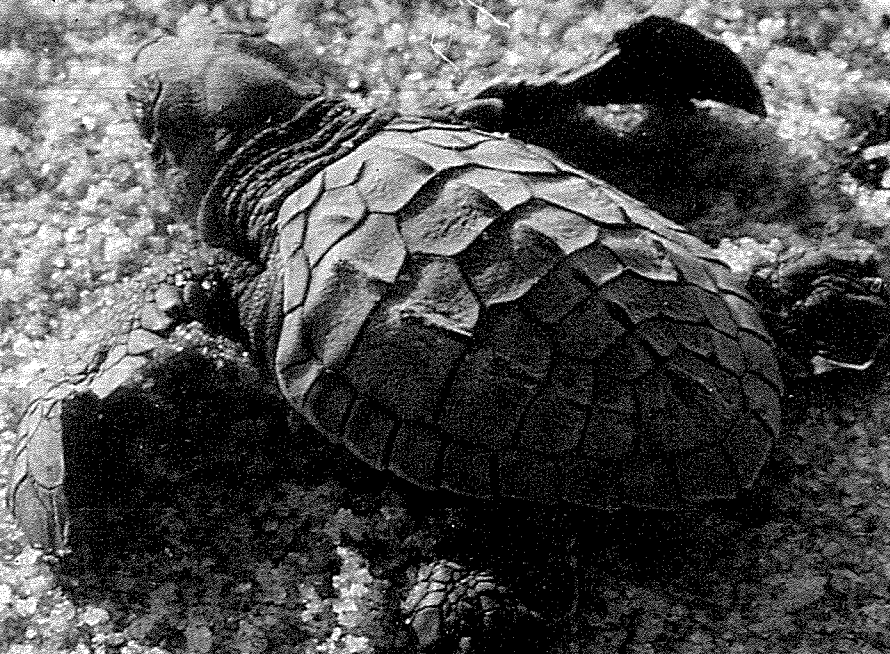


SEA TURTLE PROGRAMME

1994-95 REPORT

Conservation and Management of
Sea Turtles on The Madras Coast



STUDENT'S SEA TURTLE CONSERVATION NETWORK

A1/4/4, 3rd Main Road, Besant Nagar,
Madras - 600 090, Tamil Nadu, INDIA

SEA TURTLE PROGRAMME

1994 - 95 REPORT

CONSERVATION OF SEA TURTLES
ON THE MADRAS COAST

PREPARED FOR THE
STUDENTS' SEA TURTLE CONSERVATION NETWORK (SSTCN)

BY

Arjun Sivasundar
C. Bharadwaj
G. Vivek
Anand. M

SUBMITTED TO THE
TAMIL NADU FOREST DEPARTMENT
GOVERNMENT OF TAMILNADU

MAY 1995

Students Sea Turtle Conservation Network (SSTCN)
A1/4/4, 3rd Main Road, Besant Nagar,
Madras 600 090. INDIA.

PERSONNEL

Abi Tamim F. Vanak

Anand M.

Anto Sunil

Aravindan G.P.

Ariun Sivasundar

Bharadwaj C.

Gautami B.

John Mathew

Lionel P.J.

Roshni Chandran

Subramaniam J.

Sundaramoorthy P.M.

Tharani Selvam B.

Vasudev T.

Vivek G.

Vikram

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The Wavefront Witnesses for staging the musical play Olive and helping with the education and publicity programmes

Mr. Mahadevan for providing us with a new fence.

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PREFACE

The SSTCN's sea turtle programme was established, seven years ago, in December 1988. By sheer hard work and unfailing support and encouragement from various well-wishers every season has had its own rewards to offer. Through advanced methods in the area of hatchery management and with the successful functioning of the beach management programme, the SSTCN can look back upon its growth as a contributive environmental organisation with justifiable pride.

With its rapid industrialization, Madras city is unable to pay much heed to the natural habitat, which in itself is rather insignificant. The olive Ridley is but one of the many species mutely pleading for their right to survive. Man, in his insular attempts at promoting his own selfish interests, seems to have lost sight of the fact that irreparable harm may be sustained in the loss of even one representative member of our global family.

REVIEW OF SEASONS

Recorded season	1988-89	1989-90	1990-91
Nests collected	68	55	206
Total no. of eggs	8625	6635	24586
Mean clutch size	126.09	120.60	120.00
No. of hatchlings	5725	3838	12454
LH percentage	66.38	63.90	50.65

Recorded season	1991-92	1992-93	1993-94
Nests collected	175	28	66
Total no. of eggs	19626	3198	7621
Mean clutch size	106.00	114.21	115.47
No. of hatchlings	16616	1555	4937
LH percentage	84.82	48.62	64.78

SEA TURTLE PROGRAMME

PROGRAMME OBJECTIVES:

To ensure the conservation and continued presence of sea turtles on the Madras coast.

To generate scientific information on the biology, management and conservation of the olive Ridley sea turtle.

To safe guard nesting turtles and beaches against environmentally detrimental factors.

To deter poaching activities by the maintenance of a hatchery for translocation of nests.

To carry out environment and conservation education programmes among the coastal residents, fisherfolk, student community and the general public.

AREA OF STUDY:

The dominant nesting sea turtle species on the east coast of India is the olive Ridley (Lepidochelys Olivacea). Madras, located at approximately 13 degrees north latitude and 80 degrees east latitude, in the coastal state of Tamil Nadu, is considered a minor nesting ground today.

During the 1994-95 season the area chosen for study and patrolling included a five kilometer stretch from Besant Nagar to Neelankarai.

The beaches are sandy with no rocks. Dominant vegetation includes Ipomea, Pandanus and Spinifex. Human burden on the land, approximating a fishing village every 1.3 Kms is now increasing with an encroaching urban population. The olive Ridley nesting season on the Madras coast follows the north east monsoon and falls between the winter months of november and march.

HATCHERY MANAGEMENT:

The hatchery for the concluded season was constructed at a distance of 20 Mtrs from the water line adjacent to the TNFDC prawn hatchery. It is relevant to note that there is a marginal shift in the position of the hatchery every season in order to avoid excessive abuse of vegetation and soil.

Unlike the previous season this seasons hatchery was a square (36 X 36 Ft) of area 936 sq.ft, fenced by 7 feet tall galvanized chain link fence supported by casuarina poles. An accompanying thatch roofed hut was erected to house workers and equipment.

The area selected for survey and collection was patrolled

on foot every night from December 21st 1994 to May 8th 1995. Nests were located with the use of probes and the eggs collected. Care was taken to ensure that egg handling was kept to a minimum. Necessary data was collected at the nest site whenever possible.

The eggs were transported in soft cloth bags to the hatchery. Each clutch was carried separately and subjected to a minimum of stress or jolting during transport. Efforts were made to ensure that nests were relocated within 2-3 hrs of nesting.

The enclosure was divided into four sectors each comprising 16 nest areas of 16 sq.ft. Nest pits were dug based on measurements taken at the nesting site. The eggs were relocated with a minimum of handling. Each nest was provided with a tag denoting pit number. A chart was maintained giving details on the (i) Date of collection, (ii) Number of eggs & (iii) Expected date of hatching in order to efficiently manage the hatchery. Nests were kept under observation through out the incubation period. After the appearance of a cup shaped depression on the roof of a nest a wicker basket was placed over the nest site. As a precautionary measure chicken mesh was erected along the perimeter to ward off crabs and to prevent the odd hatchling from escaping.

Emerging hatchlings were released at various points at a distance of 20 ft. from the waterline. The nests were allowed to remain undisturbed for a period of 48 hrs after initial

emergence. The nests were then excavated and the remaining hatchlings collected and released. The contents of the nest were examined and the results recorded.

FACTORS RESPONSIBLE FOR DECLINING TURTLE POPULATIONS:

Sea turtle population have declined drastically over the last few decades, as a direct or indirect result of human activities, to such an extent that even factors like natural predation have to be controlled in order to conserve and restore viable sea turtle populations.

The olive Ridley though comparatively the most abundant among sea turtles, has succumbed to the pressures of varied human activity.

The most evident threats that confront the sea turtle and its nesting habitat on the Madras coast discussed below.

Incidental Catch

A major threat today is the direct result of 'Gill net' and 'Trawl fishing' operations. During such operations live turtles entangled in the nets are removed with minimum damage to the net and usually at the animals expense. In addition when gill nets are used over extended periods death as a

result of drowning occurs. these mutilated carcasses are often washed ashore.

During this season, ten to twelve carcasses were seen. Much to our amazement we also found an adult Hawksbill carcass in Thiruvanniyur.

Exploitation

On the Madras coast, fortunately or unfortunately, exploitation is restricted to eggs. Local beliefs including the veneration of the sea turtle as an incarnate of god seems to have protected the adult population to a certain extent.

In the absence of sea turtle workers most or all of the eggs are collected for consumption and sale by poachers. These professional or full time egg collectors receive a price of 40 paise per egg from regular fish markets and local inhabitants. It is interesting to note that most traditional fishing communities do not consume sea turtle eggs at all.

Today, open movement of sea turtle eggs in the various fish markets in Madras has reduced to a great extent due to the efforts of the Tamil Nadu Forest Department.

Habitat Perturbation

In addition to the fishing villages on the coast an encroaching urban population if not controlled and properly managed would prove extremely detrimental to sea turtle nesting habitats and the coastal environment in general.

Tourism, associated resorts, population and sand mining are increasingly evident on the Madras coast. Beach lighting is on the increase with obvious effects on nesting and hatchling sea turtles.

Non-human Predation

Non-human predator species have been exhaustively classified by Stancyk (1982). On the Madras coast natural predators are decreasing in number. As in the case in many parts of the world, predation by humans and domestic or feral animals seem to have exceeded that of natural predators.

The most important natural predators of sea turtle eggs in this area are the crabs and dogs. On the Madras coast incidental predators could also include the mongoose. Hatchling predators include gulls, common and jungle crow.

Feral and semi-domestic dogs from the fishing villages harass nesting sea turtles and also consume or destroy a substantial number of eggs and hatchlings over the course of

the season.

Detailed quantitative data on the extent of poaching, predation and adult mortality from the Madras coast is not available as yet. Even without such supportive information it is evident that the olive Ridley populations nesting on the Madras coast have drastically declined. Even the most optimistic estimate today would leave us with less than 15-20 nests/km/season.

RESULTS AND ANALYSIS

1. Nesting pattern

The nesting frequency was found to be maximum between the fourth week of January and the second week of february. It is necessary to observe that due to the vagaries of the weather nesting was almost nil during the initial 3 weeks(Refer graph :- date vs no. of nests). A significant number of nests were found in vegetation (Ipomea).

2. Areawise nesting frequency

Area	Number of nests
Besant Nagar - Thiruvanmiyur	10
Thiruvanmiyur - Kottivakkam	29
Kottivakkam - Palavakkam	6
Palavakkam - Neelankarai	9
Neelankarai - Hatchery	11
Hatchery-	2

3. Summary of nest collection data

Dates of collection	30.12.94 - 20.03.95
Total nests collected	41
Total eggs	4920
Mean clutch size	120

4. Nest excavation and hatchling data

	Eggs	DPE + DIN	LH	UH
Total	4920	1034	2836	717
%		21.02	63.69	14.57
Average	120	25.22	69.17	17.49

5. Wild nests

A significant number of nests were left in their natural habitat in areas where dangers, both natural and man-made were relatively absent. These nests were monitored through the season and a few were excavated upon hatching. It was found that, as in the case of the nests relocated, hatching rates in the earlier part of the season were significantly higher than towards the end.

Areawise distribution of wild nests

Area	Number of nests
Besant Nagar - Thiruvanniyur	4
Thiruvanniyur - Kottivakkam	14
Kottivakkam - Palavakkam	2
Palavakkam - Neelankarai	3
Neelankarai - Hatchery	3
Total	26

6. Graphs

(i) Date VS No. of nests - Maximum nesting was recorded between the fourth week of January and the second week of February.

(ii) Clutch size VS DPE% - The DPE% was found to be directly proportional to the clutch size.

(iii) Clutch size VS LH% - No apparent correlation was found.

(iv) Clutch size VS LIVE% - No definite correlation was found. However there seems to be a general downward shift with increase in clutch size.

(v) Pie diagram giving sector wise nesting frequency .

EDUCATION & PUBLICITY

One of the primary aims of the SSTCN is to generate and promote awareness of environmental concern among the public. The sea turtle and the hatchery, in this regard, are looked upon as resources used to "open the eyes" of the casual onlooker. Publicity itself is carried out in a two-pronged approach. first, to gain the financial support of philanthropists, and second, to educate the public about the living coastline which lies right in their backyard.

In order to put our ideas into practice , we have been following a dynamic approach in "education", having evolved over the years. The mainstay of this program has been the "PUBLIC WALKS" where many citizens from different walks of life witness the marvel of the olive Ridley.

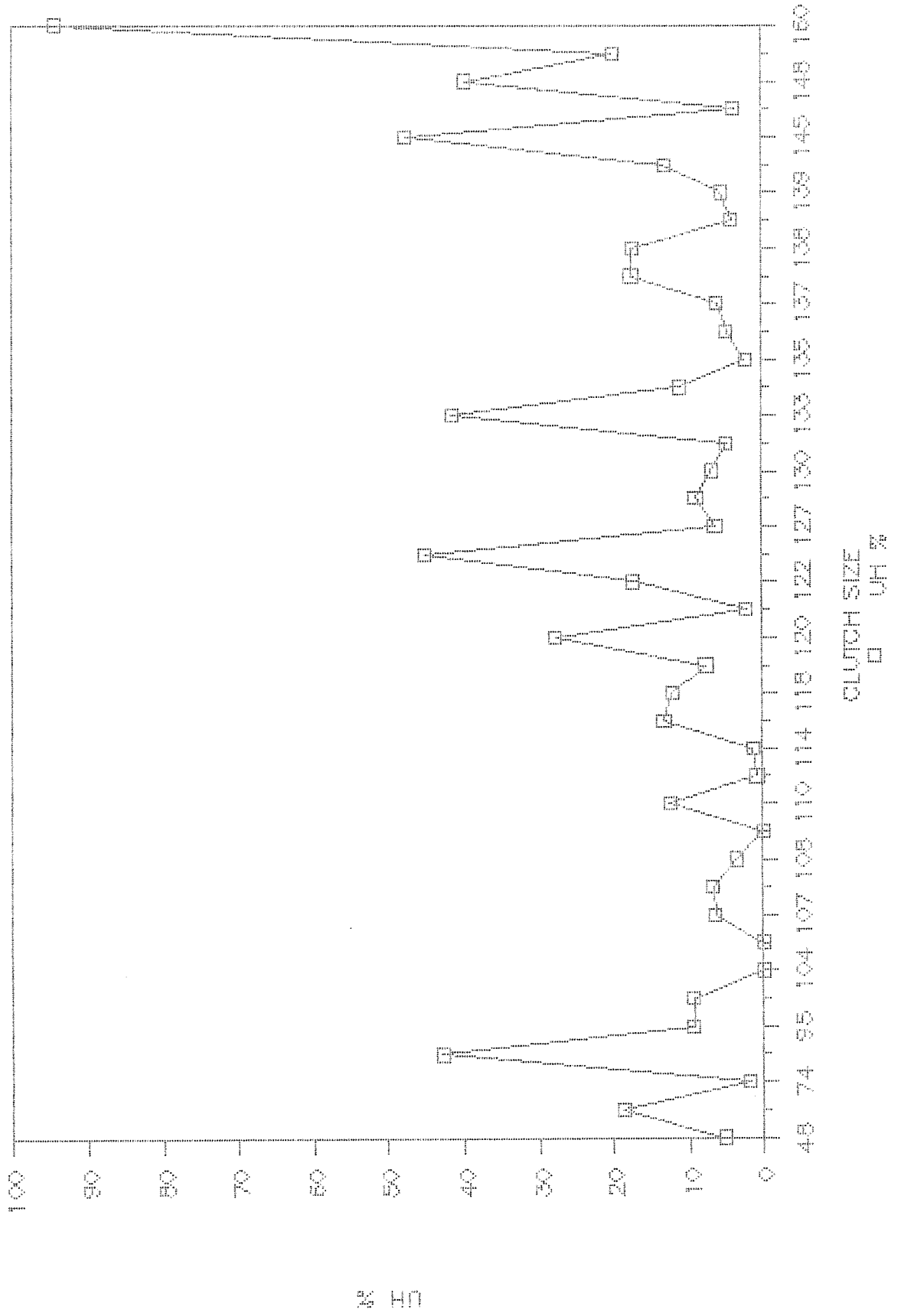
Many other activities are constantly on the cards. A series of talks were given by eminent conservationists and academicians under our "SPEAKERS FORUM" which were aimed at general awareness and education for the public and our members.

The much talked about musical "OLIVE" was produced & staged by "THE WAVEFRONT WITNESSES" and the SSTCN wasted no time in gaining mileage. About 2000 T.Shirts were printed and sold at dirt cheap prices to gain publicity and also a handout was made on rejected stationery for awareness.

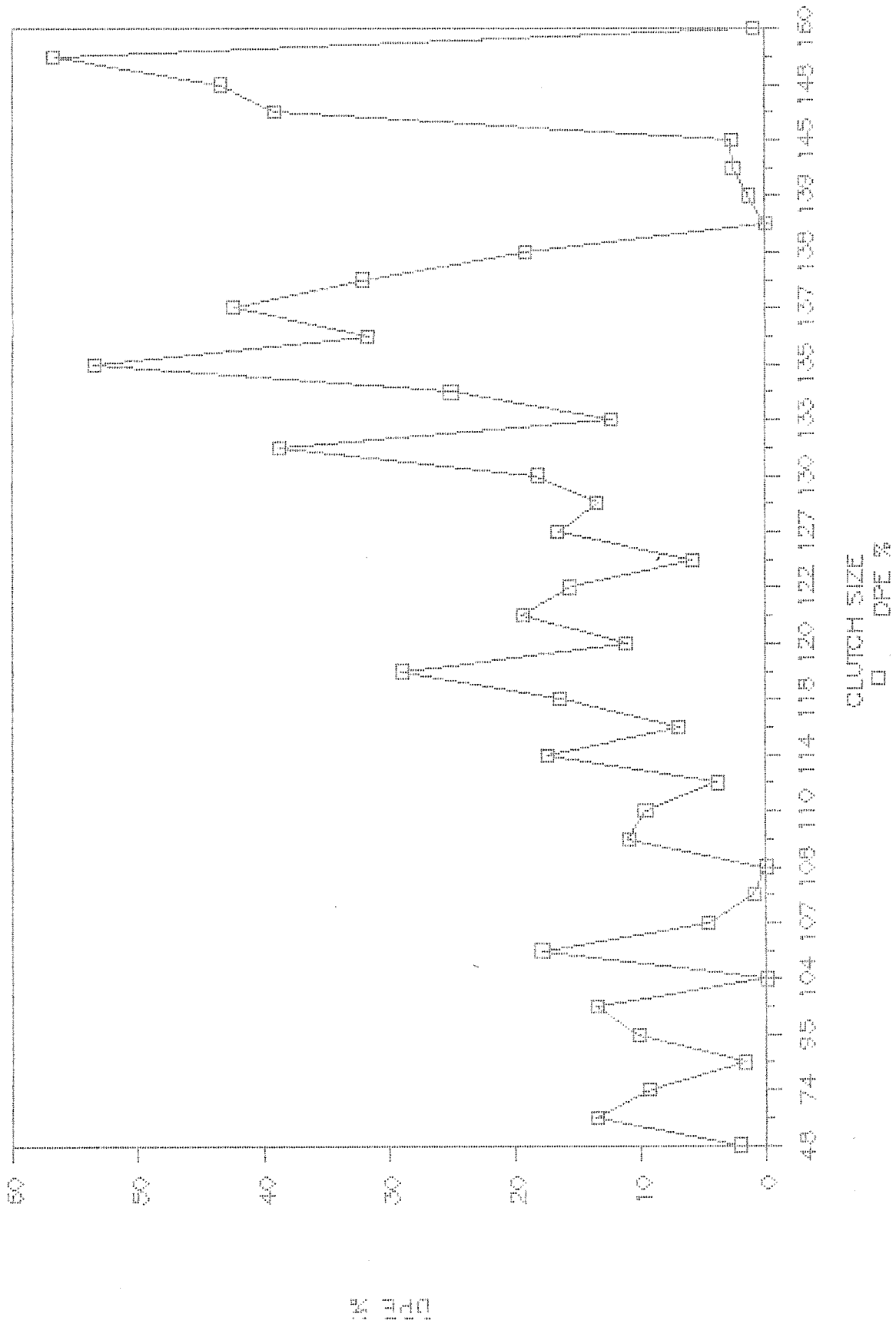
The SSTCN is also endeavouring to increase its contacts and initiate coordinated efforts with other NGOs of Madras city. In this connection we participated in a workshop conducted by The Madras Naturalists Society in January.

The SSTCN also participated in a seminar on March 7th held to commemorate 25 years of WWF. A paper "The Olive Ridley-A Focus of Conservation on the Madras coast." co-authored by John Mathew, C.Bharadwaj, M.Anand, Arjun Sivasundar & Tharani Selvam was presented at the seminar which will be appearing in a forthcoming issue of COBRA - A quarterly journal published by the Madras Snake Park Trust. A performance of Olive was staged on this occasion for the delegates and interested public.

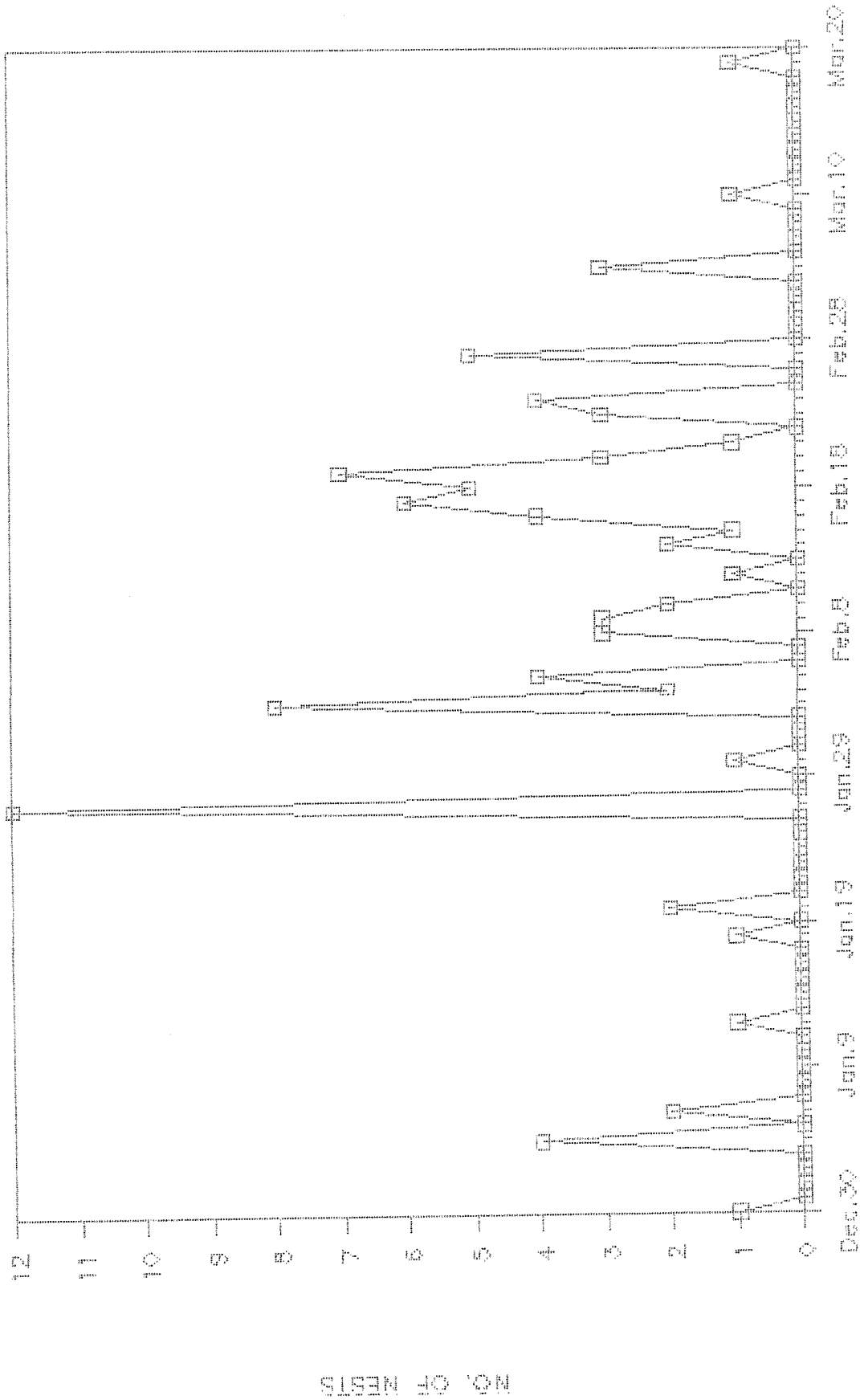
CLUTCH VS UH %



CLUTCH VS DPE %

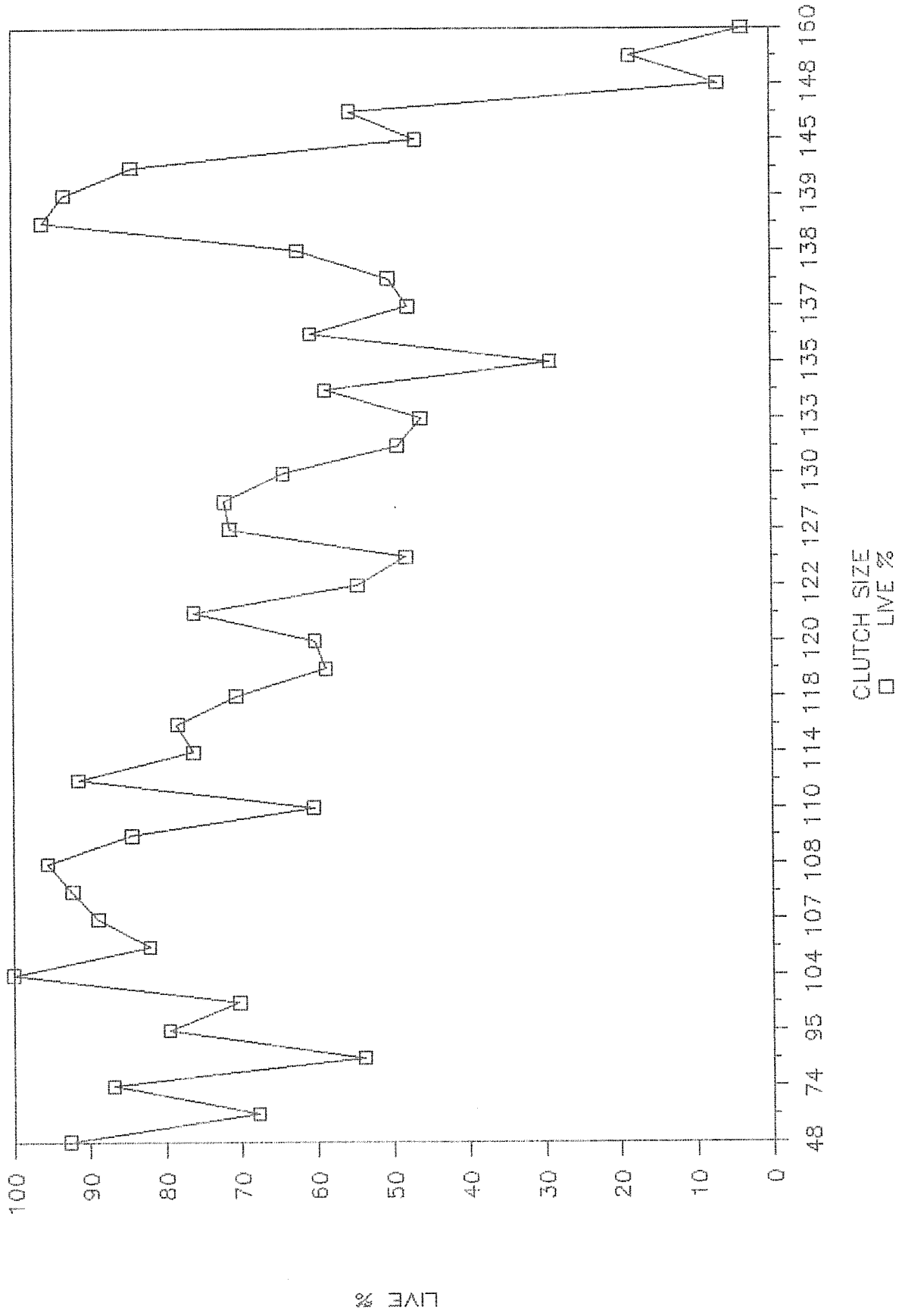


DATE VS NO. OF NESTS

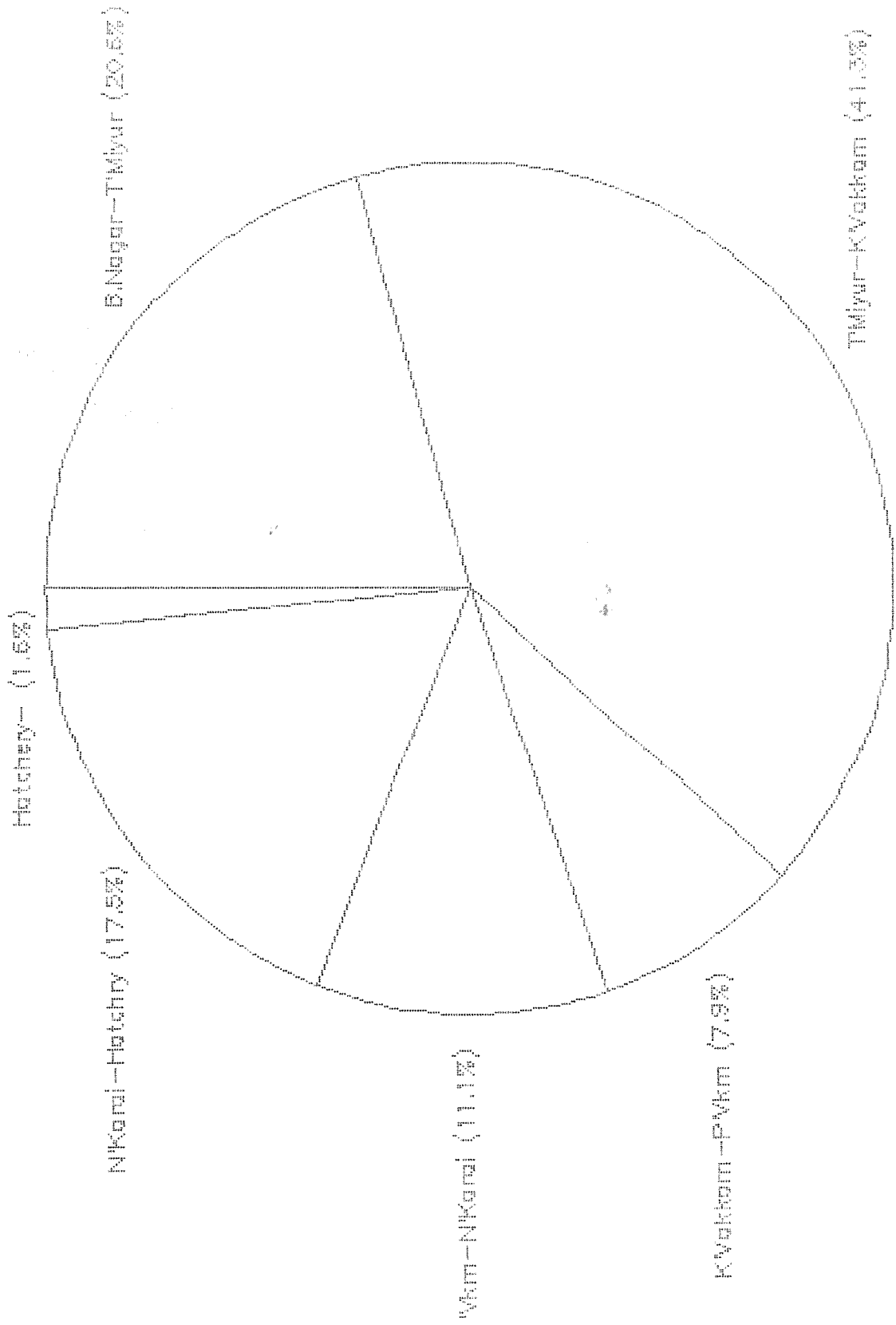


DATE
□ NO. OF NESTS

CLUTCH VS LIVE %



SECTOR WISE DISTRIBUTION



NEST NO.	DATE	NO. EGGS	SHELLS	LH	LIN	LFE	LIVE %	DIN	DPE	DPE %	TOTAL UH	UH %
1	30.12.94	95	88	72	16	0	92.63	0	2	2.11	5	5.26
2	04.01.95	118	90	58	21	0	67.80	0	16	13.56	22	18.64
3	04.01.95	140	142	88	19	0	86.88	3	15	9.38	3	1.68
4	12.01.95	122	65	60	2	1	53.78	2	2	1.68	51	42.68
5	18.01.95	117	92	74	17	2	79.49	1	12	10.26	11	9.40
6	27.01.95	127	91	78	10	0	70.34	8	16	13.56	11	9.32
7	27.01.95	66	65	64	1	0	100.00	0	0	0.00	0	0.00
8	27.01.95	103	87	53	22	0	82.08	0	19	17.92	0	0.00
9	27.01.95	108	96	90	6	0	88.89	0	5	4.63	7	6.48
10	27.01.95	105	95	94	0	0	92.23	0	1	0.97	7	6.50
11	27.01.95	104	105	99	7	1	95.45	1	0	0.00	4	3.64
12	27.01.95	111	97	72	14	0	84.40	5	12	11.01	0	0.00
13	27.01.95	151	112	37	27	0	60.42	25	14	9.72	18	12.50
14	30.01.95	133	122	79	44	0	91.41	5	5	3.91	1	0.78
15	03.02.95	145	116	48	24	0	76.22	7	25	17.48	2	1.40
16	03.02.95	188	101	33	39	2	78.29	2	9	6.98	17	13.18
17	08.02.95	120	76	21	58	7	70.69	1	19	16.38	14	12.07
18	08.02.95	135	83	50	31	0	58.78	6	38	29.01	10	7.63
19	08.02.95	107	64	41	18	2	60.19	1	12	11.11	30	27.78
20	09.02.95	137	105	61	38	0	76.12	3	26	19.40	3	2.24
21	10.02.95	137	90	50	20	0	54.48	17	21	15.67	23	17.16
22	10.02.95	135	66	66	1	0	48.15	1	8	5.93	61	45.19
23	12.02.95	127	97	71	20	0	71.43	7	21	16.67	8	6.35
24	15.02.95	114	84	61	15	2	72.07	5	15	13.51	10	9.01
25	16.02.95	122	86	45	31	0	64.35	12	21	18.26	8	6.96
26	16.02.95	139	70	35	12	1	49.21	9	49	38.89	6	4.76
27	17.02.95	130	60	18	5	0	46.15	0	16	12.31	54	41.54
28	17.02.95	145	91	77	27	0	58.74	7	36	25.17	16	11.19
29	18.02.95	138	56	24	9	0	29.13	19	68	53.54	3	2.36
30	19.02.95	147	83	58	19	9	60.69	4	46	31.72	7	4.83
31	20.02.95	120	58	36	20	0	47.79	4	48	42.48	7	6.19
32	21.02.95	148	75	55	14	0	50.34	0	48	32.21	26	17.43
33	23.02.95	108	69	21	17	0	62.39	1	21	19.27	19	17.43
34	24.02.95	48	46	52	0	0	95.83	0	0	0.00	2	4.17
35	24.02.95	74	67	50	17	0	93.06	0	1	1.39	4	5.56
36	27.02.95	76	62	48	8	2	64.21	0	2	2.63	10	13.16
37	27.02.95	107	53	17	16	0	46.73	3	3	2.60	51	47.66
38	27.02.95	132	74	56	24	0	55.38	2	51	39.23	5	3.85
39	05.03.95	133	22	15	2	0	6.87	13	57	43.51	52	39.69
40	10.03.95	128	29	14	0	0	18.40	6	71	56.80	25	20.00
41	19.03.95	110	5	1	3	0	3.64	1	1	0.91	104	94.35

4920 3225 2142 694 29 182 852 717

AVERAGE = 120 63.69 17.67 14.87

Correlation : No. of eggs - live % = -0.4278

SECTOR	NO.	WILD	RELOC.	TOTAL
B. Nagar-T'Miyur	1	4	6	10
T'Miyur-K'Vakkam	2	14	10	24
K'Vakkam-P'Vkm	3	2	4	6
P'Vkm-N'Karai	4	3	6	9
N'Karai-Hatchry	5	3	8	11
Hatchery-	6	0	2	2

DATE	NO. OF NESTS
Dec. 30	1
Dec. 31	0
Jan. 1	0
Jan. 2	0
Jan. 3	0
Jan. 4	3
Jan. 5	0
Jan. 6	1
Jan. 7	0
Jan. 8	0
Jan. 9	0
Jan. 10	0
Jan. 11	0
Jan. 12	1
Jan. 13	0
Jan. 14	0
Jan. 15	0
Jan. 16	0
Jan. 17	0
Jan. 18	1
Jan. 19	0
Jan. 20	1
Jan. 21	0
Jan. 22	0
Jan. 23	0
Jan. 24	0
Jan. 25	0
Jan. 26	0
Jan. 27	10
Jan. 28	0
Jan. 29	0
Jan. 30	1
Jan. 31	0
Feb. 1	0
Feb. 2	0
Feb. 3	0
Feb. 4	1
Feb. 5	2
Feb. 6	0
Feb. 7	0
Feb. 8	0
Feb. 9	2
Feb. 10	2
Feb. 11	0
Feb. 12	1
Feb. 13	0
Feb. 14	1
Feb. 15	1
Feb. 16	0
Feb. 17	4
Feb. 18	0
Feb. 19	4
Feb. 20	2

Feb. 21	1
Feb. 22	0
Feb. 23	2
Feb. 24	0
Feb. 25	0
Feb. 26	0
Feb. 27	4
Feb. 28	0
Mar. 1	0
Mar. 2	0
Mar. 3	0
Mar. 4	0
Mar. 5	2
Mar. 6	0
Mar. 7	0
Mar. 8	0
Mar. 9	0
Mar. 10	1
Mar. 11	0
Mar. 12	0
Mar. 13	0
Mar. 14	0
Mar. 15	0
Mar. 16	0
Mar. 17	0
Mar. 18	0
Mar. 19	1
Mar. 20	0
<hr/>	
TOTAL =====	67
<hr/>	

THE OLIVE RIDLEY - A FOCUS OF CONSERVATION ON THE MADRAS COAST

John Mathew, C.Bharadwaj & Tharani Selvam.

Students' Sea Turtle Conservation Network,

P.O. Box 8642,

Thiruvannamipur,

Madras - 600090.

The beaches of Madras (13 deg 0' N , 80 deg 15' E) have long been a minor nesting site for the olive Ridley (*Lepidochelys olivacea*), the smallest of five species of sea turtle found in Indian waters, all of which are critically endangered and find inclusion in Schedule 1 of the Wildlife Protection Act, 1972. Having been subjected to a variety of human depredations ranging from the poaching of eggs to disorientation by high intensity city lights, the Ridley has been the focus of local conservation for well over two decades. The programme of organised conservation has perforce changed hands several times since Romulus Whittaker first started the process in 1974, and the onus has fallen on the Students' Sea Turtle Conservation Network (SSTCN) to deliver, from 1988 onwards.

What justifies such conservation activity in the first place? The answer resides in the fact that the marine world bound turtle inexplicably travels thousands of kilometres from their feeding grounds only to mate offshore and nest on the very sands on which they hatched. The nesting Ridley can be an impressive sight - 2.5 feet by 2.5 feet on an average (though males, which rarely, if ever, come ashore, tend to be smaller), and weighing about 40 kgs. On an average, 125 eggs (each of the dimension of a ping pong ball, and flexible to avoid breakage during oviposition in mass) may be found in a single nest. Incubation is normally in the region of 48 to 55 days, and the emergent hatchlings waste little time in heading towards the sea. However, all three - eggs, hatchlings and adults fall victim (either directly or otherwise) to humankind and their agents. Eggs often find their way to the local market for consumption; hatchlings (which depend on light for navigation) can be vastly disoriented by high power beams from street and house alike, often with deleterious consequences; and adults can face untimely ends through drowning via incidental catch in fishing nets. Besides, with the constraints of an ever expanding urban population, habitat destruction of once prime nesting areas is an almost foregone conclusion. These stark revelations, coupled with a natural viability rate of one in a thousand hatchlings, project a dismal future for the Ridley as a whole.

But the question remains - is conservation in a minor nesting area worthwhile? With the recent furore over the possible environmental impact on the arribada (mass nesting) phenomenon exhibited near annually at Gahirmatha, Orissa, through the proposed construction of a fishing complex in the region, worldwide attention is now concentrated on decision makers who can permanently banish turtles which nest by the hundreds of thousands, within a mere two weeks. In the light of such awesome statistics, it may be argued that a nesting area which boasts of only a sub four hundred or so adult females, may be disregarded as being insignificant and that all possible resources be pumped into arribada locations. Such a point of view merits refuting on three counts: i) the clutches (nests) of solitaires have been demonstrated to yield substantially higher hatching percentages than turtles mass nesting, ii) with burgeoning human populations, there is every likelihood of local governments being pressurised to make concessions e.g., denotification of existing sanctuaries, construction of fishing jetties in sensitive areas etc. Except this time, there are no alternative sites for the turtle (in arribada or otherwise) to remove to, iii) a critical human angle. Quite simply, there is no substitute for a hands-on experience. To take our own example, the SSTCN today relates greatly to the problem faced at Gahirmatha, on account of the fact that its attention is also directed towards the olive Ridley. But even in a larger perspective, any environmental issue becomes of direct relevance, simply because we first had a conservation focus, here, with the opportunity and the framework to act upon it.

It is interesting to observe that the protection of a species in a particular set up is dependent upon the enforcement of laws which are themselves necessarily dependent upon locale specificity. Let us qualify. Laws in themselves are theoretical (often antiquated), and cultural practices can assume an important regional role. Today, the fact of the Ridley being a Schedule 1 animal, is aided, quite unconsciously, by the nature of the adult being revered as a god among local fishermen (as opposed to other places on the

Coromandel coast like Tuticorin and Calcutta, where a flourishing trade exists in sea turtle meat). This good fortune, however, does not extend to the eggs, several thousands of which reach the market to be sold at approximately 40 paise per. Yet the poacher is, in all fairness, incapable of blame. Eggs do represent a viable source of inexpensive food protein and are hence a remunerative resource. So what would a counter conservation strategy involve? The active mooting of a controlled harvest during the peak season (late January to mid February)? Not impractical, unless weighed against the realities of a restraining law coupled with the fact that there are never enough clutches to count. What are the alternatives? One short term option is the hatchery - an enclosed area to which entire nests are translocated in order to ensure that they remain unmolested until the hatchlings emerge. The SSTCN has run a hatchery programme at Neelankarai village for the past six years and the resultant statistics may appear flattering. But with growing opposition to the concept of the hatchery as a conservation tool (given its inability to address the real problems of habitat destruction, beach lighting and coastal pollution) concomitant with the dismissing of the same as an aspect of "halfway technology" (Fraser, 1992), which seeks to deal with issues on a compensatory, rather than remedial level, the emphasis of the SSTCN in recent seasons has been on more holistic beach management, inclusive of the monitoring of wild nests in areas deemed relatively safe, and preliminary efforts to involve local inhabitants in the conservation process. If the hatchery is persisted with at all today in our working model, it is to provide a tangible and consequently, significant, focus of conservation from an educational perspective, rather than serve as a barricade against human and canine despoilers.

As indicated earlier, long term solutions obviously lie in co-operation with the local community. And in practical terms, any conservation programme undertaken here runs the risk of being an aesthetic irrelevance unless a very serious cost benefit analysis is taken into account. Conservation cannot help the fishing community unless there is an economic angle. And lest such an attitude appear commercial, it may be worthwhile considering that the fisherperson is endangered too, from the point of view of a precariously balanced lifestyle which is increasingly being threatened by the needs of a burgeoning urban population. Tentative proposals are already on the anvil with reference to enhanced interaction between coastal house dwellers and the fishing village in the immediate vicinity through the link services of the SSTCN, and it is hoped that with a greater and more sensitive understanding of the cultural singularity that marks the fishing community, conservation may yet be of social significance as well.

The SSTCN has another aim in view which also demands immediate attention. Having established that high intensity lights are a disorienting factor, it is felt that Government intervention is necessary in ensuring that lighting levels on the beach remain low during the nesting season (December - May). Pollution, too, remains an attendant problem, as it is all along the Coromandel coast, and the SSTCN admits to a deep sense of helplessness in addressing the issue of a persistent and growing toxic effluent at Palavakkam, in the face of administrative indifference.

In summing up, it would appear obvious that the only answer to coastal conservation lies in tie-ups among various like minded organisations along the Coromandel, irrespective of individual foci. Such co-operation can find expression in the institution of a nerve centre representative of coastal concerns and issues, and fed from various substations all along the coast. It is hoped therefore that such an establishment will serve as a repository of coastal information in various social and scientific fields, in order that the plantkind, animalkind and humankind of a whole shoreline under threat, may yet look to a tomorrow.

References:

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REVIEW OF SEASONS

Recorded season:	1988-'89	1989-'90	1990-'91	1991-'92	1992-'93	1993-'94
Nests collected:	68	55	206	175	28	66
Total no. of eggs:	8625	6635	24586	19626	3198	7621
Mean clutch size:	126.83	120.60	120.00	106.00	114.21	115.47
No. of hatchlings:	5725	3838	12454	16616	1555	4937
Live hatchling %:	66.38	63.90	50.65	84.82	48.62	64.70