

**STATUS OF SEA TURTLE RESOURCES AND
CORAL REEFS OF MALIANGIN ISLAND
SANCTUARY, KUDAT, SABAH, MALAYSIA**



CLEMENT LIEW KET HIN

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**BORNEO MARINE RESEARCH INSTITUTE
UNIVERSITI MALAYSIA SABAH
2010**

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CORAL REEFS OF MALIANGIN ISLAND
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CLEMENT LIEW KET HIN



**THIS IS SUBMITTED IN FULFILLMENT
FOR THE DEGREE OF MASTER OF
SCIENCE**

**BORNEO MARINE RESEARCH INSTITUTE
UNIVERSITI MALAYSIA SABAH
2010**

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DECLARATION

I hereby declare that the material in this thesis is my own except for the quotations, excerpts, equations, summaries and references, which have been duly acknowledged.

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Clement Liew Ket Hin
1 May 2010

ABSTRACT

STATUS OF SEA TURTLE RESOURCES AND CORAL REEFS OF MALIANGIN ISLAND SANCTUARY, KUDAT, SABAH, MALAYSIA

Maliangin Island Sactuary (MIS), Kudat, Sabah was chosen as a model site for the future management of the Proposed Tun Mustapha Park. Research was conducted to collect baseline data on beach characteristics where green (*Chelonia mydas*) and hawksbill (*Eretmochelys imbricata*) sea turtles nest sporadically. Potential food resources for the sea turtles and the status of coral reefs at Maliangin Island Sanctuary were also assessed. The nesting beaches were divided into "frequent nesting" and "seldom nesting" stations where beach profile, ambient parameters, grain sizes of the beach and turtle egg chambers were determined. Three indicator fish families and bottom substrate coverage were used to assess the status of coral reefs. Results showed that beach profile, sand grain size and environmental conditions did not influence the selection of sea turtle nesting sites. Seagrass (main diet of greens) coverage and density of sponges (main diet of hawksbills) were calculated. The study area may not have high potential as feeding grounds for the turtles due to the lack of actual cropping sightings during underwater surveys. There were six seagrass species present but coverage was low (7%) whereas only 4 of the 25 genera of sponges had bite marks. Average values of live coral cover (46.8%), morphological diversity index (2.5), mortality index (0.13), condition index (0.37), development index (0.32) and succession index (-0.62) showed that the reefs of MIS were categorised as good condition and good development but with very poor succession. The 49 species of damselfishes (Pomacentridae), 8 species of butterflyfishes (Chaetodontidae) and 11 species of groupers (Serranidae) indicate that the hard corals in the study area were complex, healthy (live corals > dead corals) and that the reefs are rugose, respectively. Maliangin Island Sanctuary is rich with marine resources and with proper management, it can be utilised in multiple ways (livelihood of locals, ecotourism and aquaculture).

ABSTRAK

*Santuari Pulau Maliangin, Kudat, Sabah telah dipilih sebagai tapak contoh untuk pengurusan Taman Cadangan Taman Tun Mustapha. Kajian telah dijalankan untuk mendapatkan data asas ciri-ciri pantai peneluran di mana pendaratan penyu hijau (*Chelonia mydas*) dan penyu sisik (*Eretmochelys imbricata*) adalah agak kurang. Sumber makanan potensi untuk penyu-penyu dan status terumbu karang di Santuari Pulau Maliangin juga telah ditaksirkan. Pantai peneluran telah dibahagikan kepada stesen-stesen "kerap bertelur" dan "jarang bertelur" di mana profil pantai, parameter sekeliling, saiz butiran pasir pantai dan pasir lubang sarang penyu telah ditentukan. Tiga famili ikan penunjuk dan liputan substrat dasar telah digunakan untuk menaksir status terumbu karang. Keputusan menunjukkan bahawa profil pantai, saiz butiran pasir dan keadaan sekeliling tidak mempengaruhi pemilihan kawasan bertelur penyu. Liputan rumput laut (diet utama penyu hijau) dan kepadatan span (diet utama penyu sisik) telah dihitung. Kawasan kajian mungkin tidak mempunyai potensi yang tinggi sebagai kawasan pemakanan untuk penyu-penyu disebabkan oleh ketiadaan penyu meragut diperhatikan ketika aktiviti penyelaman dijalankan. Terdapatnya enam spesies rumput laut tetapi liputan adalah rendah (7%) manakala hanya 4 daripada 25 genera span mempunyai tanda gigitan. Nilai purata liputan karang hidup (46.8%), kepelbagaian morfologi terumbu karang (2.5), indeks kematian (0.13), indeks keadaan (0.37), indeks pertumbuhan (0.32) dan indeks sesaran (-0.62) menunjukkan bahawa terumbu karang di Santuari Pulau Maliangin adalah dikategorikan sebagai berkeadaan baik, pertumbuhan baik tetapi dengan sesaran yang tidak baik. Sebanyak 49 spesies ikan bombin (*Pomacentridae*), 8 spesies ikan bagang (*Chaetodontidae*) dan 11 spesies ikan kerapu (*Serranidae*) menunjukkan bahawa terumbu karang di kawasan kajian adalah kompleks, sihat (karang hidup > karang mati) dan kedut, masing-masing. Santuari Pulau Maliangin adalah kaya dengan sumber laut dan dengan pengurusan yang sewajarnya, ia boleh digunakan dengan pelbagai cara (mata pencarian tempatan, perlancongan dan akuakultur).*

TABLE OF CONTENTS

	Page
TITLE	i
DECLARATION	ii
CERTIFICATION	iii
ACKNOWLEDGEMENTS	iv
ABSTRACT	v
<i>ABSTRAK</i>	vi
LIST OF CONTENTS	vii
LIST OF TABLES	x
LIST OF FIGURES	xii
LIST OF PLATES	xvii
LIST OF EQUATIONS	xviii
LIST OF ABBREVIATIONS	xix
LIST OF APPENDICES	xxi
CHAPTER 1: INTRODUCTION	
1.1 Introduction	1
1.2 Status of Sea Turtles	3
1.2.1 Nesting Beaches	4
1.2.2 Foraging Grounds	5
1.3 Status of Coral Reefs	6
1.4 Significance of Study	8
1.5 Objectives of Study	9
CHAPTER 2: LITERATURE REVIEW	
2.1 Sea Turtles	10
2.1.1 Green Turtles (<i>Chelonia mydas</i>)	11
2.1.2 Hawksbill Turtles (<i>Eretmochelys imbricata</i>)	15
2.1.3 Nesting Beach Assessments	17
2.1.4 Nesting Beach Characteristics	19
2.1.5 Egg Chamber Sand Characteristics	25
2.1.6 The Roles of Green and Hawksbill Turtles	29
2.1.7 Diet Selection	33
2.1.8 Threats and Human Interactions	34

2.2	Coral Reef Ecosystem	39
2.2.1	Coral Reef Status in Sabah	41
2.2.2	Fish as Reef Indicators	44
	a. Damselfish (Pomacentridae)	45
	b. Butterflyfish (Chaetodontidae)	47
	c. Grouper (Serranidae)	48
2.2.3	Natural and Anthropogenic Threats to Coral Reefs	51
2.2.4	Conserving the Reef	54

CHAPTER 3: METHODOLOGY

3.1	Study Area	57
3.2	Sampling Methods	58
3.2.1	Habitat Surveys for Sea Turtles	59
	a. Nesting Habitat Survey	59
	i. Beach Profiling	60
	• Statistical Analysis for Beach Profile	62
	ii. Beach Grain Size Analysis	62
	• Dry Sieving	62
	• Statistical Parameters for Grain Size Analysis	63
	• Statistical Analysis for Beach Grain Size Analysis	64
	iii. Littoral Environment Observation (LEO)	65
	• Statistical Analysis for LEO	65
	iv. Turtle Egg Chamber Grain Size Analysis	66
	• Statistical Analysis for Turtle Egg Chamber Grain Size Analysis	66
	b. Foraging Habitat Survey	66
	i. Transect and Quadrat Method for Seagrass Coverage	67
	• Statistical Analysis for Seagrass Coverage	69
	ii. Linear Transects (LT) for Density of Sponges	70
	• Statistical Analysis for Linear Transects	71
3.2.2	Coral Reef Communities	71
	a. Line Intercept Transect (LIT)	71
	i. Major Benthic life-form	72
	ii. r-K-S Ternary Diagram	73
	iii. Statistical Analysis for LIT	75
	b. Underwater Visual Census (UVC) for Reef Fish Indicators	75
	i. Statistical Analysis for Reef Fish Indicators	76

CHAPTER 4: RESULTS

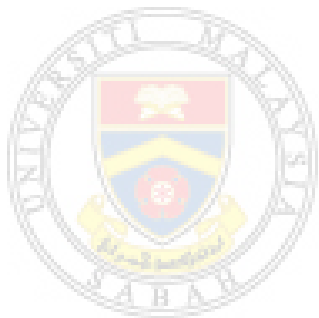
4.1	Preliminary Survey – Interview	77
4.2	Nesting Habitat Survey	80
	4.2.1 Beach Profiling	80
	4.2.2 Beach Grain Size Analysis	90
	4.2.3 Littoral Environment Observation (LEO)	100
	4.2.4 Turtle Egg Chamber Grain Size Analysis	100
4.3	Foraging Habitat Survey	107
	4.3.1 Transect and Quadrat for Seagrass Coverage	107
	4.3.2 Linear Transects (LTs) for Density of Sponges	114
4.4	Coral Reef Communities	118

4.4.1	Line Intercept Transect (LIT)	118
4.4.2	Underwater Visual Census (UVC) for Reef Fish Indicators	127
CHAPTER 5: DISCUSSION		
5.1	Preliminary Survey – Interview	135
5.2	Nesting Habitat Survey	137
5.2.1	Profile of Sea Turtle Nesting Beach at MIS	137
5.2.2	Sand Characteristics of Sea Turtle Nesting Beach at MIS	140
5.2.3	Ambient Characteristics of MIS	142
5.2.4	Turtle Egg Chamber Grain Size Analysis	144
5.3	Foraging Habitat Survey	146
5.3.1	Potential Feeding Grounds of Green Turtles at Maliangin Island Sanctuary (MIS)	146
5.3.2	Potential Feeding Grounds of Hawksbill Turtles at MIS	148
5.4	Coral Reef Communities	151
5.4.1	Status of Coral Reefs at MIS	151
5.4.2	The LCC, Condition, Development and Succession of MIS Reefs	154
5.4.3	Morphological Classification of Coral Reef at MIS	157
5.4.4	Determining the Status of Coral Reef Using Reef Fish Indicators	160
	a. Damselfish (Pomacentridae) – Live Coral Cover (LCC)	160
	b. Butterflyfish (Chaetodontidae) – %r (ruderals)	162
	c. Grouper (Serranidae) – %K (competitors)	164
CHAPTER 6: CONCLUSION AND SUGGESTIONS		
6.1	Conclusion	169
6.1.1	Sea Turtles of Maliangin Island Sanctuary (MIS)	169
	a. Nesting Beach Characteristics	169
	b. Potential Food Resources for Sea Turtles at Maliangin Island Sanctuary (MIS)	171
6.1.2	Coral Reefs of Maliangin Island Sanctuary (MIS)	171
	a. Status of Coral Reefs	172
	b. Abundance and Diversity of Reef Fish Indicators	173
6.2	Suggestions	174
6.2.1	Research Study Improvements	174
6.2.2	Notes for Future Park Management	174
REFERENCES		177
APPENDICES		199

LIST OF TABLES

	Page
Table 2.1 Average live and dead coral coverage (in percentage) at selected sites in Sabah.	42
Table 3.1 Classes of dominance used to record cover.	69
Table 3.2 Semi-qualitative scale for the assessment index in three corresponding forms, percentage, ratio and scale form.	73
Table 4.1 General description of all "frequent nesting" and "seldom nesting" beach profile stations at MIS.	86
Table 4.2 LEO data recorded across all 14 stations surveyed.	89
Table 4.3 Statistical parameters for beach grain size analysis.	99
Table 4.4 The minimum, maximum and mean values of six parameters measured from Littoral Environment Observation (LEO).	100
Table 4.5 Statistical parameters for turtle egg chamber grain size analysis.	105
Table 4.6 Mean percentage of seagrass coverage data. The alphabets: A, B and C represents the replicate transects conducted for seagrass stations (SG).	112
Table 4.7 Mean dominant seagrass species coverage at all seagrass stations. The alphabets: A, B and C represents the replicate transects conducted for seagrass stations (SG).	113
Table 4.8 Abundance and distribution of all sponges across all LT transects. Numbers represent the total quantity of sponges whereas the numbers in parenthesis represent the quantity of sponges with bite marks.	115
Table 4.9 Densities of both edible and total sponges across all LT transects. The numbers in the table indicates the densities of sponges in unit $\times 10^{-3} \text{ m}^{-2}$. Numbers represent the total density of sponges whereas the numbers in parenthesis represent the density of sponges with bite marks.	116
Table 4.10 Mean percentage cover of major benthic life-forms at all nine stations.	120
Table 4.11 Condition index (CI), development index (DI) and succession index (SI) at all nine stations.	122

Table 4.12	Percentages of ruderals (r), competitor (K), stress tolerators (S) and conservation class number for all nine stations.	123
Table 4.13	Morphological diversity index (mH'), mortality index (MI) and percentage live coral cover (LCC), at all nine stations.	124
Table 4.14	Mean values of morphological diversity index, mortality index and percentage live coral cover according to conservation class scores (mean \pm s.d.).	125
Table 4.15	List of all identified reef fish indicators and their locations found.	131



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LIST OF FIGURES

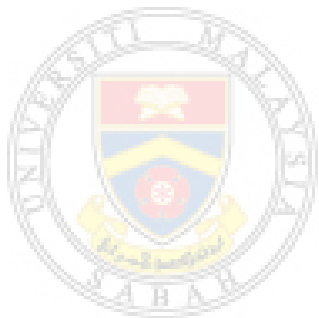
		Page
Figure 2.1	Relationships between physical characteristics of Ascension beaches and nesting density. Some beaches have more than one of the characteristics and thus are included in more than one category. Brackets indicate standard deviation.	24
Figure 2.2	Relationships between combinations of beach characteristics and nesting density at Ascension Island. Each bar represents one beach.	24
Figure 2.3	Relationship between sorting coefficients and mean particle diameters (mm) at each of the 65 beaches examined around the world. Biogenic beaches are indicated by closed circles and volcanic or pyrogenic beaches by open stars.	26
Figure 2.4	Relationships between the mean emergence success of clutches at 15 Ascension beaches and the sorting coefficients and mean particle diameters (mm) of the sands at those beaches.	27
Figure 3.1	Maliangin Kecil (left) and Maliangin Besar (right) Islands.	58
Figure 3.2	Summary diagram of methodology.	59
Figure 3.3	Station numbers for beach profile (BP) and turtle nesting (TN) stations. Solid stars (★) represent the "frequent nesting" stations while circles (○) represent the "seldom nesting" stations for sea turtles.	61
Figure 3.4	Station numbers for seagrass (SG) stations. Solid stars (★) represent stations that were studied. "Site A" represented in circle (○) was not studied because there were no seagrass in the area during the study period.	68
Figure 3.5	Schematic representation of sampling method for seagrass survey.	68
Figure 3.6	Station numbers for Line Intercept Transect (LIT) and Linear Transect (LT) stations. Solid stars (★) represent the location of stations.	70
Figure 3.7	Idealised r-K-S ternary diagram for coral reef conservation classes.	74

Figure 4.1	Map of Maliangin Island Sanctuary showing the topographical distribution of landmark and marine ecosystems.	79
Figure 4.2	The distribution of sea turtle nests across all stations. Grey and white bars in the graph represent the nests for green turtles and hawksbill turtles, respectively.	80
Figure 4.3	Combination of all nine turtle nesting beach profiles in Maliangin Besar Island.	81
Figure 4.4	Combination of all five turtle nesting beach profiles in Maliangin Kecil Island.	82
Figure 4.5	Combination of all seven "frequent nesting" beach profiles in Maliangin Island Sanctuary (MIS).	83
Figure 4.6	Combination of all seven "seldom nesting" beach profiles in Maliangin Island Sanctuary (MIS).	84
Figure 4.7	Height of turtle nesting beach platforms across all stations. White and grey bars in the graph represent the "frequent nesting" and "seldom nesting" stations, respectively.	85
Figure 4.8	Foreshore slope degree across all, "frequent nesting" and "seldom nesting" stations surveyed. Bars indicate the value of standard deviation (s.d.).	88
Figure 4.9	Beach sand grain size distribution graphs at station BP 1 ("seldom nesting" station).	90
Figure 4.10	Beach sand grain size distribution graphs at station BP 2 ("frequent nesting" station).	91
Figure 4.11	Beach sand grain size distribution graphs at station BP 3 ("seldom nesting" station).	91
Figure 4.12	Beach sand grain size distribution graphs at station BP 4 ("seldom nesting" station).	92
Figure 4.13	Beach sand grain size distribution graphs at station BP 5 ("frequent nesting" station).	92
Figure 4.14	Beach sand grain size distribution graphs at station BP 6 ("seldom nesting" station).	93
Figure 4.15	Beach sand grain size distribution graphs at station BP 7 ("seldom nesting" station).	93

Figure 4.16	Beach sand grain size distribution graphs at station BP 8 ("seldom nesting" station).	94
Figure 4.17	Beach sand grain size distribution graphs at station BP 9 ("seldom nesting" station).	94
Figure 4.18	Beach sand grain size distribution graphs at station BP 10 ("frequent nesting" station).	95
Figure 4.19	Beach sand grain size distribution graphs at station BP 11 ("frequent nesting" station).	95
Figure 4.20	Beach sand grain size distribution graphs at station BP 12 ("frequent nesting" station).	96
Figure 4.21	Beach sand grain size distribution graphs at station BP 13 ("frequent nesting" station).	96
Figure 4.22	Beach sand grain size distribution graphs at station BP 14 ("frequent nesting" station).	97
Figure 4.23	Grain size distribution graphs for green turtles at "frequent nesting" stations.	101
Figure 4.24	Grain size distribution graphs for green turtles at "seldom nesting" stations.	102
Figure 4.25	Grain size distribution graphs for hawksbill turtles at "frequent nesting" stations.	103
Figure 4.26	Grain size distribution graphs for hawksbill turtles at "seldom nesting" stations.	104
Figure 4.27	Seagrass coverage for <i>Halodule pinifolia</i> (HP), <i>Halophila ovalis</i> (HO), <i>Halophila minor</i> (HM), <i>Cymodocea serrulata</i> (CS), <i>Cymodocea rotundata</i> (CR) and <i>Thalassia hemprichii</i> (TH) across transect length at SG 1A.	108
Figure 4.28	Seagrass coverage for <i>Halodule pinifolia</i> (HP), <i>Halophila ovalis</i> (HO), <i>Halophila minor</i> (HM), <i>Cymodocea serrulata</i> (CS), <i>Cymodocea rotundata</i> (CR) and <i>Thalassia hemprichii</i> (TH) across transect length at SG 1B.	109
Figure 4.29	Seagrass coverage for <i>Halodule pinifolia</i> (HP), <i>Halophila ovalis</i> (HO), <i>Halophila minor</i> (HM), <i>Cymodocea serrulata</i> (CS), <i>Cymodocea rotundata</i> (CR) and <i>Thalassia hemprichii</i> (TH) across transect length at SG 2A.	109

Figure 4.30	Seagrass coverage for <i>Halodule pinifolia</i> (HP), <i>Halophila ovalis</i> (HO), <i>Halophila minor</i> (HM), <i>Cymodocea serrulata</i> (CS), <i>Cymodocea rotundata</i> (CR) and <i>Thalassia hemprichii</i> (TH) across transect length at SG 2B.	110
Figure 4.31	Seagrass coverage for <i>Halodule pinifolia</i> (HP), <i>Halophila ovalis</i> (HO), <i>Halophila minor</i> (HM), <i>Cymodocea serrulata</i> (CS), <i>Cymodocea rotundata</i> (CR) and <i>Thalassia hemprichii</i> (TH) across transect length at SG 3A.	110
Figure 4.32	Seagrass coverage for <i>Halodule pinifolia</i> (HP), <i>Halophila ovalis</i> (HO), <i>Halophila minor</i> (HM), <i>Cymodocea serrulata</i> (CS), <i>Cymodocea rotundata</i> (CR) and <i>Thalassia hemprichii</i> (TH) across transect length at SG 3B.	111
Figure 4.33	Seagrass coverage for <i>Halodule pinifolia</i> (HP), <i>Halophila ovalis</i> (HO), <i>Halophila minor</i> (HM), <i>Cymodocea serrulata</i> (CS), <i>Cymodocea rotundata</i> (CR) and <i>Thalassia hemprichii</i> (TH) across transect length at SG 3C.	111
Figure 4.34	Seagrass coverage for <i>Halodule pinifolia</i> (HP), <i>Halophila ovalis</i> (HO), <i>Halophila minor</i> (HM), <i>Cymodocea serrulata</i> (CS), <i>Cymodocea rotundata</i> (CR) and <i>Thalassia hemprichii</i> (TH) across transect length at SG 4A.	112
Figure 4.35	Mean percentage cover of all life-form categories at all nine stations.	118
Figure 4.36	Mean percentage cover for the six major benthic life-forms: hard corals (HC), dead corals (DC), soft corals (SC), abiotic substance (AB), algae (AL) and other fauna (OT) at all nine stations in MIS.	119
Figure 4.37	The mean condition index (CI), development index (DI) and succession index (SI) at all nine stations.	121
Figure 4.38	r-K-S ternary diagram for all nine stations.	123
Figure 4.39	Mean morphological diversity index (mH') and mortality index (MI).	124
Figure 4.40	Status of coral reefs at all stations in MIS. Solid stars indicate the location of stations.	126
Figure 4.41	Mean abundance of damselfishes, butterflyfishes and groupers at all nine stations. Bars indicate the value of standard deviation (s.d.).	127

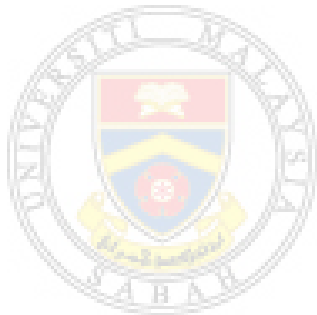
Figure 4.42	Mean distribution for fish diversity index of damselfish, butterflyfish and grouper at all nine stations.	128
Figure 4.43	Abundance of damselfish and %LCC at all nine stations. Bars indicate the value of standard deviation (s.d.).	129
Figure 4.44	Abundance of butterflyfishes and %r at all nine stations. Bars indicate the value of standard deviation (s.d.).	130
Figure 4.45	Abundance of groupers and %K across stations. Bars indicate the value of standard deviation (s.d.).	130



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LIST OF PLATES

		Page
Plate 4.1	Seagrass Species found in Maliangin Island Sanctuary (MIS). <i>Thalassia hemprichii</i> (TH), <i>Halodule pinifolia</i> (HP), <i>Halophila minor</i> (HM), <i>Halophila ovalis</i> (HO), <i>Cymodocea serrulata</i> (CS) and <i>Cymodocea rotundata</i> (CR).	107
Plate 4.2	A typical example of sponge <i>Callyspongia</i> sp. without bite mark (left) and with bite marks (right).	114
Plate 4.3	Bitten sponge genera found in Maliangin Island Sanctuary (MIS). <i>Amphimedon</i> , <i>Callyspongia</i> , <i>Haliclona</i> and <i>Leuconia</i> .	117



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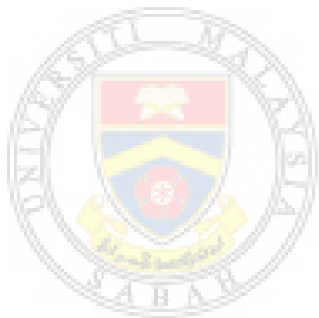
LIST OF EQUATIONS

		Page
Equation 3.1	Foreshore sloping degree	61
Equation 3.2	Platform height	61
Equation 3.3	Φ (phi) value	63
Equation 3.4	Median (M_{ϕ})	63
Equation 3.5	Mean (M_{ϕ})	63
Equation 3.6	Standard deviation (σ_{ϕ})	64
Equation 3.7	Skewness (α_{ϕ})	64
Equation 3.8	Kurtosis (β_{ϕ})	64
Equation 3.9	Longshore current speed	65
Equation 3.10	Seagrass coverage (C)	69
Equation 3.11	Sponge density	71
Equation 3.12	Percentage covers of life-form categories	72
Equation 3.13	Percentage live coral cover (LCC)	72
Equation 3.14	Condition index (CI)	72
Equation 3.15	Development index (DI)	73
Equation 3.16	Succession index (SI)	73
Equation 3.17	Morphological diversity indices (mH')	74
Equation 3.18	Coral mortality index (MI)	75

LIST OF ABBREVIATIONS

AIMS	Australian Institute of Marine Science
ASEAN	Association of Southeast Asian Nations
BEAC	Bangi Environmental Awareness Centre
BMRI	Borneo Marine Research Institute
CC	Conservation class
CCL	Curved carapace length
CI	Condition index
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
df	Degree of freedom
DI	Development index
ENSO	El Niño-Southern Oscillation
FWS	Fish and Wildlife Service
HWL	High Water Level
ISRS	International Society for Reef Studies
IUCN	International Union for Conservation of Nature
LEO	Littoral Environment Observation
LIT	Line Intercept Transect
LT	Linear Transect
LWL	Low Water level
mH'	Morphological diversity index
MI	Mortality index
MIS	Maliangin Island Sanctuary
MPAs	Marine Protected Areas

MWL	Mid Water Level
NMFS	National Marine Fisheries Service
PCA	Priority Conservation Area
r-K-S	Ruderals- competitors - stress-tolerators
SCL	Average straight carapace length
SEA	Southeast Asia
SI	Succession index
TIP	Turtle Islands Park of Sabah
TMP	Tun Mustapha Park
UVC	Underwater Visual Census



UMS
UNIVERSITI MALAYSIA SABAH

LIST OF APPENDICES

	Page
Appendix 1 Interview Questionnaire Forms	199
Appendix 2 Beach Profile Datasheet	201
Appendix 3 Stations, Coordinates and Locations for Beach Profiling Stations	202
Appendix 4 Grain Size Classification Table	203
Appendix 5 Verbal Description of Statistical Parameters: Sorting, Skewness and Kurtosis	204
Appendix 6 Littoral Environment Observation (LEO) Datasheet	205
Appendix 7 Stations, Coordinates and Locations for Seagrass Field Work at MIS	206
Appendix 8 Stations, Coordinates and Locations for Line Intercept Transect (LIT) Underwater Surveys at MIS	207
Appendix 9 Life-form category codes of all benthic substrates	208
Appendix 10 Mann-Whitney U test result for nesting platform analysis	209
Appendix 11 Mann-Whitney U test results for Littoral Environment Observation (LEO) between "frequent nesting" and "seldom nesting" stations	210
Appendix 12 One-way ANOVA test results for median, mean, standard deviation, skewness and Kruskal-Wallis test results for transformed kurtosis across all stations	211
Appendix 13 Mann-Whitney U test results for the comparison of turtle egg chamber grain size statistical parameters between "frequent nesting" and "seldom nesting" stations of green and hawksbill turtles at MIS	221
Appendix 14 Mann-Whitney U test results for the comparison of turtle egg chamber grain size statistical parameters between "frequent nesting" and "seldom nesting" stations of green and hawksbill turtles at MIS	222
Appendix 15 Kruskal-Wallis test results of both density of edible sponges and density of total sponges (in unit $\times 10^{-3} \text{ m}^{-2}$) among all LT stations surveyed	223

Appendix 16	Kruskal-Wallis test results of both density of edible sponges and density of total sponges (in unit $\times 10^{-3} \text{ m}^{-2}$) among all LT stations surveyed	224
Appendix 17	One-way ANOVA test results of mH' , MI and LCC across CC scores	225
Appendix 18	Pearson correlation coefficients test results of LCC with abundance of fish indicators, LCC with diversity of fish indicators, mH' with abundance of fish indicators and mH' with diversity of fish indicators across all nine stations	226
Appendix 19	Pearson correlation coefficients test results of fish indicators (damselfish, butterflyfish and grouper) abundance and fish indicators diversity with coral morphologies across all nine stations	230



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