



Australian Government
Bureau of Rural Sciences

PREPARATION OF THE BRS COMPONENT OF AUSTRALIA'S DATA SUBMISSION FOR 2007

by

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Abstract

The aggregated catch and effort, catch by fleet, raised catch, catch at size, and non-retained catch data sets submitted to CCSBT by the Bureau of Rural Sciences on behalf of the Australian Government are compiled from a number of databases. The daily fishing logbooks, catch disposal records and fisheries observer reports, collected and managed by the Australian Fisheries Management Authority, are the main data sources. The Australian catch of SBT from surface and longline fisheries is also sampled by contracted field staff prior to release into farm cages or processing (longline catch). The sample data includes size and weight measurements that are used to calculate representative size distributions and average weights.

Relational databases, spreadsheets and query scripts are used to integrate and process the source data sets and create the data files required for the CCSBT data exchange. In some cases data submitted in previous years is revised where errors are identified or statistical methodology is improved. This document provides facsimiles of data collection forms as well as flow charts illustrating the data integration procedures.

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1. Introduction

The Bureau of Rural Sciences, within the Australian Government Department of Agriculture, Fisheries and Forestry, provides data reports each year to the CCSBT as part of the annual data exchange. In April 2007, BRS submitted the following reports to the data exchange.

1. Aggregated catch and effort data 2006 and 2005
2. Raised Catch 2006 and 2005
3. Total Catch by Fleet 2006 and 2005 (quota and calendar year)
4. Catch at Size data 2006
5. Catch at Size data 2005
6. Non-retained Catches 2002-2005 (REVISED30042007)
7. Non-retained Catches 2006

Reports are also provided directly to the data exchange by CSIRO, the preparation of which is covered in a separate paper.

2. Data Sources

There are five sources of data required to produce the data reports. These are: Daily Fishing Logs Database; Catch Disposal Database; Tow Cage Size Monitoring Database and the Longline Fishery Size Monitoring Reports; and Fisheries Observer Database.

2.1. Daily Fishing Logs Database

The Daily Fishing Logs Database is maintained by the Australian Fisheries Management Authority (AFMA) and contains data collected from scientific logbooks that fishers are required to complete. The logbooks of relevance to SBT catch for the 2007 submission were the AL05 (longline and minor line), OT03 (minor line), PS01 (purse seine), TPB02 and TPB03 (purse seine and pole). See Appendix 2 for samples of these logbooks. Each fishing operation is given a unique identifier in the Daily Fishing Logs Database and tables are linked using this identifier. The following tables are required from this database:

1. **Operations** – contains information on each operation, including start latitude, start longitude and vessel identifier.
2. **Catch** – contains a separate record for each species caught, together with the number of fish caught and estimated weight of the catch.
3. **Fishing_Effort** – contains fishing method used and fishing effort information, eg number of hooks for longline operations; search hours for purse seine operations.
4. **Operation_Longline** – contains other information on longlining operations, eg length of mainline.
5. **Operation_Pole** – contains other information on poling operations, eg number of poles used.
6. **Vessel** – contains information on each licensed vessel; vessel name is used to identify individual vessels when determining the number of boats that fished.

7. **Tow_Cage_Transfer** – contains information on each transfer of fish from the capture vessel to the tow cage in each purse seine operation. Provides the link between the Daily Logs Database and the OtherInfo table produced from the Tow Cage Size Monitoring Reports.

2.2. Catch Disposal Database

This is the database AFMA uses for quota monitoring and contains data collected from the CR4A (SBT Catch Disposal Record; all methods except purse seining for farms), SBT02 (SBT Farm Catch Disposal Record – Purse Seine Boat) and SBT04A (SBT Farm Catch Disposal Record; purse seining for farms). See Appendix 3 for samples of these forms. The following tables are required from this database:

1. **Catch Disposal** – contains information on trip start and end dates.
2. **Landing** – contains information on species caught, numbers of fish caught and weight of catch.
3. **Fishing_Method** – provides the fishing method information.
4. **Tow_Catch_Transfer** – contains identification of capture vessel for purse seine operations.

2.3. Tow Cage Size Monitoring Database

Tow cage size monitoring data is collected by Protec Marine Pty Ltd, a company contracted to AFMA, and its primary purpose is for estimation of total weight of SBT in tow cages prior to transfer of fish to farm cages. In 2006, BRS developed a database for Protec Marine to use to record this information, the Tow Cage Size Monitoring Database. Data for the 2006–07 season were then entered into this database from the original spreadsheets. The database was then used when preparing the data submission to CCSBT. A sample of one of the reports produced by the database is given in Appendix 4.

For each tow cage, fish were sampled until forty fish weighing 10 kg or more were measured and weighed. The length and weight of all fish sampled were entered into the database, including fish smaller than 10 kg, as were the total number of fish transferred to farm cages. Data were then collated to produce a table of statistics for each tow cage, named **Analysis – OtherInfo**, which was used in preparation of Raised Catch and Total Catch by Fleet reports. The raw lengths and weights of all sampled fish for the year were combined and used in conjunction with the Daily Fishing Logs data to prepare the Catch at Size report.

2.4. Longline Fishery Size Monitoring Reports

These data are provided by WW Fisheries Pty Ltd, a company contracted to AFMA and are collected onshore at processing establishments. The reports include the length and weight information for non-farm fish, all caught by longline in 2005 and 2006. This report is used to determine the Catch at Size data for longline operations.

2.5. Fisheries Observer Database

AFMA employs fisheries observers to collect data on board fishing vessels in a number of domestic fisheries and opportunistically on the high seas. Observer coverage of pelagic longline vessels has been variable over the period 2001 to 2006, mainly concentrated in the eastern EEZ. There has been limited coverage of longline fisheries in the southern and western EEZ and minimal purse seine coverage. A

database of observed fishing operations is maintained by AFMA, including records of retained and discarded catch and biological data collection. The AFMA observer data was used to produce the revised report “Non-retained Catches 2002-2005” and the “Non-retained Catches 2006” report. This report provided only numbers of non-retained fish observed in the longline fishery and was not raised or imputed from logbook data. The total longline fishing effort for each five degree cell is provided from the Aggregated Catch and Effort report with the corresponding observed effort and non-retained catch. The following observer database tables contributed data to the Non-retained Catches report:

1. **Activity_Log** – describes vessel activity eg setting, hauling, searching and time, location, environmental conditions.
2. **Voyage** – details of observer cruise including vessel identifier.
3. **Voyage_Gear_Items** – contains values of attributes for each fishing operation eg number of hooks deployed.
4. **Bio_Collection** – describes biological attributes of animals caught including life status of retained and discarded fish

3. Data Preparation

Raw data files of database tables from the AFMA Daily Fishing Logs, Catch Disposal Records and Observer databases are acquired late in the first quarter of each calendar year. The data are loaded into an Oracle relational database server to enable analysis using Structured Query Language (SQL) via Microsoft Access software on client workstations. The length data sets ie Tow Cage Size Monitoring Database (MS Access database) and Longline Fishery Size Monitoring Reports (MS Excel workbook) are processed at least partly in MS Excel and some output data imported to Access for combination with other database sets. Standard queries and procedures have been established to produce the data reports that BRS submits each year. These queries may require minor modification each year as changes are made to the source data collection process or CCSBT requirements.

See Appendix 1 for flow diagrams of data sources and tables used to produce the various reports.

3.1. Definition of Seasons

All data reports use date of capture to sort catch records by time period, except the catch by fleet – quota year statistics. The quota year statistics use tow end date (farm purse seining) or trip end date (other methods) to define whether a catch falls within a particular season/fishing period.

3.2. Spatial Definitions

The 2003 submission was the first time that raised catch or catch at size data were provided by latitude/longitude grid (1x1 degrees for purse seine and 5x5 degrees for longline). This was made possible for the farm sector by the introduction of the SBT03 forms. The forms enable the linking of Tow Cage Size Monitoring Database to the Daily Fishing Logs Database, thus providing capture location information. The Aggregated Catch and Effort Report also provides spatial information, all data for this report coming from the Daily Fishing Logs Database.

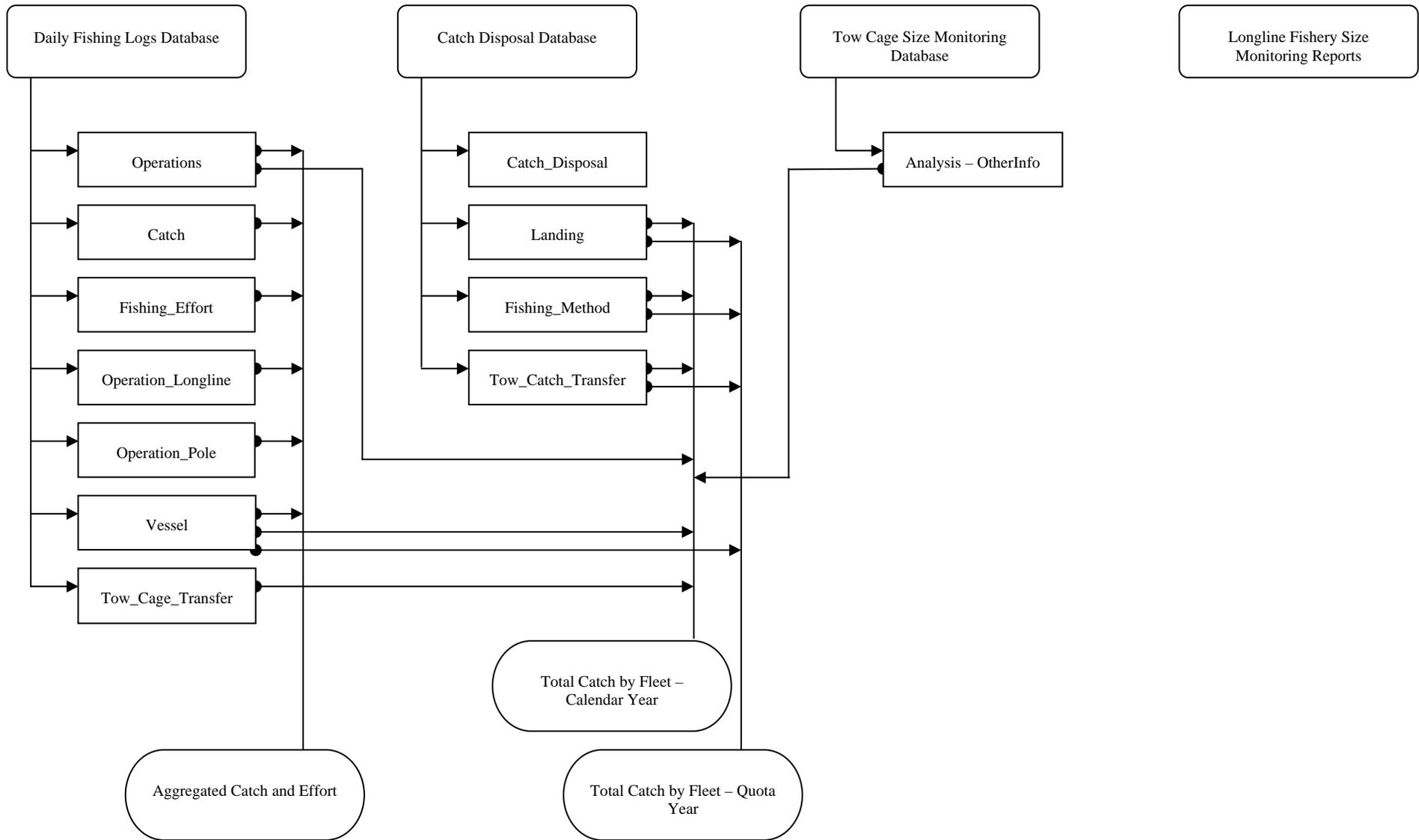
3.3. Revision of Non-retained Catch Data

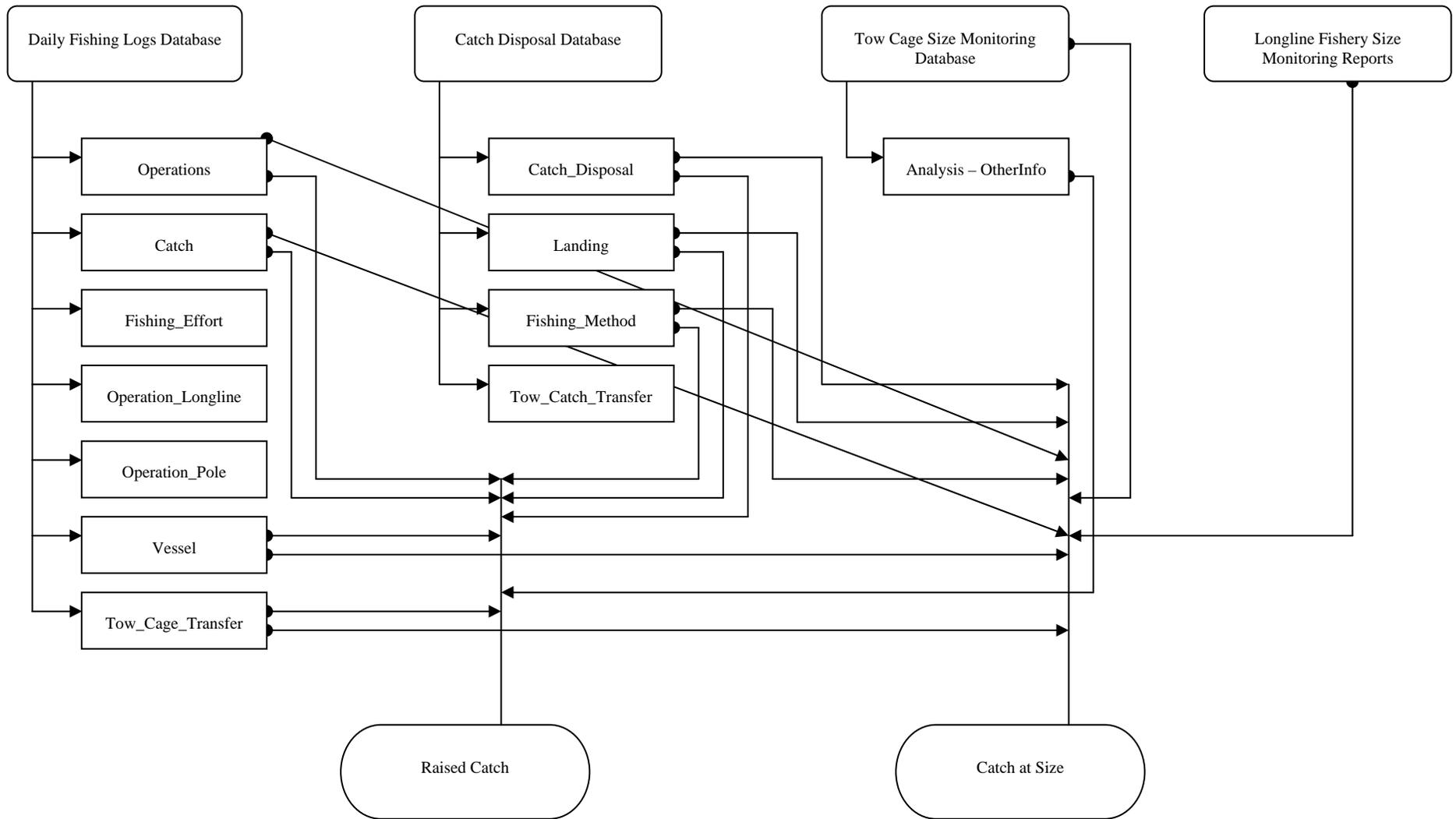
The 2002 to 2005 non-retained catch statistics were revised in the 2007 data exchange to correct the numbers of observed fish for each life-status code. Due to an error in one of the database queries, the previously provided statistics excluded some fish that did not have size estimates recorded in the database.

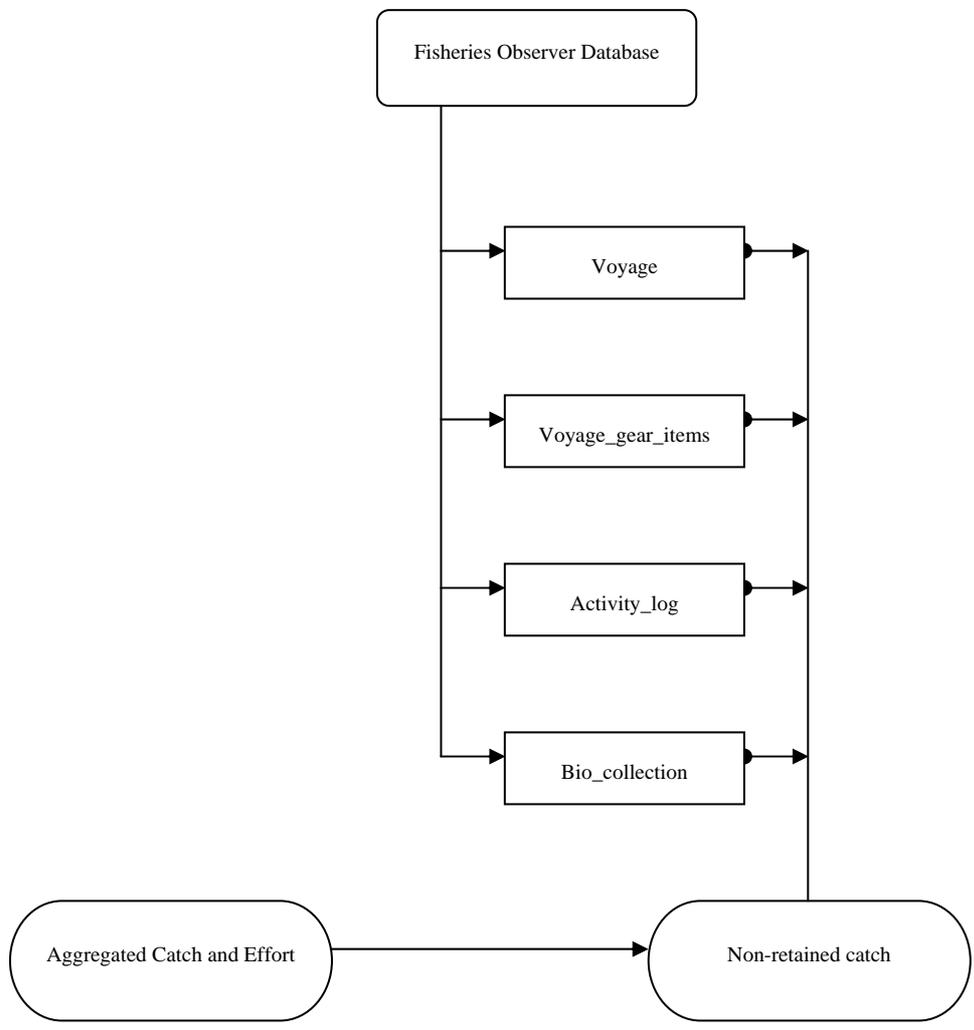
4. Closing Remarks

The description of data preparation and submission in this report applies to the 2005 and 2006 data supplied to CCSBT. A more detailed description of the fields within the data sources can be obtained.

Appendix 1: Flow Charts Showing Flow of Data from Data Sources to Reports







**Appendix 2: Scientific Logbook Forms (AL05, OT03, PSP01, TPB02
and TPB03)**

Australian Tuna Minor Line Daily Fishing Logbook - OT03

Form Codes: W = Whole; G = Gilled & Gutted;
H = Headed; F = Filleted;
T = Trunk (headed & gutted).

Log No: **0333009** Date: **8/10/96** Boat Name: **Hot Tuna** Master's Name: **C. Gavin**
 Dist. Symbol: **LFB139**
 I did not work between **3** and **7** and **7** and **7** due to: **NON-FISHING CODE (TICK APPROPRIATE BOX)**
 1 Bad Weather 2 In Port 3 Broken Down 4 Steaming
 10 Refit 5 Other Fishery (specify) **Fish trapping**

FISHING DETAILS Area Fished: Latitude **37°** Longitude **152° 50'**
 Minor Line Method(s) Used Today (tick appropriate boxes)
 Handline No. Lines Hrs.
 Trolling No. Lines **4** Hrs. **4.5**
 Rod & Reel (not trolling) No. Lines **2** Hrs. **6**
 Other Method? (list here) No. Lines Hrs.
Poling Details (if applicable)
 No. Poles Used? Type used (ie. single/double)?
 Hours Searched? Poling Start Time (24 hr) Hours Fished?
 Were you assisting a Seine Boat during your fishing? (Y/N)
 Dist. Symbol of assisted seine boat?

Bait Details - list bait type/s used today & tick appropriate boxes
 Lures Used? Bait Purchased?
 Live Bait Used? Bait caught by self?
 Dead Bait Used?
 Type **Yellowtail** Qty **20** Kg
 Type Qty Kg
 Type Qty Kg

TOTAL CATCH FOR THE DAY

Species Code (see list on back of wiring template)	No. of Fish caught and kept (kg)	Estimated Total Weight caught and kept (kg)	No. of Fish Returned to Sea.
4FT	12	21	1
ALB	15	9	3
SKT	7	45	5
DDL	5	30	2

LANDING DETAILS (Includes Total Verified Weights for each species landed. Don't forget to add form codes for these weights - these are listed at the top right of this page.)
 Record here as soon as possible after sale of catch

Export Wt (kg)	Form Code	Domestic Wt (kg)	Form Code
49	Q	14	Q
		10	Q
		53	Q
		28	Q

Port of Landing: **Coffs Harbour**
 Date of Landing: **7/10/9**
 Fish Sold To: **Coffs Co-op.**
Sydney Fish Market
 Comments: **Weather very calm. Found a current line about 10km offshore. Heaps of fish on surface all day.**

Wildlife Interactions
 Number Caught:
 Life Status on release (codes on hold-out flap):
 Other Comments - include species names if possible, as well as details of the interaction (eg. whether animals hooked, entangled, stealing fish etc):
Saw 3 - 4 whales around 10 km offshore from Coffs. I think they were humpbacks.

Master's Signature: **C. Gavin** Date: **7/10/9**

WHITE COPY - send to AFMA. BLUE COPY - retain for your records. If you catch any banded or tagged animals, please forward details to AFMA using one of the Tag recapture forms at the rear of this book (also see instructions at front - TAG RECAPTURES)

Australian Purse Seine and Pole Daily Fishing Log - For Farmed Southern Bluefin Tuna Only TPB03

Australian Fisheries Management Authority, Commonwealth of Australia

Log Book No: **0026** Page No: **02** Boat Name: *Sea Spray* Dist. Symbol: *LFB 12345* Master's Name: *C. Gavin*

TICK APPROPRIATE NON-FISHING (NF) CODE BOX AT RIGHT: 1 Bad Weather 2 In Port 3 Broken Down 7 Cage Towing Poling Purse Seining

I did not work between *28/5/98* and *28/11/98* 4 Steaming 10 Relif Fishing Method Used? (tick appropriate box) *LFB023 (pole boat)*

Date of Fishing (day/month)	NF Codes listed above	Search Details				Fishing Details				Total Weight and Type of Bait			Estimated Catch Weights per Shot (kg)				Towing						
		Hours Searched	Spotter Used? (Y/N)	Sea Surface Used? (Y/N)	Start Time (24hr local time)	Latitude	Longitude	No. Poles Used?	Pole Boat Assisted Y/N	Seine Boat Assisted Y/N	Type	Kgs	SBT Weight	Other Species	Other Weight	Estimated % of school caught	Carrier Boat Name	Weight Transferred	Transfer Date	SBT 03 Book No.	Page No.		
29/11	6	4			20	1300	32°40'	132°30'	4			4			8,000	-	-	90	Star	8,000	29/11	036	09
30/11	4																						
1/12		4	N		21	1200	37°05'	131°08'	4						15,000	-	-	95	Jane S.	15,000	1/12	024	36
2/12		5	4		19	1100	33°50'	131°20'	N						25,000	-	-	70	"	25,000	2/12	024	36
2/12		2	4		19	1600	33°54'	131°17'	4						12,000	-	-	80	"	12,000	2/12	024	36

Comments:

Wildlife Interactions:
List any wildlife interacting with you during your fishing activities, including netted animals. If possible, list Species name, Interaction Date, No. of Animals and Life Status of any animals released after capture. Life Status Codes are listed on the writing template. Please record any extra details in the Comments section.

Species: _____ Date(s): _____ Qty: _____ Life Status: _____

Concession Holder or Authorised Person:
I certify that the information I have provided on this form is a complete and accurate record.
Dated: 3/12/98
Name: C. GAVIN
Signature: C. Gavin

WHITE COPY - send to AFMA BLUE COPY - retain for your records

Note: There are tagged fish/wildlife recapture forms at the rear of this book.

Appendix 3: Catch Disposal Forms (CR4A, SBT03A, SBT04A)

CR4A Form
Southern Bluefin Tuna Fishery
Catch Disposal Record

Book No.		Page No.	
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Part A: SFR Holder or Authorised Representative to Complete

SFR Holder **Tuna International P/L** Boat Name **Hunter IV** Dist. Symbol **0999**

Area Fished Tas Vic NSW SA WA QLD

Fishing Method Pole Purse Seine Longline Trolling

Trip Start Date **8 / 7 / 04** Trip End Date **14 / 7 / 04**

Port Unloaded **Tuncurry** Date Unloaded **14 / 7 / 04**

Whole Catch Consigned Part Catch Consigned

Book No. Page No. Other CR4A details

Name of Receiver **Tuna Exporters P/L**

Name of Transporter **Bradley Transport** Type of Vehicle **Truck** Trailer Vehicle Reg **YLT-091** Date/Time of Departure of Consignment from point of Unloading **14 / 7 / 04 15:30**

SOUTHERN BLUEFIN TUNA		
Number of Fish	Total Accurate Weight Kg	Form Code
3	300	B

NORTHERN BLUEFIN TUNA		
Number of Fish	Total Accurate Weight Kg	Form Code

Form Codes

W means Whole Weight – No Processing

A means SBT that has been gilled and gutted so that:

- a. the gill plates are removed; and
- b. the tail is wholly removed.

B means SBT that has been gilled and gutted so that:

- a. the gill plates are not removed; and
- b. the tail is not wholly removed.

I declare that the information I have provided in Part A to be a complete and accurate record.

SFR Holder or Authorised Representative Printed Name **JOHN WELSH**

Signature & Date *J. Welsh* 14/7/04

Part B

I acknowledge that I have received for transportation the amount of fish referred to in Part A.

Printed Name of Driver **PETER BRADLEY**

Signature & Date *Peter Bradley* 14/7/04

Forward White copy to AFMA within 24 hours of unloading.

Leave Green copy in book.

Send the Blue and Yellow copies with the fish to the receiver of your fish.

SBT03A
Southern Bluefin Tuna Fishery
Farm Transit Log

Log No:	Page No:
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Carrier Boat Name	MARY LOU	Dist. Symbol	DE 123
Permit Holder	A B CUTTER	Carrier Boat Permit Number	400100
Tow Cage ID Number	T600		
Fish Received From	<input checked="" type="checkbox"/> Purse Seine Boat – Complete Sections 1 and 3 then 4 or 5		
Fish Received From	<input type="checkbox"/> Carrier Boat – Complete Sections 2 and 3 then 4 or 5		

Section 1		Transfer Details		Estimate of Weight (Tonnes)	SBT02 Book No.	SBT02 Page No.
Name of Purse Seine Boat	Dist. Symbol	Date & Time Last Transfer Finished				
BLUE OCEAN	333	20/ 12 / 04 9:30		50	111	05

Section 2		Dist. Symbol	
Previous Carrier Boat Name			
SBT03A Log No:	Page No:	A Record of Mortalities Recorded in Box "G" of Previous SBT03A	E

Section 3		Record of Mortalities During This Tow										
Date/Time Tow Started		Record a Date + Number of Mortalities for Each 24 hr Period.										
22/ 12 / 04 8:30		22/12	24/12	25/12	28/12							
		10	5	1	1							
Total Mortalities During This Tow	F	17								Progressive Total of Mortalities (E & F = G)	G	17

Section 4		Tow Cage Transferred To Another Carrier Boat	
Carrier Boat Name		Dist. Symbol	
SBT03A Book No		SBT03A Page No	
		Date/Time Tow Cage Transferred	/ / :

Section 5		Tow Cage Transferred To Fish Receiver	
Date/Time Tow Ended	29/ 12 / 04 11:30	Name of Fish Receiver Permit Holder	McNALLY FRESH FISH
		Fish Receiver Permit Number	9999

Declaration
 I declare that the information which I have provided on this form to be a complete and accurate record.

Carrier Boat Permit Holder or Person Acting on their Behalf

Print Name	B. BOXALL	Signature	B. Boxall	Date	29 / 12 / 04
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SBT04A
Southern Bluefin Tuna Fishery
Farm Catch Disposal Record

Log No:	Page No:
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Part 1

Fish Receiver Permit Holder Name	McNally Fresh Fish	Tow Cage ID Number	T600
Fish Receiver Permit Holder Number	9999	Carrier Vessel SBT03A Log and Page No	Log No: 198 Page No: 15

Progressive Total of mortalities during tow (G = SBT03A) **A** 17

Number of mortalities recorded from date of receipt of tow cage **B** 8

Transfer from Tow Cage to Farm

Transfer Date	Farm Number Cage No.	Live Fish Count
29/1/05	A93	4,802
30/1/05	A85	1,098

Count Total **C** 5,900

Total Number of mortalities $F = A + B + J$ **F** 35

Weight Total $D = C \times E$ (E: Average Weight in Kg) **D** 107675

Total Weight of mortalities $H = F \times E$ (E: Average Weight in Kg) **H** 638.75

Total Weight of Fish in Kg $I = D + H$ **I** 108313.75

I have had the opportunity to witness the verified count conducted by AFMA's Agent and I agree with and verify the count taken.

I declare that the information which I provide on the form to be a complete and accurate record.

Video Reference Number 2930404

FRP Holder E. Watson

Video Reference Date 1 / 2 / 05

FRP Signature E. Watson

Date 1 / 2 / 05

Part 2

Purse Seine Boat Name	TUNA 1	Dist. Symbol	0253
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SBT02	Log No: 12	Page No: 4	J	10	Number of mortalities during pursing and transfer to tow cage
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Average Weight sample from Tow Cage

Sample Date	29 / 1 / 05	Name of Person Sampling	T. Smith	Signature of Person Sampling	T. Smith
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Average Weight in Kg	No. of Fish taken from tow cage
E 18.25	42

I declare that the information which I provide on the form to be a complete and accurate record.

AFMA Agent's Name	B. Brown	AFMA Agent's Signature	B. Brown	Date: 29 / 1 / 05
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Appendix 4: Tow Cage Size Monitoring Report

Southern Bluefin Tuna Fishery
Farm Catch per Tow Cage

200506

Tow Identification

Tow Cage ID _____	Book No. Page No. _____
Tow Number for Season _____	Catch Disposal Form _____
	Fish Receiver Number: _____

Catch Information

Catcher Vessel _____	AFMA Form: _____
Capture location _____	
Date of First Transfer to Tow Cage _____	
Date of Last Transfer to Tow Cage _____	
Tow Vessel _____	
Date Tow Ended _____	Total Weight of Fish Captured in this Tow Cage: _____
Number of Mortalities during Catching _____	Estimated Weight (kg): _____
Number of Mortalities during Tow _____	Total Number of Mortalities: _____
Number of Mortalities between end of Tow and Release to Farm _____	Total Number of Fish: _____

Average Weight Sample Information

Sample Date _____	Witnesses _____	Average Length _____	Average Weight _____
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Fish Count Information

Transfer Date	Video Count	Tonnage	State Cage ID	State Cage Owner

Total number of live fish counted: _____

200506

Tow Identification

Tow Cage ID _____ Catch Disposal Form _____ Book No. Page No.
Tow Number for Season _____ Fish Receiver Number: _____

Average Weight Data

40 Fish Sample
Weight Length Tag
Number of Under 10 kg Fish
Under 10 kg Fish
Weight Length