

ESTIMATED
TURTLE BY-CATCH BY THE COASTAL FISHING FLEET OF SURINAME

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Summary

On behalf of the **World Wildlife Fund Suriname** a survey was done to estimate the number of turtles caught by the coastal fishing boats of Suriname. It started the 1st of March 2006 till the end of August 2006.

The focus of this report is the coastal fleet (SK), fishing methods, gear, landings etc and the number of turtles caught during the above mentioned period.

Introduction to the Fisheries sector

Suriname is located on the Guiana-Brazil Continental Shelf.

As a result of the river outflow of the Amazon- and Orinoco rivers the country is rich in plankton and other primary organic matter.

This provides the country with a broad and rich resource of Marine live.

Fisheries is important for Suriname because of:

- the contribution to the food supply, fish and fish products supply 30 – 40 % of the protein;
- employment, the sector provides about 8000 jobs;
- export earnings, in 2005 export earnings were about \$ 30 million, the highest within the agriculture sector; rice comes second with \$ 12 million;
- its contribution is 4% to the GDP.

Fishing fleet

Many different types of fishing vessels are operating in Suriname's marine, brackish and inland waters.

According to their characteristics, the type of fishing gear used, the fishing grounds they exploit, they can be divided into the industrial fleet and the artisanal fleet.

Number of registered fishing units 1994 - 2005

OVERZICHT VAN HET AANTAL UITGEGEVEN VERGUNNINGEN (PERIODE 1994 - 2005)

Number of registered fishing units 1994 - 2005												
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Shrimptrawlers	119	101	107	109	109	104	99	85	87	79	77	68
Seabobtrawlers		5	5	18	21	24	24	30	24	26	27	30
Fishingtrawlers	22	21	13	13	12	13	11	18	18	18	19	15
Snapperliners	55	97	73	103	126	134	82	74	62	54	58	56
Total industrial fleet :	196	224	198	243	268	275	216	207	191	177	181	169
Decked boats (inboard engines)	70	75	56	63	54	44	49	45	44	42	58	62
Open boats (outboard engines)	219	189	124	209	231	263	309	240	266	262	328	305
Open boats (Guyanese)										21	21	20
Bangamary (uitsluitend)								3		15	39	40
Total coastal fleet	289	264	180	272	285	307	358	285	310	340	446	427
Chinese seine (BV)	357	351	27	291	248	237	250	253	321	349	289	315
Longline (BV)	89	99	77	68	33	36	38	16	24	30	21	21
Drifting gillnet (BV) :	137	145	107	134	103	113	108	64	72	90	80	100
Guyanese BV											17	
Sport (BV) :	30	32	28	41	39	33	35	42	66	58	75	63
Fixed gillnet (BV) :	50	49	24	30	23	22	14	15	15	11	8	8
Dragnet (BV) :	9	11	7	8	8	4	7	7	7	3	1	2
Riverseine (BV)	19	21	9	12	12	14	7	8	8	7	4	5
Lagoon gillnet (lagoon)	162	148	84	84	50	38	52	85	103	74	42	36
Aquarium					1							
Total inland and estuary fleet (BV)	691	708	613	668	517	497	511	490	616	639	520	550
Total artisanal fleet (coastal, inland and estuary)	1115	1120	793	940	802	804	869	775	926	979	966	977

Source : Fisheries Department

Industrial fleet (169)

The industrial fleet operates in water depths from 10 fathom and deeper and consist of:

- steel Florida types outrigger shrimp- and seabobtrawlers;
- steel stern trawlers from the North Sea area;
- a few shrimptrawlers adjusted to catch fish;
- Venezuelan wooden snapper boats (handliners);
- And lately 4 chinese steel fishing vessels.

According to the fish license conditions the shrimptrawlers have to use TED's (Turtle Excluding Device). In a recent meeting the Minister of Agriculture mentioned that a Vessel monitoring System will be introduced for the industrial fleet.

All legal fishing vessels are registered by the Fisheries Department.

The river, river mouths, brackish water boats under a BV- (Inlands fisheries) number.

The coastal fisheries under a SK- (Suriname Coast) number.

There are also 40 boats under an SKB-number. These boats are fishing only during daytime, in water depths of 3- 5 fathoms, using 2 ½ inch marlon/nylon nets.

From 2003 about 21 Guyanese fishermen from point 66 (Guyana) were given a license to fish in the coastal area from Corantyne river up to the Coppename river.

Artisanal fleet (977)

The artisanal fleet operates in the:

- river mouths, large canoes are using several types of Chinese seine to catch mainly shrimp and fish;
- river and brackish water lagoons several types of canoes are operating using drifting and fixed gillnets, longlines, river seines and dragnets;
- coastal waters in water depths up to 10 fathoms so called "**open**" and "**closed**" **Guyana type boats**, using drifting gillnets and pin seine to catch fish.

Open Guyana type boats are 12- 14 m in length, approx. 2.80 m wide and have gasoline powered outboard motors between 40- 50 hp. Most of them use 4- 6 inch stretched polyethylene drifting gillnets of about 2- 3 km length.

They have a small deck in front and a ice-box for 2- 3 ton of ice.

A small number of open Guyana type boats are using pin seine, 2 inch stretched poly nets of about 2 km length.

Closed Guyana type boats are between 14- 18 m in length, approx. 3.80 m wide and powered by inboard diesel engines of about 125 hp.

They are decked, have a cabin and built-in ice box with a capacity of approx. 5 ton ice.

They use 6- 8 inch stretched polyethylene drifting gillnets with a length of 3- 4 km.



Open Guyana type



Closed Guyana type

Fishing methods (SK coastal fishing boats)

When coastal fishing boats reaches the fishing area, they release the nets in the water, tie one end of the net to the boat and let it drift slowly in the stream in a vertical position to the coast line.

On the topline the nets have floaters and at the bottom line pieces of lead attached to it. After 5- 6 hours they start to retrieve the net, taking the fish out of the net; large species like bang-bang (*Cynoscion acoupa*), kandratiki (*Cynoscion virescens*), are gutted and stored in the ice box.

If the catch is good they stay in the same area, if not they move to another place/area.

Fishing effort

The Florida type shrimptrawler are staying 50- 60 days at sea.

The seabob trawler about 8- 10 days; the fishing trawlers about 8- 12 days.

The river, rivermouth fishing boats are operating on a daily basis.

The open type Guyana boats are staying 9- 12 days at sea and the closed type 10- 14 days.

Landings/Catch

The shrimp trawlers land their catch at the shrimp processing plants. The data is collected on regular basis by the Fishery Department.

The fish trawlers are landing their catch mainly at Cevihás – the Government owned Central Fishing Harbour- and a few at jetty's of private processing plants.

In 1985 the Suriname and the Venezuelan Government signed a fishery agreement and the Venezuelan Red Snapper boats (handliners) also have to land their catch at Cevihás, where it is distributed to several processing plants.

Species caught by the river. River mouth fishermen are landed daily at the Central Market, Nieuw Nickerie, Boskamp and several villages around the Commewyne/Suriname river.

The coastal fishing fleet are landing their catch at the Central Market and mainly at several landing sites around the Suriname river, Nieuw Amsterdam and Nickerie.

The estimated amount of fish landed by the fishing fleet are:

2001	– 19,295.5 ton
2002	– 14,895.3 „
2003	– 16,626.0 „
2004	– 18,647.3 „
2005	– 17,395.0 „



Bang Bang (Cynoscion acoupa)



Kandra tiki (Cynoscion virescens)



Botro fisie, Snoek, Bangamery



Smoked cat fish (koepila)

Processing industry

The shrimp and fish processing industry can be divided into industrial and artisanal plants.

Industrial processing

Shrimp –Peanaeus shrimps caught by the shrimp trawlers are processed into head- on/or head off products and frozen by 2 processing plants:

- Sujafi (Suriname Japan Fisheries Ltd) a joint venture between Surinamese and Japanese entrepreneurs;
- And government owned SAIL (Surinam American Industries Ltd);
- Seabob shrimps (Xyphopenaeus kroyeri) are processed, frozen ore peeled by SAIL and Guyana Seafood.

Fish –Caught by the industrial fleet are landed at a few jetty's, but mainly at Cevihas, and distributed to several fish processing plants.

A large part of the catch of the coastal fleet is also sold to the industrial processors. The fish is cleaned, exported fresh on ice or turned into steak, or filet and frozen.

Artisanal processing

A part of the catch of the rivermouth is processed in small villages around the Commewyne river, Pomona, Rust en Werk, Nieuw Amsterdam and also in Nickerie. Artisanal processing are mainly family – undertakings.

They produced salted and smoked fish, dried peeled shrimp, all for the local market.

Export

To export shrimp and fish products to the EU, Suriname has complied with the EU HACCP {Hazard Analyzes Critical Control Point}- rules for quality and hygiene. The Fishery Department is the authority for the inspection and enforcing of the standards and does that on a regular basis.

13 industrial processing plants are HACCP-certified.

The main export countries for Suriname are EU, USA, Japan and some Caricom countries, total value \$ 30 million (2005).

Overview fisheries export period 2000 – 2005

OVERZICHT VISSERIJEXPORTEN OVER DE PERIODE 2000 - 2005

		Visserijexporten 2000	
		Net weight	Custom value
Definition	Omschrijving	Netto kg	Douane waarde (USD)
Deepsea shrimp	Zeegarnalen	1,599,912.67	21,995,815.25
Seabob	Seabob	2,657,181.66	5,021,800.70
Cultured shrimp	Vanamei	95,094.50	913,008.74
Fish	Vis	7,856,498.00	4,767,906.92
	Totaal	12,208,686.83	32,698,531.61

		Visserijexporten 2001	
		Netto kg	Douane waarde (USD)
Definition	Omschrijving	Netto kg	Douane waarde (USD)
Deepsea shrimp	Zeegarnalen	1,720,372.80	24,285,556.14
Seabob	Seabob	3,301,568.77	5,787,450.04
Cultured shrimp	Vanamei	219,067.94	1,697,975.59
Fish	Vis	7,718,721.00	546,697.18
	Totaal	12,959,730.51	32,317,678.95

		Visserijexporten 2002	
		Netto kg	Douane waarde (USD)
Definition	Omschrijving	Netto kg	Douane waarde (USD)
Deepsea shrimp	Zeegarnalen	1,725,465.95	22,343,352.01
Seabob	Seabob	4,963,822.90	7,684,140.57
Cultured shrimp	Vanamei	143,418.63	248,108.50
Fish	Vis	10,302,045.00	8,289,384.06
	Totaal	17,134,752.48	38,564,985.14

		Visserijexporten 2003	
		Netto kg	Douane waarde (USD)
Definition	Omschrijving	Netto kg	Douane waarde (USD)
Deepsea shrimp	Zeegarnalen	1,645,919.53	20,446,700.75
Seabob	Seabob	5,278,875.32	7,628,816.38
Cultured shrimp	Vanamei	211,320.32	785,147.52
Fish	Vis	9,574,530.00	8,349,586.23
	Totaal	16,710,645.17	37,210,250.88

		Visserijexporten 2004	
		Netto kg	Douane waarde (USD)
Definition	Omschrijving	Netto kg	Douane waarde (USD)
Deepsea shrimp	Zeegarnalen	1,454,578.65	17,195,273.80
Seabob	Seabob	4,696,396.17	7,206,160.56
Cultured shrimp	Vanamei	171,319.32	533,042.70
Fish	Vis	9,601,292.65	10,727,287.09
	Totaal	15,923,586.79	35,661,764.15

		Visserijexporten 2005	
		Netto kg	Douane waarde (USD)
Definition	Omschrijving	Netto kg	Douane waarde (USD)
Deepsea shrimp	Zeegarnalen	1,199,066.80	14,335,334.75
Seabob	Seabob	3,965,270.33	6,623,143.06
Cultured shrimp	Vanamei	108,352.20	225,161.40
Estuarine shrimp	Witbere (estuarine garn.)	17,971.70	21,730.05
Fish	Vis	11,903,671.00	9,274,029.23
	Totaal	17,194,332.03	30,479,398.49

Aquaculture

In the Commewyne area 2 private companies are involved in small scale shrimp aquaculture (*Penaeus Vannamei*).

Recently the government in cooperation with a few small rice farmers started a test project to grow rice together with fish.

Fish season/coastal area

From November/December up to April/May is the low season. The catches are low and the fishermen can barely cover their costs.

From around May, the weather gets better, the coastal area becomes calmer and the fish catches increases.

Species landed

The most important fish species landed by the artisanal fleet are bang-bang, kandratiki, dagoetifi, koepila and botrofisi etc.

Artisanal GG boat type landings of important species 2005 (SK)			
Local name	scientific name	family	tons
Bang bang	<i>Cynoscion acoupa</i>	Sciaenidae	1.053,4
Kandra tiki	<i>Cynoscion virescens</i>	Sciaenidae	199,3
Koepila	<i>A. proops</i>	Ariidae	44,5
Haai	<i>Shark all species</i>	sharkoid	33,8
Trapoen	<i>Tarpon atlanticus</i>	Tarpon	27,9
Red snapper	<i>Lutjanus purpurens</i>	Lutjanidae	25,8
Jarabaka	<i>Arius parkeri</i>	Ariidae	24,2
Snoek	<i>Centropomus sp.</i>	Centropomidae	20,7
Blaka tere	<i>Cynoscion steindachneri</i>	Sciaenidae	14,9
Kodokoe	<i>Arius quadriscutis</i>	Ariidae	14,3

Artisanal bangamery (BM) boat type landings of important species 2005 (SKB)			
Local name	scientific name	family	tons
Dagoetifi, Bangamery	<i>Macrodon ancylodon</i>	Sciaenidae	145,7
Botro fisie	<i>Nebrius microps</i>	Sciaenidae	70,6
Kandra tiki-heel	<i>Cynoscion virescens</i>	Sciaenidae	21,8
Bang bang	<i>Cynoscion acoupa</i>	Sciaenidae	4,0
Barbaman	<i>Bagre bagre</i>	Ariidae	3,0

Artisanal OG boat type Landings of important species 2005			
Local name	scientific name	family	tons
Bang bang	<i>Cynoscion acoupa</i>	Sciaenidae	1.933,0
Kandra tiki	<i>Cynoscion virescens</i>	Sciaenidae	1.195,6
Dagoetifi, Bangamery	<i>Macrondon ancylodon</i>	Sciaenidae	511,8
Koepila	<i>A. proops</i>	Ariidae	499,1
Botro fisie	<i>Nebris microps</i>	Sciaenidae	313,9
Barbaman	<i>Bagre bagre</i>	Ariidae	161,0
Pani	<i>Arius passani</i>	Ariidae	135,2
Snoek	<i>Centropomus sp.</i>	Centropomidae	134,9
Kodokoe	<i>Arius quadriscutis</i>	Ariidae	121,5
Jarabaka	<i>Arius parkeri</i>	Ariidae	62,1
Koema koema	<i>Arius couma</i>	Ariidae	60,3
Makreel	<i>scombridae sp (mackerels)</i>	scombridae	60,0
Blaka tere	<i>Cynoscion steindachneri</i>	Sciaenidae	51,0
Paoema	<i>Lobotes surinamensis</i>	Lobotidae	46,6
Trapoen	<i>Tarpon atlanticus</i>	Tarpon	41,7
Overige gladvis	<i>other catfishes</i>		39,3
Aarder / prassie	<i>Mugil liza/ M.brasiliensis</i>	Mugilidae	34,6
Haai	<i>Shark all species</i>	sharkoid	32,2

Artisanal kj (canoe) boat type landings of important species 2005			
Local name	scientific name	family	tons
Dagoetifi, Bangamery	<i>Macrondon ancylodon</i>	Sciaenidae	579,2
Sea-bob	<i>Xyphopeneus kroveri</i>	Hippolytidae	556,2
Barbaman	<i>Bagre bagre</i>	Ariidae	298,1
Kandra tiki	<i>Cynoscion virescens</i>	Sciaenidae	258,7
Kodokoe	<i>Arius quadriscutis</i>	Ariidae	157,6
Koepila	<i>A. proops</i>	Ariidae	135,0
Koema koema	<i>Arius couma</i>	Ariidae	127,9
Botro fisie	<i>Nebris microps</i>	Sciaenidae	115,3
Makreel	<i>scombridae sp (mackerels)</i>	scombridae	87,8
Tilapia	<i>Oreochromis mossambicus</i>	Cichlidae	66,5
Snoek	<i>Centropomus sp.</i>	Centropomidae	54,9
Soke kwie kwie	<i>Hoplosternum littorales</i>	callichthyidae	49,3
Trapoen	<i>Tarpon atlanticus</i>	Tarpon	43,0
Bang bang	<i>Cynoscion acoupa</i>	Sciaenidae	41,6
Pani	<i>Arius passani</i>	Ariidae	41,2
Plata hede kwie kwie	<i>callichthys callichthys</i>	Callichthyidae	40,7
Gezouten vis	<i>salted fish</i>		32,1
Bruine gamaal	<i>brown shrimp</i>	Penaeidae	26,3
Warme gladvis	<i>smoked catfish</i>		21,4
Witi bere	<i>Nematopalaemon schmitti</i>	Palaemonidae	19,9
Krobia	<i>Krobia guianensis</i>	Cichlidae	19,7
Jarabaka	<i>Arius parkeri</i>	Ariidae	19,5
Overige gladvis	<i>other catfish</i>		16,7
Aarder / prassie	<i>Mugil liza/ M.brasiliensis</i>	Mugilidae	16,2
Warme schubvis	<i>smoked scatedfish</i>		15,8
Catrina kwie kwie	<i>Hoplosternum thoracatum</i>	Callichthyidae	14,6
Pataka	<i>Hoplias malabaricus</i>	Erythrinidae	14,5
Warapa	<i>Hoplerthrinus uniaeniatus</i>	Erythridae	12,7
Trie	<i>collection of small scianidae</i>		9,8
Overige zeevis-heel	<i>other marine fish</i>		9,3
Blaka tere	<i>Cynoscion steindachneri</i>	Sciaenidae	7,6
Koebie	<i>plagioscion surinamenses</i>	Sciaenidae	7,3
Paoema	<i>Lobotes surinamensis</i>	Lobotidae	5,6
Droge gladvis	<i>dried catfish</i>		5,2

Surveillance

It is a fact that an unknown number of foreign fishing vessels are fishing illegal in Surinamese waters.

The responsibility for surveillance has been given by law to the Ministry of Defence. However due to the lack of funds they cannot survey on a regular basis.

Fisheries policy

The Fisheries Department is promoting an optimal but sustainable use of the marine resources.

In that order in 2001 the minimum mesh sizes of the coastal fleet were increased.

From 2006 it is increased even further for the SK-fleet the minimum mesh size is 8 inches (20 cm) stretched and the SKB-fleet 3 ½ inches (8,75 cm) stretched.

The Ministry of Agriculture also is trying to decrease the number of seabob vessels.

Remarks

Most of the registered coastal fishing boats are owned by Surinamese, but most of the crew are Guyanese.

Not all of the boats registered in Suriname are landing their catch in Suriname on a regular basis, but in Guyana.

An unknown number of boats from Guyana are fishing illegal in Surinamese territory up to the French area and land their catch in Guyana.

Recently the Surinamese Government installed a committee for the purpose to create a National Coast Guard.

In 2007 the Japanese Government will start with a construction of several facilities for the coastal fishing boats at Cevihis (Bethesda, Paramaribo), operational in 2008. The coastal fleet will be forced to land their catch there, so more reliable data will become available.

During the first half of the 90's the fishing nets had a length of about 1,5 km. From 1995 on the whole sector started to complain about decreasing catches. The coastal fishing fleet started to increase the length of the fishing nets. Although the holding space for fishing nets in the boats is limited, it is not known if the nets will be increased further.

TURTLE BY-CATCH IN THE COASTAL FISHERIES

On behalf of World Wildlife Fund (WWF) Suriname a survey was done to estimate the number of turtles caught in the nets of the coastal fishing fleet (SK) of Suriname.

The total length of the coastline is about 380 km.

The survey focused on the external coast area from the mouth of the Suriname river till the Marowynne river (about 160 km), the turtle egg laying area.

The so called SKB fleet (40 boats) also working in the coast area were not included in the survey because:

they are only involved in daytime fishing;

they only fish up to the Matapica area and west of the Suriname river;

they are only staying 2 to 3 days at sea, returning to Paramaribo;

they use small mesh sizes 2,5 / 3 inch marlon/nylon nets;

when asked, they always reported not have seen or caught any turtles.

Time frame

The survey started at the 1st of March 2006 and lasted till the 31st of August 2006.

Landing sites

The largest part of the fish catch is being unloaded at several landing sites around the Suriname river, near and around Nieuw Amsterdam and in the Western part of Suriname (Nickerie).

Data collectors

Four (4) data collectors were involved in collecting the data on a daily basis at the most important landing sites:

Nieuw Amsterdam and surrounding area (Commewijne), Bisoen and Robby, Waldring all located at the Anton Dragtenweg and at the Central Market.

Collecting data

An “easy to use” data form was created.

In the beginning a form was given to the captain when he was leaving the landing site to start his fishing trip. This did not work well because the form got wet or lost.

So whenever a fishing boat entered the harbour/landing site, the data collector approached the captain and asked for the information needed.

The data collectors filled in the form accordingly.

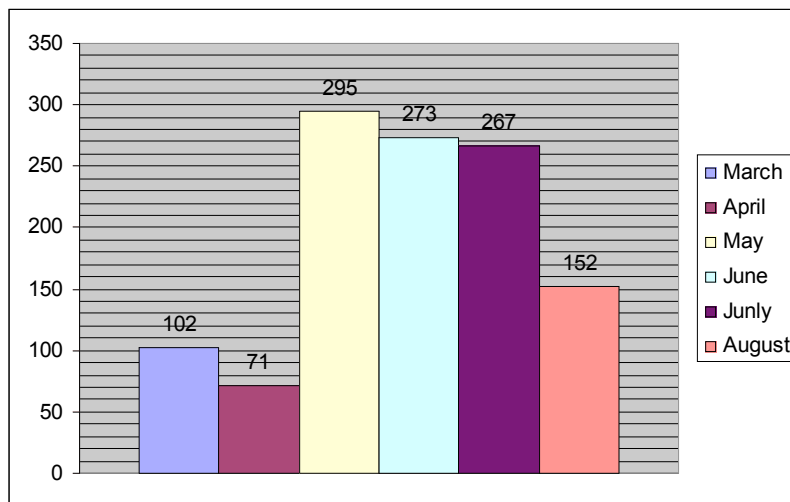
Every month a report was handed to WWF.

During the first month –March- no distinction was made between the “open” and “closed” type boat, that started from the month of April.

From the first of March till the end of August 2006 the following data was collected of Aitkanti (*Dermochelys coriacea*), Krape (*Chelonia mydas*) and Warana (*Lepidochelys olivacea*).

Table 1 Total number of boats monitored and turtles caught

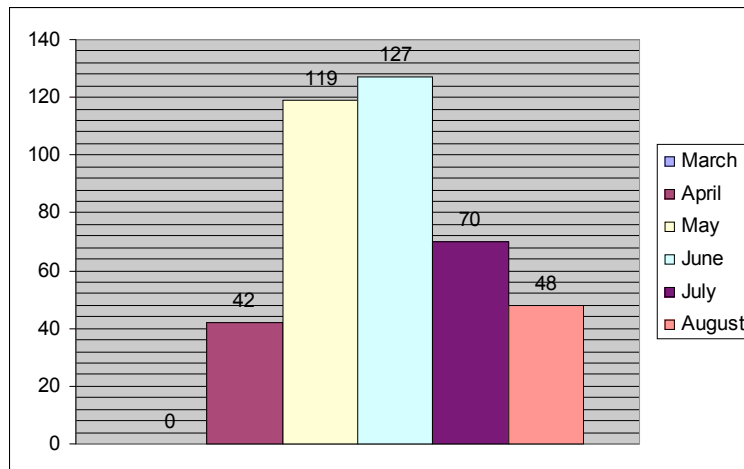
Month	Number of boats monitored		Species caught			Turtles caught per month
	open type	closed type	Aitkanti	Krape	Warana	
March	207	---	48	32	22	102
April	137	40	43	12	16	71
May	192	48	159	96	40	295
June	211	41	162	83	28	273
July	233	38	148	75	44	267
August	245	45	24	83	45	152
Total	1225	212	584	381	195	1160



Number of turtles caught by the closed type boats

Table 2

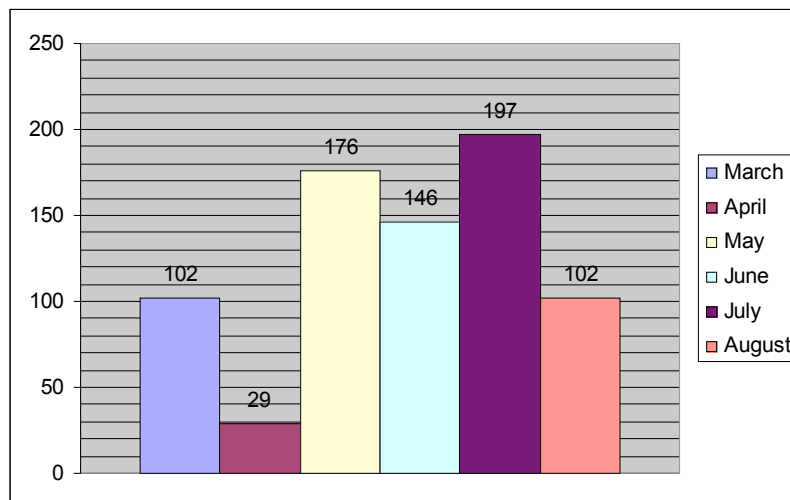
Month	Species caught				Turtles caught per month
	closed type	Aitkanti	Krape	Warana	
March	0	0	0	0	0
April	40	23	9	10	42
May	48	55	40	24	119
June	41	55	57	15	127
July	38	34	18	18	70
August	45	7	16	25	48
Total	212	174	140	92	406



Number of turtles caught by the open type boats

Table 3

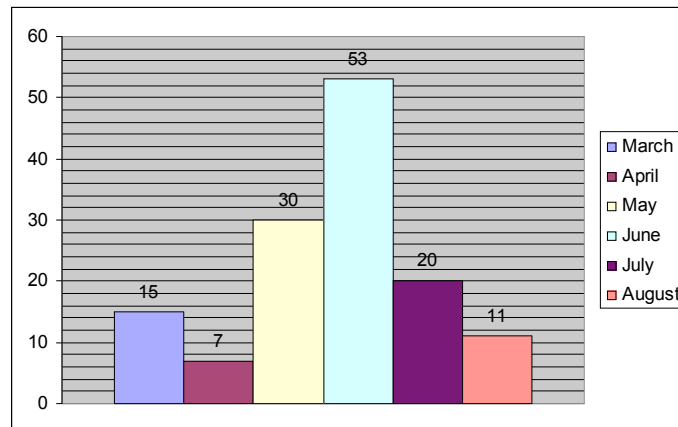
Month	Species caught				Turtles caught per month
	open type	Aitkanti	Krape	Warana	
March	207	48	32	22	102
April	137	20	3	6	29
May	192	104	56	16	176
June	211	107	26	13	146
July	233	114	57	26	197
August	245	17	65	20	102
Total	1225	410	239	103	752



Number of turtles reported dead

Table 4

Month				Total killed per month
	Aitkanti	Krape	Warana	
March	5	4	6	15
April	2	2	3	7
May	20	8	2	30
June	36	16	1	53
July	15	4	1	20
August	2	4	5	11
Total	80	38	18	136



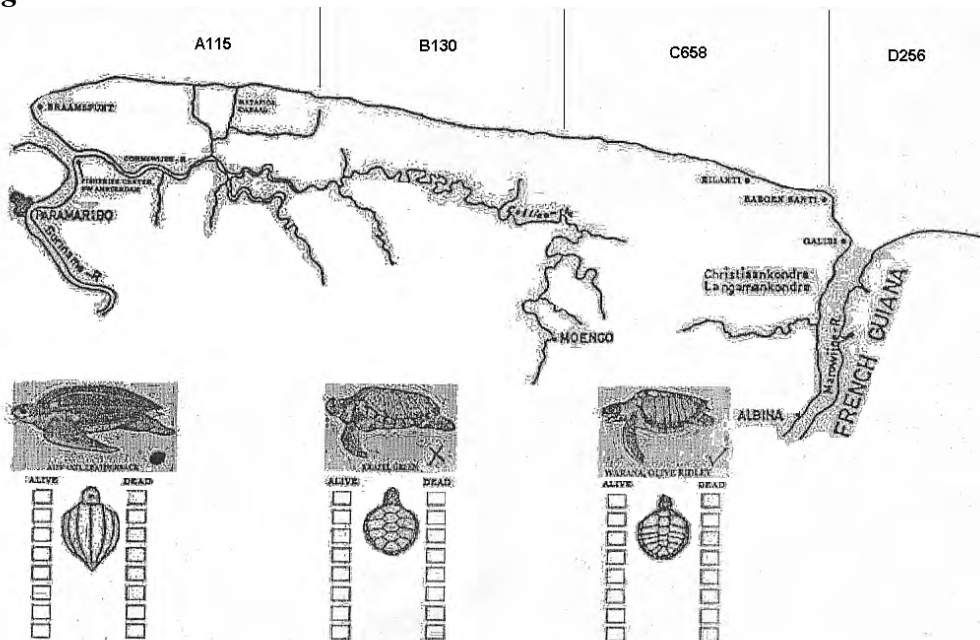
Number of turtles caught per location.

Table 5

Month	Area A	Area B	Area C	Area D
March	6	8	44	44
April	10	6	31	23
May	26	33	140	96
June	13	16	201	43
July	50	33	146	38
August	10	34	96	12
Total	115	130	658	256

One was caught out of the survey area, near the mouth of the coppename river

Fig 1



Survey area

The survey area was divided into four.
 The number of turtles caught in the four area's (see above).
 Most of the turtles were caught in Area C and D.

Turtles in fishing nets

When the fishermen are retrieving the net and find a turtle caught in the net, they bring the net alongside the boat.

Because of the weight of the turtle they cannot lift it into the boat and have to cut the net around the turtle to release it.

As a consequence the fishing net get damaged, that is why the fishermen are not pleased to find turtles in the nets.

Most of the turtles were alive when found in the net.

According to the fishermen, turtles caught in the shallow waters very often survive because they are able to come to the surface to breathe.

It seems that turtles get tangled easier in the larger mesh sizes of the fishing nets.

No fishing zone

Since 2001 a no fishing zone was established to protect the turtles in the egg laying season.

According to the fish license conditions “no fishing activities are allowed from the 1st of April till the 31st of July, North of Galibi and 15 km to the West of Eilanti with a wide of 15 km”.

Remarks

Fishermen reported that turtles are already seen in January in the coastal waters.

Fishermen do not want to catch turtles because they damages the fishing nets, and it takes valuable time to remove them.

In general turtles meat is not consumed by Surinamese people.

However turtle eggs are a delicacy for some ethnic groups.

It seems that the high egg laying season for turtles coincides with the high fish season.

It is estimated that:

About 30% of the coastal fleet is not working in the eastern part of the sea area (turtle area) but west of the Suriname river.

About 20% of the fleet did not cooperate during the survey and did not want to give any information (data)

The actual catch of turtles might be 2 to 3 times higher.

Recommendations

1. To discuss the findings of this report with the stakeholders, the Fisheries Department, representatives of fishermen, Minister of Defence (Coast guard) etc. and try to reach consensus regarding the activities.
2. To increase the awareness among the fishermen regarding protection of turtles.
3. To put some markers (buoys) to mark the closed area; fishermen complains not to know the exact area.
4. Try to find a way to warn the turtles for the fishing nets.
5. To increase the survival rate of turtles as a whole:
try to minimize the poaching of turtles eggs;
discourage the consuming of turtle eggs;
increase the surveillance in the sea area as well on land/roads.