MONITORING AND ASSESSMENT OF OFFSHORE (GILLNET/LONGLINE) FISHERY IN SRI LANKA

D.C.T. Dissanayake, C. Amarasiri, E.K.V. Samaraweera, U. Adikari & C. Perera (NARA)

F. Poisson (IOTC/OFCF)

INTRODUCTION

Fisheries data collection programme started in 1982

↓

Pay special attention for Tuna catch and Effort

↓

Limited to few landing centers – Northwest, west, southwest, south

This was updated by

IPTP - 1987

FAO /TCP - 1994

Further strength , Extend to East coast, *PELAGOS data base*

IOTC /OFCF - 2004 - 2006

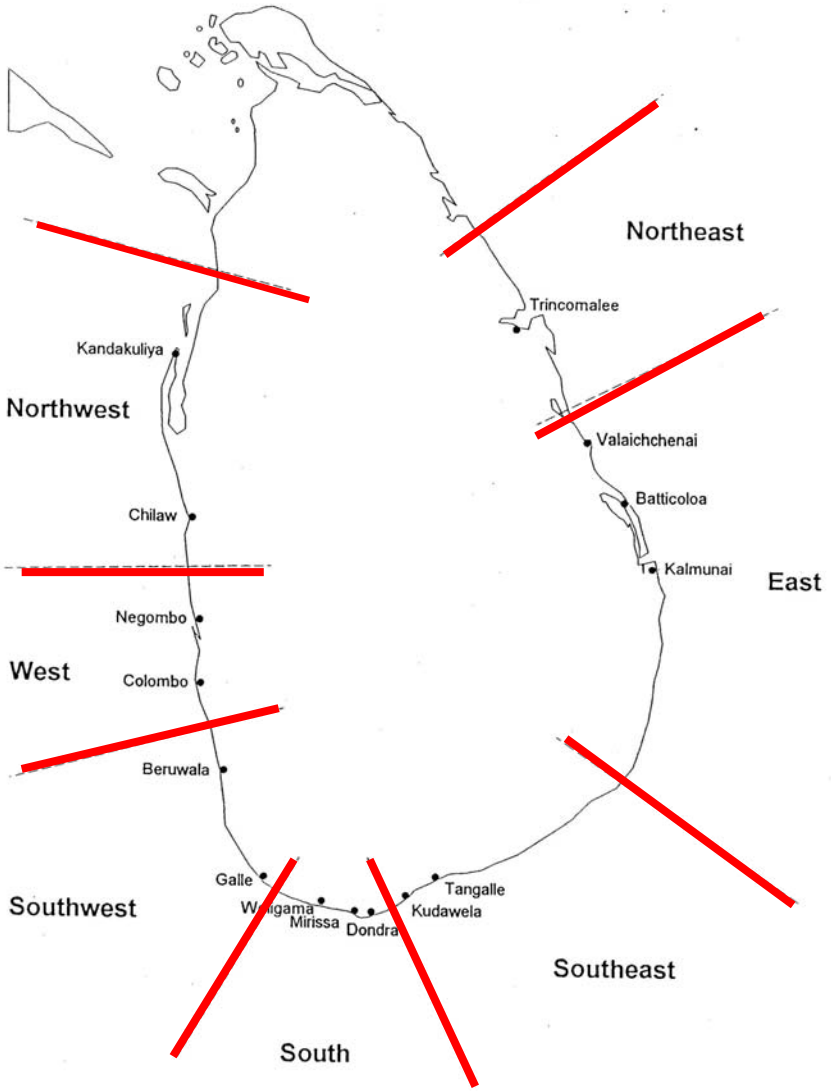
STRUCTURE OF THE DATA COLLECTION PROGRAMME

A. Data collection

- **Stratified Random Sampling programme**
- **Random port sampling with the help of 18 data collectors**
  - **12 permanent data collectors**
  - **6 data collectors on contract basis – IOTC / OFCF**

- **Sampling stratification**
  - Spatial strata (Landing sites)
  - Technical information (Vessel categories)
  - Temporal information (Month)

Spatial strata



Seven Statistical zones

Initially 12 data collectors - 6 zones

Under IOTC / OFCF Programme

- **Northwest** - **2 data collectors**
- Other 4 - West, Southwest

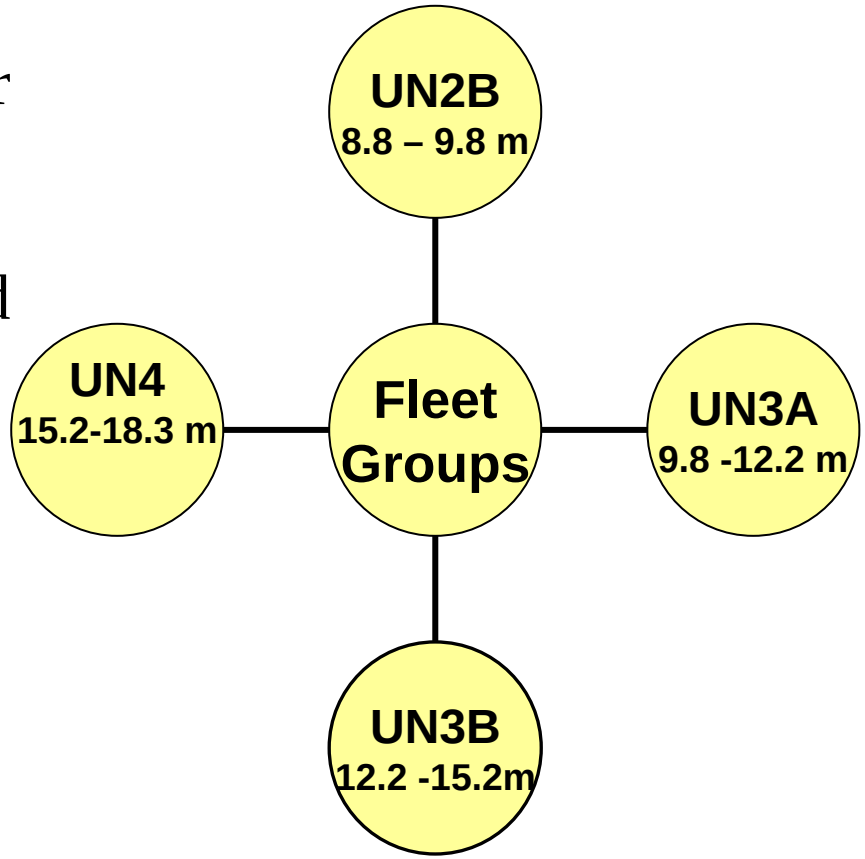
Sampling

- Major sites - Full
- Minor sites - Effort

Sites are visited on rotational basis according to **time table**

Technical Information – (a) Vessel Types

- 1700 offshore fishing vessels (Ministry of Fisheries)
- Categorized into 4 major groups
- 40-60 hp inboard engines and insulated fish holds
- Stay at sea 7 - 40 days
- 4 - 6 crew



UN2B

UN3A

UN3B

Technical Information – (b) Gear types

A range of gears are used in offshore fishing activities

Major Gears

Longline

Gillnets

Temporal Information

- Data are collected on daily basis and calculations are made on monthly basis.
- In few sites
  - Morning Strata
  - Afternoon Strata

Targetted species

- Mainly targetted on highly migratory species

- There are seven major categories

  - Tuna (Skipjack, Yellowfin, Bigeye, Frigate, Bullet)
  - Marlins (Black, Blue, Striped, Shortbill spearfish)
  - Seerfish (Narrow barred, Wahoo)
  - Swordfish
  - Sailfish
  - Sharks (Silky, Blue, White tip, Thresher, Hammerhead)
  - Rays


Skipjack tuna
16.09.2004


Yellowfin tuna
Sail fish


Sword fish


Sharks

Types of data

- Following data are collected

  - Daily Effort data
    - Total number of landed crafts in each category
  - Catch and Effort data
    - Total landings of sample boats (Partial or total)
    - Details of fishing gears
    - Species composition (catch in number and/or weight)
  - Biological data
    - Length and weight measurements
    - Record the type of length and weight
  - Information about fishing ground
    - Interviewing of skippers

      Not sucessful

Data sheets

Daily effort form	craft enumeration				
DATE	LOCATION		PAGE		
FLEET DETAILS	UN1	UN2A	UN2B	UN3A	UN3B
Number operated					

BOATS INFORMATION

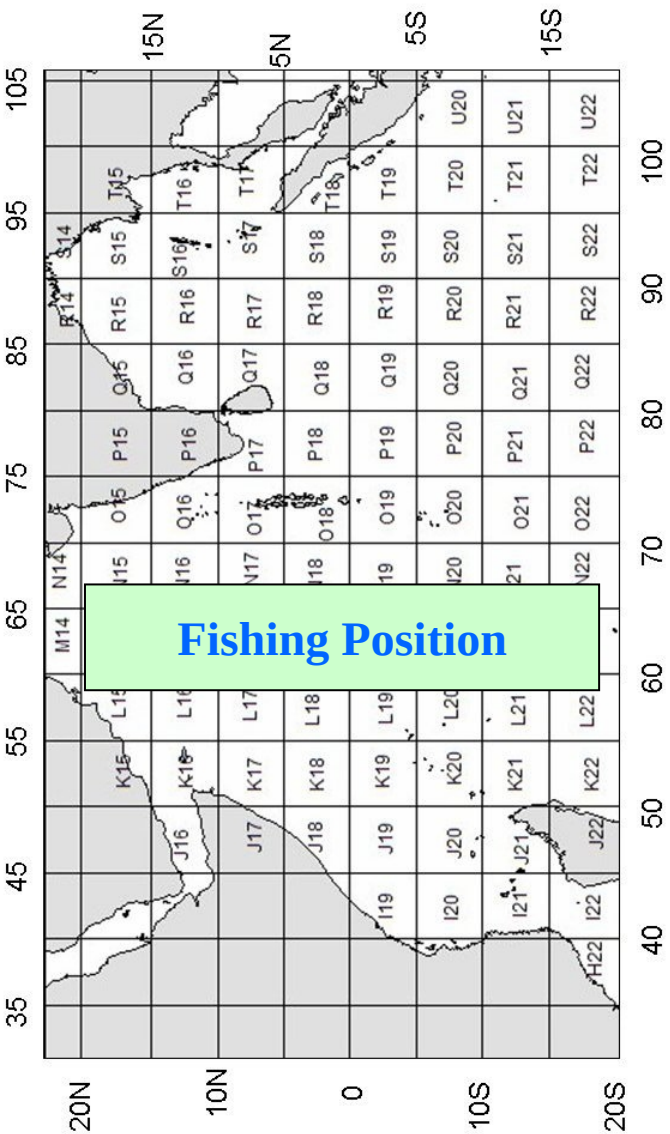
Boat Type	Boat's Name	Sampled(Y/N)	Registration Number

Daily Effort Form

Catch & Effort Form															
DATE		LOCATION			PAGE										
FLEET DETAILS		UN1			UN2A			UN2B			UN3A			UN3B	
Number operated															
Number sampled															
BOAT & FISHING TECHNIQUES															
boat number															
Boat Type															
Boat's Name															
Boat registration no															
Target species															
Days fished															
Gear Type															
Hook number															
Pieces of net															
bait type (LL)															
Gear setting time (night/day)															
How many set per day															
transfer at sea (yes/no)															
CATCH		No	Weight	Type	No	Weight	Type	No	Weight	Type	No	Weight	Type	No	Weight	Type
	YFS														
Yellowfin	YFM														
	YFL														
	SKS														
Skipjack	SKM														
	SKL														
Skipjack dry	SKD														
Kawakawa	KAW														
Frigate	FRI														
Bullet	BLT														
Bigeye	BET														
Other tuna	TUX														
Narrow barred	COM														
Wahoo	WAH														
Other seer	KGX														
Black marlin	BLM														
Blue marlin	BUM														
Striped marlin	MLS														
Sailfish	SFA														
Shortbill spearfish	SSP														
Swordfish	SWO														
Marlin	MAR														
Other bony fish	MZZ														
Dolphin fish	DOF														
Carangid sp.	CAR														
Silky shark	FAL														
Blue shark	BSH														
White tip	OWT														
Spot tail	SPT														
Longfin mako	LFM														
Shortfin mako	SFM														
Bigeye thresher	BTH														
Pelagic thresher	PTH														
Scallop hammerhead	SCH														
Smooth hammerhead	SMH														
Great hammerhead	GRH														
Other sharks	SKH														
Manta ray	MAR														
Devil ray	DER														
Eagle ray	EGR														
Guitar fish	GUF														
Other skates	SKA														
COMMENTS : Name and registration numbers of boats at landing site															

Catch & Effort

Data sheets cont.



Length & Weight frequency Form

Biological sampling

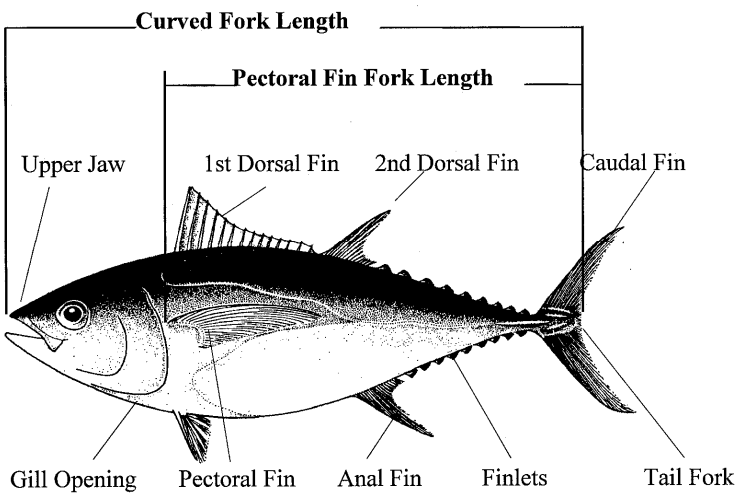
DATE | LOCATION | PAGE | OF

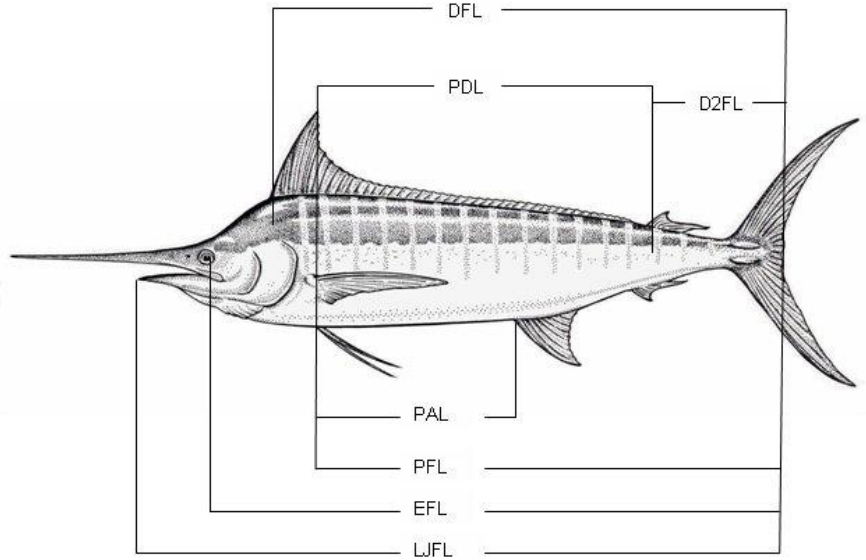
Boat No	Species	WEIGHT: No fish	Weight	Type	Gear	Label	Sex	LENGTH: Length	Type1	Length2	Type2	Length3	Type3

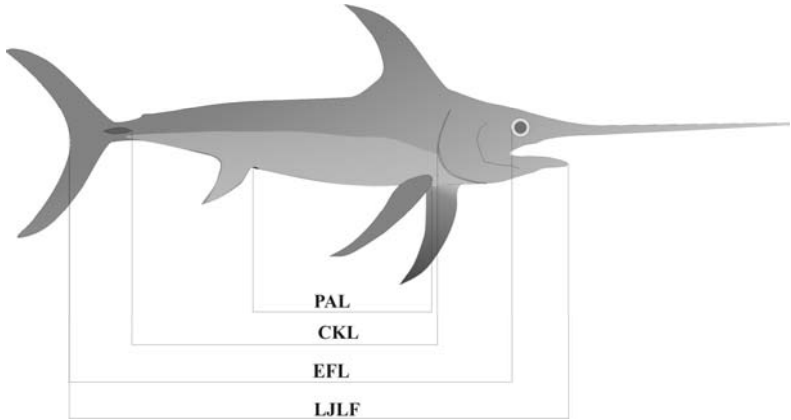
COMMENTS

Biological sampling

Types of Length Measurements







DATA ANALYSIS

Data analysis

- The total amount of fish unloaded (or landings) from the boat during which the sampling occurred is considered as the **sampling unit /unit effort.**

- The following steps are supposed to carry out to obtain the total catches in each major landing

Step 1:

Daily landing estimate at one landing site for a given boat category (Cd):

$$Cd = \left(\sum_{b=1-n} Cb\right) * \frac{N}{n}$$

Cb : Landing of species on sampling day per boat type

n : Number of vessels sampled on sampling day

N: Number of vessels operating on sampling day

Step II:

Monthly landing estimate by boat category at a landing site (Cm):

$$Cm = \left(\sum_{b=1-Nds} Cd\right) * \frac{Nl}{Nds}$$

Cd: daily landing on sample day

Nl: Number of landing days in that month

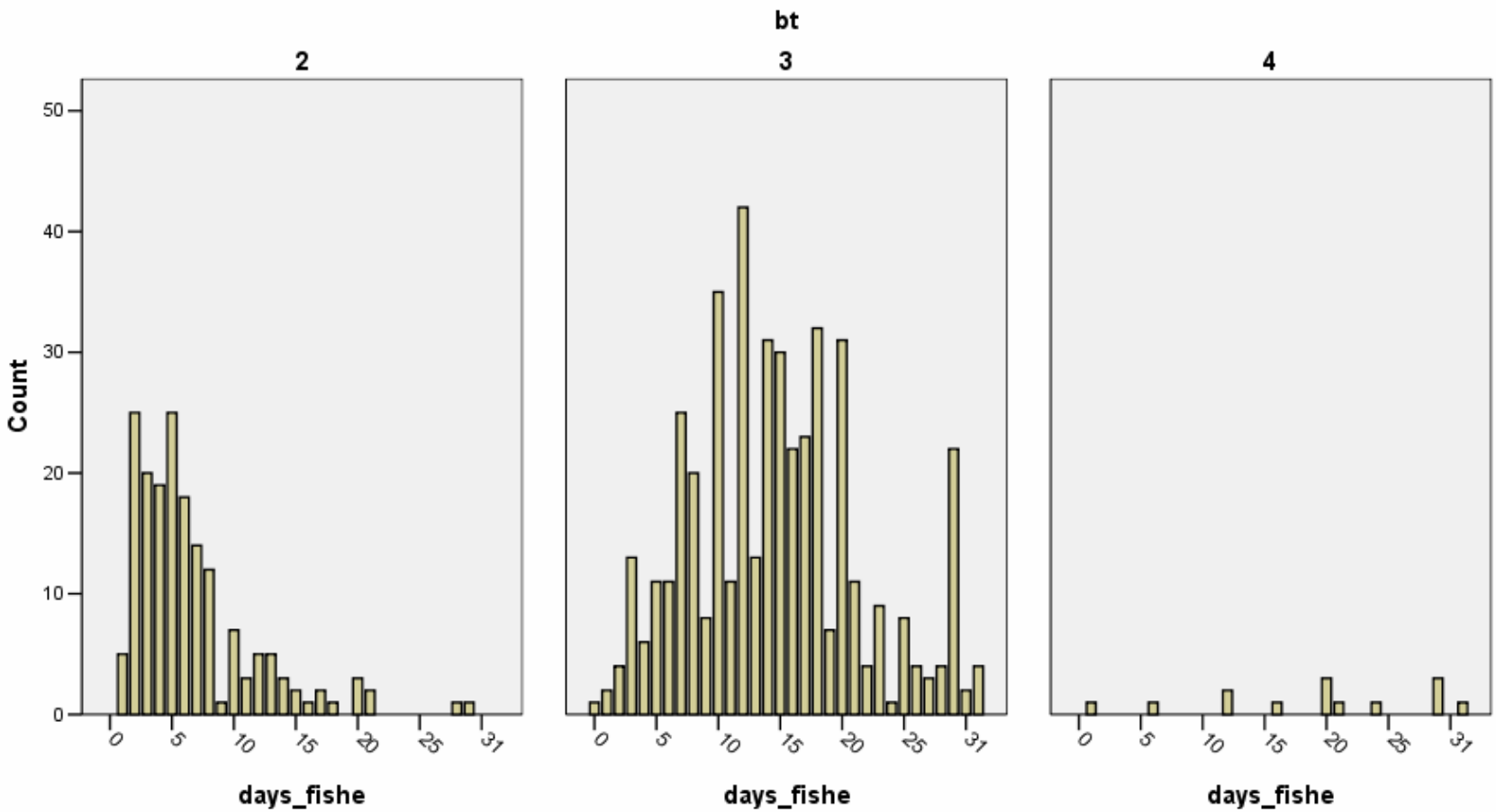
Nds: Number of days sampled

Step 111

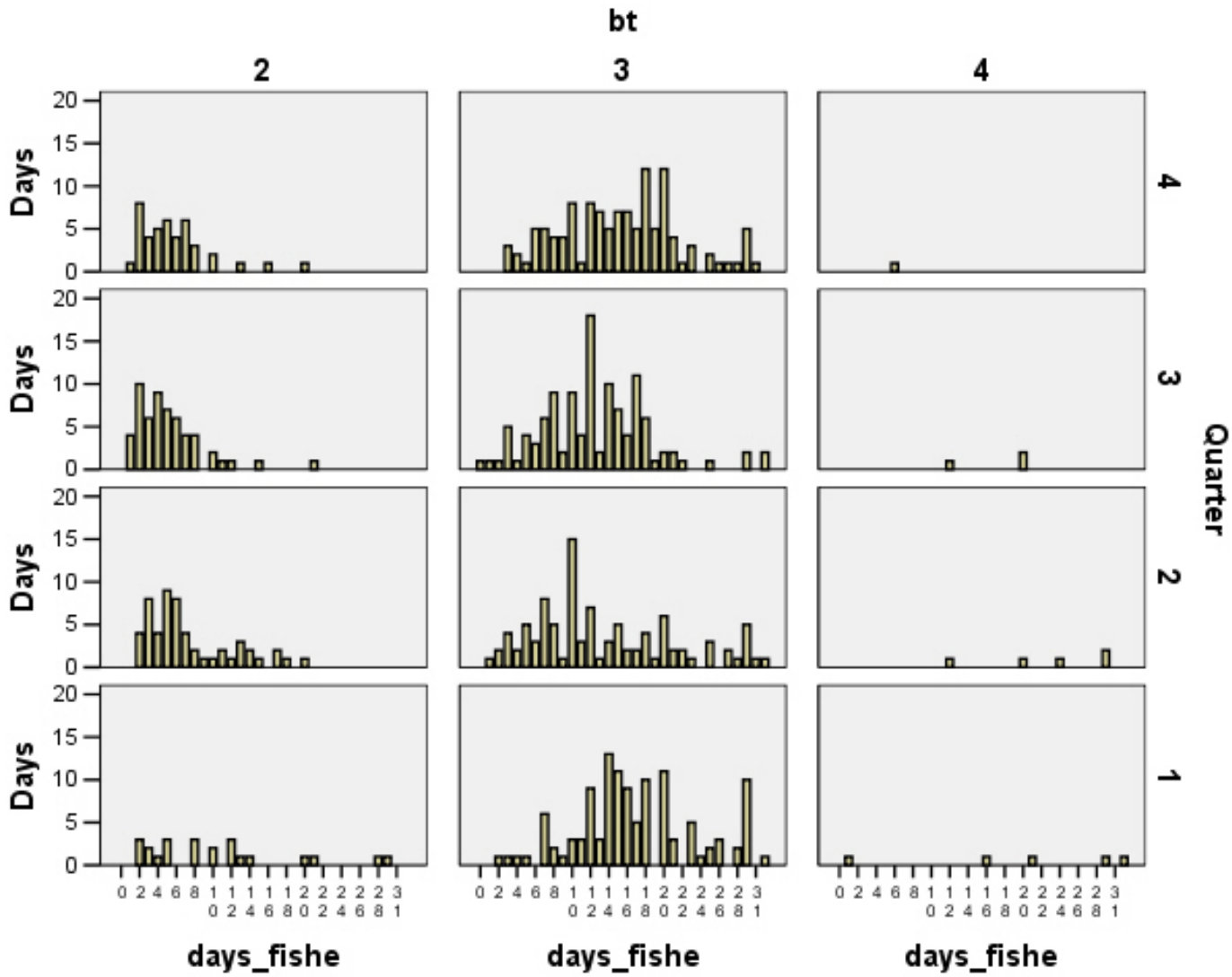
Monthly catches are summed to obtain the annual landings by boat category at a landing site.

RESULTS – NEGOMBO

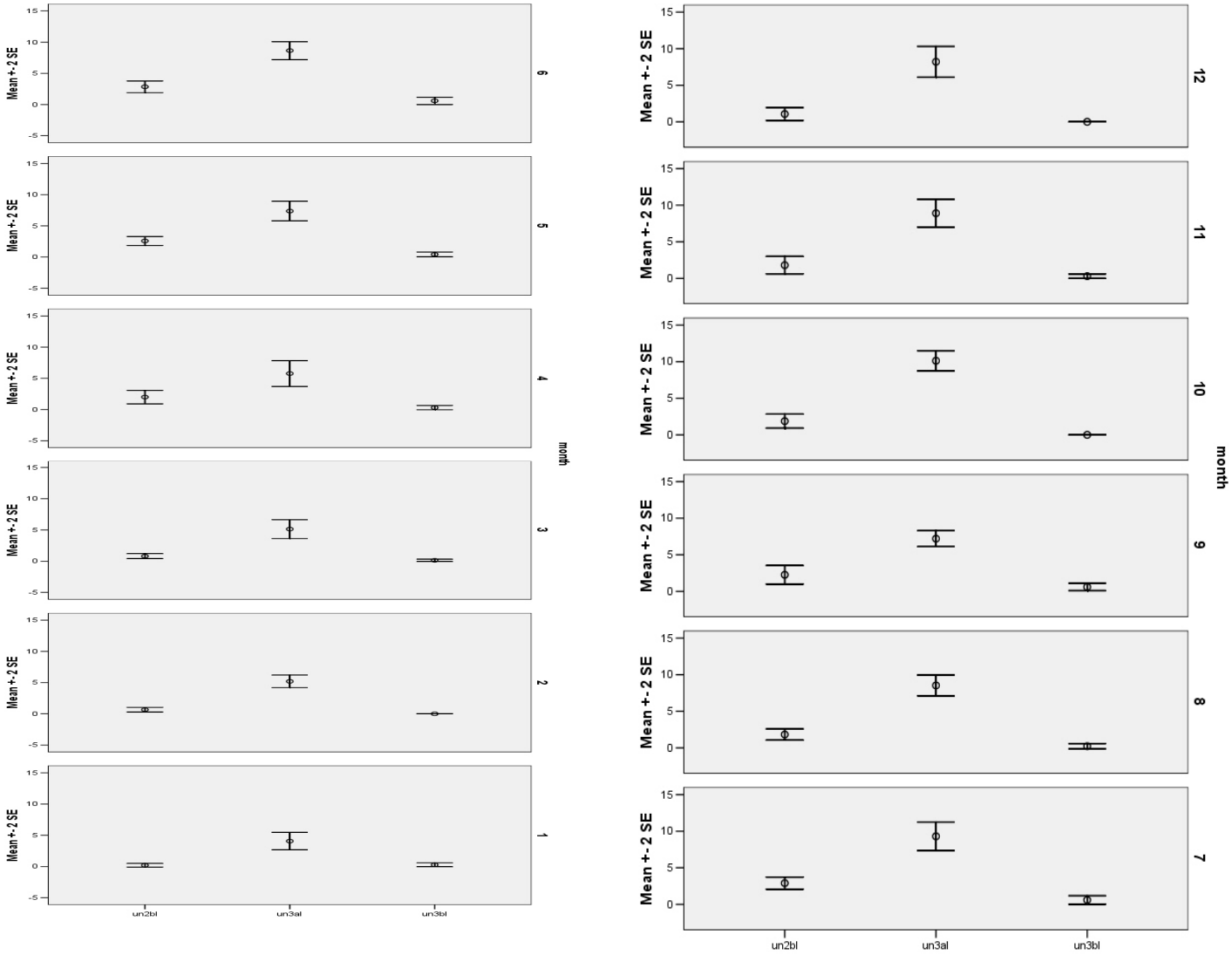
(A). Fishing Effort : Fishing days



(A). Fishing Effort : Fishing days (on quarterly basis)

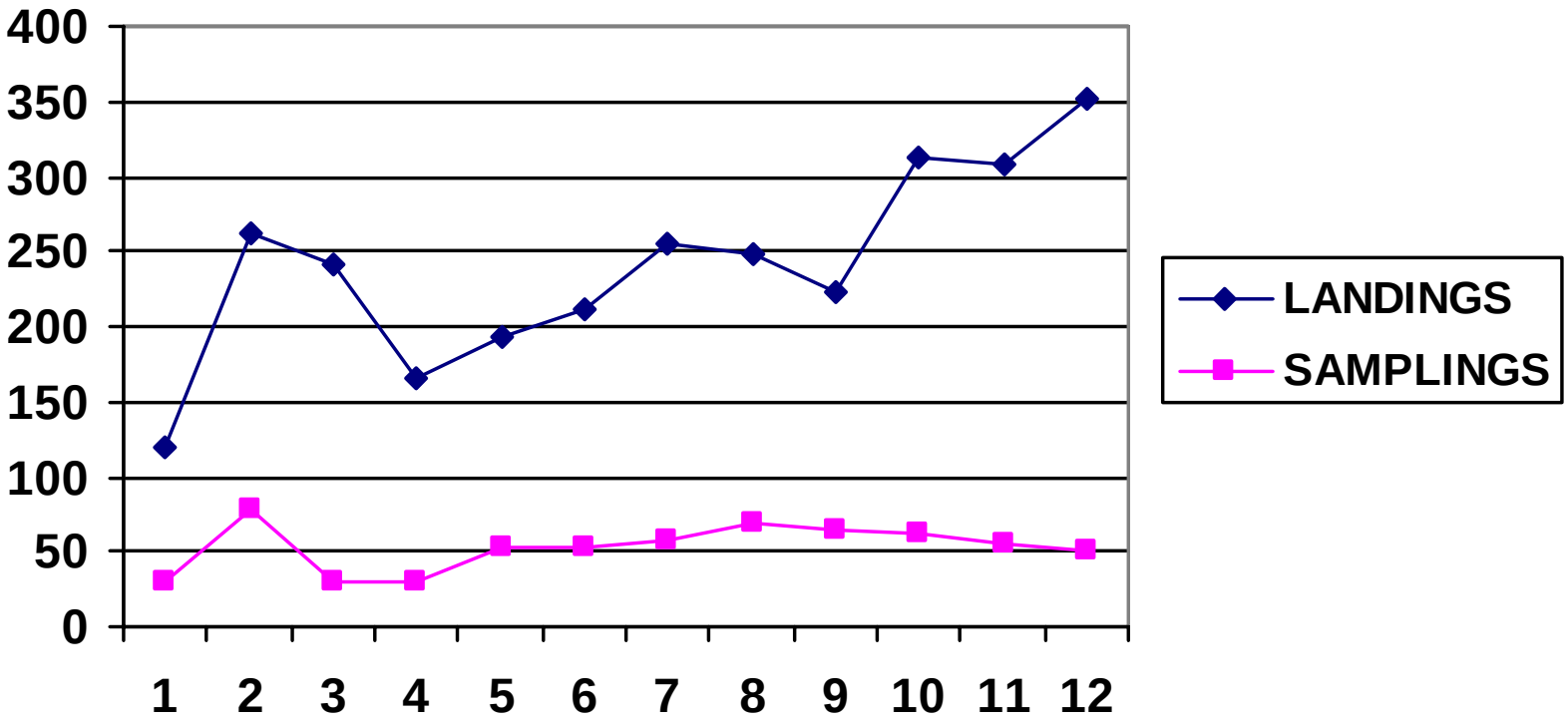


(A). Fishing Effort : Number of landings per day

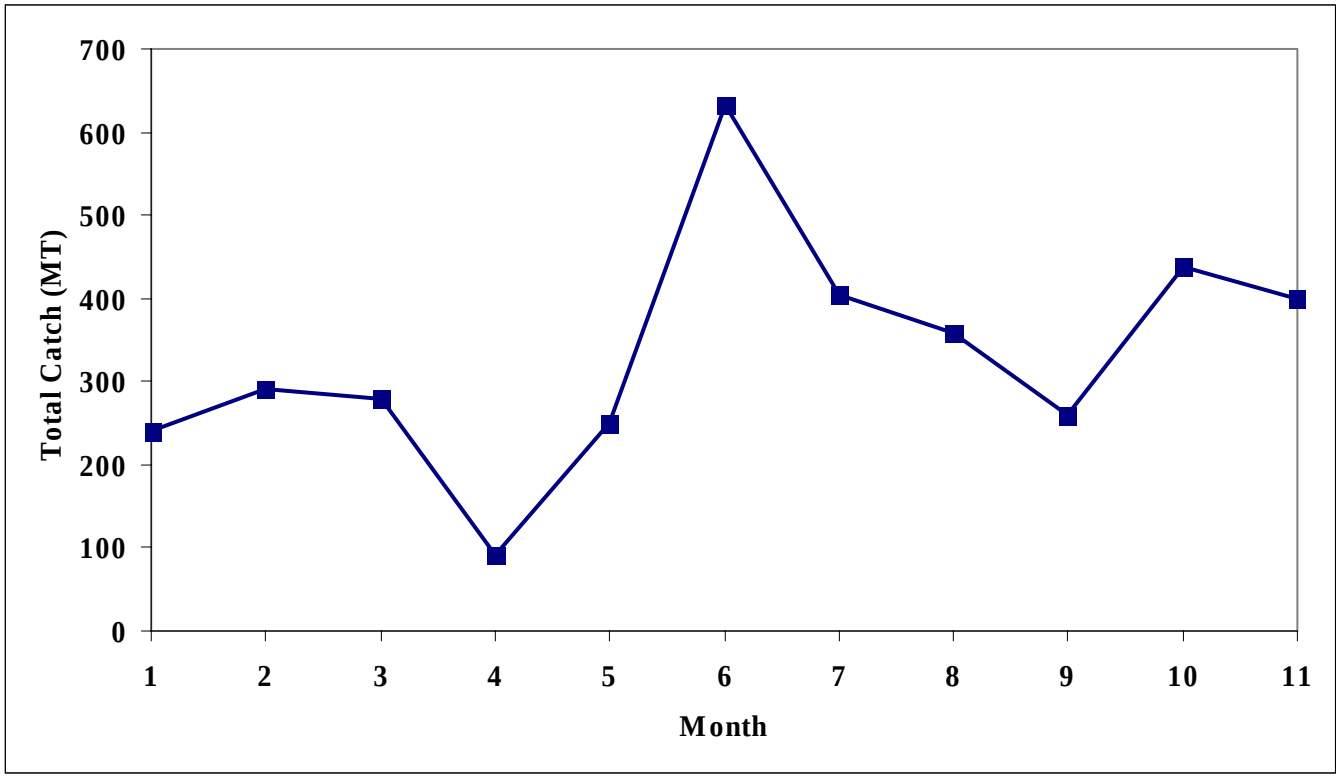


(A). Fishing Effort : Total landings vs. sampling

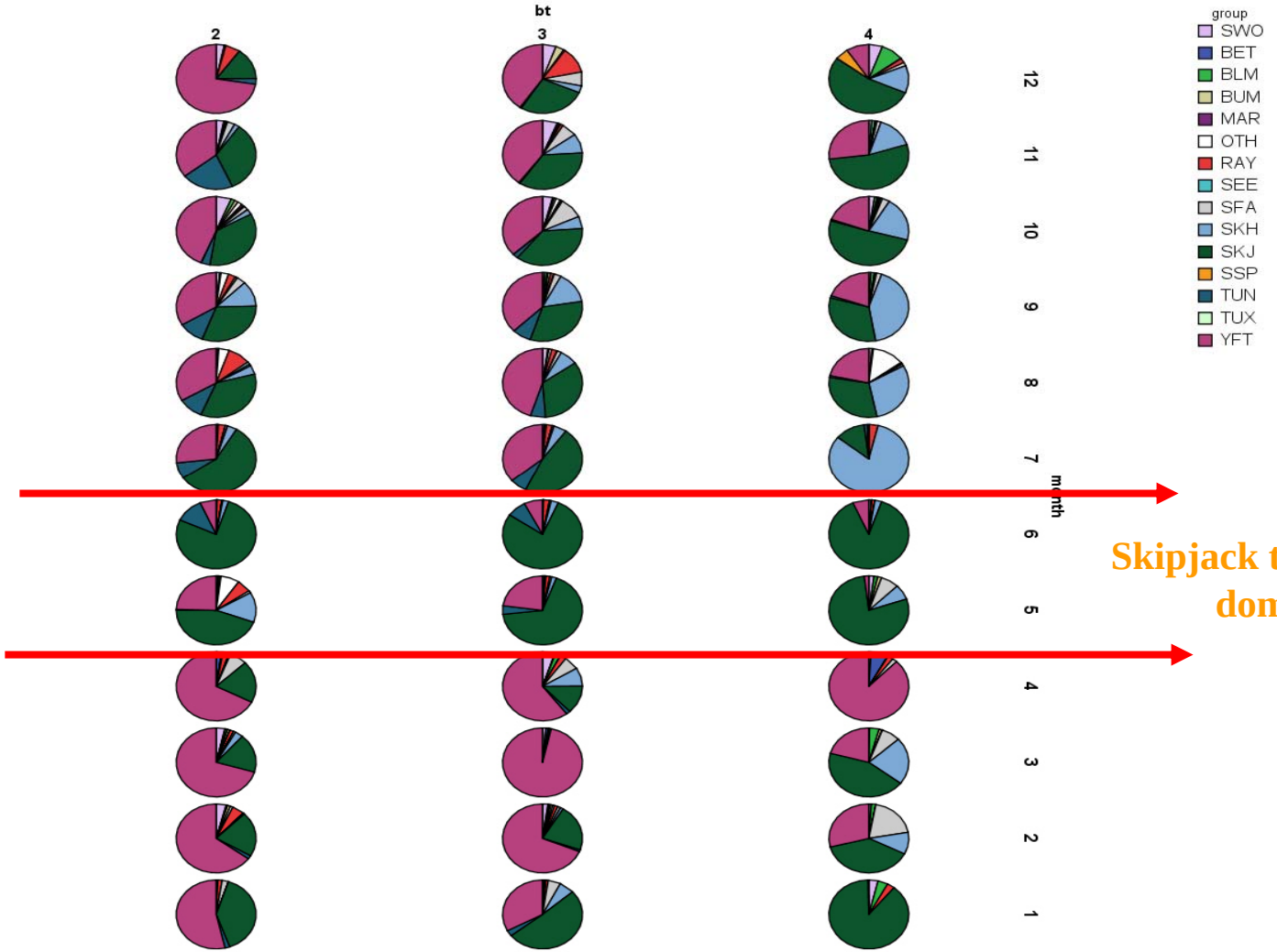
NEGOMBO



(B). Catch : Total Production

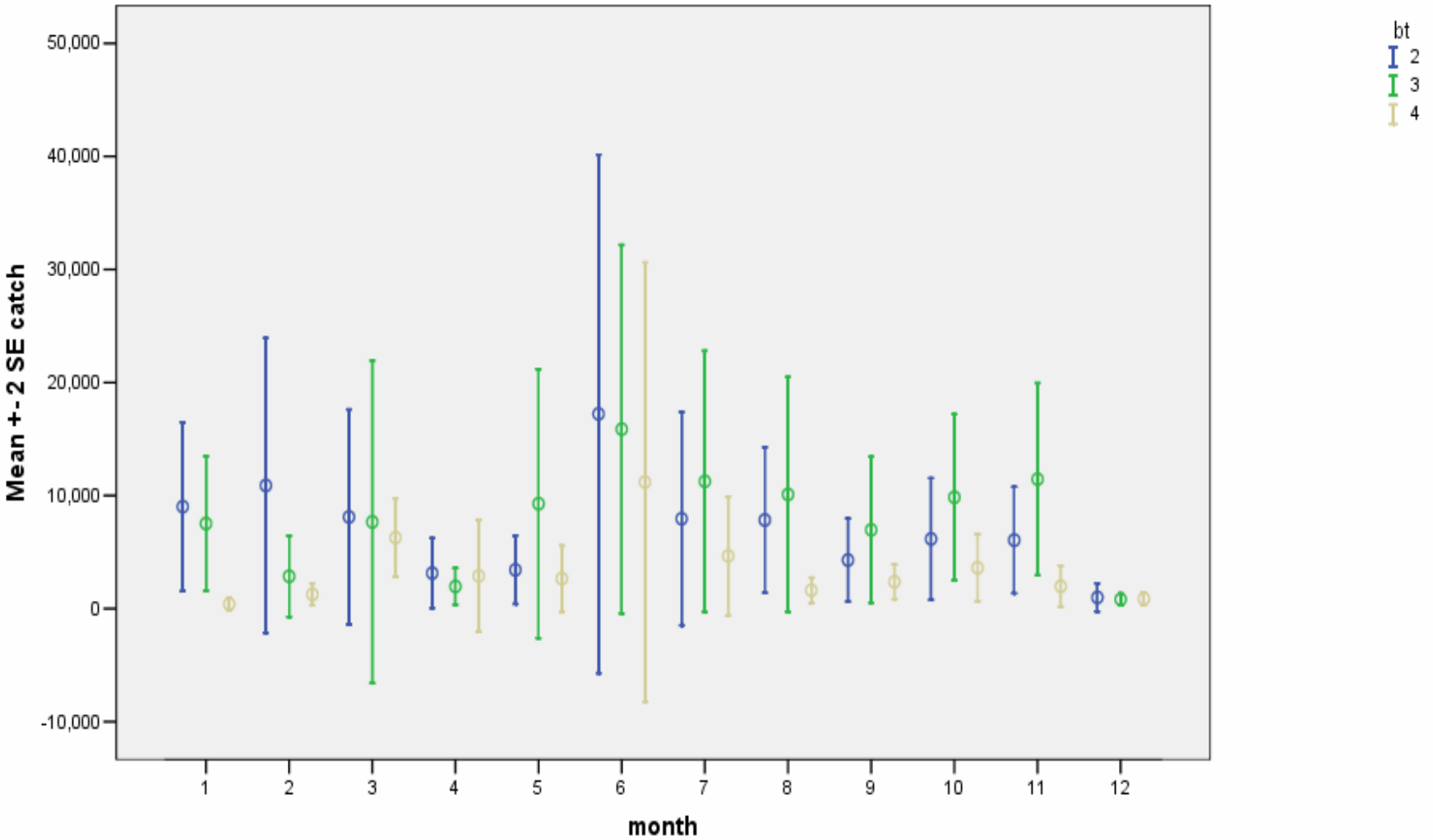


(B). Catch :Species Composition according to the fleet categories

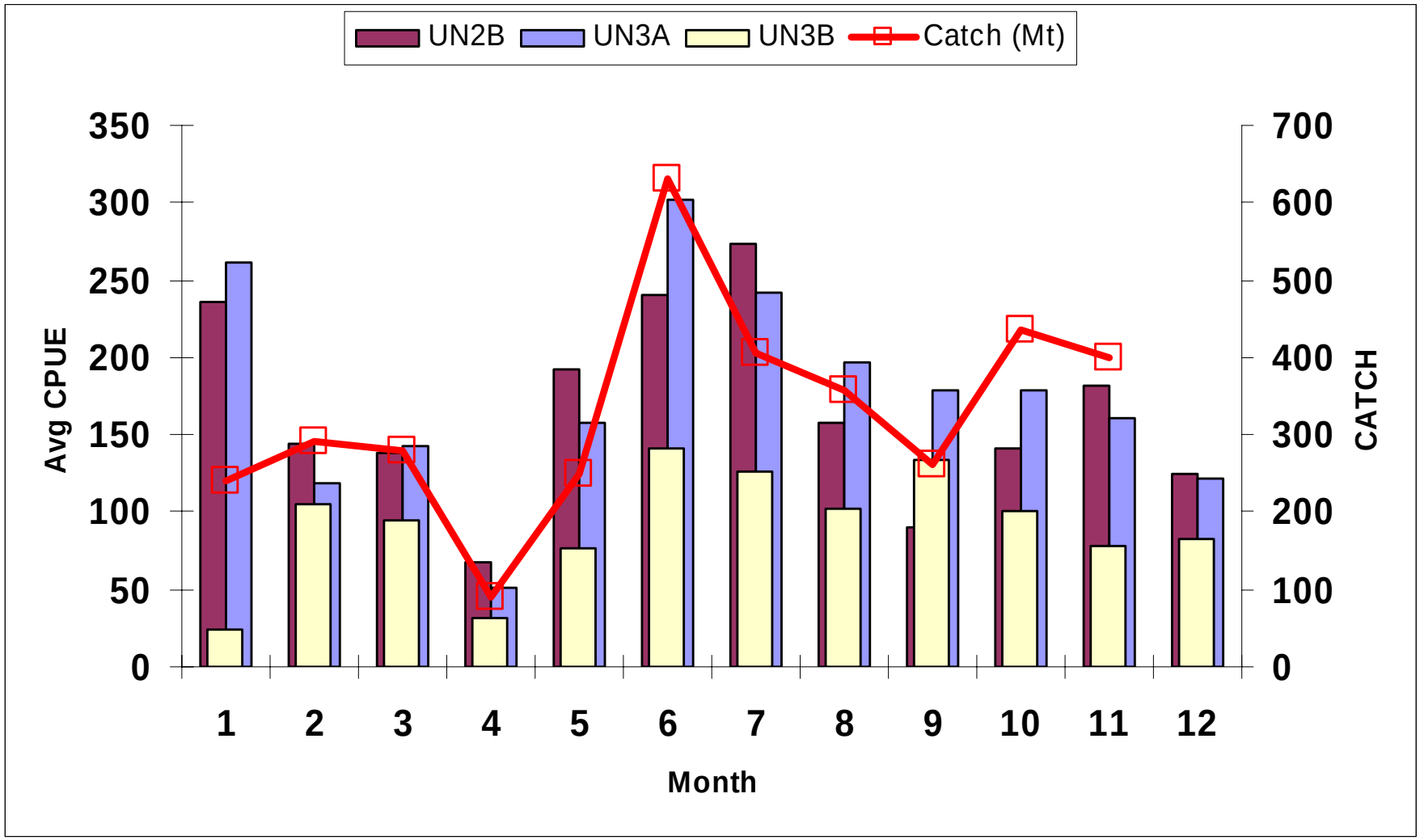


Skipjack tuna become dominant

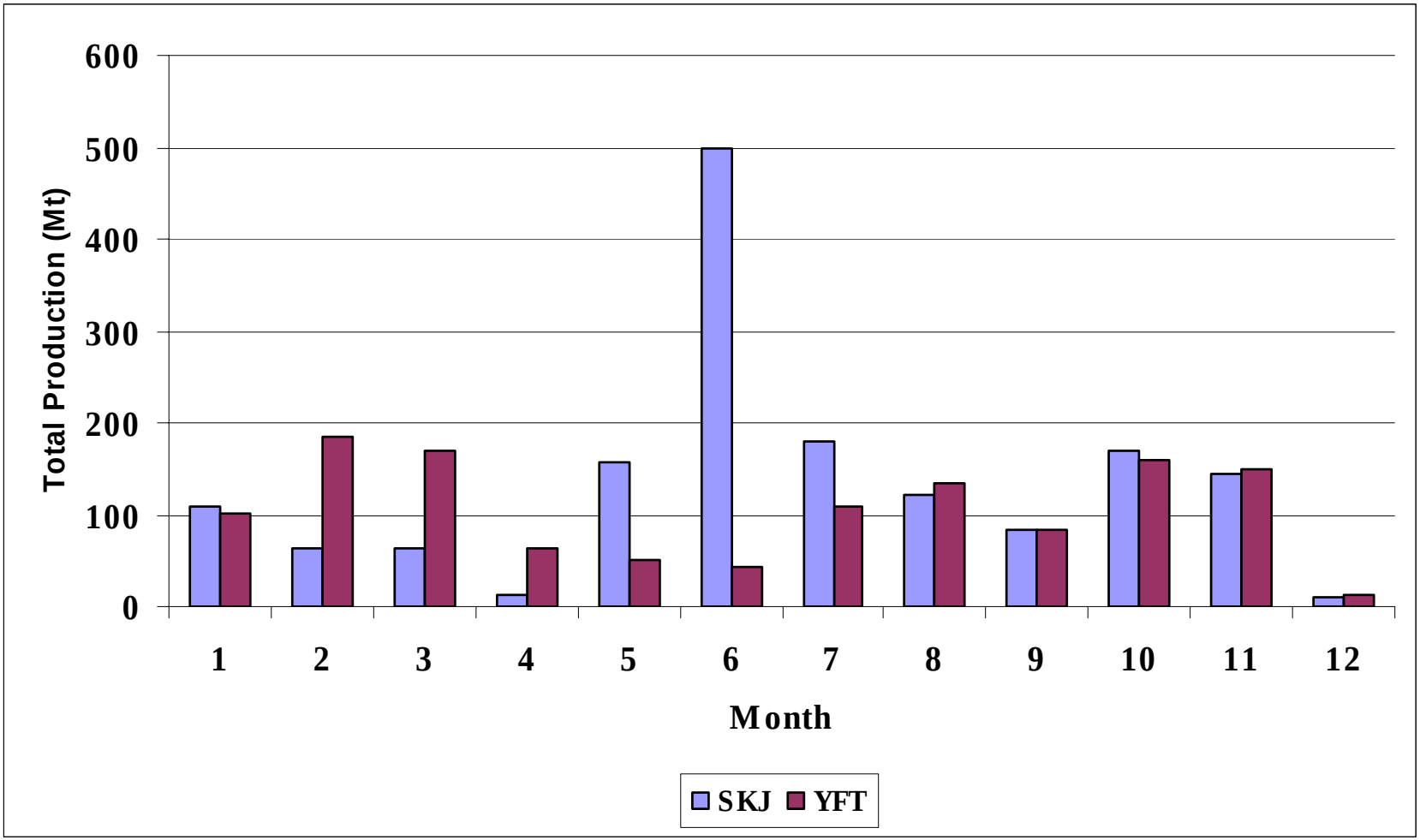
(B). Catch : Monthly catch per boat type



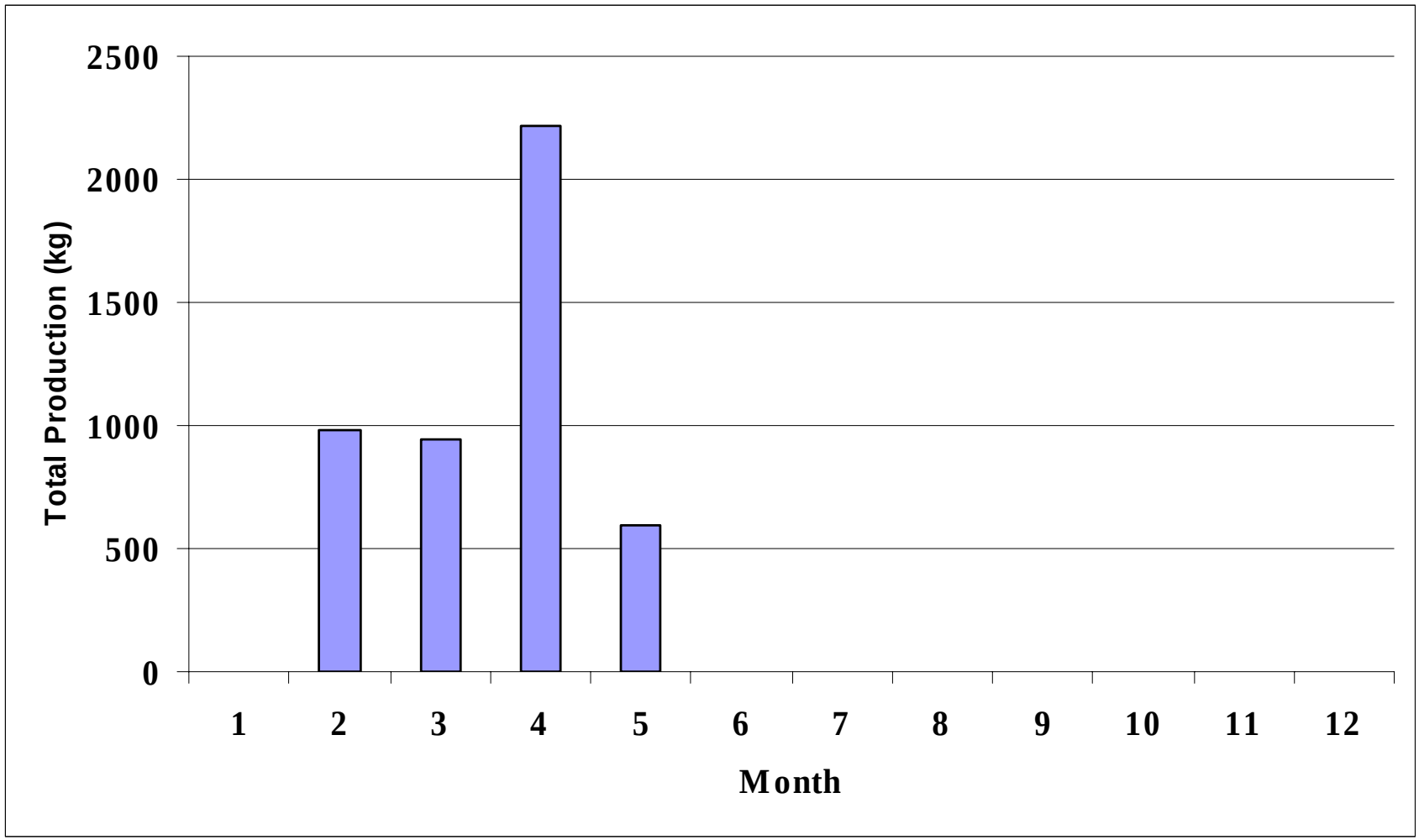
Monthly variation of total catch and average CPUE (Boat categories)



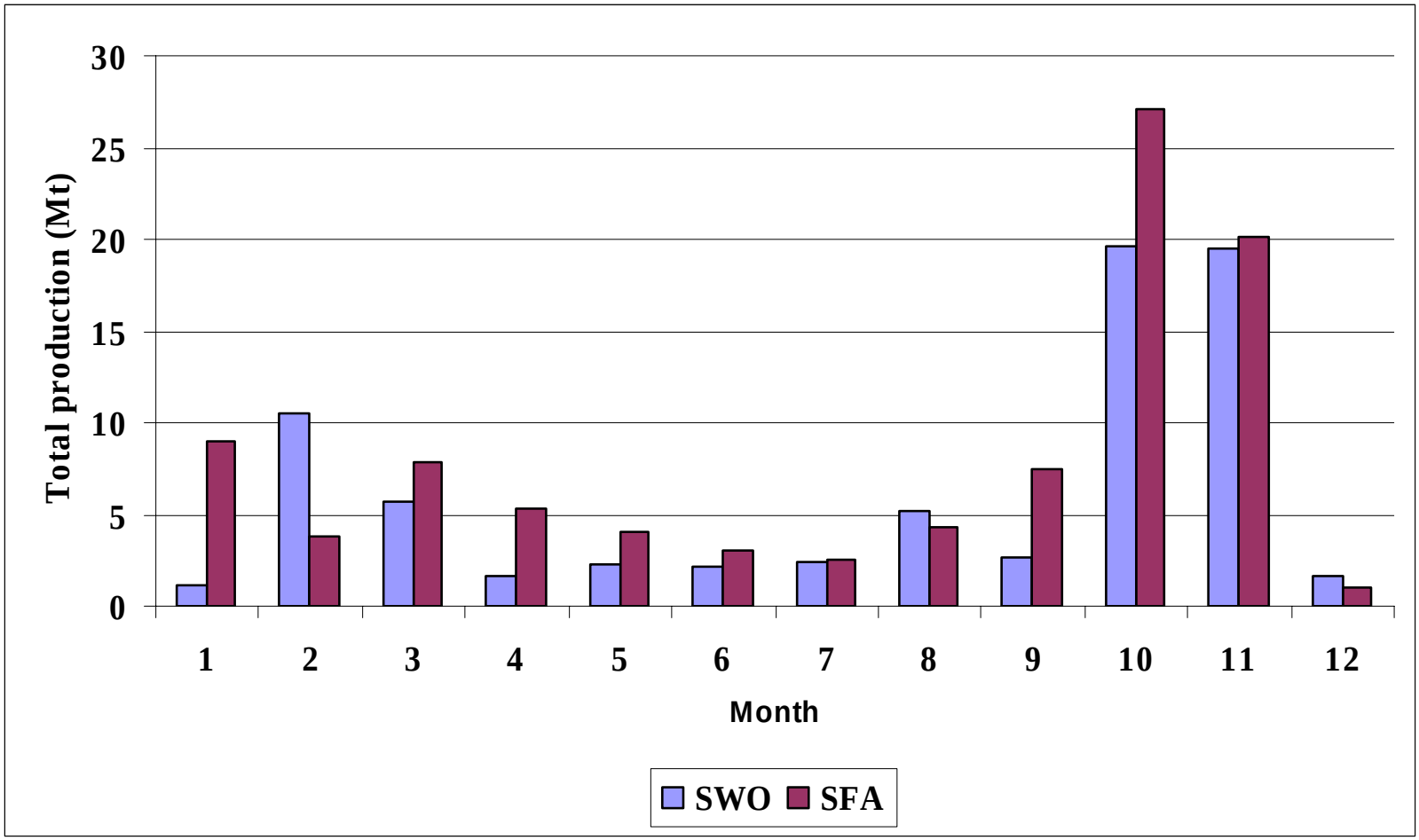
Total production of Skipjack & Yellowfin tuna



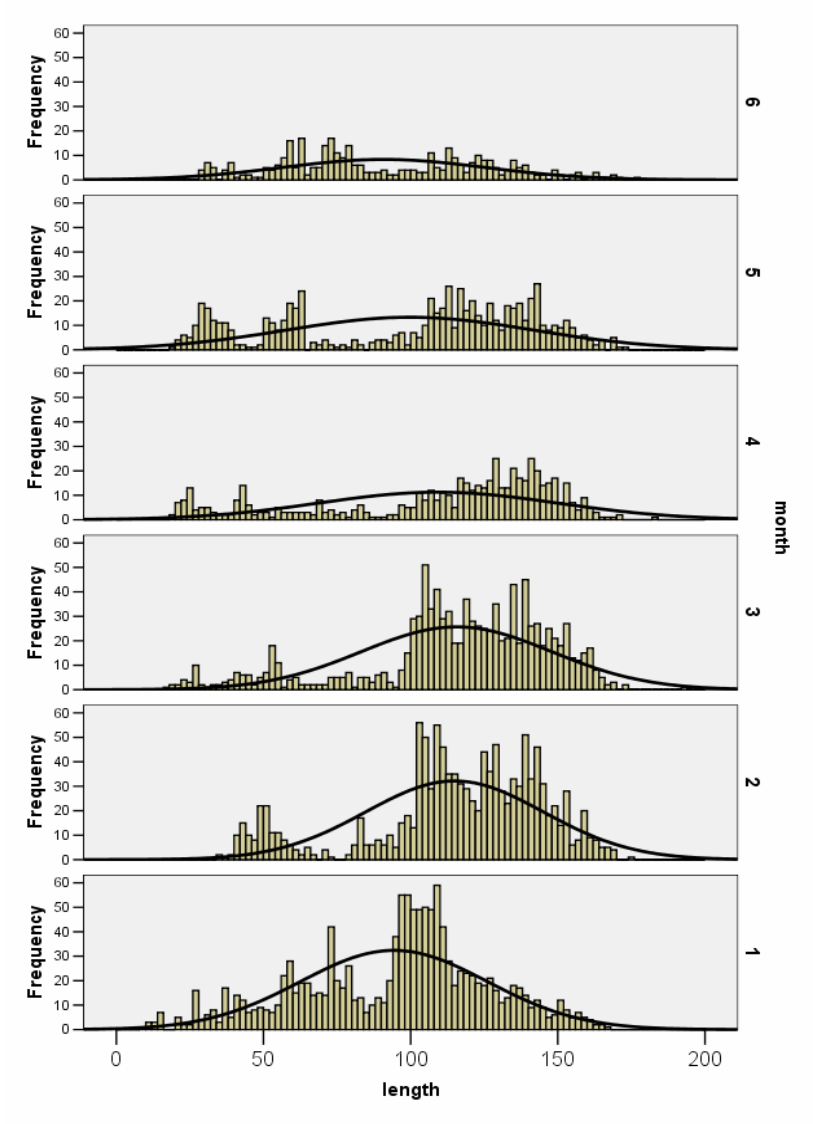
Total production of Bigeye tuna

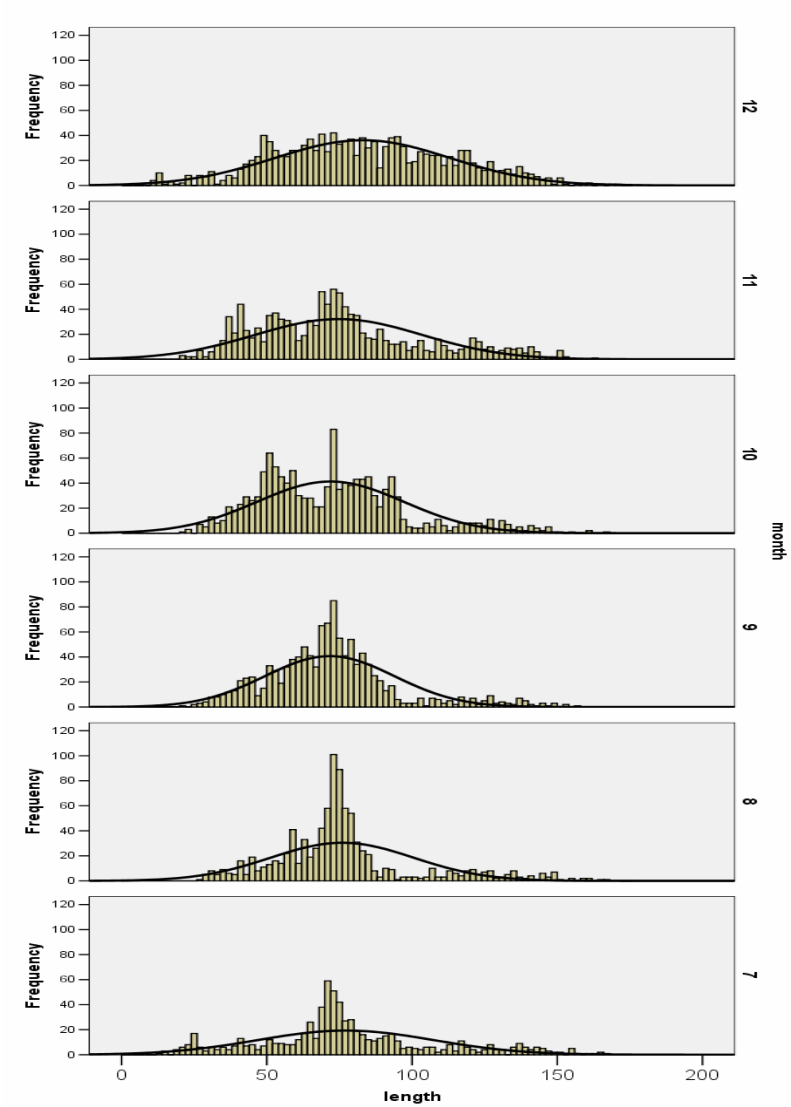


Total production of SWO & SFA

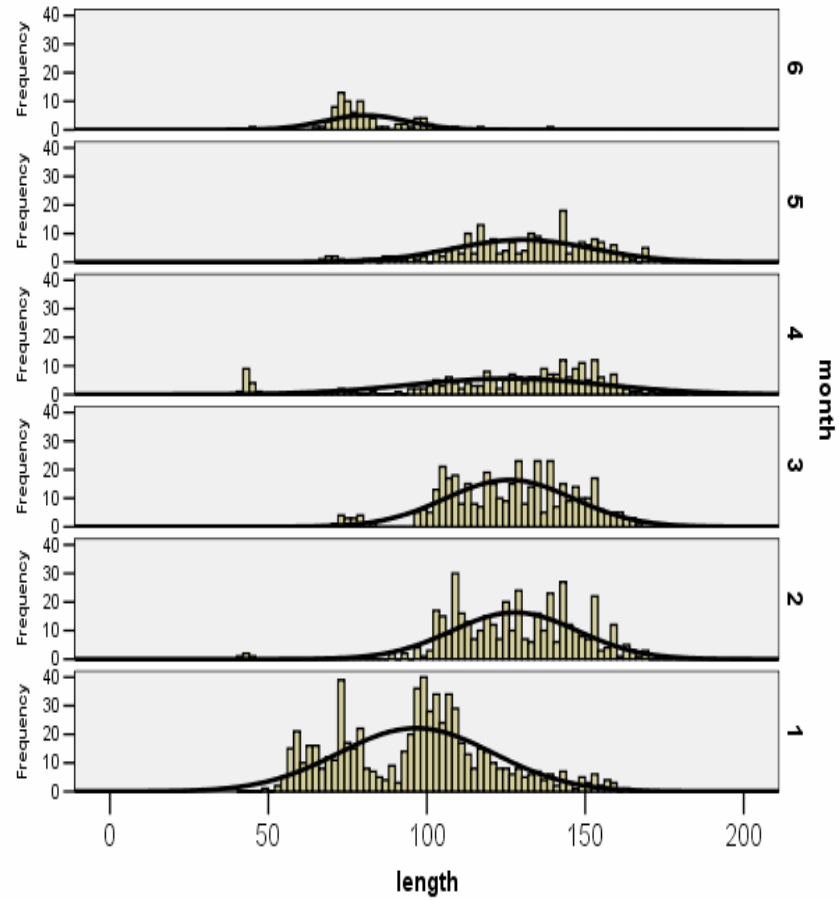


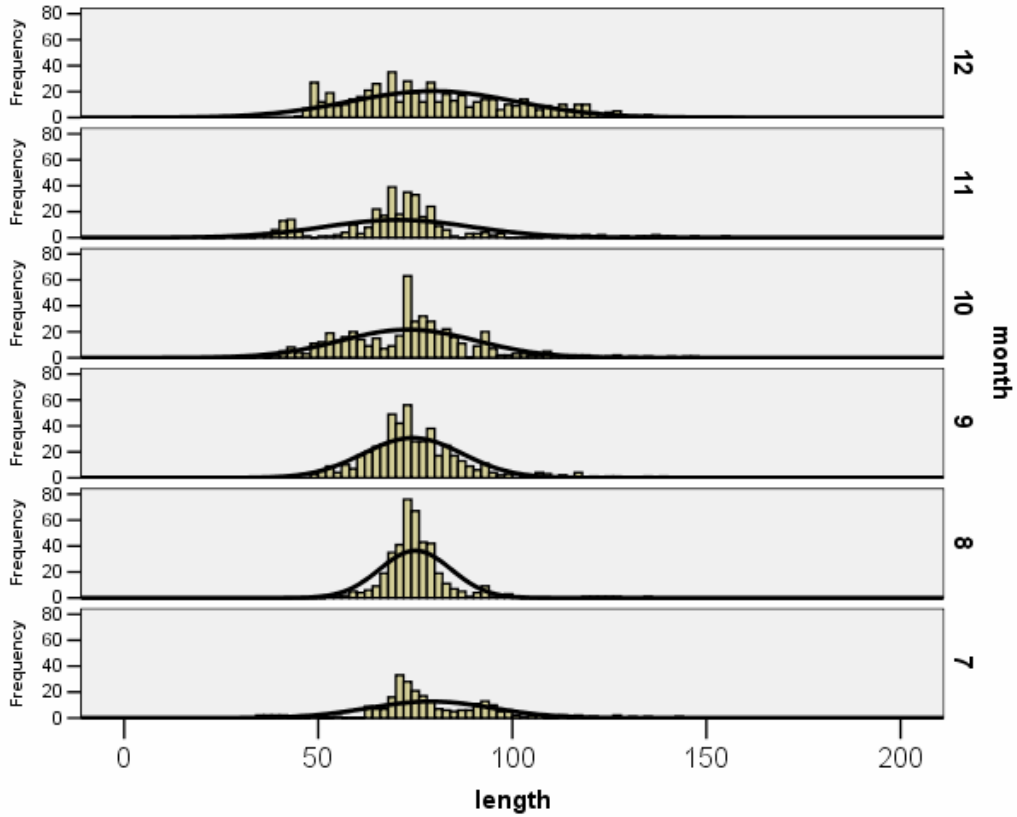
Size frequency distribution YFT





Size frequency distribution YFT (Negombo)





Constrains

- Partial landings
- Long landing hours
- Differences in landing time
- Ghost landings
- No information about the catch by gear type
- Non targeted species, incidental gear ect.
- No information about the fishing areas (Position)
- Landing sites are scattered
- Onboard processing – salted, gill and gutted

Problem : in raising factor specially for dry fish


GLE
DAEWOO MARINE ENGINE
POWERED BY
DAEWOO

Problems

In taking Biological measurements (Length)

Total number of fish landed

Constrains cont.

- Lack of adequate staff
- Motivation
- No information about the total number of boats
  - Started Sticker programme under the IOTC / OFCF programme


1401

THANK YOU