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South African National Report to the Scientific Committee of the Indian Ocean Tuna Commission, 2011

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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 2010, final data for the 2009 calendar year must be provided to the Secretariat by 30 June 2010)	YES 01/08/2011
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 2010, preliminary data for the 2009 calendar year was provided to the Secretariat by 30 June 2010). **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 2010, final data for the 2009 calendar year must be provided to the Secretariat by 30 December 2010).	YES 01/08/2011
If no, please indicate the reason(s) and intended actions:	

Executive Summary

South Africa has three commercial fishing sectors which either target or catch tuna and tuna-like species as by-catch in the Indian Ocean. These sectors are swordfish/tuna longline, pole and line/ rod and reel, and shark longline. In addition, there is a boat-based recreational/sport fishery.

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) permits. 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 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. The fishery is in the process of encouraging foreign vessels in the tuna-directed sub-sector to reflag and to transfer skills to South Africa.

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. In recent years, a sizeable amount of the fishing effort was conducted 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. The latter also catches blue shark, tuna 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 shark exemption holders were permitted to fish 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.

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 to this, 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 catch is presumed to be of Indian Ocean origin.

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 linefish species such as kob, geelbek and slinger are not available. These catches usually only contribute to a small percentage of the total catch by the linefishery due to the multispecies nature of the fishery.

2. FLEET STRUCTURE

Table 1: Number of vessels operating in the IOTC area of competence, by gear type and size

	Fleet Structure			
Fishing Sector	No Active Permits	Min Vessel Size (in m)	Max Vessel Size (in m)	Avg Vessel Size in (m)
Tuna/swordfish longline (pelagic shark longline, inclusive in total)	35 (5)*	19	50	~30
Pole & Line	167*	8	49	~18
Rod & Reel (commercial)	454*	4	12	~7
Rod & Reel (recreational)	unknown	4	10	~6
* - denotes registered not necessarily active in the Indian Ocean				

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 2006 to 2010.

Year	Total number of hooks	Bigeye tuna	Albacore	Yellowfin tuna	Swordfish	Southern bluefin tuna	Blue shark	Shortfin mako shark
2006	380080	51.0	62.9	119.0	141.9	7.0	8.8	3.8
2007	2890080	414.8	97.7	740.5	206.1	38.9	88.2	27.6
2008	3142204	377.6	176.5	513.6	237.6	13.5	106.8	38.6
2009	3030966	505.4	107.9	829.8	163.4	25.0	70.8	35.5
2010	3505069	602.8	45.6	898.3	304.8	4.3	76.0	34.7
Total	12948399	1951.6	490.6	3101.3	1053.9	88.7	350.7	140.1

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 2006 to 2010.

Year	Total number of catch days	Albacore	Yellowfin tuna	Tuna Unid
2006	82	66.2	13.4	5.0
2008	12	2.9	4.5	0.0
2009	4	0.3	0.0	0.0
2010	2	3.5	0.0	0.0
Total	100	72.903	17.933	4.95

Figure 1. Historical 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	Swordfish	Southern bluefin tuna	Tuna unid	Blue shark	Shortfin mako shark
Pelagic longline								
1997	0.0	0.0	0.0	37.5	0.0		0.0	0.0
1998	6.5	5.2	38.6	102.5	0.2		1.1	2.4
1999	10.8	0.8	96.8	28.4	0.0		2.9	3.2
2000	18.6	9.3	153.9	10.1	2.1		3.8	2.5
2001	28.0	12.8	85.2	218.7	0.1		0.7	4.3
2002	187.7	73.2	143.1	631.2	0.6		29.0	10.9
2003	206.1	64.9	497.5	629.6	0.2		64.5	15.2
2004	330.2	49.6	626.4	217.4	8.7		29.9	14.3
2005	516.0	85.7	817.4	182.2	21.4		31.8	26.2
2006	51.0	62.9	119.0	141.9	7.0		8.8	3.8
2007	414.8	97.7	740.5	206.1	38.9		88.2	27.6
2008	377.6	176.5	513.6	237.6	13.5		106.8	38.6
2009	505.4	107.9	829.8	163.4	25.0		70.8	35.5
2010	602.8	45.6	898.3	304.8	4.3		76.0	34.7
Pole and line/road and reel								
1989		0.01	16.75			0		
1990		0.008	11.582			0		
1991		0	0			5.93		
1992		0	0			0.01		
1994		0.942	0.002			0		
1995		0	1.1			0		
1997		0	0			0.27		
1998		1	6.759			0.769		
2000		0.04	0.03			0		
2001		6.84	3.143			0		
2002		2.234	0			0		
2004		0.18	3			0		
2005		0	4.1			0		
2006		66.198	13.414			4.95		
2008		2.909	4.519			0		
2009		0.296	0			0		
2010		3.5	0			0		

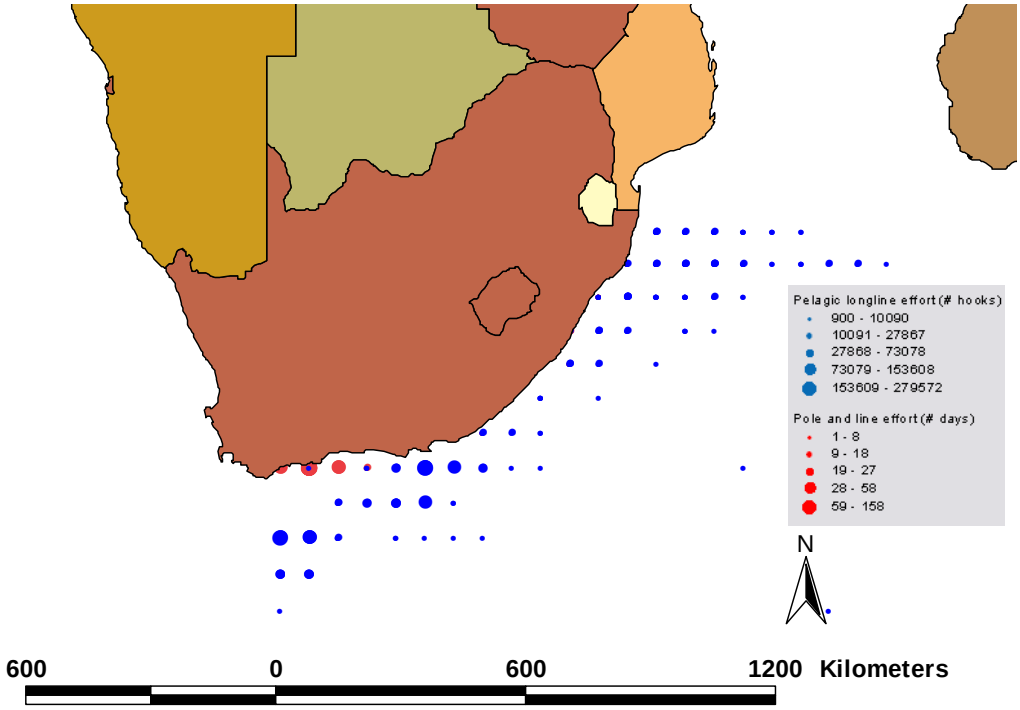


Figure 2a. Map of the distribution of fishing effort for pelagic longline (number of hooks) and pole and line/road and reel(number of days) for the national fleet in the IOTC area of competence in 2010.

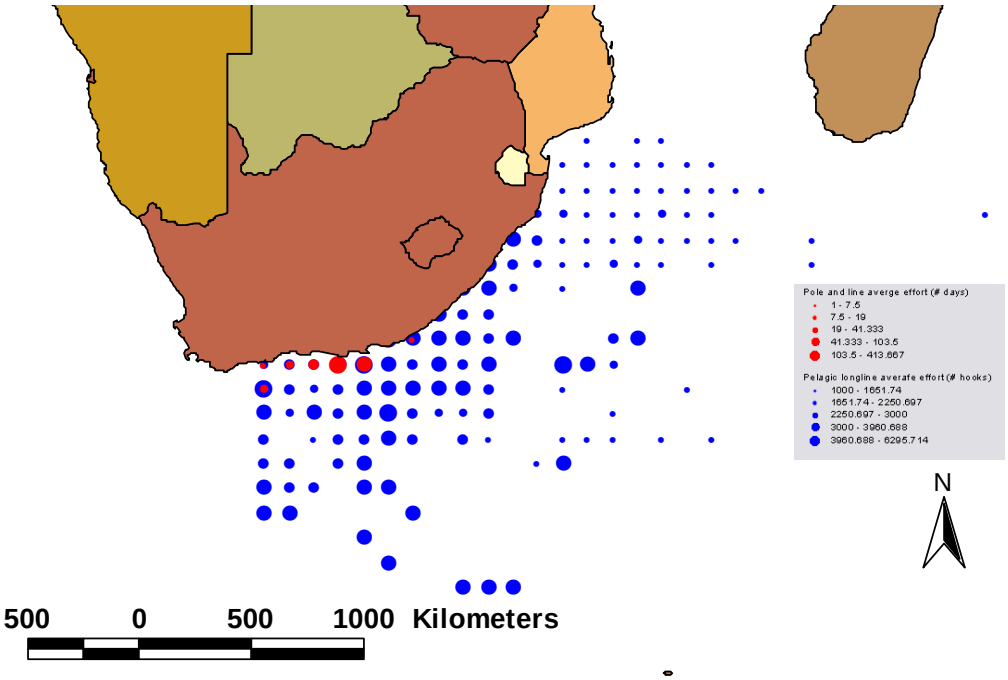
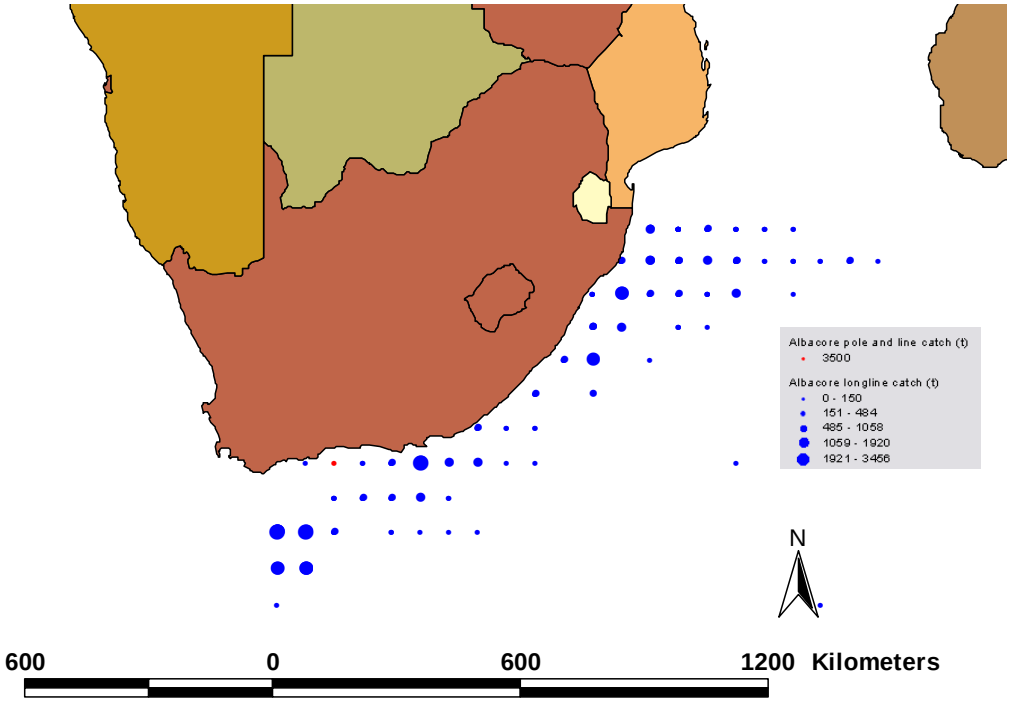
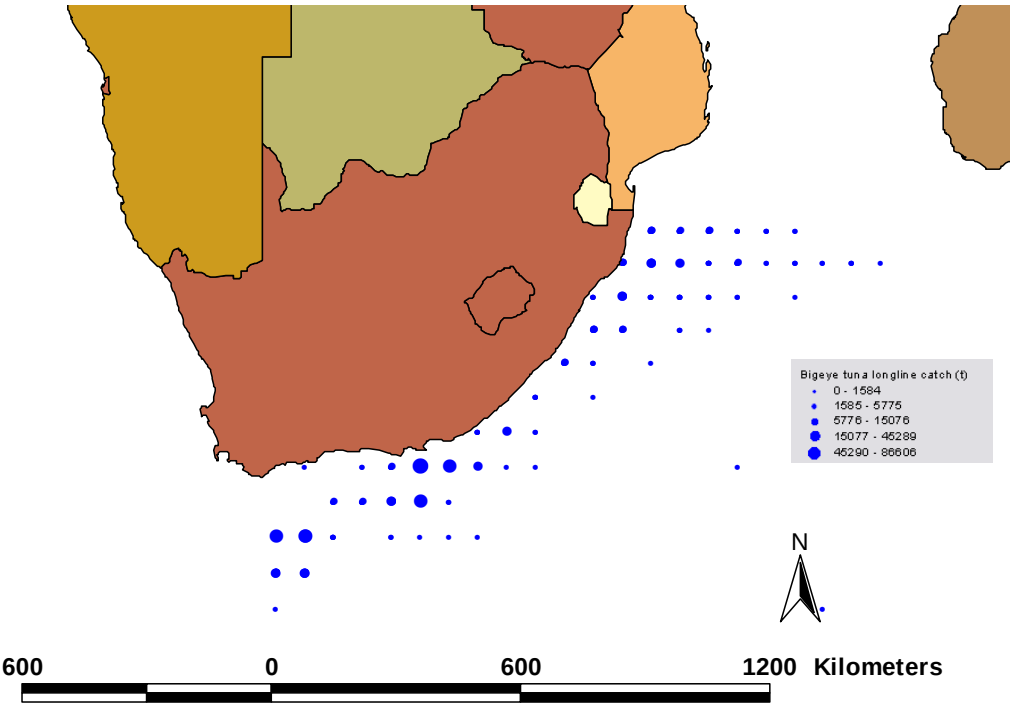


Figure 2b. Map of the distribution of average pelagic longline (number of hooks) and pole and line/rod and reel (number of days) effort from 2006 to 2010 in the IOTC area of competence.

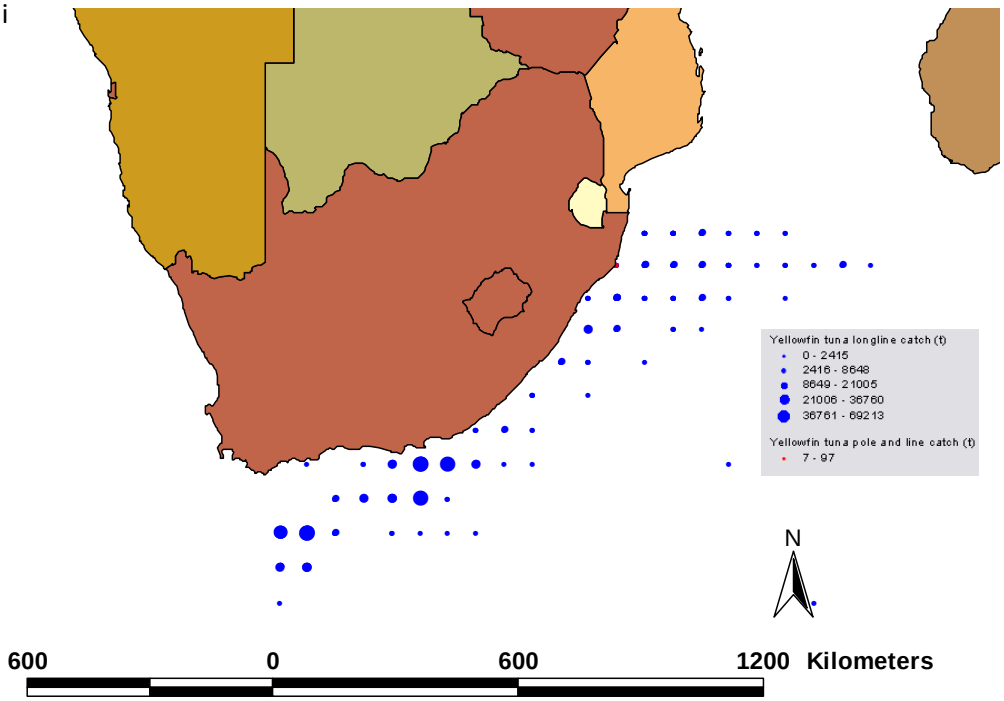
i


Albacore pole and line catch (t)
3500
Albacore longline catch (t)
0 - 150
151 - 484
485 - 1058
1059 - 1920
1921 - 3456
N
600
0
600
1200
Kilometers

ii


Bigeye tuna longline catch (t)
0 - 1584
1585 - 5775
5776 - 15076
15077 - 45289
45290 - 86606
N
600
0
600
1200
Kilometers

iii



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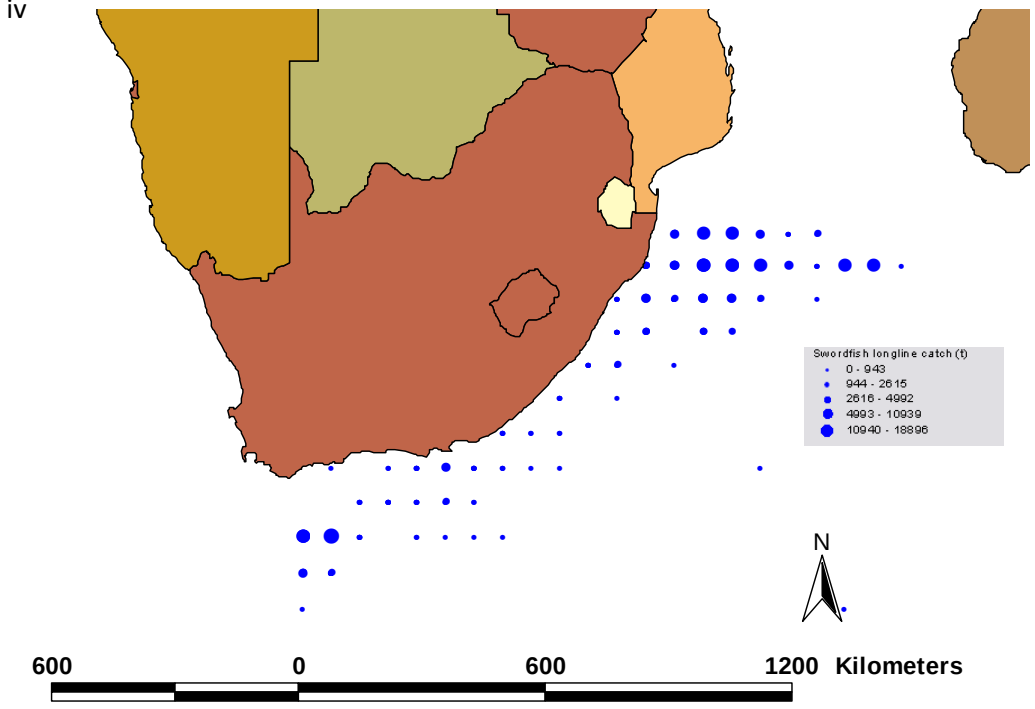
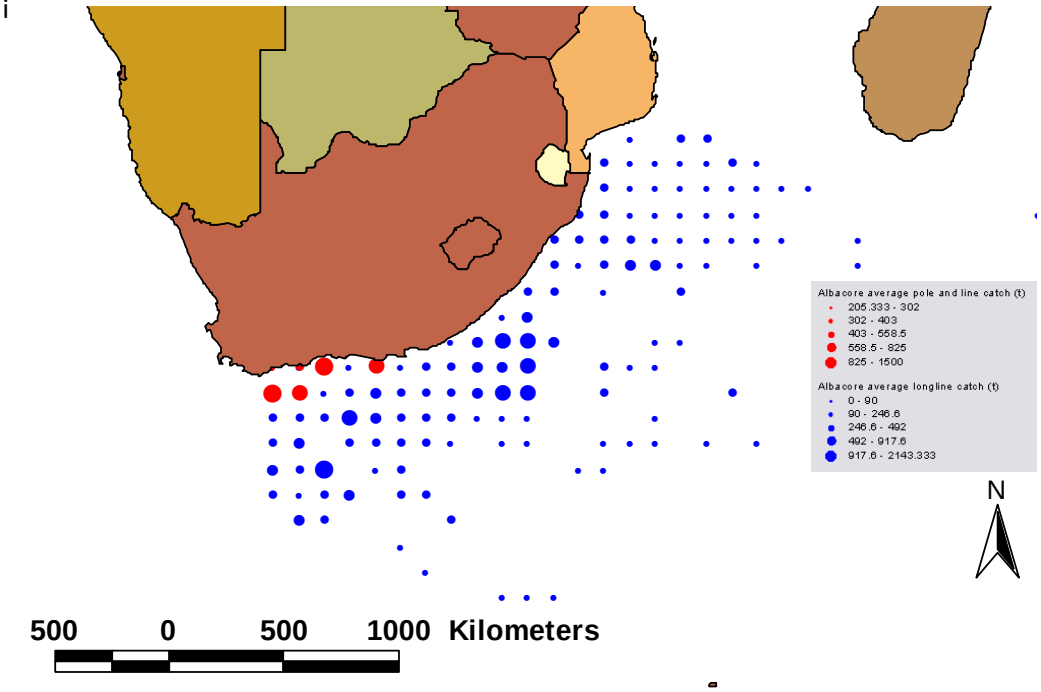
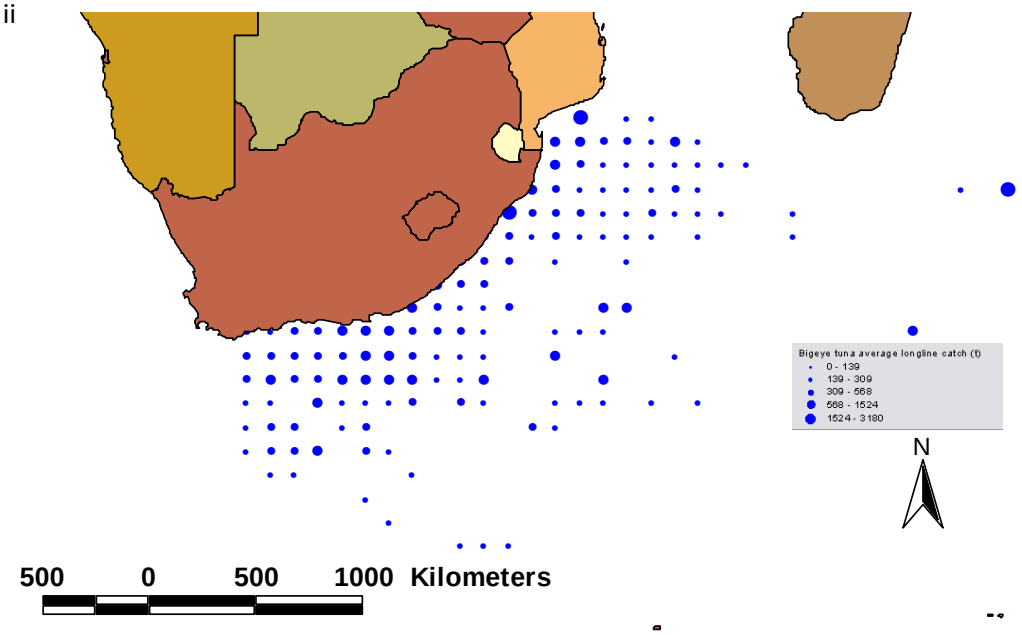


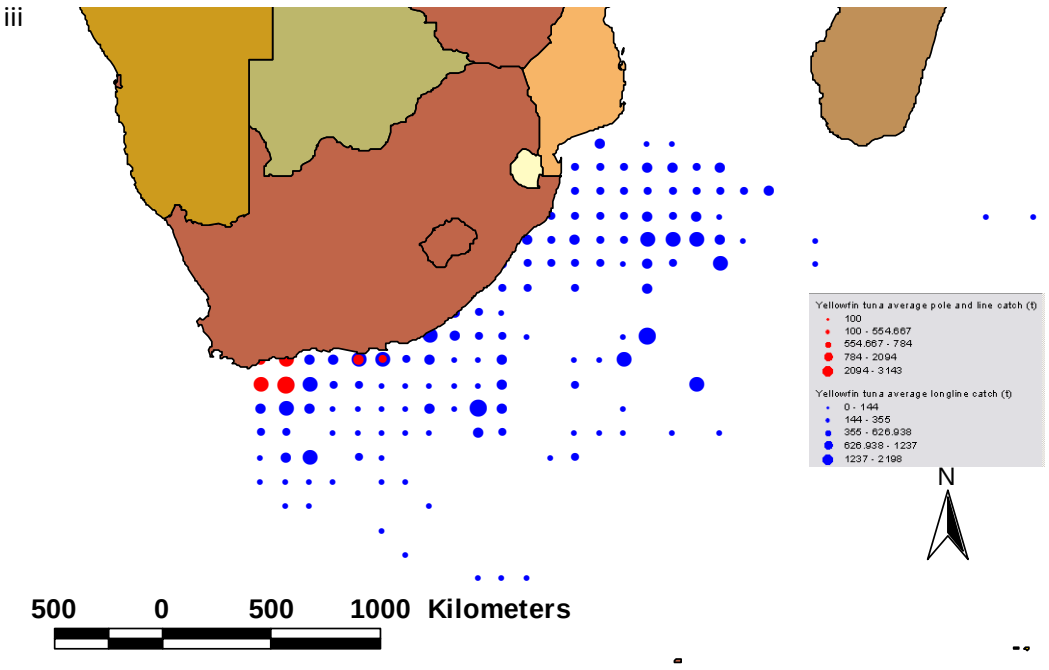
Figure 3a. Map of distribution of fishing catch (tons), for i) albacore, ii) bigeye tuna, iii) yellowfin tuna, and iv) swordfish for longline and pole and line/rod and reel for South Africa, in the IOTC area of competence in 2010.

i


Albacore average pole and line catch (t)
205.333 - 302
302 - 403
403 - 558.5
558.5 - 825
825 - 1500
Albacore average longline catch (t)
0 - 90
90 - 246.6
246.6 - 492
492 - 917.6
917.6 - 2143.333
N
500 0 500 1000 Kilometers

ii


Bigeye tuna average longline catch (t)
0 - 139
139 - 309
309 - 568
568 - 1524
1524 - 3180
N
500 0 500 1000 Kilometers



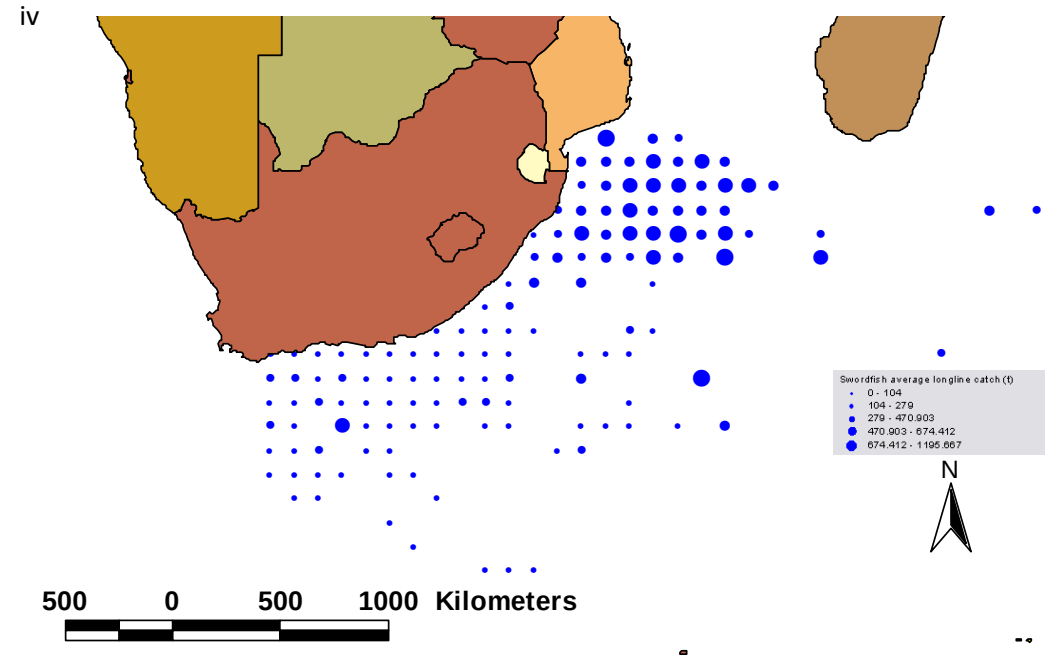


Figure 3b. Map of distribution of pelagic longline and pole and line/rod and reel average catches from 2006 to 2010 for i) albacore, ii) bigeye tuna, iii) yellowfin tuna and iv) swordfish in the IOTC area of competence.

4. RECREATIONAL FISHERY

The recreational fishery uses rod and reel from ski-boats (5-8 m) to target numerous game fish, including yellowfin, king mackerel and billfish. Although catch and effort data are unknown for this fishery it is estimated that over 100 t of yellowfin and king mackerel 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 weight restrictions of 3.2 kg for yellowfin and bigeye, 6.4 kg for southern bluefin and 25 kg for swordfish caught.

5. ECOSYSTEM AND BYCATCH ISSUES

Sharks

The NPOA for sharks has been redrafted in 2011 and is in the process of being finalized.

Table 3: a) total number and b) weight in tons of sharks, by species, retained by the national fleet in the IOTC area of competence

a)

Year	Shortfin mako	Blue shark	Requiem sharks	Thresher shark	Soupfin shark
2006	381	69	9	2	0
2007	378	184	14	10	0
2008	336	163	13	1	0
2009	373	143	44	0	0
2010	452	190	20	0	0

b)

Year	Shortfin mako	Blue shark	Requiem sharks	Thresher shark	Soupfin shark
2006	16134	5462	207	66	1
2007	15977	11331	361	218	0
2008	14439	9689	286	26	2
2009	16553	8161	1015	0	0
2010	22675	11951	450	0	0

Seabirds

South Africa has been collecting data on seabird interaction with its longline fishery since 1998. South Africa has finalized its NPOA for seabirds and was gazetted in 2008. The NPOA-SEABIRDS specifies a maximum bycatch rate of 0.05 birds/1000 hooks, and lays out bycatch mitigation measures for use in longline fishing. South Africa has made a number of bird mitigation measures a permit condition 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.

Marine Turtles

The South African government has worked closely with WWF to educate skippers on release procedures for turtles. The use of circle hooks are also encouraged as stated in the permit conditions.

Table 5. Observed annual catches of seabirds and marine turtles and marine mammalsin the national pelagic longline fleet from 2006 to 2010, in the IOTC area of competence.

Seabirds						
Species	**2006**	**2007**	**2008**	**2009**	**2010**	**Total**
Albatros Unid	8	21		36	16	81
Albatross Black browed		24	5	12	10	51
Albatross Grey Headed		15	3		1	19
Albatross Northern Royal				1		1
Albatross Shy	6	252	41	73	28	400
Albatross Wandering		16	3		5	24
Albatross Yellow nosed		66	5	14	32	117
Gannet Cape		61		7	12	80
Gannet Unid	1					1
Petrel Cape		5		33		38
Petrel Giant		5				5
Petrel Great-Winged		1				1
Petrel Grey			1			1
Petrel Pintado				1		1
Petrel Southern Giant		8	1	6		15
Petrel Unid	2	96	1	27	1	127
Petrel White chinned	2	590	96	198	57	943
Seal unid	2	1		1		4
Shearwater Unid				1		1
Skua				2		2
Tern Unid				1		1
Unidentified bird		15	1	51		67
Marine turtles						
Species	**2006**	**2007**	**2008**	**2009**	**2010**	**Total**
Turtle green			1		1	2
Turtle Leatherback	1	14	5	2	17	39
Turtle Loggerhead Sea Turtle	1	13	5	4	2	25
Turtle Olive Ridley		6	2	1		9
Turtle Unid	1	9	2	6	4	22
Marine mammals						
Species	**2006**	**2007**	**2008**	**2009**	**2010**	**Total**
Cape fur seal			1			1
Killer Whale	1	1			1	3
Dolphin common					1	1
Dolphin BottleNose		1		1		2
Dolphin unid	2	1	1			4
Grand Total	**27**	**1221**	**174**	**478**	**188**	**2088**

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 1997, 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 and 20% observer coverage on local vessels per year based on the total effort deployed. There were 15 observers actively observing on the tuna/swordfish longline vessels in 2010. There are no observers stationed on pole and line vessels; however, limited sampling of pole vessels is covered in port.

Table 6. The number of trips and number of hooks observed per year from 2006 to 2010 in the IOTC region.

Year	Number of hooks observed	Percentage of total effort in IOTC region	Number of trips observed
2006	177496	17	14
2007	3594965	80	28
2008	3288378	77	34
2009	3118159	70	43
2010	2441265	48	32

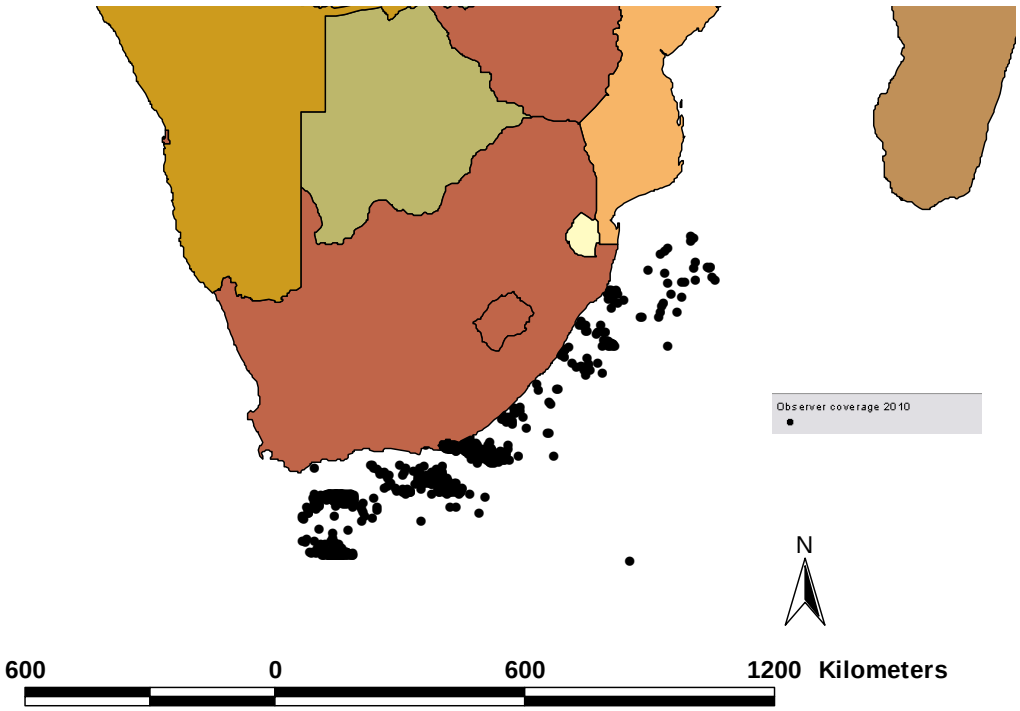


Figure 4. Map showing the spatial distribution of observer coverage in 2010. Each point represents a line set.

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 length frequency data through port sampling of pole and line/rod and reel vessels in 2010 has been achieved by the land-based observer program and by vessels sending in yellowfin tuna length frequency data. Length frequencies on the longline vessels are collected at sea prior to the fish being dressed.

Table 7. Number of yellowfin tuna, skipjack tuna and bigeye tuna measured from pole and line/rod and reel vessels in 2009 and 2010 in the IOTC region.

	Number of length frequency measurements	
	2009	2010
Yellowfin tuna	695	562
Skipjack tuna		3
Bigeye tuna	120	
Southern bluefin tuna	60	
Albacore	21	

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 by a South African Fisheries Control Officers. Transhipment of fish is not permitted at sea. Transhipments of fish in port requires pre authorisation. Unloading of tuna pole vessels are monitored on a random basis. These measures have been in place since 1998.

7. NATIONAL RESEARCH PROGRAMS

Various projects were initiated in 2008 including: the age and growth of albacore and bigeye tuna; the life history, stock delineation and spatial movement and distribution of bigeye tuna, swordfish and blue sharks between the Atlantic and Indian Oceans. The recent establishment of a large pelagic fishery represents an important milestone in the development of South African fisheries. However, research activities directed at the large pelagic species targeted by longline are in its infancy in South Africa and to date only three dedicated research trips have been undertaken since 2008. 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 archival tags (PATs) have been provided for deployment on swordfish, yellowfin and bigeye tunas as well as hook monitors and time depth records for deployment of an instrumented longline. Prior to the inception of this project two bigeye tuna and four blue sharks have previously been tagged with PATs as well as a further 441 blue sharks tagged with conventional tags.

In 2010, three yellowfin tuna were tagged with PAT 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 PAT 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 PAT tagged in the SWIO region with SWIOFP tags. Swordfish have proven to be very sensitive to handling on the line and South Africa is the first country to achieve PAT tagging of swordfish in this region. Tags have been programmed for either 90 or 180 days and, although six swordfish has reported to have most likely died shortly after tagging, we await the success of the five remaining tags deployed.

The Department continues to collaborate with WWF, University of Washington Seas Grant, and Birdlife SA to assess 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 also 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 has resulted in

seabird mortalities to decrease and is currently almost at the goal identified in NPOA-seabirds.

Rhodes University (Grahamstown) is also collaborating with the Department andhas conducted research on the stock delineation of yellowfin in the boundary region between the Indian and Atlantic Oceans by conducting genetic analysis and investigating movement patterns. The results of this project are still to be distributed.

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 should not exceed 8%. 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. In 2011 no wire traces are allowed to be used within 50cm from the hook. The upper precautionary catch limit for sharks is set at 2000t dressed weight for the entire South African longline fishery. Only charter vessels are restricted to a 10% shark by-catch limit.
08/04	Concerning the recording of catch by longline fishing vessels in the IOTC area	Paragraph 1–3.	Longline fishing vessels are required to fill out a logbook every trip and submit this to the Department on a monthly basis.
09/06	On marine turtles	Paragraphs 2, 8, 11, 12, 13 and 14.	South Africa collects data on marine turtle bycatch through the observer programme.
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 is collected through the observer program and port sampling.

No.	Resolution	Scientific requirement	CPC progress
10/06	On reducing the incidental bycatch of seabirds in longline fisheries.	Paragraph 7.	South Africa has in previous years submitted a report outlining measures that are being implemented to reduce seabird bycatch. A report for 2011 is yet to be submitted to the IOTC.
10/12	On the conservation of thresher sharks (family Alopiidae) caught in association with fisheries in the IOTC area of agreement	Paragraphs 6 and 7.	Thresher shark spp are prohibited from being retained on board vessels. In addition hammerheads and oceanic whitetips are also banned.
11/04	On a regional observer scheme	Paragraph 9.	100% observer coverage is achieved on foreign-flagged vessels and 20% observer coverage is required for the domestic vessels

9. LITERATURE CITED