

*Mexican nesting beach and the immediate release into the sea of the hatchlings produced.*

#### IN SUMMARY

There is evidence from work in the United States that, far from helping turtles, removing the eggs from their natural nests, and keeping the babies in captivity, may actually reduce their chance of survival.

Programmes that; protect natural nesting sites; allow the eggs to develop and hatch undisturbed; and ensure that hatched baby turtles enter the sea as quickly as possible; are being encouraged. Turtle hatcheries and ponds for rearing the young are not considered to be a viable alternative.

These animals have been around for a great deal longer than we have, longer even than the dinosaurs! The only reason that they are at risk is because of human interference. We should concentrate on minimising the existing interference rather than adding to it or our grandchildren will never see a turtle in the sea!

#### THE MAY/JUNE STORM

Unusually strong winds were reported throughout the Maldives at the end of May and the start of June. Damage to buildings and vegetation was substantial on some islands.

Winds records for Hulule supplied by the Department of Meteorology show a maximum wind speed of 56kts from the WNW at 1659hrs on the 02nd of June. The average wind speed exceeded 20kts from the 29th of May to the 07th of June.

The storm appears to have been good news for several of those Resorts that have stuck with natural beaches and not built substantial seawalls and groynes. On these Resorts the extended storm has gone some way to reversing the effects of sand build-up on the west side of the island (and associated erosion on the NE). Abdul Azeez Hakeem reports that the sand that collected on the west of Thuru over several monsoons was moved back to the east over a matter of only a few hours where it remains for the time being.

The beneficial effects have been much less obvious on Resorts with extensive seawalls and groynes. Angaga beach has recovered completely probably because it has no groynes. The rate of sand movement has been so great that it has swamped any negative effects of the seawall. Some resorts like Makunudu did not fare so well. Seawalls and groynes may well have added to the destructive effects of the storm resulting in more serious problems than if the beaches were natural.

Piling buildings to protect them from erosion and leaving the beach to move naturally seem to be the best precautionary measures to take against such storm events.

REG. No: 354

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Please give a Copy to  
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MAY-JULY 1991

## COT NEWS LETTER



GREAT BARRIER REEF  
MARINE PARK AUTHORITY

10 SEP 1991

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## EDITORIAL

### 24 YEARS FROM NOW

It is now 24 years to the Golden Jubilee of independence. A start has been made on dealing with the environmental issues that will, hopefully, make the Golden Jubilee a time of dignity and pride and not of recrimination and blame. Perhaps the most important development has been the creation of a central environmental monitoring and policy unit within the Ministry of Planning and Environment (MPE). Draft legislation, when enacted, will give MPE sweeping powers to ensure that the environment is managed properly. Already, and as a result of the Male' crack incident last year (see *COT Newsletter No. 11 - Ed*), approval for any coral blasting to make harbours and channels must first be given by MPE. In late May, and according to this requirement, conditional approval was given by MPE, to the National Security Service, to undertake limited blasting on Dhoonidhoo. Such environmental jurisdiction over the Military is unusual for any nation.

Unfortunately such powers are proposed but not yet provided for other environmentally damaging activities such as dredging, reclamation, construction of seawalls, waste disposal standards and so on. In the meantime powerful sectorial lobbies justify a variety of environmental abuses on a case by case basis because "approval has been given to do it on other islands"; because "people get away with it on other islands"; because "another Ministry has been allowed to do it"; or because "there is no law against it".

Against this background the silent majority stand by powerless to comment or initiate alternative courses of action. Hopefully, and at a time when development is occurring at an unprecedented rate, the legislation will be implemented before too much irreversible damage has been done.

In the meantime the level of co-operation between Ministries on environmental issues is increasing. On the 13th of April a dive instructor from Bodufinolhu phoned up Marine Research Section to say that some sharks

in a pool at the neighbouring Resort Island of Olhuveli were at risk because the pool was being filled up with dredged material. By 11.00 am that day the sharks had been released as a result of a request from the Ministry of Tourism.

Ministry of Planning and Environment and Marine Research Section, together with the assistance of the Ministry of Public Works and Labour, and the Ministry of Tourism, have made a detailed survey of the beachlines of Rannalhi and Mirihi. Both islands were selected because the beaches are pristine and are not blocked with groynes or seawalls and because the Resorts were interested and agreed to provide food and accommodation for free. Such 'natural' islands provide an ideal opportunity to observe the unrestricted movement of the beach over time. We thank these Resorts for their support. Embudu Village, Ihuru, and Nakatchafushi are scheduled for a survey if, and when, they ever have any empty rooms to put us up in!

### COT - NEWS FROM RESORTS

Table 1 shows the incidence of COT from 27 Resorts. Unfortunately the majority of Resorts have not bothered to respond despite the fact that they were sent the questionnaire by registered letter. Resorts on Ari atoll appear to be unaware of the danger on their doorstep from a huge plague at the south end of the atoll (see below). Only three resorts in Ari atoll have replied to the questions so far. We hope to discuss mechanisms for ensuring that Resorts and dive operators make some effort to respond to questionnaires in the October Workshop.

On the 09th of May staff from MRS discovered a massive COT plague on a patch reef about 3km to the south west of Mirihi Resort in Ari Atoll. 498 COT were counted in one hour (450 of them in the last 20 minutes of the swim) with aggregations of up to 20 COT piled on top of each other. This beautiful reef covered in profuse table corals was in the process of being eaten alive.

Mats Enguist from Eurodivers tells us that divers came across a reef in North Male' atoll

about 30 minutes by dhoni from Kanifinolhu and N-NW of Tulagiri. They picked up approximately 300 COT in 30 minutes!

**TABLE 1. INCIDENCE OF COT AROUND 27 RESORTS IN MARCH 1991\***

ATOLL	RESORT	NUMBER OF COT SEEN
Ari	Athuruga	1-9
	Mirihi	0
	Nika Hotel	0
Baa Lhaviyani N.Male'	Baros	1-9
	Boduhithi	10-99
	Eriyadu	0
	Farukolhufushi	0
	Helengeli	0
	Ihuru	10-99
	Kanifinolhu	1-9
	Kurumba	0
	Lohifushi	0
	Little Hura	0
	Nakatchafushi	1-9
	Reethirah	10-99
	Thulagiri	1-9
	Vabbinfaru	10-99
S.Male'	Biyadoo	1-9
	Dhigufinolhu	0
	Embudu Village	0
	Fihalhohi	0
	Fun Island	1-9
	Laguna Beach	0
	Rannalhi	0
	Rihiveli	0
	Veligandu Huraa	0
	Villivaru	10-99
Vaav		

\*Please note that the condition of the reef is not included in this table since this might discourage resorts from replying to the questionnaire. Of the 27 replies 18 reefs were reported to be healthy, 4 recovering, and 5 deteriorating - Ed.

## TURTLES

### WHAT IS A TURTLE?

All marine-turtles are reptiles, breathe the air, and only leave the sea to lay their eggs. Divers and snorkellers love to see these curious creatures of the sea in their natural habitat. Unfortunately marine turtles may not be here for our grandchildren to enjoy. These creatures that have been around for longer than the dinosaurs are in danger of becoming extinct due to the uncontrolled activities of man.

## GREEN AND HAWKSBILL TURTLES

Two species of marine-turtle are seen regularly by divers and snorkellers in the Maldives. They are the Green turtle (Vela) and the Hawksbill turtle (Kahumba). The Green turtle differs from the hawksbill (see fig. 1) in three basic ways.

- 1 The hawksbill has a rather narrow head and a pointed "hawklike" beak. The head of the green turtle is blunt and also wider.**
- 2 The green has one pair of scales on the top of the head extending for wards from the eyes whilst the hawksbill has two.**
- 3 The plates on the back of the green turtle do not overlap whilst those on the hawksbill usually do.**
- 4 The green has one claw on each flipper whilst the hawksbill has two.**

### WHERE DO THEY FEED?

Green turtles usually feed on seagrass beds where they occur in shallow lagoons whilst hawksbills feed on sponges on the coral reef. Both species nest on coral sand beaches and the eggs hatch a couple of months after they are laid.

### WHY ARE THEY AT RISK?

Both green and Hawksbill turtles are heavily exploited in Maldives. Green turtles are caught to eat. The eggs of the green turtle are dug from the beaches where they are laid and are mainly used to make pancakes which are a great local delicacy. The shell of the hawksbill turtle is highly prized and is used to make jewellery. Finally the very beaches where the turtles nest are at risk (see fig. 2).

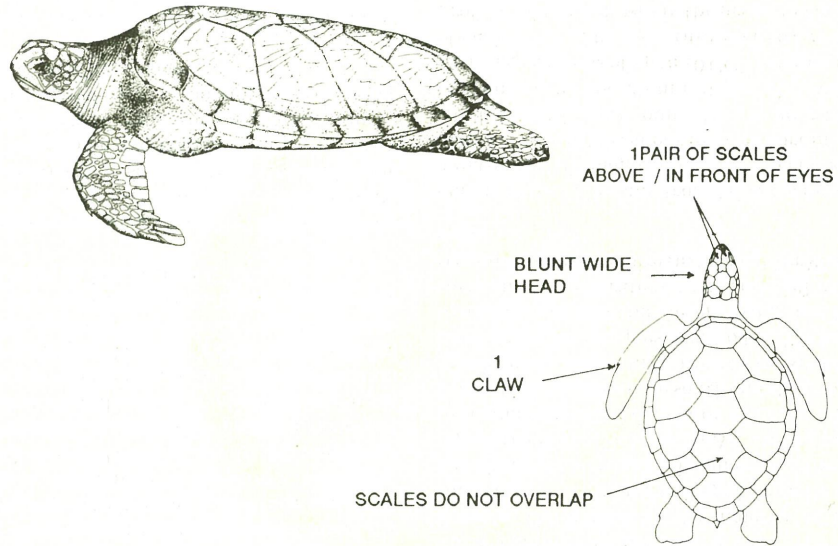
### WHO BENEFITS FROM THEIR EXPLOITATION?

The Ministry of Fisheries and Agriculture has

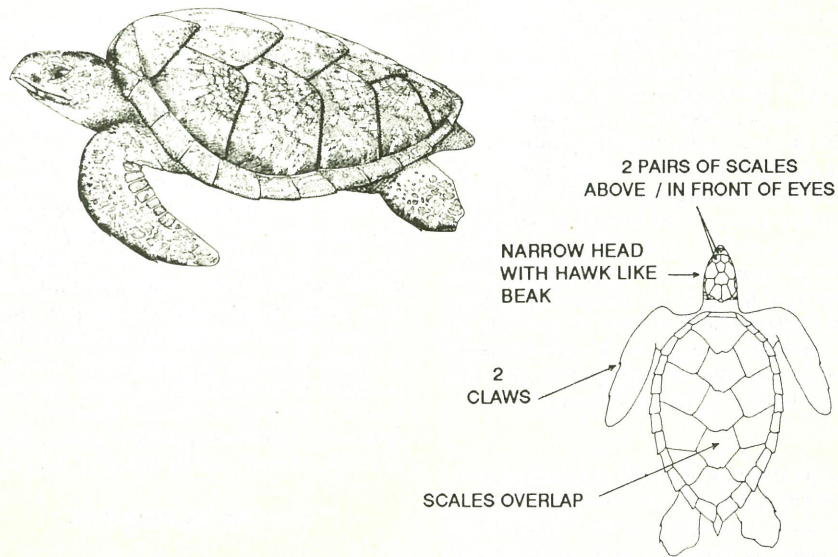


Fig 1. HOW TO TELL A GREEN TURTLE FROM A HAWKSBILL TURTLE. \*

**GREEN TURTLE**



**HAWKSBILL TURTLE**



\* Drawings for courtesy of Fao, Rome

Fig 2. TURTLES SAY NO! TO SEAWALLS





**Table 2. Numbers of persons, by atoll, earning more than the US\$ equivalent per capita income per year (\$US 641.16\*\*) from turtle exploitation (1990 figures).**

ATOLL	NUMBER OF ISLANDS		NUMBER OF PERSONS EARNING \$642+	MAXIMUM \$US EARNED BY INDIVIDUAL	TOTAL \$US EARNED BY ATOLL
	INHABITED	REPLYING			
HAA ALIF	16	16	0	538	1032.60
HAA DHAAL	17	17	0	100	300.00
SHAVIYANI	15	15	3	1258	5485.10
NOONU	15	14	0	25	50.00
RAA	17	13	0	80	505.50
BAA	16	13	2	1067	3408.90
LHAVIYANI	4	4	0	13	50.33
KAAFU	13	-	-	-	-
ALIF	18	12	0	571	5989.70
VAAV	5	-	-	-	-
MEEMU	9	9	0	72	308.40
FAAF	5	4	31	4700	62337.30
DHAAL	8	-	-	-	-
THAA	13	1	-	-	-
LAAM	12	-	-	-	-
GAAF ALIF	10	9	1	2500	3300.00
GAAF DHAAL	10	-	-	-	-
FOAMULAH	1	1	0	200	200.00
ADDU	6	-	-	-	-
<b>TOTAL</b>	<b>210*</b>	<b>99</b>	<b>37</b>	<b>4700</b>	<b>82997.83</b>

\* Novelty Press Maps

\*\* Statistical Year Book of Maldives 1990. Ministry of Planning and Environment

asked all local islands to send details of the amounts earned per person per year from exploitation of turtles (see Table 2).

The Figures take no account of substantial non-commercial exploitation of green turtles for eggs and meat.

The returns indicate that revenues from exploitation of turtles are substantial on some local islands. This makes the banning of turtle exploitation a very sensitive issue.

### WHAT CAN WE DO?

Unfortunately what may seem to be the best thing to do to help turtles may actually be harmful.

Dr Jeanne Mortimer, consultant on the WWF (Worldwide Fund for Nature) Malaysia Marine Turtle Conservation programme has been kind enough to answer a number of questions about marine-turtle conservation. The answers are so important to conservation of turtles in the Maldives that we print them below.

### Question

Is it likely that turtle populations could be over-exploited in the Maldives?

### Answer

The average green turtle or hawksbill turtle lays about 4 or 5 times during the nesting season, and lays an average of about 100 to 150 eggs per nest. Usually these females do not nest every year, but rather at intervals of 2,3 or more years.

Green turtles take about 25-50 years to attain adulthood after hatching from the egg. The data on hawksbill turtles are not as complete, but what we know suggests that they probably take at least 20 or 30 years to mature. This fact has the following important implications for marine turtle management:

- a) *Eggs can be severely over-exploited for two or more decades before the damage done will manifest itself as a decline in the number of females nesting on the beach. But, by the time a decline in nesting females is observed, the damage done*

*to the population will already be severe and very difficult to reverse.*

- b) *Large numbers of immature turtles are necessary in order to maintain a healthy breeding population. If the immature population is over-harvested, there may be a delay of many years before the excessive harvest will manifest itself as a decline in the numbers of nesting females. By that time, serious damage will already be done.*
- c) *The "level of sustainable harvest" for sea turtle populations is actually a very small number of turtles. It is certainly much lower than the numbers of turtles that have been, and continue to be harvested, in most parts of the world.*

### Question

Should turtle hatchlings be kept in captivity (given a 'headstart') before being released to the wild?

### Answer

I strongly suggest that you do not keep turtles hatchlings in captivity before releasing them. To date there is no evidence that helping hatchlings in this way is beneficial to turtles, but there is much evidence that it may be harmful.

### Question

Should turtle eggs be moved to a 'safer' beach to hatch or raised in a hatchery?

### Answer

Whenever possible turtle eggs should be left to hatch in the natural nests constructed by the female turtles. It is in the natural nests that hatching success is highest. Because the sex ratio of the offspring is determined by temperature rather than by genetics (warmer temperatures produce more females and cooler temperatures more males), it is best to let the nesting female turtles choose the nest sites. Often, sex ratios are not 1:1 when the eggs are placed in an artificial hatchery.

In many parts of the world human predation or predation by animals introduced by humans (dogs, pigs, racoons, etc.) is so great that the nests must be moved to a safe place in order to hatch. These predators do not occur in the Maldives and generally natural predation (that from birds, crabs, etc.) is relatively low and does not justify establishing a hatchery.

When setting up a hatchery, it is important to duplicate natural conditions as closely as possible. Hatchlings produced in artificial hatcheries should be released as quickly as possible -- preferably on the same night that they hatch. Ideally they should be released in the vicinity of the natural nesting beach. To hold turtles in captivity, even for a few hours, usually decreases their vigour.

We have learnt much from the co-operative efforts of the US and Mexico to save the highly endangered Kemp's ridley turtle. Much of what we learned can be applied to save the hawksbill and green turtles. Following are a few highlights:-

- a) *A large scale project has been conducted in which Kemp's ridley eggs have been moved from the nesting beaches in Mexico to the beaches of Padre Island in Texas, US. To date there is no evidence that the translocation experiment has been successful. The program is being phased out.*
- b) *As yet, there is no evidence that the Kemp's ridley headstarting project is working. Many of headstarted Kemp's ridleys have been found dead at sea or washed ashore. A number of headstarted animals have been intercepted when they approached swimmers or boats (apparently looking for food).*
- c) *Happily the Kemp's ridley population does seem to be increasing. In particular the numbers of healthy juvenile animals that have been encountered are not headstarted individuals (all headstarted individuals have been double tagged). The conservation effort most likely to be responsible for the observed increase in the Kemp's ridley population is the protection of natural beach hatcheries on the*