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ICCAT Secretariat

SUMMARY OF THE SURVEY ON TUNA FISHERIES BY-CATCHES, 1993

In 1993, the Secretariat conducted a survey of tuna fisheries by-catches (see COM-SCRS/93/19). A summary of the responses received by the Secretariat is contained in Table 1. The countries are listed in order of receipt of their respective reports. The U.S. and French reports were presented in more detail and hence these have been copied and are attached to this document.

Although the questionnaire was aimed at information on by-catches of fisheries that target tuna and tuna-like species, some countries also provided information on by-catches of other fisheries, as well as on those that target sharks. In such cases, only the information on shark target fisheries has been included in this report.

Table 1. Summary of survey on by-catches of tuna fisheries

Country	Fisheries	By-catches Species	Catch retained?	Utilization	Proportion in total
Saint Lucia	Artisanal canoe		none		
Cyprus	LL (swordfish)	Sharks (major)	Part retained part discarded.	Human consumption	Unknown
		Oilfish	Retained	Human consumption	Unknown
		Dolphin fish	Retained	Human consumption	Unknown
		Spearfish	Retained	Human consumption	Unknown
France	GILL	See attached sheet 1.			
Bermuda	TROL	So significant shark by-catch 25,000 to 60,000 Lbs shark catches by directed fishery.			
U.S.A.	LL (SWO)	See attached sheet 2.			
	LL (TUNA)	See attached sheet 2.			
	GILL (SWO)	See attached sheet 2.			
	GILL (TUNA)	See attached sheet 2.			
	TRWD	See attached sheet 2.			
Brazil	LL	*Prionace glauca*	Retained	Human consumption (fresh or frozen)	30 %
		Carcharhinus spp.	Retained	Human consumption (fresh or frozen)	7.5%
		Isurus oxyrinchus	Retained	Human consumption (fresh or frozen)	5.0%
		Shyrna spp.	Retained	Human consumption (fresh or frozen)	6.5%
		Alopias spp.	Retained	Human consumption (fresh or frozen)	1.5%
Libya	LL & TRAW	*Prianaca glauca*	Retained (Major by-catch)	Human consumption (fresh and frozen)	?
		Carcharodon carcharias	Retained (Major by-catch)	Human consumption (fresh and frozen)	?
		CArcharhinus limbatus	Retained (Major by-catch)	Human consumption (fresh and frozen)	?
		Lamna nasus	Retained (Major by-catch)	Human consumption (fresh and frozen)	?
		Isurus pancua	Retained (Major by-catch)	Human consumption (fresh and frozen)	?
		Isurus oxyrinachus	Retained (Major by-catch)	Human consumption (fresh and frozen)	?
		Scyliorhinus canicula	Retained (Major by-catch)	Human consumption (fresh and frozen)	?
		Scyliorhinus stelaris	Retained (Major by-catch)	Human consumption (fresh and frozen)	?
		Mustelus mustelus	Retained (Major by-catch)	Human consumption (fresh and frozen)	?
		Squalus acanthias	Retained (Major by-catch)	Human consumption (fresh and frozen)	?

Table 1. (Contintued)

Country	Fisheries	By-catches Species	Catch retained?	Utilization	Proportion in total
		Squathina squatina	Retained (Major by-catch)	Human consumption (fresh and frozen)	?
		Rhinabatos rhinabatos	Retained (Major by-catch)	Human consumption (fresh and frozen)	?
		Raja spp.	Retained (Major by-catch)	Human consumption (fresh and frozen)	?
		Heptrachias perlo	Retained (Minor by-catch)	Human consumption (fresh and frozen)	?
		Eugomphodus taurus	Retained (Minor by-catch)	Human consumption (fresh and frozen)	?
		Odontaspis ferox	Retained (Minor by-catch)	Human consumption (fresh and frozen)	?
		Cetrorhinus maximus	Retained (Minor by-catch)	Human consumption (fresh and frozen)	?
		Mustelus mustelus	Retained (Minor by-catch)	Human consumption (fresh and frozen)	?
		Other species	Retained (Minor by-catch)	Human consumption (fresh and frozen)	?
South Africa	Shark Longliners	*Isurus oxyrinchus*	Retained		71.7%
		Prionace glauca	Retained		8.8%
		Galeorhinus galeus	Retained		17.1%
		Raja straeleni	Retained		.1%
		Other sharks	Retained		2.7%
		(total)			84.5MT
		Isurus oxyrinchus	Retained		100%
		(total)			24.5MT
Japan	LL	Yellowfin tuna	Retained (Major by-catch)	Human consumption	10%
		Albacore	Retained (Major by-catch)	Human consumption	2-3%
		Swordfish	Retained (Major by-catch)	Human consumption	10%
		Blue marlin	Retained (Major by-catch)	Human consumption	2%
		White marlin	Retained (Major by-catch)	Human consumption	0%
		Sailfish	Retained (Major by-catch)	Human consumption	0%
		Spearfish	Retained (Major by-catch)	Human consumption	0%
		Sharks	Fin retained, rest discarded	Human consumption	0%
		Lancet fish	Discarded (Major by-catch)	Human consumption	0%
		Black marlin	Retained (Minor by-catch)	Human consumption	0%
		Moon fish	Retained (Minor by-catch)	Human consumption	0%
		Butterfly fish	Retained (Minor by-catch)	Human consumption	0%
		Spanish mackerel	Retained (Minor by-catch)	Human consumption	0%
		Oceanic ray	Discarded (Minor by-catch)		
		Sea birds	Released (Minor by-catch)		

Table 1. (Contintued)

Country	Fisheries	By-catches Species	Catch retained?	Utilization	Proportion in total
		Sea turtles	Released (Minor by-catch)		
Malta	LL (TUNA & SWO)	Rat-tail	Retained	Human consumption	0.2%
		Blue shark	Retained	Human consumption	
Angola	BB & TRAP		Data collection is very difficult		
Canada	LL (SWO)	*Prionace glauca*	Discarded (Finning prohibited)	Major by-catch	Unknown
		Isurus oxyrinchus	Retained (Minor by-catch)	Human consumption (GG iced)	< 1%
		Lamna nasus	Retained (Minor by-catch)	Human consumption (GG iced)	< 1%
	LL (TUNA)	*Prionace glauca*	Discarded (Major by-catch)	Major by-catch	Unknown
		Isurus oxyrinchus	Discarded (Minor by-catch)	Human consumption (GG iced)	< 1%
		Lamna nasus	Discarded (Minor by-catch)	Human consumption (GG iced)	< 1%
	LL (Shark)	*Lamna nasus*	Target speceis	Human consumption (GG iced)	
		Prionace glauca	Discarded (Major by-catch)		Under study
		Isurus oxyrinchus	Retained (Minor by-catch)	Human consumption (GG iced)	< 1%
	HARP (SWO)	*Isurus oxyrinchus*	Retained (Minor by-catch)	Human consumption (GG iced)	< 1%
	TDL (BFT)	*Prionace glauca*	Retained (Minor by-catch)	Human consumption (GG iced)	< 1%
		Isurus oxyrinchus	Retained (Minor by-catch)	Human consumption (GG iced)	< 1%
	R R (BFT & shark)	*Prionace glauca*	Retained (target species)	Human consumption (GG iced)	Unknown
Brasil	LL (TUNA & SWO)	*Prionace glauca*	Part discarded (Major by-catch)	Human consumption (GG, Filet)	5.6%
		Carcharinus spp.	Part discarded (Major by-catch)	Human consumption (GG)	3.3%
		Sphyrna spp.	Part discarded (Major by-catch)	Human consumption (GG, Filet)	1.1%
		Isurus oxyrinchus	Retained (Major by-catch)	Human consumption (GG, Filet)	0.8%
		Alopias vulpinus	Part discarded (Minor by-catch)	Human consumption (GG, Filet)	
		Odontaspis taurus	Part discarded (Minor by-catch)	Human consumption (GG, Filet)	

Countries listings are in order of receipt of the report.
Only shark targetted fishery and tuna fishery by-catches are listed.

CAPTURES ACCESSOIRES DES FILEYEURS GERMONIERS FRANCAIS EN 1992

Espèce	Utilisation		Nombre d'individus observés dans les captures[1]	Proportion en poids dans la prise globale
	débarqué	rejeté		
PRINCIPALES CAPTURES ACCESSOIRES				
Requin peau-bleue (*Prionace glauca*)	5 %	95 %	18 969	10,6 %
Espadon (*Xyphias gladius*)	100 %	0 %	259	0,72 %
Hirondelle (*Brama raii*)	90 %	10 %	17 752	0,62 %
Cernier (*Polyprion americanus*)	100 %	0 %	1 561	0,16 %
Taupe (*Isurus oxyrinchus*)	100 %	0 %	61	0,11 %
Calmars (*sp*)	0 %	100 %	371	0,05 %
Thon rouge (*Thunnus thynnus*)	100 %	0 %	49	0,04 %
CAPTURES ACCESSOIRES MINEURES				
Balistes (*Balistes sp.*)		x	113	< 0,02 %
Poisson lune (*Mola mola*)		x	75	
Poisson pilote (*Naucrates ductor*)		x	27	
Orphie (*Belone belone*)		x	17	
Poulpe pélagique (indéterminé)		x	11	
Requin pèlerin (*Cetorhinus maximus*)		x	7	
Centrolophus niger et *Schedophilus medusophagus*		x	6	
Listao (*Katsuwonus pelamis*)	x		3	
Daurade Coryphène (*Coryphaena hippurus*)	x		3	
Rémora (*Remora remora*)		x	3	
Spinex niger		x	3	
Régalec (*Regalecus glesne*)		x	2	
Opah (*Lampris guttatus*)	x		2	
Aigle de mer (*Myliobatis sp.*)	x		2	
Escolier noir (*Lepidocybium flavobrunneum*)	x		1	
Voilier (*Histiophorus albicans*)	x		1	
Requin renard (*Alopias vulpinus*)		x	1	
Méduse (indéterminée)		x	1	
CAPTURES ACCIDENTELLES (cétacés, oiseaux, tortues)				
Dauphin bleu et blanc (*Stenella coeruleoalba*)	rejetés ou relachés vivants (pour 3 % des individus)		330	sans signification
Dauphin commun (*Delphinus delphis*)			114	
Globicéphales (*Globicephala sp.*)			13	
Grand dauphin (*Tursiops truncatus*)			10	
Rorqual commun (*Balaenoptera physalus*)			2	
Cachalot (*Physeter macrocephalus*)			1	
Dauphin de Risso (*Grampus griseus*)			1	
Cétacés non identifiés (dont 2 mésoplodons)			4	
Puffin majeur (*Calonectris diomedea*)	rejetés		10	
Pétrel Fulmar (*Fulmarus glacialis*)			1	
Tortue Luth (*Dermochelys coriacea*)	relachées vivantes		7	
Caretta (*Caretta caretta*)			1	

(1) Pour un total de 242 540 thons germons (*Thunnus alalunga*). Ces nombres d'individus observés dans les captures l'ont été par les observateurs scientifiques de l'IFREMER embarqués à bord des fileyeurs germoniers pendant la saison 1992.

GEAR : LONGLINE
TARGET: SWORD

AREA	SHARK	SPECIES	SHARKS CAUGHT	PROPORTION KEPT	DISCARDED DEAD	DISCARDED ALIVE	PERCENT SHARKS
CARIBBEAN	blue	Prionace glauca	797	0.01	0.18	0.82	6.8
CARIBBEAN	oceanic whitetip	Carcharhinus longimanus	390	0.07	0.09	0.83	3.3
CARIBBEAN	other	other	200	0.62	0.23	0.16	1.7
CARIBBEAN	tiger	Galeocerdo cuvieri	73	0.14	0.11	0.75	0.6
CARIBBEAN	bigeye thresher	Alopias superciliuosus	54	0.24	0.15	0.61	0.5
CARIBBEAN	blacktip	Carcharhinus limbatus	45	0.13	0.02	0.84	0.4
CARIBBEAN	white	Carcharodon carcharias	35	0.00	0.00	1.00	0.3
CARIBBEAN	common thresher	Alopias vulpinus	29	0.17	0.24	0.59	0.2
CARIBBEAN	shortfin mako	Isurus oxyrinchus	28	0.79	0.00	0.21	0.2
CARIBBEAN	smooth hammmer	Sphyrna zygaena	20	0.05	0.70	0.25	0.2
CARIBBEAN	dusky	Carcharhinus obscurus	16	0.69	0.06	0.25	0.1
CARIBBEAN	longfin mako	Isurus paucus	15	0.53	0.07	0.40	0.1
CARIBBEAN	scalloped hammer	Sphyrna lewini	12	0.08	0.75	0.17	0.1
CARIBBEAN	great hammer	Sphyrna mokarran	12	0.17	0.50	0.33	0.1
CARIBBEAN	silky	Carcharhinus falciformi	8	0.13	0.00	0.88	0.1
GRAND BANKS	blue	Prionace glauca	46054	0.03	0.14	0.83	62.0
GRAND BANKS	shortfin mako	Isurus oxyrinchus	1631	0.63	0.05	0.32	2.2
GRAND BANKS	blacktip	Carcharhinus limbatus	288	0.00	0.20	0.80	0.4
GRAND BANKS	longfin mako	Isurus paucus	154	0.45	0.11	0.44	0.2
GRAND BANKS	bignose	Carcharhinus altimus	106	0.06	0.14	0.80	0.1
GRAND BANKS	dusky	Carcharhinus obscurus	73	0.00	0.07	0.93	0.1
GRAND BANKS	great hammer	Sphyrna mokarran	17	0.06	0.71	0.24	0.0
GRAND BANKS	porbeagle	Lamna nasus	17	0.06	0.24	0.71	0.0
GRAND BANKS	bigeye thresher	Alopias superciliuosus	13	0.08	0.08	0.85	0.0
GRAND BANKS	other	other	6	1.00	0.00	0.00	0.0
GRAND BANKS	night	Carcharhinus signatus	5	0.00	0.00	1.00	0.0
GRAND BANKS	tiger	Galeocerdo cuvieri	2	0.00	0.00	1.00	0.0
GRAND BANKS	common thresher	Alopias vulpinus	1	0.00	0.00	1.00	0.0
GRAND BANKS	smooth hammmer	Sphyrna zygaena	1	0.00	1.00	0.00	0.0
GRAND BANKS	oceanic whitetip	Carcharhinus longimanus	1	0.00	1.00	0.00	0.0
GULF OF MEXICO	blacktip	Carcharhinus limbatus	290	0.17	0.43	0.40	6.5
GULF OF MEXICO	dusky	Carcharhinus obscurus	163	0.41	0.08	0.51	3.6
GULF OF MEXICO	great hammer	Sphyrna mokarran	135	0.16	0.53	0.31	3.0
GULF OF MEXICO	other	other	113	0.79	0.12	0.10	2.5
GULF OF MEXICO	night	Carcharhinus signatus	94	0.13	0.51	0.36	2.1
GULF OF MEXICO	shortfin mako	Isurus oxyrinchus	83	0.95	0.00	0.05	1.9
GULF OF MEXICO	silky	Carcharhinus falciformi	66	0.62	0.20	0.18	1.5
GULF OF MEXICO	tiger	Galeocerdo cuvieri	38	0.24	0.16	0.61	0.9
GULF OF MEXICO	bigeye thresher	Alopias superciliuosus	31	0.16	0.32	0.52	0.7
GULF OF MEXICO	smooth hammmer	Sphyrna zygaena	29	0.62	0.31	0.07	0.6
GULF OF MEXICO	blue	Prionace glauca	28	0.18	0.64	0.18	0.6
GULF OF MEXICO	scalloped hammer	Sphyrna lewini	10	0.40	0.40	0.20	0.2
GULF OF MEXICO	oceanic whitetip	Carcharhinus longimanus	10	0.40	0.30	0.30	0.2
GULF OF MEXICO	longfin mako	Isurus paucus	9	0.67	0.11	0.22	0.2
GULF OF MEXICO	common thresher	Alopias vulpinus	7	0.57	0.29	0.14	0.2
GULF OF MEXICO	bignose	Carcharhinus altimus	3	0.00	0.00	1.00	0.1
GULF OF MEXICO	spinner	Carcharhinus brevipinna	2	0.00	0.50	0.50	0.0
NE COASTAL	blue	Prionace glauca	3013	0.00	0.19	0.81	40.8
NE COASTAL	dusky	Carcharhinus obscurus	291	0.59	0.08	0.33	3.9
NE COASTAL	blacktip	Carcharhinus limbatus	289	0.04	0.17	0.79	3.9
NE COASTAL	shortfin mako	Isurus oxyrinchus	275	0.88	0.01	0.11	3.7
NE COASTAL	silky	Carcharhinus falciformi	246	0.00	0.35	0.65	3.3
NE COASTAL	great hammer	Sphyrna mokarran	101	0.00	0.67	0.33	1.4
NE COASTAL	spinner	Carcharhinus brevipinna	77	0.00	0.35	0.65	1.0
NE COASTAL	other	other	43	0.12	0.42	0.47	0.6
NE COASTAL	bigeye thresher	Alopias superciliuosus	40	0.03	0.70	0.28	0.5
NE COASTAL	tiger	Galeocerdo cuvieri	17	0.00	0.00	1.00	0.2
NE COASTAL	longfin mako	Isurus paucus	12	0.50	0.17	0.33	0.2
NE COASTAL	scalloped hammer	Sphyrna lewini	10	0.00	0.30	0.70	0.1
NE COASTAL	smooth hammmer	Sphyrna zygaena	5	0.20	0.00	0.80	0.1
NE COASTAL	oceanic whitetip	Carcharhinus longimanus	3	0.33	0.00	0.67	0.0
NE COASTAL	common thresher	Alopias vulpinus	1	0.00	0.00	1.00	0.0
NE COASTAL	white	Carcharodon carcharias	1	0.00	0.00	1.00	0.0
SE COASTAL	silky	Carcharhinus falciformi	1035	0.53	0.13	0.34	3.2
SE COASTAL	blue	Prionace glauca	818	0.01	0.08	0.91	2.6
SE COASTAL	blacktip	Carcharhinus limbatus	658	0.68	0.06	0.26	2.1
SE COASTAL	other	other	545	0.27	0.30	0.43	1.7
SE COASTAL	dusky	Carcharhinus obscurus	441	0.68	0.10	0.22	1.4
SE COASTAL	smooth hammmer	Sphyrna zygaena	376	0.07	0.18	0.75	1.2
SE COASTAL	night	Carcharhinus signatus	344	0.55	0.29	0.16	1.1
SE COASTAL	great hammer	Sphyrna mokarran	290	0.03	0.34	0.63	0.9
SE COASTAL	tiger	Galeocerdo cuvieri	290	0.06	0.03	0.91	0.9
SE COASTAL	scalloped hammer	Sphyrna lewini	242	0.02	0.48	0.50	0.8
SE COASTAL	oceanic whitetip	Carcharhinus longimanus	185	0.44	0.05	0.51	0.6
SE COASTAL	shortfin mako	Isurus oxyrinchus	116	0.91	0.03	0.06	0.4
SE COASTAL	bigeye thresher	Alopias superciliuosus	97	0.18	0.30	0.53	0.3
SE COASTAL	white	Carcharodon carcharias	52	0.06	0.15	0.79	0.2
SE COASTAL	longfin mako	Isurus paucus	51	0.29	0.14	0.57	0.2
SE COASTAL	spinner	Carcharhinus brevipinna	51	0.78	0.02	0.20	0.2
SE COASTAL	common thresher	Alopias vulpinus	32	0.31	0.06	0.63	0.1
SE COASTAL	porbeagle	Lamna nasus	8	0.38	0.38	0.25	0.0
SE COASTAL	bignose	Carcharhinus altimus	5	0.60	0.20	0.20	0.0

GEAR : LONGLINE
TARGET : TUNA

AREA	SHARK	SPECIES	SHARKS CAUGHT	PROPORTION KEPT	PROPORTION DISCARDED DEAD	PROPORTION DISCARDED ALIVE	PERCENT SHARKS
CARIBBEAN	blue	Prionace glauca	618	0.06	0.09	0.86	6.8
CARIBBEAN	oceanic whitetip	Carcharhinus longimanus	500	0.09	0.10	0.81	5.5
CARIBBEAN	blacktip	Carcharhinus limbatus	138	0.09	0.08	0.83	1.5
CARIBBEAN	bignose	Carcharhinus altimus	68	0.49	0.03	0.49	0.8
CARIBBEAN	bigeye thresher	Alopias superciliuosus	62	0.11	0.13	0.76	0.7
CARIBBEAN	other	other	38	0.26	0.29	0.45	0.4
CARIBBEAN	dusky	Carcharhinus obscurus	35	0.14	0.14	0.71	0.4
CARIBBEAN	tiger	Galeocerdo cuvieri	34	0.03	0.00	0.97	0.4
CARIBBEAN	shortfin mako	Isurus oxyrinchus	29	0.83	0.03	0.14	0.3
CARIBBEAN	longfin mako	Isurus paucus	25	0.08	0.28	0.64	0.3
CARIBBEAN	silky	Carcharhinus falciformi	18	0.94	0.06	0.00	0.2
CARIBBEAN	common thresher	Alopias vulpinus	9	0.22	0.11	0.67	0.1
CARIBBEAN	great hammer	Sphyrna mokarran	7	0.00	0.57	0.43	0.1
CARIBBEAN	smooth hammmer	Sphyrna zygaena	7	0.43	0.14	0.43	0.1
CARIBBEAN	white	Carcharodon carcharias	6	0.00	0.00	1.00	0.1
CARIBBEAN	night	Carcharhinus signatus	1	1.00	0.00	0.00	0.0
GRAND BANKS	blue	Prionace glauca	8820	0.01	0.12	0.87	60.2
GRAND BANKS	shortfin mako	Isurus oxyrinchus	406	0.48	0.03	0.49	2.8
GRAND BANKS	other	other	300	0.33	0.00	0.67	2.0
GRAND BANKS	longfin mako	Isurus paucus	21	0.81	0.00	0.19	0.1
GRAND BANKS	porbeagle	Lamna nasus	16	0.00	0.00	1.00	0.1
GRAND BANKS	blacktip	Carcharhinus limbatus	10	1.00	0.00	0.00	0.1
GRAND BANKS	great hammer	Sphyrna mokarran	2	0.00	0.50	0.50	0.0
GRAND BANKS	bigeye thresher	Alopias superciliuosus	1	0.00	0.00	1.00	0.0
GRAND BANKS	oceanic whitetip	Carcharhinus longimanus	1	0.00	0.00	1.00	0.0
GULF OF MEXICO	blacktip	Carcharhinus limbatus	893	0.60	0.10	0.30	1.3
GULF OF MEXICO	other	other	629	0.78	0.08	0.14	0.9
GULF OF MEXICO	dusky	Carcharhinus obscurus	296	0.40	0.15	0.46	0.4
GULF OF MEXICO	tiger	Galeocerdo cuvieri	268	0.12	0.12	0.76	0.4
GULF OF MEXICO	silky	Carcharhinus falciformi	267	0.37	0.39	0.24	0.4
GULF OF MEXICO	shortfin mako	Isurus oxyrinchus	186	0.91	0.01	0.08	0.3
GULF OF MEXICO	smooth hammmer	Sphyrna zygaena	179	0.92	0.03	0.05	0.3
GULF OF MEXICO	night	Carcharhinus signatus	168	0.13	0.22	0.65	0.2
GULF OF MEXICO	white	Carcharodon carcharias	154	0.05	0.04	0.92	0.2
GULF OF MEXICO	great hammer	Sphyrna mokarran	132	0.35	0.30	0.36	0.2
GULF OF MEXICO	longfin mako	Isurus paucus	110	0.35	0.17	0.48	0.2
GULF OF MEXICO	scalloped hammer	Sphyrna lewini	107	0.64	0.29	0.07	0.2
GULF OF MEXICO	spinner	Carcharhinus brevipinna	70	0.30	0.21	0.49	0.1
GULF OF MEXICO	bigeye thresher	Alopias superciliuosus	66	0.23	0.32	0.45	0.1
GULF OF MEXICO	oceanic whitetip	Carcharhinus longimanus	65	0.26	0.22	0.52	0.1
GULF OF MEXICO	blue	Prionace glauca	55	0.15	0.09	0.76	0.1
GULF OF MEXICO	common thresher	Alopias vulpinus	32	0.47	0.19	0.34	0.0
GULF OF MEXICO	bignose	Carcharhinus altimus	24	0.21	0.17	0.63	0.0
GULF OF MEXICO	porbeagle	Lamna nasus	23	0.22	0.35	0.43	0.0
NE COASTAL	blue	Prionace glauca	18619	0.01	0.14	0.85	26.1
NE COASTAL	dusky	Carcharhinus obscurus	1943	0.25	0.11	0.63	2.7
NE COASTAL	shortfin mako	Isurus oxyrinchus	1417	0.74	0.01	0.26	2.0
NE COASTAL	smooth hammmer	Sphyrna zygaena	871	0.01	0.44	0.55	1.2
NE COASTAL	bigeye thresher	Alopias superciliuosus	632	0.07	0.20	0.73	0.9
NE COASTAL	silky	Carcharhinus falciformi	511	0.16	0.14	0.70	0.7
NE COASTAL	great hammer	Sphyrna mokarran	510	0.03	0.45	0.52	0.7
NE COASTAL	blacktip	Carcharhinus limbatus	481	0.28	0.22	0.50	0.7
NE COASTAL	other	other	459	0.34	0.19	0.47	0.6
NE COASTAL	scalloped hammer	Sphyrna lewini	191	0.00	0.73	0.27	0.3
NE COASTAL	common thresher	Alopias vulpinus	181	0.04	0.14	0.82	0.3
NE COASTAL	longfin mako	Isurus paucus	173	0.45	0.12	0.44	0.2
NE COASTAL	tiger	Galeocerdo cuvieri	125	0.03	0.06	0.90	0.2
NE COASTAL	porbeagle	Lamna nasus	41	0.41	0.02	0.56	0.1
NE COASTAL	spinner	Carcharhinus brevipinna	21	0.05	0.10	0.86	0.0
NE COASTAL	oceanic whitetip	Carcharhinus longimanus	13	0.15	0.00	0.85	0.0
NE COASTAL	night	Carcharhinus signatus	8	0.13	0.00	0.88	0.0
NE COASTAL	white	Carcharodon carcharias	5	0.00	0.20	0.80	0.0
NE COASTAL	bignose	Carcharhinus altimus	1	0.00	1.00	0.00	0.0
SE COASTAL	blacktip	Carcharhinus limbatus	634	0.22	0.53	0.25	4.8
SE COASTAL	blue	Prionace glauca	610	0.01	0.11	0.88	4.6
SE COASTAL	silky	Carcharhinus falciformi	545	0.29	0.30	0.41	4.1
SE COASTAL	dusky	Carcharhinus obscurus	228	0.11	0.21	0.68	1.7
SE COASTAL	other	other	167	0.32	0.34	0.35	1.3
SE COASTAL	tiger	Galeocerdo cuvieri	129	0.05	0.07	0.88	1.0
SE COASTAL	great hammer	Sphyrna mokarran	112	0.08	0.46	0.46	0.8
SE COASTAL	bigeye thresher	Alopias superciliuosus	79	0.15	0.11	0.73	0.6
SE COASTAL	shortfin mako	Isurus oxyrinchus	67	0.73	0.00	0.27	0.5
SE COASTAL	oceanic whitetip	Carcharhinus longimanus	64	0.05	0.59	0.36	0.5
SE COASTAL	smooth hammmer	Sphyrna zygaena	35	0.14	0.46	0.40	0.3
SE COASTAL	common thresher	Alopias vulpinus	30	0.10	0.07	0.83	0.2
SE COASTAL	longfin mako	Isurus paucus	27	0.37	0.22	0.41	0.2
SE COASTAL	white	Carcharodon carcharias	26	0.77	0.08	0.15	0.2
SE COASTAL	scalloped hammer	Sphyrna lewini	24	0.00	0.42	0.58	0.2
SE COASTAL	night	Carcharhinus signatus	12	0.92	0.00	0.08	0.1
SE COASTAL	porbeagle	Lamna nasus	2	0.00	0.50	0.50	0.0
SE COASTAL	spinner	Carcharhinus brevipinna	2	1.00	0.00	0.00	0.0
SE COASTAL	bignose	Carcharhinus altimus	1	0.00	0.00	1.00	0.0

GEAR : GILLNET
TARGET : SWORD

AREA	SHARK	SPECIES	SHARKS CAUGHT	PROPORTION KEPT	PROPORTION DISCARDED DEAD	PROPORTION DISCARDED ALIVE	PERCENT SHARKS
GRAND BANKS	blue	Prionace glauca	2	0.00	0.00	1.00	18.2
GRAND BANKS	tiger	Galeocerdo cuvieri	1	0.00	0.00	1.00	9.1
NE COASTAL	scalloped hammer	Sphyrna lewini	398	0.01	0.99	0.00	20.4
NE COASTAL	great hammer	Sphyrna mokarran	88	0.00	1.00	0.00	4.5
NE COASTAL	blue	Prionace glauca	88	0.06	0.66	0.28	4.5
NE COASTAL	bigeye thresher	Alopias superciliuosus	83	0.37	0.63	0.00	4.3
NE COASTAL	shortfin mako	Isurus oxyrinchus	63	1.00	0.00	0.00	3.2
NE COASTAL	dusky	Carcharhinus obscurus	23	0.04	0.39	0.57	1.2
NE COASTAL	other	other	21	0.62	0.38	0.00	1.1
NE COASTAL	common thresher	Alopias vulpinus	11	1.00	0.00	0.00	0.6
NE COASTAL	longfin mako	Isurus paucus	5	1.00	0.00	0.00	0.3
NE COASTAL	tiger	Galeocerdo cuvieri	3	0.00	0.00	1.00	0.2
NE COASTAL	smooth hammmer	Sphyrna zygaena	1	0.00	0.00	1.00	0.1

GEAR : GILLNET
TARGET : TUNA

AREA	SHARK	SPECIES	SHARKS CAUGHT	PROPORTION KEPT	PROPORTION DISCARDED DEAD	PROPORTION DISCARDED ALIVE	PERCENT SHARKS
NE COASTAL	blue	Prionace glauca	28	0.00	0.46	0.54	9.2
NE COASTAL	scalloped hammer	Sphyrna lewini	21	0.00	1.00	0.00	6.9
NE COASTAL	shortfin mako	Isurus oxyrinchus	13	0.85	0.08	0.08	4.3
NE COASTAL	dusky	Carcharhinus obscurus	11	0.00	0.55	0.45	3.6
NE COASTAL	other	other	8	0.00	0.75	0.25	2.6
NE COASTAL	smooth hammmer	Sphyrna zygaena	1	0.00	1.00	0.00	0.3
NE COASTAL	tiger	Galeocerdo cuvieri	1	0.00	0.00	1.00	0.3

GEAR : PAIR TRAWL
TARGET : TUNA

AREA	SHARK	SPECIES	SHARKS CAUGHT	PROPORTION KEPT	PROPORTION DISCARDED DEAD	PROPORTION DISCARDED ALIVE	PERCENT SHARKS
NE COASTAL	smooth hammmer	Sphyrna zygaena	23	0.04	0.61	0.35	0.3
NE COASTAL	scalloped hammer	Sphyrna lewini	21	0.00	0.57	0.43	0.3
NE COASTAL	dusky	Carcharhinus obscurus	20	0.00	0.20	0.80	0.3
NE COASTAL	shortfin mako	Isurus oxyrinchus	10	0.90	0.00	0.10	0.1
NE COASTAL	great hammer	Sphyrna mokarran	9	0.00	0.44	0.56	0.1
NE COASTAL	blue	Prionace glauca	4	0.00	0.50	0.50	0.1
SE COASTAL	dusky	Carcharhinus obscurus	2	0.00	0.00	1.00	10.0
SE COASTAL	smooth hammmer	Sphyrna zygaena	1	0.00	1.00	0.00	5.0

1992 PELAGIC LOGBOOK EFFORT DATA

GEAR	TARGET	AREA	QUARTER	HOOKS	SETS
LL	SWORD	CARIBBEAN	1	235424	449
LL	SWORD	CARIBBEAN	2	32570	85
LL	SWORD	CARIBBEAN	3	450	1
LL	SWORD	CARIBBEAN	4	31880	87
LL	SWORD	GRAND BANKS	1	300	1
LL	SWORD	GRAND BANKS	2	92130	152
LL	SWORD	GRAND BANKS	3	412719	610
LL	SWORD	GRAND BANKS	4	141147	206
LL	SWORD	GULF OF MEXICO	1	34472	79
LL	SWORD	GULF OF MEXICO	2	27564	84
LL	SWORD	GULF OF MEXICO	3	10240	31
LL	SWORD	GULF OF MEXICO	4	17966	49
LL	SWORD	NE COASTAL	1	6270	20
LL	SWORD	NE COASTAL	2	30990	59
LL	SWORD	NE COASTAL	3	62070	113
LL	SWORD	NE COASTAL	4	18800	43
LL	SWORD	SE COASTAL	1	151635	512
LL	SWORD	SE COASTAL	2	217069	729
LL	SWORD	SE COASTAL	3	182265	662
LL	SWORD	SE COASTAL	4	114843	443
LL	TUNA	CARIBBEAN	1	109316	225
LL	TUNA	CARIBBEAN	2	45689	77
LL	TUNA	CARIBBEAN	3	7	1
LL	TUNA	CARIBBEAN	4	36360	91
LL	TUNA	GRAND BANKS	2	56730	84
LL	TUNA	GRAND BANKS	3	52861	80
LL	TUNA	GRAND BANKS	4	36415	49
LL	TUNA	GULF OF MEXICO	1	462859	791
LL	TUNA	GULF OF MEXICO	2	546004	780
LL	TUNA	GULF OF MEXICO	3	528305	728
LL	TUNA	GULF OF MEXICO	4	417184	552
LL	TUNA	NE COASTAL	1	111239	214
LL	TUNA	NE COASTAL	2	280713	490
LL	TUNA	NE COASTAL	3	782341	1328
LL	TUNA	NE COASTAL	4	518290	825
LL	TUNA	SE COASTAL	1	81105	213
LL	TUNA	SE COASTAL	2	97027	229
LL	TUNA	SE COASTAL	3	60273	173
LL	TUNA	SE COASTAL	4	51514	163
GILL	SWORD	GRAND BANKS	3	0	2
GILL	SWORD	NE COASTAL	1	0	31
GILL	SWORD	NE COASTAL	2	0	15
GILL	SWORD	NE COASTAL	3	0	65
GILL	TUNA	NE COASTAL	2	0	4
GILL	TUNA	NE COASTAL	3	0	23
PT	TUNA	NE COASTAL	2	0	2
PT	TUNA	NE COASTAL	3	0	154
PT	TUNA	NE COASTAL	4	0	100
PT	TUNA	SE COASTAL	3	0	1

3.1.1 SHARK MEAT AS FOOD FOR MAN

There was little consumption of shark in the U.S. until the 1970's. Since then, shark meat has gained in popularity as seafood. This occurred because of: 1) improved handling at sea; 2) a Federally-assisted marketing program that promoted shark consumption; and 3) the combination of high costs for other fish and low prices for sharks.

Shark meat is nutritious, boneless, mild-flavored, and the texture has eye-appeal. Species considered to excel in eating quality are the mako, thresher, soupfin, sandbar, and blacktip. Some species, such as the blue shark, are considered unpalatable. Shark meat is susceptible to spoilage because of its high urea content. The flavor and quality of the meat depend on effective bleeding of the carcass and on storage temperatures.

3.1.2 SHARK FINS

Shark fins are used by the Chinese for making soup. Sharkfin soup is highly regarded by the Chinese, and there is an insatiable demand for shark fins in the Orient. Because of this demand, the fins have become the most valuable part of the shark. Fishermen get about $44/kg for dried fins. Dealers and processors get substantially higher prices. The dorsal fin, the pectoral fins, and the lower lobe of the caudal fin of most species are usable. In some species such as the mako and the thresher sharks, only the lower caudal lobes are usable. Other species, such as the nurse shark, have unsuitable fins.

3.1.3 SHARK HIDES

The skins of many sharks can be processed to produce high quality leather. Shark fishing carried out mainly for shark skin is apparently not very profitable and needs to be combined with a more complete utilization of the shark (such as shark fins) or another fishery. There is a demand for skins, but the market is highly quality conscious, making it necessary for producers to exercise great care in turning out an acceptable product.

3.1.4 SHARKS AND MEDICINE

Sharks have been used for pharmaceuticals. Heparin-like compounds that have potencies far in excess of that of commercial heparin have been found in nearly all parts of dogfish. The shark compounds cause fewer undesirable side effects than does commercial heparin. Commercial heparin is prescribed for individuals who have a tendency to form blood clots.

In the late 1930's the discovery that dogfish liver oil contained about 10 times the amount of vitamin A contained in cod liver oil. Later, it was discovered that the liver oil of the soupfin shark contained about 100 times the amount of vitamin A contained in cod liver oil. These discoveries started a shark-fishing bonanza of such intensity that it was likened to a gold rush. By 1942, the price of shark liver had risen to $1,653 per mt from a price of about $11 per mt in 1938. Shark liver oil has been used in tanning as well as a source of vitamin A. The value of fish oils as a source of vitamin A was reduced sharply by the production of synthetic vitamin A in the late 1940's. There is some concern that the synthetic substitute may be inferior to the fish liver oils because it lacks minerals, amino acids, and possibly other unidentified nutrients.

In work conducted when shark liver oil was used as a source of vitamin A, it was observed that the oil promoted the growth of white blood cells. Although there is no evidence to support the theory that shark liver oil contains an anticancer agent, sharks apparently do not develop tumors of any kind, and this fact continues to generate hope in finding a cure to cancer.

Shark corneas have been used experimentally in transplants to humans. Because shark corneas are not affected by osmotic swelling, they were used experimentally in the 1960's to restore vision in humans. The experiments were discontinued, apparently because of the logistics of acquiring shark material and the availability of alternative materials (Payrau, 1965 and 1969).

3.1.5 MISCELLANEOUS SHARK PRODUCTS

Sharks have other miscellaneous uses, such as shark jaws and teeth which are sold extensively in seaside curio shops. Jewelry made from shark teeth is a popular item. Tiger shark vertebrae are turned into a white face powder used by Japanese Geisha girls.

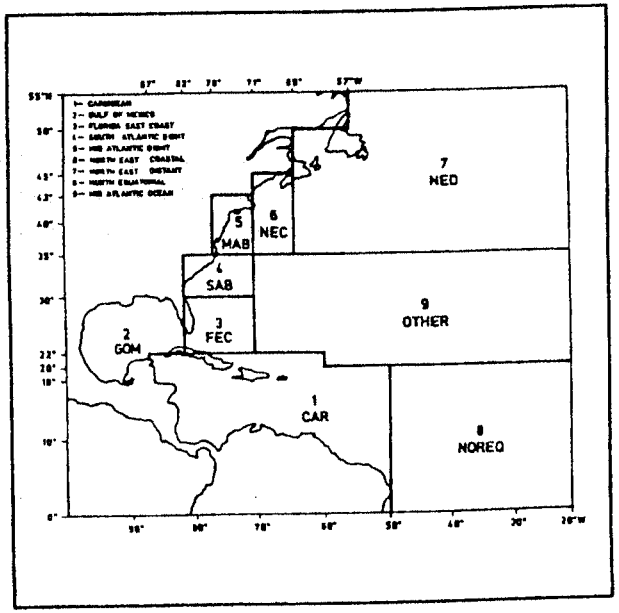

Figure 1. The fishing areas used in summarizing shark bycatch reported in the 1992 US large pelagic logbook database. Areas 1(CAR) + 8(NOREQ) were used to represent the Caribbean: , Area 2(GOM), the Gulf of Mexico; Areas 3(FEC) + 4(SAB), SE Coastal; Areas 5(MAB) + 6(NEC), NE Coastal; and Area 7(NED), Grand Banks.