588	169.8	11620	304.4	38	1.715
2014	7544	102.9	8720	249.3	24	1.36

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 White tip 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
Big eye 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 *Pseudocarcharias 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 spp.*	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

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, prohibition of 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) has developed a management plan to reduce seabird by-catch in its longline fishery in 2008. This plan includes two seabird bycatch limits per vessel per year that were implemented in 2008. 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.

Since the implementation of seabird mitigation measures and the stringent monitoring thereof, seabird mortality has 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} to 0.38, 0.37 and 0.37 for 2012, 2013 and 2014, respectively, the lowest mortality rate achieved to date. The absence of an observer programme to monitor the local pelagic longline vessels has made it challenging to obtain reliable and accurate data on all seabird encounters in the fleet.

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 on how to safely handle and release caught turtles in their permit conditions. The use of circle hooks are encouraged as stated in the permit conditions, as well as releasing turtles with the use of a de-hooker. As of 2014, skippers were required to record interactions with turtles in the catch statistic logbooks on board the vessel, including the fate of the turtle. The absence of an observer programme to monitor the local pelagic longline vessels has made it challenging to obtain reliable and accurate data on all turtle encounters in the fleet.

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

South Africa encourages vessels to take cognisance of sustainable fishing practices and impacts of tuna longline operations on the ecosystem. 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 these 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 80mm stretched length.

All inorganic waste material, garbage and pollutants are required to be stored safely on board the vessel until discharge in port.

Table 5. Observed annual catches of seabirds, marine turtles and marine mammals in the national pelagic longline fleet from 2010 to 2014, in the IOTC area of competence.

	2010		2011		2012			2013			2014	
	Alive	Dead	Alive	Dead	Alive	Dead	Unknown	Alive	Dead	Unknown	Alive	Dead
Seabirds												
Atlantic yellow-nosed albatross *Thalassarche chlororhynchos*			187	42	12	5		8	2		34	
Black-browed albatross *Thalassarche melanophris*	8		64	62	4	1		10			4	2
Grey-headed albatross *Thalassarche chrysostoma*		1		99	4							
Indian yellow-nosed albatross *Thalassarche carteri*	29	1	1950	34	11			80	1		26	
Shy albatross *Thalassarche cauta*	3	22	350	814	4	7		1	11		1	6
Albatross unidentified	3	15	387	465	1			6	4		2	1
Cape gannet *Morus capensis*	12		180		1			5			19	
White-chinned petrel *Procellaria aequinoctialis*	4	52	319	8326	9	66		9	131	4	16	78
Petrel unidentified		1	172	2870		1						
Cape petrel *Daption capense*			32									
Great skua *Stercorarius skua*			11									
Marine turtles												
Leatherback turtle *Dermochelys coriacea*	3		227		1			1			2	
Loggerhead turtle *Caretta caretta*	2		202		1						2	
Green turtle *Chelonia mydas*			32		1			1				
Hawksbill turtle *Eretmochelys imbricata*					1							
Turtle unidentified	3		154					3				
Marine mammals												
Common dolphin *Delphinus*	1											
Dolphin unidentified							1					

1. How many vessels operated south of 25˚S in the period covered by this report? 15

2. What proportion of effort south of 25˚S used the following combinations of mitigation measures?:

   a) Bird scaring lines and night setting __100_%

   b) Bird scaring lines and line weighting __100_%

c) Night setting and line weighting __100_%

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 and 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 and Line vessels. All longline and pole and line are required to have a functional VMS system on board that transmits directly to the Department's base station. It is the vessels responsibility to ensure that the VMS transmits data continuously and uninterruptedly prior and throughout the duration of the trip.

6.3. Observer programme (including date commenced and status; number of observer, 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, and the Department is in the process of re-establishing the programme in the near future. The observer programme for joint-venture (Japanese-flagged) vessels has continued with 100% of fishing trips observed.

There were 7 observers actively observing on the four Japanese foreign-flagged joint-venture vessels in 2014 in the IOTC region. There are no observers stationed on pole and line vessels; however, increased inspections and sampling of pole vessels is conducted during offloading in port by South Africa Fisheries Compliance Officers and Fisheries Monitors.

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

Table 6. The number of hooks observed (local and foreign-flagged joint-venture vessels) per year from 2010 to 2014 in the IOTC region.

Year	Total number of hooks set on vessel 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%)

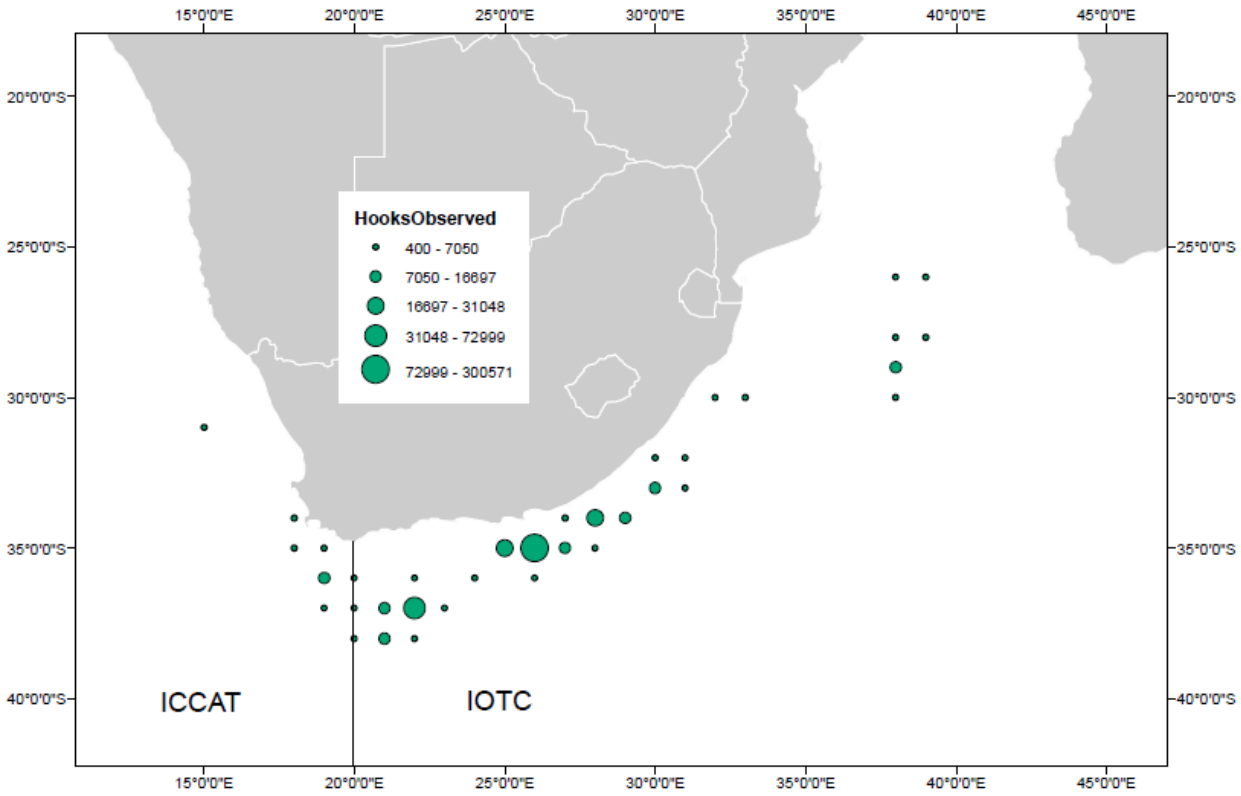

Figure 4. Map showing the spatial distribution of observer coverage on the Large Pelagic Longline vessels in 2014 in the indicated IOTC. Points are scaled by the number of hooks observed in each 1x1° block.

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 and 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.

Table 7. Number of individuals measured by observers on pelagic longline vessels in 2014 in the IOTC area of competence.

English name	Scientific name	2012	2013	2014
Albacore	*Thunnus alalunga*	6002	4211	1037
Atlantic pomfret	*Brama brama*	15	3	571
Atlantic sailfish	*Istiophorus albicans*			2
Bigeye tuna	*Thunnus obesus*	8138	4812	3134
Big-scale pomfret	*Taractichthys longipinnis*	7		
Black marlin	*Makaira indica*	16	15	12
Blue marlin	*Makaira nigricans*	7	9	6
Blue shark	*Prionace glauca*	2199	1572	967
Brilliant pomfret	*Eumegistus illustris*			1
Butterfly kingfish	*Gasterochisma melampus*	7		
Common dolphinfish	*Coryphaena hippurus*	101	227	35
Copper shark	*Carcharhinus brachyurus*			1
Crocodile shark	*Pseudocarcharias kamoharai*			7
Escolar	*Lepidocybium flavobrunneum*	1978	1547	844
Indo-Pacific sailfish	*Istiophorus platypterus*	8	7	4
Long snouted lancetfish	*Alepisaurus ferox*			8
Longfin mako	*Isurus paucus*		4	
Mako sharks	*Isurus spp*	62	6	68
Moonfish	*Mene maculata*		1	
Ocean sunfish	*Mola mola*		2	2
Oilfish	*Ruvettus pretiosus*	2452	772	545
Opah	*Lampris guttatus*	231	524	124
Pomfrets, ocean breams nei	*Bramidae*	1507	1656	127
Porbeagle	*Lamna nasus*		1	6
Rudderfish/Black ruff	*Centrolophus niger*	2		15
Shortbill spearfish	*Tetrapturus angustirostris*	1	8	
Shortfin mako	*Isurus oxyrinchus*	664	625	303
Silky shark	*Carcharhinus falciformis*			1
Skipjack tuna	*Katsuwonus pelamis*	826	253	113
Southern bluefin tuna	*Thunnus maccoyii*	411	161	35
Striped marlin	*Tetrapturus audax*		6	1

Swordfish	*Xiphias gladius*	672	339	114
Wahoo	*Acanthocybium solandri*	23	173	18
Yellowfin tuna	*Thunnus albacares*	12741	12912	7666

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

Offloading 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. South Africa is striving towards 100% monitoring of tuna pole discharges in port. These measures have been in place since 1998.

7. NATIONAL RESEARCH PROGRAMS

The management boundary that separates the ICCAT from the IOTC at 20° East divides the South African pelagic marine environment in two approximately equally sized zones. 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. Current research projects

7.1.1. 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 the data are currently being analysed for publication. Proposed outputs include:

- Across two oceans: demographic connectivity and population structure of albacore tuna from the southwest Indian Ocean and the southeast Atlantic.
- Multi-markers approach inferring demographic pattern of albacore.

- Feeding behaviour of albacore (isotopes, stomach contents, lipids, maturity, and fatty acids).
- Maturity of albacore.
- Organic contaminants.
- Bioaccumulation of various types of contaminants (organic and metallic) in albacore.

A summary of the project was presented at the 15th Session of the IOTC Scientific Committee (Nikolic and Bourjea, 2012).

7.1.2. Swordfish genetic samples collected around the coastline are being analysed for a study on swordfish stock delineation between the Indian and Atlantic Oceans. 19 microsatellite markers on 605 samples are being used in the study. The MSc student will conclude with this project in December 2015.

7.1.3. South Africa is seeking ways to improve the indices of abundance in the tuna pole fleet and tuna/swordfish longline fleet for contribution in future stock assessment sessions of tunas, swordfish and sharks.

7.1.4. Foraging ecology and habits of albacore tuna, *Thunnus alalunga*, in the south east Atlantic Ocean off South Africa, including comparisons made with yellowfin tuna, *Thunnus albacares*.

7.1.5. Age and growth determination of swordfish, *Xiphias gladius* L., 1758 in the South East Atlantic Ocean using anal fin spines.

7.1.6. Stock delineation of yellowfin tuna, *Thunnus albacares*, between the Indian and Atlantic Oceans with the use of genome-wide population genetics techniques. The samples have been collected for this project and the MSc student is due to start in December 2015.

7.1.7. 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.

7.1.8. The heavy metal contamination of commercially important large pelagic species (yellowfin tuna, blue shark and mako shark) is currently under investigation by a PhD student in the Meat science, Processing & Product Development research team (Department of Animal Sciences) at Stellenbosch University.

7.1.9. A MSc project has begun collecting biological data on the reproductive and feeding behaviour of blue and mako sharks. The project hopes to extend the knowledge of breeding and nursing grounds around South Africa. In addition, the collection of genetic samples from closely related requiem shark species (silky sharks *Carcharhinus falciformis*, dusky sharks *Carcharhinus obscurus* and bronze whaler sharks *Carcharhinus brachyurus*) will answer questions on the level of species misidentification by vessels.

7.1.10. "Genetic diversity and population structure among Atlantic nurseries of the blue shark Prionace glauca (Linnaeus, 1758)". The study aims to help clarify the Atlantic stock structure of blue sharks by using 13 nuclear microsatellites and a 993 bp fragment of the mitochondrial control region, and by sampling young-of-year and small juveniles (< 2 yr) at each of three reported Atlantic blue shark nurseries, i.e. western Iberia, Azores and South Africa. This paper is currently being published (Website link: http://repositorio-aberto.up.pt/handle/10216/72285).

7.1.11. "Movement of juvenile shortfin mako sharks (Isurus oxyrinchus) around the Agulhas Bank shelf edge- Investigating the existence of a nursery ground". This project aims to investigate the movement of juvenile shortfin mako sharks around the Agulhas Bank shelf edge by tagging 10-15 juvenile mako sharks with PSAT tags on the Agulhas Bank shelf edge. The survey will be conducted on the *R.V. Ellen Khuzwayo* between the 23rd November – 6th December 2015.

7.1.12. Movement and distribution of blue sharks based on PSAT tagging data has been analysed within a multi-authored study that is currently under review for publishing suggesting a single blue shark stock within the southern Atlantic Ocean.

7.1.13. 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*1000hooks^{-1}. There is good collaboration with the fishing industry, researchers and managers to achieve continual refining of mitigation measures and the implementation of stringent management measures through permit conditions. Close monitoring through the observer programme has resulted in decreased seabird mortalities and the country edges closer each year to achieving the NPOA-seabirds goal of less than 0.05 seabirds per thousand hooks.

7.1.14. The Albatross Task Force (ATK, BirdLife South Africa) has been working with Fishtek (http://fishtekmarine.com/hookpod.php) to trial the Hook Pod on the pelagic longline vessels to reduce the incidental catch of seabirds during setting operations. The device is designed to easily attach to pelagic (mid-water) longline gear and prevents incidental seabird capture by protecting the barb of the hook during the setting operations. Once the fishing gear sinks to a predetermined depth, the pod opens (using a pressure-release system), releasing the hook to begin fishing. The pod is then simply retrieved during hauling operations closed and is ready to be reused on the following set (BirdLife South Africa website, 2015).

7.1.15. The Smart Tuna Hook by OceanSmart was tested in 2014 on 27 longline sets during two fishing trips. The results of this feasibility study were issued in 2015: http://www.oceansmart.com.au/1154/oceansmart-tuna-hook.aspx. OceanSmart will conduct further studies to assess the success of mitigating the capture of seabirds and turtles, and the potential additional economic benefits of increased CPUE and productivity with the use of these devices.

7.2. Previous research projects

7.2.1. Two bigeye tuna, three yellowfin tuna, seven blue sharks had been tagged with PSATs and SPOTs and 441 blue sharks with conventional tags in 2009 and 2010. The yellowfin tuna tags popped up and transmitted data earlier than what they were programmed for, indicating that the animals had died prematurely and the tags had exceeded their depth limit of 1200m. The trends in the data are yet to be analysed in detail to understand the cause of these premature pop-ups. The data from the bigeye tuna tags will be analysed with the project mentioned in *2.3.1.7.* The data from the blue sharks tags will be analysed with the project mentioned in *2.3.1.11*.

7.2.2. 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.

7.2.3. 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*).

7.2.4. South Africa has 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.

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 2015.

No.	Resolution	Scientific requirement	CPC progress
15/01	On the recording of catch and effort by fishing vessels in the IOTC area of competence	Paragraphs 1–10	All longline and pole and line/rod and reel 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 120cm LJFL are prohibited. No discarding of dead marlins is permitted.
13/04	On the conservation of cetaceans	Paragraphs 7-9	There have been minimal encounters with cetaceans by the longline vessels. South Africa will explicitly state in the 2016 permit conditions that all cetaceans are to be released alive. Onboard observers collect data on all encounters with cetaceans. South Africa endeavours to have skippers collect cetacean release data.
13/05	On the conservation of whale sharks (*Rhincodon typus*)	Paragraphs 7-9	There have been no recorded encounters with whale sharks by the longline vessels. South Africa will explicitly state in the 2016 permit conditions that all whale sharks are to be released alive. Onboard observers collect data on all encounters with bycatch species. South Africa endeavours to have skippers collect bycatch release data.
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 clustered 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.
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. The vessel has 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

No.	Resolution	Scientific requirement	CPC progress
			correct specifications and procedures are followed. Deck lighting is kept to a minimum. The beam 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 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 60g weights within 2m of the hook to ensure optimal sinking rates. Where multiple weights are used then the first weight should be within 2m of the hook and the last weight within 3m 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 they 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 to follow instructions given by the observer.
12/04	On the conservation of marine turtles	Paragraphs 3,4,6-10	The use of circle hooks are 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: • Use a long-handles de-hooker on turtles too large to bring onboard and a de-hooker on turtles onboard to remove the hook. • 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 longline

No.	Resolution	Scientific requirement	CPC progress
			vessels and they record all interactions with marine turtles during the fishing operation. Since 2013, all have been required to record interactions with marine turtles in their logbooks began, 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 (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 have to be retained and the shark fin to trunk ratio shall not exceed 13% for blue sharks and 8% of the total weight of all other shark species trunks. In the Large Pelagic fishery a 10% shark by-catch limit was imposed between 2006 and 2010 and skippers were required to release live sharks. The precautionary upper catch limit (PUCL) for sharks is set at 2000t dressed weight for the entire South African longline fishery. From 2011 no wire traces are allowed to be used within 50cm from the hook once 60% of the 2000t PUCL has been met. Joint venture vessels are restricted to a 10% shark by-catch limit. Thresher sharks belonging to the genus *Alopias*, hammerhead sharks (belonging to genus *Sphryna*), oceanic whitetip and silky sharks shall not be retained on board the vessel.

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