REBYC
Reduction of Environmental Impact from Tropical Shrimp Trawling, through the introduction of By-catch Reduction Technologies and Change of Management
(EP/GLO/201/GEF)

Nigeria

Report of on-shore data collection

EP/GLO/201/GEF

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

EP/210/GLO/GEF – Nigeria.

REDUCTION OF ENVIRONMENTAL IMPACT FROM TROPICAL SHRIMP TRAWLING THROUGH THE INTRODUCTION OF BY-CATCH REDUCTION TECHNOLOGIES AND CHANGE OF MANAGEMENT.

REPORT OF ONSHORE DATA COLLECTION

FUNDING: GLOBAL ENVIRONMENTAL FACILITY (GEF)

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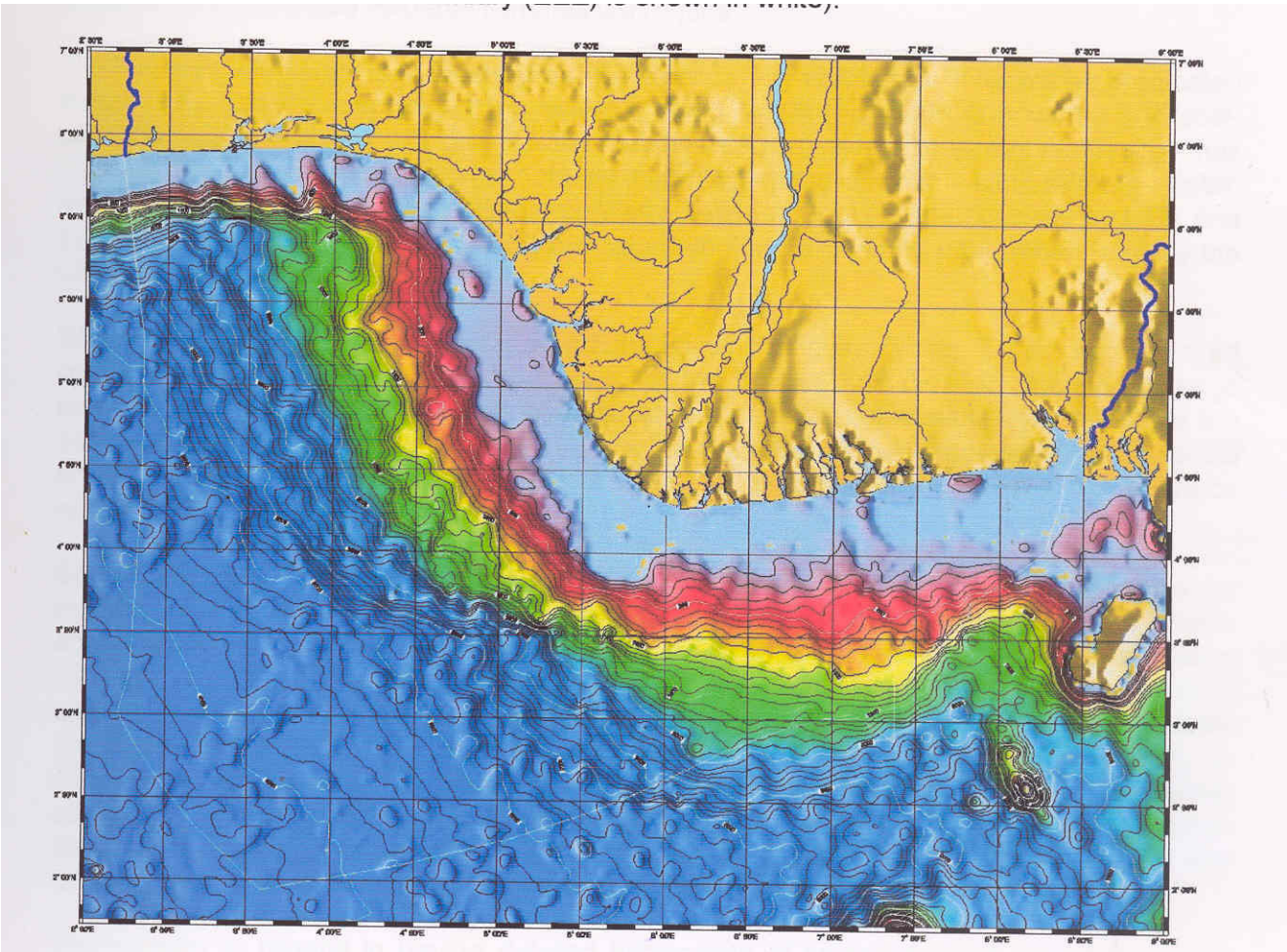

Figure 1: Nigerian coastline and adjacent ocean showing the 200 nm EEZ boundary and regional bathymetry

ON-SHORE DATA COLLECTION

Introduction

Nigeria lies between Latitude $4^{o}.16^{`}$ - $13^{o}.52^{`}$ North and Longitude $2^{o}.49^{`}$ -$14^{o}.37^{`}$ East. It boarders the Gulf of Guinea with an estimated coastline of about 850 km. The continental shelf is generally narrow. It goes wider from the Lagos – western (15 km) to Calabar South Eastern end (80km). Artisanal fishermen are found to operate almost exclusively within the continental shelf between the 18m contour

while Industrial operation tends to limit their activities between 18m and 40m contour or beyond.

Industrial fishing activities are predominant in the South Eastern end of the coast because of its deltaic nature. The delta is formed by an intricate number of rivers that open into the ocean on their way through the hinterland that carry a lot of debris e.t.c. which makes the river mouths including adjourning seas rich and shrimpers often vie into the non-trawling zone in order to get closer the mouths to take advantage of rich resources. The result is that a lot of unwanted by-catch is caught along with target fish/shrimp and the chance of conflict with artisanal fishermen is very high.

The production of by-catch in tropical shrimp trawling fisheries has been profusely documented. It is estimated that a total of 20 million by-catch worldwide is produced during shrimping operations. The level of by-catch production varies from country to country.

In Nigeria the Sea Fisheries Decree allows shrimping vessels to use trawl nets that are 44mm cod-end stretched mesh size. The same decree allows shrimp to land up to 75% fish and other products (by-catch) during their operations. The fishing vessels use trawl nets of 76mm cod-end and are allowed landing some quantity of shrimps.

The implication of the above scenario is that some unscrupulous captains, though licensed for fishing activities change the cod-end mesh size of their net to 44mm at Mid-sea. This allows all forms of living resources to be harvested because the small size of the cod-end meshes disallows the escapement of non target organisms. The harvesting of juveniles of large food fish along the targeted

shrimp resources has implications on recruitment, species diversity and recovery of the resources.

The aim of this component of the project is therefore to collect reliable fish and shrimp data as well as up-to-date by-catch and discards at sea. This activity would establish the level of by-catch production vis-à-vis discards and enable government to intervene appropriately. Fish/Shrimp landing data was collected in two ways; On Shore and On-board. It is necessary to state right away that the same formats were applied for both exercises.

Methodology:

The preparations for take off of this aspect of the project started with in-house meeting of FDF statistical and MCS staff with the National Coordinator and the National Consultant. The meeting was just to brief them on the focus/approach of the project.

Thereafter the old format for data collection was reviewed and adjustments were made in line with the demands of the project. The format was taken to the Steering Committee which ratified it for data collection. The collection proper commenced in August 2003 and is continuing because FDF has now adopted the forms as the new format for fisheries data collection. A total of thirteen fisheries superintendents were trained and involved in the activity. Fish landing data was collected from all shrimping vessels in all the jetties. The details of the data collected are as shown;

Result:

1. Number of Companies - 26
2. Number of vessels - 224
3. Size of vessels - (24 – 26.6)m LOA

4. GRT	-	130 - 150
5. Quantity of fish landed	-	5,700,901.3 kg (5,701 mt.)
6. Quantity of Shrimp landed	-	5,703,032 kg (5,703 mt.)
7. Quantity of Mix	-	11,065,612.5 kg (11,066 mt.)
8. Total Landings	-	22,469,546.25kg (22,470 mt.)
9. Percentage composition of By-Catch	-	74%
10.Total Number of Fishing Days	-	43,621
11.Fishing Hours	-	761,192.6 Hrs
12.Catch per fishing day	-	515.11 Kg/Day
13. Catch Per Unit Effort (CPUE)	-	29.52 Kg/Hr.
14. Percentage of Shrimp By-Catch	-	27/73

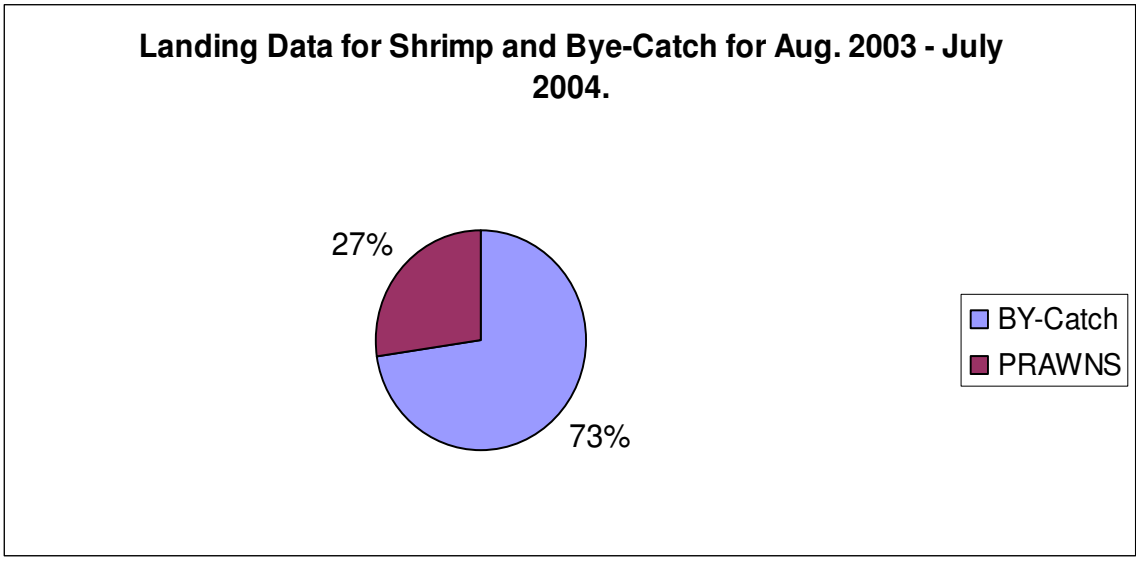

Fig. II

Sorting/Grading of Fish.

Fish caught in the inshore waters of Nigeria is sorted into the following size classes and frozen at sea in 20 kg bags as follow;

Large

Medium

Small

Mixed (Mix)

The Mixed fish is made up of assorted species of small fish including crabs and Cuttle fish. The Mixes are further divided into size classes of Mix I, II, III, and IV. Among the Mixes, Mix I is the largest in terms of average size while Mix IV is the lowest. At the moment size grading are company specific but the MCS has come up with the following grading especially on the sciaenids which are the predominant species e.g;

Large Croaker - 50 – 59cm
Medium Croaker - 31 – 30cm
Small Croaker - 25 – 30cm
Mix I minimum - 21cm
Mix II minimum - 16cm
Mix III minimum - 14cm
Mix IV minimum - 9cm

Landing Data for Shrimp and By-Catch for August 2003 to July 2004

MONTH	PRAWNS	CROAKER	SOLE	SHARK	RAY	CATFISH	GROUPER
Aug-03	478988	219552	151124	8326	3671	5120	249
Sep-03	459159.2	271925.5	212943	28722	3348	10260	510
Oct-03	385312.4	304324	205086	24496	11246	6544	1413
Nov-03	390855.4	246648	112248	16017	3673	6016	1007
Dec-03	349992	239882.4	157326	16629	2860	10321	875
Jan-04	310929.6	215044.7	106346	5790.5	4439	4140	112
Feb-04	370260.4	196975.5	121582.5	2619	4267	8001	241.5
Mar-04	510019.3	199251.8	117741.5	1986	4516	4980	257.5
Apr-04	512794.4	64113.8	108034.5	6578	26073	22425	557
May-04	545816.5	110756.5	128379	7450.5	1402	3860	1051
Jun-04	525093	170078	132779.5	10832	7195	2489	2364
Jul-04	863812.3	283360.5	236907	3402	9096	4289	5482

TUNA	CRAB	LOBSTER	CUTTLE	MIX I	MIX II	MIX III	MIX IV
1995	48112.4	305	58816	164940	120890	244470	254800
1935	77827.5	514	52734	227688	152672	311379	416164
1740	75142.5	175	38295.6	264427.5	164060	350464	450431
2489	82431	153	28640	167053	86760	218717	303665
142	38852	44	12556.8	182612	72740	229270	271536
160	24093	294	11357	219063	114698	272769	354763
123	52147.5	227	14068.8	162058	72946	235031	324021
178	57130	288	15396.8	184077	67589	261369	404523
730	67480.5	628.5	11017.2	158319	90260	267677.5	394876
3660	41020	153	18099.4	154216	78510	275106	354794
3549	52818	373	21109.9	191703.5	111498	273403.5	360820
4681.5	84304.5	8662	54644.2	223259	116300	318406.5	368818

Table I

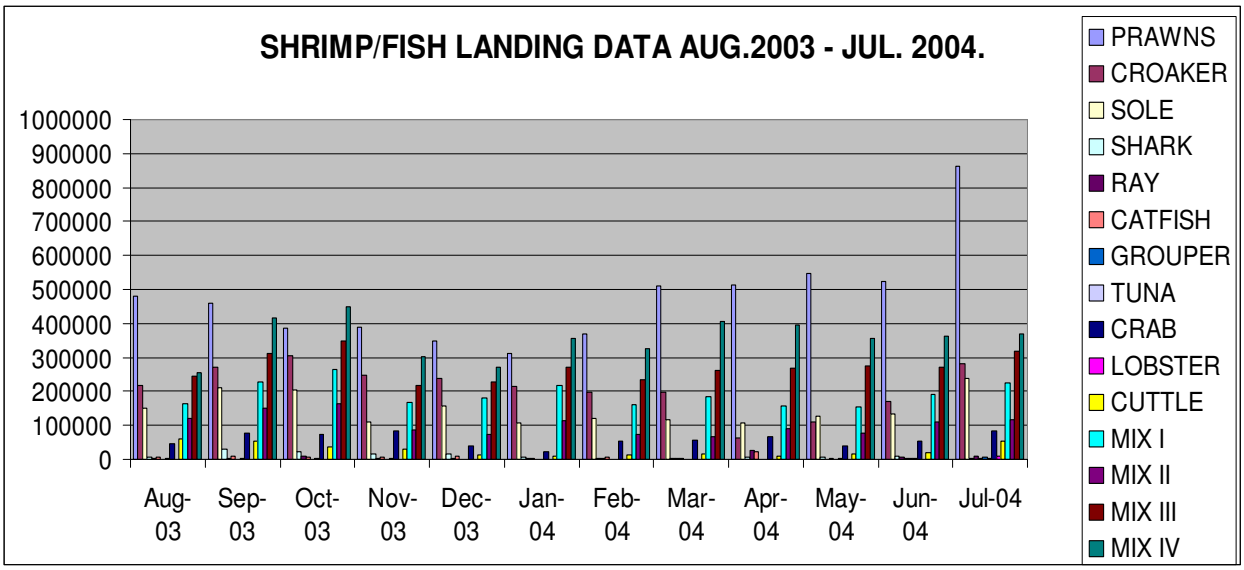

Fig. III

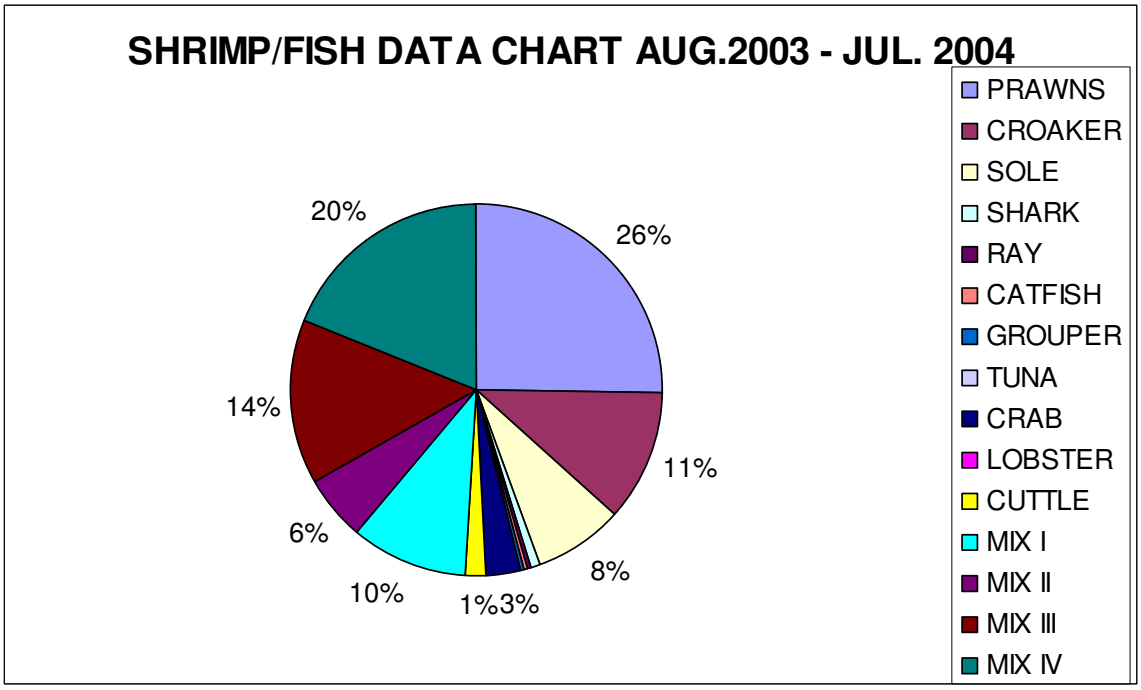

Fig. IV

A general look at the total landing showed predominance of prawns in the following catch composition.

The catch profile showed the following;

- Shrimp - 26%
- Mix IV - 20%
- Mix III - 14%
- Croakers - 11%
- Mix I - 10%
- Soles - 8%
- Mix II - 6%
- Crabs - 3%
- Cuttle Fish - 1%

MONTHLY CATCH OF FISH/SHRIMP LANDING

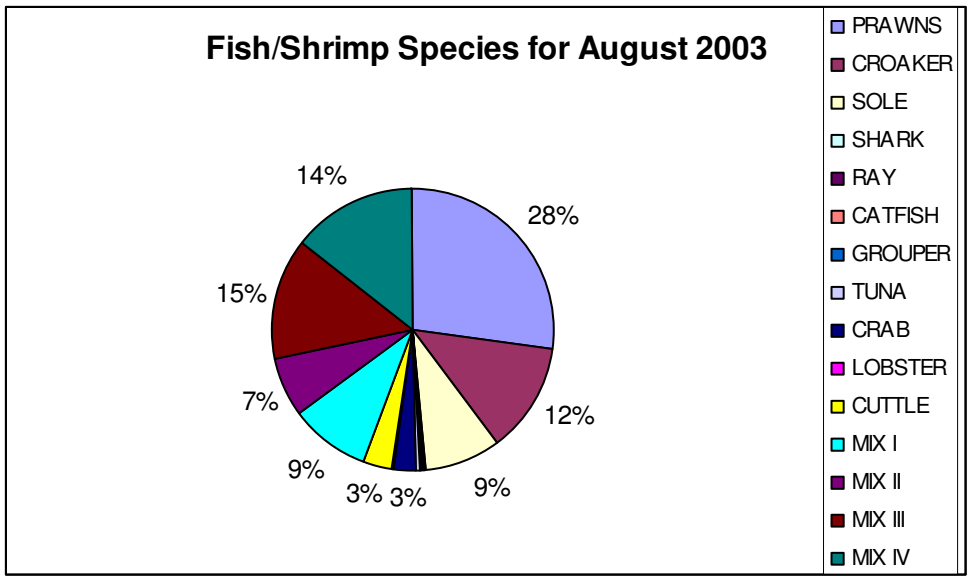

Fig. V

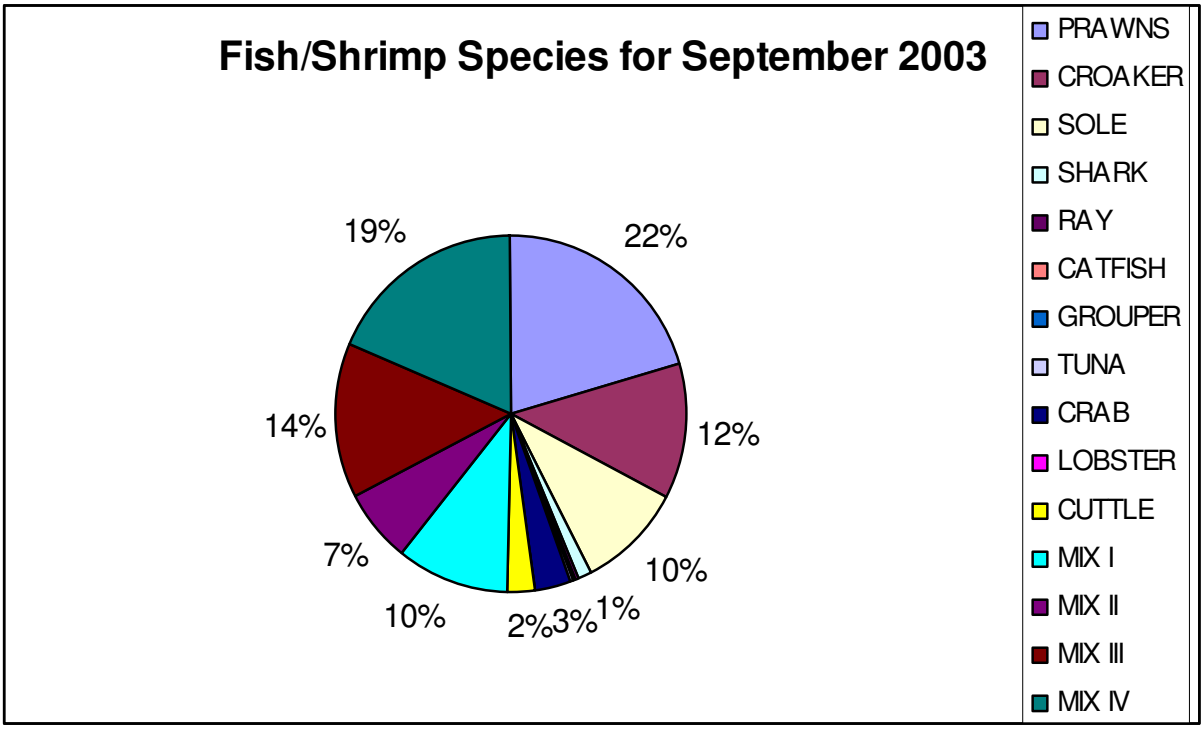

Fig. VI

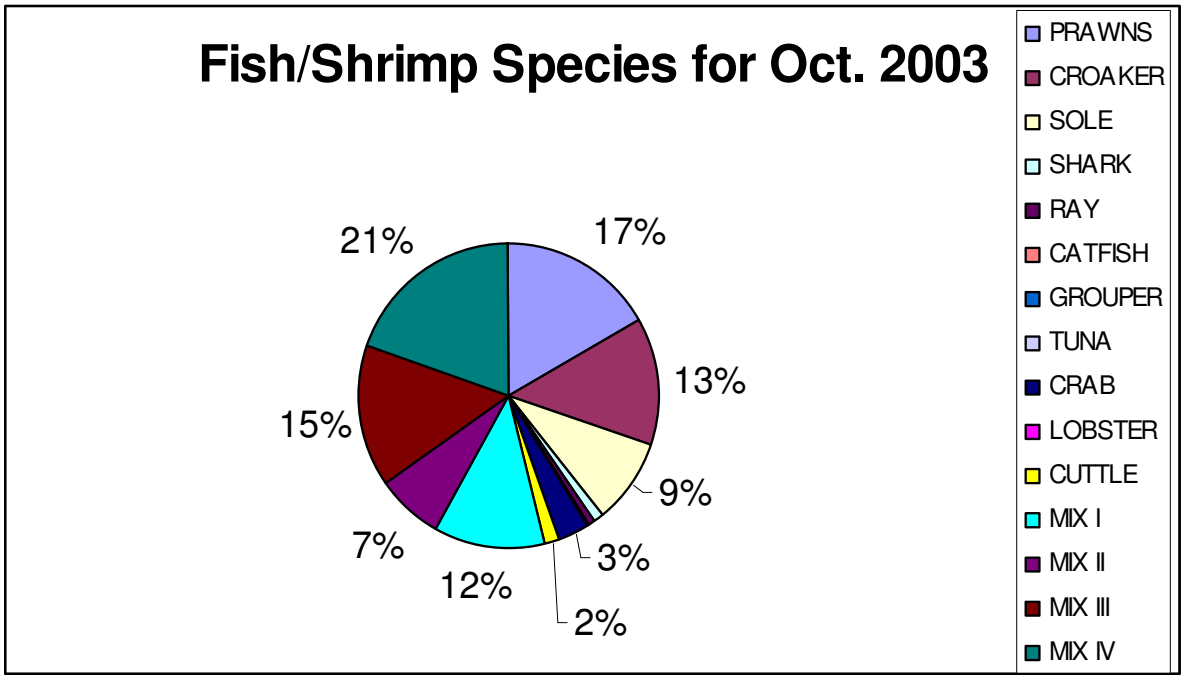

Fig. VII

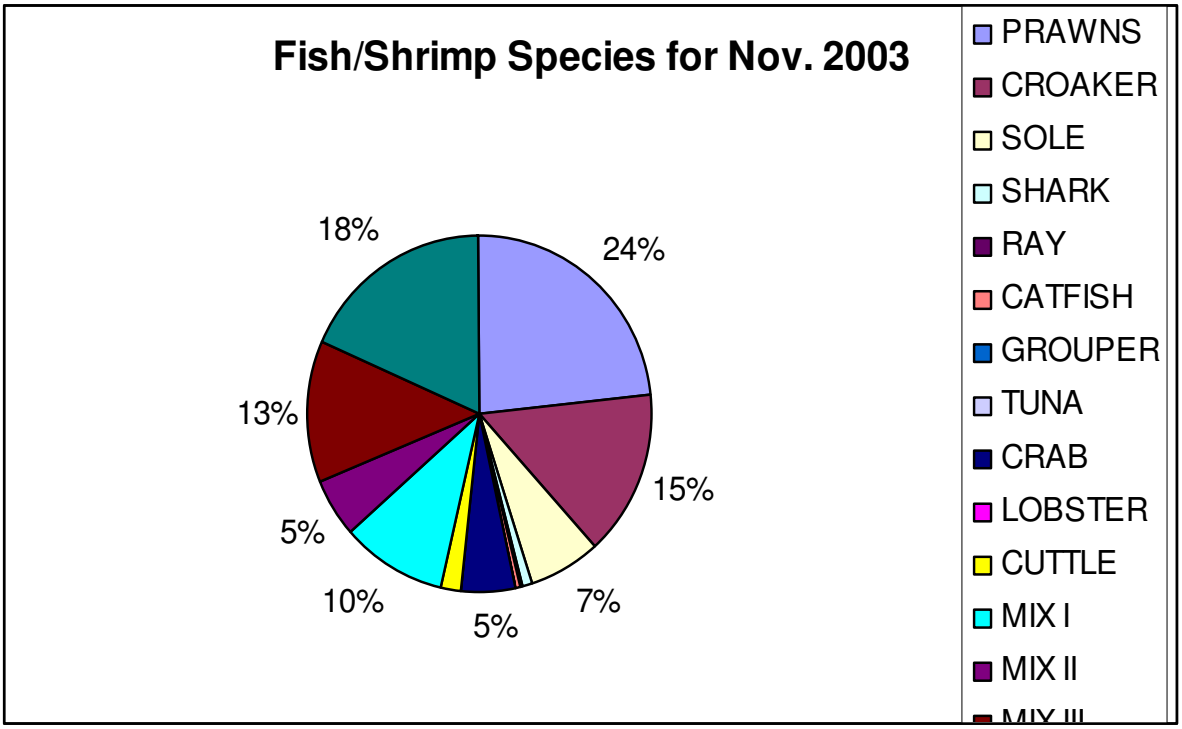

Fig. VIII

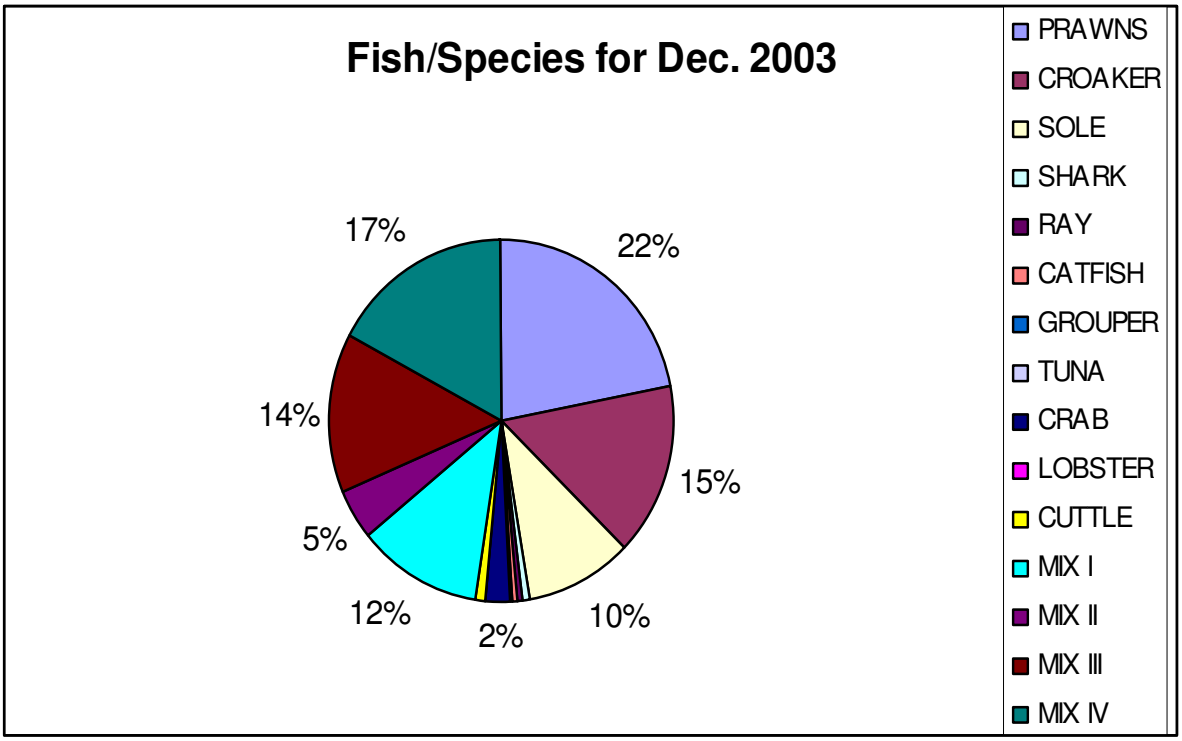

Fig. IX

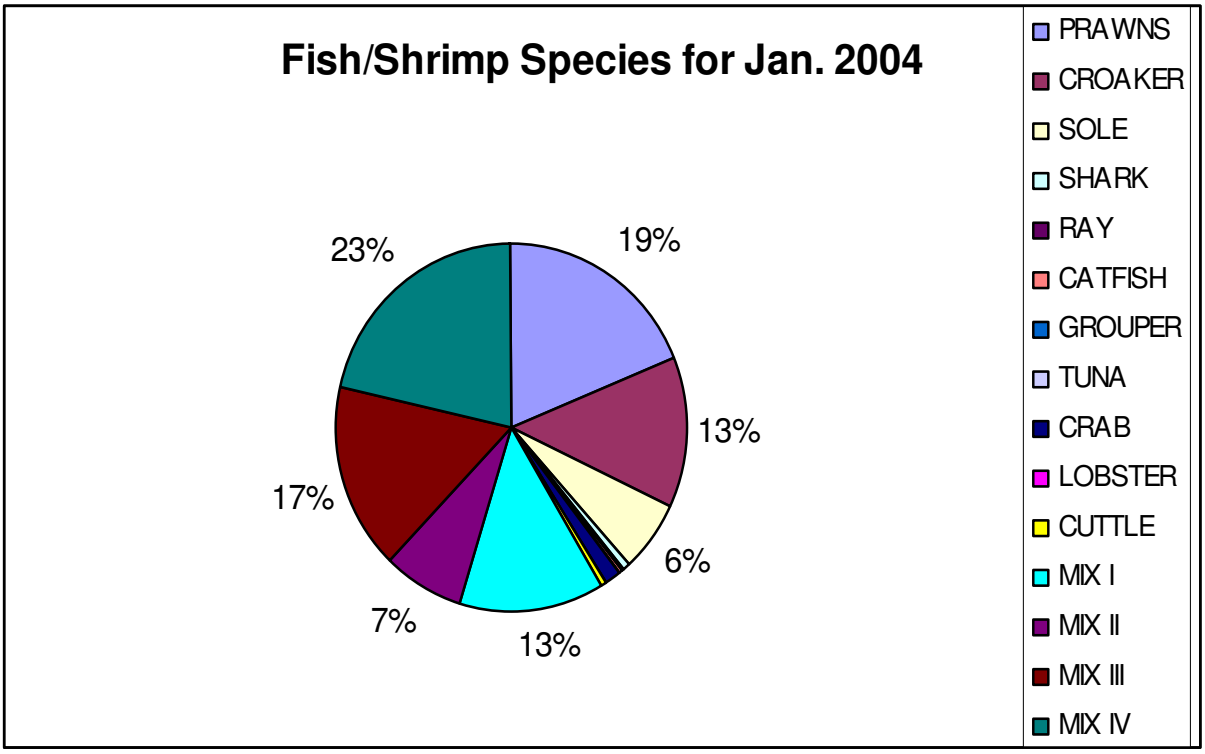
Fish/Shrimp Species for Jan. 2004
19%
13%
6%
13%
7%
17%
23%
PRAWNS
CROAKER
SOLE
SHARK
RAY
CATFISH
GROUPER
TUNA
CRAB
LOBSTER
CUTTLE
MIX I
MIX II
MIX III
MIX IV

Fig. X

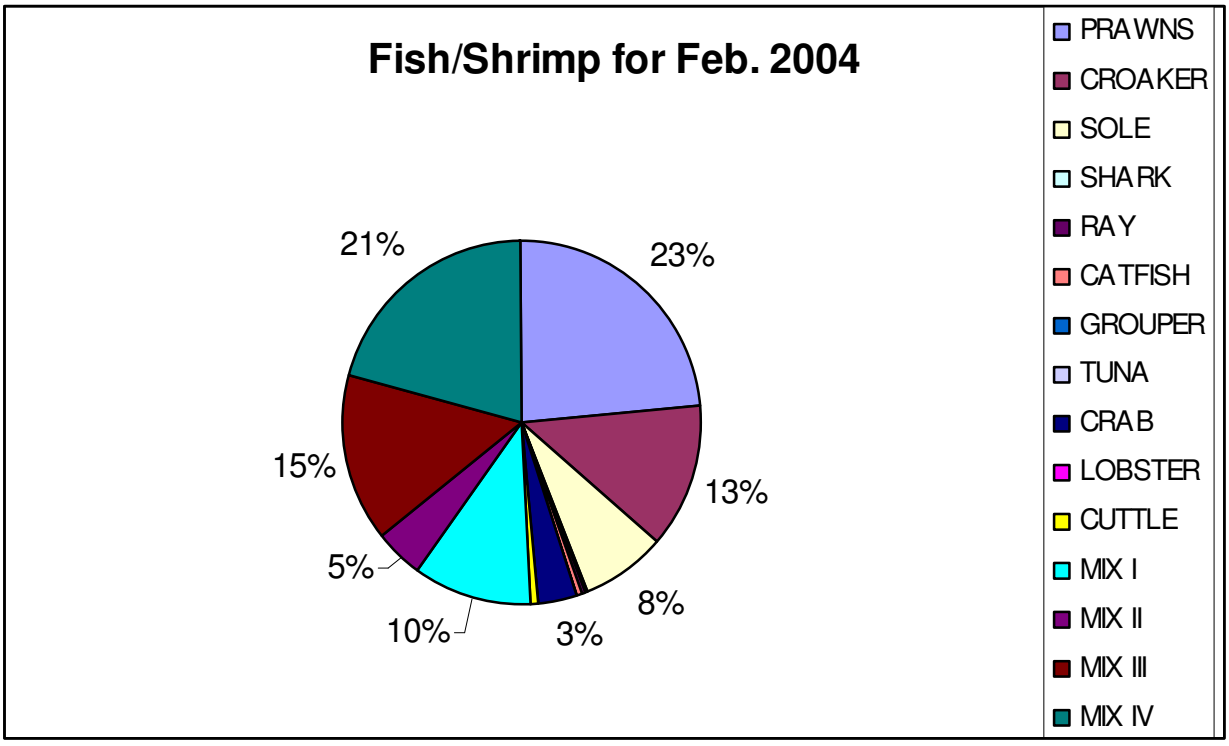
Fish/Shrimp for Feb. 2004
23%
13%
8%
3%
10%
5%
15%
21%
PRAWNS
CROAKER
SOLE
SHARK
RAY
CATFISH
GROUPER
TUNA
CRAB
LOBSTER
CUTTLE
MIX I
MIX II
MIX III
MIX IV

Fig. XI

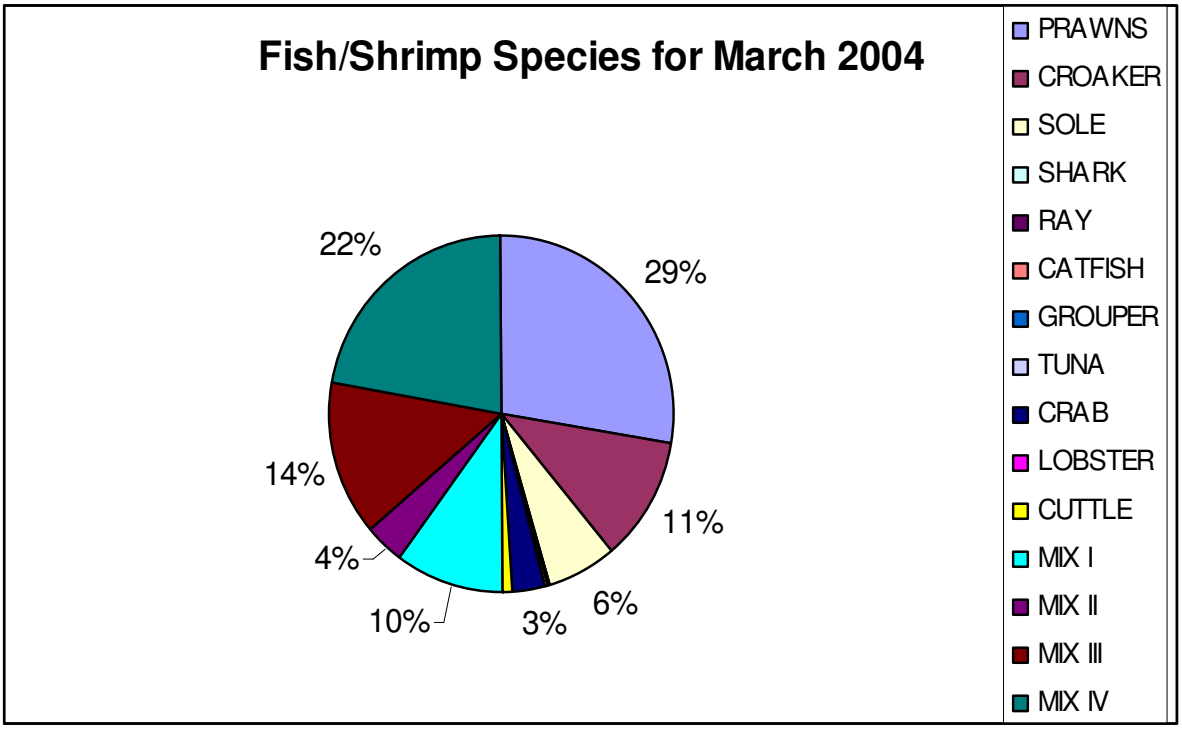

Fig. XII

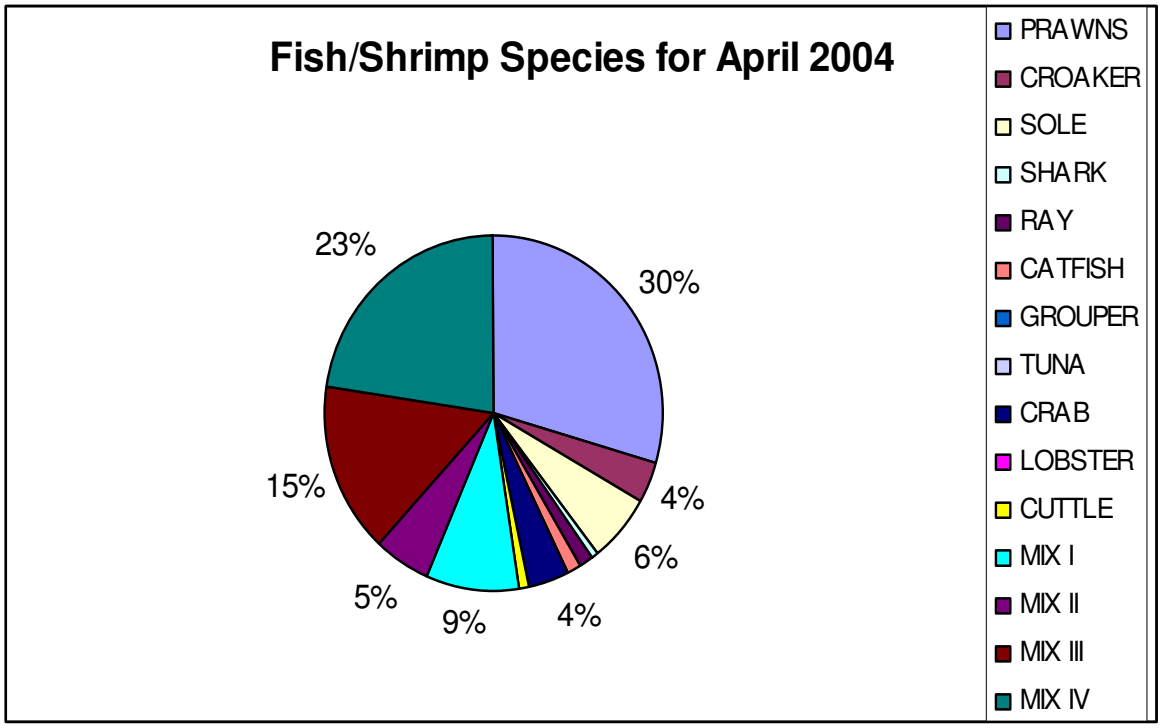

Fig. XIII

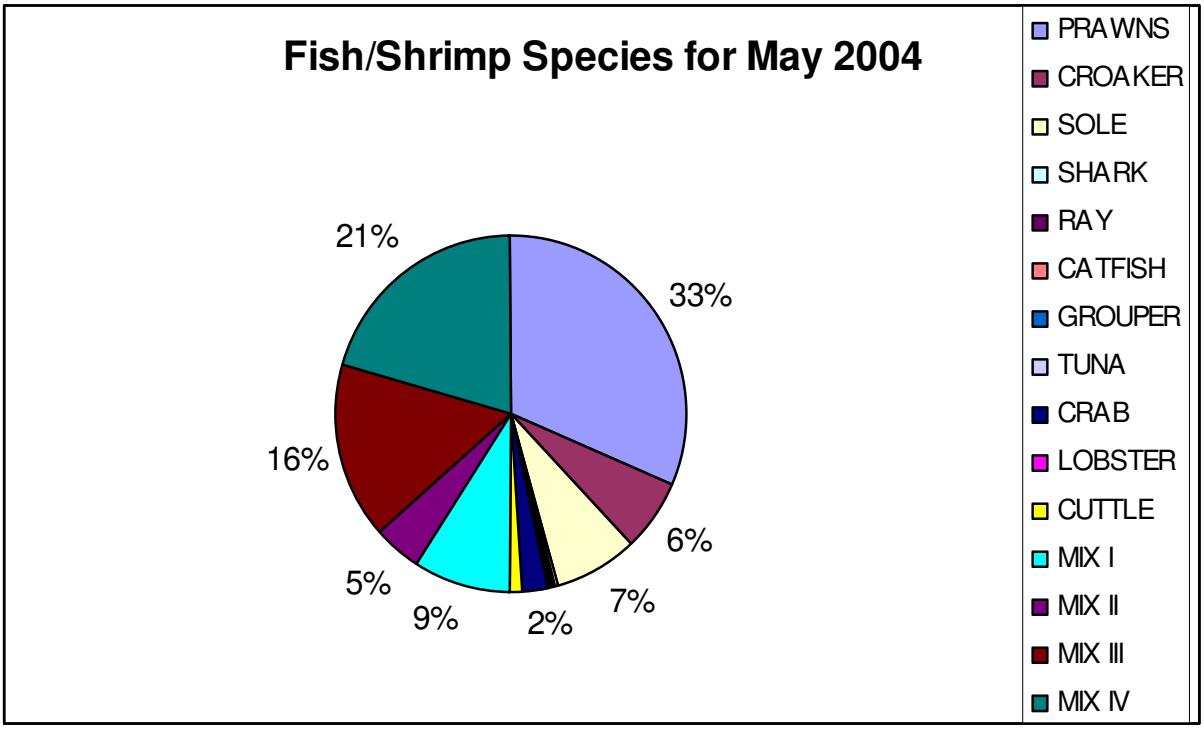

Fig. XIV

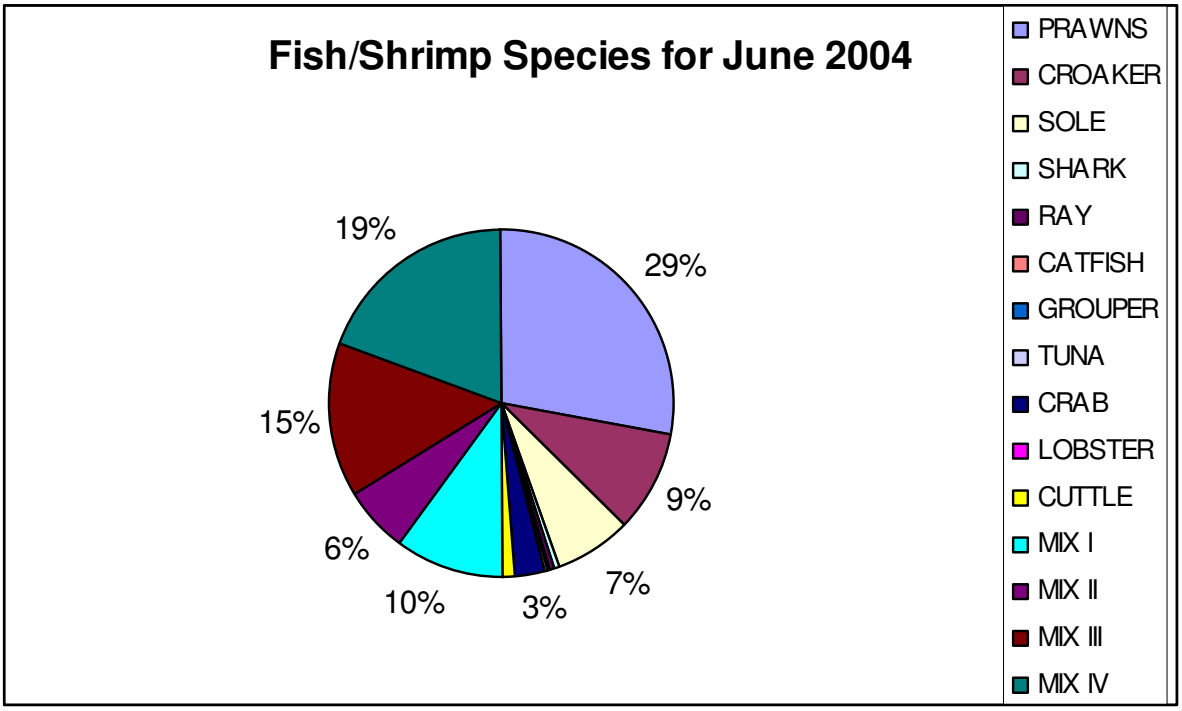

Fig. XV

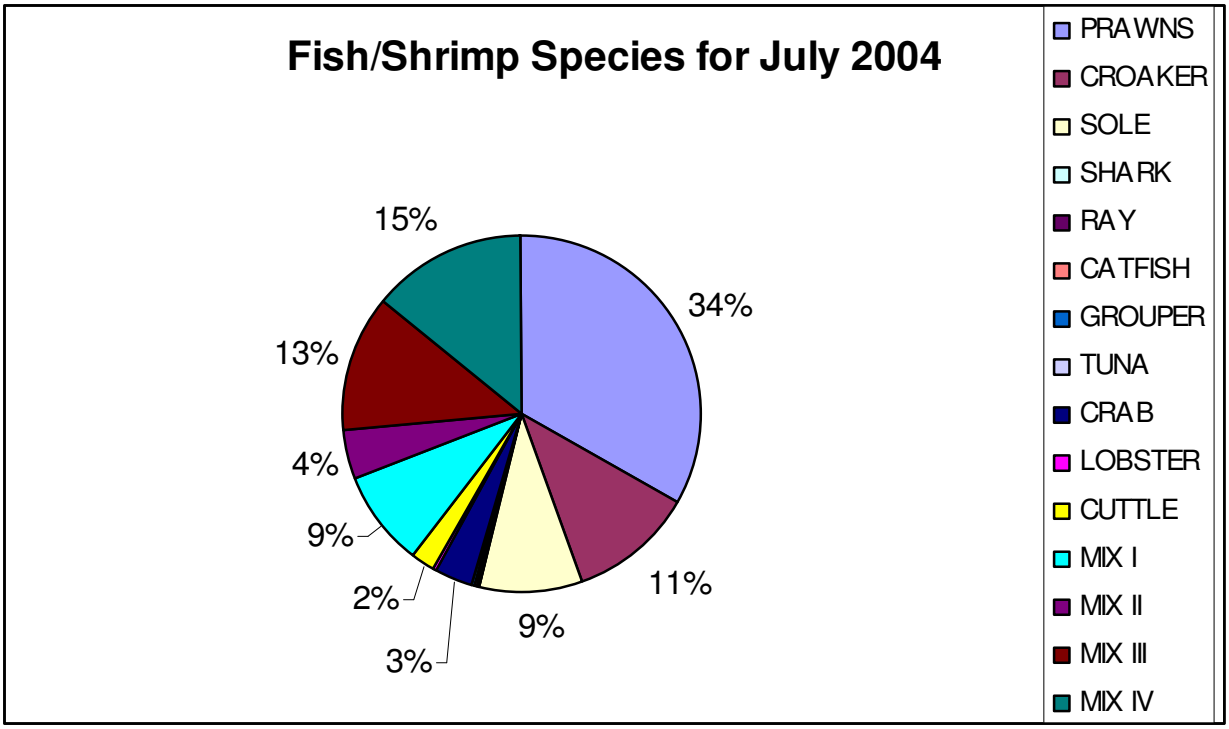

Fig. XVI

The monthly landing of shrimp showed a very clear pattern. Shrimp catches were lowest in December and January and started to rise from March with peak in July before coming down through August – January. By-Catch production was almost the same in the year; however highest peak was recorded in October followed closely by September and then August.

Monthly By-Catch/Prawn Landing Figures.

BY-CATCH	PRAWNS	MONTH
1282370.4	478988	**Aug-03**
1768622	459159.2	**Sep-03**
1897844.6	385312.4	**Oct-03**
1275517	390855.4	**Nov-03**
1235646.2	349992	**Dec-03**
1333069.2	310929.6	**Jan-04**
1194308.8	370260.4	**Feb-04**
1319283.6	510019.3	**Mar-04**
1218770	512794.4	**Apr-04**
1178457.4	545816.5	**May-04**
1341012.4	525093	**Jun-04**
1721612.2	863812.3	**Jul-04**

Table II

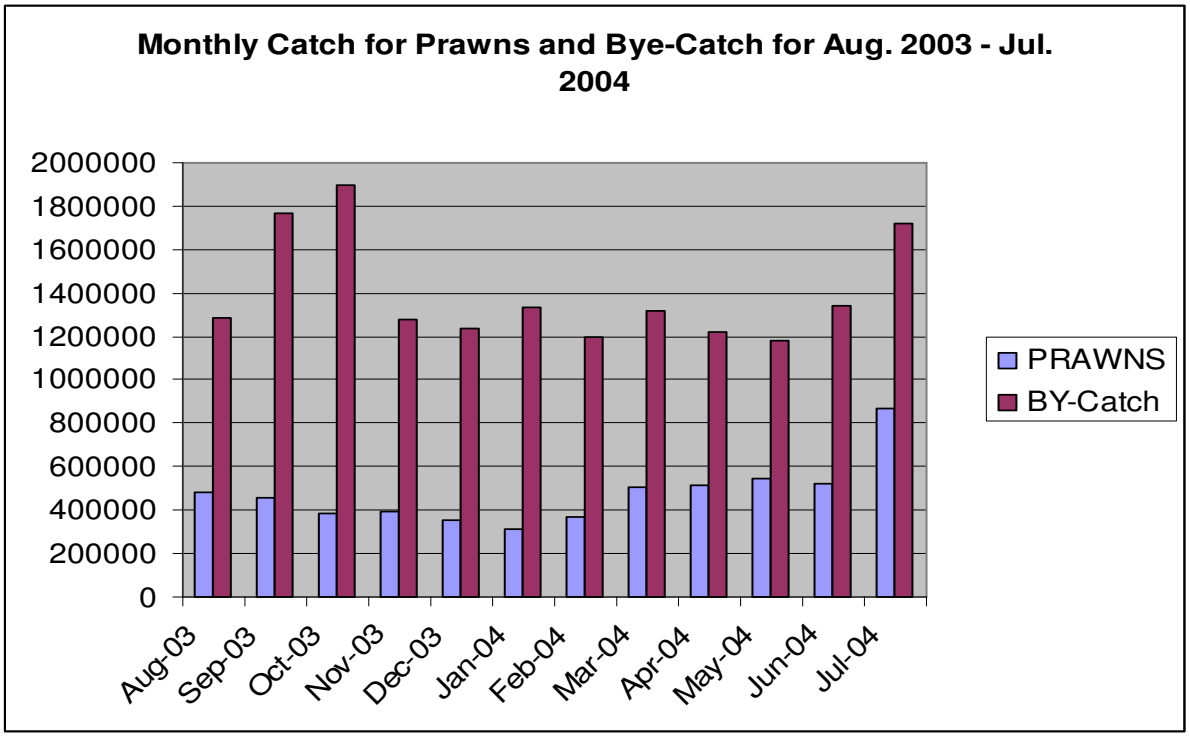

Fig. XVII

The by-catch landing for the same period showed a very interesting pattern as the list sizes of fish in Mix IV and Mix III formed 45% of the total by-catch landing.

- Mix IV - 26%
- Mix III - 19%
- Croakers - 15%
- Mix I - 14%
- Soles - 11%
- Mix II - 7%
- Crabs - 4%
- Cuttle Fish - 2%
- Catfish - 1%
- Shark - 1%

A comparison of the by-catch landings alone showed that the smallest mixes comprising half of the total by-catch landings.

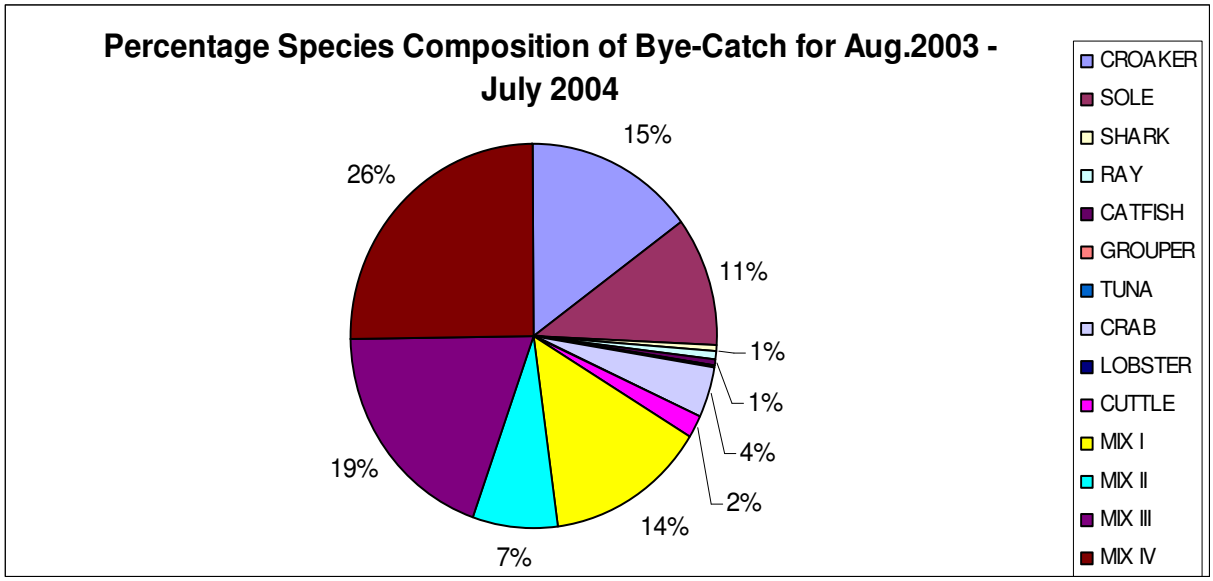

Fig. XIX

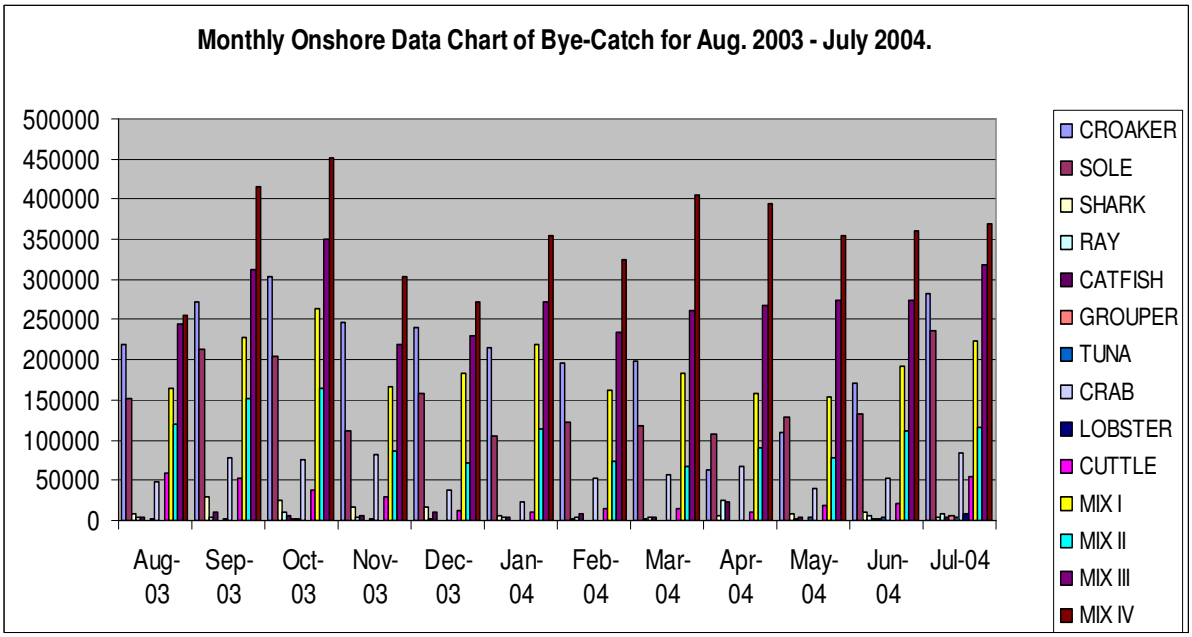

Fig. XX

The profuse production of the mixes especially the high volume (50%) of the mixes showed conclusively that the demersal resources were being exploited irrationally. If the current trend continues there might be mix V and VI in a few years.

Therefore the need for the immediate introduction of By-Catch Reduction Devices cannot be overemphasized. This component of the project has also kick started new fish data gathering awareness both in the industry and in the management. Though the land-based data collection had run its course (one calendar year) the momentum created by the project has not diminished. There is therefore the need to continue assisting the data activity until government completely takes over.