

428

SRI LANKA NATURALIST

JOURNAL OF ECOLOGY AND NATURE

සමස්තම ඉරිදි
PROTECT NATURE



VOL. II Nos. 01 & 02 January/June 1998

ISSN 1391 281X

Sri Lanka Naturalist is a quarterly journal, published by the Young Zoologists' Association of Sri Lanka, and is devoted for dissemination of knowledge on ecology, nature, and their diverse aspects. It welcomes original research papers, notes on observations, and scientific articles.

If any naturalist, who possesses valuable information, is unable to publish them due to the language barrier, YZA is ready to provide translation facilities.

Articles for any issue of Sri Lanka Naturalist should be sent in by the end of the first month of that particular quarter. Refer last page for the guidelines for authors.

EDITOR

Chamara Visanka Senaratna

EDITORIAL BOARD

Dewaka Weerakoon

Jagath Gunawardene

Sanjeewa Praharshana Ranwella

Deepal Warakagoda

K.L.G. Hasantha Sanjeewa

Chamica Wijesinghe

EDITORIAL ASSISTANCE

Kaushalya Molligoda

Mahi Wikramagama

Wathsala Gunasinghe

Sanjeewa Karunawardana

The editorial board invites suggestions for the qualitative improvement of this journal. Address all correspondence to;

The Editor**"Sri Lanka Naturalist"**

The Young Zoologists' Association of Sri Lanka,

National Zoological Gardens,

Dehiwala,

Sri Lanka.

Telephone - 94-1-712751/3

Fax - 94-1-714542

CONTENTS

CENTRE FOR HERPETOLOGY
MADRAS CROCODILE BANK
POST BAG NO. 4
MAMALLAPURAM - 603 104
TAMIL NADU S. INDIA

Page
Number

**The Marine Turtles in Rekawa; a Survey on
Nesting Activities and Exploitation** 01
Rohan Cooray

**Oriental Turtle Dove *Streptopelia orientalis* :
A Sight Record from Galge, Moneragala
District** 08

Chamara Visanka Senaratna

A List of the Birds of Horton Plains: 09
Melissa Maxwell

Snakes and Agamids of Hanthana Area 11
Nimal Rathnayake, Nadeera Weerasinghe

**Land Slugs of Sri Lanka
(Phylum Mollusca, Family Veronicellidae)** 14
T.G.M. Priyadarshana

**Observations on the Natural Breeding
Behaviour of the Green Chromide
Etrophus suratensis (Perciformes: Cichlidae)** 16
Thushan Kapurusinghe

Guide Line for Authors

CENTRE FOR HERPETOLOGY
MADRAS CROCODILE BANK
POST BAG NO. 4
MAMALLAPURAM - 603 104
TAMIL NADU S. INDIA.

Cover: *Cophotis ceylanica* Peters

This fully arboreal, slow-moving agamid that possesses a rounded and prehensile tail inhabits the moss-covered bases of tree trunks in mountain regions of Sri Lanka. Owing to its sentience to the changes in temperature and humidity, it is used as a bio-indicator to identify the Montane Cloud Forest ecosystem. This ovoviviparous lizard has an awesome camouflage that enables it to blend with its habitat to perfection. *Cophotis ceylanica* is endemic to Sri Lanka. Today it has faced the threat of extinction due to the habitat destruction, environmental changes due to global warming, air pollution, and predatory birds such as crows and coucals that have followed the humans in to the Montane Cloud Forests.

Photographed by K.L.G.Hasantha Sanjeewa at Maha Eliya Plains

EDITORIAL

The race for industrialisation is in progress. Sri Lanka in her bid to keep up with the developing nations must facilitate economic growth by promoting development projects. But in this race, the environmental consequences must not be ignored.

According to the National Environment Act those who propose to start a project must first forward an Initial Environment Examination (IEE) report. This must state what the impact on the environment by the proposed project is. Once it is forwarded a time period of 30 days is set apart for the public to voice their opinions. If a necessity arises, this in turn will be followed by an Environmental Impact Assessment (EIA) report. This includes a detailed scientific study on environmental consequences as well as alternative proposals, sites and technology.

However it has been proposed that the time period for the public opinion should be eliminated. Industrialists argue that forwarding an IEE is sufficient to show that they have paid attention to the environment; that an interval for the public opinion is only a time wasting aspect that applies breaks on the pace. Especially as a public opinion might reveal some hazardous consequences which they might conveniently oversee.

Since the conclusions drawn by an IEE decides whether an EIA should follow or not, the bottom line may be that an EIA will not be even considered. Thus the damage to the environment and to the people by a particular project as well as the suggestions made by environmentalists might altogether be ignored.

For example is the proposal for a joint venture in Phosphate mining at Eppawela on a large-scale basis. The government has promised that the Phosphate deposit shall only be leased to a company, which promises to pay the most attention to the environment. But obviously, these are only pike cross promises. Easily made, easily broken. After all, their aim is to get the maximum they can, within the allocated years.

They feel that forwarding an IEE stating the environmental consequences as they see fit is all that is required, but what would they say about almost 11 000 people being made homeless? About 56 km² of natural habitats rich of flora and fauna being wiped off in a few years? About the serious health hazards which people will inevitably have to face as consequences to large-scale mining? Why does the government turn a blind eye upon these issues?

It finally boils down to the fact that ours is a third world country and we need the foreign investments. However we have no right to stripe the future generations of their dues. The time set aside for the public opinions is the only chance we have, to stand up against parochial and shortsighted exploitation of our environment and natural resources.

On the other hand, if we keep thinking about the environmental consequences and say NO to every development project, we as a nation, might be at a stand still. After all the first colonials did not think of the native Red Indians when they exploited the continent of America in their race which brought them to the top rung of industrialisation.

We must develop our country while preserving the environment and without extensive exploitation of our natural resources. For any change in the physical environment will effect the biological one which in turn will effect all humankind. To what avail do we race towards industrialisation if there will not be a healthy future generation to reap its benefits?

- The author/s of an article published in *Sri Lanka Naturalist* is/are accountable for the accuracy and reliability of its contents.
- Material published in *Sri Lanka Naturalist* may be reproduced with due acknowledgement

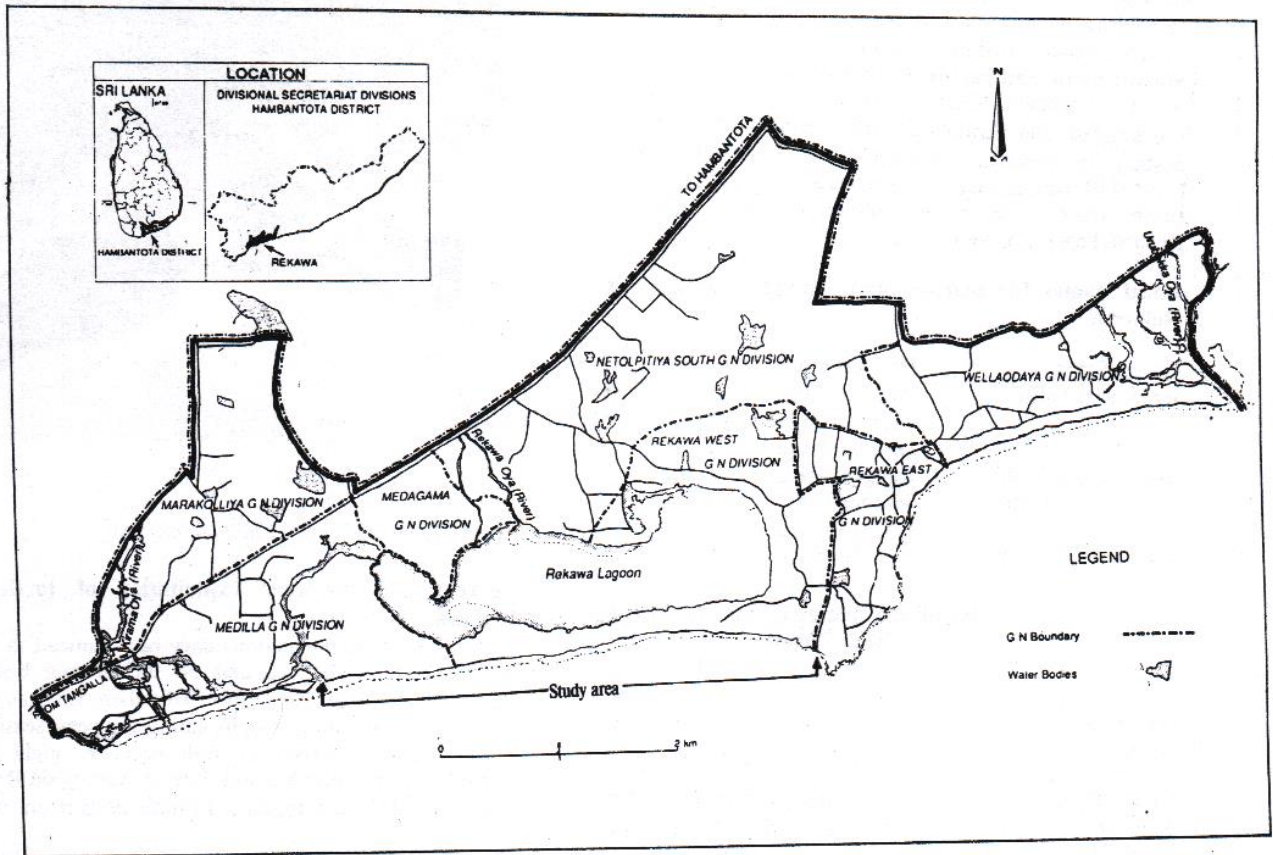


Figure 02 Map of the Study area

Table 02. The average numbers of nests that are laid per night with regard to each month of the survey period.

Month	May	June	July	Total
No. of nests recorded	42	95	42	179
No. of nights Surveyed	7	18	9	34
Average no. of nests per night	6.00	5.28	4.67	5.26

The table 02 indicates that more nests were laid (per night) in May than in either of the other two months, although a relatively low number of nights were sampled during the month of May compared to the number of nights in the whole study period.

Table 03 summarises the average curved carapace length (CCL) and width (CCW) and the average clutch size (CS) of each of the species recorded.

Table 03. Averages of curved carapace length (CCL), curved carapace width (CCW), and clutch size (CS) for each species.

	(CCL) cm	(CCW) cm	CS
Green Turtle	104.66	94.73	123
Leatherback Turtle	144.0	118.0	92
Loggerhead Turtle	0	0	102

Although marine turtle nests and tracks had been observed by the author and local residents along the entire length of the beach from Rekawa headland to Tangalle, the most frequently used stretch of beach by the nesting females was a 2km stripe immediately eastwards of the Rekawa headland.

Marine turtle natural history and exploitation survey

The following is a summary of the information obtained from the fishermen, during the interviews.

Marine turtle natural history in Rekawa

All five species (Green, Leatherback, Olive ridley, Loggerhead, and Hawksbill Turtles) have been observed nesting in Rekawa, although the Olive ridley and Hawksbill Turtles have only been seen very rarely during recent years. The most common species nesting on Rekawa beach is Green Turtle.

Local names for marine turtle species that nest in Rekawa.

Green Turtle	Batu kesbewa
Hawksbill Turtle	Potu kesbewa
	Girahota kesbewa
	Lelly kesbewa
Loggerhead Turtle	Kangamattaya
Olive ridley Turtle	Murunga Malaya
	Penda Malaya
Leatherback Turtle	Dara kesbewa

The nesting season for all the species is from January to August. Although the Green Turtle nests fairly consistently from January to August, the peak nesting-season for it is generally from April to July. During the off peak season, Green Turtles laid approximately 3 nests per night.

The peak nesting-season for the Loggerhead Turtle is from May to August. Very few (less than 10 per year) Leatherback nests had been observed in recent years.

It was reported that the seasons for each species vary annually.

Nesting turtles arrive on the beach from 6 p.m. to 6 a.m. and most of the nests are laid 2 – 3 days before the full moon Poya day.

Hatchlings have not been seen on Rekawa beach for approximately 20 years.

The coastal village of Usangoda and Pattiya-waraya were identified as the locations of other important local turtle nesting beaches. (These two locations are situated in Hambantota district close to the Walawe River)

Adults and sub Adults of Hawksbill, Green, and Loggerhead Turtles have been observed feeding on reefs and sea grass beds in the near- shore waters. Leatherbacks have only been observed further out in sea, and during nesting.

Turtles (Species not defined) have been mating in offshore waters where the sea becomes deeper ('Atholla' sea), usually from January to February.

Some fishermen have observed the Flatback Turtle in offshore waters.

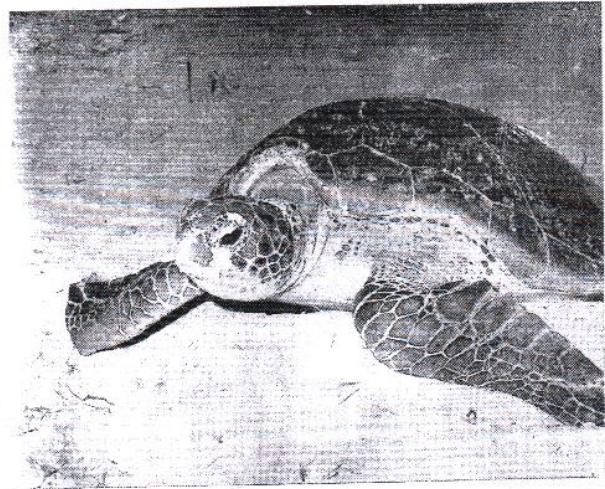


Figure.03 Green Turtle (*Chelonia mydas*)

Current and historical exploitation of turtles in Rekawa

The marine turtle populations have been noticed to be in decline both at the sea and on the nesting beaches. Fishermen reported that in the 1970s there were as many as 90 turtles nesting per night during the peak season. In recent years the number of turtle nests per night rarely exceed 10 (the Turtle Nesting Activity Survey on Rekawa beach recorded a maximum of 11 turtle nests in one night).

Three major reasons were identified for the observed decline in the marine turtle populations in Rekawa. They are, in the order of importance, as follows:

1. turtle egg collection
2. the incidental entrapment of turtles in fishing gear
3. the slaughter of nesting female turtles on the beach.

Turtle egg collection. Turtle egg collection has been carried out on Rekawa beach for many years and it is considered as a traditional village activity. According to the fishermen, turtle hatchlings have not been seen on Rekawa beach over the past twenty years. This may be due to two reasons. First, a decline in the population of nesting turtles resulting in a reduction in the number of eggs available. Second, demand for turtle eggs has risen steadily over the past 20 years. This has resulted in almost 100% removal of turtle eggs laid in the nests. However, in the past, the number of eggs exceeded the number removed. This allowed some of the eggs to hatch, and the hatchlings to return back to the sea. Value of the turtle eggs has also risen over the years. Twenty years ago, a turtle egg fetched around 25 cts in the open market. At present, brokers pay around Rs 1.25 per egg, and they in turn sell them at a price of Rs 2.25. Usually Leatherback eggs that are generally larger, fetch about a rupee more than other turtle eggs. The main market for turtle eggs is found in Hambantota. However, turtle eggs are also sent

to markets in Tangalle, Dikwella, and Ratnapura. Egg collection is carried out on a regular basis by approximately 25 young males between 15 to 25 years of age. The majority of them are unmarried, are from poor fishing families, and have no specific occupation. In the peak season, as many as 50 egg collectors may be present on the beach at night.

None of these egg collectors depend entirely on turtle eggs for their income, but use the money as a supplementary income, enabling them to take part in adverse social activities such as drinking and gambling.

All nests laid on Rekawa beach are robbed of their eggs. Egg collection was identified as the main cause for the decline in populations of the different species of turtles that nest in Rekawa.



Figure. 04 Leatherback turtle (*Dermochelys coriacea*)

Incidental entrapment of turtles in fishing gear.

Many fishermen reported entrapment of Green, Leatherback, Olive ridley and Hawksbill Turtles in their fishing nets. Generally the turtles drown, entangled in the nets. Most fishermen claimed that they release live turtles from their nets. All the fishermen reported that the net which catches turtles mostly is the 'Madu Dela' (Ray Net), a net which drops horizontally to the sea bed entangling anything that gets underneath.

Dead turtles are taken back to the shore and the meat is sold. Although there is no high local market value for turtle meat, it fetches approximately Rs. 60/- per kilogram.

The shells of dead Hawksbills are removed and saved. A businessman from Tangalle visits the village and

buys Hawksbill shells for approximately Rs. 2000/- per kilogram. It is thought that these are then sold to factories in Galle. Kirinda and Itigala (Yala to Panama beach) were identified as the locations of high Hawksbill exploitation. The author was shown the carapaces of Hawksbill Turtles in the homes of fishermen who are storing the shells for sale to the trader. The specimens examined were all of juveniles and sub-adults of Hawksbill Turtle, measuring more than 50 cm in length.

Slaughter of female nesting turtles on Rekawa beach

Many fishermen reported that in the 1960's and 1970's a businessman would regularly pay Rs. 35/- for a live turtle caught on the beach. These were then loaded on to a truck and taken to Jaffna. This was identified as one of the main reasons for marine turtle population decline in Rekawa. This business has stopped since the businessman was arrested and given a three-year prison sentence.

Occasionally nesting female turtles are killed on Rekawa beach for their flesh. Turtle flesh is consumed at special occasions such as weddings. Leatherbacks tend not to get killed as their flesh is thought to cause body sores after consumption.

Law enforcement in Rekawa concerning marine turtle exploitation

No body in Rekawa is totally dependent on the exploitation of marine turtles for their income. Therefore most believe that the current laws protecting turtles are 'fair'. However, some people stated that due to the lack of job opportunities in the Rekawa area, the laws are unfair unless alternatives for supplementary income are provided.

Many egg collectors stated that they do not possess necessary capital to allow them to take up full time employment of their preferred vocation, which they believed would allow them a better standard of living. For example cultivators require fertilisers for their land and fishermen need capitals to buy new boats, nets, etc. Therefore in order to supplement their low incomes, they resort to egg collecting.

During the transportation of eggs, the local police had made few arrests. The eggs had been confiscated and fines had been imposed.

However marine turtle egg collectors in Rekawa currently rob all of the nests of their eggs and therefore most people realise that current law enforcement in Rekawa is having no effect on illegal turtle exploitation.

Most believe that even if all turtle exploitation stopped in Rekawa, there would be a little effect on the village economy.

DISCUSSION AND CONCLUSIONS

The main drawback of this survey is the relatively small sample size of nights. Data collection was restricted to a few nights in the nesting season that was identified by the people of Rekawa.

Total number of nights in the season (January to August included) is 243. The number of nights of data collection was 34. Therefore the sample size is 14%.

Furthermore, this study was conducted during the peak-nesting season for each species recorded and this may have biased the results.

However, from the results of the surveys we can assume that populations of Green Turtles, Leatherback Turtles and Loggerhead Turtles still use Rekawa beach as a rookery. The carapace measurements and clutch size were similar to those reported for each species in populations studied in other parts of the world (Morosovsky, 1983; Rudloe & Rudloe, 1994; Anon, 1990).

It can be concluded that Rekawa beach is an important rookery for Green Turtle as:

1. The Rekawa community identified the Green Turtle as the most common species.
2. The Green Turtle nesting season was reported to be longer than the other two species recorded, and
3. The survey was carried out during the peak-nesting season for all species recorded, and 93.4% of all nests were of the Green Turtle.

It can be further assumed that the Rekawa nesting populations of Loggerhead Turtles and Leatherback Turtles are very low. These species are in urgent need of conservation action to avoid complete disappearance from this nesting site.

Because no Hawksbill or Olive ridley Turtle nests were recorded, and because the local community identified these two species as been infrequent nesters on Rekawa beach, it can be concluded that the nesting adults are either very low or absent in Rekawa nesting site.

It is interesting to note that local fishermen have observed the Flatback Turtle and there is a Sinhala name for this species ('Pathali Kesbewa').

From the average number of nests per night (5.26), calculated for May, June, and July, it can estimate that 484 nests are laid during these months.

The estimated number of nests per day for the months of January, February, March, April and August is 3, and the estimated number of nests for the total period of these months is 453.

Therefore the estimated number of nests for a season is approximately 940 (937), of which approximately 93.3 % would be Green Turtle nests (i.e. 874). Because of the flaws in the samples and methods of this survey, these

figures must be treated as an initial estimation, which need confirmation from further more intense studies.

However, these mean that Rekawa beach is one of the most significant rookeries in Sri Lanka for the globally threatened Green Turtle. Unfortunately due to the complete removal of eggs as reported by the people of Rekawa, and experienced during the rookery survey it is assumed that very few, or no hatchling recruitment currently originates from Rekawa beach for any of the marine turtle species. Because no hatchlings have been observed on the Rekawa beach for approximately 20 years, due to the constant activities of egg collectors, it is assumed that little or no recruitment had originated from Rekawa beach for the last 20 years.

The marine turtles are thought to become sexually matured at approximately 30 years of age (Morosovsky, 1983). Thus, it can be assumed that the effect of zero recruitment for 20 years on the populations of marine turtles nesting on Rekawa beach will be experienced in the next ten years, in the form of a sudden and rapid decline in populations.

This rapid decline in populations would also be facilitated by the incidental capture and drowning of turtles in fishing nets and the occasional slaughter of gravid females on Rekawa beach.

It is interesting to note that perhaps the most important function of egg collection is to facilitate social bonding among collectors. The author has noticed that apart from the income generated by egg collection, the act of gathering on the beach at nights is an important social event for those involved. In Rekawa, there is little village infrastructure to facilitate social gatherings of young people. This aspect of the importance of egg collection is further strengthened by the fact that mainly young males partake in this activity. It is possible that older males 'grow out' of egg collecting when they assume family responsibilities after marriage and are forced to seek more gainful employment.

RECOMMENDATIONS

Research

It is advisable to establish a full time monitoring and research program extending throughout the year, in order to verify the claims of this report, and to find out more about the nesting marine turtle populations of Rekawa. The program should focus on the 3-km stretch of beach most commonly used by nesting turtles, and should be aimed at monitoring and verifying the followings.

- The nesting population size, dynamics and biology of all species of marine turtles that nest in Rekawa beach; this would involve a program of tagging and measurement of every turtle that nests during the season.
- The number of nests laid and the successful hatching per species, per year, and for different seasons of the year.

- The incidence of female turtles been caught locally and non- locally in fishing gear; a tagging program and the recovering of tags or tag numbers from captured turtles would reveal this. This would also indicate the location of marine turtle feeding habitats both locally and distant.

Surveys should be made of the several important marine turtle habitats that were identified by the fishermen of Rekawa. Usangoda and Pattiya-waraya were identified as important turtle rookeries, and Kirinda and Itigala were identified as places where there is a high incidental entrapment of Hawksbill Turtles. A more detailed survey of incidental turtle entrapment, not only by Rekawa fishermen but also by fishermen from other areas who use the same waters, (e.g. Hambantota, Tangalle) would yield information necessary to provide solutions for the problem.

Conservation Measures

Rekawa beach is almost certainly one of the largest and most significant turtle rookeries in Sri Lanka. It is also a rookery for the highly endangered Leatherback Turtle.

Due to the need of immediate and long-term maximum recruitment of hatchling in order to allow marine turtle populations of Rekawa to recover, this report recommends that immediate conservation actions be implemented at Rekawa beach. The conservation strategies to be adopted by the relevant authorities should comply with the following conditions in order to be effective.

The conservation strategies must;

- Totally eliminate egg collection and turtle slaughter on Rekawa beach.
- Be sustainable so that they are effective for at least 30 years.
- Be sensitive to the needs of the Rekawa community, that are Making sure that the Rekawa community members currently destructively exploiting turtles are given valid alternative sources of income. If this condition is not fulfilled, then the egg collection will continue at Rekawa.

- This is the report that was submitted to the TCP for the initial planning of its activities



Figure. 05 Loggerhead turtle (*Caretta caretta*)

Acknowledgements

Mr. Peter Richardson (TCP Leader 1993-1996), Mr. Thushan Kapurusinghe, and Mr. Nisala Perera are gratefully acknowledged for their support and encouragement. The author is also very grateful to Mr. Chamara Visanka Senaratna for his assistance in the preparation of this report.

References

- Agardy, T. (1992) Last Voyage of the Ancient Mariner. *BBC Wildlife Magazine*. Vol.10.
- Anon (1990) Sea Turtles of the World. An annotated and illustrated catalogue of Sea Turtle Species known to Date. *FAO Fisheries Synopsis* No. 125, Volume ii, 81pp.
- Deraniyagala P.E.P (1953). *A colored Atlas of Some Vertebrates from Ceylon (vol. Two)Tetrapod Reptilia*. Ceylon National Museums Publication.
- Gunawardene P.S. (1986) *The Launch of the National Sea Turtle Survey*. Report for NARA.
- Green Peace. (1991) *Indo Pacific Marine Turtles Identification Key*. Queensland Department of Environmental Heritage.
- Hewavisenthi, S. (1990) Exploitation of marine turtles in Sri Lanka: Historic background and the present status. *Marine Turtle News Letter*, No.48
- Morosovsky N. (1983) *Conserving Sea Turtles*. The British Herpetological Society of London.
- Rudloe J. & Rudloe A. (1994) In Race of Survival. *National Geographic Magazine* vol. 185