A Review of the Data Collection Systems in use in the British Indian Ocean Territory (BIOT) Fisheries Conservation and Management Zone (FCMZ) (Chagos Archipelago).

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1 Review of the BIOT Data Collection Systems

The data collection systems currently in use in the British Indian Ocean Territory (BIOT) Fisheries Conservation and Management Zone (FCMZ) consist of four components which together make up an integrated Fisheries Information Management System (FIMS) with smaller administrative components for the administration of vessel licensing, equipment management, market information and revenue analysis. This FIMS brings together all the different data collected from the fishery from vessel details, biological information on fish sampled by observers through to fish price information. The primary aim of the integrated system is to allow easier dissemination of both accurate and relevant information to each person involved in the management of the fishery.

These four main components are;

- Vessel registry and licensing;
- Logbook programme;
- Monitoring, control and surveillance programme;
- Observer programme.

The first point of entry for any vessel wishing to fish inside the BIOT FCMZ is to complete the BIOT Vessel Notification Form (See Appendix 1). This form must be accompanied by a colour photograph and copy of the International Tonnage Certificate for the vessel. After the vessel details have been checked the vessel is issued with a BIOT Notification Number that is unique to that vessel and is used by that vessel from then on, regardless of changes of name, callsign, nationality and owner. This system simplifies the process of licensing vessels as all the vessel details are already recorded, and all the applicant needs to submit is the BIOT Notification Number, the dates they wish to fish and details of the Fishing Master during the period of the licence.

A logbook programme for all fishing and support vessels was implemented with the declaration of the Fisheries Conservation and Management Zone (FCMZ) in 1991. The logbook programme has 100% coverage of the purse seine and longline fleets operating in the BIOT FCMZ, logbooks are issued before vessels have left port or on entry into the zone by the Senior Fisheries Protection Officer. These logbooks have undergone several modifications as the knowledge of the fishery around the Chagos Archipelago has grown. The current versions of the logbooks can be found in Appendices 2 (Longline - English version), 3 (Longline - Chinese version) and 4 (Purse seine).

In the first few years of the fishery there were problems with the level of logbook returns especially within the longline fleets. To rectify this situation two solutions have been implemented. The first was to provide a version of the longline logbook and accompanying notes in Chinese so that the Fishing Master on board a Taiwanese longline vessel would have no problem in understanding the logbook, the second was to incorporate a £500 refundable deposit into the cost of each longline licence. This deposit was refundable on completion of the longline logsheet for the licensed period to the satisfaction of the Director of Fisheries. Since these two solutions have been implemented longline logsheet returns have been close to 100% each year, much higher than the levels found in similar coastal states in the region.

There is a problem though with using logbook data as a primary data source in that there is a delay in receiving the data. Logbooks are not sent back to the BIOT Authorities until the vessel has returned to port. This can be from a matter of weeks for purse seiners up to several months for longliners. As up to date information on catch rates and numbers of vessels

currently operating inside the zone are required as part of the management of the zone, another source of data is required. These data are supplied as fishing vessel activity reports.

Before entering the BIOT FCMZ a fishing vessel must submit an entry report to the Senior Fisheries Protection Officer on the Fisheries Patrol Vessel detailing their BIOT notification number, licence number and proposed date, time and position of entry along with details of catch by species on board [2]. Activity reports for all fishing vessels must then be submitted on a daily basis. For purse seine vessels this consists of the current position, intended position at 06:00 (local) the next day and catch by species made that day. Longliners who often do not have the secure fax or telex communications of the purse seiners are only required to report their position on a daily basis. Longliner catches are reported weekly by fax to the BIOT Authorities. A similar report to the entry report must be given on exit from the BIOT FCMZ, detailing in addition to catch by species on board, the catch taken between the last catch report and departure.

A simple subtraction of the catches submitted in the entry report from those in the departure report gves the catch by species taken inside the zone for a particular fishing trip. The reported catch from the vessel activity reports should equal the catches recorded in the logbook and those in the daily or weekly reports of catch. A regular programme of boardings from the Fisheries Patrol Vessel (FPV) ensures that the information recorded is accurate and is kept up to date and also enables further instruction on completion of logbooks and radio reports to be given directly by the Senior Fisheries Protection Officer to the master of the vessel. This has been found to be a key element in getting accurate data.

All the data collected through the systems described above are entered, verified, stored and analysed by a suite of database applications that are being developed in Microsoft Access 97. A major upgrade to the current suite is currently under development to allow a higher degree linkage between the separate data sources to allow cross checking of information (e.g. radio reports vs logbook data) and to include desktop mapping via a MapX based ActiveX component into the system to provide simple catch and effort distribution maps within the database.

Through the use of the best currently available technology, data validation and quality control have been improved greatly over the past few years. Obvious errors in data entry are trapped within the individual data entry and editing forms of the database applications (e.g. making sure a set position is within a certain area or required information is not left unfilled). Other more surreptitious errors can be determined through more detailed error analysis routines within the applications for example in checking the catches in terms of both numbers and weight by species against a set domain of values for the smallest and largest fish expected, errors can be highlighted or by checking for patterns in data over a period of days it could indicate premeditated misreporting of catches e.g. all catches of a certain species for ten days all recorded at 10000 kg would be suspicious and can be flagged for checking against other data sources and hardcopy logbooks.

The suite of applications developed for the BIOT FIMS allows different views of the system to be provided to different users, therefore allowing simplicity of use to the end user and allowing other sensitive commercial data to remain concealed. For instance the application for use on the Fisheries Patrol Vessel by the Senior Fisheries Protection Officer is tailored to enable the SFPO to co-ordinate the monitoring, control and surveillance activities in the zone. This application provides the SFPO with all licensing information, vessel radio reporting data entry and editing facilities and forms for recording vessel boardings etc. The elements that are not required by the SFPO such as analysis of fish price information and length-weight relationship

[2] The same reporting formats for entry to and exit from the BIOT FCMZ applies to vessels on innocent passage, except callsign and vessel name are used for vessel identifiers instead of the BIOT notification number.

analysis do not appear in the application.

An example of part of the database structure is displayed in Figure 1, which shows the structure relating to the vessel registry module of the BIOT FIMS.

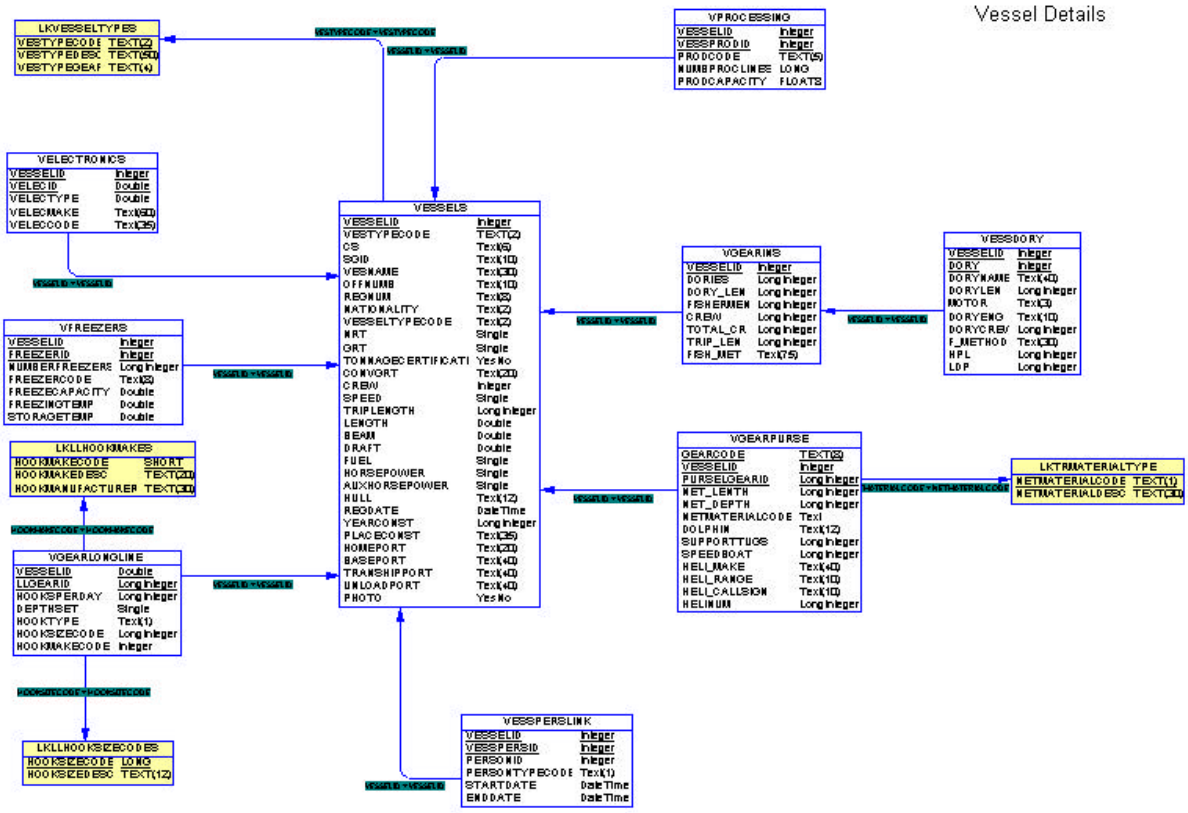

Figure 1 Physical data model of the Vessel Registry Module of the BIOT FIMS.

A vessel monitoring system is currently under development for the BIOT FCMZ, with administration of the system to be conducted in London and on board the Fisheries Patrol Vessel. The system will be integrated with the BIOT FIMS to allow accurate position information of vessels to be collected and identification of fishing activity through analysis of vessel movement patterns. The position information will then allow immediate cross-checking against vessel activity reports and later against logbook data.

2 Estimation of Nominal Catch and Effort

Estimates of the nominal catch by species and gear type for the BIOT FCMZ are calculated from the commercial logbook returns. Typically in fisheries data collection logbooks have not been regarded as the best source of data for estimation of true catch and effort, without a high degree of groundtruthing. This has in part been due to the structure of licencee fee payments. The licence fee paid by a vessel for the right to fish in an EEZ is often dependent to a high degree on the amount of fish caught. At an early stage in the development of the BIOT licensing regime after the declaration of the FCMZ in 1991 it was decided that this method of licensing was inappropriate for the tuna fisheries in the BIOT FCMZ as there would be difficulties in checking the true level of catch taken in the zone, without adding the great expense of 100% observer coverage. Licensing of both longline and purse seine vessels is now carried out on the basis of licensing of a vessel for a period of time. No catch limitations are imposed.

The BIOT Authorities believe that the logbook data received under this system give an accurate picture of the fisheries within the BIOT FCMZ, and verification against other independent data sources such as vessel boardings radio reports and observer logbooks supports this belief.

For the small number of vessels that do not return a part or whole set of logbooks for a period, the missing catch and effort is estimated from the previous mean performance history of that particular vessel where available and / or the mean performance of the vessel's national fleet for that particular time period.

3 Catch by time-area strata

Due to the census nature of the primary data collection source (longline and purse seine logbooks) we have an almost complete dataset for each set made down to time set and position in degrees and minutes. These data are verified by cross-checking against catch and effort data from the observer programme and against radio reports made to the Fisheries Patrol Vessel. These radio reports state the total catch on board each fishing vessel on entry and exit into the BIOT FCMZ and are checked by the Fisheries Officers during their routine boardings during the fishing season. No major differences have yet been found between the independent data sources.

Due to the nature of the British Indian Ocean Territory, no landing or transhipment sites are available. Therefore no port sampling is possible. Mechanisms for the collection of transhipment data are in place but no transhipment has taken place inside the BIOT FCMZ during the period 1991 - 1999. The BIOT transhipment logsheet can be found in Appendix 6.

For the past six years the BIOT Authorities have funded an observer programme, consisting of a minimum of two observers deployed for three months to cover the main purse seine season (December - January). This has developed over the past six years with the benefit of experience in the fishery. The BIOT observer programme attempts to split the total observer time equally between the longline and purse seine fleets , with the time within the fleets being split between nationalities licensed, (e.g. 25% French purse seiners, 25% Spanish purse seiners, 25% Taiwanese longliners and 25% Japanese longliners).

The observers employed for the BIOT tuna fishery have a combination of skills, from fisheries experience, often to Masters degree level, previous employment as fisheries observers or fisheries officers and experience in commercial fisheries. This is quite important as the scope of work they are expected to cover is quite wide and requires some degree of flexibility.

A typical workplan for a BIOT observer tour would involve the observer recording details of the operations of fishing vessels including, *inter alia*;

- Duration of search and patterns of search employed.
- Position and duration of purse-seine setting and hauling, and FAD deployment and retrieval.
- Position, duration, pattern and other characteristics (including description of the fishing gear and bait) of the longline setting operations.
- Catch weight of target species for each set.
- Information on observed and calculated conversion factors
- Weight of discard and by-catch species for each set.

- The distribution of fish and other species on individual longlines, through the counting of hooks during the hauling process.

- General fishing practices and fleet movements.

- Climatic and oceanographic information.

The types of biological data collected by the observer programme are described in Section 4.

The observers worked in three hour shifts in order on longline vessels to survey the entire haul (up to 16 hours duration). This enables a complete and unbiased survey of all target tuna and by-catch species and allowed accurate comparison of the observed catch data with the catch figures obtained from the captain of the vessel. The temporal distribution of the catch through the haul tends to be sporadic and an incomplete survey would lead to survey biases.

During longline hook surveys, individual hooks, buoys, floats and transponders were noted and their relative positions recorded. The hook number was recorded, as was the hook number and type of any remaining bait. The observers surveyed hooks in 3 hour shifts. In practice it is easiest to count hooks as they are unclipped from the mainline rather than as the hooks come aboard. This is because the order of hooks can become confused during the hauling process and lines with fish take longer to haul.

Effort units currently in use in the BIOT FCMZ are kept relatively simple. For the purse seine fleet effort is measured in days fishing. This includes all days spent actively searching for fish inside the zone as the act of searching for fish is regarded as a fishing activity under the BIOT legislation. Longline effort is measured in both days and hooks set. For measurement of catch rates the simple catch per day (MT day^{-1}) is used to compare vessels and fleets, and where more detailed observer data are available catch per hook (CPH) and catch per hook hour (CPHH) are also used. Hooking rates are also measured by observers where full hook surveys have been conducted.

A set of database routines to analyse and compare observer catch composition and vessel catch composition are under development. These routines will provide conversion factors to be used over the fleet to return corrected species compositions. The misidentification of species within the BIOT FCMZ is restricted to those purse seine vessels fishing using FADs where juvenile yellowfin and bigeye tunas are classified as skipjack tuna on a size basis only.

Work is currently in development between the BIOT Authorities and the Seychelles Fishing Authority on the development of a ranking index for the purse seine vessels currently operating in the Western Indian Ocean. The index will represent the fishing efficiency of a

4 Size frequency and other biological data

For the purposes of the longline and purse seine fisheries inside the BIOT FCMZ yellowfin tuna (*Thunnus albacares)*, bigeye tuna (*Thunnus obesus*) and skipjack tuna (*Katsuwonus pelamis*) are considered to be target species. All other tuna, tuna-like species and billfish retained as part of the catch are considered by-catch species, with all other species of fish are considered discards.

The following define the scope of the biological sampling of the BIOT observer programme :

- Measurement of the length individuals of target species from representative samples of the catch.

- # Collection of data to determine length-weight relationships for target species.

- # Identification of sex, sexual maturity and, where possible, stomach contents of the target species and other identified species.

- # Collection, where possible, of otoliths, scales or other material for the determination of the age of individual fish of the target species and other identified species. [3]

- # Collection of length-frequency and other data, as appropriate, on discard and by-catch species.

- # Information on by-catch of sea-birds and marine-mammals.

- # Analysis of the differences in length-weight, length-frequency and species composition of catches under FADs as compared to free schools.

During the observer programme on longline vessels all target, by-catch and the majority of discard fish were measured for curved fork length - the length from the tip of the lower jaw with the mouth closed to the tail fork, along the lateral line of the fish. All measurements were made to the nearest 0.5cm using a flexible plastic measuring tape. Weight measurements were made for all the target tuna and by-catch species and where possible, for discards. Weights were recorded for the target tuna species both before and after processing, the latter being a record of the captain's figures for accurate calculation of vessel's conversion factors. Fish were weighed using 10kg and 100kg scales. For fish over 30kg, it was normal practice to use a cradle or a strop which was pre-weighed to obtain an accurate figure. Vessel's scales were used after verification using the observer's scales.

In order to compare the vessel's records of catch, by-catch and discards with the actual observed catch, the master's dressed weight (processed weight) were converted to green weight (live weight) using conversion factors determined by previous observer programmes.

Data collection on purse seiners must be carried out in a different manner as the fishing deck can become extremely hectic during the brailing operation and an observer measuring fish may obstruct proceedings and be in danger from machinery and cables. Hence the collection of most biological data is best performed within the factory. The exception is for discard species which are often thrown onto the fishing deck where they can be examined after the brailing procedure and before they are returned to the sea.

Prior to brailing discussions are held with the officer in charge of factory operations to discuss intentions and to arrange measuring apparatus. With a maximum time period of one to two hours available for data collection, prior organisation and an efficient system are required in order to gather the maximum amount of data in this short time period.

Fish are randomly sampled from the conveyor belt before they reach the brine tanks, although every effort is made to sample as many fish as possible. The conveyors are not used for filling the tanks furthest aft, instead these are filled directly from the chute. Under these circumstances fish can be taken for measurement by manoeuvring the tank cover to interrupt the flow of fish and divert some to the factory floor, thereby removing any bias that could have been introduced by sampling from different brails in a single set.

[3] The 2nd dorsal spines from swordfish sampled during the BIOT observer programme are retained and are sent to the Seychelles Fishing Authority as part of an ongoing investigation of the swordfish in the Seychelles EEZ.

From these data length frequency distributions by gear type and length-weight relationships have been determined for all the main target and by-catch species caught in the BIOT FCMZ. See Appendix 5.

Sex and maturity data is taken for all target tuna species and swordfish on longliners and purse seiners according to the following scale.

Stage		Description
i	IMMATURE	Sexual organs very small, situated close to the vertebral column. Testes and ovaries transparent, colourless or grey straight ribbon
ii	RESTING	Testes translucent, grey-red. Gonads approximately ½ length of ventral cavity. Outer edge starting to become pleated/frilly. 1 or 2 capillaries present. Ovaries colour, length and presence of capillaries as for testes. No eggs visible.
iii	EARLY DEVELOPING	Sexual organs opaque, reddish with a network of blood capillaries. Testes heavily frilled, no milt present. Ovary has a few eggs visible.
iv	LATE DEVELOPING	Sexual organs occupy 2/3 of the body cavity. Testes reddish-white. No milt produced under pressure, although visible (may be necessary to cut open to ascertain presence). Ovary orange-red. Eggs clearly discernible.
v	RIPE	Sexual organs fill ventral cavity. Testes extremely pleated. White and full with drops of milt produced under pressure. Ovary with eggs completely round, some already translucent and ripe.
vi	RUNNING	Testes – milt runs freely when slight pressure applied. Ovary – roe runs freely when slight pressure applied.
vii	SPENT	Testes purple/red, not completely empty. Ovary purple/red, not completely empty. No opaque eggs left in ovary.
viii	RECOVERING SPENT	Testes red and empty. Ovary red and empty. A few eggs in state of resorption.

Studies on the development of tuna gonads have used a maturity scale based on gross morphological criteria. These may vary considerably and distinction between stages is often subjective. It is noted here that testes in tuna species are smooth and not pleated.

5 Fishing Craft Statistics

All fishing vessels wishing to obtain a licence from the BIOT authorities must first complete a Fishing Vessel Notification Form (See Appendix 1). The data on the form must be kept up to date and any modifications made to the vessel must be notified to the BIOT Authorities within 30 days.

In summary the following basic information is collected for each fishing vessel ;

Vessel name, International Radio Call Sign, Country of Registration, Registration Number, Vessel Type, Construction (Year and Place), Hull, GRT and Convention used to calculate GRT, Length (m), Main Engine (hp), Fuel Capacity, Storage / Freezing Capacities, Vessel Communications and Contact details for owners, agents and charterers.

In addition a wide variety of information is collected depending on the vessel type. For example longliners are required to supply the average number of hooks per day that they will typically set, purse seine vessels must supply net dimensions and if they have a helicopter on board.

6 Transhipment and Landings

Data collection mechanisms for transhipment have been set in place. All transhipments must be carried out under a separate transhipment licence issued by the BIOT Authorities. Information is collected on the discharging and receiving vessels (both of which must have been previously notified with the BIOT Authorities), the date and position of the transhipment and transhipment weights by species. (See Appendix 6).

However due to the nature of the Chagos Archipelago, there is neither a domestic harbour (and therefore no landings) nor alternatively a safe deep water anchorage available where vessels would wish to tranship. Hence no transhipment or unloading have been recorded since 1991.

7 Information on By-catch and Discards

7.1 Longliners

The logbook covers the main by-catch species (albacore, swordfish, sailfish and marlins) recording numbers caught and total catch weight for each species, with other species and sharks being recorded in numbers only as it is unlikely that these will be weighed on board. The recording of by-catch is especially important for the BIOT longline fishery as the average percentage by weight of these species is typically between 10% and 20%. This information is recorded by nearly all longline vessels completing logbooks. As the refund of the logsheet deposit is dependent on the logsheet being completed to the satisfaction of the BIOT Director of Fisheries, we have found that the by-catch species columns on the logbook are completed correctly much more often now than in previous years, and only vessels new to the fishery tend to not to complete this information.

The observer programme verifies the logbook figures for by-catch and also allows for length, weight, sex and maturity for the main by-catch species to be recorded. Discards are difficult to measure on longline vessels due to the nature of the operation many discarded fish being released from the line by either shaking the line before the fish is landed or by simply cutting the line The longline hook surveys conducted as part of the observer programme will record these fish often by species where other sampling techniques would not. The hook surveys therefore provide invaluable information on the actual hook saturation rates taking into account by-catch species and also on the temporal and spatial catch distribution along the line.

7.2 Purse Seiners

The purse seine logbook has a column to record by-catch and discard species on a set by set basis. However, this is not completed very often as the catch estimation is not done on deck but as the fish are being transferred to the hold. Discards are removed at this time and often make up such a small component of the catch that they are just ignored. Only large individual fish such as sharks and manta rays are recorded or where a FAD set has brought in a large number of smaller species associated with the FAD such as the frigate tuna *Auxis thazard* and the rainbow runner *Elagatis bipinnulata*.

Discards, as mentioned in Section 4, are thrown out of the way of operations onto the fishing deck during the brailling process, before being returned to the sea. During this delay the discards can be sampled by observers for length, weight, sex and maturity.

The 1996/97 and 1998/99 BIOT observer programmes investigated the by-catch and discards in relation to FAD and free sets as little information could be drawn out from the logbooks. The

sets made on free schools showed a discard rate of well under 1% for both years. However, sets made around FADs were shown to have discard rates of around 10% by weight due to the high proportion of small tunas and undesirable species taken from around the FAD.

8 Fleet Activity Patterns

8.1 Longliners

During the period 1993 to 1996 there were two distinct periods of activity within the longline fleet operating within the BIOT FCMZ. The first peak of activity occurred between July and September, with a second more pronounced peak of activity during the period November - January. In the past few years however the second peak of the season has become more extended with longliners operating in the BIOT FCMZ into March and April. (See Figure 2).

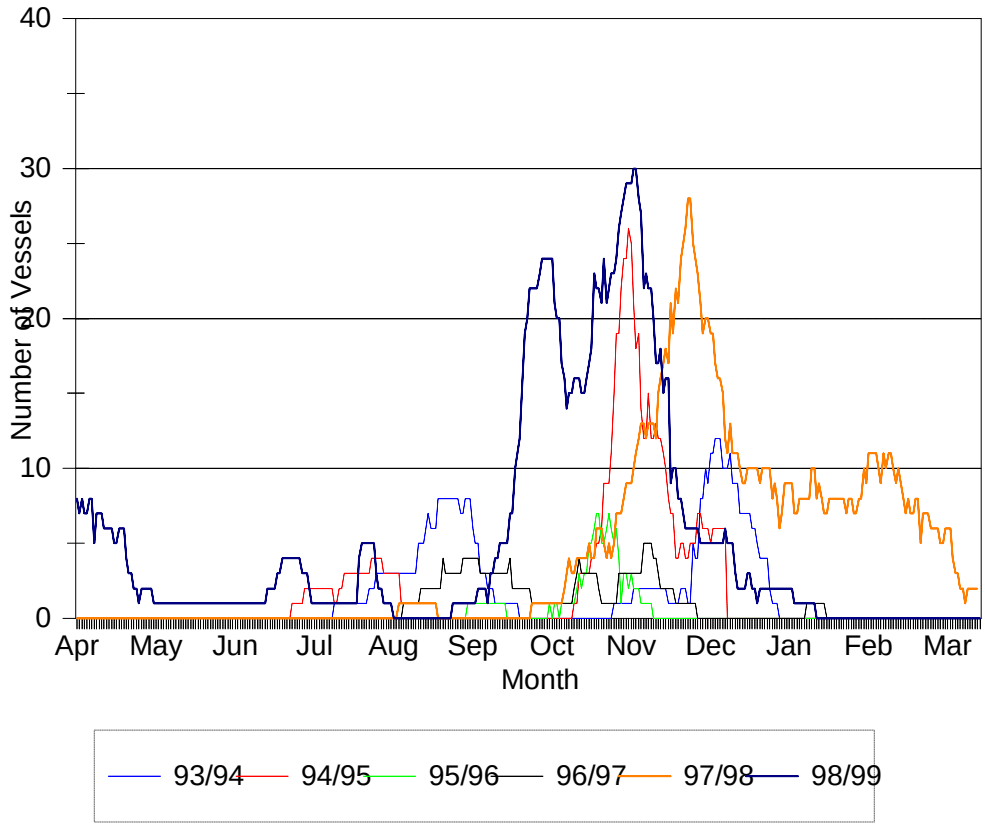

Figure 2 Longliner Activity Patterns in BIOT FCMZ 1993 to date.

The latest information available from the current season has shown an increase in longline vessel activity at the start of the season, with twenty longliners being licensed to fish in the BIOT FCMZ during August 1999.

8.2 Purse Seiners

The main purse seine season for the BIOT FCMZ runs from December through to January. The first few vessels will arrive in the zone during November searching for fish and the last few will remain until February or March. During this main period of activity the majority of the EU fleet will be operating within the BIOT FCMZ with the remaining vessels, either transhipping their catch in the Seychelles or other port, or in transit to or from the BIOT FCMZ.

In the past two years it has been noted that the fleet has been searching for fish to the east of the BIOT FCMZ.

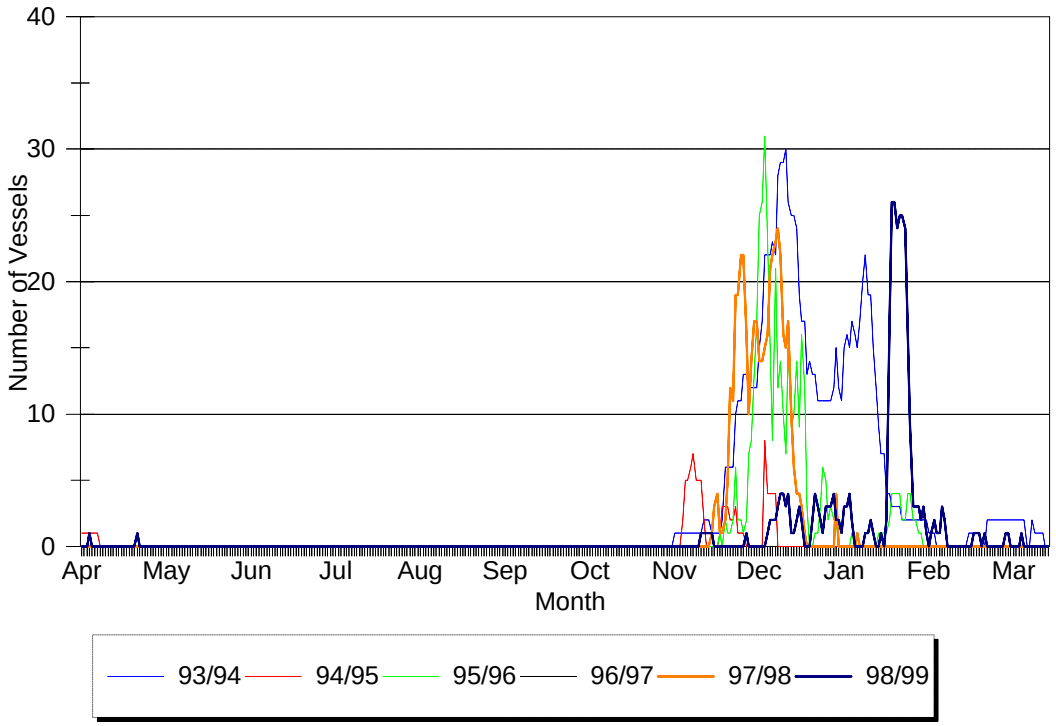

Figure 3 Purse Seiner Activity Patterns in BIOT FCMZ 1993 to date.

Appendix 1 Fishing Vessel Notification Form

BRITISH INDIAN OCEAN TERRITORY

FISHING VESSEL NOTIFICATION

APPLICATION FORM

To : Director of Fisheries, British Indian Ocean Territory

c/o Marine Resources Assessment Group Ltd
8 Prince's Gardens
London SW7 1NA
United Kingdom

Tel : + 44 171 225 3666 Fax : + 44 171 823 7916

I, _____ owner / charterer / agent, of the longline / purse seine tuna fishing vessel _____ , hereby make notification of the aforementioned vessel for the purpose of future fishing in the British Indian Ocean Territory fishing waters. I understand that notification of vessel details is a requirement prior to fishing licence application. I declare that the information given in the attached schedule is to the best of my belief accurate and true. I understand that, if any of the information changes, I must inform you not later than 30 days after the change has taken place and that failure to do so may lead to a penalty.

_____ DATE __ / __ / __

(Signature of Owner / Charterer / Agent)

British Indian Ocean Territory : Longline Fishing Logsheet

Month | Licence No. | BIOT No. | Vessel Name

	Position					Number of hooks	Yellowfin		Bigeye		Albacore		Swordfish		Sailfish		Striped Marlin		Black Marlin		Shark	Other	Bait Code	Sea Temp. (°C)	Comment
	Latitude			Longitude																					
Day	Deg	Min	N/S	Deg	Min		No.	Kg.	No.	Kg.	No.	Kg.	No.	Kg.	No.	Kg.	No.	Kg.	No.	Kg.	No.	No.			
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Captain's Name | Captain's Signature _____ Date ___/___/___

Appendix 3 Longline sheet (Chinese version)

英国印度洋领海 - - 延绳钓纪录表

船名 ______ 执照号码 ______ BIOT 号码 ______ 月份 ______

日期	位置					钓钩数量	黄肌鲔 (Yellowfin)		大目鲔 (Bigeye)		长鳍鲔 (Albacore)		剑旗鱼 (Swordfish)		雨伞旗鱼 (Sailfish)		红肉旗鱼 (Striped Marlin)		黑旗鱼 (Black Marlin)		鲨鱼	其它	诱饵代码	海水温度 (C)	作业活动代码
	纬度			经度																					
	Deg	Min	Hem	Deg	Min		No.	Kg	No.	Kg	No.	Kg	No.	Kg	No.	Kg	No.	Kg	No.	Kg	No.	No.			

船长姓名 ______ 船长签字 ______________ 日期 ___/___/___

BRITISH INDIAN OCEAN TERRITORY - PURSE SEINE LOGSHEET

VESSEL NAME _____ BIOT FISHING VESSEL NOTIFICATION NUMBER: _____ DATE: _____

START OF DAY'S FISHING OPERATIONS:
TIME : POSITION: Latitude ° 'S Longitude ° 'E Log Reading nm

END OF DAY'S FISHING OPERATIONS:
TIME : POSITION: Latitude ° 'S Longitude ° 'E Log Reading nm Day's Comment Code

SET	TIME SET		POSITION				SHOAL TYPE CODE (S)	CATCHES					SIGNIFICANT DISCARDS			SEA SURFACE TEMP.	SET COMMENT CODE
	START (Skiff Out)	FINISH (Skiff In)	Latitude South		Longitude East			YELLOWFIN		SKIPJACK	BIGEYE	ALBACORE	Tuna	Other Species			
	HHMM	HHMM	Deg	Min	Deg	Min		Large (>10kg)	Small (<10kg)	(MT)	(MT)	(MT)	(MT)	Code	(MT)		
1	:	:															
2	:	:															
3	:	:															
4	:	:															
5	:	:															

CAPTAIN'S NAME: _____

CAPTAIN'S SIGNATURE: _____

If any 'other' comment codes, please describe in this space:

Please fill in one sheet per day, even if set is not made. Fill in one line for each set (successful or not)
Refer to code tables for Shoal Type, Set and Daily Comment Codes

Notes

SCHEDULE OF VESSEL DETAILS

VESSEL NAME

1

INTERNATIONAL RADIO CALL SIGN

2

COUNTRY OF REGISTRATION

3

COUNTRY REGISTRATION NUMBER

4

5

1 LEGAL PERSONALITIES

	OWNER	CHARTERER	AGENT
NAME			
ADDRESS			
CITY			
COUNTRY			
TELEPHONE			
FAX			
TELEX			
E - MAIL			

Notes

2 VESSEL CHARACTERISTICS

6 **VESSEL TYPE** Longline :

7 Purse Seine :

8 Other (Specify e.g Reefer) :

9 **CONSTRUCTION** Year :

10 Place :

11 **TECHNICAL** Hull Material :

12 Gross Registered Tonnage :

13 Convention Used for Measurement of G.R.T. :

14 Overall Length (Metres) :

15 Main Engine (Horse Power) :

16 Fuel Capacity (Kilolitres) :

17 **FISH STORAGE**

DAILY FREEZING CAPACITY mT	
FREEZING METHOD	
FREEZING TEMPERATURE °C	
STORAGE TEMPERATURE °C	
TOTAL STORAGE CAPACITY mT	

Notes

3 VESSEL OPERATIONS

LONGLINERS

18 Hooks per Day :

19 Average Set Depth (Metres) :

20 Normal Trip Length (Days) :

21 Number of Crew :

22 PORTS :

Base Port	
Transhipment Port(s)	
Unloading Port(s)	

PURSE SEINERS

23 Net Length (Metres):

24 Net Depth (Metres) :

25 Dolphin Escape Panel :

26 Normal Trip Length (Days) :

27 Number of Crew :

28 Number of Speedboats :

29 **Helicopter** Make :

30 Range (Kilometres) :

31 Registration No :

32 International Radio Call Sign :

33 PORTS :

Base Port	
Transhipment Port(s)	
Unloading Port(s)	

FISHING SUPPORT VESSEL

34 Number of Crew :

35 Type of Vessel (Describe) :

36 Function of Vessel (Describe) :

37 PORTS :

Base Port	

Notes

4 VESSEL COMMUNICATIONS AND ELECTRONICS

RADIO COMMUNICATIONS

38 International Call Sign :

39 Normal Transmitting Frequencies :

SATELLITE COMMUNICATIONS

40 Type of Equipment :

41 Access Code and Number :

TRANSPONDERS

42 Type :

43 Identifying Code :

44 POSITION DETERMINING EQUIPMENT

LORAN :

45 OMEGA :

46 DECCA :

47 GPS :

48 OTHER EQUIPMENT

Radio Buoys :

49 EPIRB's :

Fishing Vessel Notification Application Form

Guidance Notes for Completion

General :

All information required (where applicable to a particular vessel) must be entered correctly and carefully. Failure to do so may cause delays to notification and therefore to the ability to apply for a licence. Note that no notification or licence application will be accepted by vessels that are not tuna longliners, tuna purse seiners or their support vessels.

Please also enclose with this application a side view photograph of the whole vessel (colour or black and white, at least (10 x 7 cm)), and a copy of the International Tonnage Certificate.

Note No :

1 **Vessel Name :** Enter in English, include any number or letter used to identify particular vessel e.g. Kobayashi Maru, Lady Sushil II etc.

2 **International Radio Call Sign:** Enter the code of numbers and letters issued by the country of registration according to the rules of the International Telecommunications Union.

3 **Country of Registration:** Enter the country where the vessel is officially registered.

4 **Country Registration Number:** Enter the number (including letters) issued by the registering country.

5 **Legal Personalities:** Enter the names and communication details (as described and where applicable) of the owner, charterer and agent. (Note: Since fishing master may change from trip to trip the details of that person will be required during licence application).

Vessel Characteristics

6 **Longline:** If this type indicate with an X.

7 **Purse Seine:** If this type indicate with an X.

8 **Other (Specify)**: Specify what type of vessel. e.g Support Vessel, Reefer.

9 **Construction Year:** Year of Construction.

10 **Construction Place:** Place of Construction.

11 **Hull Material:** Type e.g. Steel, GRP, Wood, Ferroconcrete.

12 **Gross Registered Tonnage:** The tonnage of the vessel as recorded on the country registration document.

13 **Convention Used for Measurement of GRT:** Which convention is used e.g. IMO 1969 etc.

14 **Overall Length (Metres):** The overall length as recorded on the country registration document.

15 **Main Engine (Horse Power):** The horse power rating of the main engine.

16 **Fuel Capacity (Kilolitres):** Fuel capacity at full.

17 **Fish Storage:** Enter the daily freezing capacity (mT) and method (e.g. Brine, Blast etc), freezing temperature and storage temperature, and the total storage capacity in metric tonnes of fish.

Vessel Operations

18 **Hooks per Day:** Enter average number of hooks set on a longline each day.

19 **Average Set Depth (Metres):** Depth in metres at which hooks are set.

20 **Normal Trip Length (Days):** The number of days between leaving base/transhipment/or unloading port and returning with a full load of fish.

21 **Number of Crew:** Number of personnel including all officers, deck crew and pilots.

22 **Port(s):** Enter the base or home port and the transhipment and unloading ports (if different) usually used following a fishing trip.

23 **Net Length (Metres):** Enter the overall length of the purse seine net in metres.

24 **Net Depth (Metres):** Enter the maximum depth of the net in metres.

25 **Dolphin Escape Panel:** Indicate with an X if net has a dolphin escape panel, if not leave blank.

26 **Normal Trip Length (Days):** As 20 above.

27 **Number of Crew:** As 21 above.

28 **Speedboat No:** Enter number of speedboats used in purse seine operation.

29 **Helicopter (Make):** Enter make and model of helicopter used if any.

30 **Range (Km):** Enter total overall flying range in kilometres.

31 **Registration Number:** Enter registration number of helicopter that appears in its country registration documents.

32 **International Radio Call Sign:** As 2 above.

33 **Port(s):** As 22 above

34 **Number of Crew:** As 21 above.

35 **Type of Vessel:** Provide a brief description of the type of vessel.

36 **Function of Vessel:** Describe the function of the vessel in the BIOT fishing waters.

37 **Base Port:** As 22 above.

Vessel Communications and Electronics

38 **International Radio Call Sign:** As 2 above.

39 **Normal Transmitting Frequencies:** Enter the frequencies / channels that vessel normally uses for communications with base port and national authorities.

40 **Type of Equipment:** Enter type, make and model of satellite communication equipment e.g. INMARSAT A, INMARSAT C, etc.

41 **Access Code and Number:** Enter codes and numbers for access to voice / fax etc.

42 **Type:** Enter type of transponder, if any.

43 **Identifying Code:** Enter transponder identifying code.

44-47 **Position Determining Equipment:** Check the types of position determining and navigation equipment used on board the vessel.

48 **Radio Buoys:** Enter number and identifying marks of radio buoys used in fishing, if any.

49 **Emergency Position Indicating Radio Beacons (EPIRB's):** Check here if available.

Appendix 5 Length - Weight Relationships for Target and Major By-Catch Species (Source : BIOT Observer Programme)

Length - weight relationships have been determined for all the major target and by-catch species according to the formula $\mathbf{W = a\ L^b}$, where **W** is the weight in kg, **L** is the length in cm (calculated both for LF - fork length and LD-01, the distance between the first dorsal fin and the tip of the snout), and the parameters **a** and **b** are derived by regression from log transformed data.

Data Source	Species	Parameters			
		a	b	n	R^2
98/99 Longline Observer Programme	Yellowfin	0.0000287	2.8704	232	0.96
	Bigeye	0.0000188	3.0002	81	0.98
	Swordfish	0.00000104	3.47442	33	0.99
	Blue shark	0.00000141	3.28842	18	0.99
	Pelagic thresher	0.0000130	3.01919	11	0.97
	Yugan	0.0000325	2.74323	15	0.87
	Sailfish	0.00000104	3.24288	9	0.99
	Rainbow runner	0.0005851	2.01366	14	0.41
98/99 Purse seine Observer Programme	Yellowfin	0.00003	2.872	42	0.99
	Bigeye	0.0000288	2.9187	34	0.99
	Albacore	0.000209	2.4835	18	0.75
	Skipjack	0.0000172	3.0451	30	0.96
97/98 Observer Programme	Yellowfin	0.00002	2.96	77	0.97
	Bigeye	0.00004	2.84	102	0.99
	Albacore	0.00003	2.93	27	0.66
96/97 Observer Programme	Yellowfin <80cm	1.05127	2.78	234	0.93
	Yellowfin >80cm	0.00006	2.73	437	0.96
	Yellowfin (all)	0.00005	2.96	671	0.99
	Bigeye	0.00001	3.09	126	0.98
	Skipjack	0.00001	3.26	282	0.87
95/96 Observer Programme	Yellowfin	0.00003	2.91	58	0.98
	Bigeye	0.00002	3.05	16	0.99
	Albacore	0.00002	2.52	9	0.84
	Skipjack	0.00003	2.97	90	0.78
94/95 Observer Programme	Yellowfin	0.00006	2.75	N/A	N/A
ORSTOM L-W Relationship (94 /95)	Yellowfin <76cm	0.00002	3.02	21	1.00
	Yellowfin >76cm	0.00001	3.09	50	1.00
	Skipjack	0.00003	3.48	51	1.00

Appendix 6 **Transhipment Logsheet**

BRITISH INDIAN OCEAN TERRITORY

TRANSHIPMENT LOGSHEET
FISHERIES OPERATIONS REPORT FORM: RF3

	DISCHARGING VESSEL	RECEIVING VESSEL
Vessel Name:	_____	_____
BIOT Notification Number:	_____	_____
Transhipment Date:	_____ / _____ / _____	
Transhipment Licence Number:	_____	
Transhipment Position:	Latitude	_____ ° _____ 'S
	Longitude	_____ ° _____ 'E

	Code	Species	Transhipment Weight (MT)
1	SKJ	Skipjack Tuna	
2	YFT	Yellowfin Tuna	
3	BET	Bigeye Tuna	
4	ALB	Albacore	
5	SWO	Swordfish	
6	MLS	Striped Marlin	
7	BLM	Black Marlin	
8	SAI	Sailfish	
9	BIL	Billfishes nei	
10	SRX	Skates and Rays	
11	SHK	Sharks	
12	OTH	Other Species nei	

Discharging Master (Signature): Receiving Master (Signature):

_____ _____

Discharging Master (Printed): Receiving Master (Printed):

_____ _____

Transhipment Logsheet Form (RF3)

Guidance Notes for Completion

A transhipment logsheet must be completed for each transhipment that occurs within the BIOT fishing waters. It is the responsibility of the master of the receiving vessel to ensure that the log is completed accurately, passed to the master of the transhipping vessel for countersigning, and forwarded to the Director of Fisheries c/o the Marine Resources Assessment Group Ltd, London. The conditions governing the transhipment of fish are laid down in Part 4 of the British Indian Ocean Territory Fishing Regulations 1993.

The Master of the receiving vessel holding the Transhipment Licence must notify the Director of Fisheries of his intended entry into the BIOT fishing waters (ENTREP) and departure from the BIOT fishing waters (DEPREP) by sending a fisheries operation report as specified in the section of this document on Fishing Operations Reporting using the Fisheries Operations Report Form specified in the Terms and Conditions of Licensing.

The following details must be entered onto the transhipment log following each transhipment event:

Vessel Details

Vessel Names:	Enter the name of the Discharging and Receiving vessels in English, including any number or letter used to identify a particular vessel.
BIOT Registration Number:	Enter the BIOT Fishing Vessel Registration Number of both discharging and receiving vessels as allocated by the Director of Fisheries.

Transhipment Details

After each transhipment event, the following details must be recorded by the participating vessels:

Transhipment Date:	Enter the date that transhipment occurred in the format: DD/MM/YY.
Transhipment Licence Number:	Enter the Transhipment Licence Number.
Cargo Details:	Enter, next to each of the species or species groups transhipped, the total weight of that species (or species group) transhipped (in MT).

Both Fishing Masters should sign the transhipment log, and print their full name underneath their signatures, indicating that it is, to the best of their knowledge, an accurate and completed record of the transhipment.

As soon as the Transhipment Log is completed it must be sent by FAX directly from the vessel if possible, or if this is not possible, the correct information should be radioed to the agent for immediate faxing to the BIOT Director of Fisheries, c/o MRAG Ltd.

The Master of the Transhipment Vessel / Reefer following completion of transhipment operations must send copies of the transhipment logs relating to the transhipment events occurring in the BIOT FISHING waters by the fastest possible postal service to the BIOT Director of Fisheries (see Annex 11 for the contact address) to arrive not later than 21 days following the arrival of the vessel in port following transhipment. Failure to do so may result in a penalty.