

SELECTIVITY STUDIES ON MALAYSIAN TRAWLS

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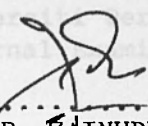
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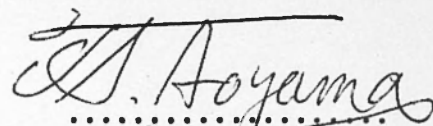
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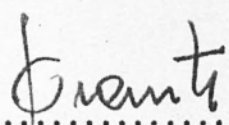
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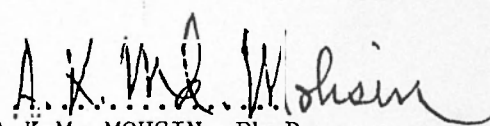
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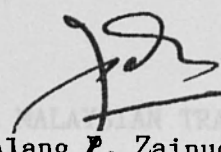
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DEDICATION

SELECTIVITY STUDIES ON MALAYSIAN TRAWLS

To my wife Aidah,

my son Adil Ridha,

by

Mohd. Ibrahim Bin Haji Mohamed

A thesis submitted in partial fulfillment of the requirements
for the degree of Doctor of Philosophy
in the Faculty of Fisheries and Marine Science,
Universiti Pertanian Malaysia.

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DEDICATION

I am truly indebted to my supervisor Associate Professor Dr. Gunzo Kawamura whose guidance, critical comments, constant encouragement and intellectual stimulation has tremendously assisted me during this period of candidature. Also to my co-supervisor Associate Professor Dr. Abu Khair Mohammad Mohsin, whose patience, encouragement, and critical comments have been a source of inspiration for me during the long hours of preparation, fieldwork, analysis and thesis preparation.

My heartfelt gratitude are also extended to Mohamed Bin To my wife Aidah, Ismail, Sujak Bin Samad, Saat Bin Mat and Mohd. Zin & Bin Abu Bakar whom at one time or another assisted me during my son Adil Ridha, in Terengganu and Selangor and in the

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I am very grateful to the Universiti Pertanian Malaysia for providing the financial assistance necessary to carry out this project. To the many friends and colleagues who have been a constant source of encouragement, I extend my sincere thanks. To the fishermen who were kind enough to accommodate me on their fishing trips I am truly grateful.

Finally my eternal gratitude goes to Professor Nelson Marshall of the University of Rhode Island, USA, for his encouragement and trust.

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TABLE OF CONTENTS

	page
Depth Ratio	42
Selectivity Data on Shrimp	page
ACKNOWLEDGEMENT	iii
TABLE OF CONTENTS	iv
LIST OF TABLES	viii
LIST OF FIGURES	x
LIST OF PLATES	xiii
LIST OF APPENDICES	xiv
NOMENCLATURE	xv
ABSTRAK	xvi
ABSTRACT	xviii
CHAPTER 1. INTRODUCTION	50
The Malaysian Fishery	1
The Development of fishing Technology in Malaysia	5
Signs of Overfishing	8
Promise of The EEZ	13
Fishery Management in Malaysia	16
The Present Fishery Conservation Methods in Malaysia	18
Problems of Fishery Management in Malaysia	23
How This Study Relates	29
CHAPTER 2. LITERATURE REVIEW	34
Theory of Mesh Selection	36
Selection Factor	38
Length-Girth Relationship	41

	page
Depth Ratio	42
Selectivity Data on Shrimp	43
Optimum Mesh Size	44
Practical Considerations in the Conduct of The Experiment	45
Mesh Measurement	46
Design of Cod-end Covers	47
Randomization	48
Subsampling	48
Other Factors Affecting Cod-end Mesh Selection . .	49
Cod-end Material	49
Catch Size	49
Trawling Speed	50
Bottom time	50
Fish Trawl	117
CHAPTER 3. MATERIALS AND METHODS	123
The Study Area	52
The Trawls	55
Cod-end Cover Design	58
The Boats	60
Methodology	65
Mesh Measurement	65
Speed Determination	66
Fish Measurement	66
MATERIALS AND METHODS	140
RESULTS	143

	page
CHAPTER 4. A MODEL FOR DETERMINATION OF SELECTION CURVE BY USING LENGTH-DEPTH DATA	
INTRODUCTION	69
Theory	72
MATERIALS AND METHODS	78
RESULTS	79
Computing the Selection Curve	89
Masking	99
DISCUSSION	99
CHAPTER 5. CATCH SELECTION	
INTRODUCTION	113
MATERIALS AND METHODS	115
RESULTS	117
Fish Trawl	117
Shrimp Trawl	123
DISCUSSION	128
Mesh Selection in Fish and Shrimp Trawl	128
Trawling Speed	129
Bottom Time	129
Catch Size	132
CHAPTER 6. THE EFFECT OF SPEED, BOTTOM TIME AND CATCH SIZE ON TRAWL SELECTION	
INTRODUCTION	137
MATERIALS AND METHODS	140
RESULTS	143

	page
Effect of Trawling Speed	143
Effect of Bottom Time	149
Effect of Catch Size	155
DISCUSSION	158
 CHAPTER 7. THE APPLICATION OF MESH SELECTION IN THE MALAYSIAN TRAWL FISHERY	
INTRODUCTION	164
MATERIALS AND METHODS	166
RESULTS	168
DISCUSSION	174
Implementation Strategy for Mesh Selection of Trawls	176
 CHAPTER 8. CONCLUSION, SUMMARY AND RECOMMENDATIONS	
CONCLUSION	180
SUMMARY	187
RECOMMENDATIONS	193
 BIBLIOGRAPHY	195
APPENDICES	202
VITA	218

LIST OF TABLES

Tables		Page
1.1	Marine Fish Landings by Gear Groups in 1983 (Peninsular Malaysia).	5
1.2	Potential Resources in the Malaysian EEZ (in Tonnes).	14
3.1	Trawl Boat Particulars.	61
3.2	Experimental Design.	62
4.1	Cod-end Mesh Size Measurement of Fish Trawl.	81
4.2	Cod-end Mesh Size Measurement of Shrimp Trawl.	82
4.3	Examples of Values of Standard Deviation of Maximum Body Depth Distribution.	94
4.4	Tables of σD , p and q Values of Major Species in Fish Trawl.	95
4.5	Tables of σD , p and q Values of Major Species in Shrimp Trawl.	96
4.6	Predicted and Experimental Values of L_{50} , S_R and E Values for Fish and Shrimp Trawls.	97
5.1	Catch Composition of Major Groups in the Fish Trawl for 25 mm and 51 mm Cod-end.	118
5.2	Mean Fish Trawl Catch by 25 mm and 51 mm Cod-end Mesh Size.	120
5.3	Mean Fish Trawl Catch by 2 and 3 Knots Trawling Speed.	121
5.4	Mean Fish Trawl Catch by Mesh Size and Bottom Time.	122
5.5	Catch Composition of Major Groups in the Shrimp Trawl for 25 mm and 38 mm Cod-end.	124
5.6	Mean Shrimp Trawl Catch by 25 mm and 38 mm Cod-end.	125

LIST OF FIGURES

	page
5.7 Mean Shrimp Trawl Catch by Mesh Size and Trawling Speed.	126
5.8 Mean Shrimp Trawl Catch by Mesh Size and Bottom Time.	127
5.9 Coefficient of Determination (R^2) on the Correlations of Cover Catch, Trash Fish Catch and Total Catch on Bottom Time and Total Catch.	132
5.10 Multiple Linear Regression of Cover Catch and Trash Fish Catch on Total Catch.	133
6.1 L_{50} Values of 2 and 3 Knots Trawling Speed for Fish Trawl.	146
6.2 L_{50} Values of 2.5 and 3.5 Knots Trawling Speed for Shrimp Trawl.	147
6.3 L_{50} Values of 1, 2 and 3 Hours Bottom Time for Fish Trawl.	150
6.4 L_{50} Values of 2.5 and 3.5 Hours Bottom Time for Shrimp Trawl.	153
6.5 L_{50} Values for 3 Categories of Catch Size of Fish Trawl.	156
6.6 L_{50} Values for 2 Categories of Catch Size of Shrimp Trawl.	158
6.7 A Summary of Findings and Comparison with Published Data.	160
7.1 Selection Factors of Species for Fish Trawl.	169
7.2 Selection Factors of Species for Shrimp Trawl.	170
7.3 Optimum Mesh Size for Fish and Shrimp Trawl.	174
4.8 Carapace Length-Total Length Relationship of Shrimp Species.	90
4.9 Example of Determination of Standard Deviation of Maximum Body Depth by Using Probability Paper.	92

LIST OF FIGURES

Figure		Page
1.1	Total Marine Fish Landings in Malaysia	2
1.2	Trawl Catch Composition in Peninsular Malaysia	11
2.1	Length Selection Curve showing L_{50} and S_R	39
3.1	Fish Trawl Study Area.	53
3.2	Shrimp Trawl Study Area.	54
3.3	Plan of Fish Trawl.	56
3.4	Plan of Shrimp Trawl.	57
3.5	Cod-end Detachable Arrangement.	59
4.1	Relationship between Maximum Body Depth D and Vertical Mesh Opening M'	72
4.2	Distribution of Maximum Body Depth (D) for Each Length (L) when σD is Common for Various Length	74
4.3	Normal Distribution Curve Showing Retention at Critical Depth D_c	75
4.4	Cummulative Distribution Curve of the Probability Density Function of the Standard Normal Distribution	76
4.5	Distribution of P for Various L	76
4.6	Standard Length - Maximum Depth Relationship of Major Species in Fish Trawl.	83
4.7	Standard Length/Total Length - Maximum Depth Relationship of Major Species in Shrimp Trawl.	86
4.8	Carapace Length-Total Length Relationship of Shrimp Species.	90
4.9	Example of Determination of Standard Deviation of Maximum Body Depth by Using Probability Paper.	92

	page
4.10 Predicted and Experimental Selection Curves for Fish Trawl Species.	100
4.11 Predicted and Experimental Selection Curves for Fish Trawl Species.	101
4.12 Predicted and Experimental Selection Curves for Fish Trawl Species.	102
4.13 Predicted and Experimental Selection Curves for Shrimp Trawl Species.	103
4.14 Predicted and Experimental Selection Curves for Shrimp Trawl Species.	104
4.15 Predicted and Experimental Selection Curves for Shrimp Trawl Species.	105
4.16 Length Composition of Catches by 25 mm Cod- end Fish Trawl by Covered and Non-covered Cod-ends.	106
4.17 Length Composition of Catches by Covered and Non-covered Cod-ends.	107
4.18 Length Composition of Catches by 38 mm Cod- end Shrimp Trawl by Covered and Non-covered Cod-ends.	108
4.19 Size Relationships and General Body Forms of Fish and Shrimp Species Examined	111
5.1 Catch Components of Trawl.	130
6.1 The Effect of Trawling Speed on the Selectivity of Fish Trawl.	144
6.2 The Effect of Trawling Speed on the Selectivity of Fish Trawl.	145
6.3 The Effect of Trawling Speed on the Selectivity of Shrimp Trawl.	148
6.4 The Effect of Bottom Time on the Selectivity of Fish Trawl.	151
6.5 The Effect of Bottom Time on the Selectivity of Fish Trawl.	152

LIST OF PLATES

	page
6.6 The Effect of Bottom Time on the Selectivity Plate of Shrimp Trawl.	154
6.7 The Effect of Catch Size on the Selectivity of Fish Trawl.	157
6.8 The Effect of Catch Size on the Selectivity of Shrimp Trawl.	159
7.1 Scattergram of Selection Factor and Mesh Size for Fish and Shrimp Trawl	172
7.2 Regression of L_{50} Against Mesh Size for Fish and Shrimp Trawl.	173

LIST OF APPENDICES

LIST OF PLATES

Appendix		page
	Plate	page
A.	Table of Catch Data	202
B.	Worksheet Measurement of Data	203
C.	1. A Typical Shrimp Trawl Catch in the West Coast of Peninsular Malaysia	20 10
	2. Cod-end Cover During Operation	20 60
	3. Constant Tension Mesh Gauge and Dutchman's Log	20 67
	4. Differences in the Size of Fish Caught by 25 mm and 51 mm Cod-end	2 134
G.	Analysis of Variance Tables for Fish Trawl Catch Components	212
H.	Analysis of Variance Tables for Shrimp Trawl Catch Components	215

LIST OF APPENDICES

NOMENCLATURE

Appendix		page
A.	Table of Catch Data	202
B.	Worksheet Measurement of Data	203
C.	Fish Trawl Catch Data	204
D.	Shrimp Trawl Catch Data	205
E.	Results of T-test Computations for Fish Trawl	208
F.	Results of T-test Computations for Shrimp Trawl	210
G.	Analysis of Variance Tables for Fish Trawl Catch Components	212
H.	Analysis of Variance Tables for Shrimp Trawl Catch Components	215

- M' = vertical mesh opening of a net
- M_a = mesh size of a net
- M_{ext.} = mesh size extension after loading
- M_o = optimum mesh size for a fishery
- S_c = selection curve
- S_f = selection factor
- S_r = selection range
- K = growth constant
- F = rate of fishing mortality
- M = rate of mortality
- Z = rate of natural mortality
- E = experimental L₅₀ / Predicted L₅₀
- C_L = carapace length
- T_L = total length

NOMENCLATURE

D	=	maximum body depth
D_c	=	critical body depth
D_R	=	depth ratio
L_{25}	=	25 percent retention length
L_{50}	=	50 percent retention length
L_{75}	=	75 percent retention length
L_c	=	length of first capture
L_∞	=	the maximum length of a species
L_o	=	optimum length of first capture
L/G	=	length - girth
M'	=	vertical mesh opening of a net
M_s	=	mesh size of a net
$M_{ext.}$	=	mesh size extension after loading
M_o	=	optimum mesh size for a fishery
S_C	=	selection curve
S_f	=	selection factor
S_R	=	selection range
K	::	growth constant
F	::	rate of fishing mortality
M	::	rate of mortality
Z	::	rate of natural mortality
E	::	experimental L_{50} / Predicted L_{50}
C_L	=	carapace length
T_L	=	total length

Abstrak tesis yang dikemukakan kepada Senat Universiti Pertanian Malaysia sebagai memenuhi sebahagian daripada keperluan untuk Ijazah Doktor Falsafah.

SELECTIVITY STUDIES ON MALAYSIAN TRAWLS

oleh

Mohd. Ibrahim Bin Haji Mohamed

Jun, 1987

Penyelia : Profesor Madya Dr. Gunzo Kawamura

Penyelia Bersama : Profesor Madya Dr. Abu Khair Mohammad Mohsin

Fakulti : Perikanan dan Sains Samudera

Suatu kajian yang menggunakan kaedah "Covered Cod-end" dan 70 tundaan pukut tunda ikan dan udang telah dijalankan di Laut China Selatan dan Selat Melaka untuk mengkaji corak pemilihan pukut pukut tunda di Malaysia. Penyiasatan ini adalah bertujuan untuk mengurangkan tekanan yang hebat terhadap sumber-sumber ikan terutamanya terhadap tangkapan anak-anak ikan komersial.

Suatu "model" untuk meramalkan geraf pemilihan spesis ikan dan udang berasaskan ukuran panjang dan lebar spesis tersebut telah dicipta. "Model" ini akan menyenangkan kerja penyiasatan pemilihan pada pukut dengan hanya mendapatkan makluman tersebut dari sampel ikan atau udang dari mana-mana tangkapan.

Hasil penyelidikan ini menunjukkan bahawa saiz mata keroncong 25 mm menangkap 98.20 peratus berbanding dengan saiz

mata keroncong 51 mm yang menghasilkan 56.10 peratus dari ikan-ikan yang memasuki pukot tunda ikan. Dengan pukot tunda udang pula, saiz mata keroncong 25 mm menangkap 92.60 peratus manakala saiz mata keroncong 38 mm menangkap 51.35 peratus dari jumlah ikan yang memasuki pukot tersebut.

Bersamaan ini, ikan baja merupakan 46.40 peratus dari tangkapan pukot tunda ikan dan 68.20 peratus dari tangkapan pukot tunda udang yang menggunakan saiz mata keroncong 25 mm. Ini berbanding dengan 34.60 peratus bagi pukot tunda ikan yang menggunakan saiz mata keroncong 51 mm dan 56.80 peratus untuk pukot tunda udang yang menggunakan saiz mata keroncong 38 mm.

Walaupun kenaikan kelajuan menunda mengurangkan pemilihan dan tambahan masa menunda menambah pemilihan pada pukot saiz mata keroncong yang besar, saiz mata keroncong yang kecil telah menghasilkan keputusan yang berlawanan. Kesan-kesan kelajuan dan masa menunda hanya kecil dan diatasi oleh kesan tangkapan yang besar. Tangkapan besar mengurangkan pemilihan pada semua saiz mata keroncong dan pukot tunda ikan mahupun pukot tunda udang.

Berbeza dari anggapan ramai, saiz mata pukot kecil yang biasa digunakan dalam industri perikanan di Malaysia, mengakibatkan faktor pemilihan yang dependen kepada saiz mata pukot. Berasaskan kepada faktor pemilihan yang didapati, saiz mata pukot yang optimum bagi industri pukot tunda negara adalah 55 mm bagi pukot tunda ikan dan 38 mm untuk pukot tunda udang.