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AN OVERVIEW OF SHARK DATA COLLECTION BY ICCAT

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SUMMARY

Some species of sharks are taken as by-catch in various fisheries directed at tunas. ICCAT has taken steps to collect Atlantic shark statistics, with emphasis on catch of pelagic species.

RÉSUMÉ

Certaines espèces de requins sont capturées en tant que prise accessoire de diverses pêcheries qui visent les thons. L'ICCAT a entrepris la collecte de statistiques sur les requins de l'Atlantique, en insistant sur la capture des espèces pélagiques

RESUMEN

Algunas especies de tiburones se pescan como captura fortuita en numerosas pesquerías dirigidas a los túnidos. ICCAT ha tomado medidas para recopilar estadísticas sobre los tiburones del Atlántico, centrándose sobre todo en las capturas de especies pelágicas.

PERIOD PRIOR TO 1994

At the meeting of the Sub-Committee on Statistics in 1991, the delegate of the USSR, noting the importance of pelagic sharks in the incidental catches of tuna fisheries and the repercussions that this could have on the shark stocks and on the oceanic ecosystems, proposed that ICCAT collect statistics relating to sharks.

The Sub-Committee on Statistics concluded that, bearing in mind the terms of reference of the ICCAT Convention (see **Appendix 1**), this did not enter into the mandate of the Commission. Nevertheless, the Sub-Committee considered that, given the prestige and reputation of ICCAT in relation to scientific research, and its experience in data base management, ICCAT should take the first steps towards estimating the level of by-catch in the fisheries. It was proposed that this item be included on the agenda of the next meeting of the SCRS, and asked the Secretariat to draw up a questionnaire on these fisheries.

In 1992, the SCRS concluded that the study of sharks, particularly pelagic sharks, taken as by-catch in tuna fisheries is within the competence of the Commission. It was recommended that contacts be established in order to exchange information with the shark Committee of ICES with a view to eventual collaboration.

In 1993, the SCRS evaluated the responses to the questionnaire on the collection of by-catch data and proposed that a Sub-Committee on by-catch be created in 1994.

PERIOD SINCE 1994

In 1994, CITES attempted to put some shark species on its lists of endangered species, which would have serious implications for a substantial part of the tuna fisheries which take these species as by-catch. Since then, the Shark Working Group and the SCRS have made several recommendations aimed at improving the collection of shark by-catch data, and the Secretariat started a shark data base (for Task I data), which is still provisional. Further questionnaires to better evaluate these fisheries have also been circulated. **Table 1** summarizes these activities.

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In 1995, the Commission adopted a Resolution on cooperation with FAO on shark statistic collection (**Appendix 2**), and in 1998, the FAO initiated an International Plan of Action (IPOA) for the conservation and management of sharks. Support of this IPOA by Contracting Parties is encouraged by the Commission.

DATA COLLECTION SYSTEM

Following the recommendations of the SCRS, each country should establish a scientific observer program in order to estimate the volume of sharks in the by-catch. A form (**Table 2**) was adopted in 1996 for the submission of Task I shark data. This form was slightly modified in 2001 in order to serve for the collection of Task II data, as the SCRS requested the submission of shark data in the finest strata possible (**Table 3**). Swordfish sampling areas (**Figure 1**) were adopted for sharks.

Shark data will be integrated into the ICCAT relational database as additional species.

SHARK STATISTICS

The current database comprises catch data from 1982 to 2000. It should be noted that data for 2000 are very partial at the time of writing this report, and data for previous years may be incomplete. Given the heterogeneity of the data, tables are submitted in three forms: catch in number of fish; catch in round weight; catch in dressed weight. **Table 4** shows the total catch by species and year, for those species for which information is available.

The Secretariat has adopted the FAO alpha-code system of classification, as shown in **Table 5**.

Table 6 shows the catch of the three species (shortfin mako, blue shark and porbeagle) to be considered at the data preparatory meeting, by country and year.

All available information from the ICCAT shark data base can be found in a soft copy file called Pivotable_sharks.xls (this spreadsheet can be obtained from http://www.iccat.es).

For size data, the same format as that for tunas can be used. Some countries have regularly submitted size data, but these have not yet been integrated into the database, and hence a comprehensive catalogue cannot be compiled. The same is true for tagging data.

Once observer and other biological data are received, they will be incorporated into the new database as far as possible.

POSSIBLE PROBLEMS

All Task I data submitted to the Secretariat have been included in the database. However, these data are far from being complete, as not all countries have sent data for the entire time series. Before 1993, data are almost non-existent, while there is a significant increase after 1996 (**Figure 2**). Furthermore, not all countries have submitted data, and it is unknown whether those which have not reported harvest any sharks (either as by-catch or target species). Consideration needs to be given on how to extrapolate the existing data to the total catch.

The original form developed for the collection of shark data offered various possibilities for submitting data. Therefore, some countries have submitted their data in number of fish, others in round weight and others in dressed weight. Coherent conversion factors need to be developed or adopted to convert dressed weight to round weight, and methods of converting number of fish to weight need to be considered.

Many data are reported for unclassified species of sharks, or by general groups, e.g mako unspecified or hammerhead sharks unspecified. National data collection systems need to be improved in order to report sharks by species.

As no bases have yet been established for size data or tagging data, historic data that have submitted to the Secretariat in files together with tuna species have not yet been processed. Doing so will take considerable time and staff resources.

Appendix 1

Extract from the ICCAT Convention

Article IV

1. In order to carry out the objectives of this Convention the Commission shall be responsible for the study of the populations of tuna and tuna-like fishes (the Scombriformes with the exception of the families Trichiuridae and Gempylidae and the genus *Scomber*) and such other species of fishes exploited in tuna fishing in the Convention area as are not under investigation by another international fishery organization.Such study shall include research on the abundance, biometry and ecology of the fishes; the oceanography of their environment; and the effects of natural and human factors upon their abundance. The Commission, in carrying out these responsibilities shall, insofar as feasible, utilise the technical and scientific services of, and information from, official agencies of the Contracting Parties and their political sub-divisions and may, when desirable, utilise the available services and information of any public or private institution, organization or individual, and my undertake within the limits of its budget independent research to supplement the research work being done by governments, national institutions or other international organizations.

2. The carrying out of the provisions in paragraph 1 of this Article shall include:

   (a) collecting and analyzing statistical information relating to the current conditions and trends of the tuna fishery resources of the Convention area;
   (b) studying and appraising information concerning measures and methods to ensure maintenance of the populations of tuna and tuna-like fishes in the Convention area at levels which will permit the maximum sustainable catch and which will ensure the effective exploitation of these fishes in a manner consistent with this catch;
   (c) recommending studies and investigations to the Contracting Parties;
   (d) publishing and otherwise disseminating reports of its findings and statistical, biological and other scientific information relative to the tuna fisheries of the Convention area.

Appendix 2

[ICCAT Resolution 95-2]

RESOLUTION ON COOPERATION WITH FAO WITH REGARD
TO STUDY ON THE STATUS OF STOCKS AND BY-CATCH OF SHARK SPECIES

NOTING that more than 350 shark species inhabit both the pelagic areas and coastal areas, and that information on stock sizes, biological parameters, by-catch levels and effects of by-catch is insufficient;
NOTING that some shark species are incidentally caught in tuna fisheries;
FURTHER NOTING that, at present, sharks are not generally subject to specific conservation and management measures by international or regional/sub-regional fishery organizations;
RECOGNIZING the work of the Study Group on Elasmobranch Fishes of the International Council for the Exploration of the Sea (ICES);
RECOGNIZING that the Ninth Meeting of the Conference of the Parties to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), (Fort Lauderdale, Florida - November 7 to 18, 1994), adopted a Resolution on the "Status of International Trade in Shark Species";
AFFIRMING that the Sub-Committee on By-catches of the ICCAT Standing Committee on Research and Statistics (SCRS) is presently assembling relevant information and identifying those species which should be studied by ICCAT;
ALSO, CONSIDERING that cooperation on research and analysis on a global basis is fundamentally essential to elucidate on the overall nature of this problem and actions to be taken concerning shark species;

Therefore,

THE INTERNATIONAL COMMISSION FOR THE CONSERVATION OF ATLANTIC TUNAS (ICCAT)
RESOLVES:

1. That FAO be the focal point in which to initiate a program to collect, on a global scale, the necessary biological data, including stock abundance and the magnitude of by-catch, and trade data on shark species, and to serve a coordination function among regional or sub-regional fisheries management organizations for said activities;

2. That the Contracting Parties of ICCAT provide FAO with the information, and financial assistance where possible, to conduct the work required; and

3. That international or regional/sub-regional fisheries management organizations cooperate with FAO in providing the necessary information and advice in response to the requests made, including the aforementioned CITES Resolution.

Table 1. Summary of activities on sharks

	Secretariat	SCRS	COM	W-G	CITES
1994		Creation of ad hoc Working Group on By-catch			RESOLUTION OF Status of International trade in Sharks. Attempt to put sharks in Appendix
1995	Survey to improve catch estimations on by-catch	Recommendation to establish observers Program on a national level. Discussion about role & responsibilities of ICCAT	Adoption of recommendation 95-2		
1996	start storing catch data in MS access data base	Set-up of objectives of Sharks Working group: 1)species identification 2)setting data collection system 3)answer to Cites		First meeting of Sharks working group and adoption of format to submit data and species list.	CITES meeting in Czech Republic
1997	Close cooperation with Intern. Organ. (CITES.FAO.NAFO.GFCM.ICES)	Define ICCAT response. To collect information on sharks by-catch		Second meeting of Sharks working group and review SHARKS CPUE and prepare a letter to CITES	CITIES meeting in HARARE
1998	reception of taski from 10 fleets and task-2 from 3	Recommendation to all countries to establish adequate system to collect task-1 & task-2 data including discards			
1999	reception of taski from 24 fleets and task-2 from 3	All information on sharks (by-catch and targeted) should be collected & transmitted to ICCAT			
2000	Secretariat need to develop data base to manage information required by the SCRS and approval of FAO recommendation on IPOA & NPOA	task-1, task-2, discards, tagging &genetic studies should be transmitted to ICCAT			
2001		data preparatory meeting			

Table 2. Reporting form adopted in 1996

REPORTING FORM FOR SHARK BY-CATCH

FLAG COUNTRY: _____

REPORTING AGENT: _____

ADDRESS: _____-___-_

Tel: _____

Code	Common Names	Scientific Names	Gear Used	Area	Total Effort	Unit of Effort	Dead discards		Landing Landing					Remarks
							Number	Weight	Number fish	Processed Weight	Type of Product	Conv. Factors	Round Weight	
PELAGIC SHARKS														
ALV	Thresher	Alopias vulpinus												
BTH	Bigeye thresher	Alopias superciliuosus												
FAL	Silky shark	Carcharhinus falciformis												
OCS	Oceanic wh itetip shark	Carcharhinus longimanus												
SMA	Shortfin mako	Isurus oxyrinchus												
LMA	Longfin mako	Isurus paucus												
POR	Porbeagle	Lamna nasus												
BSH	Blue shark	Prionace glauca												
Pelagic sharks unclassified														
PELAGIC SHARKS TOTAL														

Table 2 (cont.).

FLAG COUNTRY:_____ **YEAR**_____

REPORTING AGENT: _____

Code	Common Names	Scientific Names	Gear used	Area	Total Effort	Unit of Effort	Dead Discards		Landings					Remarks
							Number of Fish	Weight	Number fish	Processed Weight	Type of Product	Conv. Factor	Round Weight	
COASTAL SHARKS														
CCT	Sand tiger shark	Carchaias taurus												
CCA	Bignose shark	Carcharhinus altimus												
CCB	Spinner shark	Carcharhinus brevipinna												
CCL	Blacktip shark	Carcharhinus limbatus												
CCE	Bull shark	Carcharhinus leucas												
DUS	Dusky shark	Carcharhinus obscurus												
CCP	Sandbar shark	Carcharhinus plumbeus												
CCS	Night shark	Carcharhinus signatus												
WSH	White shark	Carcharodon carcharias												
BSK	Basking shark	Cetorhinus maximus												
TIG	Tiger shark	Galeocerdo cuvieri												
GAG	Tope shark	Galeorhinus galeus												
SPL	Scalloped hammerhead	Sphyrna lewini												
SPK	Great hammerhead	Sphyrna mokarran												
SPZ	Smooth hammerhead	Sphyrna zygaena												
COASTAL SHARKS UNCLASSIFIED														
COASTAL SHARKS TOTAL														
SHARKS TOTAL														

Table 3. New Form adopted in 2001

ICCAT FORM 4 (REV)

ATLANTIC SHARK CATCH AND EFFORT STATISTICS BY AREA, QUARTER, AND SPECIES

Country _____ ☐☐☐ Year ☐☐☐☐

Flag _____ ☐☐☐ Landing ☐ or Discards ☐

Gear _____ ☐☐ ☐ Weight Unit_____ Condition (type of product) _____

Unit of effort _____ ☐☐ ☐ Number of fish

Converted from _____ Conversion factor_____

QUARTER	AREA			ICCAT AREA	EFFORT	CATCH BY SPECIES IN ROUND WEIGHT									
	QUADR	LAT	LONG			TOTAL	BSH *P. Glaucae*	POR *L.Nausus*	SMA *I.Oxyrinchus*			OTHER SPECIES (SPECIFY)			
						Total by Species									

Table 4. Total catch (n. fish; dressed weight and round weight in MT) by species and year.

		year																				
Data	Alfa3FAO	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	Grand Total
Sum(n_fish)	ALV												25	92	76		0	0	0		193
	BSH					6	12506	12938	12525	13147	16562	10962	55419	12091	9787	53614	40322	32818	5643	6309	294649
	BSK																	0		0	0
	BTH											409	1042	147	274	0	0	1		0	1873
	CCA											68						0			68
	CCB											32		23					0		55
	CCE	1									1	279	39	98	90	9	0	0		0	517
	CCG														0	786	500	400			1686
	CCL	2	16	161	30	54	206	121	132	183	233	962	795	1309	1138	1304	1103	281	386	588	9004
	CCP	1	1		1	1	1	2	1	4	54	2920	1693	4136	12539	15851	11282	5853	5100	6291	65731
	CCS												22	380	128	1	1196	925	1727	4136	8515
	CCT												9								9
	CXX	589	632	903	720	620	7320	8298	7509	5813	5245	3119	2409	6606	5975	5506	1750	596	794	1132	65536
	DGH																			0	0
	DUS	1					1	10	33	30	28	1550	1073	3154	1613	2045	1071	1806	782	997	14194
	FAL	1					2				254	11103	3764	4330	4562	1948	3621	1499	7235	3358	41677
	GAG																0	17	0		17
	LMA	2	5	5	7	2	11	15	9	11	10	439	93	248	203	24	19	17	16		1136
	MAK	1164	1258	1723	1910	2318	2809	3525	4857	3729	3501	4396	257	446	238		0	2678	2256	2780	39845
	OCS		30		1	5			7	2	4	220	622	434	316	155	222	182	80	52	2332
	POR	1		2	1	3	24	4	39	24	70	58	642	1316	461	1521	1232	2090	38	6	7532
	PSK											2	1420								1422
	PXX													1	954	5716	2135	8986	3111	1197	22100
	RHT											1941								0	1941
	RSK											5441	12149	0	27		442	0	0		18059
	SCK													0	0						0
	SKH					0	0	0	0	0	0	34230	15432	0	93	0	0	0	550	0	50305
	SMA									0	0	3178	7256	4959	4939	8815	9412	5430	1328	0	45317
	SMD													0	0						0
	SPK											340	40	72	7			0			459
	SPL											6599	2904	765	1529	0	0	0	117		11914
	SPN	2					3030	4134	3427	2860	3622	1940	1840	1775	1737	830	1087	656	1085	857	28882
	SPZ											68		0	8		0	0	0		76
	THR	187	366	102	83	51	4039	1088	980	705	546	709	324	569	666	1229	1009	534	438	203	13828
	TIG	3	6	3	1	1	80	76	131	90	131	351	115	94	202	138	33	74	31	3	1563
	WSH						35	52	59	67	81										294
Total Sum(n_fish)		1954	2314	2899	2754	3061	30064	30263	29709	26665	30342	91316	109384	43045	47562	99492	76436	64843	30717	27909	750729

		year																			
Data	Alfa3FAO	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	Grand Total
Sum(drwt)	ALV												0	0	1		0	0	0		1
	BSH					0	0	0	0	0	0	0	0	0	46	0	0	2	24463	85	24597
	BSK																	0		0	0
	BTH											0	0	0	0	0	0	0		0	0
	CCA											0						0			0
	CCB											0		0					0		0
	CCE	0									0	0	0	0	0	0	0	0		0	0
	CCG														0	0	0	0			0
	CCL	0	0	0	0	0	0	0	0	4	7	19	0	0	0	0	0	5	6	9	50
	CCP	0	0		0	0	0	0	0	0	1	53	0	0	0	0	0	76	73	86	289
	CCS												0	0	0	0	0	0	3	1	4
	CCT												0								0
	CXX	0	0	0	0	0	0	0	0	32	29	98	0	0	0	0	0	1	1	2	163
	DGH																			0	0
	DUS	0					0	0	0	1	1	1	0	0	0	0	0	9	14	11	36
	FAL	0					0				0	1	0	0	0	0	0	5	19	8	33
	GAG																0	0	0		0
	LMA	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	1	1		4
	MAK	0	0	8	0	0	0	0	0	92	105	130	0	0	0		0	100	90	83	608
	OCS		0		0	0			0	0	0	0	0	0	0	0	0	3	1	1	5
	POR	0		0	0	0	0	0	0	1	2	1	0	0	2	0	4	6	2	4	21
	PSK											0	0								0
	PXX													0	249	0	206	94	295	0	844
	RHT											0								0	0
	RSK											0	0	0	30		9	0	0		39
	SCK													0	0						0
	SKH					0	0	0	0	0	0	0	0	0	0	301	5	2	0	77	385
	SMA									0	0	0	0	0	15	0	12	1	34	45	106
	SMD													0	0						0
	SPK											0	0	0	0			0			0
	SPL											0	0	0	0	0	0	0	9		9
	SPN	0					0	0	0	1	0	4	0	0	8	0	3	3	4	1	24
	SPZ											0		0	0		0	0	0		0
	THR	3	0	1	0	0	0	0	0	7	6	10	0	0	0	0	0	24	26	11	90
	TIG	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	3
	WSH						0	0	0	0	0										0
Total Sum(drwt)		3	0	9	0	0	0	0	0	138	152	318	0	0	351	301	239	334	25041	425	27312

Table 4. (continued…)

		year																			
Data	Alfa3FAO	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	Grand Total
Sum(rwt)	ALV												2	7	9		30	45	1		94
	BSH					1	526	421	480	2129	3029	1768	6886	7845	8134	8114	11247	32313	32654	3652	119199
	BSK																	0		1	1
	BTH											0	20	18	39	14	199	114		7	411
	CCA											5						1			6
	CCB											1		1					1		2
	CCE	0									0	19	3	8	7	1	0	0		7	44
	CCG														10	5	4	6			26
	CCL	0	0	6	2	2	8	5	8	7	13	40	20	120	44	50	44	21	24	51	465
	CCP	0	0		0	0	0	0	0	0	1	111	61	146	327	468	343	154	149	174	1935
	CCS												0	3	1	0	21	23	27	91	167
	CCT												0								0
	CXX	37	28	48	47	34	223	267	297	218	204	199	112	483	289	177	98	154	22	32	2970
	DGH																			13	13
	DUS	0					0	0	1	2	1	64	36	270	80	52	48	54	38	48	694
	FAL	0					0				13	341	138	90	125	531	344	34	141	93	1850
	GAG																1	1	0		2
	LMA	0	0	0	1	0	1	3	2	1	1	29	8	18	17	3	29	10	2		125
	MAK	73	69	100	102	127	161	204	253	225	226	273	11	20	123		92	234	180	163	2636
	OCS		1		0	0			1	0	0	8	11	10	14	8	12	15	2	2	83
	POR	0		0	0	0	1	2	3	2	6	4	51	110	1417	1099	1450	1048	974	918	7085
	PSK											0	0								0
	PXX													1476	2410	1747	1300	842	1581	90	9446
	RHT											2								22	24
	RSK											0	0	20	43		186	257	161		666
	SCK													1	0						1
	SKH					51	83	150	143	36	23	292	308	2755	4643	3685	2888	4624	3541	265	23486
	SMA									193	314	246	1094	977	1089	1316	5038	3826	3447	711	18250
	SMD													0	1						1
	SPK											19	2	4	1			1			28
	SPL											363	14	33	103	25	217	34	9		799
	SPN	0					84	273	126	163	143	87	106	126	120	40	883	795	49	49	3043
	SPZ											4		3	1		176	115	9		307
	THR	15	31	14	8	6	189	94	77	62	42	60	38	65	60	98	140	102	112	24	1237
	TIG	0	1	0	0	0	6	2	2	4	7	13	11	10	20	5	5	9	1	0	97
	WSH						1	2	2	2	3										9
Total Sum(rwt)		127	130	168	161	221	1285	1423	1395	3044	4028	3944	8934	14618	19124	17437	24794	44830	43125	6411	195201

Table 5. List of shark species codes

SpeciesID	Alfa3FAO	ScieName	NameUK	FamilyTx	TAXOCODE
101	SBL	Hexanchus griseus	Bluntnose sixgill shark	Hexanchidae	1050200201
102	NTC	Notorynchus cepedianus	Broadnose sevengill shark	Hexanchidae	1050200502
103	BSK	Cetorhinus maximus	Basking shark	Cetorhinidae	1060100301
104	CCT	Carcharias taurus	Sand tiger shark	Odontaspididae	1060200501
105	ALV	Alopias vulpinus	Thresher	Alopiidae	1060600601
106	PTH	Alopias pelagicus	Pelagic thresher	Alopiidae	1060600602
107	BTH	Alopias superciliosus	Bigeye thresher	Alopiidae	1060600603
108	THR	Alopias spp	Thresher sharks nei	Alopiidae	10606006XX
109	SMA	Isurus oxyrinchus	Shortfin mako	Lamnidae	1060800201
110	LMA	Isurus paucus	Longfin mako	Lamnidae	1060800203
111	MAK	Isurus spp	Mako sharks	Lamnidae	10608002XX
112	POR	Lamna nasus	Porbeagle	Lamnidae	1060800301
113	LMD	Lamna ditropis	Salmon shark	Lamnidae	1060800303
114	WSH	Carcharodon carcharias	Great white shark	Lamnidae	1060800701
115	MSK	Lamnidae	Mackerel sharks,porbeagles nei	Lamnidae	10608XXXXX
116	GNC	Ginglymostoma cirratum	Nurse shark	Ginglymostomatidae	1070300901
117	GNG	Ginglymostoma spp	Nurse sharks nei	Ginglymostomatidae	10703009XX
118	RHN	Rhincodon typus	Whale shark	Rhincodontidae	1070500401
119	SHO	Galeus melastomus	Blackmouth catshark	Scyliorhinidae	1080100104
120	GAU	Galeus spp	Crest-tail catsharks nei	Scyliorhinidae	10801001XX
121	SYC	Scyliorhinus canicula	Small-spotted catshark	Scyliorhinidae	1080100301
122	SYT	Scyliorhinus stellaris	Nursehound	Scyliorhinidae	1080100302
123	SCL	Scyliorhinus spp	Catsharks, nursehounds nei	Scyliorhinidae	10801003XX
124	API	Apristurus spp	Deep-water catsharks	Scyliorhinidae	10801014XX
125	SYX	Scyliorhinidae	Catsharks, etc. nei	Scyliorhinidae	10801XXXXX
126	BSH	Prionace glauca	Blue shark	Carcharhinidae	1080200401
127	LMT	Lamiopsis temmincki	Broadfin shark	Carcharhinidae	1080200701
128	CCP	Carcharhinus plumbeus	Sandbar shark	Carcharhinidae	1080201001
129	CCL	Carcharhinus limbatus	Blacktip shark	Carcharhinidae	1080201003
130	BLR	Carcharhinus melanopterus	Blacktip reef shark	Carcharhinidae	1080201005
131	CCN	Carcharhinus acronotus	Blacknose shark	Carcharhinidae	1080201009
132	OCS	Carcharhinus longimanus	Oceanic whitetip shark	Carcharhinidae	1080201011
133	CCR	Carcharhinus porosus	Smalltail shark	Carcharhinidae	1080201012
134	DUS	Carcharhinus obscurus	Dusky shark	Carcharhinidae	1080201016
135	FAL	Carcharhinus falciformis	Silky shark	Carcharhinidae	1080201017
136	CCE	Carcharhinus leucas	Bull shark	Carcharhinidae	1080201018
137	ALS	Carcharhinus albimarginatus	Silvertip shark	Carcharhinidae	1080201019
138	BRO	Carcharhinus brachyurus	Copper shark	Carcharhinidae	1080201020
139	CCB	Carcharhinus brevipinna	Spinner shark	Carcharhinidae	1080201021
140	CCI	Carcharhinus sealei	Blackspot shark	Carcharhinidae	1080201022
141	CCS	Carcharhinus signatus	Night shark	Carcharhinidae	1080201023
142	CCM	Carcharhinus macloti	Hardnose shark	Carcharhinidae	1080201024
143	CCO	Carcharhinus isodon	Finetooth shark	Carcharhinidae	1080201025
144	CCA	Carcharhinus altimus	Bignose shark	Carcharhinidae	1080201026
145	TIG	Galeocerdo cuvier	Tiger shark	Carcharhinidae	1080201703
146	NGB	Negaprion brevirostris	Lemon shark	Carcharhinidae	1080202701
147	RHT	Rhizoprionodon terraenovae	Atlantic sharpnose shark	Carcharhinidae	1080204001
148	RHZ	Rhizoprionodon spp	Sharpnose sharks nei	Carcharhinidae	10802040XX
149	RSK	Carcharhinidae	Requiem sharks nei	Carcharhinidae	10802XXXXX
150	SPZ	Sphyrna zygaena	Smooth hammerhead	Sphyrnidae	1080300501
151	SPL	Sphyrna lewini	Scalloped hammerhead	Sphyrnidae	1080300506
152	SPJ	Sphyrna tiburo	Bonnethead	Sphyrnidae	1080300509
153	SPK	Sphyrna mokarran	Great hammerhead	Sphyrnidae	1080300510
154	SPN	Sphyrna spp	Hammerhead sharks nei	Sphyrnidae	10803005XX
155	SPY	Sphyrnidae	Hammerhead sharks, etc. nei	Sphyrnidae	10803XXXXX
156	CTK	Mustelus henlei	Brown smooth-hound	Triakidae	1080400707
157	SDP	Mustelus schmitti	Narrownose smooth-hound	Triakidae	1080400712
158	SMD	Mustelus mustelus	Smooth-hound	Triakidae	1080400713
159	SDS	Mustelus asterias	Starry smooth-hound	Triakidae	1080400718
160	SDV	Mustelus spp	Smooth-hounds nei	Triakidae	10804007XX
161	GAG	Galeorhinus galeus	Tope shark	Triakidae	1080401103
162	LES	Triakis semifasciata	Leopard shark	Triakidae	1080402302
163	TRK	Triakidae	Houndsharks,smoothhounds nei	Triakidae	10804XXXXX
164	PTM	Pseudotriakis microdon	False catshark	Pseudotriakidae	1080502801
165	CVX	Carcharhiniformes	Ground sharks		108XXXXXXX
166	GSK	Somniosus microcephalus	Greenland shark	Squalidae	1090100201
167	SOR	Somniosus rostratus	Little sleeper shark	Squalidae	1090100202

Table 5. (Continued…)

SpeciesID	Alfa3FAO	ScieName	NameUK	FamilyTx	TAXOCODE
168	DGS	Squalus acanthias	Picked dogfish	Squalidae	1090100704
169	DOP	Squalus megalops	Shortnose spurdog	Squalidae	1090100708
170	DGZ	Squalus spp	Dogfish nei	Squalidae	10901007XX
171	GUP	Centrophorus granulosus	Gulper shark	Squalidae	1090100801
172	CPU	Centrophorus uyato	Little gulper shark	Squalidae	1090100802
173	GUQ	Centrophorus squamosus	Leafscale gulper shark	Squalidae	1090100803
174	CPL	Centrophorus lusitanicus	Lowfin gulper shark	Squalidae	1090100804
175	ETX	Etmopterus spinax	Velvet belly	Squalidae	1090101001
176	ETR	Etmopterus princeps	Great lanternshark	Squalidae	1090101005
177	ETP	Etmopterus pusillus	Smooth lanternshark	Squalidae	1090101022
178	SHL	Etmopterus spp	Lanternsharks nei	Squalidae	10901010XX
179	DCA	Deania calcea	Birdbeak dogfish	Squalidae	1090101401
180	DNA	Deania spp	Deania dogfishes nei	Squalidae	10901014XX
181	CYO	Centroscymnus coelolepis	Portuguese dogfish	Squalidae	1090101601
182	CYP	Centroscymnus crepidater	Longnose velvet dogfish	Squalidae	1090101602
183	CYY	Centroscymnus cryptacanthus	Shortnose velvet dogfish	Squalidae	1090101603
184	SYO	Scymnodon obscurus	Smallmouth knifetooth dogfish	Squalidae	1090101701
185	SYR	Scymnodon ringens	Knifetooth dogfish	Squalidae	1090101702
186	SCK	Dalatias licha	Kitefin shark	Squalidae	1090101801
187	CFB	Centroscyllium fabricii	Black dogfish	Squalidae	1090101901
188	DGX	Squalidae	Dogfish sharks nei	Squalidae	10901XXXXX
189	DGH	Squalidae, Scyliorhinidae	Dogfishes and hounds nei		10901XXXXX040
190	AGN	Squatina squatina	Angelshark	Squatinidae	1090300401
191	ASK	Squatinidae	Angelsharks, sand devils nei	Squatinidae	10903XXXXX
192	OXY	Oxynotus centrina	Angular roughshark	Oxynotidae	1090500603
193	OXN	Oxynotus paradoxus	Sailfin roughshark	Oxynotidae	1090500604
194	SHB	Echinorhinus brucus	Bramble shark	Echinorhinidae	1090600901
195	CCG	Carcharhinus galapagensis	Galapagos shark	Carcharhinidae	1080201027
196	CCV	Carcharhinus perezi	Caribbean reef shark	Carcharhinidae	1080201030
197	PSK	Pseudocarcharias kamoharai	Crocodile shark	Pseudocarchariidae	1060403601
198	SKH	Selachimorpha(Pleurotremata)	Various sharks nei		199XXXXXXX053
500	PXX		Pelagic Sharks nei		
501	CXX		Coastal Sharks nei		

Table 6a. Catch statistics (n. fish; dressed weight and round weight in MT) for blue shark.

		year															
Data	flag	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	Grand Total
Sum(n_fish)	BENIN																
	BRASIL							3912	26006						1660		31578
	BRASIL.BZE																
	BRASIL.EQG																
	BRASIL.ESP																
	BRASIL.HON														458		458
	BRASIL.PAN														183		183
	BRASIL.POR														20		20
	BRASIL.STV																
	BRASIL.TAI																
	BRASIL.URU														340		340
	BRASIL.USA														49		49
	CANADA																
	CAP VERT																
	CYPRUS																
	EC.ESPAÑA																
	EC.IRELAND																
	EC.PORTUGAL													5			5
	EC.UK																
	JAPAN											37738	33668	27368			98774
	MEXICO										1						1
	NAMIBIA																
	PANAMA																
	S.AFRICA														886		886
	UK.BERMUDA											33	30	71			134
	URUGUAY																
	USA	6	12506	12938	12525	13147	16562	7050	29413	12091	9786	15843	6624	5374	2047	6309	162221
Sum(drwt)	BENIN																
	BRASIL																
	BRASIL.BZE														4		4
	BRASIL.EQG														49		49
	BRASIL.ESP														67		67
	BRASIL.HON																
	BRASIL.PAN																
	BRASIL.POR																
	BRASIL.STV														5		5
	BRASIL.TAI														25		25
	BRASIL.URU																
	BRASIL.USA																
	CANADA																
	CAP VERT																
	CYPRUS																
	EC.ESPAÑA														24296		24296
	EC.IRELAND																
	EC.PORTUGAL																
	EC.UK																
	JAPAN																
	MEXICO																
	NAMIBIA																
	PANAMA																
	S.AFRICA														16		16
	UK.BERMUDA													1			1
	URUGUAY										46					85	131
	USA					0		0						1	0	0	2
Sum(rwt)	BENIN												6	4	27		36
	BRASIL											743	1103				1847
	BRASIL.BZE														5		5
	BRASIL.EQG														59		59
	BRASIL.ESP														80		80
	BRASIL.HON																
	BRASIL.PAN																
	BRASIL.POR																
	BRASIL.STV														5		5
	BRASIL.TAI														30		30
	BRASIL.URU																
	BRASIL.USA																
	CANADA										276	9	11	21	54	18	388
	CAP VERT									0							0
	CYPRUS															9	9
	EC.ESPAÑA												5427	28137	29005		62569
	EC.IRELAND														66		66
	EC.PORTUGAL					1387	2257	1583	5726	4669	5569	5710	3518	3078	3049	3346	39891
	EC.UK										12						12
	JAPAN									2596	1589	1044	996	850			7075
	MEXICO										0					0	0
	NAMIBIA														0		0
	PANAMA														177	22	199
	S.AFRICA													23	21		44
	UK.BERMUDA										3	1	1	2	8		14
	URUGUAY										64					119	183
	USA	1	526	421	480	742	772	185	1160	580	622	607	186	198	71	138	6688
Total Sum(n_fish)		6	12506	12938	12525	13147	16562	10962	55419	12091	9787	53614	40322	32818	5643	6309	294649
Total Sum(drwt)						0		0			46			2	24463	85	24597
Total Sum(rwt)		1	526	421	480	2129	3029	1768	6886	7845	8134	8114	11247	32313	32654	3652	119199

Table 6b. Catch statistics (n. fish; dressed weight and round weight in MT) for shortfin mako.

		year											
Data	flag	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	Grand Total
Sum(n_fish)	BRASIL			2741	2782						831		6354
	BRASIL.BZE												
	BRASIL.EQG												
	BRASIL.ESP												
	BRASIL.HON										20		20
	BRASIL.PAN										5		5
	BRASIL.STV												
	BRASIL.TAI												
	BRASIL.URU										11		11
	BRASIL.USA										13		13
	CANADA												
	CHINA PR												
	EC.ESPAÑA												
	EC.PORTUGAL									3			3
	JAPAN							5690	5721	5423			16834
	MEXICO						155						155
	NAMIBIA												
	PANAMA												
	S.AFRICA										448		448
	ST.VINCENT												
	UK.BERMUDA							4	4	4			12
	URUGUAY								443				443
	USA			437	4474	4959	4784	3121	3244				21019
Sum(drwt)	BRASIL												
	BRASIL.BZE										0		0
	BRASIL.EQG										7		7
	BRASIL.ESP										6		6
	BRASIL.HON												
	BRASIL.PAN												
	BRASIL.STV										2		2
	BRASIL.TAI										7		7
	BRASIL.URU												
	BRASIL.USA												
	CANADA												
	CHINA PR												
	EC.ESPAÑA												
	EC.PORTUGAL												
	JAPAN												
	MEXICO												
	NAMIBIA												
	PANAMA												
	S.AFRICA										11		11
	ST.VINCENT												
	UK.BERMUDA									1			1
	URUGUAY						15		12			45	72
	USA												
Sum(rwt)	BRASIL							83	190				273
	BRASIL.BZE										0		0
	BRASIL.EQG										8		8
	BRASIL.ESP										8		8
	BRASIL.HON												
	BRASIL.PAN												
	BRASIL.STV										2		2
	BRASIL.TAI										9		9
	BRASIL.URU												
	BRASIL.USA												
	CANADA								110	69	70	78	328
	CHINA PR											153	153
	EC.ESPAÑA								3777	3347	2895		10020
	EC.PORTUGAL	193	314	220	796	649	749	785	451	389	411	406	5363
	JAPAN							213	248				461
	MEXICO						10					10	21
	NAMIBIA										1		1
	PANAMA										25	1	26
	S.AFRICA									19	13		32
	ST.VINCENT							0			3		3
	UK.BERMUDA						-1	1	1	2	2		4
	URUGUAY						21		16			63	100
	USA			26	298	328	310	234	244				1439
Total Sum(n_fish)				3178	7256	4959	4939	8815	9412	5430	1328		45317
Total Sum(drwt)							15		12	1	34	45	106
Total Sum(rwt)		193	314	246	1094	977	1089	1316	5038	3826	3447	711	18250

Table 6c. Catch statistics (n. fish; dressed weight and round weight in MT) for Porbeagle

		year																		
Data	flag	1982	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	Grand Total
Sum(n_fish)	BENIN																			
	BULGARIA																			
	CANADA																			
	CHILE																			
	EC.ESPAÑA																			
	EC.IRELAND																			
	EC.PORTUGAL																			
	EC.SPAIN																			
	EC.SPAIN -FK																			
	JAPAN														260	336	1967			2563
	JAPAN-FK																			
	POLAND																			
	SEYCHELLES																			
	UK.FALKLAND																			
	URUGUAY															127				127
	USA	1	2	1	3	24	4	39	24	70	58	642	1316	461	1261	769	123	38	6	4842
Sum(drwt)	BENIN																			
	BULGARIA																			
	CANADA																			
	CHILE																			
	EC.ESPAÑA																			
	EC.IRELAND																			
	EC.PORTUGAL																			
	EC.SPAIN																			
	EC.SPAIN -FK																			
	JAPAN																			
	JAPAN-FK																			
	POLAND																			
	SEYCHELLES																			
	UK.FALKLAND																			
	URUGUAY													2		4			3	9
	USA								1	2	1						6	2	1	13
Sum(rwt)	BENIN															4	0	4		8
	BULGARIA									0										0
	CANADA													1378	1015	1339	1008	958	902	6601
	CHILE												1			0				1
	EC.ESPAÑA															27	27			54
	EC.IRELAND																	8		8
	EC.PORTUGAL																		9	9
	EC.SPAIN						0			1			0	0	0		0			2
	EC.SPAIN -FK																		0	0
	JAPAN						1					1	0	0	6	18	0	1		27
	JAPAN-FK																		1	1
	POLAND							0			0	0	1							1
	SEYCHELLES																0			0
	UK.FALKLAND											0		0	0	0	1	0	0	2
	URUGUAY													3		5			4	12
	USA	0	0	0	0	1	0	2	2	5	4	50	108	35	78	56	13	3	1	359
Total Sum(n_fish)		1	2	1	3	24	4	39	24	70	58	642	1316	461	1521	1232	2090	38	6	7532
Total Sum(drwt)									1	2	1			2		4	6	2	4	21
Total Sum(rwt)		0	0	0	0	1	2	3	2	6	4	51	110	1417	1099	1450	1048	974	918	7085

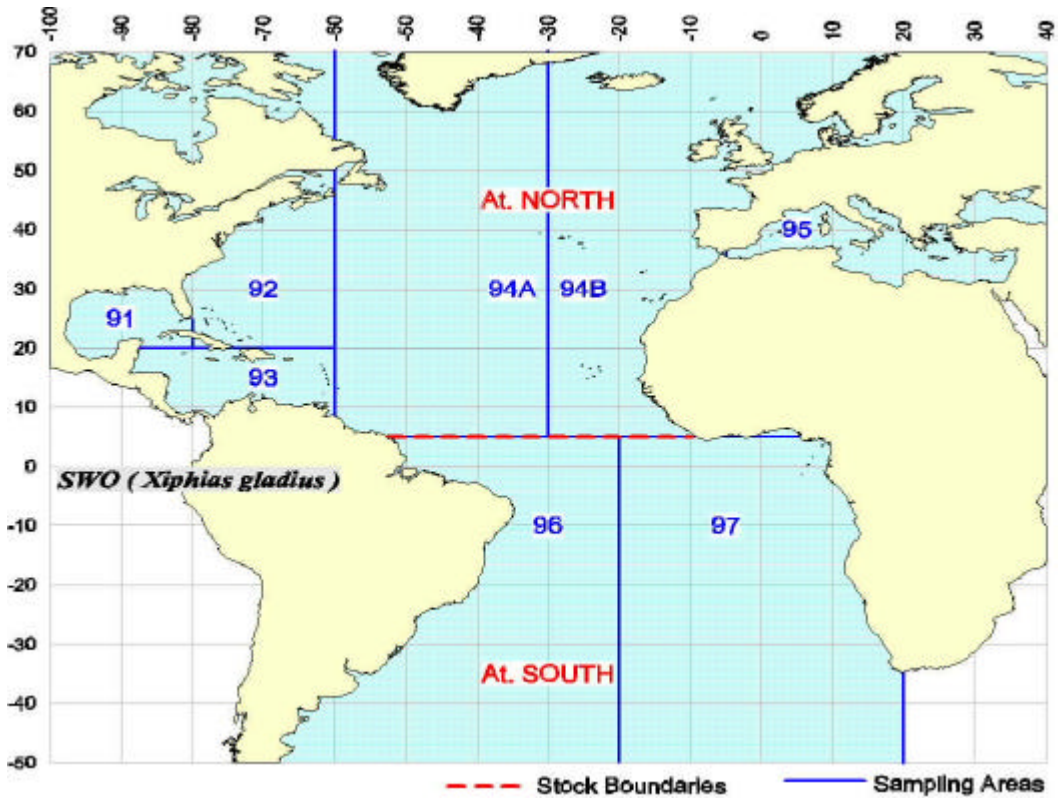

Figure 1. ICCAT Sampling Areas

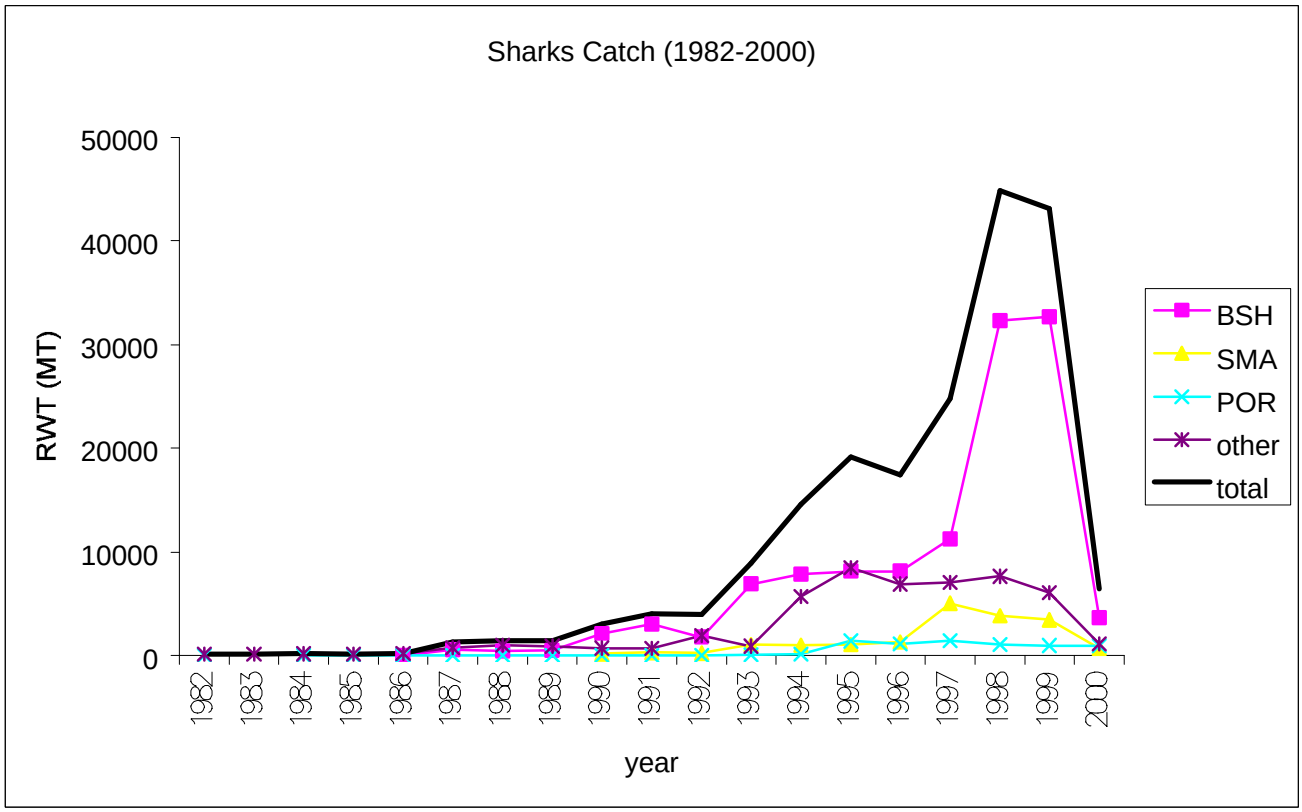

Figure 2. Shark catch statistics available at ICCAT.