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MARINE FISHERY RESOURCES
DEVELOPMENT AND MANAGEMENT
DEPARTMENT OF SEAFDEC

KUALA TERENGGANU, MALAYSIA

SEAFDEC MFRDMD RM/8

REPORT OF THE FIRST SEAFDEC MEETING

ON

REGIONAL SEA TURTLE DATA MANAGEMENT

ORGANISED BY:

MARINE FISHERY RESOURCES
DEVELOPMENT AND MANAGEMENT DEPARTMENT
SOUTHEAST ASIAN FISHERIES DEVELOPMENT CENTER

KUALA TERENGGANU, MALAYSIA

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REPORT OF THE FIRST SEAFDEC MEETING ON REGIONAL SEA TURTLE DATA MANAGEMENT
20 – 21 NOVEMBER 2000
KUALA TERENGGANU, MALAYSIA

I. INTRODUCTION

1. At the invitation of the SEAFDEC Marine Fishery Resources Development and Management Department (MFRDMD), the First SEAFDEC Meeting on Regional Sea Turtle Data Management was held in Kuala Terengganu, Malaysia from 20 to 21 November 2000.

2. The Meeting was attended by participants from Brunei Darussalam, Cambodia, Indonesia, Malaysia, Myanmar, the Philippines, Thailand, and Vietnam, as well as officials from SEAFDEC Marine Fishery Resources Development and Management Department (MFRDMD), and observers from Sarawak Forest Department, The Board of Trustee of Sabah Parks, Sea Turtle Information Center in Terengganu, and Sea Turtle and Marine Ecosystem Center in Terengganu, Malaysia. The list of participants and observers appears as Annex 1.

II. OPENING OF THE MEETING

3. The Deputy Chief of MFRDMD, Mr. Hitoshi Fujita delivered the opening address. He welcomed the participants to the Meeting. He stressed on the importance of sea turtles to the marine ecosystem and the need to conserve these animals. He requested active deliberation from the participants to ensure the success of the Meeting.

III. APPOINTMENT OF CHAIRMAN AND ADOPTION OF AGENDA

4. The Meeting agreed to appoint Mr. Ibrahim Saleh as the Chairman. The Agenda, which appears as Annex 2, was adopted.

IV. REPORT OF SEAFDEC/MFRDMD

5. Mr. Syed Abdullah bin Syed Abd. Kadir from MFRDMD presented the "Review on the Progress of Regional Sea Turtle Tagging Program and Population Statistics" as appears in Annex 3. He informed the Meeting of the background and objectives of sea turtle population statistics and tagging program in Southeast Asia. The Meeting took note that the major sea turtle species in Brunei Darussalam is olive ridley.

V. REPORT ON THE SEA TURTLE POPULATION STATISTICS

6. Mr. Syed Abdullah bin Syed Abd. Kadir from MFRDMD also presented the Summary Reports of Sea Turtle Population Statistics for the east and west coasts of Peninsular Malaysia for the years 1998 to 2000 (Annexes 4a and b). Green turtle was the major sea turtle species which nested on the east coast of Peninsular Malaysia from 1998 to 2000. For the west coast of Peninsular Malaysia, the major species which nested in 1998 and 1999 was hawksbill. However, green turtle was the major species which nested in the year 2000.

7. Mr. Paul Basintal from The Board of Trustee of Sabah Park presented the "Turtle Island Park, Sabah, Malaysia: Population Statistics" (Annex 5). He informed the Meeting that only two sea turtles, namely the green turtle and hawksbill, nested on those islands. A gradual increase of green turtle nesting was observed since 1998. However, the nesting trend for hawksbill was decreasing since 1994.

8. Mr. Oswald Braken Tisen from Sarawak Forest Department, Malaysia presented the "Report on the Sea Turtle Population Statistics" as appears in Annex 6. The major species which nested in Sarawak was the green turtle, followed by olive ridley, hawksbill, and leatherback. Statistical data showed that the number of nests and eggs production had increased in 1999. The emergence success for all species of nesting turtle for the past few years remained constant, except for 1999 when lower success was observed probably due to heavy waves which occurred in December.

9. Mr. Mickmin Charuchinda from Thailand presented the population statistics of sea turtle in Thailand (facing the Gulf of Thailand). Only two species of sea turtle, namely the green turtle and hawksbill, nested on Ko Khram Island and some islands in Rayong. Mr. Supot Chantrapornsyl presented the statistical data on sea turtle population in the other parts of Thailand (facing the Andaman Sea). Three species of sea turtle (green turtle, olive ridley and leatherback) nested at various nesting sites on Phrathong Island, Thaimuang beach, Similan Island and Maikhaw beach.

10. Mr. Baringin Hutadjulu from Indonesia presented a country report on "Tagging Programme and Population Statistics on Sea Turtle in Indonesia" (Annex 7). He informed the Meeting that six species of sea turtle namely *Dermochelys coriacea, Eretmochelys imbricata, Chelonia mydas, Lepidochelys olivacea, Natator depressus* and *Caretta caretta* are protected in Indonesia. These species were found to nest at various nesting sites in Indonesia, except for the *Caretta caretta.*

11. Mr. Sabri Haji Mohd Taha from Brunei Darussalam presented the population statistics data of sea turtle in his country. The sea turtle program statistics is still not actively conducted in this country due to shortage in manpower. He briefly informed the Meeting on the sea turtle statistical data for the years 1999 and 2000. Olive ridley is the dominant species found in this country, followed by the green turtle and hawksbill.

12. Mr. U Tin Win from Myanmar presented a country report as appears in Annex 8. Five species of sea turtle, namely olive ridley, loggerhead, green turtle, hawksbill and leatherback, nested on Myanmar island and main land beaches that are locally known as "Leik Thaung" (turtle banks). However, the

latter two species are considered extremely rare. He briefly informed the Meeting on the population statistics of sea turtle and nesting sites in Myanmar. He sought assistance from SEAFDEC/MFRDMD to conduct the sea turtle conservation program in Myanmar.

13. Mr. Ing Try from Cambodia presented the "Report on Sea Turtle Statistics in Cambodia" (Annex 9). The Meeting was informed on the lack of the latest information on sea turtle habitat, population statistics and nesting site in Cambodia due to lack of budgetary to conduct the study. Previous studies have shown that five species of sea turtle (olive ridley, hawksbill, loggerhead, green turtle and leatherback) were found in Cambodian waters. The hawksbill and green turtle came to nesting sites on Koh Kong Krao, Koh Rong and Koh Rong San Loeum islands to lay their eggs during the full moons of October and November. The Department of Fisheries of Cambodia is hoping for NGO and international organizations to provide funds and assistance to implement the protection and conservation of sea turtle in this country in future.

14. Mr. Dinh Thanh Dat from Vietnam presented "Status on marine turtle study and conservation in Vietnam sea water" (Annex 10). Five species of sea turtle (green turtle, hawksbill, olive ridley, loggerhead and leatherback) were found in this country. Many sea turtles breeding grounds exist in Con Dao Island in the East-South area. Thousands of sea turtle come to lay eggs every year, and the major species is the green turtle. In the past few years, the number of sea turtles which nested in Vietnam decreased due to high pressure of population growth, tourism activities and food demand for human consumption.

15. Mr. Renato D. Cruz from Philippines presented "Nesting sites in the Philippines currently monitored by the Pawikan Conservation Project" and "Turtle Islands in the Province of Tawi-Tawi". He briefly informed the Meeting on the background of the Pawikan Conservation Project and the Turtle Islands. Five species of sea turtle (green, hawksbill, olive ridley, loggerhead and leatherback) have been recorded in this country. The number of nest and egg production in the year 2000 (January - September) was decreasing compared to the year 1999. 15 dead sea turtles were found in the Turtle Island from 1998 to 2000, probably due to fishing methods such as trawl net and Hulbot-Hulbot.

VI. DISCUSSION ON SEA TURTLE STATISTICS

16. The participants deliberated at length and agreed on the following issues:

(i) The nesting for each year reported in the bulletin referred to those collected within a set of time frame from 1201 hr on the 1st January until 1200 hr of 1st January of the following year. Similarly, hatchling production data for each year are those from egg production recorded within the same time frame even though some eggs may hatch in the following year.

(ii) The Meeting agreed to use the Curved Carapace Length (CCL) and the Curved Carapace Width (CCW) as measurement of size.

(iii) The Meeting agreed to provide data on turtle nesting only instead of nesting and landing.

(iv) The term "in situ" referred to the natural incubation without relocating the eggs.

(v) "Emergence success" is expressed in percentage. It is calculated using the following formula:

$$\frac{\text{number of hatchlings emerged}}{\text{number of eggs incubated}} \times 100\%$$

(vi) The draft Bulletin of Sea Turtle Statistics in Southeast Asia for the years 1998 and 1999 should be completed by the end of February 2001. Draft copies of this document will be circulated to member countries for their comments prior to publication.

(vii) Statistical data for the year 2000 has to be submitted by all Member Countries to MFRDMD before the end of March 2001 for compilation and publication.

(viii) The Bulletin will be published as a hard copy, and should there be enough budget, it will also be produced in the CD-ROM form.

(ix) The Meeting agreed for future meetings on Regional Sea Turtle Data Management be organized once in two year. If possible, the meetings can be held back-to-back to the SEAFDEC–ASEAN Regional Workshop on Sea Turtle Conservation and Management.

(x) SEAFDEC plans to include in her Homepage information on the Conservation and Management of Sea Turtles in the SEAFDEC Member Countries based on the outcome of previous SEAFDEC Regional Sea Turtle meetings. All Member Countries are requested to report to MFRDMD on any amendment or up-dated information.

VII. REPORT ON THE SEA TURTLE TAGGING PROGRAM

17. Participants from each Member Countries except Brunei Darussalam, Cambodia and Myanmar reported the status of sea turtle tagging program in their respective countries. Brunei Darussalam has not carried out the tagging of sea turtle program due to shortage of manpower in the Department of Fisheries. Sea turtle tagging exercise was not conducted in Cambodia and Myanmar since no inconel tag was given to these countries.

VIII. DISCUSSION ON THE SEA TURTLE TAGGING PROGRAM

18. The participants discussed and agreed on the following issues:

(i) SEAFDEC, in particular MFRDMD, should be available in providing assistance to new SEAFDEC member countries like Myanmar, and Cambodia (which is expected to be a member soon), in the implementation of their regional sea turtle tagging programs, including the supply of inconel tags and applicators. An official request should however be made to SEAFDEC by these countries concerned relating to their needs on the training of their relevant staff members in matters relating to turtle tagging and turtle conservation activities.

(ii) MFRDMD is required to compile and collate all sea turtle tagging data from the region and, with the help of experts to be later determined by MFRDMD, will convene a Training Workshop for the purpose of analyzing the available sea turtle tagging data before 2003.

(iii) The Meeting recognized the need for SEAFDEC to continue with its financial support to Member Countries on sea turtle tagging program.

(iv) The Meeting agreed for sea turtle tagging methodology be expanded to include other techniques such as using satellite tracking.

(v) DNA studies can also be conducted by member countries to determine the population unit of sea turtles in the region.

(vi) The Meeting agreed for Member Countries to use their present turtle statistic and tagging format.

(vii) The Meeting took note on the importance of compilation of turtle statistical and tagging data of each Member Country. These data could be used for management of sea turtle in the region.

(viii) Member Countries are encouraged to analyze the turtle statistical and tagging data using suitable software for better results and interpretation of data.

IX. RESOLUTIONS

19. The Meeting identified the following resolutions for sea turtle data management in the region:

(i) The Meeting agreed for future meetings on Regional Sea Turtle Data Management be organized once in two year. If possible, the meetings can be held back-to-back to the SEAFDEC–ASEAN Regional Workshop on Sea Turtle Conservation and Management.

(ii) The Meeting agreed for MFRDMD to publish the Bulletin on Sea Turtle Population Statistics in Southeast Asia in the form of hard copies, and should there be enough budget, CD-ROMs on the turtle statistics could also be produced.

(iii) Close coordination effort among the countries of the region is vital to enable the regional sea turtle tagging exercises conducted in any of the SEAFDEC Member Country can be implemented successfully. Greater awareness should also be promoted among the other Member Countries relating to the tagging exercises that are being undertaken.

(iv) SEAFDEC, in particular MFRDMD, should be available in providing assistance to new SEAFDEC Member Countries like Myanmar, and Cambodia (which is expected to be a member soon), in the implementation of their regional sea turtle tagging programs, including the supply of inconel tags and applicators. An official request should however be made to SEAFDEC by these countries concerned relating to their needs on the training of their relevant staff members in matters relating to turtle tagging and turtle conservation activities.

(v) MFRDMD is required to compile and collate all sea turtle tagging data from the region and, with the help of experts to be later determined by MFRDMD, will convene a Training Workshop for the purpose of analyzing the available sea turtle tagging data before 2003.

(vi) The Meeting recognized the need for SEAFDEC to continue with its financial support to Member Countries on sea turtle tagging program.

(vii) The Meeting agreed for sea turtle tagging methodology be expanded to include other techniques such as using satellite tracking.

(viii) DNA studies can also be conducted by Member Countries to determine the population unit of sea turtles in the region.

X. CLOSING

20. The Meeting appreciated the cooperation given by participants and observers in making this meeting a success. It is hoped that the sea turtle population statistics and tagging program will be continuously carried out in future for better management of sea turtle in the region.

ANNEX 1

Annex 1

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ANNEX 2

Annex 2

THE FIRST SEAFDEC MEETING ON REGIONAL SEA TURTLE DATA MANAGEMENT KUALA TERENGGANU, MALAYSIA 20 - 21 NOVEMBER 2000

Meeting Agenda

1. *Introduction*
   - 1.1 Welcome address
   - 1.2 Adoption of the agenda
2. *Report of the SEAFDEC/MFRDMD*
3. *Report of the Turtle Statistic Programme*
   - 3.1 Malaysia (Peninsular Malaysia, Sabah & Sarawak)
   - 3.2 Thailand (Bangkok & Phuket)
   - 3.3 Indonesia
   - 3.4 Philippines
   - 3.5 Brunei D.S
   - 3.6 Vietnam
   - 3.7 Myanmar
   - 3.8 Cambodia
   - 3.9 Discussion
4. *Report of the Turtle Tagging Programme*
   - 4.1 Malaysia
   - 4.2 Thailand
   - 4.3 Indonesia
   - 4.4 Philippines
   - 4.5 Brunei D.S
   - 4.6 Vietnam
   - 4.7 Myanmar
   - 4.8 Cambodia
   - 4.9 Discussion

5. Other Matters

5.1 Review on sea turtle homepage

5.2 Meeting on ASEAN – SEAFDEC Sea Turtle Working group

5.3 Training course on sea turtle conservation for new members of SEAFDEC

6. Concluding Matters

6.1 Adoption of the Report

6.2 Conclusion on related issues

6.3 Closing

20th November 2000 (Monday)

8.30 - 9.00 a.m	:	Registration
9.00 - 9.15 a.m	:	Welcome address by Deputy Chief of MFRDMD
9.15 - 9.20 a.m	:	Appointment of chairman & adoption of the agenda
9.20 - 9.45 a.m	:	Report of the SEAFDEC / MFRDMD by Mr. Syed Abdullah
9.45 - 10.15 a.m	:	Refreshment & group photography
10.15 - 12.30 p.m	:	Report of the turtle population statistics
12.30 - 2.00 p.m	:	Lunch
2.00 - 2.30 p.m	:	Continue meeting
3.30 - 3.45 p.m	:	Refreshment
3.45 - 5.00 p.m	:	Discussion & other matters
7.30 - 9.00 p.m	:	Dinner

21st November 2000 (Tuesday)

9.00 - 10.30 a.m	:	Report of the turtle tagging programme
10.30 - 10. 45 a.m	:	Refreshment
10.45 - 12.00 p.m	:	Continue meeting
12.00 - 1.00 p.m	:	Dicussion & other matters
1.00 - 3.00 p.m	:	Lunch
3.00 - 4.00 p.m	:	Adoption of the report
4.00 - 4.15 p.m	:	Closing

Turtle Statistics

Discussion matters:

1. Producing a bulletin on 'Sea Turtle Population Statistics in the Southeast Asia'
2. Workshop / Seminar on Sea Turtle Data Management
3. Regular meeting (annually, twice year or etc. & venue)

Other matters:

1. Review on Turtle Homepage; *Conservation and Managemant of Sea Turtle in SEAFDEC Member Countries.*
2. Turtle tagging program

Discussion matters:

1. Workshop on Regional Sea Turtle Tagging Analysis

Other matters:

1. Meeting on ASEAN – SEAFDEC Sea Turtle Working Group
2. Training course on Sea Turtle Conservation and Management for new members of SEAFDEC (Indonesia, Cambodia, Myanmar & Vietnam).

ANNEX 3

Annex 3

THE FIRST SEAFDEC MEETING ON
REGIONAL SEA TURTLE DATA MANAGEMENT

Kuala Terengganu, Malaysia 20 – 21 November, 2000

REVIEW ON THE PROGRESS OF REGIONAL SEA TURTLES TAGGING PROGRAM AND POPULATION STATISTICS

By

SYED ABDULLAH BIN SYED ABD. KADIR

Marine Fishery Resources and Development Department (MFRDMD)
Southeast Asian Fisheries Department Center (SEAFDEC)
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1. INTRODUCTION

MFRDMD/SEAFDEC had organised the first meeting on Regional Tagging Program and Data Collection on Marine Turtle at MFRDMD, Kuala Terengganu from 21st – 23rd December 1997. Two main issues had been discussed during the meeting; (i) turtle tagging program and (ii) turtle statistics. MFRDMD as a host had presented two proposal (i) Collaborative Tagging Program of Marine Turtle in the Southeast Asian Region and (ii) Marine Turtle Statistics for the Southeast Asia.

The First SEAFDEC Meeting on Regional Sea Turtle Data Management was organised by MFRDMD / SEAFDEC with the intention to evaluate the progress action done by the SEAFDEC Members Countries according to the decision/agreement from the above meeting. This meeting will also act as a platform to gather the current population status of six living species of sea turtles in the Southeast Asian region. Finally, these information will facilitate MFRDMD/SEAFDEC to produce a bulletin on *Sea Turtle Population Statistics in Southeast Asia* and to create *a digitised atlas of sea turtles in the region.* The following table showed the distribution of six species of sea turles in the SEAFDEC Member Countries.

Country	Leatherback	Green	Hawksbill	Loggerhead	Olive ridley	Flatback
Brunei		x	x		x	
Cambodia	x	x	x	x	x	
Indonesia	x	x	x	x	x	x
Malaysia	x	x	x		x	
Myanmar	x	x	x	x		
Philippines	x	x	x	x	x	
Singapore	x	x	x	x		
Thailand	x	x	x	x	x	
Vietnam	x	x	x	x	x	

2. REGIONAL SEA TURTLE POPULATION STATISTICS

The Objectives of these activities are (i) to compile all available sea turtle population statistics in the region and (ii) to collate, update and disseminate the information to countries in and outside the region. In December 1998, MFRDMD had disseminated the format of regional sea turtle population statistics to the SEAFDEC Member Countries for their action to obtain the current status of marine turtles in the region. The details of the format are shown below:

Format code	Descriptions
Statistics 01	Turtle Nesting Site.
Statistics 02	Annual Landing.
Statistics 02A	Annual Nesting.
Statistics 03	Monthly Landing.
Statistics 03A	Monthly Nesting.
Statistics 04	Number of *in-situ* and artificial hatcheries.
Statistics 05	Total of annual production, egg incubation, hatchlings and emergence success.
Statistics 06	Total annual egg incubation, hatchling and emergence success by *in-situ* hatcheries.
Statistics 07	Total annual egg incubation, hatchling and emergence success by artificial hatcheries.
Statistics 08	Monthly statistics of egg production at every nesting site.
Statistics 09	Monthly statistics of egg production, egg incubation, hatchling and emergence success.
Statistics 10	Monthly record on mortality for every species.

According to schedule, all Member Countries are requested to send these data on turtle population statistics for the year 1998 to MFRDMD before 15th March 1999. Whereas for the years 1999 & 2000 data should be sent before 16th November 2000. At this moment MFRDMD had only received the data from Peninsular Malaysia, Sabah, Thailand and Vietnam.

3. REGIONAL SEA TURTLE TAGGING PROGRAM

Tagging program has been implemented intensively in Peninsular Malaysia, Sabah, Sarawak, Indonesia as well as Philippines and had already started in Thailand and Con Dao National Park in Vietnam. The objectives of tagging programs are to understand the migration, growth, mortality and reproduction of sea turtles in the region. Starting in 1997, SEAFDEC Member Countries had agreed to implement a standard tagging code for sea turtle tagging program in the region. A total of 11,000 units of inconel tag had been distributed by MFRDMD to the SEAFDEC Member Countries from 1998 to the year 2000. The details of tagging code and serial number are described below:

Country Code	Institution	Serial Number	No. of unit
MY: Malaysia	DOF	MY0001-MY2000	2000
	Sabah Park	MY(S)0001-MY(S)1000	1000
	S'wak F. Dept.	MY(Sa)0001-MY(Sa)1000	1000
TH: Thailand	Queen Project	TH0001-TH1100	1100
	PMBC	TH(P)0001-TH(P)1000	1000
PH: Philippines	DOE	PH0001-PH2000	2000
VN: Vietnam	North Vietnam	VN(N)0001-VN(N)0200	200
	South Vietnam	VN(S)0001-VN(S)0200	200
	Central Vietnam (RIMP)	VN(C)0001-VN(C)0200	200
ID: Indonesia	PHPA	ID0001-ID2000	2000
BN: Brunei	DOF	BN0001-BN0300	300

Cambodia and Myanmar are not registered yet as members of SEAFDEC during the meeting in 1997. As a result, these two countries are not involved in the standardization of the regional sea turtle tagging code. Therefore the distribution of inconel tags does not cover these countries. As a regional co-ordinator, MFRDMD suggest that both countries will propose the details of tagging code in order to implement the tagging exercises in their own territories. In future, MFRDMD will no longer provide the inconel tag to the Member Countries except for Cambodia and Myanmar.

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ANNEX 4A

Annex 4A

THE FIRST SEAFDEC MEETING ON
REGIONAL SEA TURTLE DATA MANAGEMENT

Kuala Terengganu, Malaysia 20 – 21 November, 2000

SUMMARY REPORT OF SEA TURTLE POPULATION STATISTICS IN EAST COAST OF PENINSULAR MALAYSIA FOR THE YEAR 1998

Marine Fishery Resources and Development Department (MFRDMD)
Southeast Asian Fisheries Department Center (SEAFDEC)
Kuala Terengganu, Malaysia

Annex 4a

Marine Fishery Resources
Development and Management Department (MFRDMD)
Kuala Terengganu, Malaysia
November 2000

SUMMARY REPORT OF SEA TURTLE POPULATION STATISTICS IN EAST COAST OF PENINSULAR MALAYSIA FOR THE YEAR 1998

1. SPECIES OCCURRENCE

Four species are recognised to land and nest in East Coast of Peninsular Malaysia. These species are Leatherback (*Dermochelys coriacea*), Green (*Chelonia mydas*), Hawksbill (*Eretmochelys imbricata*) and Olive ridley (*Lepidochelys olivacea*).

1.1 Major species: Green turtle (*Chelonia mydas*), Penyu agar

2. MAJOR NESTING LOCATIONS

Leatherback: Rantau Abang, Dungun, Terengganu

Green: Redang Island, Perhentian Island, Geliga, Paka, Ma Daerah (Terengganu), Chendor (Pahang), Mersing Marine Park (Johor).

Hawksbill: Mersing Marine Park (Johor)

Olive ridley: Rhu Sepuluh and Paka (Terengganu)

3. HATCHERY

3.1 *In – situ* hatcheries: Mak Kepit and Chagar Hutang (Redang Island)

3.2 Artificial hatcheries: Perhentian Island, Rhu Sepuluh, Paka, Ma Daerah, Geliga (Terengganu), Chendor (Pahang), Tinggi Island (Mersing Marine Park)

4. ANNUAL LANDING

Leatherback: 19

Green: 2,581

Hawksbill: 87

Olive ridley: 4

5. ANNUAL NESTING

Leatherback:	19
Green:	2,581
Hawksbill:	87
Olive ridley:	4

6. PEAK SEASON

Leatherback:	May - August
Green:	May - August
Hawksbill:	May - July
Olive ridley:	May - July

7. TOTAL OF EGGS INCUBATED

Leatherback:	1,385
Green:	81,084
Hawksbill:	6,776
Olive ridley:	96

8. TOTAL OF HATCHLINGS

8.1 *In – situ* hatcheries: ***Green:*** 15,117

8.2 Artificial hatcheries:

Leatherback:	237
Green:	39,559
Hawksbill:	2,892
Olive ridley:	19

9. MORTALITY

Leatherback:	2
Green:	23
Hawksbill:	2
Olive ridley:	2

SUMMARY REPORT OF SEA TURTLE POPULATION STATISTICS IN EAST COAST OF PENINSULAR MALAYSIA FOR THE YEAR 1999

1. SPECIES OCCURRENCE

Four species are recognised to land and nest in East Coast of Peninsular Malaysia. These species are Leatherback (*Dermochelys coriacea*), Green (*Chelonia mydas*), Hawksbill (*Eretmochelys imbricata*) and Olive ridley (*Lepidochelys olivacea*).

1.1 Major species: Green (*Chelonia mydas*)

2. MAJOR NESTING LOCATIONS

Green turtle (*Chelonia mydas*), Penyu agar:

Leatherback:	Rantau Abang, Dungun, Terengganu
Green:	Redang Island, Perhentian Island, Geliga, Paka, Ma Daerah (Terengganu), Chendor (Pahang), Mersing Marine Park (Johor)
Hawksbill:	Mersing Marine Park (Johor)
Olive ridley:	Rhu Sepuluh, Paka (Terengganu)

3. HATCHERY

3.1	*In – situ* hatcheries:	Mak Kepit and Chagar Hutang (Redang Island)
3.2	Artificial hatcheries:	Perhentian Island, Rhu Sepuluh, Paka, Ma Daerah, Geliga (Terengganu), Chendor (Pahang), Tinggi Island (Mersing Marine Park).

4. ANNUAL LANDING

Leatherback:	10
Green:	2,350
Hawksbill:	98
Olive ridley:	6

5. ANNUAL NESTING

Leatherback:	10
Green:	2,350
Hawksbill:	98
Olive ridley:	6

6. PEAK SEASON

Leatherback:	May - August
Green:	May - August
Hawksbill:	May - July
Olive ridley:	May - July

7. TOTAL OF EGGS INCUBATED

Leatherback:	586
Green:	94,157
Hawksbill:	9,821
Olive ridley:	571

8. TOTAL HATCHLINGS

8.1	*In – situ* hatcheries:	***Green:***	19,978
		Hawksbill:	89
8.2	Artificial hatcheries:	***Leatherback:***	254
		Green:	58,362
		Hawksbill:	5,591
		Olive ridley:	333

9. MORTALITY

Leatherback:	2
Green:	14
Hawksbill:	8
Olive ridley:	4

SUMMARY REPORT OF SEA TURTLE POPULATION STATISTICS IN EAST COAST OF PENINSULAR MALAYSIA FOR THE YEAR 2000

1. SPECIES OCCURRENCE

Four species are recognised to land and nest in East Coast of Peninsular Malaysia. These species are Leatherback (*Dermochelys coriacea*), Green (*Chelonia mydas*), Hawksbill (*Eretmochelys imbricata*) and Olive ridley (*Lepidochelys olivacea*).

1.1 Major species: Green (*Chelonia mydas*)

2. MAJOR NESTING LOCATIONS:

Green turtle (*Chelonia mydas*), Penyu agar:

Leatherback:	Rantau Abang, Dungun, Terengganu
Green:	Redang Island, Geliga, Ma Daerah (Terengganu), Chendor (Pahang), Mersing Marine Park (Johor)
Hawksbill:	Mersing Marine Park (Johor)
Olive ridley:	Rhu Sepuluh (Terengganu)

3. HATCHERY

3.1	*In – situ* hatcheries:	Mak Kepit and Chagar Hutang (Redang Island)
3.2	Artificial hatcheries:	Perhentian Island, Rhu Sepuluh, Paka, Ma Daerah, Geliga (Terengganu), Chendor (Pahang), Tinggi Island (Mersing Marine Park).

4. ANNUAL LANDING

Leatherback:	28
Green:	1,510
Hawksbill:	69
Olive ridley:	3

5. ANNUAL NESTING

Leatherback:	28
Green:	1,510
Hawksbill:	69
Olive ridley:	3

6. PEAK SEASON

Leatherback:	June - August
Green:	May - August
Hawksbill:	May - July
Olive ridley:	April - June

7. TOTAL OF EGGS INCUBATED

Leatherback:	1,809
Green:	144,288
Hawksbill:	6,105
Olive ridley:	81

8. TOTAL HATCHLINGS

8.1	*In – situ* hatcheries:	***Green:***	43,513
		Hawksbill:	245
8.2	Artificial hatcheries:	***Leatherback:***	116
		Green:	61,729
		Olive ridley:	50

ANNEX 4B

Marine Fishery Resources
Development and Management Department (MFRDMD)
Kuala Terengganu, Malaysia
November 2000

SUMMARY REPORT OF SEA TURTLE POPULATION STATISTICS IN WEST COAST OF PENINSULAR MALAYSIA FOR THE YEAR 1998

1. SPECIES OCCURRENCE

Three species are recognised to land and nest in West Coast of Peninsular Malaysia. These species are Green (*Chelonia mydas*), Hawksbill (*Eretmochelys imbricata*).

1.1 Major species: Hawksbill (*Eretmochelys imbricata),* Penyu Karah

2. MAJOR NESTING LOCATIONS

Green: Segari (Perak) & Keranchut Beach (Pulau Pinang)

Hawksbill: Melaka

3. HATCHERY

3.1 *In – situ* hatcheries: none

3.2 Artificial hatcheries: Segari, Melaka and Keranchut Beach

4. ANNUAL LANDING

Green: 132

Hawksbill: 222

5. ANNUAL NESTING

Green: 132

Hawksbill: 222

6. PEAK SEASON

Green: March - June

Hawksbill: May - August

7. TOTAL OF EGGS INCUBATED

Green: 13,555

Hawksbill: 25,831

8. TOTAL OF HATCHLINGS

8.2 Artificial hatcheries: *Green:* 4,821

Hawksbill: 8,940

9. TOTAL OF MORTALITY

No record

MARINE FISHERY RESOURCES DEVELOPMENT AND MANAGEMENT DEPARTMENT (MFRDMD)

SUMMARY REPORT OF SEA TURTLE POPULATION STATISTICS IN WEST COAST OF PENINSULAR MALAYSIA FOR THE YEAR 1999

1. SPECIES OCCURRENCE

Three species are recognised to land and nest in West Coast of Peninsular Malaysia. These species are Green (*Chelonia mydas*), Hawksbill (*Eretmochelys imbricata*).

1.1 Major species: Hawksbill (*Eretmochelys imbricata*), Penyu Karah

2. MAJOR NESTING LOCATIONS

Green: Segari (Perak) & Keranchut Beach (Pulau Pinang)

Hawksbill: Melaka

3. HATCHERY

3.1 *In – situ* hatcheries: none

3.2 Artificial hatcheries: Segari, Melaka and Keranchut

4. ANNUAL LANDING

Green: 220

Hawksbill: 241

5. ANNUAL NESTING

Green: 220

Hawksbill: 241

6. PEAK SEASON

Green: May - July

Hawksbill: May - July

7. TOTAL OF EGGS INCUBATED

Green: 23,622

Hawksbill: 258,254

8. TOTAL OF HATCHLINGS

8.1 Artificial hatcheries: ***Green:*** 11,843

Hawksbill: 16,611

10. TOTAL OF MORTALITY

No record

SUMMARY REPORT OF SEA TURTLE POPULATION STATISTICS IN WEST COAST OF PENINSULAR MALAYSIA FOR THE YEAR 2000

1. SPECIES OCCURRENCE

Three species are recognised to land and nest in West Coast of Peninsular Malaysia. These species are Green (*Chelonia mydas*), Hawksbill (*Eretmochelys imbricata*)

1.1 Major species: Green (*Chelonia mydas*), Penyu agar

2. MAJOR NESTING LOCATIONS

Green: Segari (Perak) & Keranchut Beach (Pulau Pinang)

Hawksbill: Melaka

3. HATCHERY

3.1 *In – situ* hatcheries: none

3.2 Artificial hatcheries: Segari, Melaka and Keranchut Beach

4. ANNUAL LANDING

Green: 100

Hawksbill: 88

5. ANNUAL NESTING

Green: 100

Hawksbill: 88

6. PEAK SEASON

Green: February - April

Hawksbill: May - July

7. TOTAL OF EGGS INCUBATED

Green: 10,681

Hawksbill: 10,672

8. TOTAL OF HATCHLINGS

8.1 Artificial hatcheries: ***Green:*** 4,392

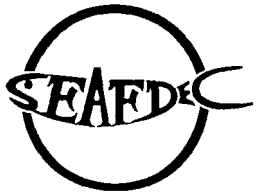
Hawksbill: 1,185

9. TOTAL OF MORTALITY

No record

ANNEX 5

Annex 5



THE FIRST SEAFDEC MEETING ON
REGIONAL SEA TURTLE DATA MANAGEMENT

Kuala Terengganu, Malaysia 20 – 21 November, 2000

TURTLE ISLANDS PARK, SABAH, MALAYSIA: POPULATION STATISTICS OF SEA TURTLES[1]

By

PAUL BASINTAL

Marine Fishery Resources and Development Department (MFRDMD)
Southeast Asian Fisheries Department Center (SEAFDEC)
Kuala Terengganu, Malaysia

Annex 5

TURTLE ISLANDS PARK, SABAH, MALAYSIA: POPULATION STATISTICS OF SEA TURTLES

by
Paul Basintal
Assistant Director, Sabah Parks
Sabah, MALAYSIA

1. INTRODUCTION

The Turtle Islands Park, located some 40km north of Sandakan in the Sulu Sea, is the most important turtle rookery in Sabah. The park consists of three islands namely Selingaan (8.1 ha.), Bakkungaan Kechil (8.5 ha.) and Gulisaan (1.6 ha.). Two species of sea turtles - the green (*Chelonia mydas*) and the hawksbill turtles (*Eretomohelys imbricata*) - nest on these islands. About 50 percent of the green turtle nestings occur at Selingaan, while about 30 percent nestings happen at Bakkungaan Kechil, and about 20 percent nesting take place at Gulisaan. On the other hand, Gulisaan accounts for about 80 percent nesting of hawksbill turtle.

This report on sea turtle population statistics covers the period from 1998 to October 2000.

2. ANNUAL LANDING AND NESTING

2.1 Green Turtle

Island	Year					
	1998		1999		2000 (up to Oct.)	
	Landing	Nesting	Landing	Nesting	Landing	Nesting
Selingaan	2,578	2,575	5,700	5,689	4,315	4,315
Bakkungaan Kechil	1,835	1,835	3,523	3,523	2,593	2,593
Gulisaan	1,422	1,422	2,160	2,149	1,596	1,596
Total	5,835	5,832	11,383	11,361	8,504	8,504

For the year 1998, Selingaan recorded the highest monthly landings in August with 393 landings. Other high monthly landings were also observed during July at Selingaan and Bakkungaan Kechil with 363 and 279 landings respectively. For Gulisaan, the highest monthly landings at 245 occurred in July.

For the year 1999, Selingaan again recorded the highest monthly landing at 863 that occurred in May. Other high monthly landings also took place at Selingaan in June and July with 753 and 638 landings respectively. For Bakkungaan Kechil the highest monthly landings at 565 happened in July. Other high monthly landings were 532 in May and 520 in June. For Gulisaan, the highest monthly landings were recorded in July with 346 landings.

For year 2000, the highest monthly landings at 796 occurred at Selingaan in April. For Bakkungaan Kechil, it was in April with 428 landings while in Gulisaan it also happened the same month with 251 landings.

2.2 Hawksbill Turtle

Island	Year					
	1998		1999		2000 (up to Oct.)	
	Landing	Nesting	Landing	Nesting	Landing	Nesting
Selingaan	40	38	51	51	41	41
Bakkungaan Kechil	26	26	50	50	31	31
Gulisaan	313	313	388	386	244	244
Total	379	377	489	487	316	316

For the year 1998, Gulisaan recorded the highest monthly landings for the hawksbill in July with 47 landings. Selingaan and Bakkungaan Kechil recorded 7 landings each that occurred in March and July respectively.

For the year 1999, Gulisaan again recorded the highest monthly landings at 58 in March. Twelve landings happened in Selingaan during March, and 11 landings occurred in April for Bakkungaan kechil.

For year 2000, the highest monthly landings in Gulisaan happened in January, February and March with 33 landings each. For Selingaan, the highest monthly landings occurred in March with 8 landings, while for Bakkungaan Kechil it was in February with 5 landings.

3. GREEN AND HAWKSBILL TURTLE: ANNUAL EGG PRODUCTION, INCUBATION AND HATCHLING

3.1 Year 1998

Island	Egg Production		Egg Incubation		Hatchling	
	Green	Hawksbill	Green	Hawksbill	Green	Hawksbill
Selingaan	224,973	3,274	224,593	3,249	108,724	1,437
Bakkungaan Kechil	175,059	2,791	175,059	2,791	110,374	1,978
Gulisaan	127,508	33,995	127,508	33,995	61,292	11,983
Total	527,540	40,060	527,160	40,035	280,390	15,398

3.2 Year 1999

Island	Egg Production		Egg Incubation		Hatchling	
	Green	Hawksbill	Green	Hawksbill	Green	Hawksbill
Selingaan	482,628	4,791	481,756	4,635	363,215	3,364
Bakkungaan Kechil	326,663	5,682	326,553	5,679	243,441	4,519
Gulisaan	188,430	43,975	188,430	43,955	116,684	24,713
Total	997,721	54,448	996,739	54,269	723,340	32,596

3.3 Year 2000

Island	Egg Production*		Egg Incubation*		Hatchling**	
	Green	Hawksbill	Green	Hawksbill	Green	Hawksbill
Selingaan	355,146	3,847	354,730	3,768	227,850	2,306
Bakkungaan Kechil	237,948	3,335	237,948	3,335	140,027	1,805
Gulisaan	130,661	28,235	130,637	28,230	66,138	13,439
Total	723,755	35,417	723,315	35,333	434,015	17,550

*up to October only

**up to July only

For the period from 1998 to year 2000, egg production for the year 1999 was the highest with 1,052,169 eggs of which 997,721 green turtle eggs and 54,448 hawksbill turtle eggs. When compared to previous years, this figure is higher than the egg produced in 1997 (1,047,007 eggs) but lower than the figure for 1991 (1,156,677 eggs).

In the Turtle Islands Park, all eggs gathered are transplanted into hatcheries. The hatcheries are partially shaded in order to lower the incubation temperature. The average incubation temperature for shaded hatcheries is about 29.8 °C.

4. TURTLE MORTALITY

For the year 1998, one green turtle carcass was found on 25 July at Selingaan Island. It was not possible to determine the cause of the death because of the advanced stage of decomposition.

Ten green turtles and one hawksbill turtle were recorded dead within the park during 1999. Two deaths were reported May and August, three deaths in September and October, and one in November. Four of the dead green turtles bore the Turtle Islands Park's tags, while the rest were untagged. Fish trawling activities might be the cause of most of the deaths.

5. HIGH TIDE

A phenomenal high tide occurred on 23rd December 1999. The hatchery at Selingaan was partially submerged, but the hatchery at Gulisaan was totally drowned. However, hatchery operations were not affected and the year 1999 recorded the highest number of hatchlings produced (755,936 hatchlings) breaking the record set in 1991 (736,098 hatchlings).

6. CONCLUSIONS

The general trend of nesting for the period from 1998 to 2000 reveals a continuation of the gradual increase observed since 1988. Green turtle nesting contributes to the maintenance of this pattern although its annual nesting fluctuates. In the case of hawksbill turtle, however, the nesting trend displays a decreasing pattern noted since 1994.

ANNEX 6

THE FIRST SEAFDEC MEETING ON
REGIONAL SEA TURTLE DATA MANAGEMENT

Kuala Terengganu, Malaysia 20 - 21 November, 2000

COUNTRY REPORT

MALAYSIA

SARAWAK

REPORT ON THE SEA TURTLE POPULATION STATISTIC

By:

OSWALD BRAKEN TISEN AND JAMES BALI

National Parks and Wildlife Division
Sarawak Forest Department
Sarawak, Malaysia

1. Introduction

For more than 150 years, eggs laid by Sarawak's sea turtles have been harvested by humans for consumption. Since 1927, this harvest have been particularly efficient, and most of the eggs laid have been collected (Hendrickson, 1957 in Harrison, 1962). Leh, (1985) noted that the history of turtle egg collection dates probably to the 16th century when eggs were a barter trade item with China. In the 1950s, the annual number of green turtle eggs collected and sold in the local market was around 2 million. He also stated that the local residents did not eat turtles, but only their eggs. Bank (1986) wrote that, the mean number of eggs exported from 1900-1927 was 300,000 per year. He also summarized the annual take of green turtle eggs from 1927-1985, showing that 1-3 million eggs were collected per year until 1960, roughly 500,000 eggs were collected per year during 1960s, and less than 300,000 eggs have been collected per year since. In 1989 and 1990, 185,461 and 117, 701 eggs, respectively, were collected (data courtesy of the Sarawak Museum), or less than 5% of peak yields in the mid-1930s. From 1971-75, 1,194, 391 eggs were collected from the three Turtle Island at the northwest of Sarawak (Chin 1975).

The Sarawak Museum has been recording the yearly of green turtle landing of green turtles on each of the Turtle Islands (Pulau Talang-Talang Besar, Pulau Talang-Talang Kecil and Pulau Satang Besar) since 1946. Conservation began in 1951 with the transferal of 21,363 eggs to unshaded natural beach hatchery (Harrison, 1955).

The Turtles Trust Ordinance 1957, the Sarawak Wildlife Protection Ordinance 1957, the Sarawak Protection Ordinance 1973, the Wildlife Protection Ordinance 1990 (Amended 1995, and the Sarawak Wildlife Ordinance 1998 Wildlife were gazzetted to conserve, protect and manage the turtles in Sarawak. Turtle population at the Sarawak Turtle Islands has decreased by 95% in the last 50 years (Banks 1937, 1986; Harrison 1947, 1962; Chin 1969, 1975; Mortimer 1990; Bali 1998). Various reasons have been put forward for the declination such as: over-harvesting of eggs; incidental mortality in fishing gears; coastal development; predation; and various other environmental causes (Bali, 1998).

2. SEA TURTLES MANAGEMENT AND CONSERVATION IN SARAWAK

The conservation and management of sea turtles in Sarawak is very complex. Various government agencies are involved: The Sarawak Forest Department, Sarawak Museum, Turtles' Board and Marine Fisheries Department.

In 1957, the Turtle Trust Ordinance was gazzetted. Since then the management and conservation of marine turtle in the three Turtle Islands falls under jurisdiction of the Director of the Museum in his capacity as the Executive Officer of the Turtle's Board. Its jurisdiction only extends for half a nautical mile from each of these islands. The Sarawak Turtles Board owned all eggs from Sarawak Turtle Islands. All the revenue from selling of turtle eggs will be used for management of Sarawak Turtles Board and for Sarawak Malay Islamic Charity. The Sarawak Museum was also traditionally been responsible for turtle research on the three Turtle Islands. In 1957, the curator of Sarawak Museum was in-charge of wildlife in the state in his capacity as Chief Game Warden. Thus was responsible for marine turtles for

the whole state. Green, hawksbill and leatherback turtle are listed as protected spesies. Under this ordinance no person should hunt, kill, or capture any protected animal otherwise than under and in accordance with the conditions of a licence issued under this Ordinance.

However, when the Wildlife Protection Ordinance was amended in 1973, the Conservator of Forests (now known as the Director of Forestry) was appointed in charge of wildlife for the state, and as such became responsible for the protection of marine turtles within Sarawak. Dugongs were also added to the list of protected species. The Director of the Museum still remained the Executive Officer of the Turtle's Board, but his jurisdiction now only extended to the three Turtle Islands.

In 1990, the Wildlife Protection Ordinance, 1990, was gazetted. In this ordinance, there were classifications for "totally protected animals" and "protected animals". All marine turtles were listed as totally protected. In 1995, an amendment to the Wildlife Protection Ordinance, 1990 to include all animals, birds, reptiles, fish, and invertebrates, listed under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) as protected spesies.

The Marine Fisheries Department, Sarawak is responsible for turtles when they are in the sea. Under the Fisheries (Prohibited Areas) Regulations 1994, the maritime waters within two nautical miles of the outermost points of the Sarawak Turtle Islands (measured from the low water mark) of: Pulau Talang-Talang Besar; Pulau Talang-Talang Kecil; and Pulau Satang Besar) are Fisheries Prohibited Areas under section 61 of the Fisheries Act 1985. All forms of fishing and collecting are prohibited.

In 1998, the Sarawak Forest Department was awarded with the Intensification Research in Priority Areas (IRPA) grant from Ministry of Science Technology and the Environment, Malaysia. This IRPA project # 08-04-06-0002 entitled: "A Conservation Study of the Ecology of Marine Turtles in Sarawak" which amount approved for a 34 month study from March 1998 to December 2000 was RM1, 359,912.00 has enabled the Forestry Department to purchase "state of the art" equipment, as well as supplies and basic field equipment. It has also enabled the employment of full time laborers and graduates, as well as enabling some final year and Masters programs to be undertaken in sea turtles in Sarawak.

This project has also enabled the various agencies to coordinate together a responsible and coordinated research programme for the Sarawak Turtle Islands. The "Talang Satang Turtle Research Working Group" was formed in June 1998 consisting of: Sarawak Turtles Board (Chairman); Sarawak Museum; Sarawak Forestry Department; and the Marine Fisheries Department, Sarawak.

This group meets monthly to review research on the Turtle Islands. It considers the conservation of turtles and ensures that there is no unnecessary research or duplication. It also makes management recommendations where necessary that are then forwarded to the Turtle's Board for consideration.

In addition the group has also been able to monitor enforcement of the various rules and regulations for sea turtles at the Turtle Islands. This is due to the fact that most of its members are actively in the field conducting research and are able to be the "eyes and ears" of enforcement. This has coordinated enforcement and has had the benefit of stopping transgressors who previously flouted the laws and in doing so disturbed the turtles.

3. NESTING SITES

The major nesting sites for sea turtles in Sarawak are found at Satang Besar (110°9.7'E, 001°47.1'N), Talang-Talang Besar (109°64.4'E, 001°55'N) and Talang-Talang Kecil (109°45.8'E, 001°53.8'N) which were formally known as the Sarawak Turtle Islands. (Hendrickson, 1957;Leh et. al., 1985; Leh,, 1989; de Silva, 1995). These island are located off southeast coast of Sarawak and accounts for 99% of whole of the Sarawak egg yield (Harrison, 1966). Bali (1998), noted that other nesting sites are situated along the sandy beaches of Sematan and Miri, Tanjung Datu National Park and Similajau National Park.

4. SPECIES OCCURRENCE

Green turtle (*Chelonia mydas*) locally known as 'penyu pulo' is the main species of sea turtles that nest in large numbers during the months of May and October each year at the turtles islands. This species also nests at Tanjung Datu National Park, Sematan and Similajau National Park. Hawksbills turtle (*Eretmochelys imbricata*) locally known as 'penyu sisik' or 'penyu sisit' also nest on the Sarawak turtle island during wet northwest monsoon season from October to March. Olive Ridleys turtle (*Lepidochelys olivacea*) locally known as 'penyu ranto' or 'penyu bengal' nest at these three islands and Tanjung Datu National Park. Leatherback turtle (*Dermochelys coriacea*) locally known as 'penyu timbo' was recorded to nest at Similajau National Park in 1998, Tanjung Lobang off Miri, Bedaun and Siru off Sematan in 2000.

TURTLE NESTING AREAS IN SARAWAK

Figure 1: ***Turtle nesting areas in Sarawak***

Location/Site/ Rookery (name)	Latitude	Longitude	Leatherback	Green	Hawksbill	Olive ridley
Pulau Talang-Talang Kecil	1°53.8'N	109°45.8'E		√		√
Pulau Talang-Talang Besar	1°55'N	109°46.4'E		√		√
Pulau Satang Besar	1°47.1'N	110°9.5'E		√	√	√
Tg. Datu NP	2°02.37'N	109°39'E		√		√
Similajau NP	3°27'N	113°14'E		√		
Kg. Puguh	1°43.9'N	109°48'E	√	√		√
Tg. Lobang	4°22.31'N	113°58'E	√	√		
Kg. Bedaun	1°53.35'N	109°40'N	√	√		
Kg. Siru	1°50.18'N	109°43'N	√	√		

Table 1: ***Nesting site and species occurrence***

5. NUMBER OF NESTS

In 1998 a total 1792 of green turtle nests recorded at Sarawak. Out of this number, 1775 nested at Sarawak Turtle Islands (793 nests at Talang-Talang Kecil; 907 nests at Talang-Talang Besar; and 63 nests at Satang Besar). Number of green turtle nests increased to 2,891 nests in 1999, of which 2,870 nests were laid at the Turtle Islands (1,297 nests at Talang-Talang Besar; 1,343 at Talang-Talang Kecil; and 230 at Satang Besar). Till October 2000, 1,723 nests were recorded at Sarawak Turtle Islands (918 nests at Talang-Talang Besar; 665 at Talang-Talang Kecil; and 140 at Satang Besar). Data from the mainland are not available at the moment.

Only 10 nests of olive ridley were recorded in Sarawak in 1998, of which 3 nests laid at Talang-Talang Kecil, 5 at Satang Besar and another 2 laid at Tanjung Datu National Park. The number of nests increased to 24 in 1999, of which 10 nets recorded at Tanjung Datu National Park, 8 at Talang-Talang, 4 at Talang-Talang Besar and another 2 nests were laid at Satang Besar.

In year 2000 (January to October), 8 nests were recorded at Talang-Talang Besar and 3 nests at Satang Besar. No nest recorded at Talang-Talang Kecil this year and data from the mainland are not available.

Only a nest of hawksbills turtle were recorded in 1998, 17 nests in 1999 and 10 nests were recorded at Satang Besar in year 2000 (January to October). No nest has been recorded from other place in Sarawak for the past three years. A numbers of juvenile hawksbill were seen around the coral reef areas at Similajau National Park and Sarawak Turtle Islands.

The first documented leatherback nesting in Sarawak was at Similajau National Park in 1998. All 104 eggs were relocated to the hatchery but non of it hatched. This year a nesting female leatherback turtle was seen at Tanjung Lobang Beach, Miri. All eggs were taken by the passer-by. Another three nests were found at Kampung Siru and Kampung Bedaun of Sematan, but all egg was taken by the villagers. Figure 2, shows the number of nests for each turtle species recorded in Sarawak since 1998 to 2000.

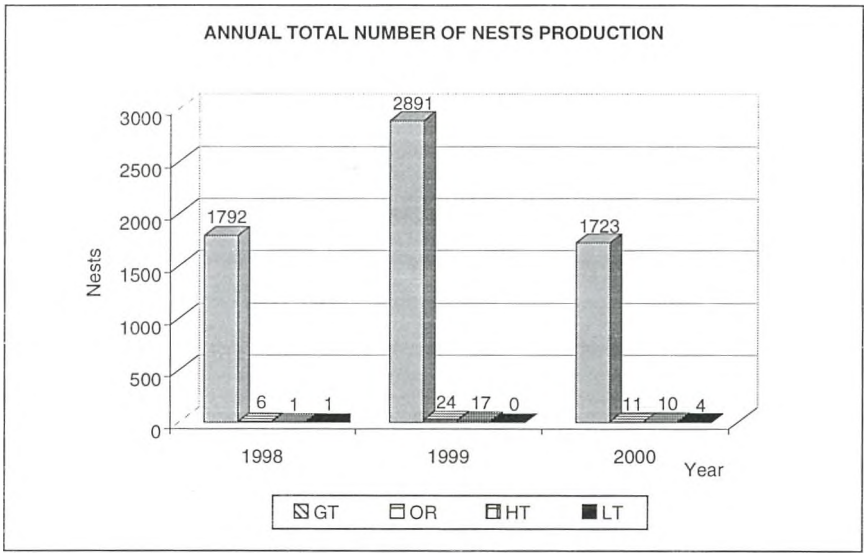


Figure 2: ***Annual number of nests laid in Sarawak: 1998 - 2000***

6. NUMBER OF EGG

169,433 eggs of green turtle were laid at Sarawak in 1998. Out of this number, 168,242 eggs were laid at the Sarawak Turtle Islands (86, 918 eggs laid at Talang-Talang Besar; 75,333 laid at Talang-Talang Kecil; and 5,991 were laid at Satang Besar). Number of green turtle eggs increased to 287,804 in 1999, of which 286,070 eggs were laid at the Turtle Islands (126,841 eggs laid at Talang-Talang Besar; 136,318 at Talang-Talang Kecil; and 22,911 at Satang Besar). In year 2000 (January to October), 15,356 eggs were recorded at the Sarawak Turtle Islands (81,815 eggs at Talang-Talang Besar; 58,637 at Talang-Talang Kecil; and 13,114 at Satang Besar).

1,016 eggs of olive ridley were recorded in Sarawak in 1998, of which 362 eggs laid at Talang-Talang Kecil, 532 at Satang Besar and another 120 laid at Tanjung Datu National Park. The number of eggs increased to 1,943 in 1999, of which 664 eggs were recorded at Tanjung Datu National Park, 842 at Talang-Talang Kecil, 4,249 at Talang-Talang Besar and another 189 eggs were laid at Satang Besar. In year 2000 (January to October) 942 eggs were recorded at Talang-Talang Besar and 252 eggs were laid at Satang Besar. No nest was recorded at Talang-Talang Kecil this year and data from the mainland are not available.

Only 190 eggs of hawksbills turtle were recorded in 1998, 11,949 eggs in 1999 and 1,422 eggs were recorded at Satang Besar till October this year. Figure 3, shows the number of eggs recorded at Sarawak since 1998 to 2000.

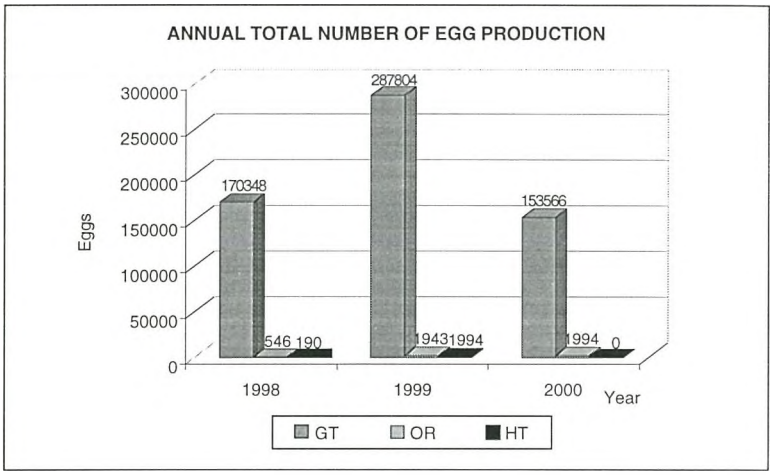


Figure 3: ***Annual Total Number of egg production: 1998 - 2000***

7. CLUTCH SIZE

Average clutch size for green turtle at every Sarawak Turtle Islands is 95 eggs per nests in 1998. In the mainland, clutch size is 96 eggs per nests. In 1999, clutch size at Talang-Talang Kecil is 101 eggs per nests, 98 in Talang-Talang Besar, 100 in Satang Besar and only 83 at the mainland. Average clutch size for green turtle's nest in Sarawak in the year 1999 is 100 eggs per nest. Average clutch size for green turtle for the three Turtle Islands in the year 2000 is 89 eggs per nest (94 at Satang Besar, 88 at Talang-Talang Kecil and 89 in Talang-Talang Besar).

Clutch size for olive ridley turtle in 1998 is 121 eggs per nests at Talang-Talang Kecil, 106 at Satang Besar and 101 at Tanjung Datu National Park, which average is 102. In 1999, clutch size is 105 eggs per nest at Talang-Talang Kecil, 62 at Talang-Talang Besar, 94 at Satang Besar and only 66 at Tanjung Datu National Park. The reason for this is still unknown. But in 2000, clutch size for olive ridley at Talang-Talang Besar is 118 eggs per clutch and 82 for Satang Besar.

Clutch size for hawksbill turtle at Satang Besar is 190 eggs per nest in 1998, 115 in 1999 and 142 in 2000. Clutch size for leatherback turtle is unknown because all eggs were taken by poachers.

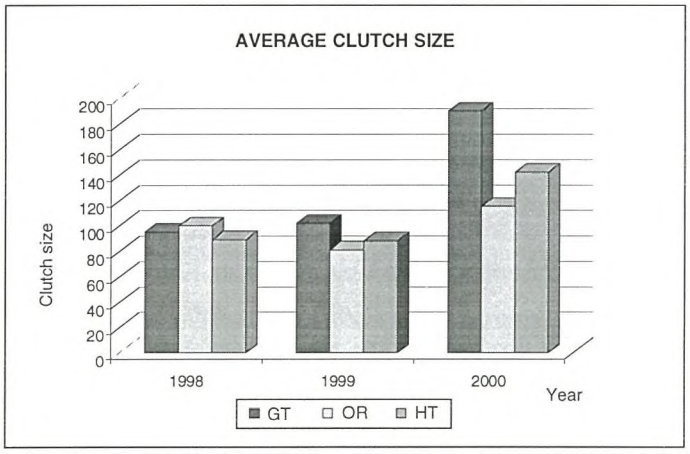


Figure 4: ***Average clutch size for green, olive ridley and hawksbills turtles: 1998 - 2000***

8. EMERGENCE SUCCESS

In 1998, the average emergence success for green turtle in Sarawak is 60.05% (58.64% at Talang-Talang Kecil; 61.01% at Talang-Talang Besar; 54.64% at Satang Besar; and 79.11% at Tanjung Datu National Park). In 1999 average emergence success dropped to 51.98% (55.36% at Talang-Talang Kecil, 47.85% at Talang-Talang Besar; 55.86% at Satang Besar and 39.47% at Tanjung Datu National Park). Drastically dropped of the emergence success of green turtles in Sarawak in 1999 is due to all *in-situ* and hatchery nest were damaged and splashed by big wave in December 1999.

Emergence success for olive ridley and hawksbill turtle in 1999 also showed the same pattern. Emergence success for olive ridley decreased from 54.76% in 1998 to 46.99% in 1999, meanwhile emergence success for hawksbill turtle dropped from 56.84% in 1998 to 34.12% 1998.

For the year 2000 (for eggs that incubated from January to August), average emergence success for green turtle in Sarawak is 60.05%. Average emergence success for olive ridley and hawksbill turtle is 54.05% and 56.84% respectively.

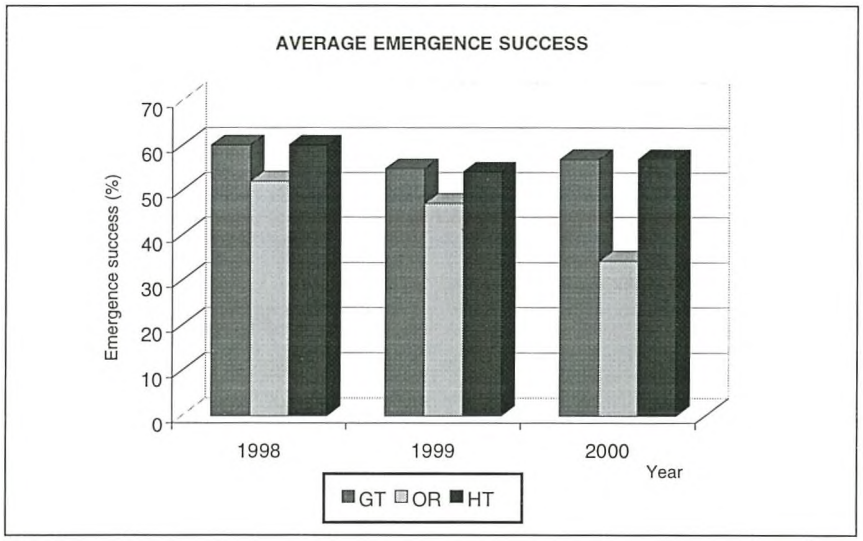


Figure 5: ***Average emergence success for each species: 1998 - 2000***

9. CONCLUSION

In Sarawak, green turtle account for 99% of nesting marine turtle, followed by olive ridley turtle and hawksbill turtle. Leatherback turtle nesting was first record in 1998, none in 1999 and four nesting in year 2000. The emergence success for all species of nesting turtle remain constant for past few years except for emergence success in 1999.

There is a marked decrease in emergence success in 1999 for all species of nesting turtles. This is mainly due to nest and egg extraordinary heavy wave which occur in November to December 2000.

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ANNEX 7

Annex 7

THE FIRST SEAFDEC MEETING ON
REGIONAL SEA TURTLE DATA MANAGEMENT

Kuala Terengganu, Malaysia 20 – 21 November, 2000

COUNTRY REPORT

TAGGING PROGRAMME AND POPULATION STATISTICS ON SEA TURTLES IN INDONESIA

By:

Baringin Hutadjulu

Representing of Directorate General of Nature Protection and Conservation
Ministry of Forestry

Jakarta, November 2000

COUNTRY REPORT
TAGGING PROGRAMME AND POPULATION STATISTICS ON SEA TURTLES IN INDONESIA

1. INTRODUCTION

In the year 1978, three species sea turtles in Indonesia was protected, and in the year 1999 all the Sea Turtles (6 species) have been protected base on regulation of government No. 7, 1999 concerning Preservation of Fauna and Flora. The six species Sea Turtles are *Dermochelys coriacea, Eretmochelys imbricata, Chelonia mydas, Lepidochelys olivacea, Natator depressus, and Caretta caretta.*

As general the problems in management the sea turtles in Indonesia can be classified as follows:

- Using of sea turtles as food and livelihood for local community;
- Using products of sea turtles or their parts to commercial purposes;
- Damaging of sea turtles as consequence on fish catching activities;
- Damaging of coastal as nesting habitat for sea turtles;
- Water pollution.
- Etc.

This phenomena is founded at several region in Indonesia i.e. Bali, East Borneo, Riau, and Irian Jaya. According to all sea turtles including migratory species and they have migratory behavior differences, then conservation efforts must be enhanced.

2. MANAGEMENT OF SEA TURTLES AND ITS IMPLEMENTATION IN INDONESIA

The main objective of national sea turtle conservation strategy:

1. Population status have been protected;
2. Species status in Indonesia with reference to CITES (Appendix I);
3. Marine turtle sanctuaries and protected habitat.

The distribution area of sea turtles in Indonesia can be classified as follows:

No.	Species	Distribution Area
1.	*Caretta caretta*	No found nesting in Indonesia
2.	*Dermochelys coriacea*	Java, Kepulauan Kei, Bengkulu, Manokwari
3.	*Eretmochelys imbricata*	Kalimantan, Riau, Sulawesi, East Java
4.	*Chelonia mydas*	Java, Sumatera, Bali, Kalimantan, Irian Jaya
5.	*Lepidochelys olivacea*	East Java
6.	*Natator depressus*	Irian Jaya

Institution and organization have responsible and care to conserve the sea turtles in Indonesia i.e.:

- Directorate General of Nature Protection and Conservation;
- Minister of State of Environmental;
- Department Marine and Fishery;
- WWF;
- Kehati Foundation;
- And others NGO's.

3. TAGGING PROGRAM

Tagging activity in Indonesia has been executed since year 1984. The tag material made plastic and no standard, until the data can not compiled perfectly. As the fact of tagging activity was reported by Meru Betiri National Park that they ever founded return to landing in Indonesia. Indonesia has been using three tag code, i.e.:

1. Tag number : 001; 002; 050; 090; etc
   Material : Titanium, plastic
   Location : Kepulauan Seribu National Park and Segama island (Lampung province)
2. Tag number : IN 001; IN 0010; IN 2088; etc
   Material : Inconel
   Location : Pesemut Island
3. Tag number (SEAFDEC) : ID 0001 until ID 1000; ID 1001 until 2000
   Material : Inconel

Realization:

1998 to 2000 (May 2000)	:	82 sea turtles (see Annex)
Location	:	Kepulauan Seribu National Park
Organizer	:	PKA-Japan Bekko Association (JBA)
September 1996 to October 2000	:	49 sea turtles (see Annex)
Location	:	Segama Besar, Pesemut, and Memperang
Organizer	:	Alam Lestari Foundation

September 25, 2000 to September 28, 2000: 9 sea turtles

Tag Number	Landing Date	Tag Position	CCL (cm)	CCW (Cm)
ID 0524	September 25, 2000	Right	92.9	83.0
ID 0501	September 25, 2000	Right	103.9	91.7
ID 0523	September 25, 2000	Left	104.5	94.3
ID 0576	September 28, 2000	Left	94.6	88.5
ID 0503	September 28, 2000	Left	104.1	96.0
ID 0521	September 28, 2000	Left	94.9	87.8
ID 0522	September 28, 2000	Left	105.0	94.7
ID 0504	September 28, 2000	Left	101.6	91.3
ID 0505	September 28, 2000	Left	99.5	93.5

Location: Berau (East Kalimantan)
Organizer: KEHATI Foundation

4. MONITORING POPULATION STATISTIC

Monitoring population on sea turtle has been executing on several location in Indonesia. The locations are Alas Purwo NP, Meru Betiri NP, Kepulauan Seribu NP, West Java (Cipatujah and Pangumbahan), and Berau (East Kalimantan). Based on data collecting is reported approximately 138 nesting site on several habitat in Indonesia. As you may be aware on the reality at field to take some obstruction especially fulfill of SEAFDEC form which implementation in field is not easy (until data cannot complete) and restrictedness budget.

Hatching process (as form SEAFDEC) in Indonesia with way semi natural hatching. Using of sea turtle especially their eggs by local community will be directed on sustainable use. The methods can accommodation the problems are divide regulation of eggs number that may used and restocking purposes (50%:50%), rearing process, Captive breeding, and ecotourisme.

Conservation efforts have been executed as solution of the problems by Directorate General of Nature Protection and Conservation as follows:

- Law enforcement;
- Conservation extension;
- Pacification effort;
- Monitoring on research station at several National Park (Alas Purwo National Park, Meru Betiri National Park, Kepulauan Seribu National Park) and work area by responsible our regional office (BKSDA), in West Java Province, Irian Jaya Province, East Borneo Province, and others places.
- Population inventory.
- Tagging Programme.
- Ecotourism.

Sea Turtle Tagging Information

Year : **1998 - 2000**
Country : **Indonesia**
Area/Location : **Kepulauan Seribu National Park**
Tag starting number :
Species : **Hawksbill**

Tag number	Landing date	No. of egg	Hatching date	No. of hatch	% hatching	SCL (cm)	SCW (cm)
2213 / 2214	25/10/98	-	-	-	-	42.3	32.3
2215 / 2216	25/10/98	-	-	-	-	34.5	29.1
2217 / 2218	25/10/98	-	-	-	-	39.0	32.5
2219 / 2220	25/10/98	-	-	-	-	37.6	31.1
2251 / 2252	07/12/98	-	-	-	-	40.0	32.5
2223 / 2293	20/02/98	-	-	-	-	36.0	31.5
2221 / 2222	01/03/99	-	-	-	-	37.5	31.5
2261 / 2225	18/03/99	-	-	-	-	40.5	33.4
2129 / 2124	11/04/99	-	-	-	-	41.5	33.4
2954 / 2978	11/04/99	-	-	-	-	19.0	14.7
2235 / 2236	11/04/99	-	-	-	-	21.6	16.5
2237 / 2238	11/04/99	-	-	-	-	25.3	20.1
2240 / 2241	11/04/99	-	-	-	-	26.5	20.1
2244 / 2245	11/04/99	-	-	-	-	28.8	21.7
2233 / 2234	11/04/99	-	-	-	-	24.4	17.7
2246 / 2247	11/04/99	-	-	-	-	33.9	24.7
2248 / 2249	11/04/99	-	-	-	-	20.3	15.6
2968 /	11/04/99	-	-	-	-	15.0	11.6
2971 /	11/04/99	-	-	-	-	13.2	10.1
2979 /	11/04/99	-	-	-	-	11.8	9.0
2962 /	11/04/99	-	-	-	-	12.6	10.7
2998 /	11/04/99	-	-	-	-	12.9	10.0
2991 /	11/04/99	-	-	-	-	12.3	9.6
2193 / 2194	13/04/99	-	-	-	-	35.8	26.9
2195 / 2196	13/04/99	-	-	-	-	41.3	32.2
2197 / 2198	15/04/99	-	-	-	-	40.1	35.7
2144 / 2243	15/05/99	-	-	-	-	63.3	48.7
2143 / 2142	15/05/99	-	-	-	-	48.0	38.9
2137 / 2136	15/05/99	-	-	-	-	55.9	46.5
2259 / 2269	02/08/99	-	-	-	-	45.2	36.8
2101 / 2116	14/11/99	-	-	-	-	30.5	24.5
2239 / 2242	14/11/99	-	-	-	-	67.9	45.4
2292 / 2079	14/11/99	-	-	-	-	54.9	43.5

Sea Turtle Tagging Information

Year : **05 Sep 96 – 8 Oct 2000**
Country : **Indonesia (Yayasan Alam Lestari)**
Area/Location : **Segama Barat, Pesemut, Momperang**
Tag starting number :
Species : **Hawksbill**

Tag number	Landing date	No. of egg	Hatching date	No. of hatch	% hatching	CCL (cm) SCL	CCW (cm) SCW
004/005	05-Sep-96	-	-	-	-	75.3	56.0
077/078	08-Dec-97	-	-	-	-	79.5	58.0
079/080	08-Dec-97	-	-	-	-	78.0	64.5
081/083	16-Dec-97	-	-	-	-	81.4	59.4
082/085	20-Dec-97	-	-	-	-	77.0	56.0
084/086	20-Dec-97	-	-	-	-	80.0	57.0
088/090	23-Dec-97	-	-	-	-	81.0	61.5
IN 012/IN 011	29-Mar-98	-	-	-	-	82.3	61.5
IN 2180/IN 2181	31-Jan-99	-	-	-	-	74.7	55.1
IN 2275/IN 2274	03-Feb-99	-	-	-	-	75.6	55.8
IN 2253/IN 2254	04-Feb-99	-	-	-	-	76.7	58.2
IN 2262/IN 2263	06-Feb-99	-	-	-	-	79.9	57.2
IN 2258/IN 2257	07-Feb-99	-	-	-	-	79.1	58.8
IN 2089/IN 2088	08-Feb-99	-	-	-	-	73.3	57.2
IN 2055/IN 2056	08-Feb-99	-	-	-	-	84.2	61.2
IN 2199/IN 2289	23-May-99	-	-	-	-	75.6	55.4
ID 0001/ID 0002	24-May-99	-	-	-	-	77.7	54.2
ID 0024/ID 0023	06-Aug-99	-	-	-	-	80.3	59.9
ID 0008/ID 0007	09-Aug-99	-	-	-	-	78.3	58.3
ID 0012/ID 0011	13 Aug-99	-	-	-	-	76.7	57.1
ID 0015/ID 0016	07-Feb-00	-	-	-	-	81.7	54.1
ID 0014/ID 0013	09-Feb-00	-	-	-	-	78.6	56.6
ID 0032/ID 0031	13-Feb-00	-	-	-	-	77.0	56.8
ID 0085/ID 0084	29-Feb-00	-	-	-	-	82.8	63.4
ID 0036/ID 0035	03-Mar-00	-	-	-	-	82.5	58.8
ID 0038/ID 0037	07-Mar-00	-	-	-	-	82.4	56.4
ID 0040/ID 0039	05-Apr-00	-	-	-	-	84.3	59.2
ID 0043/ID 0044	06-Apr-00	-	-	-	-	78.2	69.0
ID 0041/ID 0042	08-Apr-00	-	-	-	-	80.2	58.9
ID 0046/ID 0045	30-Apr-00	-	-	-	-	84.6	56.7
ID 0056/ID 0057	05-Oct-00	-	-	-	-	78.7	56.5

Sea Turtle Tagging Information

Year : **05 Sep 96 – 8 Oct 2000**
Country : **Indonesia (Yayasan Alam Lestari)**
Area/Location : **Segama Barat, Pesemut, Momperang**
Tag starting number :
Species : **Green**

Tag number	Landing date	No. of egg	Hatching date	No. of hatch	% hatching	CCL (cm) SCL	CCW (cm) SCW
ID 0003/ID 0004	24-May-00	-	-	-	-	91.4	65.7
ID 0005/ID 0006	24-May-00	-	-	-	-	95.2	69.3
IN 2129/IN 2130	21-May-00	-	-	-	-	87.4	64.1
IN 2131/IN 2133	22-May-00	-	-	-	-	92.5	70.7
IN 2164/IN 2165	22-May-00	-	-	-	-	95.0	71.8
IN 2138/IN 2139	22-May-00	-	-	-	-	95.4	76.0
IN 2140/IN 2141	22-May-00	-	-	-	-	89.3	68.9
IN 2127/IN 2128	23-May-00	-	-	-	-	93.4	69.7
ID 0009/ID 0010	03-Aug-00	-	-	-	-	-	-
IN 2120/IN 2119	06-Aug-00	-	-	-	-	90.9	60.8
IN 2126/IN 2125	06-Aug-00	-	-	-	-	95.9	74.5
ID 0022/ID 0021	13-Aug-00	-	-	-	-	90.4	70.9
ID 0027/ID 0026	12-Feb-00	-	-	-	-	87.4	64.1
ID 0028/ID 0029	12-Feb-00	-	-	-	-	89.0	65.1
ID 0047/ID 0048	21-Jun-00	-	-	-	-	94.5	73.9
ID 0053/ID 0054	02-Oct-00	-	-	-	-	97.3	74.3
ID 0058/ID 0059	07-Oct-00	-	-	-	-	90.5	70.4
ID 0060/ID 0061	08-Oct-00	-	-	-	-	84.4	64.1

LEGEND:

SCL : Straight Carapace Length
SCW : Straight Carapace Width

ANNEX 8

Annex 8

THE FIRST SEAFDEC MEETING ON
REGIONAL SEA TURTLE DATA MANAGEMENT

Kuala Terengganu, Malaysia 20 – 21 November, 2000

COUNTRY REPORT

MYANMAR

By:

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MYANMAR COUNTRY REPORT

INTRODUCTION

The Union of Myanmar is the largest country in mainland Southeast Asia, comprising a land area of 676,577 sq: kilometers with a population of approximately 50 million in the year 2000. She has a long coastline that stretches approximately from 21'N to 10'N to over a distance of 1,800 km. With its large member of estuaries and islands, a total coastal line will be close to 3,000 km. In order to represent main ecological divisions, the coastline of Myanmar has been divided into (3) sub-areas; (a) The Rakhine (Arakan) coast. Bordering with Bangladesh in the north, a narrow shelf areas, a few islets down to 16° 00'N, (b) The Ayeyarwady (Irrawaddy) coastal areas: shelf area between 16'N and 13'N 30' to Dowei (Tavoy) point: (c) The Tanintharyi (Tenasserim) coast: from 13' 30'N to about 10' 10'N (Victoria point).

The water of Myanmar coastal areas harbors many of species of marine turtles. There are five species of marine turtles are known to nest in Myanmar at well - known island and main land beaches locally as "Leik Thaung" (turtle banks). These are olive ridley (Lepoidchely olivacea) (In Myanmar - "Leik Lyaung"), loggerhead (*Caretta caretta*) (In Myanmar - "Leik Khway"), green (*Chelonia mydas*) (In Myanmar - Pyin tha Leik), hawksbill (*Eretmochelys imbricata*) (In Myanmar - "Leik Kyet Tu Yway") and leatherback (*Dermochelys coriacea*), (In Myanmar - "Leik Zaung Lyar"). However, the latter two species are considered extremely rare.

According to the local villagers, the number of marine turtles that nest on area beaches is rapidly declining. For example, in 1985 an egg collector could expect more than hundred nests per night during the nesting season of Kadonekalay kyun (15° 49'N 95° 13'E). Now due to few turtles, collectors may find only one to six nests per night. Many fear that if present trends continue, the turtle will stop returning to the beaches altogether.

MARINE TURTLE CONSERVATION & MANAGEMENT

There are five species of marine turtles found on the Myanmar coast. Today must populations have collapsed as a result of over - exploitations and habitat degradation and destruction. At present there is a need to take strong steps for conservation is research aimed at understanding biology of the turtle so that intelligent management decision can be made. We believe that the future of marine turtle in Myanmar must not be depended upon people moving nests or raising turtles in captivity. Our goal is self-sustaining populations that do not rely on human intervention.

Our objectives for marine turtle conservation and managements are as follows:

1. Pressure and restore developmental, feeding and nesting habitats,
2. Make nesting beaches acceptable to turtles by eliminating the impact of artificial lighting through technology, ordinances (law) and publication,

3. Beach cleaning program and control predators,
4. Minimized solid waste and pollution of the marine environment, and
5. Increase public awareness and participation in marine turtle conservation through public education.

LAWS AND REGULATIONS

There are five species of marine turtles since 1905. In the Fisheries Act (Burma Act 111-1905) protection for turtle hatching areas and turtle was included and those who trespassed on those areas without official consent were effectively penalized. In 1924, the Government of Burma, Agriculture (Fishery Department) Notification No. 1 made an official annoucement not to trespass within three-mile radius from the turtle hatching area. In 1991, the Myanmar Covernment redraw a new "FRESH WATER FISHERIES LAW" due to the great changing conditions with the old law "Fisheries Act (Burma Act 111-1905)," which was drawn in last over nightly years ago. In 1993, the Department of Fisheries declared the "Notification No.1/93" for Sea turtle conservation.

TURTLE'S SAND BARS IN MYANMAR SEAS

Sea turtles live to be over 80-years although they live most of their lifetime in the seas, they come to the safe haven of sand bars to lay their eggs. In Myanmar water waters there are many island and lay their eggs.

NAME OF TURTLE'S SAND BARS IN MYANMAR

In Ayeyarwady division,

1. Thamihla Kyun
2. Kaing Thaung
3. Yebyu Thaung
4. Pyinsalu
5. Hteik kwet galay
6. Ga yet gyi

In Tanintharyi division,

7. Pulaw
8. Shin maw
9. Pa Nyit

10. Launglon Boke
11. Maunmagan Boke South Island
12. Maunmagan Boke North Island
13. Phaung taw
14. Pyin gyi
15. Bawar
16. Byaik
17. Myauk Moscos (North Moscos)

In Mon State

18. Bi Gi
19. Hnet pyaw daw
20. Thatayma wei island

In Rakhine State

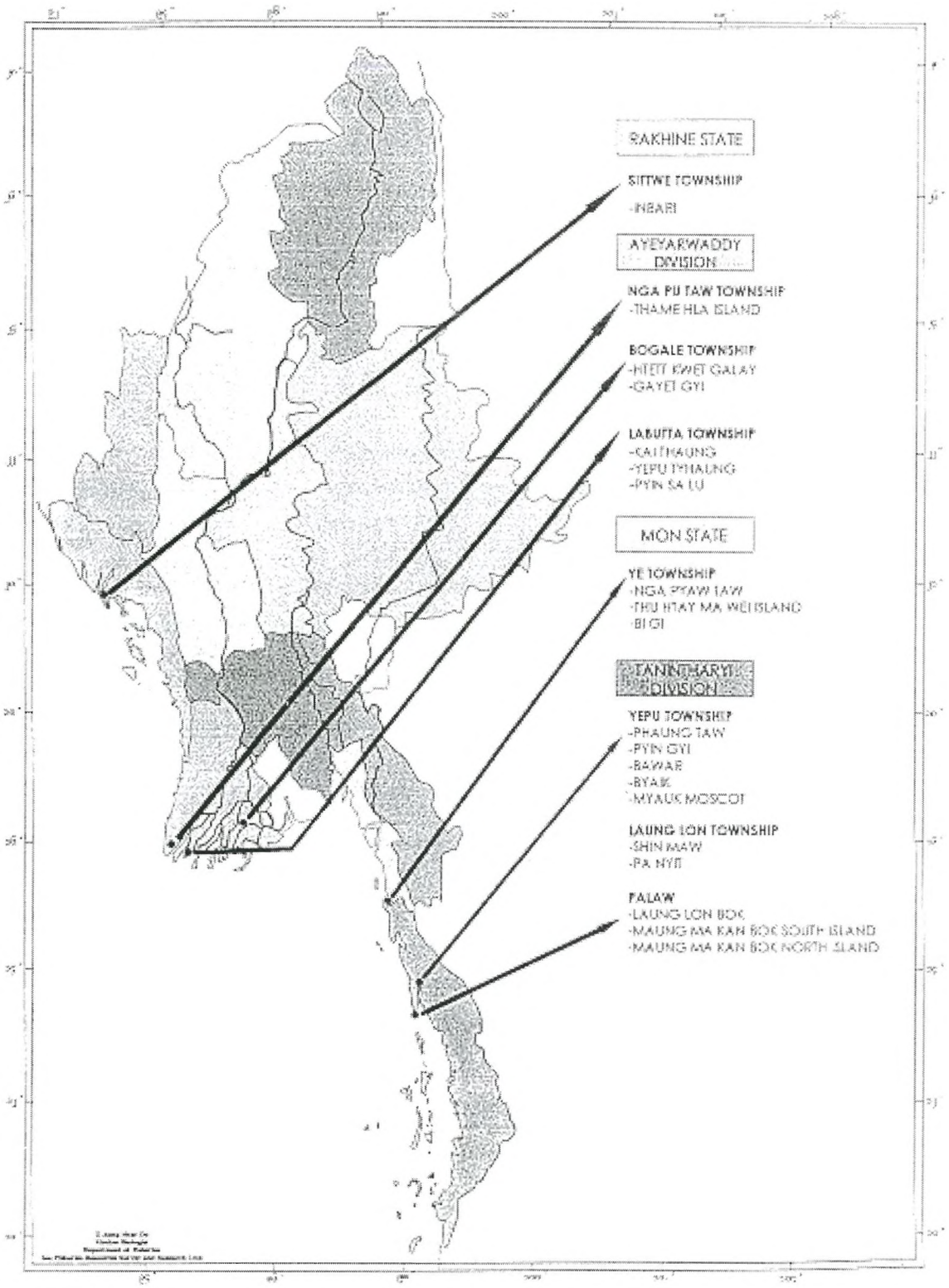
21. Inbari

Among the above-mentioned places, Thamihla Kyun Turtle island of Ngapudaw Township, Ayeyarwady division is the year round hatching ground for sea turtles. Turtles lay eggs also in Ga yet gyi island, Hteik kwet galays Island of Biology Township from August to April every year.

Hatching area of Thamihla island is one mile in length and half mile in breath. Ga yet gyi island is one and half mile in breath, and Hteik kwet galay island is two miles in length and three-quarters mile in breath.

Ministry of livestock and Fisheries, Department of Fisheries was under taking sea turtle nursery and research in Thamihla island in 1985-86 and Ga yet gyi and Hteik kwet galay island in 1997-98. Department of Fisheries has been maintaining other turtle banks and will be under taking sea turtle conservation and research in the future.

TURTLE DISTRIBUTION AND TURTLE BANK AREA IN MYANMAR COASTAL LINE



DECLINE OF MARINE TURTLE NESTING POPULATIONS IN MYANMAR

The beaches of Thamihla island (Daimond island 15° 51'N 94° 17'E), an island at the mouth of the Pathein River, host the nesting green turtle (*Chelonia mydas*) and loggerhead turtle (*Caretta caretta*). But Kaing Thaung Kyun (15° 44'N 95° 04'E) and Thaung Kadone Kyun (15° 43'N 95° 18'E) at the mouths of the Ayeyarwady and Bogalay rivers, respectively host the nesting olive *ridley* (*Lepidochelys olivacea*) and loggerhead (*Caretta caretta*). Maxwell (1911) conducted an extensive investigation of the "turtle banks" of coastal Myanmar, as part of a review for the Burmese Fisheries Act of 1902. At that time 1.5 million olive ridley turtle eggs and 1.6 million green turtle eggs were harvested annually. Base on this egg harvest and several assumptions regarding female fecundity, Maxwell estimated a nesting population of 5,000 green turtles and 3,750 olive *ridley* turtles.

Most of the small, recently formed islands off the mouth of the Bogulay River are used by sea turtles for nesting. According to the data from the Myanmar Fisheries Department, the total number of nests in the region is currently about 300 annually, indicating adrastic reduction in regional turtle populations during this century. Most nesting is by olive ridley turtle (70%), followed by loggerhead turtles (20%) and green turtles (10%).

At the time of Maxwell's report, the only islands in existence were Kadone Kalay Kyun (15° 49'N 95° 13'E), a recently formed sandbar, and Kaing Thaung Kyun. Human settlement began around 1980, and today both island are densely populated. A series of other islands have formed at the mouth of the Bogalay River, but Kadone Kalay Kyun Approximately 180 turtles nests are found each year along the eastern shore. About 80 turtles nests are found annually on Gayet Gyi Kyun (15° 41'N 95° 16'E), smaller island (ca. 1km^2) located east of Kadone Kalay, formed 30 Years ago and currently inhabited by 200-300 families. An additional 10 nests per year occur on Nga Mahn Taung, a small island some 30 meters in diameter, which began forming east of Gayet gyi in the late 1980s. Less than 5 nests a year are deposited on Ma Sein Yone and Nget U Tin, which are sand islands formed during the last five years to the west of Kadone Kalay Kyun.

Today only 1-2 turtles a year nest on Kaing Thaung Kyun, and no nesting occurs at Thaung Kadone Kyun. The largest concentration of nesting currently occurs on Thamihla Kyun (Daimon Island), a protected beach, where according to the Fisheries eggs are laid annually. However, there appear to be some confusion regarding the discrimination between loggerhead and olive turtle and some of the reported loggerhead turtle eggs may, in fact be those of the olive ridely turtle.

Prior to 1986, beaches were leased by the Fisheries Department to the highest bidder, and virtually all eggs were collected. From 1986 to 1996 the egg collection program was run through local fishing communities, who were required to leave one third of the eggs to hatch. After 1997, the Fisheries Department fully protected all offshore turtle nesting beaches and established a conservation program. The program involves nest-monitoring, establishment of hatcheries to incubate transplanted nests that are threatened by flooding, and even relocation of villagers to reduce the impact on nesting turtles.

SEA TURTLE TAGGING PROGRAMMES

Sea turtles, which are highly migratory and most probably share the waters of the Southeast Asian region are recognized as one of the most seriously endangered species in the world. These reptiles can face extinction very soon unless serious and proper conservation effort can be quickly undertaken. Comprehensive biological information such as migration, growth, mortality, reproduction and baseline information on population statistics of sea turtles is crucial for the proper management in future. In order to get biological information of sea turtles, sea turtle tagging exercises were practiced in many countries. Although Myanmar has some of the major sea turtle nesting locations, tagging exercise is not yet introduced in the country because of some problems.

The recommendations from the First Workshop on Marine Turtle Research and Conservation, held in January 1996, established the needs for the compilation of turtle statistics for the region and initiated as well as coordinated the turtle tagging programmes for the region. Mr. Cho Hla Aung, a participant from Myanmar was attended that Workshop and learned successfully how to use trutle tagging equipments. But unfortunately, he was received no tagging equipments, which are very expensive and donated by the Japanese Trust Fund, like other participants. Because, Myanmar is not an SEAFDEC member country at that time. However, he tried to use local plastic tag for turtle tagging exercise, when he arrived back to his station, but it was not succeed. For this reasons we can not present any results from sea turtle tagging exercises in this Workshop but we are sure that if we can have tagging equipments like other member countries, we can present many information about Myanmar Sea Turtle in next Workshop.

STATUS OF NESTING POPULATIONS OF SEA TURTLES IN MYANMAR AND THEIR CONSERVATION

In support of informed and wise management of sea turtles inhabiting its national parks, Myanmar Department of Fisheries recently undertook an evaluation of the status of the country's sea turtle populations and the various conservation programs.

There are five species of marine turtles are known to nest in Myanmar at well known island and main land beaches locally as "Leik Thung" (turtle banks). These are olive ridley (*Lepoidochely olivacea*) (In Myanmar - "Leik Lyaung"), loggerhead (*Caretta caretta*) (In Myanmar - "Leik Khway"), green (*Chelonia mydas*) (In Myanmar - Pyin Tha Leik), hawksbill (*Eretmochelys imbricata*) (In Myanmar - "Leik kyet Tu Yway") and leatherback (*Dermochelys coriacea*), (In Myanmar - "Leik Zaung Lyar"). However, the latter two species are considered extremely rare.

In general, all population are seriously reduced from previous levels. The Department of Fisheries has started to initiate sea turtle conservation and research program in Thamihla Kyun (Daimond Island) since 1986. From that time to 1996, green and loggerhead turtle came to nests on the island regularly every year. But after 1996, the nesting number of loggerhead is decreasing and green is increasing. In 1986, the total number of sea turtles on that island was 520 and it was decreasing to 420 in the year 1998. The total egg production in the year of 1999 on that island is 20,522 eggs of green turtle and 1,579 eggs of loggerhead. By 1989, total egg production of both species was 92,000. Conservation programs have

increase in quality and visibility, but the annual number of clutches continues to decline in all but one well-protected area, Thamihla Kyun (Daimond Island). It is clear that the dominant threat to sea turtle survival is human activity, including egg collection and turtle hunting. Indirect take in fishing gear (e.g., trawlers, drift nets, puse seines) also plays a significant role. In addition to consumption of meat and eggs, shall are fashioned into ornamental objects.

The next most important site nationally for olive ridley and loggerhead may be Gayet Gyi Kyun and Kadone Kalay Kyun in Bogalay township. Unfortunately, no complete data for the whole year of the park was available. In 1999/2000 fiscal year, only biological data of sea turtle were recorded for (5) month. During these 5-month, 142 nests of olive ridley turtle were recorded. The egg production of those nests were altogether 15,690 eggs and hatchling from those eggs were 11,699. The species composition of the sea turtle in that areas is 80% of olive ridley and 20% of loggerhead.

Conservation efforts: strength and weaknesses: Myanmar lacks complete distributional data for sea turtles. A few site managers keep good records, but the vast majorities do not. In particular, information from Thamihla Kyun (Daimond Island) is essential to understanding the national situation. A few dedicated person and workers lack scientific training and an understanding of basic conservation biology, which would enable them to collect data and carry out effective resource management. It is essential to the long-term survival of sea turtles in Myanmar that resource managers understand what the threats are and how to effectively counter them. Simply raising more turtles and introducing them into habitat ill suited to support them is waste. Most areas are heavily populated and conservation initiatives must take this into account.

The importance of continuing conservation: Because of Thamihla Kyun (Daimond Island) has been protected by the Department of Fisheries since 1970, there is likely to have been considerably more recruitment. (i.e., yound turtles emerging safely from their nests and surviving to sexual maturity) to that population in recent years than to other population in Myanmar that have been heavily exploited. The fact that the nesting beaches have been protected for more than three decades is the logical reason for the relatively higher number of nesting females seen there today. By the same token, the results of conservation efforts today will be visible in decade to come. For this reason, this is essential to maximize the number of protected nests everywhere and the hatch react of each nest.

AN UPDATE ON THE MORTALITY OF THE SEA TURTLES IN AYEYARWADY DELTA AREA

Shrimp trawling has been identified as one of the greatest causes of sea turtle mortality throughout the world. Despite the wide acceptance of this fact, the Government of Myanmar and the Department of Fisheries appear reluctant to accept this large scale mortality is a result of incidental capture of turtles in fishing nets. They speculate that disease, migration fatigue and marine pollution are the causes of these deths. To counteract these arguments quantitative information on observed captures of sea turtles and the rate of mortality of these individuals during offshore fishing operations is absolutely essential. In the interim, strict enforcement of Myanmar Marine Fisheries Law (1990), which prohibit any kind of mechanized fishing within five mile of the shore along the coast, is needed. A blanket ban on near shore

mechanized fishing should significantly reduce the turtle mortality. A second step towards minimizing this mortality would be the mandatory use of Turtle Excluder Divices (TEDs) in trawl nets. Currently some of the trawlers operating off the Myanmar coast use TEDs in their nets.

However, the used of TEDs alone will not eliminate turtle mortality resulting from fisheries. Additional factors which must be considered are that in areas of high fishing intensity, turtles that are captured and released several times may die and turtles are also caught and drowned in gill nets. Therefore strict enforcement of the exiting law, prohibiting near shore mechanized fishing seems to be the best short term solution to reduce turtle mortality.

RECOMMENDATION

Based on our finding, we would like to make the followint recommendation. First, Myanmar clearly hosts a sustantial proposition of olive ridley nesting that take place in the Ayeyar wady. Delta area each year, and the country is duty band to protect this heritage. Since most of the waste is completely un-spoiled by human developed, and the tourism industry is nascent, there is potential for Myanmar becaming a modlel for conservation, management and planing with regards to its diverse custal zone. The effective protection of marine turtle nesting beaches should be taken into account in all future planning for the coastal areas.

Secondly, the fishing community should be educated in marine turtle biology and conservation, including gear technology and other measure to reduce incidential catch. Advantage should be take of the relatively enveloped nature of the national fishing industry, and a serious policy of informing fichermen and involving them in couservation proctices should be establish as a priority. With this effort, the well known consequenres of marine turtles and fishing interaction will come to pass. With assistance from different sources, this policy should operate at all levels in the fishing.

CONCLUSION

Myanmar law has protected all sea turtles since 1905. In the Fisheries Act (Burma Act 111-1905) protection for turtle hatching areas and turtle was included and those who trespassed on those areas without official consent were effectively penalized. In 1924, the Government of Burma, Agriculture (Fishery Department) Notification No. 1 made an official announcement not to trespass within three-mile radius from the turtle hatching area.

Myanmar has also been a member of CITES (Convention on International Trade in Endangered Species), which prohibits the import or export of sea turtles and their products. Therefore, the Ministry of Livestock and Fisheries, with the aim to protect more effectively against the extinction of sea turtles, have declared coastal regions along the Myanmar coastline, Myanmar waters and islands as sea turtle sanctuaries. Although the Department of Fisheries is putting their best efforts in the conservation of the sea turtles, there are a lot of problems to implement the conservation project because of lack of experts in this subject and equipment, necessary for the implementation of the project. For this reason, we

would like to request assistance from SEAFDEC (MFRDMD) for technical know how and necessary equipments, to conduct sea turtle conservation program successfully in our waters.

Although Myanmar have many islands and sand bars for sea turtle nesting in her coastal areas, the Department of Fisheries can only conducting sea turtles conservation program in Ayeyarwady delta areas at present. As sea turtles are recognized as one of the most seriously endangered species in the world, the Department of Fisheries is also planning to set up a new unit for sea turtle conservation and management in its organization. For this reason, nearly all of the turtle nesting areas along the Myanmar coastal will be controlled by the Department of Fisheries in future for conservation and management.

FIVE YEARS PROGRAM PROPOSAL

TITLE: TURTLE CONSERVATION AND RESEARCH PROJECT (MYANMAR)

Principal investigator

Department of Fisheries
Research and Development Division

Starting date

Though the hatching and releasing of marine turtle has been conducted three decades ago, intensive program was started only in 1998 the task is assigned to U Cho Hla Aung who has completed a training course on sea turtle conservation and research provided by ASEAN in Malaysia.

New equipments and methodology are to be provided to related activities.

Background/Rational

In the past the Ministry of Forest, which was competent authority at that time, gave permit to bidder for collection of turtle eggs annually. Year by year the nesting number of sea turtles decreased and some species were nearly to be extinct. In 1963 the Department of Fisheries has initiated a project to breed and release sea turtles on Thamihla Island in Ayeyarwady Delta.

Objectives

To keep sustainable development of national aquatic resources.

Description

- To prevent from human habitation in turtle areas.
- To protect sea turtles from fishing.
- To maintain the turtle banks.
- To preserve routes to hatching areas and hatchling places.
- To abolish pouching of turtle eggs.

Schedule of Activities

- To identify turtles bank.
- Turtle banks are to be reserved through law enforcement.
- Hatcheries stations are to be established.
- Conservation and research activities are to be carried out.
- Data and information are to be collected and analysed.

Scheduled of Activities

Schedule	1999	2000	2001	2002	2003
1	←	—	→		
2		←	—	→	
3	←	—	→		
4			←	—	→
5			←	—	→

Budgets

1. Salary for staffs & workes
2. Building & station
3. Travel allowance
4. Equipment & material
5. Miscellaneous

Funds will be required for the conservation, research and training of sea turtles. While the departmental funding of reasonable proportions can be expected, i.e. salary, construction and travel allowance, additional funding and other suitable assistance from ASEAN member countries, FAO and UNDP etc, will contribute to the rapid expansion and development of sea turtle conservation project.

REGIONAL MARINE TURTLE
STATISTICS & POPULATION

Year	**: 1999**
Country	**: MYANMAR**

Turtle Nesting Site
(please marked for existing species in each location)

Statistics 01

Location/Site/Rockery (name)	Latitude	Longitude	Leatherback	Green	Hawksbill	Olive ridley	Loggerhead	Kemp's Ridley	Flatback	Black
Thamihla Kyun	15° 51'N	94° 17'E		*			*			
Kaing Thaung Kyun	15° 44'N	95° 04'E				*	*			
Thaung Kadone Kyun	15° 43'N	95° 18'E				*	*			
Kadone Kalay Kyun	15° 49'N	95° 13'E				*	*			
Gayet Gyi Kyun	15° 41'N	95° 16'E				*	*			

REGIONAL MARINE TURTLE
STATISTICS & POPULATION

Year : 1999
Country : MYANMAR

Annual Nesting

Statistics 02A

Location/Site/Rockery (name)	Leatherback	Green	Hawksbill	Olive Ridley	Loggerhead	Kemp's ridley	Flatback	Black
Thamihla Kyun (Daimond Island)		103			32			

REGIONAL MARINE TURTLE
STATISTICS & POPULATION

Year : 1999
Country : MYANMAR

Statistics 03A

Monthly Nesting of Sea Turtle

Location/Site/ Rookery	Species	Jan	Feb	March	Apr.	May	June	July	Aug	Sept.	Oct.	Nov.	Dec.	Total
Thamihla Kyun (Diamond Island)	Leatherback													
	Green		30	34							39			103
	Hawksbill													
	Olive Ridley													
	Loggerhead		14								18			32
	Flatback													
	Kemp's ridley													
	Black													
	Total		44	34							57			135

REGIONAL MARINE TURTLE
STATISTICS & POPULATION

Year :1999
Country: MYANMAR
Location: THAMIHLA KYUN

Total of annual egg production, egg incubation, hatchlings and emergence success

Statistics 05

Species	Egg Production	Egg Incubation	Hatchling	Emergence Success
Leatherback				
Green	10,570			
Hawksbill				
Olive Ridley				
Loggerhead	3,571			
Flatback				
Kemp's ridley				
Black				

REGIONAL MARINE TURTLE
STATISTICS & POPULATION

Year :1999
Country: MYANMAR
Location: THAMIHLA KYUN

Statistics 08

Monthly Statistics on Egg Production at Every Nesting Site

Species	Jan	Feb	March	Apr.	May	June	July	Aug	Sept.	Oct.	Nov.	Dec.	Total
Leatherback													
Green		3,008	3,567							3,995			10,570
Hawksbill													
Olive ridley													
Loggerhead		1,579								1,992			3,571
Flatback													
Kemp's ridley													
Black													
Total		4,587	3,567							5,987			14,141

REGIONAL MARINE TURTLE
STATISTICS & POPULATION

Year : 2000
Country : MYANMAR

Turtle Nesting Site
(please marked for existing species in each location)

Statistics 01

Location/Site/Rockery (name)	Latitude	Longitude	Leatherback	Green	Hawksbill	Olive Ridley	Loggerhead	Kemp's ridley	Flatback	Black
Thamihla Kyun	15° 51'N	94° 17'E		*			*			
Kaing Thaung Kyun	15° 44'N	95° 04'E				*	*			
Thaung Kadone Kyun	15° 43'N	95° 18'E				*	*			
Kadone Kalay Kyun	15° 49'N	95° 13'E				*	*			
Gayet Gyi Kyun	15° 41'N	95° 16'E				*	*			

REGIONAL MARINE TURTLE
STATISTICS & POPULATION

Year : 2000
Country : MYANMAR

Annual Nesting

Statistics 02A

Location/Site/Rockery (name)	Leatherback	Green	Hawksbill	Olive Ridley	Loggerhead	Kemp's ridley	Flatback	Black
Thamihla Kyun (Diamond Island)		139						

REGIONAL MARINE TURTLE
STATISTICS & POPULATION

Year : 2000
Country : MYANMAR

Statistics
03A

Monthly Nesting of Sea Turtle

Location/Site/ Rookery	Species	Jan	Feb	March	Apr.	May	June	July	Aug	Sept.	Oct.	Nov.	Dec.	Total
	Leatherback													
	Green				34	35	29	21	20					139
	Hawksbill													
	Olive Ridley													
	Loggerhead													
	Flatback													
	Kemp's ridley													
	Black													
	Total				34	35	29	21	20					139

REGIONAL MARINE TURTLE
STATISTICS & POPULATION

Year :2000
Country: MYANMAR
Location: THAMIHLA KYUN

Total of annual egg production, egg incubation, hatchlings and emergence success

Statistics 05

Species	Egg Production	Egg Incubation	Hatchling	Emergence Success
Leatherback				
Green	13,947			
Hawksbill				
Olive Ridley				
Loggerhead				
Flatback				
Kemp's ridley				
Black				

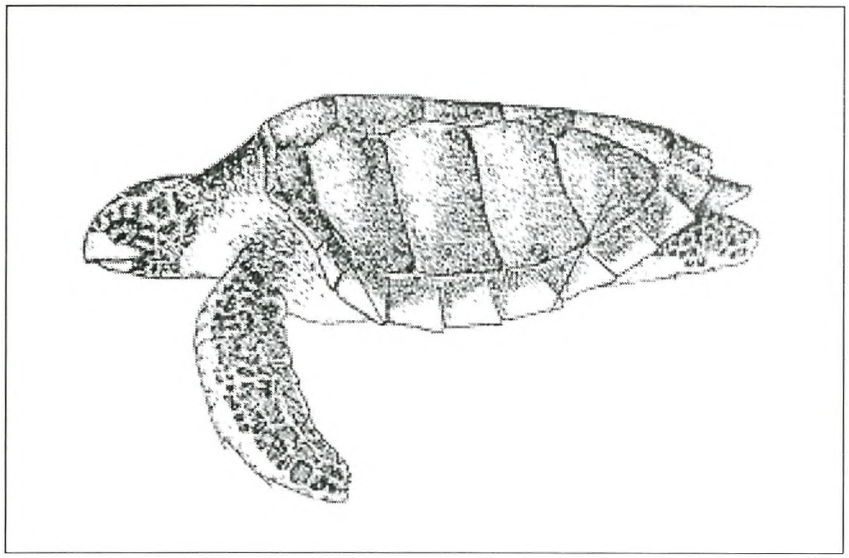
REGIONAL MARINE TURTLE
STATISTICS & POPULATION

Year :2000
Country:MYANMAR
Location:THAMIHLA KYUN

Statistics
08

Monthly Statistics on Egg Production at Every Nesting Site

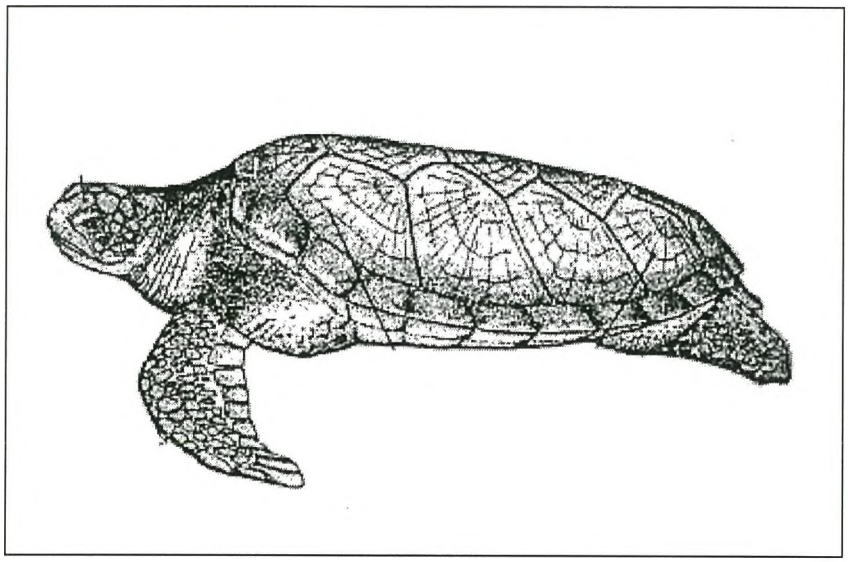
Species	Jan	Feb	March	Apr.	May	June	July	Aug	Sept.	Oct.	Nov.	Dec.	Total
Leatherback													
Green				3,373	3,455	2,914	2,214	1,991					13,947
Hawksbill													
Olive Ridley													
Loggerhead													
Flatback													
Kemp's ridley													
Black													
Total				**3,373**	**3,455**	**2,914**	**2,214**	**1,991**					**13,947**



Caretta caretta (Linneaus, 1758)
Loggerhead turtle (English name)
Leik Khway (Myanmar name)

Nesting areas - Thamihla Kyun *(Diamond Island)*, Kadone Kalay Kyun, Gayet Gyi Kyun, Taung Kadone Kyun,

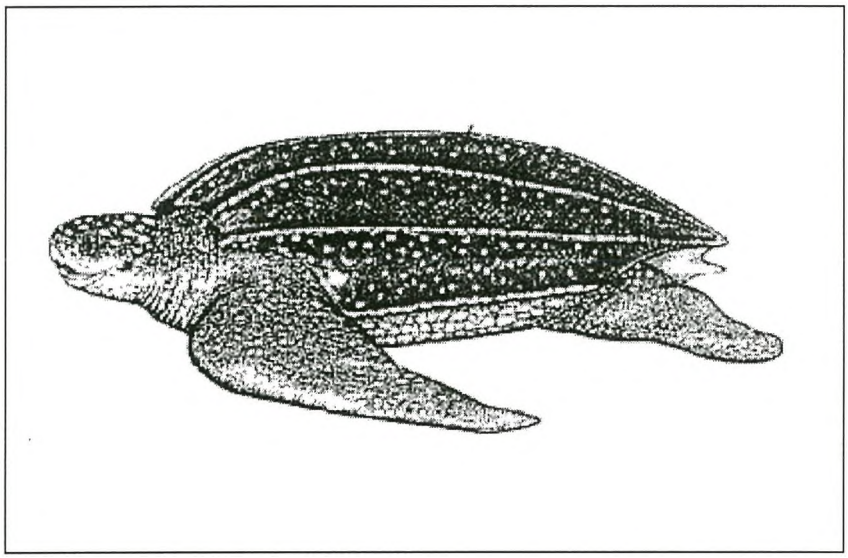
Nesting period - August to April, peak in May.



Chelonia mydas (Linneaus, 1758)
Green turtle (English name)
Pyin Thar Leik (Myanmar name)

Nesting areas - Thamihla Island.

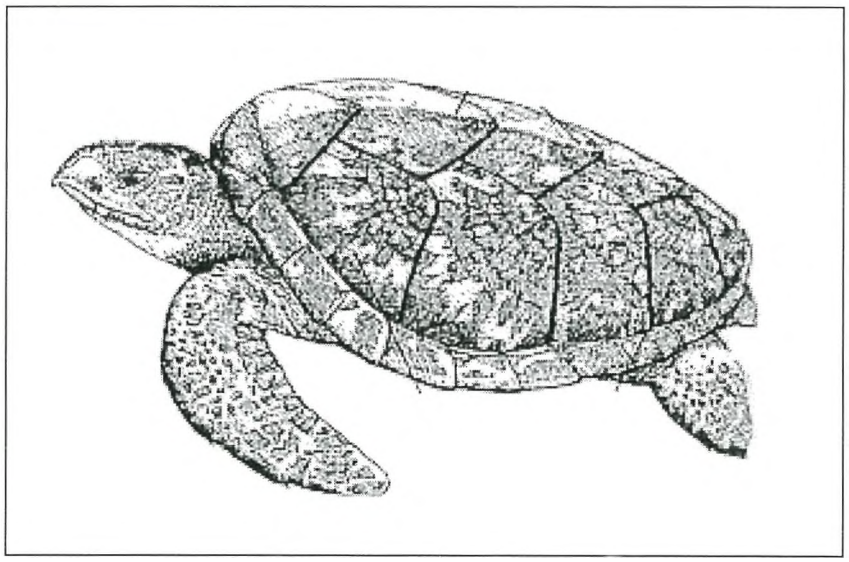
Nesting period - June to November.



Dermochelys coriacea (Vandelli, 1761)
Leatherback turtle (English name)
Leik Zaung Lyar (Myanmar name)

Nesting areas - Extremely rare in Myanmar

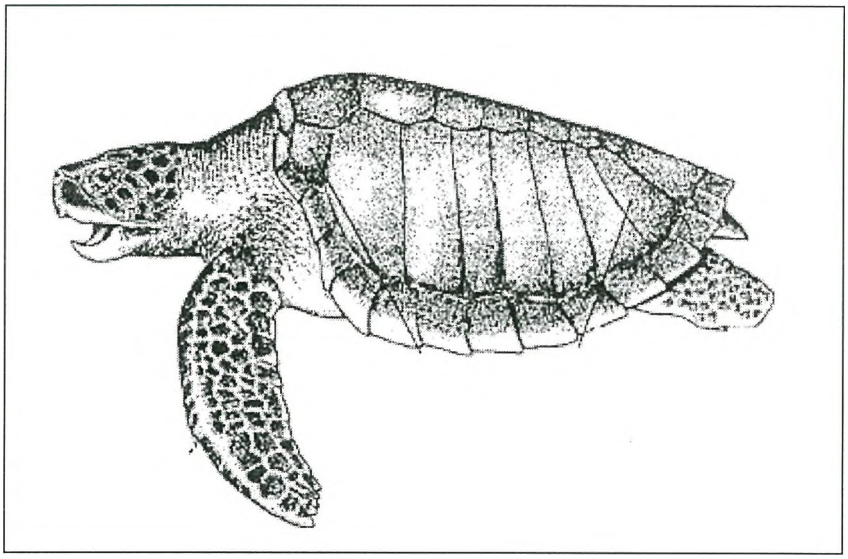
Nesting period - No information is available



Eretmochelys imbricata (Linneaus, 1776)
Hawksbill turtle (English name)
Leik Kywet Tu Yway (Myanmar name)

Nesting areas - Rare in Myanmar

Nesting period - No information is available



Lepidochelys olivacea (Eschscholtz, 1892)
Olive ridley turtle (English name)
Leik Laung (Myanmar name)

Nesting areas - Thamihla Kyun *(Diamond Island)*, Kadone Kalay Kyun, Gayet Gyin Kyun, Taung Kadone Kyun.

Nesting period - August to April.

ANNEX 9

Annex 9

THE FIRST SEAFDEC MEETING ON
REGIONAL SEA TURTLE DATA MANAGEMENT

Kuala Terengganu, Malaysia 20 – 21 November, 2000

REPORT ON SEA TURTLES STATISTIC IN CAMBODIA

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Cambodia

Annex 9

REPORT ON SEA TURTLES STATISTIC IN CAMBODIA

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INTRODUCTION

Sea turtles have been monitored and conserved by Cambodian Government since 7 December 1975 because Cambodia signed the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) on 7 December 1975 and acceded to this convention on 2 October 1997.

To manage and preserve marine living resources is the main responsibility of the Department of Fisheries. So far the Department of Fisheries lacks information about sea turtle habitats, population statistics and nesting sites. This is because the Department of Fisheries has no budget for studying or research.

Previous studies mention that 5 species of sea turtle were found in Cambodian coastline: Olive Ridley turtle (*Lepidochelys olivacea*), Hawksbill turtle (*Eretmochelys imbricata*), Loggerhead turtle (*Caretta caretta*), Green turtle (*Chelonia mydas*), and Leatherback turtle (*Dermochelys coriacea*) (Try, 1999). Among these turtles, only Hawksbill and Green turtle have often been found in the coastline of Cambodia, especially in Kompong Som Bay around Koh Rong, Koh Rong Salem, Koh Tang and Koh Pring Islands (Tana, 1997).

So in order to get more information on sea turtles, I have selected two locations in Kompong Som Bay for this study in Sihanoukville and Koh Kong provinces. The period for this study was from 4th to 14th November 2000.

MATERIAL AND METHODS

Two methods were selected for this study: the first is to interview fishermen who are fishing along the coastline of Cambodia and the second is questioning the old fishermen who are living in the coastal area. These surveys consisted of 20 fishermen who are fishing in Cambodian Sea. Among these, 13 fishermen are living in Koh Kong province and 7 fishermen are living in Sihanoukville.

RESULTS AND DISCUSSION

The fishermen that were selected for interviewing were classified into three groups: 1) using trawler, 2) using gill nets and 3) hooks line fishermen. Of the 20 fishermen who were selected for interviewing, 9 (45 %) are using trawl, 4 (20 %) are using gill nets and 7 (35 %) are using hooks line.

The results show that 12 (60 %) fishermen said that before 1979, they had found 5 species of sea turtle: Olive Ridley turtle (*Lepidochelys olivacea*), Hawksbill turtle (*Eretmochelys imbricata*), Loggerhead turtle (*Caretta caretta*), Green turtle (*Chelonia mydas*), and Leatherback turtle (*Dermochelys coriacea*). More recently they found only Hawksbill, Leatherback and Green turtle around Koh Rong, Koh Rong Salem, Koh Tang, Koh Pring and Koh Kong Krao Islands. Two species of sea turtle, Hawksbill and Green turtle, are often found around these island and Leatherback turtles are very rarely seen and only in the offshore or in the deeper waters. The landing and nesting sites of Hawksbill and Green turtle are located around Koh Kong Krao, Koh Rong and Koh Rong San Loeum Islands. For the question about the number of sea turtles landing and nesting, they said that for Hawksbill and Green turtle, they cannot say exactly, but they estimated that totally around 40 to 50 turtles came ashore in these islands, and around 20 to 30 were nesting. These turtles came to lay eggs during full moon of October and November. For Leatherback turtle, they said they never found this species landing on Cambodian coast-lines, but they came for feeding only in the deeper waters and would go back afterwards.

This year, 3 specimens of Green turtle and 2 specimens of Hawksbill turtle were caught by hooks line and trawl by accident.

Four (20 %) fishermen said that only 2 species of turtle, namely Hawksbill and Green turtle were found around Koh Rong, Koh Sdach and Koh Kong Krao Islands during full moon in October and November when they came to lay eggs. They estimated totally around 10 turtles.

Two (10 %) of the fishermen had seen Leatherback turtles in offshore waters during September and October. They came for feeding only and after this they left. This species the fishermen never eat because they are poisonous and the local name is Lmich Bruy Bai.

So far the Department of Fisheries has no information and statistics on sea turtle population, nesting and the number of turtles caught by fishermen, because even though they are caught by accident, they try to hide it from the fisheries authorities.

RECOMMENDATION

In regard to management and conservation of sea turtles in Cambodia. The Department of Fisheries would like the NGOs and/or International Organisations to supply funds and co-operate with them for studying or surveying landing and nesting sites. If we have no exact information, it will be difficult for the Department of Fisheries to implement protection and conservation of these turtles in the future.

ACKNOWLEDGEMENT

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ANNEX 10

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THE FIRST SEAFDEC MEETING ON
REGIONAL SEA TURTLE DATA MANAGEMENT

Kuala Terengganu, Malaysia 20 – 21 November, 2000

STATUS ON MARINE TURTLE STUDY AND CONSERVATION IN VIETNAM SEA WATER

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STATUS ON MARINE TURTLE STUDY AND CONSERVATION IN VIETNAM SEA WATER

1. INTRODUCTION

The ancestor of sea turtle is inland animal, in the development they adapt step by step to living under water. It explains why sea turtle females have to come back to coastal sand-banks to lay eggs in the nesting season. The incubating and hatching of eggs occur on land, the sea turtle juveniles will come into the sea by low intensity of sunlight of skyline. The sea turtle juveniles move to ocean water, in which they grow up. The distance from these habitats to the place that they were born can be thousands of kilometers. The females, when they are matured, they will also have to cross this distance back to the breeding grounds to lay eggs.

In Vietnam, sea turtle has been mentioned for long time. In "Van Dai Loai Ngu" the ninth volume of Le Quy Don (1777: 320) dealt with tortoise-shell, In "Gia Dinh Thanh Thong Chi" of Trinh Hoai Duc (1863: 74) shown 2 kinds of sea turtle. Then some French authors : Bocourt (1886), Tirant (1885) ... P. Chevay published some documents on sea turtle catching in Paracels (1926: 1 - 4). Dao Van Tien gave to the public a classification list of Vietnam sea turtle (1976), which shown 5 sea turtle in Vietnam. From 1997, sea turtle has officially been researched in Vietnam on resource, species composition, distribution, breeding grounds, tagging, ... at national level.

2. VIETNAM RESEARCHER ON MARINE TURTLE

- Survey on species composition and distribution areas.
  - Survey by interviewing people.
  - Field investigating.
  - Catch by net, dive to test in the fixed stations.
- Identify the nesting season.

3. SOME RESULTS OF MARINE TURTLE STUDY IN VIETNAM SEA WATER

3.1. Species composition and distribution

According to the research and statistical results show that there are 5 species of sea turtle belonging to 2 families, 3 genera. They are: Green turtle (*Chelonia mydas*), Hawksbill (*Eretmochelys imbricata*), Olive ridley (*Lepidochelys olivacea*), Loggerhead (*Caretta caretta*) and Leatherback (*Dermochelys coriacea*).

Table 1: Marine turtles species and their distribution in Vietnam sea water.

Area	Number of species	Scientific name	English name
Tonkin Gulf	4	Chelonia mydas Caretta caretta Dermochelys coriacea Eretmochelys imbricata	Green turtle Loggerhead turtle Leatherback turtle Hawksbill turtle
Central area	4	Chelonia mydas Caretta caretta Lepidochelys olivacea Eretmochelys imbricata	Green turtle Loggerhead turtle Olive ridley turtle Hawksbill turtle
Southeast area	4	Chelonia mydas Caretta caretta Lepidochelys olivacea Eretmochelys imbricata	Green turtle Loggerhead turtle Olive Rridley turtle Hawksbill turtle
Southwest area		Chelonia mydas Caretta caretta Eretmochelys imbricata	Green turtle Loggerhead turtle Hawksbill turtle
Hoang Sa (Paracels)	2	Caretta caretta Eretmochelys imbricata	Loggerhead turtle Hawksbill turtle
Truong Sa (Spratly)	2	Chelonia mydas Eretmochelys imbricata	Green turtle Hawksbill turtle

Source: Chu Tien Vinh and Pham Thuoc, 1998.

3.2. Nesting season and breeding grounds

Presently, we have not identified yet the breeding grounds of sea turtle in the North and the Central of Vietnam. However, through field investigating and sea turtle juvenile catching results we knew that the nesting season of sea turtle in the Northern area is about from February to June. In the Central there were some breeding grounds of sea turtle such as: Cam An – Hoi An, Tam Ky (Da Nang Province), however due to overexploiting the mother sea turtle and collecting eggs, and the tourism activities, there are rarely sea turtles come to breeding grounds.

The East-South area is the richest resource of sea turtle in Vietnam. In this area there are many breeding grounds of sea turtle, the great number of breeding grounds is in Con Dao Island (Ba Ria-Vung Tau Province). Each year there are thousands of sea turtles come to lay eggs, the majority species is green turtle, sometimes there is also Hawksbill and Loggerhead, but not many. Phu Quy Island (Binh Thuan Province) also has sea turtle lay eggs, but in this area there are no rescue stations, therefore, we could not monitor sea turtle mothers, eggs and juvenile.

In Con Dao, the nesting season is from April to November, concentrated in July and August. The number of egg in each giving birth time is ranging from 15 – 160 eggs, but normally is from 70 – 100 eggs. In a nesting season the sea turtle mother comes to the breeding ground from 2 –5 times, the internesting is from 12 – 25 days. After long time of incubating (48 – 75 days), on average from 50 – 65 days, eggs will hatch.

Table 2: **Monthly nesting of sea turtle at Con Dao Islands in 1998**

Nesting Beach / Months	Tai Beach (Con Dao Islands)	Bay Canh Beach (Con Dao Islands)	Hon Cau Beach (Con Dao Islands)	Tre Lon Beach (Con Dao Islands)
January				
February				
March		94		
April		734		92
May		3369		644
June	514	6440	1573	4049
July	756	5495	2332	6994
August	1188	3357	2140	5706
September	1695	1575	1171	3129
October	848	1217	838	736
November	225		209	461
December				
Total of eggs	**5226**	**22281**	**8263**	**21811**

4. THE SEA TURTLE STATUS IN VIETNAM

From 1980s and backward, the sea turtle resource in Vietnam was abundant not only in species composition but also in number. The desert sand-banks on the coastal islands and in the coastal areas, along the country, we always find sea turtle come to lay eggs. Recent years, because high pressure of population growth, tourism activities, food demand of human are the main reasons causing the serious deduction of sea turtle resource. Some sea turtle is being overexploited such as hawksbill for fine art, green turtle, loggerhead are exploited for meat. The breeding grounds were destroyed by tourism activities, eggs collecting and sea turtle mothers catching. Presently, in Phu Quy Island (Binh Thuan Province), there are still sea turtles come to lay eggs, but we have no rescue and protection methods. In Con Dao, there are many breeding grounds, this area is the national conservation area, hence the managing and rescue activities of sea turtle are in good situation, the biological research programmes are implementing in this area.

5. CONSERVATION AND MANAGEMENT IN VIETNAM:

The sea turtle species in Vietnam were recorded in Red Data Book of Vietnam, the Vietnamese government pays more attention to the protection of sea turtle. The Vietnamese government passed the decrees on catching, trading wild animals. The marine conservation areas were established, sea turtle conservation is the priority. In the future, Vietnamese government will authorize to establish and extend the sea turtle conservation areas at national scale and cooperate with other international organizations as well as other countries in the region and all over the world.

6. REFERENCES

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APPENDIX

REGIONAL TAGGING PROGRAMME ON SEA TURTLES: PROGRESS ON TAGGING EXERCISE IN SABAH, MALAYSIA

by
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1. INTRODUCTION

Following the recommendations made during the First Workshop on Marine Turtle Research and Conservation held in January 1996, the Marine Fishery Resources Development and Management Department (MFRDMD) proposed two regional projects. One of them is the regional turtle tagging. Under this project, sea turtles will be externally tagged on both their front flippers using inconel tags. In October 1998, MFRDMD provided Sabah Parks some 1000 inconel tags with codes starting from MY(S) 0001 to MY(S)1000.

Tagging program was carried out at Selingaan Island, one of the three islands within the 1,740-hectare Turtle Islands Park.

2. PROGRESS ON TAGGING EXERCISE

2.1 Tagging Period and Tagging Method

These inconel tags were applied to landing or nesting sea turtles starting from 8th July 1999 through 4th September 1999. Sea turtles were double tagged, with each tag applied through the first large axillary scale on the trailing edge of both the front flippers.

2.2 Number of Turtle Tagged

A total of 494 green turtles (*Chelonia mydas*) were tagged which amounted to 988 tags. Twelve tags were found spoiled and thus not utilized. One hawksbill turtle (*Eretmochelys imbricata*) was tagged with tags {MY(S)0513/0514} recovered from a dead green turtle.

2.3 Tags Return

A total of 217 turtles or 43.9 percent made their nesting returns after being tagged. Of the figure, 112 turtles or 22.6 percent returned one time, 69 turtles or 13.9 percent returned two times, and 23

turtles or 4.6 percent returned three times. A few numbers of turtle returned to nest more than three times. For instance, only 8 turtles or 1.6 percent repeated nesting four times, 4 turtles or 0.8 percent made five returns, and only one turtle returned six times. The return interval period ranges from 1 day {for a turtle with tags MY(S) 0771/0772} to 78 days {for a turtle with tags MY(S) 0003/0004}.

2.4 Tag Loss

A total of 43 tags were found missing from the tagged turtles upon their returns. Thirty-two tags were discovered missing from turtles making their first return, while eight tags and three tags were observed missing during their second and third return respectively.

2.5 Dead Turtle with Inconel Tags

A green turtle bearing tag numbers MY(S) 0105/0106 was reported dead at Baguan Island, Philippines on 30 September 1999. The said turtle, with a - 112.2cm CCL and 99.3cm CCW, was first tagged on 10 July 1999. This turtle made two returns to Gulisaan Island on 7th August and 12th September depositing 45 eggs and 35 eggs respectively.

Another green turtle with tag numbers MY(S) 0513/0514 was found dead at Selingaan Island on 28th September 1999. This turtle was first tagged on 10th August 1999 and made three nesting returns to the same island on 1st September, 12th September, and 26th September 1999.

3. SUBSEQUENT STEPS TAKEN BY SABAH PARKS

After the supply of tags from MFRDMD, SEAFDEC was exhausted, Sabah Parks placed an order to National Band and Tags Co., New Port, Kentucky, USA for 10,000 inconel tags - MY(S) 1001 through MY(S)10,000. The cost of the tags including handling and custom duties amounted to RM37,369.91 or US$9,834.00. With the delivery of this order, tagging exercise at the Turtle Islands Park is now continued using inconel tags as opposed to monel tags previously.

4. CONCLUSIONS

The implementation of this regional tagging program, to double tag sea turtles with inconel tags, no doubt would be able to provide accurate information on the reproductive biology and population trends and dynamics of sea turtles. With this information, it certainly helps turtle experts to formulate conservation measures and management programs for the perpetuity of these animals.

5. ACKNOWLEDGMENTS

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