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South African National Report to the Scientific Committee of the Indian Ocean Tuna Commission, 2014

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INFORMATION ON FISHERIES, RESEARCH AND STATISTICS

In accordance with IOTC Resolution 10/02, final scientific data for the previous year was provided to the Secretariat by 30 June of the current year, **for all fleets other than longline** [*e.g.* for a National report submitted to the Secretariat in 2013, final data for the 2013 calendar year must be provided to the Secretariat by 30 June 2014)	YES 30/06/2014
In accordance with IOTC Resolution 10/02, provisional **longline data** for the previous year was provided to the Secretariat by 30 June of the current year [*e.g.* for a National report submitted to the Secretariat in 2014, preliminary data for the 2013 calendar year was provided to the Secretariat by 30 June 2014). **REMINDER:** Final longline data for the previous year is due to the Secretariat by 30 Dec of the current year [*e.g.* for a National report submitted to the Secretariat in 2014, final data for the 2013 calendar year must be provided to the Secretariat by 30 December 2014).	YES 30/06/2014
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 swordfish/tuna longline and the pole and line/ rod and reel sector. The pole 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. In 2013, no tuna pole vessels fished in the Indian Ocean and instead targeted yellowfin available inshore in the Atlantic Ocean, or opted to fish for albacore on the Atlantic high seas. The South African flagged 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*Thunnus albacares* 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 (blue and mako sharks). Catches of albacore (bycatch in the longline sector), bigeye tuna, shortfin mako (*Isurus oxyrinchus*) and blue shark (*Prionace glauca*) remained relatively stable in 2013 compared to previous years. The southern bluefin tuna (*Thunnus maccoyii*) catches however decreased. South Africa's quota from CCSBT is minimal (40t) making this a non-target. It is concerning that swordfish catches remained low in the South West Indian Ocean. New vessels are encouraged to target swordfish yet the situation has not improved. Yellowfin tuna catches increased from 522t to 907t in 2013, an increase that is mirrored by the tuna pole sector operating in the Atlantic Ocean over the same time period. The necessity to conduct 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. TUNA/SWORDFISH LONGLINE

This fishery was commercialized in 2005, with the issuing of 18 swordfish-directed and 26 tuna-directed long term (ten year) fishing rights. The fishery is restricted to 50 permits (one permit per vessel) through a Total Applied Effort (TAE) control until quotas are stipulated for this 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. South Africa amended its fishery policy in 2007 after only 9 swordfish-directed longline vessels operated in 2006, resulting in the lowest annual catch since 2001. The fishery is allowing an interim period for foreign vessels to charter in this sub-sector as a means of skills development and a means of acquiring suitable vessels. Foreign vessel owners in the tuna-directed sub-sector are encouraged to reflag their vessels and to transfer skills to South Africans.

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 development of ice and processing facilities at Richard's Bay, which is situated on the east coast of South Africa. The targeting and catches of tropical bigeye and yellowfin tunas has proven more successful in the Indian Ocean, resulting in a sizeable amount of the longline fishing effort 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 and hound sharks, and a pelagic longline component, which predominantly targets shortfin mako and blue sharks. The latter also 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 stock status of these species. South Africa consolidated the pelagic shark fishery with the tuna/swordfish longline fishery in March 2011. Seven exemption holders were permitted to fish for shark in 2010, but only four vessels were

active in the Indian Ocean. Six of the seven shark exemption holders were issued with tuna/swordfish rights in March 2011, five of which are actively fishing. These vessels are undergoing a phase-out period to reduce shark targeting and focus on tuna and/or swordfish catches. Pelagic sharks are generally managed as bycatch in the tuna and swordfish longline fishery.

1.2. POLE AND LINE/ROD AND REEL

The use of pole and line has been employed commercially since the 1970s to target tuna. In 1979 commercial tuna fishing effort increased after a record run of yellowfin tuna off Cape Point. Subsequent, the South African tuna fishery has essentially been a surface pole and line fishery that targets mainly juvenile (3-4 year old) albacore in near-shore waters off the west coasts of South Africa and Namibia. The fishery generally operates between September and May along the west coast of South Africa. It is important to note that within the tuna pole fishery there has been an emerging rod and reel component that targets large yellowfin tuna (> 45 kg dressed weight) south of Cape Town. Although the fishing ground lies just outside the IOTC area the yellowfin catch is presumed to be of Indian Ocean origin, although this is yet to be confirmed. In 2013, no tuna pole vessels fished in the Indian Ocean, likely due to two reasons; the 2012/2013 season was poor and vessels opted to stay close to port off Cape Town; and the 2013/2014 season started well with yellowfin and albacore available inshore off Cape Point in the Atlantic Ocean.

The duration of individual outings in the tuna pole fishery depends on vessel size and layout. The small ski-boat type vessels will typically fish for one night only, whereas large freezer vessels can undertake trips up to 4 weeks. The main fishing grounds are south of Cape Point, along the west coast and offshore at Valdivia ridge. The method employed involves attracting schools of tuna to the surface either with dead (fresh or frozen) bait or live bait (anchovy). The number of crew varies from 4-12 crew men working in pairs to catch and bring tunas onboard using bamboo poles with bait or jigs on a single hook.

South Africa also has a commercial linefish fishery which opportunistically catches albacore, yellowfin, king mackerel and shark 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 2009 - 2013.

	Fleet Structure in 2013			Fleet structre 2009 - 2012		
Fishing Sector	Nr Active Permits	Vessel size range (m)	Trip duration (days)	Nr Active Permits	Vessel size range (m)	Trip duration
Tuna/swordfish longline (pelagic shark longline, inclusive in total)	22 (4)	20 - 50	7 - 90	2012: 24 2011: 29 2010: 21 2009: 17	2012: 22 - 50 2011: 22 - 50 2010: 21 - 50 2009: 22 - 50	7 - 90
Pole & Line	0	-	-	2012: 6 2011: 6 2010: 2 2009: 3	2012: 14 - 20 2011: 13 - 22 2010: 13 2009: 13	2 - 14
Rod & Reel (commercial)	335	4 - 8	1 - 2			
Rod & Reel (recreational)	Unknown	4 - 10	1			

3. CATCH AND EFFORT (BY SPECIES AND GEAR)

Table 2 a). Annual pelagic longline catch (t dressed weight excluding albacore) and effort (number of hooks) of primary species in the IOTC area of competence from 2009 to 2013.

Year	Total number of hooks	Bigeye tuna	Yellowfin tuna	Albacore	Southern bluefin tuna	Swordfish	Skipjack	Shortfin mako	Blue shark
2009	3441454	535.5	891.1	122.1	25.7	177.8	0.0	38.6	78.3
2010	4455080	704.6	1070.1	60.7	4.3	355.5	0.0	42.0	90.9
2011	5331523	691.3	940.9	254.7	33.4	371.0	0.0	432.3	224.7
2012	3816271	671.9	522.2	161.7	60.6	300.3	0.7	221.3	171.7
2013	3863036	521.8	907.6	177.3	29.6	231.4	3.0	304.0	169.6
Total	20907364	3125	4332	776	154	1436		1038	735

Table 2 b). Annual pole and line/rod and reel catch (t dressed weight excluding albacore) and effort (number of days) of primary species in the IOTC area of competence from 2008 to 2013.

Year	Total number of catch days	Albacore	Yellowfin tuna
2008	79	4.6	4.5
2009	14	1.2	0.0
2010	2	3.5	0.0
2011	25	45.67	0.7
2012	31	15.3	0.2
2013	0	0.0	0.0
Total	151	70.2	5.4

Figure 1. Historical combined annual catch (t dressed weight excluding albacore) of primary species for the national pelagic longline and pole and line/road and reel fleets for the IOTC area of competence for the entire history of the fishery/fleet.

Year	Bigeye tuna	Albacore	Yellowfin tuna	Southern bluefin tuna	Swordfish	Tuna unid	Blue shark	Shortfin mako shark
Pelagic longline								
1997	0.0	0.0	0.0	0.0	37.5		0.0	0.0
1998	9.0	5.3	44.2	0.2	275.5		4.3	1.8
1999	12.6	1.1	112.7	0.0	48.9		4.2	4.0
2000	29.3	16.1	205.0	2.5	20.0		4.6	5.2
2001	28.8	7.0	121.9	0.1	237.1		5.7	2.8
2002	220.8	75.2	155.4	0.8	666.5		12.7	32.7
2003	218.2	67.4	543.9	0.2	634.7		15.9	67.0
2004	292.9	59.2	655.1	8.7	216.0		15.2	31.2
2005	687.5	112.4	1190.0	23.1	190.0		37.4	43.3
2006	52.5	62.9	153.8	7.0	153.4		3.9	9.4
2007	468.6	118.0	862.9	39.1	238.2		32.0	96.8
2008	388.6	194.1	524.1	13.9	243.7		41.0	117.2
2009	533.5	121.8	890.9	25.4	177.0		38.6	78.1
2010	704.6	60.7	1070.1	4.3	355.5		42.0	90.9
2011	691.3	254.7	940.9	33.4	371.0		431.3	224.7
2012	671.9	161.7	522.2	60.6	300.3		221.3	171.7
2013	521.8	177.3	907.6	29.6	231.4		304.0	169.6
Pole and line/road and reel								
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		0.0	0.0			0.0		

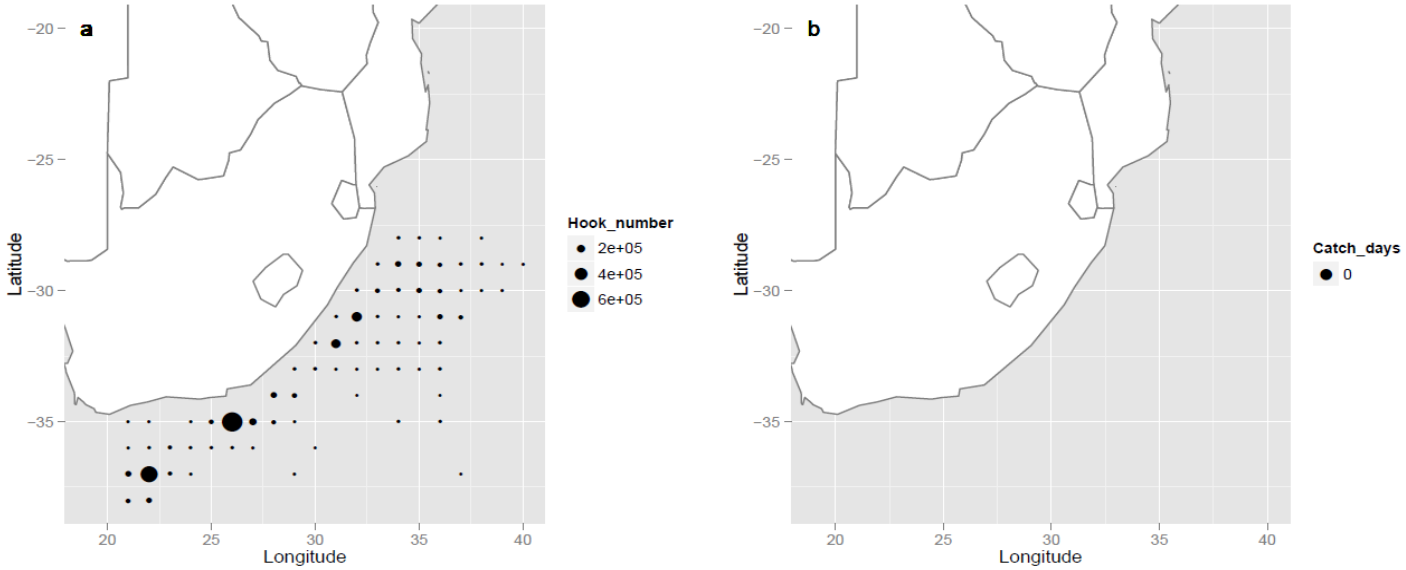

Figure 2a. Map of the distribution of fishing effort for a) pelagic longline (number of hooks) and b) pole and line/rod and reel (number of days) for the national fleet in the IOTC area of competence in 2013.

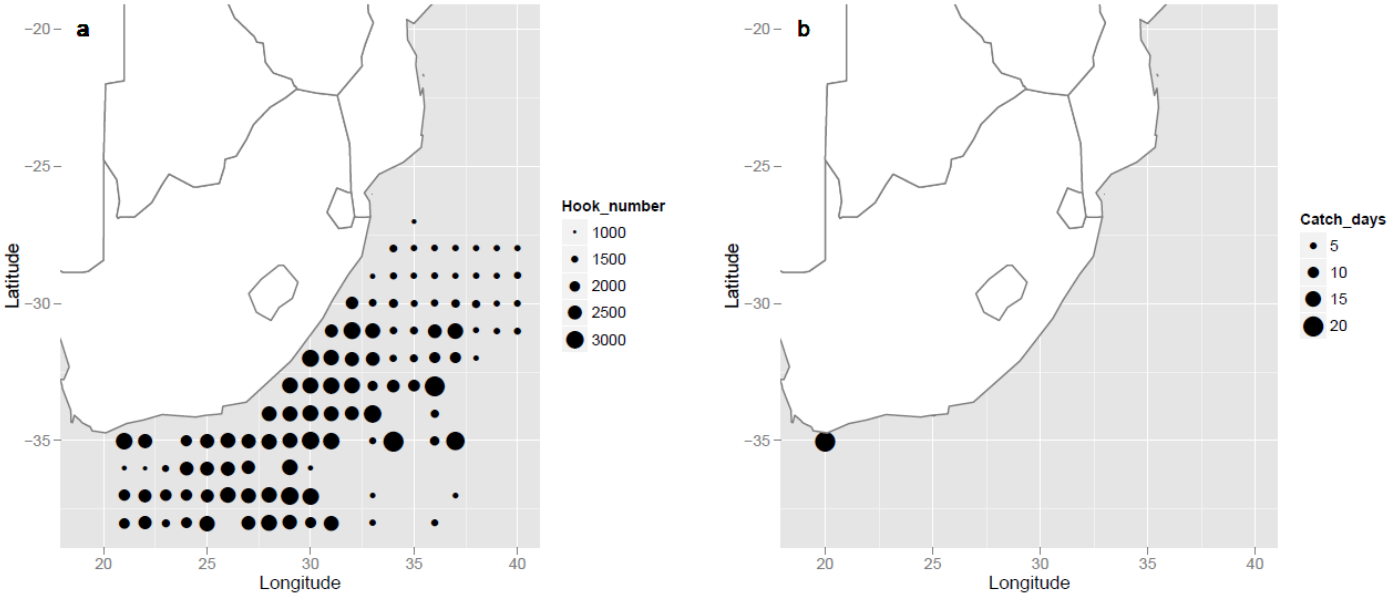

Figure 2b. Map of the distribution of average a) pelagic longline (number of hooks) and b) pole and line/rod and reel (number of days) effort from 2009 to 2013 in the IOTC area of competence.

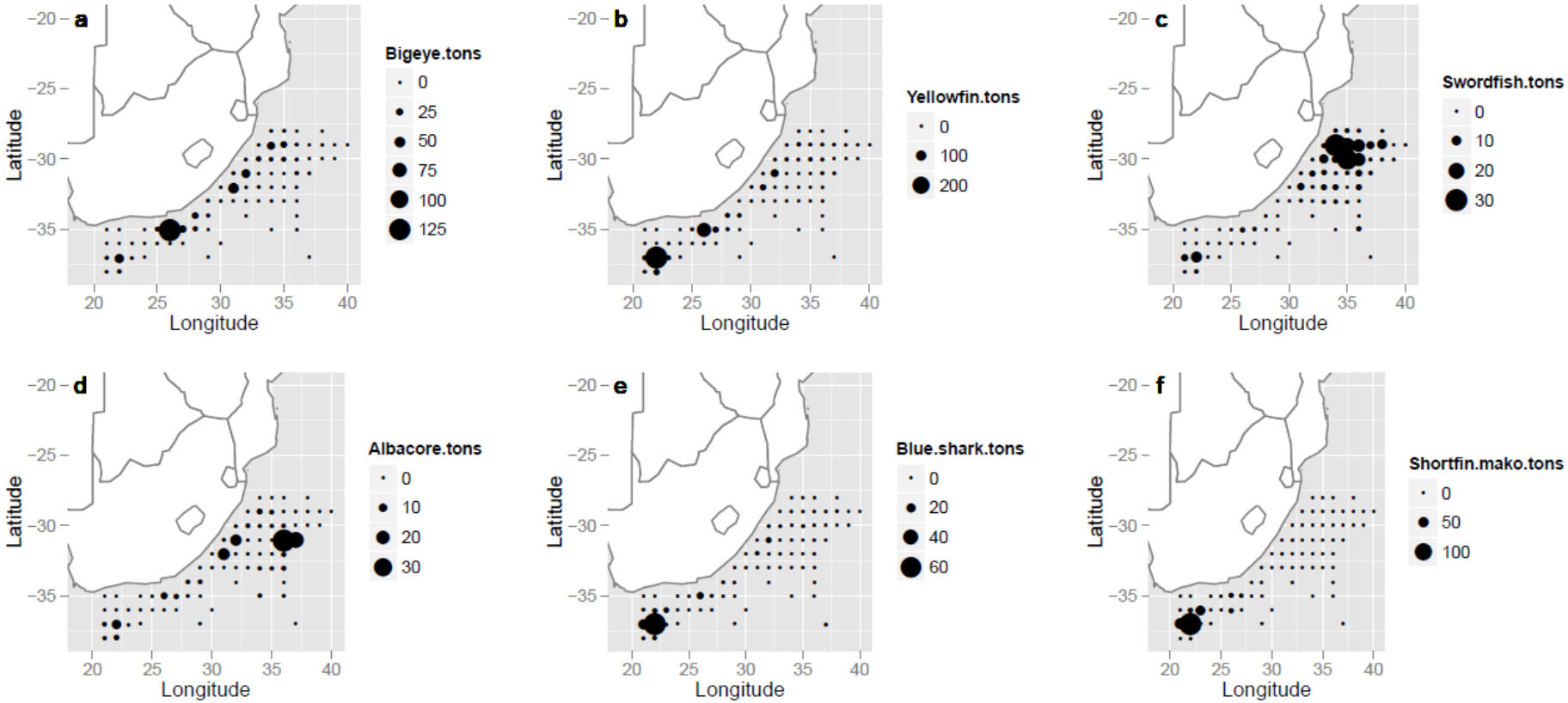

Figure 3a. Map of distribution of fishing catch (tons), for a) bigeye tuna, b) yellowfin tuna, c) swordfish, d) albacore, e) blue shark and f) shortfin mako shark for pelagic longline in South Africa, in the IOTC area of competence in 2013.

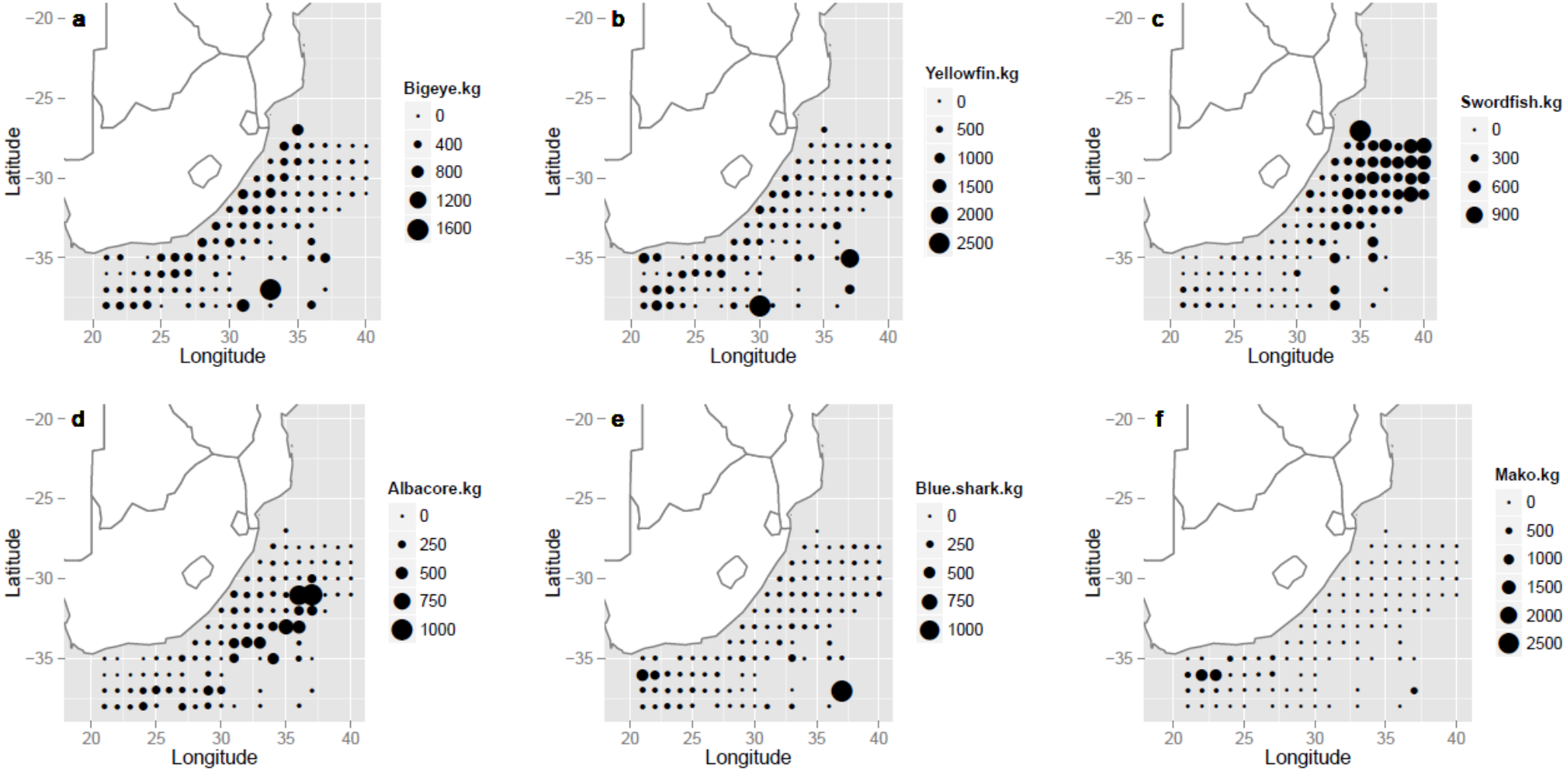

Figure 3b. Map of distribution of pelagic longline average catches (kg) from 2009 to 2013 for a) bigeye tuna, b) yellowfin tuna, c) swordfish, d) albacore, e) blue shark and f) shortfin mako shark in the IOTC area of competence.

4. RECREATIONAL FISHERY

The recreational fishery uses rod and reel from ski-boats (5-14 m) to target numerous game fish, including yellowfin, king mackerel and billfish. Although catch and effort data are not consistently available for this fishery it is estimated that over 100 t of yellowfin and king mackerel and 100t of albacore are landed annually for the Atlantic and Indian Oceans combined. 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 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.

The angling associations have regular tuna and billfish competitions every year where they promote research (e.g. tagging), catch-and-release and responsible fishing.

5. ECOSYSTEM AND BYCATCH ISSUES

Sharks

The NPOA for sharks has been finalised and was launched at the 2013 ICCAT Commission meeting being held in Cape Town, South Africa. Shark-relates issued discussed in the NPOA-sharks have been categorised into clusters with proposed actions by the responsible unit within a time frame. The NPOA-sharks task team has begun to address the issues that fall within the first to second year time frame.

A precautionary upper catch limit (PUCL) of 2000t dressed weight of *Chondrichthyans* was enforced in 2012. Foreign flagged fleets may not land *Chondrichthyans* that exceed 10% of the total dressed weight of tuna species per season. South African flagged vessels may not land *Chondrichthyans* that exceed 50% of the total dressed weight of tuna species per season. Once 60% of the PUCL has been reached, vessels will not be allowed to use wire traces on the branch lines.

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.

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, by species, retained by the national fleet in the IOTC area of competence from 2009 to 2013.

Year	Blue shark nr.	Blue shark tons	Shortfin mako shark nr	Shortfin mako shark tons	Requiem sharks nr.	Requiem sharks tons
2009	78319	78.3	38614	38.6	0	0.003
2010	90917	90.9	42015	42.0	5	0.094
2011	224653	224.7	432305	432.3	586	30.28
2012	171716	171.7	221286	221.3	456	16.795
2013	169557	169.6	304006	304.0	38	1.715

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**
Big eye 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*	1	3			1		5

longimanus							
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*		2									2

pelagicus											
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**
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		2									2

shark *Alopias pelagicus*											
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

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. 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 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 has developed a management plan to reduce seabird by-catch in its longline fishery in 2008. This plan includes a seabird limit per vessel per year that was implemented in 2008. 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. Since the implementation of seabird mitigation measures and the stringent monitoring thereof seabird mortality has reduced by more than an order of magnitude. The seabird mortality rate for 2012 and 2013 has been, for the first time in history, below the stipulated rate of 0.05 birds/1000 hooks.

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 this year, skippers are required to record interactions with turtles in the catch statistic logbooks on board the vessel, including the fate of the turtle.

Table 5. Observed annual catches of seabirds and marine turtles in the national pelagic longline fleet from 2009 to 2013, in the IOTC area of competence.

	2009		2010		2011		2012		2013	
	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead
Seabirds										
Albatros unidentified	1	1	1	1						
Black-browed albatross	1	1		1	1	1	3	1	6	
Grey-headed albatross			1			1	3			
Albatross Northern Royal		1								
Shy albatross	1	1	1	1	1	1	4	4	1	4
Albatross Yellow nosed	1	1	1	1						
Atlant. yellow-nosed albatross					1	1	5	2	3	1
Indian yellow-nosed albatross					3	1	9		22	1
Cape gannet		1		1	2		1		1	
Cape petrel		1			1					
Great skua					1					
Petrel Pintado		1								
Petrel Southern Giant	1	1								
White-chinned petrel	1	1	1	1	1	1	9	31	6	29
Petrel Unid	1		1		1	1		1		
Skua		1								
Tern unidentified		1								
Marine turtles										
Green turtle					1		1		1	
Hawksbill turtle							1			
Leatherback turtle		1		1	2		1		1	
Loggerhead turtle	1			1	2		1			
Marine turtles nei					1				3	
Flatback turtle					1					
Turtle Unidentified		1		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 tuna/swordfish longline fishery have been required to complete daily logs of catches since 1997. The data are verified by comparing logs of catches with landing declarations that are overseen by South Africa Fisheries Compliance Officers.

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

The Vessel Monitoring System (VMS) became a requirement in 1998 for longline vessels and was subsequently followed by the tuna pole vessels. All longline, pole and line/rod and reel vessels 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 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 requires 100% observer coverage on foreign-flagged vessels. Up until March 201, 11- 20% observer coverage was achieved on local vessels per year based on the total effort deployed. The observer programme contract expired in March 2011, but the Department is in the process of re-establishing the programme in 2015. The observer programme for charter vessels has continued with 100% of fishing trips on charter vessels observed. There were 15 observers actively observing on the tuna/swordfish longline vessels in 2013. 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.

Table 6. The number of trips and number of hooks observed, including charter vessels, per year from 2009 to 2013 in the IOTC region.

Year	Number of hooks observed	Number of trips observed	Percentage of total effort in IOTC region observed
2009	2856956	20	83
2010	2291492	10	51
2011	1874389	11	35
2012	2615568	12	69
2013	2235366	9	58

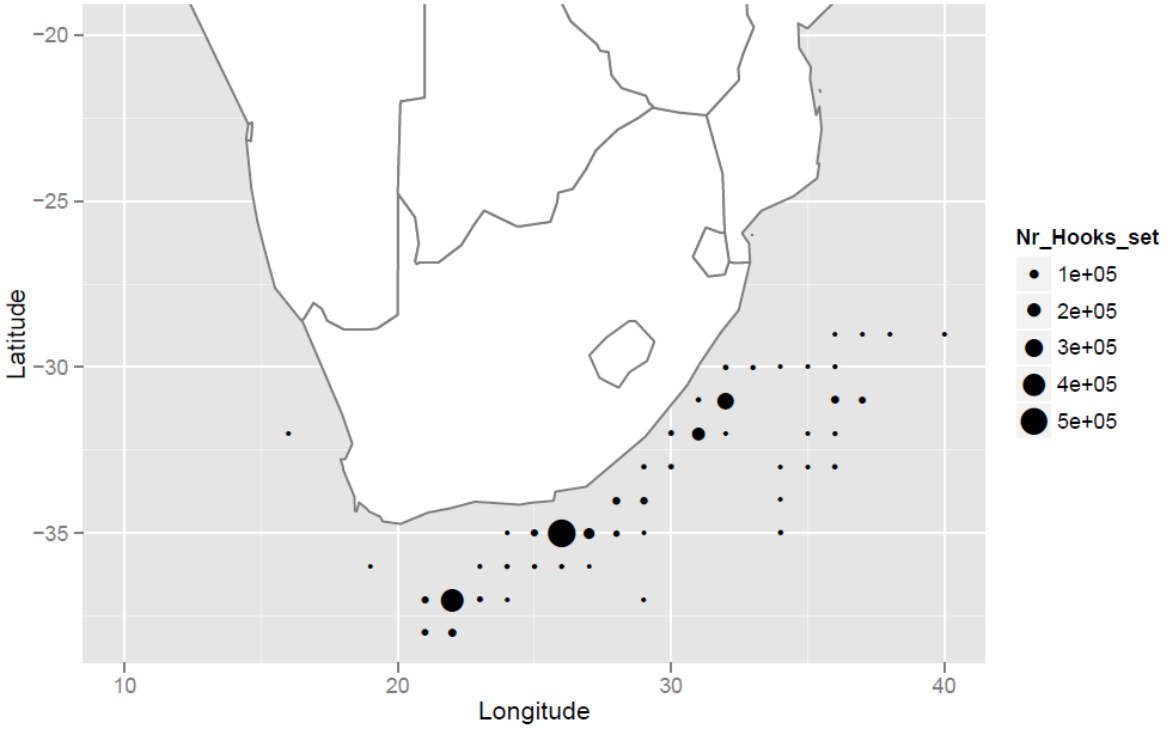

Figure 4. Map showing the spatial distribution of observer coverage in 2013. Points are scaled by the number of hooks set in each 1x1° block.

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/rod and reel vessels in 2011 has been undertaken by employees of the Department of Agriculture, Forestry and Fisheries. Yellowfin tuna length frequency data that they have taken onboard the vessel prior to dressing the catch are provided by the skippers Length frequencies on the 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 2013 in the IOTC area of competence

	Number of length frequency measurements, 2012	Number of length frequency measurements, 2013
Yellowfin tuna	12741	12912
Skipjack tuna	826	253
Bigeye tuna	8138	4812
Southern bluefin tuna	411	161
Swordfish	672	339
Albacore	6002	4211
Blue shark	2199	1572
Shortfin mako shark	726	631

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. 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

Albacore has been studied mainly in the North Atlantic and the North Pacific, and very 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 that are typical of these areas. In the Indian Ocean, it is thought that there is only one southern stock, distributed from 5°N to 45°S, because there is no northern gyre and low catches in northern regions. This hypothesis needs to be investigated and more particularly the link between Indian Ocean and South Atlantic. In South African waters, mainly juveniles are caught and the source is still unknown. South Africa is a collaborator on the GERMON project led by IFREMER to better understand the stock structure of albacore between the Indian and Atlantic Oceans. Sampling was concluded in July 2014 and samples are currently being analysed.

Swordfish genetic samples collected around the coastline are being analysed for a study on the swordfish stock boundary between the Indian and Atlantic Oceans. 19 microsatellite markers are being used in the study. Results should be available by the next SCRS.

South Africa is seeking ways to improve the indices of abundance in the tuna pole fleet and tuna longline fleet for contribution in future stock assessment sessions of tunas, swordfish and sharks. On test in the standardised CPUE will be to utilise all South African data, Indian and Atlantic Ocean, and test out the effect of area on the abundance estimation.

A project investigating the reproductive and feeding behaviour of South African blue and mako sharks has commenced. One of the aims is to identify breeding and nursing grounds around South Africa. In addition, the collection of genetic samples from requiem shark species (silky sharks *Carcharhinus falciformis*, dusky sharks *Carcharhinus obscurus* and bronze whaler sharks *Carcharhinus brachyurus*) will aid the quantification of species misidentification by vessels.

"Genetic Diversity and Population Structure of the Cosmopolitan Blue Shark Prionace glauca (Linnaeus, 1758) in the Atlantic Ocean", with samples having come from South Africa, is currently being published (Website link: http://repositorio-aberto.up.pt/handle/10216/72285)

A manuscript 'Tracking the Atlantic Ocean-crossing migration of blue sharks' is currently under review for publishing.

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 was published in 2008, which aimed to reduce seabird mortalities below 0.05 seabirds.1000hooks^{-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. Currently, trials on the success of the Smart Tuna Hook by Ocean Smart and the Hook Pod by Fishtek and Birdlife International are being trialled and tested on longline vessels to further reduce seabird bycatch (*Rec 11-10*).

Previous research projects

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. Prior to that, two bigeye tuna and four blue sharks had been tagged with PSATs and 441 blue sharks with conventional tags.

In 2010, three yellowfin tuna were tagged with PSAT tags provided by SWIOFP. The three 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. Three blue sharks were also tagged with PSAT tags in 2010 and a further two blue sharks were tagged with SPOT tags in 2011. The Department's national research cruise in 2011 was a momentous achievement during which 11 swordfish were successfully PSAT tagged in the 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). There are a remaining 10 PSAT tags awaiting deployment through the ICEMASA-2 Science Plan. 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 difference 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*).

South Africa has 3 years of instrumented longline data (Time depth recorders and hook timer) from the dedicated research cruises on the *Ellen Khuzwayo* research vessel, though more data are required to gain meaningful results.

Table 8. Summary table of national research programs, including dates

Project title	Period	Countries involved	Budget total	Funding source	Objectives	Short description
GEnetic St**R**ucture and **M**igration **O**f albacore tu**N**a (GERMON).	2013 - 2015	EU – France, Réunion, Seychelles, South Africa		EU	Study the genetic structure, spawning and feeding of albacore in the Indian Ocean	In the Indian Ocean, it is thought that there is only one southern stock, distributed from 5°N to 45°S,

					and the connectivity with the Atlantic Ocean.	because there is no northern gyre and low catches in northern regions. This hypothesis needs to be investigated and more particularly the link between Indian Ocean and South Atlantic. In South African waters, mainly juveniles are caught and the source is still unknown. To determine the connectivity between these stocks is of primary concern for Regional Fishery Management Organiza-tions.
Swordfish population genetics structure around South Africa	2014 - 2015	South Africa, Reunion Island (France)	R306 000	Department of Agriculture, Forestry and Fisheries, South Africa	Study the genetic stock delineation of swordfish between the Indian and Atlantic Oceans	There is uncertainty surrounding the stock delineation of swordfish (and the important commercial tuna species) between the Indian and Atlantic Oceans, the level of genetic mixing and spatial intermixing between the two stocks. Muscle samples were collected around South Africa's coastline in 2005, including the data on sex. This study aims to reveal structure at the boundary between the two Ocean basins in relation to sex, season and environmental factors.

8. IMPLEMENTATION OF SCIENTIFIC COMMITTEE RECOMMENDATIONS AND RESOLUTIONS OF THE IOTC RELEVANT TO THE SC.

Table 9. Respond with progress made to recommendations of the SC and specific Resolutions relevant to the work of the Scientific Committee – the Secretariat to provide a table for completion no later than 60 days prior to the next SC meeting.

No.	Resolution	Scientific requirement	CPC progress
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 and local vessels are restricted to a 50% 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.
10/02	Mandatory statistical requirements for IOTC members and cooperating non contracting parties	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.
10/06	On reducing the incidental bycatch of seabirds in longline fisheries.	Paragraph 7.	A report outlining measures implemented to reduce seabird bycatch was sent to the IOTC in February 2013.
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.
13/03	On the recording of catch and effort by fishing vessels in the IOTC area of competence	Paragraphs 1-9	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.
12/04	On the conservation of marine turtles	Paragraphs 3, 4 6-10	A report outlining measures implemented to manage marine turtle bycatch was sent to the IOTC in February 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 allowed to be retained.

9. LITERATURE CITED