New South Wales Government

Department of Agriculture

NEW ENGLAND, HUNTER AND METROPOLITAN REGION

12 Shirley Road Wollstonecraft 2065

86/67 and 86/54

Our reference:

Your reference:

The Secretary. Fishing Industry Research Committee. Department of Primary Industry. CANBERRA.ACT.

Telephone: 43 5046 STD 02 439-3150 25th MAY, 1987.

NETMAKING COURSE 86/67 AND ECHOSOUNDING COURSE 86/54

Dear Gwen,

I enclose a copy of a combined report for the Netmaking and Echosounding courses which were completed early in May, 1987.

I am pleased to advise that the courses were very well received by the participants.

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Terry Gorman.

for George Knowles. Director General.

REPORT TO FIRTA

FIRTA GRANT 86/67: SHORT COURSE ON NETS, KNOTS AND ROPEWORK FIRTA GRANT 86/54: ECHOSOUNDER, SONAR, RADAR AND MARINE RADIO TRANSCEIVER COURSE

Pre-Course Publicity

The Fisheries Information Service of the N.S.W. Department of Agriculture prepared, printed and distributed publicity posters together with application forms. Full acknowledgement of FIRTA was printed on the The posters were displayed at the Sydney Fish markets, Fisheries posters. Inspectors Offices, and in the premises of fishermen's co-operatives about one month before the courses began. In addition, media releases were made to the press, radio and television, and between 750 and 1000 applications were posted out with licence renewal papers. Finally about 3000 application forms were mailed to individual fishermen just before the courses began.

Copies of the posters and application forms are enclosed for information.

Dates of Courses

Net Making 4th - 8th May 1987 Echosounder 11th - 14th May 1987

The courses were held in consecutive weeks to allow participants to attend both without the added cost of returning home between courses.

Number of Participants

The number of participants at the Net Making course was increased from 14 to 15 with the approval of FIRC. The number at the Echosounding course was reduced by one from 20 to 19 to compensate for the additional person on the Netmaking Course. Approval to make this alteration was sought when there were still vacancies on the Echosounder Course but simultaneously a waiting list on the Netmaking Course.

Eventually there was a waiting list for both courses, and these applicants have since been advised that they are eligible for the next course subject to the necessary funding being provided by FIRC.

The number finally enrolled at the courses were as follows:

Netmaking Course 14 Echosounder Course 21

In the case of the Echosounder Course, one fisherman failed to appear, and two of the participants were observers from AWA (Aust) so were not eligible for the \$200 living expenses. Last minute attempts to replace the fisherman who did not appear were not successful. The number of eligible participants for the \$200 expense allowance was 18.

Unfortunately most fishermen delay their applications until the week before the courses are run, which creates administrative problems for the Division of Fisheries.

Net Making

Name

Port of Operation

Kincumber, Gosford

Brunswick Heads

South West Rocks

Fairfield, Sydney

Coffs Harbour

Woy Woy

Woy Woy

Yamba

Ballina

Nowra

Clarence

Tuggerah

Woy Woy

Broken Bay

Gosford

1. Robert Sheehan 2. Harry Stride 3. Graham Campbell 4. Robert Cole 5. Scott Dederer 6. John MacIntosh 7. Colin A. Gale 8. Mark Nixon 9. Graeme Costello 10. Frank Thompson 11. Danny Ebenstreit 12. Brian Bevan 13. Brian Finch 14. Paul Donald 15. Ron Finch

Echosounding

Name

Organisation or Port of Operation

1. Robert Cole 2. Trevor Martin 3. Daniel Punton 4. Graham Costello 5. Frank Thompson 6. Steven Burt 7. Athol Cowan 8. Gerry Hagelstein 9. Grant Elliot 10. Brian Finch 11. Ron Finch 12. Wayne Bale 13. Andy Wallace 14. Jim Brown 15. Leon Thomas 16. Cliff Elford 17. Josip Depre 18. Carol Benn 19. Fred Mackiewicz 20. David Sievwright

Brunswick Heads Ballina Sydney Nowra Fairfield, Sydney Port Macquarie Port Macquarie Coffs Harbour Berry Woy Woy Broken Bay Tugun St. Georges Basin Port Macquarie Newport Port Macquarie Lakemba NSW Fishing Industry Training Committee, Sydney AWA AWA

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Lecturers

Netmaking Course

Terry Gorman - Division of Fisheries Ken Graham - Division of Fisheries

Echosounder Course

AWA (Aust)., the University of Melbourne, and the Australian Maritime College provided lecturers in addition to two provided by the N.S.W. Department of Agriculture, Division of Fisheries.

The lecturers were:

John Akin	-	AWA (Aust)
John Hill	-	University of Melbourne
Alf Carver	-	Maritime College
Terry Gorman		Division of Fisheries
Ken Graham	-	Division of Fisheries

Vessels

The <u>Demeeli</u> was kindly provided by AWA (Aust), and specially fitted out with a range of equipment for the course.

FRV <u>Kapala</u> was provided by the Division of Fisheries, and both vessels were used each day generally as set out in the syllabus.

The participants in the course were able to gain operating experience on the following equipment:

MV Demeeli

- 4 colour echosounders
- 1 radar (daylight viewing)
- 1 GPS receiver
- 1 video plotter

FRV Kapala

- 1 dry paper echosounder
- 1 wet paper echosounder
- 1 colour echosounder
- 1 searchlight sonar with wet paper and CRT short range presentation
- 1 acoustic transmission netsounder
- 1 cable transmission netsounder
- l radar

Both vessels were equipped with a range of radio equipment but hands on operation of these in Sydney Harbour was restricted.

<u>Fisheries Films</u>

The following films were featured on the Tuesday and Wednesday nightS of each course.

Sashimi tuna. Irish automated longline system. Fish reactions to trawl gear and performance of trawl doors. U.S. method of purse seining. Japanese squid jigging. Handle with care (lobsters). Engel balloon trawl in operation. Introduction to the flume tank. The world about us, feast or famine. The HAL auto longline system.

Syllabuses

Copies of the syllabuses for the courses are attached for information.

1987 Netmaking Course

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A group photo of participants in the 1987 netmaking course.

1987 Netmaking Course



Participants are seen learning the technique of repairing small mesh nets by inserting a patch.

1987 Echosounder, Sonar and Radar Course



Participants in the 1987 Echosounder, Sonar, Radar and Radio course attending a lecture in the training centre at the Gore Bay office of Department of Agriculture NSW, Division of Fisheries.



Course lecturer Mr John Hill (right) is seen discussing the features of an echo-trace with participants on FRV <u>Kapala</u> during a practical session.

1987 Echosounder, Sonar and Radar Course



The AWA (Aust.) demonstration vessel <u>Demeeli</u> with a group of participants aboard during a practical session on Sydney Harbour.

DETAILS OF THE SYLLABUS FOR THE SHORT COURSE ON NETS AND NETMAKING:

<u>Monday</u>

Essential knots and hitches. Flat netting: setting up, braiding, shaping

Sleeve bag and square nets; setting up and braiding

(Free evening)

<u>Tuesday</u>

Braiding a small fish trawl

Assembling nets

Hanging nets

Mending

Braiding and mending practice

(1700-1900: Fishing films)

Wednesday

Machine made netting, cutting and shaping

Making a small prawn trawl

Joining, lacing and meshing

Braiding and mending practice

Practical sea-going exercise of shooting and hauling trawl gear (The timing of the sea-going exercise may be varied to suit the weather conditions.)

(1700-1900: fishing films)

Thursday

Calculating tapers

Calculating hanging coefficients and hanging netting

Trawls: Part of the net, net types, rigging

Understanding net plans

Preparation of net plans

Braiding and mending practice

Evening: barbecue at Gore Bay for participants.

Friday

Splicing fibre rope, combination rope and wire

Whipping

Cod end knots

Miscellaneous knots

Knots in monofilament

Braiding and mending practice

DEPARTMENT OF AGRICULTURE, N.S.W.

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DIVISION OF FISHERIES

SYLLABUS

ECHOSOUNDER, SONAR, RADIO AND RADAR COURSE

12 SHIRLEY ROAD, WOLLSTONECRAFT, SYDNEY

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TIME	UNIT	SUBJECT HEADING	SYNOPSIS
9.30 am			OFFICIAL OPENING OF THE COURSE
10.00 am	1.0	THE ECHOSOUNDER	A detailed description of the echosounder picture giving the reasons for the characteristic appearance of the features found on an echogram.
		THE ECHOGRAM	The difference between wet and dry paper.
11.00 am	2.0	FACTORS AFFECTING THE ECHOGRAM	Frequency, pulse length, beam width, paper speed, stylus speed, rough seas, aeration, pitching, rolling. Nature of the sea bed: rocky, soft, uneven, undulating, sloping, level, ghosting, false echoes. Interference from ship, propellor noise and other echo sounders.
ll.45 am bottom,	3.1	FACTORS AFFECTING	Fish schools: dense schools above the bottom, isolated schools above the bottom, dense schools on the bottom, individual fish close to the appearance of single fish in the centre and edge of the beam, ship passing over stationary fish, fish and ship in motion.
12.30 pm	<u> </u>	<u></u>	LUNCH
2.00 pm to 4.00 pm			Practical echosounder training on board "Kapala" and "Demeeli".
5.30 pm to		FILM NIGHT	General lisning lims.
8.00 pm			

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TIME	UNIT	SUBJECT HEADING	SYNOPSIS
9.00 am	5.0	HOW AN ECHOSOUNDER WORKS	What is sound, propogation of sound, wave length, frequency,ultra sound, velocity of sound in water, method of measuring distance by sounds. Common frequencies used by echo sounders, weakness of returning echo, absorption and dispersion, amplification, transmitting power, beam width, pulse lengths, side lobes, reverberation, resolution.
9.45 am	6.0	THE MAJOR COMPONENTS OF AN ECHOSOUNDER	Types of transducers. Size in relation to: frequency, power, beam width, pulse length. Cavitation. Selecting transducers. Amplifier: its function and intelligent use of gain. Transmitter: its function. Display units: description of various types i.e. paper, colour, C.R.T., flashing light, digital, meter, and their advantages and disadvantages for commercial fishing.
10.30 am	7.0	SPECIAL FEATURES OF ECHO SOUNDERS	White line, grey line, bottom lock, "memory" in C.R.T. Narrow, medium and wide beam sounders and their application in fishing and bottom discrimination. Side lobes and their use. Phased scales, Transducer systems including phased array and stabilised units. Colour displays.
11.15 am	8.0	EXAMPLES AND DISCUSSION OF LOCAL RECORDINGS PART 1	Examples of local recordings discussed and explained.
12.30 pm			LUNCH
2.00 pm to 4.00 pm	<u></u>		Practical echosounder training on board "Kapala" and "Demeeli".
5.30 pm to 8.00 pm		FILM NIGHT	General fishing films.

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TIME	UNIT	SUBJECT HEADING	SYNOPSIS
9.00 am	9.0	EXAMPLES AND DISCUSSION OF LOCAL KAPALA RECORDINGS (PART II)	N.S.W. Echosounder recordings of the sea bed and fish.
10.00 am	10.0	THE NETSOUNDER ECHOGRAM	A description of the echosounder picture as displayed by the netsounder. The base line i.e. headrope, the footrope, the sea bed, the sea surface. Fish echoes: signal loss. Trawl track displays on echosounders - difference in time in such displays.
11.45 am	11.0	PRINCIPAL TYPES OF APPLICATION	Simple netsounders, multi-netsounders, displays. Types of netsounders and their methods of transmission, their advantages and disadvantages. Trawl Instrumentation Systems and special applications of netsounding devices.
12.00 pm			LUNCH
2.00 pm to 4.00 pm			Practical echosounder training on board "Kapala" and "Demeeli".
5.30 pm to 8.00 pm		FILM NIGHT	General fishing films.

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<u>DAY 4</u>

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TIME	UNIT	SUBJECT HEADING	SYNOPSIS
9.00 am	13.0	SONAR THE ECHOGRAM	A detailed description of the echogram from a sonar set giving the reasons for the characteristics of the recording. The difference between it and an echosounder recording. Changing scales, sounding vertically, interference noises, ships wake, fish echoes, bottom echoes.
9.45 am	14.0	FACTORS AFFECTING THE ECHOGRAM	Frequency, pulse length, beam width, output power, behaviour of the sound beam in water i.e. refraction. Effect of heavy rolling and pitching. Correct positioning of the transducer.
10.30 am	15.0	STAGES IN THE FISHING OPERATION	Methods of searching, use of high power, long pulse. Automatic searching, target location, use of audio signal, Doppler effect. Estimation of target size, observation of target movement. Catch phase - use of low power, short pulse, rapid scanning, wide sonar beam, rapid transmission.
11.00 am	16.0	DISCUSSION OF LOCAL RECORDINGS PART III	Slides of echo recordings and discussion of tactics using sonar and netsounders to catch fish off south eastern Australia. Development of fishing tactics using information from netsounders and echosounders. The development of fishing tactics. The combined use of sonar, echosounder and netsounder - where to aim the net. Use of temperature read out. Local examples of netsounder recordings of jack mackerel, pilchards, lightfish and nannygai.
12.00			Practical echosounder training on board "Kapala" and "Demeeli".
5.30 pm		BARBECUE	A barbecue will be held at Gore Bay.

DAY	5

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TIME	UNIT	SUBJECT HEADING	SYNOPSIS
9.00 am	17.0	RADAR	Brief history, basic principles, limitations: Display controls: brightness, gain, tune, clutter, etc: Display interpretation: head up, north up. Display features: range rings, H.L., VRM: Radar plotting: navigation, safety (other vessels): Add on facilities: radar watch, MK3, radar reflectors.
11.00 am	18.0	RADIO COMMUNICATIONS	Outline of three services available to fishermen: H.F. radio service, I.B.R.S. (27 Mhz), V.H.F. (seaphone). Advantages of these services, operating range: Equipment cost.
12.00 pm			LUNCH
1.00 pm	19.0	LONG RANGE COMMUNICATIONS	H.F. radio
2.30 pm	20.0	SHORT RANGE COMMUNICATIONS	I.B.R.S.; V.H.F.
4.00	21.0	E.P.I.R.B.s	Practical demonstration on MV "Demeeli".

Professional Fishing

The Fisheries Division of the N.S.W. Department of Agriculture is offering two courses for professional fishermen in 1987.

A NETS and NETMAKING course will be held from May 4 to 8 inclusive, and an ECHOSOUNDER, SONAR, RADAR, and RADIO course will be held from May 11 to 15 inclusive. Both courses are at Gore Cove, Wollstonecraft, Sydney.

The course are free but a refundable holding deposit of \$50 per person is required.

The Department is able to give financial assistance to people attending the courses. An allowance of \$200 per person per course will be paid to cover your living expenses while in Sydney.

Fill in the application form below and return to the Department with your deposit to secure a place in these popular courses. Numbers are strictly limited.

For more information, contact the Fisheries Information Service, N.S.W. Department of Agriculture, P.O. Box K220, Haymarket, 2000, phone: (02) 217 5093, 217 5094 or your local fisheries inspector.

Application Form:

To: Fisheries Information Service N.S.W. Department of Agriculture P.O. Box K220 HAYMARKET 2000

I wish to enrol for the (please tick):

□ 1987 Nets and netmaking course

□ 1987 Echosounder, sonar, radar and radio course

Name:

Address:

Postcode:

Telephone:

I enclose cheque/money order for \$50 refundable holding deposit. I understand the deposit is only refundable if I attend the course. (Please make cheques payable to the Department of Agriculture, N.S.W.).



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FISHING INDUSTRY RESEARCH AND DEVELOPMENT FUND

INTERIM FINAL REPORT

SECTION 1 - PROJECT TITLE

Pacific oysters in New South Wales (FIRTA 86/66; DAN11Z)

SECTION 2 - OBJECTIVES

- (a) Determination of the optimum conditions for spawning, larval survival and spat settlement of the Pacific oyster currently present in Port Stephens.
- (b) Assessment of the numbers and seasonal distribution of Pacific and Sydney rock oyster larvae in Port Stephens.
- (c) Determination of the present distribution, abundance and age composition of Pacific oysters in the oyster growing areas of New South Wales.
- (d) Establish if possible, by electrophoresis, the strain of the Pacific oyster now abundant in Port Stephens.
- (e) Comparison of seasonal changes in gonad and meat condition of adult Pacific and Sydney rock oysters in Port Stephens.
- (f) Monitoring of Sydney rock oyster spat put out on commercial leases to determine the potential for breeding QX and "winter mortality" resistant oysters. These spat were produced at the Brackish Water Fish Culture Research Station by staff employed on the FIRTA 81/2 grant.

SECTION 3 - INTERIM FINAL REPORT

The objectives have been achieved and all experimental work was completed in June, 1989. Some histological examinations of oyster gonads and chemical analyses of oyster meats need to be completed before the outstanding sections can be written up (see appendix 1). It is expected that the Final Report will be submitted before the end of June, 1990.

SECTION 4 - TRANSFER OF RESULTS TO INDUSTRY

Progress reports were presented at the annual "Open Day" at the Brackish Water Fish Culture Research Station in 1986, 87, 88 & 89 and published in the Proceedings.

Some papers have already been published and other are in preparation for publication (see appendix 1). Others have been written up in the format required for Aquaculture and may form the basis of one or more Fisheries Bulletins. The method of preparing this report (each section written up as a separate manuscript), will facilitate dissemination of results to industry.

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SECTION 5 - DURATION OF PROJECT

Three years Commencement Date: 1 July 1986 Completion Date: 31 June 1989

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APPENDIX 1

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BRACKISH WATER FISH CULTURE RESEARCH STATION

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PACIFIC OYSTERS IN NEW SOUTH WALES

FINAL REPORT

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FISHING INDUSTRY RESEARCH AND DEVELOPMENT COUNCIL

JOHN A NELL AND CAROLINE J MASON

DECEMBER 1989

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J. A. Nell. Comparison growth study of Sydney rock 1 oyster (Saccostrea commercialis) and Pacific oysters (<u>Crassostrea gigas</u>) in Port Stephens, NSW. 1 2 1 2 E

Written up

J. A. Nell and C. J. Mason. Comparison of shell density, 2 percentage cavity volume and shell weight of Sydney rock oysters (Saccostrea commercialis) and Pacific oysters (<u>Crassostrea</u> <u>giqas</u>).

Written up

3 J. A. Nell and C. J. Mason. Comparison of growth and mortality of Sydney rock oysters (Saccostrea commercialis) grown on trays, cylinders and sticks in Port Stephens, NSW.

an de Written up de la seconda J. A. Nell and C. J. Mason. Hybridisation of Sydney rock 4 oysters (Saccostrea commercialis) with Pacific oysters (<u>Crassostrea gigas</u>). . Written up

5 R. L. McBride, J. A. Nell and K. M. Easton, 1988. Acceptability of the Sydney rock and Pacific oyster.

Food Technology in Australia, 40: 287,290

- 6 J. A. Nell and J. E. Holliday, 1988. Effects of salinity on the growth and survival of Sydney rock oyster (Saccostrea commercialis) and Pacific oyster Aquaculture, 68: 39-44 (Crassostrea gigas) larvae and spat.
- J. A. Nell. Selective killing of Pacific oysters (<u>Crassostrea</u> giqas).

Written up

8 C. J. Mason and J. A. Nell. The effect of air temperature on the survival out of water of Sydney rock oysters (Saccostrea commercialis) and Pacific oysters (Crassostrea gigas).

Being written up

9 J. A. Nell and M. Gwynne. Pacific oyster (Crassostrea <u>gigas</u>) spatfall survey of Port Stephens, NSW.

Written up

10 J. A. Nell. The effect height on the recruitment of Pacific oyster (Crassostrea gigas) spat in Port Stephens, NSW.

Written up Data (Thister the

C. J. Mason. Growth and survival of Sydney rock oysters 11 (Saccostrea commercialis) and Pacific oysters (Crassostrea gigas) on depot sticks at different growing heights. O AC.

18 - 1 Dr Written up

J. A. Nell. Salinity tolerance of Pacific oysters 12 (Crassostrea gigas) from Port Stephens, NSW.

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Written up 1 . .

13 J. A. Nell. Pacific oyster (Crassostrea gigas) abundance survey of Port Stephens, NSW.

Written up

14 C. J. Mason and J. A. Nell. Seasonal variation in the meat and gonad condition of Sydney rock oysters (Saccostrea commercialis) and Pacific oysters (Crassostrea gigas) in Port Stephens, NSW.

> Oyster meats being analysed for Glycogen, total lipids and protein. Manuscript being prepared for publication in Aquaculture

C. J. Mason and D. Reid. The effect of stunting on the 15 subsequent growth of Sydney rock oyster (Saccostrea commercialis) spat. Sec. St. Sec.

> Manuscript being finalised for submission to Journal of experimental marine Biology and Ecology

16 C. J. Mason and J. A. Nell. Gonad condition of Sydney rock oysters (Saccostrea commercialis) Pacific oysters (Crassostrea gigas) in Port Stephens, NSW, correlated to the Spring/Neap tidal cycle.

Histological examination of gonads being completed

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17 C. J. Mason and J. A. Nell. Mortality of the progeny of Sydney rock oysters (Saccostrea commercialis) that survived an outbreak of QX (<u>Marteilia sydneyi</u>) disease. the state of the second

Written up

18 J. A. Nell and R. Chvojka. Effects of tributyltin oxide (TBTO) concentration in seawater on the growth rates of juvenile Sydney rock oyster (<u>Saccostrea</u> <u>commercialis</u>) and Pacific oyster (<u>Crassostrea</u> gigas) spat.

> Oyster meats being analysed for TBT and Cu. Manuscript being prepared for Science of the Total Environment

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C. J. Mason and J. A. Nell. The effect of freezing on the subsequent survival of Pacific oysters (<u>Crassostrea gigas</u>) or Sydney rock oysters (<u>Saccostrea commercialis</u>).

Written up