

88/109

Implementation of a Validated Catch and Effort
Data System for the Fisheries of NSW

by

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I. BACKGROUND AND INTRODUCTION

The New South Wales Department of Fisheries is embarking on a new era of developing and implementing management strategies for the State's numerous commercial fisheries. The only valid way to monitor the success of these management strategies is to analyse catch and effort statistics for these fisheries. Accurate catch statistics are vital for the intelligent management of commercial fisheries.

Catch statistics for the commercial fisheries of NSW have been collected since at least 1955 using catch return forms (Appendix I) that every licensed fisherman in the state is required to submit monthly. Since 1988 the data has been entered into a computerised catch statistics and licensing database system called "Fish.Licence". This system is suitable for summarising production of species by area by month but is unsuitable for detailed analysis of fishing effort because catches are not linked to methods or crews within the monthly summaries. Scientists and managers also question the accuracy of this data because it is dependent on the honesty and conscientiousness of the fishermen.

Fishermen along the coast of NSW have traditionally organised themselves into cooperatives (co-ops). All members are licensed fishermen who own shares in the co-op. They employ a manager and staff to receive catch from members, accurately weigh it, then market it for the best possible price. All profits are distributed back to the member fishermen. No accurate estimates are available, but it is generally agreed that the majority of all commercial estuarine and marine fish catches in NSW are landed through the 22 co-ops along the coast.

Catch data recorded at the co-ops is obviously accurate and self-validating because it is the basis for paying the member fishermen. When researchers want highly accurate catch data they get access to co-op records. Unfortunately, fishing effort on areas, methods, boats and crews is not recorded.

Some of the co-ops have recently begun computerising their business operations. Staff at Fisheries saw the opportunity to collect high quality catch statistics by offering to assist the co-ops with their computerisation in return for being provided with an electronic copy of catch and effort data. Fishermen who landed all their catch at a co-op and provided area, method, boat and crew data to the co-op computer system would not be required to fill in monthly catch returns. Electronic transfer of data from the co-ops would also drastically reduce the amount of data entry required by NSW Fisheries.

Computerisation of the co-ops would also allow the Sydney Fish Marketing Authority (FMA) to receive manifests for incoming shipments long before they arrive. Price data from the FMA could be disseminated rapidly to the co-ops through the

computer system.

In December 1987, Fisheries and the FMA commissioned the development of a standard software application by Concord Data Systems that would enable all co-ops to:

1. Carry out routine accounting functions, such as recording of weigh-in data, cheque payments, payroll handling, loan administration and gear sales.
2. Supply self-validating catch statistics electronically to Fisheries on behalf of the members.
3. Receive price information from the FMA computer and supply manifests electronically to the FMA in advance of product dispatch.

A modification of the computer system in use at the Clarence River Co-op was selected and work commenced on the "Dolphin" system. By February 1989 it was determined that the Dolphin system would not meet specifications primarily because it lacked a suitable accounts module and the contract was terminated.

Adept Business Systems was subsequently employed to build a suitable application around their existing accounting package. The new system is called Neptune. It was first tested at the Newcastle Co-op, which is the largest co-op system in the state. Unfortunately, it was found that the business techniques used at Newcastle are not representative of the techniques used at the other co-ops around the state. One major problem results from the fact that fish are weighed in at five separate depots, two of which are unmanned. Because of these problems, development of the Neptune system at Newcastle was terminated by March 1990.

In mid 1990 the Coffs Harbour Co-op purchased the Neptune system. Their business techniques are relatively "standard" with only one manned weigh-in depot, but they have also required subsequent software customisation. The Coffs Harbour Co-op also suffered many delays from losing and retraining staff. The computer system did not become fully functional at Coffs Harbour until November 1991.

When it became apparent in mid 1990 that the implementation of the Neptune system would be delayed by at least one year, Fisheries contracted Concord Data Systems to add a module to the existing computer system at the Clarence River Co-op for exporting catch and effort information.

The objective of this project is to develop and implement a software system that enables Fisheries to electronically capture standardised, self-validating catch and effort data from the computerised landing systems at the co-ops in New South Wales. The techniques and principles developed by this

project can be applied to other State and Commonwealth fisheries with the objective of improving fisheries statistics nationwide.

II. RESULTS AND DISCUSSION

Both the Clarence River and Neptune computer systems record catch and effort data as fishermen weigh in their daily landings. This information is exported to an ASCII file at the end of each transaction week. The format and content of these ASCII files is given in Appendix II. The codes for fisherman licence, boat licence, fishing region and fishing method are those used in the Fish.Licence database of monthly catch return data. Species codes from the Clarence River Co-op are their own. The Neptune system uses species ,size and processing codes developed by the FMA.

The computer operator is given the option of putting the ASCII file in a special directory on the hard disk, which is accessible to Fisheries via a modem, or putting it on a floppy disk. If the file is put on to a floppy disk it can be mailed to Fisheries. It is then read by a microcomputer and uploaded to the Prime minicomputer where the catch statistics database and relevant software reside. This technique is time consuming and risky. The disk can be lost or damaged in the mail. Therefore, floppy disks are only used if there is no modem connection.

The preferred transfer method is via modem. A microcomputer with a modem at Fisheries uses PROCOMM+ to initiate a 1200 baud asynchronous connection to the modem on the co-op computer system which uses CKERMIT. After logging in, the Fisheries computer is automatically attached to the directory on the co-op computer containing the ASCII file of catch and effort data. KERMIT protocol is then used to transfer the ASCII file to the Fisheries microcomputer. The file is then uploaded to the Prime minicomputer.

After the new UNIX computer system is established at Fisheries in early 1992 it is anticipated that the modem transfer method will be improved. The new minicomputer system will automatically dial up the co-op computer at night using Telecom's AUSPAC system at 9600 baud. Once contact is established the ASCII file will be transferred directly to the Fisheries minicomputer.

A software application called "Co-capture" has been developed on the Prime minicomputer at Fisheries to check incoming data from co-op computer systems, update the new database of daily catch and effort data called "Fish.Co-op" and then update the existing database of monthly catch return data called Fish.Licence. The application is written in INFO-BASIC within the INFORMATION database environment running under the PRIMOS operating system. Documentation of the Co-capture application is given in Appendix III. Co-capture will be converted to INFORMATION-PLUS running in UNIX in early 1992.

Co-capture reads in the ASCII files from co-op computer systems and checks it against data in the Fish.Licence database, which contains primary reference files on all licensed fishermen, fishing boats, regions, methods and commercial fish and shellfish species in NSW. If the co-op data does not match any of the records in the reference files it is rejected. Data that successfully passes through the check module is put into the Fish.Co-op files, where species codes used by the co-ops are converted to standard CSIRO species codes. The rejected data can be edited then run through the check module again until it finally passes into Fish.Co-op files. When starting and ending dates are given for a monthly period, Co-capture generates monthly summary files that can be put into the Fish.Licence database.

This system requires close liaison between staff at Fisheries and co-op staff. The reference files in the co-op computer system must be updated regularly to insure that fishermen's licence numbers and boat registration numbers are accurate. Reference files in the Co-capture system must be updated regularly to incorporate additional species codes.

There are several basic problems with the process of collecting daily landings data from the co-ops. Firstly, the co-op staff who weigh-in fish are often tempted to enter only default values for effort codes rather than taking the time to enter accurate data. The fishermen are not always willing to give accurate details of how and where they made large catches. Finally, boat owners who did not actually participate in the fishing operation want to get credit for the catch by having their licence numbers entered instead of the actual skipper's.

Fisheries has been collecting useable data from the Clarence River Co-op computer system since October 1991. It appears that the Co-capture system can be used to successfully capture daily landings data from this computer system. Test data has been captured from the Neptune system at Coffs Harbor Co-op but further modifications are needed before the data can be successfully incorporated into the Fisheries databases.

III. CONCLUSIONS

This project has developed the methodology and mechanisms for electronically capturing daily catch and effort data from computer systems at Fishermen's Cooperatives or from any buyers who purchase fish directly from the fishermen. The feasibility of this capture system has also been demonstrated through live operation of the system. The quality and usefulness of this daily catch and effort data is far superior to the monthly catch return data from fishermen. The accuracy of the catch data is indisputable, because this is the basis of each fisherman's income. However, accuracy of the effort data is dependant on close liaison between the co-ops or buyers and the agency collecting the data.

IV. RECOMMENDATIONS

1. The currently used system for transferring files at 2400 baud is inefficient and costly. The new computer system which Fisheries is installing will allow for direct transfer of files at 9600 baud using AUSPAC. The transfer process should be automated and all modems at the co-ops should run at 9600 baud.
2. One full-time staff position at Fisheries is required to maintain communications software and hardware, transfer files, run the Co-capture application, retrieve information from reference files in the Fish.Licence database, liaise with co-op staff and correct the incoming co-op data. One part-time position is required to visit the co-ops and help solve any problems they experience with the computer system. This part-time staff can also check to make sure that accurate information is being entered at weigh-in time.
3. Many of the problems and delays experienced in the process of acquiring and exporting fisheries data from the co-op computer systems are related to the fact that the process is voluntary. If all buyers who purchase fish directly from the fishermen were required to supply the information that Fisheries is capturing from the co-op computer systems, there would be a strong incentive to install computer systems and supply electronic information rather than filling out paper forms.

APPENDIX I

Monthly Catch Return Forms



FISHERIES AND OYSTER FARMS ACT 1935

FORM 19
ESTUARY

Monthly declaration of fish taken by a fisherman from **New South Wales ESTUARINE WATERS.**

PLEASE READ INSTRUCTIONS BEFORE COMPLETING

PLEASE PRINT IN BLOCK LETTERS

- Section A: Must be completed by ALL LICENSED FISHERMEN
 Section B: Must be completed by Fishermen who FISHED this month REGARDLESS of whether they caught any fish/shellfish.
 Section C: To be completed by Fishermen who FISHED and PRODUCED CATCH.
 Section D: To be Signed and Dated by all licensed fishermen

PLEASE READ FURTHER INSTRUCTIONS ON PAGE 3.
 A SEPARATE RETURN MUST BE COMPLETED FOR EACH ESTUARY FISHED DURING THE MONTH.

SECTION A:

1. TOTAL NUMBER OF ESTUARINE AND OCEAN FORMS YOU ARE SUBMITTING THIS MONTH
2. MONTH OF _____ 19 _____ ESTUARY _____ (See List Page 4)
3. FULL NAME OF FISHERMAN _____ FILE No. _____
4. TOTAL DAYS FISH THIS MONTH. (IF NIL, ENTER 0)
5. IF YOU DID NOT FISH THIS MONTH, PLEASE ENTER THE REASON HERE. (Then go to Section D) _____

SECTION B:

6. IF YOUR FISHING WAS UNUSUAL THIS MONTH, YOU MAY ENTER THE REASON HERE _____

7. BOATS USED IN THIS ESTUARY THIS MONTH

LFB	BOAT NAME	DAYS USED

8. CREW IN THIS ESTUARY THIS MONTH

Do you hold a **Block Licence**? YES/NO
 (If not, please ensure you submit a file No. for each crew member)

FULL NAME	FILE No.	DAYS

9. DAYS FISHED FOR EACH METHOD USED IN THIS ESTUARY THIS MONTH

DAYS	METHOD	Code	DAYS	METHOD	Code	DAYS	METHOD
10	PRAWN trawl		67	Mesh net, bottom set or diver			
12	Prawn set pocket net		68	Mesh net, splashing			
14	Prawn hauling		66	Mesh net, flathead			
16	Prawn seine (Snigger)		61	Bullringing (Garfish)			
18	Prawn running net		62	Hauling net			
36	Handline		80	Skindiving			
56	Bait net		82	Hand gathering			
60	Mesh net, top set			Other (specify).....			

TRAPS: ONLY DAYS WHEN GEAR LIFTED
 40 Lobster/Crayfish pot (Trap)
 41 Crab pot (Trap)
 42 Fish trap, bottom/demersal
 43 Eel trap

10. DAYS WHEN MORE THAN ONE METHOD USED (See example Page 3, No. 10)

SECTION C:

11. DISPOSAL OF CATCH

	QUANTITY (nearest kg)
Sold through SYDNEY FISH MARKET _____	_____
Sold through _____ Fishermen's Co-operative	_____
Sold directly to consumer under consent No. _____	_____
Sold to a wholesaler (name) _____	_____
Exported direct	_____
Other (*enter details) _____	_____
TOTAL	_____

12. SPECIES (If not listed, show at end of list.)

Code	Landed Weight (nearest kg)	FISH	Code	Landed Weight (nearest kg)	FISH	Code	Landed Weight (nearest kg)	SHELLFISH
086001		Anchovy	381011		Mullet, Pink Eye	900300		Cockle
349007		Biddy, Silver	381003		Mullet, Sand	702003		Crab, Blue Swimmer
441020		Bonito	381002		Mullet, Sea (Bully or Hardgut)	702001		Crab, Mud (Mangrove or Black)
353901		Bream (Black and Yellowfin)	354001		Mulloway (Jewfish)	702901		Crab, Sand
599919		Catfish	363001		Old Maid (Butterfish)			Crab, Other (specify)
264004		Dory, John	327002		Pike	905560		Krill
361006		Drummer	085000		Pilchard/Herring	703013		Lobster, Eastern Rock (Crayfish)
067001		Eel, Short-finned or River	344002		Salmon, Australian	701000		Mantis Shrimp (Prawn Ki)
067007		Eel, Southern Conger	018039		Shark, Black Tip	652001		Mussel, Blue
		Eel, Other (specify)	013000		Shark, Carpet or Wobbegong	601000		Octopus
296004		Flathead, Dusky or River/Black	020902		Shark, Dogfish Endeavour	654000		Pipi
296901		Flathead, Sand	020901		Shark, Dogfish Greeneye	701915		Prawn, King
		Flathead, Other (specify)	018002		Shark, Snapper or School	701917		Prawn, Greasyback
461000		Flounder (specify)	027006		Shark, Fidler (Fidler Ray)	701916		Prawn, School
234006		Garfish, River	599911		Shark, Other (includes flake-specify)	701902		Prawn, Tiger
234001		Garfish, Sea	353001		Snapper (Red Bream)			Prawn, Other (specify)
234007		Garfish, Short-beaked or No-bill			Sole (specify)	651001		Scallop (live weight)
355000		Goatfish (Red Mullet or Barbounia)	599912		Stingray, Flaps/Ray	600000		Squid (specify)
440003		Hairtail	361009		Sweep	905011		Worms
337006		Kingfish, Yellowtail	334002		Tailor	905010		Shellfish, Mixed
465000		Leatherjacket (specify)	353011		Tarwhine			Shellfish, Other (specify)
235000		Longtom	438001		Trevally, Black (Happy Moments)	TOTAL SHELLFISH		
361007		Luderick (Blackfish)	337062		Trevally, Silver			
441001		Mackerel, Common or Slimy/Blue			Trumpeter (specify)			
		Mackerel, Other (specify)			Tuna (specify)			
381004		Mullet, Fantail or Flat-tail	599920		Whitebait (Mixed Small Fish)			
			385009		Whiting, Rock or Grass			
			330010		Whiting, Sand			
			330004		Whiting, Trumpeter			
					Whiting, Other (specify)			
			337003		Yellowtail			
			599901		Fish, Mixed			
					Fish, Other (specify)			
			TOTAL FISH					

SECTION D:

I hereby certify that the information in this form is correct in all details

SIGNATURE OF FISHERMAN: _____

DATE: _____

OFFICE USE ONLY

Date received: _____

Checked OK YES/NO

Follow up YES/NO

District: _____

Inspector: _____ Date: _____



FISHERIES AND OYSTER FARMS ACT 1935

FORM 19
OCEAN

Monthly declaration of fish taken by a fisherman from OCEAN WATERS and BEACHES and landed for sale in New South Wales.

PLEASE READ INSTRUCTIONS BEFORE COMPLETING

- Section A: Must be completed by ALL LICENSED FISHERMEN
- Section B: Must be completed by Fishermen who FISHED this month REGARDLESS of whether they caught any fish/shellfish.
- Section C: To be completed by Fishermen who FISHED and PRODUCED CATCH.
- Section D: To be Signed and Dated by all licensed fishermen.

PLEASE PRINT IN BLOCK LETTERS

PLEASE READ FURTHER INSTRUCTIONS ON PAGE 3.
A SEPARATE RETURN MUST BE COMPLETED FOR EACH OCEAN ZONE FISHED DURING THE MONTH.

SECTION A:

1. TOTAL NUMBER OF OCEAN AND ESTUARINE FORMS YOU ARE SUBMITTING THIS MONTH
2. MONTH OF _____ 19 _____ OCEAN ZONE _____ (See Map Page 4)
3. FULL NAME OF FISHERMAN _____ FILE No. _____
4. TOTAL DAYS FISHED IN THIS ZONE THIS MONTH. (IF NIL, ENTER 0)
5. IF YOU DID NOT FISH THIS MONTH, PLEASE ENTER THE REASON HERE. (Then go to Section D) _____

SECTION B:

6. IF YOUR FISHING WAS UNUSUAL THIS MONTH, YOU MAY ENTER THE REASON HERE _____

7. BOATS USED IN THIS ZONE THIS MONTH

LFB	BOAT NAME	DAYS USED

8. CREW IN THIS ZONE THIS MONTH

Do you hold a **Block Licence** ? YES/NO
(If not, please ensure you submit a file No. for each crew member)

FULL NAME	FILE No.	DAYS

9. DAYS FISHED FOR EACH METHOD USED IN THIS ZONE THIS MONTH

- 10PRAWN trawl
- 30Dropline
- 31Longline, midwater/pelagic
- 32Trotline, (bottom set longline)
- 33Driftline
- 34Trolling
- 36Handline
- 50FISH trawl
- 38Poling

Code	DAYS	METHOD
TRAPS: ONLY DAYS WHEN GEAR LIFTED		
45	Fish trap, midwater/pelagic (Kingfish)
42	Fish trap, bottom/demersal
40	Lobster/Crayfish pot (Trap)
41	Crab pot (Trap)

- 39Jigging
- 44Spanner crab net
- 54Purse seine
- 56Bait net
- 62Beach haul
- 70Dredging
- 80Skindiving
- 82Hand gathering
- Other (specify).....

10. DAYS WHEN MORE THAN ONE METHOD USED (See example Page 3, No. 10)

SECTION C:

11. PORT OF LANDING (See Map Page 4)

12. DISPOSAL OF CATCH

- Sold through SYDNEY FISH MARKET _____
- Sold through _____ Fisherman's Co-operative _____
- Sold directly to consumer under consent No. _____
- Sold to a wholesaler (name) _____
- Exported direct _____
- Other (*enter details) _____

QUANTITY (nearest kg)

TOTAL _____

13. SPECIES (If not listed, show at end of list.)

Code	Landed Weight (nearest kg)	FISH	Code	Landed Weight (nearest kg)	FISH	Code	Landed Weight (nearest kg)	FISH
441005		Albacore	384000		Parrot Fish	337003		Yellowtail
086001		Anchovy	287001		Perch, Ocean	599902		Fish, Mixed
439001		Barracouta (Snoek)	320003		Perch, Pearl			Fish, Other (specify)
349007		Biddy, Silver	311001		Perch, Orange			TOTAL FISH
367000		Boarfish (Penfish)			Perch, Other (specify)			
441020		Bonito	384001		Pigfish			
441008		Bonito, Leaping or Spotted	327002		Pike			
353901		Bream, Black and Yellowfin	085000		Pilchard/Herring			
335001		Cobia	258003		Redfish (Nannygai)			
311060		Cod, Bar or Grey-Banded	440002		Ribbonfish (Southern Frostfish)			
311083		Cod, Coral			Rudderfish			
287008		Cod, Red Rock	445004		Salmon, Australian			
		Cod, Other (specify)	344002		Samson			
337904		Dart	337007		Seapike, Short-finned/Snook			
338001		Dolphin fish	382002		Shark, Angel			
264004		Dory, John	024001		Shark, Banjo			
264003		Dory, Mirror	027000		Shark, Black Tip			
264002		Dory, Silver	018039		Shark, Carpet or Wobbegong			
264001		Dory, King	013000		Shark, Dogfish Endeavour			
		Dory, Other (specify)	020902		Shark, Dogfish Greeneye			
361006		Drummer	020901		Shark, Gummy			
067007		Eel, Southern Conger	017001		Shark, Hammerhead			
		Eel, Other (specify)	019000		Shark, Mako			
296901		Flathead, Sand	010000		Shark, Saw			
296001		Flathead, Tiger	023000		Shark, Shovel-nosed			
		Flathead, Other (specify)	027001		Shark, Snapper or School			
461000		Flounder (specify)	018002		Shark, Fidler (Fidler Ray)			
234001		Garfish, Sea	027006		Shark, Ghost			
439002		Gemfish	042000		Shark, Other (includes flake-specify)			
355000		Goatfish (Red Mullet or Barbounia)	599911		Snapper (Red Bream)			
227001		Grenadier, Blue	353001		Sole, Black			
288001		Gurnard, Red	462017		Sole, Lemon			
288005		Gurnard, Spotted	463009		Stargazer			
440003		Hairtail	400000		Stingray, Flaps/Ray			
311902		Hapuku (Hapuka) or Bass Groper	599912		Sweep			
346032		Jobfish, Rosy	361009		Swordfish, Broadbill			
337006		Kingfish, Yellowtail	442001		Tailor			
288006		Latchet (Sharp-beaked Gurnard)	334002		Tarwhine			
465000		Leatherjacket (specify)	353011		Teraglin (Trag)			
228002		Ling	354006		Trevalla, Deepsea (Blue Eye)			
361007		Luderick (Blackfish)	445001		Trevally, Black (Happy Moments)			
337002		Mackerel, Jack (Cowanyoung)	438001		Trevally, Silver			
441001		Mackerel, Blue (Common or Slimy)	337062		Trumpeter			
441007		Mackerel, Spanish	321001		Trumpeter, Tasmanian			
441015		Mackerel, Spotted	378001		Trumpeter, Bastard (Moki)			
		Mackerel, Other (specify)	378002		Tuna, Big Eye			
331000		Moonfish (Tilefish)	441011		Tuna, Northern Bluefin			
377003		Morwong, Jackass	441013		Tuna, Skipjack or Striped			
377009		Morwong, Red	441003		Tuna, Southern Bluefin			
377002		Morwong, Rubberlip	441004		Tuna, Yellowfin			
381002		Mullet, Sea (Bully or Hardgut)	441002		Tuna, Mackerel			
		Mullet, Other (specify)	441010		Wahoo			
354001		Mulloway (Jewfish)	441024		Warehou			
439003		Oilfish	445901		Whitebait, (Mixed Small Fish)			
439008		Oilfish, Black	599920		Whiting, School or Redspot			
255009		Orange Roughy (Deep Sea Perch)	330002		Whiting, Sand			
			330010		Whiting, Trumpeter			
			330004		Whiting, Other (specify)			
			311090		Wirrah			

Code	Landed Weight (nearest kg)	SHELLFISH
703028		Bug, Balmain
600003		Calamari, Southern
900300		Cockle
702003		Crab, Blue Swimmer
702901		Crab, Sand
702002		Crab, Spanner
702800		Crab, Hermit
		Crab, Other (specify)
602000		Cuttlefish
703013		Lobster, Easter Rock (Crayfish)
700003		Lobster, Shovel-Nosed
		Lobster, Other (specify)
652001		Mussel, Blue
601000		Octopus
654000		Pipi
701911		Prawn, Carid
701915		Prawn, King
701917		Prawn, Greasyback
701319		Prawn, Racek
701913		Prawn, Royal Red
701916		Prawn, School
701902		Prawn, Tiger
		Prawn, Other (specify)
651001		Scallop, (live weight)
800000		Shells
600000		Squid (specify)
905011		Worms
905010		Shellfish, Mixed
		Shellfish, Other (specify)
		TOTAL SHELLFISH

OFFICE USE ONLY

Date received: _____

Checked OK YES/NO _____

Follow up YES/NO _____

District: _____

Inspector: _____ Date: _____

SECTION D:

I hereby certify that the information in this form is correct in all details

SIGNATURE OF FISHERMAN: _____

DATE: _____

APPENDIX II

ASCII File Format for Co-op Data

Clarence River Co-op Data Format

Record Type: Header

Field	Field Description	Format	Form	Len
1	Co-op code	Numeric	"999999"	8
2	Week ending date	Alphanumeric	dd/mm/yy	8

Record Type: Docket

Field	Field Description	Format	Form	Len
1	Record type	Alpha	"DOCKET"	8
2	Docket number	Alphanumeric	XXXXXXXX	7
3	Weigh-in date	Alphanumeric	dd/mm/yy	8
4	Fisherman licence	Numeric	"999999"	8
5	Boat licence	Numeric	"999999"	8
6	Days fished	Numeric	99	2
7	Region code	Numeric	"9999"	6
8	Number of crew	Numeric	99	2
9	Fishing method	Numeric	"99"	4

Record Type: Crew

Field	Field Description	Format	Form	Len
1	Record type	Alpha	"CREW"	6
2	Docket number	Alphanumeric	XXXXXXX	7
3	Crew (B for block or licence #)	Alphanumeric	"B" or "999999"	8
4	Crew name	Alpha	"XXXXXX"	27
5	Crew days	Numeric	99	2

Record Type: Catch

Field	Field Description	Format	Form	Len
1	Record type	Alpha	"Catch"	7
2	Docket number	Alphanumeric	XXXXXXX	7
3	Species code	Numeric	999	3
4	Total weight (kg)	Numeric	99999.99	8

Note: Docket number is assigned by the co-op. Codes for fisherman licence, boat licence, region and fishing method are from Fish.Licence database. Species code is unique to Clarence River.

Example of ASCII Data from Clarence Co-op

"00131","24/10/91"
"DOCKET","576356","17/10/91","780112","009076",1,"2041",1,"10"
"CREW","576356","B","WISEMAN B",1
"CATCH","576356",372,102.00
"CATCH","576356",152,14.00
"CATCH","576356",201,1.00
"DOCKET","576357","17/10/91","780304","002582",1,"2041",0,"60"
"CATCH","576357",1,13.00
"DOCKET","576358","17/10/91","780303","000323",1,"2041",0,"10"
"CATCH","576358",372,41.00
"CATCH","576358",1,13.00
"CATCH","576358",101,3.00
"DOCKET","576359","17/10/91","111111","000024",1,"2041",0,"10"
"CATCH","576359",867,50.00
"DOCKET","576360","18/10/91","770193","009422",1,"2041",2,"10"
"CREW","576360","860385","ESSEX M",1
"CREW","576360","772093","ESSEX R",1
"CATCH","576360",660,94.80
"CATCH","576360",664,37.20
"CATCH","576360",21,11.70
"CATCH","576360",600,1.00
"CATCH","576360",372,1.00

Coffs Harbour Data Format

Record Type: Header

Field	Field Description	Format	Form	Len
1	Co-op code	Numeric	"999999"	8
2	Week ending date	Alphanumeric	dd/mm/yy	8

Record Type: Docket

Field	Field Description	Format	Form	Len
1	Record type	Alpha	"DOCKET"	8
2	Docket number	Alphanumeric	XXXXXXX	7
3	Weigh-in date	Alphanumeric	dd/mm/yy	8
4	Fisherman licence	Numeric	"999999"	8
5	Boat licence	Numeric	"999999"	8
6	Days fished	Numeric	99	2
7	Region code	Numeric	"9999"	6
8	Number of crew	Numeric	99	2
9	Fishing method 1	Numeric	"99"	4
10	Method 1 days	Numeric	99	2
11	Fishing method 2	Numeric	"99"	4
12	Method 2 days	Numeric	99	2
13	Fishing method 3	Numeric	"99"	4
14	Method 3 days	Numeric	99	2

Record Type: Crew

Field	Field Description	Format	Form	Len
1	Record type	Alpha	"CREW"	6
2	Docket number	Alphanumeric	XXXXXXX	7
3	Crew (B for block or licence #)	Alphanumeric	"B" or "999999"	8
4	Crew name	Alpha	"XXXXXX"	27
5	Crew days	Numeric	99	2

Record Type: Catch

Field	Field Description	Format	Form	Len
1	Record type	Alpha	"CATCH"	7
2	Docket number	Alphanumeric	XXXXXXX	7
3	Species code	Numeric	9999	4
4	Size code	Alphanumeric	" "	2
5	Processing code	Alpha	"XX"	4
6	Count per box	Numeric	0	1
7	Number of boxes	Numeric	999	3
8	Kilos per box	Numeric	999.9	5

Note: Docket numbers are assigned by the co-op. Codes for fisherman licence, boat registration, region and fishing method come from the Fish.Licence database. Codes for species, size and processing come from the FMA. Fisheries does not use size or count per box.

Example of ASCII Data from Coffs Harbour

```
"100142" 01/11/91
"DOCKET" 2902 01/11/91 "780529" "001605" "01" "1003" 0 "10" 1 "" 0 "" 0
"CREW" 2902 "840364" "HOOPER J & R" "01"
"CATCH" 2902 90 "" "" 0 0 8
"CATCH" 2902 31 "s" "" 0 0 7
"CATCH" 2902 21 "" "" 0 0 11.5
"CATCH" 2902 27 "" "" 0 0 17.5
"CATCH" 2902 31 "l" "" 0 0 11.5
"CATCH" 2902 141 "" "c" 0 0 11.5
"CATCH" 2902 159 "m" "c" 0 0 10.5
"CATCH" 2902 138 "" "" 0 0 0
"CATCH" 2902 83 "" "" 0 0 16
"CATCH" 2902 70 "" "" 0 0 3
"CATCH" 2902 159 "s" "c" 0 0 6.5
"DOCKET" 2903 01/11/91 "780529" "001605" "01" "1003" 0 "10" 1 "" 0 "" 0
"CATCH" 2903 159 "m" "hd" 0 0 1
"CATCH" 2903 144 "" "gr" 0 0 1.5
"DOCKET" 2905 01/11/91 "" "006403" "01" "1003" 0 "10" 1 "" 0 "" 0
"CATCH" 2905 31 "s" "" 0 0 .5
"CATCH" 2905 67 "" "" 0 0 .5
"CATCH" 2905 22 "" "" 0 0 1
```


APPENDIX III

Documentation of Co-capture Application

Online modules:

The main menu is driven by an INFORMATION menu routine called CO-OP.CATCH (Figure 1) and it is located in a file called CO-OP.MENU. For details of menu routine implementation, refer to Prime INFORMATION PERFORM Reference Guide DOC 10059-2LA (Release 8).

Daily Catch Update:

Module name : WKLY.ONL.IBAS
Object name : WKLY.ONL.IRUN

This module will accept weekly input transaction files from Coffs Harbour or Clarence River depending on the option selected. If the file has already been processed it cannot be processed again using this menu screen because the input is checked against details of the processed file which are stored in the control file called FCNTRL.

The file is then passed over as a parameter to be run in batch mode by either CLARENCE.CATCH.IRUN or COFFHBR.CATCH.IRUN depending on the option chosen.

Monthly Catch Update:

Module name : MONL.IBAS
Object name : MONL.IRUN

This online module will prompt you for input in yymm format so that daily data from that month will be summed into LCATCH.TEMP, which has a format identical to that of LCATCH in FISH.LICENCE.

A warning message will be displayed if it detects insufficient data in that month, based on the details logged in a control file called FCNTRL (during daily catch update). You are given the option to discontinue the process. If the process is continued, the input period is passed to a batch job called MUPA.IRUN which sums the daily data from that period to the monthly file called LCATCH.TEMP

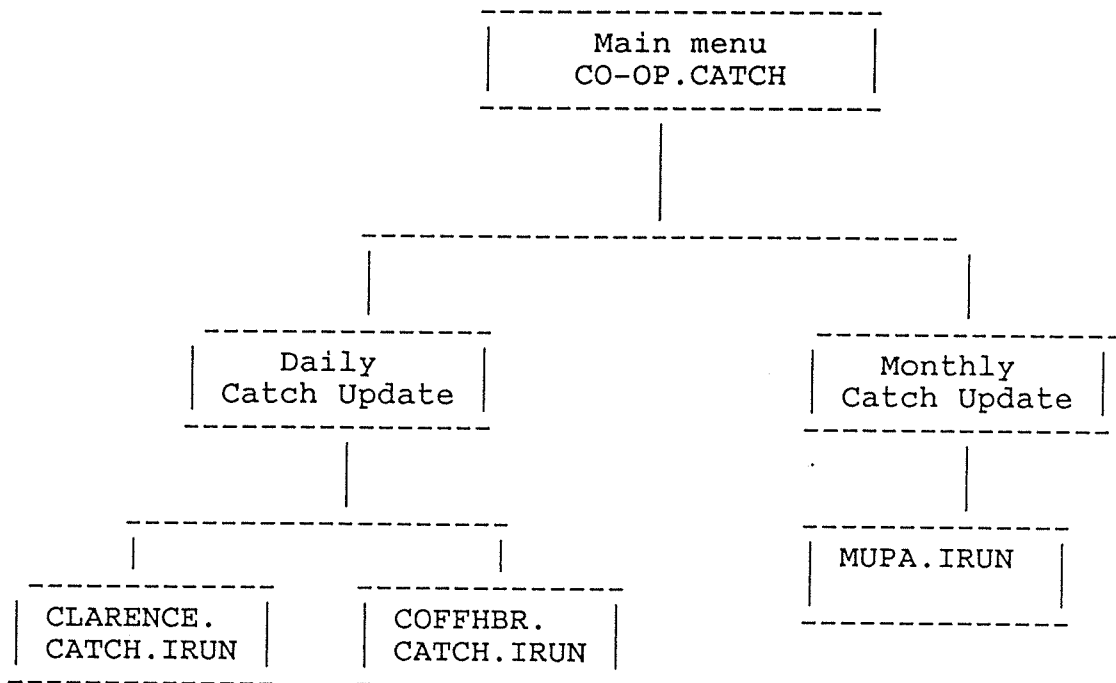


Figure 1. Structure chart of the menu.

Batch modules:

Module name : CLARENCE.CATCH.IBAS
Object name : CLARENCE.CATCH.IRUN

This module edits catch details in the weekly ASCII data files from the Clarence River Co-op and its depot at Iluka. Data from these two areas are merged into a single data file. Species codes are translated to CSIRO code numbers. Fisherman licence numbers, boat licence numbers, region codes, method codes and CSIRO codes are checked against reference files in the FISH.LICENCE database. If any of these values are invalid or any of the records are found to be duplicates, all records (docket, crew, and catch) associated with the docket are put in a reject file. An identifier of n+1 is appended to the end of the reject file name. It can then be edited and used as an input file.

Staff at the Clarence River Co-op correct mistakes on the dockets by entering appropriate negative weight values on subsequent dockets. These negative values are used to amend the data according to the rules described in the Negative Routine section.

Non-duplicate data meeting the input specifications (Appendix II) are stored in appropriate docket, crew, catch and method files (Figure 2). A control file called FCNTRL is updated with information on update transactions for all files. Reports on amendments, validation checks and updates are generated and stored in report files (Figure 2).

NEGATIVE ROUTINE

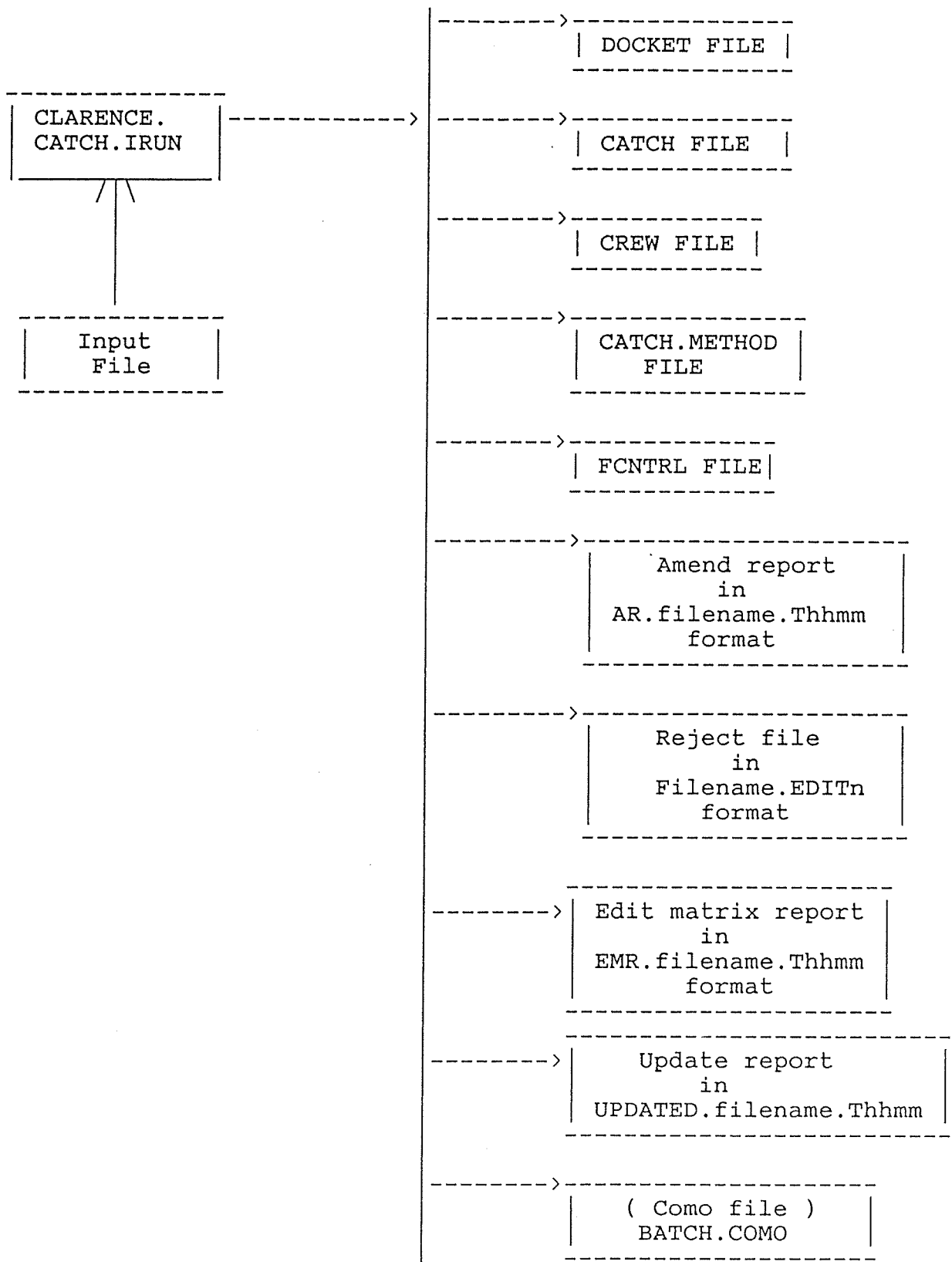
SOURCE.NAME : NEVA.IBAS
 OBJECT NAME : NEVA.IRUN
 VOC FILE : NEGATIVE.ROUTINE

CALLED BY : CLARENCE.CATCH.IRUN

OUTPUT : AR.filename.Thhmm (where hh=hours and
 mm=minutes)
 : REJ.filename.Thhmm

DIRECTORY : <USI3A>SCIF>CHRISU>&HOLD&
 <USI3A>SCIF>CHRISU>CO-OP.DIR (where REJ.* is
 put)

To resolve the difficulty of amending erroneous records with negative values, this module creates a lookup.table (Figure 3) to search for the species and catch weight of a particular catch record which has already been updated in the CATCH file. This is necessary because the catch record with negative values has no indication of which docket it is associated with in the same file.



* hhmm stands for hours and minutes

* ----> stands for output

Figure 2. System chart of CLARENCE.CATCH.IRUN.

The logic of the amendment routine assumes that all corrections occur with the one week transaction period, therefore all amendment records are within one input file. The negative values are inserted to correct three situations: 1) an incorrect weight has been entered, 2) an incorrect species code has been entered or 3) the skipper is changed. The amendment routine finds and amends the appropriate record in all three situations then logs the amendments in the amend report.

MATRIX.CHECK

SOURCE.NAME : EDM.CHECK.IBAS
 OBJECT NAME : EDM.CHECK.IBAS
 VOC FILE : MATRIX.CHECK

CALLED BY : NEVA.IRUN (negative routine)
 CLARENCE.CATCH.IRUN

OUTPUT : EMR.filename.Thhmm (where hh=hours and
 mm=minutes)

DIRECTORY : <USI3A>SCIF>CHRISU>&HOLD&

This subroutine checks the species versus regions and methods against values in two FISH.LICENCE reference files, LCEXREGIONS and LCEXMETHODS once a docket data set is successfully updated or modified. A warning code is attached to the catch file and messages will be generated accordingly in a report when catch details do not match with one of those two files.

PRINT.LOOKUP

SOURCE.NAME : PUP.IBAS
 OBJECT NAME : PUP.IRUN
 VOC FILE : PRINT.LOOKUP

CALLED BY : CLARENCE.CATCH.IRUN

INPUT : FLIC, MCATCH(16000), MWGT(16000),
 MCATCH.KEY(16000), MTHD.KEY(16000),
 MCREW.KEY(10000)

OUTPUT : AR.filename.Thhmm (where hh=hours and
 mm=minutes)

DIRECTORY : <USI3A>SCIF>CHRISU>&HOLD&

This module extracts all values stored in the lookup table and dumps the information in a report-format file. This file is produced when all data capturing and amendment processes have been completed. The report is by fisherman licence (ie, skipper id) in ascending order. A fisherman licence without any catch weight or record id is the result of rejected or amended input records.

Module name : COFFHBR.CATCH.IBAS
Object name : COFFHBR.CATCH.IRUN

This module edits catch details in the weekly ASCII data files from Coffs Harbour in a manner similar to CLARENCE.CATCH.IBAS. Non-duplicate data meeting input specifications (Appendix II) are stored in the same docket, crew, catch and method files as the Clarence Co-op data. There are no negative values to contend with so the negative routine is not used.

Module name : MUPA.IBAS
Object name : MUPA.IRUN

This module selects daily catch and crew records from the specified year-month period (ie, YMMM) which have not been previously selected and adds them to a monthly INFORMATION file called LCATCH.TEMP which has the same file format as LCATCH and LCATCH.INTER in FISH.LICENCE.MUPA.IRUN.

SOURCE.NAME : MUPA.IBAS
OBJECT NAME : MUPA.IRUN

CALLED BY : MONL.IRUN

INPUT : Information files -- DOCKET, CREW, CATCH
and PERIOD.CONTROL

OUTPUT : As input above, plus LCATCH.TEMP and period-
update report in update.input.period.created.
date.time

DIRECTORY : <USI3A>SCIF>CHRISU>&HOLD&

This module selects, in fisherman licence order, docket records that belong to the input transaction period and have not been selected previously, using the alternative key index called PERIOD. CSIRO codes and crew licence numbers stored in each docket record are used to form key values for extracting catch and crew details. These keys are then used to accumulate monthly values in each field of a CATCH.TEMP record. The CATCH.TEMP records have the same format as the LCATCH file in the FISH.LICENCE database.

Once the accumulation process is completed for each fisherman licence value within each fishing region, the LCATCH.TEMP record is written into the LCATCH.TEMP file. All selected records from the input files are marked 'selected' to prevent them from being selected again, should the same period be selected again. The key is then written to the PERIOD.CONTROL file and marked 'add' if the record did not exist previously. If it already exists in PERIOD.CONTROL, the record is marked "MOD".

The PERIOD.CONTROL file facilitates the transfer of records in

LCATCH.TEMP to LCATCH.INTER and finally to LCATCH.PERIOD.CONTROL only consists of LCATCH.TEMP keys and the update status. The transfer process only involves using the alternative key index period to specify the selected period and marking the update status afterwards with 'transferred'.

APPENDIX IV

Sample Output from Co-capture Reports
(One page per report)

REJECTED TRANSACTION OF CLARENCE RIVER CO-OP AT ENDING PERIOD 30 MAY 1991

TIME: 10:22 DATE:01/07/91

REJECTED RECORDS	EDIT STATUS	SEQ.NO	REASON
"100131", "30/05/91"	OK	10	
* DO NOT ALTER THE ABOVE LINE; THIS REPORT COULD BE USED AS AN INPUT FILE FOR * RE-RUNNING THE CO-OP UPDATE TRANSACTION PROGRAM AFTER HAVING CORRECTED THE * INVALID RECORDS LISTED BELOW MARKED BY "FAIL" UNDER THE EDIT STATUS COLUMN			
"DOCKET", "571922", "29/05/91", "880420", "004463", 1, "1002", 2, "10"	FAIL	48	Not personal licence at field 4
"DOCKET", "571986", "30/05/91", "780267", "003215", 1, "1002", 1, "10"	OK	297	
"CREW", "571986", "", "WISEMAN B", 1	FAIL	298	CREW LIC NOT IN FILE AT FIELD 3
"CATCH", "571986", 764, 6.50	OK	299	
"CATCH", "571986", 759, 6.00	OK	300	
"CATCH", "571986", 756, 1.00	OK	301	
"CATCH", "571986", 209, 2.00	OK	302	
"CATCH", "571986", 914, 13.00	OK	303	
"CATCH", "571986", 913, 7.50	OK	304	
"CATCH", "571986", 450, 22.00	OK	305	
"CATCH", "571986", 111, 9.00	OK	306	
"CATCH", "571986", 137, 1.00	OK	307	
"CATCH", "571986", 127, 0.50	OK	308	
"CATCH", "571986", 560, 11.00	OK	309	
"CATCH", "571986", 555, 3.50	OK	310	
"CATCH", "571986", 500, 4.00	OK	311	
"CATCH", "571986", 474, 2.00	OK	312	
"CATCH", "571986", 678, 9.00	OK	313	
"CATCH", "571986", 668, 300.00	OK	314	
"DOCKET", "572028", "30/05/91", "771970", "", 1, "2041", 0, "60"	FAIL	374	BOAT LICENCE NOT REGISTERED AT FIELD 5

E N D O F E D I T

THIS EDIT FILE IS W300591.CLA.EDIT2
SOURCE FILE IS W300591.CLA.EDIT1

UPDATED TRANSACTIONS OF CLARENCE RIVER CO-OP AT ENDING PERIOD 30 MAY 1991

DATE: 01/07/91

TIME: 10:22

RECORD KEY	FILE	UPDATED DATA								
781113:1002:602:8550:571918	DOCKET	CO-OP	PERIOD	DOCKET	DOCKET DATE	CREW.LIC	CSIRO.CODE			
		602	9105	571918	29/05/91	B1	701915 703028 017001 599911 600000 384001 461000 296901 367000 600003 264004 599902 355000 702902 330002			
B1:781113:1002:602:8550	CREW	CREW NAME	DAYS	PERIOD	DOCKET	DOCKET DATE	CO-OP			
		-----	1	9105	571918	29/05/91	602			
701915:781113:1002:602:8550	CATCH	CSIRO	METHOD	DAYS	PERIOD	REGION	CO-OP	BOAT.LIC	BOXES	KILO/BOX
		701915	10	1	9105	1002	602	003000	1	108.5
		CHECK FLAG	CHECK CODE	SIZE	PROCESS	DOCKET DATE				
		-----	-----	---	---	-----				
				L	C	29/05/91				
				M	C					
					SO					
10:701915:781113:1002:602:8550	METHOD	METHOD	DAYS	REGION	CSIRO	PERIOD	DOCKET DATE			
		10	1	1002	701915	9105	29/05/91			
703028:781113:1002:602:8550	CATCH	CSIRO	METHOD	DAYS	PERIOD	REGION	CO-OP	BOAT.LIC	BOXES	KILO/BOX
		703028	10	1	9105	1002	602	003000	1	33.5

W300591.CLA.EDIT1

PAGE: 1
EDIT MATRIX ADVISORY REPORT ON CO-OP WEEKLY FILE
DATE: 01/07/91

TIME: 10:22

FILE	DATA	DATA	ADVISED	DATA	ADVISED	DATA
SEQ NO	ADVISED	DATA	ADVISED	MONTH	MONTHS	
METHOD	SPECIES	REGION	REGIONS			
	METHODS	WGT	WGT			
250	381002	2041	**** - ****	05	** - **	10
	**	164.0	100			

WARNING MESSAGE : NONE

----- ADVISORY END FOR ABOVE SPECIES

AUG354	381002	2041	**** - ****	05	** - **	10
	**	176.0	100			

WARNING MESSAGE : NONE

----- ADVISORY END FOR ABOVE SPECIES

AUG406	381002	2041	**** - ****	05	** - **	10
	**	205.0	100			

WARNING MESSAGE : NONE

----- ADVISORY END FOR ABOVE SPECIES

E N D O

FISHMAN LICENCE = 771970

FISHMAN LICENCE = 780036

		FISH LIC =780036	DOCKET 1	KEY= 780036:2041:602:8551:571969	
CATCH	WGT	CATCH KEY		METHOD KEY	CREW KEY
21	1.8	353004:780036:2041:602:8551		10:353004:780036:2041:602:8551	880403:780036:2041:602:8551
101	4.1	296004:780036:2041:602:8551		10:296004:780036:2041:602:8551	
1	6.5	361007:780036:2041:602:8551		10:361007:780036:2041:602:8551	
372	205	381002:780036:2041:602:8551		10:381002:780036:2041:602:8551	
510	0.8	599911:780036:2041:602:8551		10:599911:780036:2041:602:8551	
201	0.5	354001:780036:2041:602:8551		10:354001:780036:2041:602:8551	
818	0.5	702001:780036:2041:602:8551		10:702001:780036:2041:602:8551	
119	4.3	381003:780036:2041:602:8551		10:381003:780036:2041:602:8551	
600	1.0	334002:780036:2041:602:8551		10:334002:780036:2041:602:8551	
618	0.3	337062:780036:2041:602:8551		10:337062:780036:2041:602:8551	

FISHMAN LICENCE = 780267

FISHMAN LICENCE = 781021

		FISH LIC =781021	DOCKET 1	KEY= 781021:1002:602:8550:571924	
CATCH	WGT	CATCH KEY		METHOD KEY	CREW KEY
764	20.0	701915:781021:1002:602:8550		10:701915:781021:1002:602:8550	790589:781021:1002:602:8550
940	3.0	701902:781021:1002:602:8550		10:701902:781021:1002:602:8550	
560	6.5	600000:781021:1002:602:8550		10:600000:781021:1002:602:8550	

Monthly update report of catch statistics at year 91 month 05

PAGE 1
10:26:15 04 JUL 1991

Fish licence : 770005 Fish.licence.name : BAILEY,DESMOND MERVYN
 Region code : 1002 Region name : 29 deg. - 30 deg. LATITUDE (zone 2)
 Record.id : 770005:9105:1002

Field Name	Days	LCATCH	Days	LCATCH INTER	Days	LCATCH TEMP
CBOAT					1	000119
CDAYS					1	
CPORT						
CREWLIC						
CREWNAME						
CMETHOD					5	10
CDISPLOC						602
CDISPKG		0		0		49
CDISPTOTALKG		0		0		49
CSPECODE						701915 601000 330002 702902 264004
CSPECKG		0		0		15
		0		0		12
		0		0		20
		0		0		1
		0		0		1
CPSECTOTALKG		0		0		49
CDATEIN						04/07/91
CDATECHG						

U P D A T E C O M P L E T E D