

Contents

	Page
Abstract	iii
Acknowledgements	v
Contents	vi
List of Tables	viii
List of Figures	ix
Chapter	
1. Introduction	
1.1 Background	1
1.2 Objectives	7
1.3 Literature reviews	7
2. Methodology	
2.1 Study design	12
2.2 Data source and management	12
2.3 Path diagram and variables	14
2.4 Statistical methods	15
3. Preliminary Data Analysis	
3.1 Descriptions of the variables	19

3.2 The total catch weights, percentages and species of low value fish	19
3.3 Time Series Plot	24
3.4 Distributions of the total low value fish, each gear and group	28
4. Statistical Modeling	
4.1 Model fitting	32
5. Conclusion and Discussion	
5.1 Conclusions	42
5.2 Discussion	43
5.3 Limitations and suggestion for further study	45
References	46
Vitae	51

List of Tables

Table	Page
Table 1.1 Global and regional fishing discards estimated in 1994 from Alverson in Matsuoka (2008)	2
Table 1.2 Estimation of global and national fishing discards revised in 2005 from Kelleher in Matsuoka (2008)	3
Table 1.3 Estimated low value/trash fish production in Asia-Pacific (tones)	4
Table 3.1 Study variables	20
Table 3.2 Total catch weight and percentage of low value fish categorized by year, gear type, and group, from Songkhla during 2003–2006	21
Table 3.3 Species, Family and the catch weight in metric tons of low value fish, for each group	23

List of Figures

Figures	Page
Figure 1.1 Songkhla Lake	6
Figure 2.1 Fish landings in Songkhla Lake	14
Figure 2.2 Path diagram of the study	15
Figure 3.1 Catch weights of low value fish grouping by year (2a) and gear type (2b)	22
Figure 3.2 Monthly total catch weight of low value fish in Songkhla Lake during 2003-2006	24
Figure 3.3 Monthly total catch weight of low value fish in Songkhla Lake during 2003-2006 using trap, set bag net and gill net type	25
Figure 3.4 Monthly catch weight of the low value fish of estuarine, marine invertebrates, freshwater, estuarine and marine vertebrates groups	27
Figure 3.5 Histogram of low value fish in Songkla Lake during 2003-2006	29
Figure 3.6 Histogram of low value fish by gears: trap, set bag net and gill net	30
Figure 3.7 Histogram of low value fish by groups	31
Figure 4.1 Scatter plot of observed values and fitted value, residuals plot of the low value fish	33
Figure 4.2 The catch weight of low value fish, adjusted for all other factors	33

Figure 4.3 Scatter plot of observed values and fitted value, residuals plot of the low value fish by gear	35
Figure 4.4 The catch weight of low value fish in each gear, adjusted for all other factors	36
Figure 4.5 Scatter plot of observed values and fitted value, residuals plot of the low value fish by groups	38
Figure 4.6 The catch weight of low value fish in each group, adjusted for all other factors	41

Prince of Songkla University
Pattani Campus