



**THE FIRST SEAFDEC MEETING ON
REGIONAL SEA TURTLE DATA MANAGEMENT**

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COUNTRY REPORT

MALAYSIA

SARAWAK

REPORT ON THE SEA TURTLE POPULATION STATISTIC

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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 gazetted 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 gazetted. 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 species. 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 species.

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 Ridelys 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

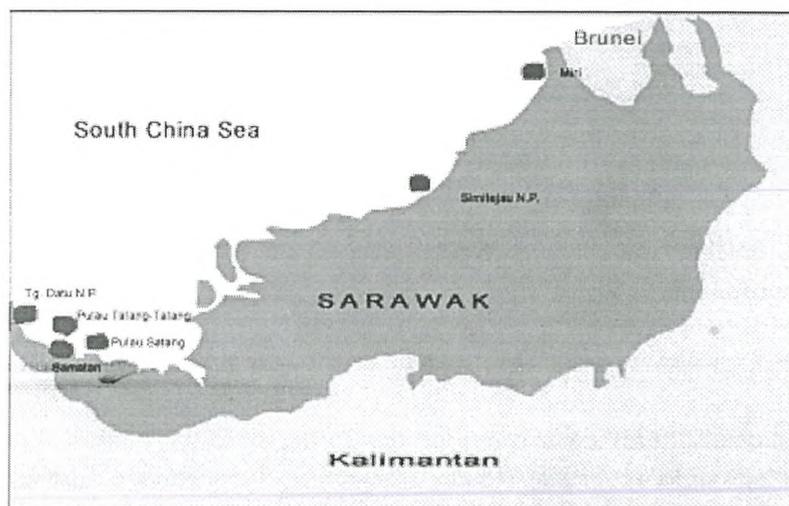


Figure 1: *Turtle nesting areas in Sarawak*



| 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. Badaun | 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 nests 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.

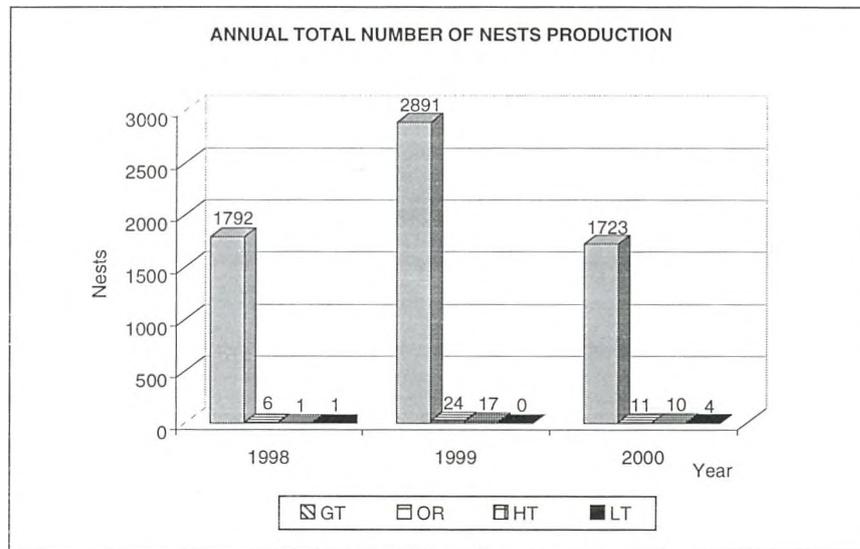


Figure 2: Annual number of nests laid in Sarawak: 1998 - 2000

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.

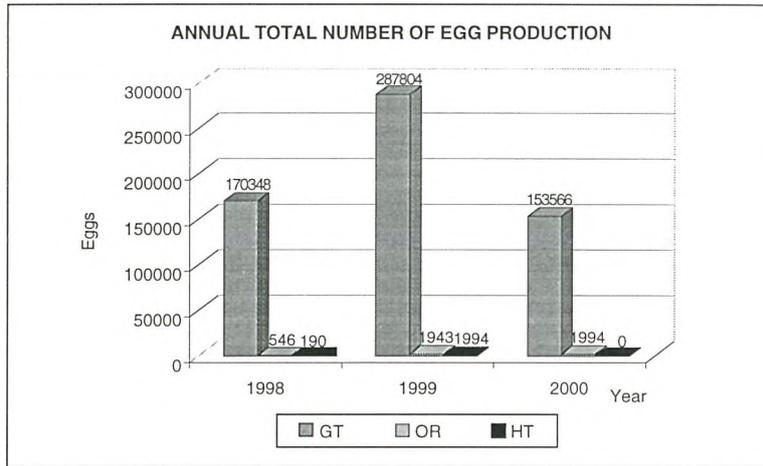


Figure 3: Annual Total Number of egg production: 1998 - 2000

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.

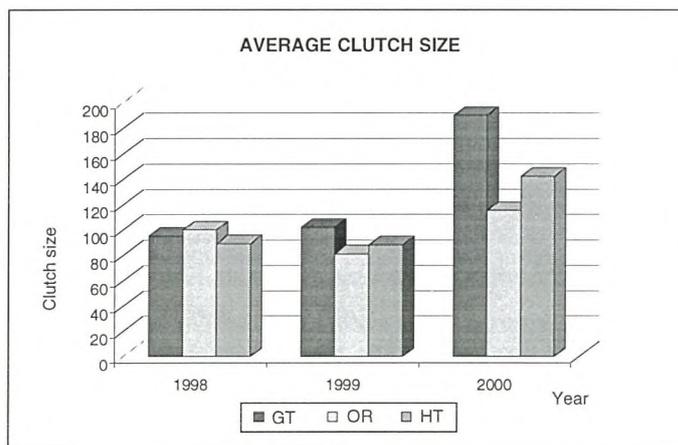


Figure 4: Average clutch size for green, olive ridley and hawksbills turtles: 1998 - 2000

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.

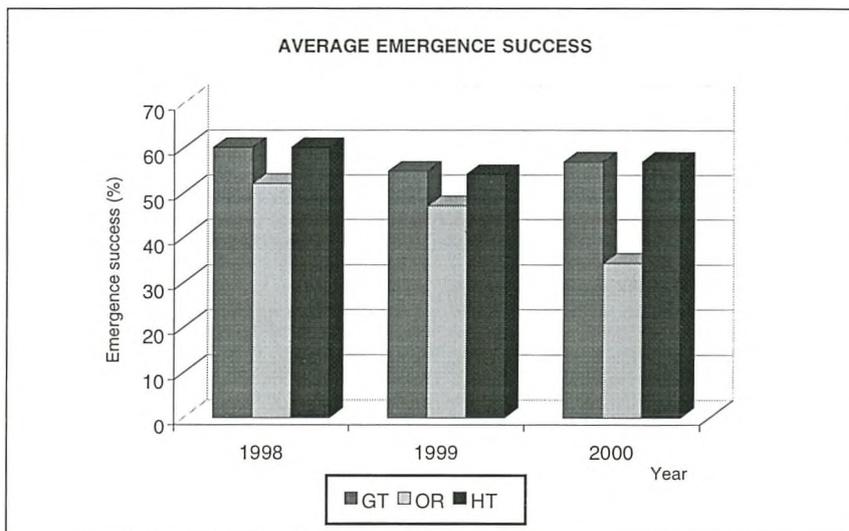


Figure 5: Average emergence success for each species: 1998 - 2000

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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