

SURVEY OF HUMAN/CROCODILE CONFLICT
IN THE UNION TERRITORY OF THE
ANDAMAN ISLANDS, HUT BAY,
LITTLE ANDAMAN, JANUARY 2008

by

Nikhil Whitaker
Curator, Madras Crocodile Trust

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Introduction

As per the agreement between the Madras Crocodile Bank Trust and the UNDP/GEF SGP, a survey of human/crocodile conflict incidence was carried out at main reported sites of conflict at Hut Bay on the east coast of Little Andaman, by the Project Head and Field Assistant, Tarun Nair, under the project entitled “Community based participation in mitigation of human-crocodile conflict in India”.

Little Andaman is an island within the Andaman & Nicobar island chain, and totals about 685 km² in area, measuring about 44 and 24 km at its longest and widest points, respectively. Hut Bay lies at around 10 ° 37' and 92 ° 32' on the east coast of the island. Living alongside are about 40,000 people, mostly laborers working on roads and buildings from Bangladesh and West Bengal. Only about 30 km of the coastline of this island is populated, with the rest being reserved forest. The island contains numerous creeks, freshwater “nallahs” and freshwater swamp, ideal nesting habitat for the saltwater crocodile (*Crocodylus porosus*), the only crocodylian occurring on these islands. A list of conflict sites was provided by the Andaman & Nicobar Forest Department (ANFD), and by researchers at the Andaman & Nicobar Environmental Team (ANET). This is a report on incidence of human/crocodile conflict, compensation paid and water-body use by local people. Conflict sites were visited with frontline Forest Department staff, villagers at conflict sites, and interested residents.

Methodology

A survey of human-crocodile conflict in Little Andaman at Hut Bay was carried out between 11th – 17th January, 2008 (Appendix 1 gives a detailed schedule). Travel to Hut Bay from Port Blair and back was aboard the M.V. Yerawa, a journey of 10 – 14 hours. Travel to conflict sites from the Forest Corporation Rest House once at Hut Bay was largely by Forest Department vehicles and a rented SUV. Upon reaching a conflict site, residents were interviewed and the proforma's filled out. Only a token number of residents interviewed had their names taken, and other unrecorded residents ranged between 2 – 5 people. Details of conflict sites, including major landmarks, sites of crocodile sightings, and other important features were recorded on a Garmin Etrex GPS. Conflict sites were also visited at night to “eye-shine” for crocodiles, using the Divisional Forest Officers high-power spotlight.

It should be noted that much of the detailed conflict information was related to human injury/fatality, and little information was reported on the injury/fatalities of livestock, though noted where it was known to occur. Conflict sites were visited along with State Forest Department personnel and Forest Corporation personnel, a complete listing is

given in Appendix II. Compensation amounts, sex and age of conflict victims, socio-economic information, circumstances of attack were collected as per the proforma in Appendix III.

Results.

Machidhara Creek, Number 1 Nala. 12th January 2008.

Machidhara Creek is connected to “Nala # 01”, and is the site of a single fatal attack. A village about 150 mts away was relocated following the 2004 Tsunami. People in the surrounding settlements about 1 – 1.5 km away have PWD drinking water, and there are numerous stray cattle. Machidhara area is therefore only rarely visited, and is used for latrine purposes and fishing, in addition to disposal of cattle carcasses alongside the creek.

A fatal attack occurred on Raj Kumar, a 32 year old male, at 0600 hrs on 25th June 2007. Raj Kumar was a migrant laborer from West Bengal, and had only been at Hut Bay for four days prior to the attack. A sum of INR 100,000 is being sanctioned for the wife or Raj Kumar by the ANFD. There were no witnesses to the attack, but another migrant worker, Palas Mandal, who was one of an eventually large crowd of people at the conflict site, described his experience. Raj Kumar had gone to relieve himself at the conflict site as he had done twice before; on the morning of the attack, he did not come to work at a local shop, and at about 0630 hrs an old man informed Palas that a crocodile had killed a person at the conflict site. On reaching the site, Palas identified Raj Kumar's bicycle near the conflict site and saw Raj Kumar in the crocodile's jaws. He followed the crocodile upstream for about 150 meters till more people arrived. Plates 1, 2, and 3 are photographs taken by Divisional Forest Officer, K.A. Rehman, who arrived at the scene when the crocodile still had Raj Kumar in its jaws. The upper torso, arms, and head were recovered en-mass only after 3 days when it was found floating at the surface. A warning sign-board about crocs in the area was installed following this attack by the ANFD.

Conflict site at Number 1 Nala, near Murugan Temple (1). 13th January 2008

This conflict site is connected to Nala # 01, and is the site of a non-fatal attack. It is located about 2 km from the first attack, near a vehicle bridge (Plate 4). The site is surrounded by human settlement, and was previously used as a fishing spot prior to the attack. Cattle and stray dogs roam freely here, except when the former are lactating, which is when they are stall fed. There was no major dependence on this part of the creek, and surrounding settlements had water supply from the Public Works Department (PWD).

A non-fatal attack occurred here on M.Ram, a 30 year old male, at 1800 hrs on 11th August 2004. He received compensation of INR 90,000 from ANFD. Ram had gone for a

bath, and when exiting the water was grabbed by the leg by the croc; the croc started to “death roll”, and he attempted to open the crocs jaws with his hands. His father, Sadhu Ram, who was at the scene and a witness to the attack tried to make the croc let go by sticking his fingers in the crocs eyes. Following the breaking of his right leg, the croc let him go and Ram was able to make good his escape. Ram was taken to Port Blair by launch (a distance of about 320 kilometers), and following treatment with antibiotics and plaster of paris for his leg, he was hospitalized for a period from 13th August 2004- 6th July 2005 (Plate 5). He subsequently received a job with the Forest Department, due to his inability to walk easily he now uses crutches. According to Ram, people here were aware of crocodiles in the vicinity, but did not know they could attack. He believed people need to be made aware of the possibility of attack. A warning sign was affixed at this site by the ANFD following the attack on Ram (Plate 5). Ram was aware that crocodiles are protected.

Conflict site at Number 1 Nala, near Murugan Temple (2). 13th January 2008

This conflict site is only about 100 meters away from the previous mentioned site, on the other side of the bridge (Plate 6), and is the site of another non-fatal attack. Utilization of the water body and statistics on the availability of water and human settlement are the same as for Case # (1).

The non-fatal attack on Pulin Sardar, a male aged 75 years, occurred on 26th November 2005 at 0830 hrs. Compensation due to him from ANFD was pending at the time of visit. He was fishing in the creek when his net snagged on the bottom and he dived to release it. He was seized by the buttocks, and he managed to stick his fingers in the crocs eye. According to him he was then hit by the crocs tail, and flung ashore in an unconscious state. His wife, Gayatri Sardar, witnessed the attack although she was unavailable for questioning. A report shown to us by the victim from the Office of the Medical Officer (In-Charge) at the Primary Health Centre, Hut Bay, recorded lacerations on the back, gluteal region, and lower limbs. This resulted in a disability in being able to walk. Pulin Sardar put the size of the crocodile at about 4 ½ meters long. He has since stopped fishing at this site, and mentioned of no sightings of crocs at the conflict site prior to his attack. Pulin was aware that crocodiles are protected.

Nanjapa Nagar at Number 2 Nala, near PWD pumphouse. 13th January 2008

This is a freshwater stream originating from a famous tourist attraction in Hut Bay, the waterfalls, and is the site of a single non-fatal attack. There are no villages nearby, and the water-body is only used by PWD workers (Plate 7) for bathing and washing. An unknown number of goats and cows enter the area from surrounding villages. Drinking water to PWD workers here is pumped from the stream. They also line fish in this stream.

The conflict victim, Ramesh, was also an employee of the PWD and was attacked when he had gone down to wash in the stream. Information was provided by Jagdish Kumar, Pump Driver, PWD. No further information was available as the conflict victim had left

the area. About 200 meters upstream we observed a ca. 2.5 meter long croc (Plate 8). J. Kumar had seen crocs here before.

Conflict site at Number 8 Nala. 13th January 2008

Number 8 nala is a tidal creek (open during rains), and is located about 1 km from Nethajinagar and about 1.5 km from Sundrapur (Plate 9). This fatal conflict site is located below and adjacent to a bridge, and this site was fished prior to the attack. There was no other dependence on the water-body, since the victims village was not in the vicinity.

A fatal attack occurred here on Subrato Mandal, a male aged 32 years, on 27th December 2005, at 1930 hrs. INR 100,00 in compensation was paid by the ANFD to his wife. According to a co-worker and witness, Tezendranath Thandar from R.K. Puram (at the 16th kilometer), he and 4 others including the victim were laying nets across the creek at the time of attack. The victim was about 25 – 30 meters from the other three in thigh-deep water when he cried out once and then disappeared. Subrato's body was only recovered the next day, and the Post-Mortem Examination Report by the Medical Officer, Hut Bay, Primary Health Centre, noted multiple deep wounds (six in number) in the chest and left hand, and a dislocation of the neck and hip joints. Tezendranath had stopped fishing at this place when he lost his friend, and changed occupation from a fisherman to an agriculturist. He was unaware that crocodiles were potentially dangerous prior to the attack. Tezendranath had seen crocodiles in this Nala in the past. Tezendranath was aware that crocodiles are protected, and felt that people are forced into potential-conflict situations to meet their daily needs. A warning sign was affixed at this site following the attack on Subrato by the ANFD.

Direct observations on crocodiles between 12th – 14th January at Hut Bay

Between 12th and 14th January, we had the opportunity to visit the sites of conflict in the day-time and at night to eye-shine for crocodiles. The below table lists our sightings. In our experience, none of our 2 size estimates of 2.5 meters and the single 3.0 meters could conform to a crocodile large enough to be any *significant* danger to humans. Read EO as eyes only (no size estimate possible), and mts as meters. This is in no way a conclusive survey, and needs to be replicated in more detail.

Location	Date	Time	Size
Nala 01	12/1/08	1800	EO
Nala 02 (near waterfalls)	13/1/08	1130	2.5 mts
Nala 08 (near conflict site)	13/1/08	1815	EO
Nala 08 (near conflict site)	13/1/08	1815	3.0 mts
Nala 01	13/1/08	1900	EO
Nala 01	13/1/08	1900	EO
Nala 01	14/1/08	1100	2.5 mts

Meetings with Andaman & Nicobar Forest Department. 16th January, Port Blair

Following completion of the survey in Hut Bay, N.W. met Shri Kazan Singh, Chief Wildlife Warden, and Shri Alok Saxena, Conservator of Forests (Wildlife) on 16th January 2008. From discussions with them, it was felt necessary to address certain questions regarding further training of ANFD staff and these points are outlined below:

- i. Training on *capture from the wild of nuisance saltwater crocodiles* will be demonstrated in the field, using techniques such as harpoons, nylon fishing nets, and cage traps.
- ii. Translocation of animals may not be successful, with reports from research on saltwater crocodiles returning to capture sites, 400 km in 20 days in one case (paper attached). Therefore in order to assess the suitability of translocation as

- a mitigation measure in human-crocodile conflict, *tagging techniques will be demonstrated.*
- iii. *Census techniques*, both direct and in-direct, will be imparted to staff of the ANFD, as understanding the partitioning of size classes, recruitment, size estimation, etc all play a vital research component role in human-crocodile conflict mitigation.
 - iv. In some cases it may be desired to not capture crocodiles at conflict sites due to the area being advantageous to breeding, in such cases educating local settlers would seem to be important. Thus, *basic information on crocodile biology, behavior, ecology, etc would be imparted to ANFD staff (in the field and via PowerPoint) in order for them to be equipped with the knowledge they require when visiting conflict sites.*

Conclusions

1. Average distance between the village in question and Nalas 1, 2, and 8 during the present survey was 970 meters (range between 150 – 3000 meters), fatal attacks on humans occurred in 2/5 of the sites visited (40 %), and non-fatal attacks occurred in 3/5 of the sites visited (60 %). The large number of stray cattle, dogs, goats that frequent the nalas and their unattendedness make estimates on livestock attacks impossible. Attacks on people in four cases were 2 in 2005, and one each in 2004 and 2007. Months of attack were in November, August, June, and December.
2. There is large scope for training ANFD personnel in human-crocodile conflict related mitigation measures, such as census techniques and capture of nuisance animals, as outlined in detail above.
3. It is essential that conflict/potential conflict affected villages get on the side of crocodiles, given their importance to fisheries and role as scavengers. The possibility of crocodile utilization in the future (i.e. collection of eggs from the wild and rearing animals in captivity for skins), taking into consideration the local inhabitants and how they can benefit should be investigated. Crocodile egg collection and rearing the young for skins and meat is a proven conservation/management strategy that can guarantee crocodile survival, provide local income and community benefits.
4. An Action Plan for Hut Bay, Little Andaman, and other areas of human-crocodile conflict incorporating sign boards and educational pamphlets will be funded by the UNDP/GEF Project. Other sites of conflict to visit in the proposed August 2008 trip would be Thiroor and Wandoor on South Andaman, Dugapur and Diglipur on North Andaman, Kadamtala on Little Andaman, and Lukodonta on Middle Andaman.

Nikhil Whitaker
Curator Madras Crocodile Bank,
Project Head, UNDP/GEF/SGP Project entitled “Community based mitigation of human-crocodile conflict in India”

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Appendix I. SCHEDULE OF HUT BAY, LITTLE ANDAMAN, HUMAN-CROCODILE CONFLICT TRIP

11th January “ Meetings with Chief Wildlife Warden and Conservator of Forests (Wildlife)

12th January 2008; Left on M.V. Yerawa from Chetam Jetty in Port Blair at 0630 hrs; reached Hut Bay at 1600. Met DFO K. A. Rehman who took us to Forest Rest House; between 1730 – 1815 visited conflict sites at No. 1 Nala (Machidhara Creek)

13th January 2008; Visited, met witnesses/victims at Conflict site at Number 1 Nala, near Murugan Temple (1), Conflict site at Number 1 Nala, near Murugan Temple (2), Nanjapa Nagar at Number 2 Nala, near PWD pumphouse, Conflict site at Number 8 Nala. 13th January 2008; at around 1900, went to Nala 08 and Nala 01 to eye-shine for crocs

14th January 2008; Walked ca. 2 km up creeks at No. 1 Nala, and walked both sides from bridge of No. 2 Nala for ca. 1 km, visited # 8 Nala near bridge at conflict site, unable to travel up the creek due to mangroves and debris; met Palas Mandal, co-worker with Raj Kumar who was killed at Number 1 Nala, Machidhara Creek. At 1930, reached jetty to board M.V. Yerawa to travel back to Port Blair; delayed for two hours leaving due to 6.0 Richter earthquake.

16th January 2008: Met with the Chief Wildlife Warden and Conservator of Forests (Wildlife) to discuss findings and further training/collaboration required between MCBT and the ANFD

Appendix II. PEOPLE AND ORGANIZATIONS MET

X	Name	Occupation	Organization
1	Abdulla	Clerk	ANFD
2	Akilesh Das	Deputy Ranger	Forest Corporation
3	Alok Saxena	Conservator of Forests (Wildlife)	ANFD
4	Anand	-	Auto driver
5	Gopal	Clerk	ANFD
6	Gopi	Forest Guard	ANFD
7	K. Abdul Rehman	Divisional Forest Officer, Hut Bay	ANFD
8	Kazan Singh	Chief Wildlife Warden	ANFD
9	Prabhu Shekar	Forest Guard	ANFD
10	Rajendra Verma	Range Forest Officer	ANFD
11	Razius Tincoy	Deputy Forester	Forest Corporation
12	Robin	Clerk	ANFD

Appendix III. MULTI PURPOSE FORM FOR COLLECTION OF DATA FROM
HUMAN/CROCODILE CONFLICT LOCATIONS.
MULTI PURPOSE FORM FOR COLLECTION OF DATA FROM
HUMAN/CROCODILE CONFLICT LOCATIONS.

Date:

Time start:

Time end:

A. Identification details

i. Name of the village:

ii. Type of water body (dam/river/lake/estuary):

iii. Distance of the village from the water body:

B. Profile of residents

i. Interviewed Resident name (s):

ii. No. of people in the village (male/female):

iii. Occupation:

iv. Educational status

S. No.	Below metric (N)	Metric (N)	H.Secondary (N)	Degree and above (N)
1				
2				
3				
4				
5				
6				

C. Dependence on water body

i. Source of drinking water:

ii. Number of live stock/pets (cattle/dog/goat/cat):

iii. If you have live-stock, how do you feed the animals (stall feeding, grazing, or both)?

iv. If stall fed, where does the fodder come from (own land, forest, or both):

v. If grazed, where do livestock go for grazing (near water-body, near forest area, or both)?

vi. Have crocodiles or any other wild animals attacked your livestock/pets?

vii. Dependence on water body (drinking water, bathing & washing clothes, washing of household materials, cattle bathing, etc):

vii. Time of utilization of water body: (0500-1000 hs, 1000-1300 hs, 1300 – 1600 hs, 1600 – 1830 hs, other):

viii. Do you have your own water-source available? (yes/no);

D. Crocodile conflict

i. Any incidence of crocodile attack? (Humans, livestock/pets, other)?

E. Details of attack(s)

Date	Time	Area (GPS location; note NA if entered in Log book)	Name of victim	Age	Male/female

iii. Damage caused by attack:

iv. Compensation obtained (yes/no):

v. Approximate size of crocodile (small/medium/huge):

vi. Reason for attack (Victim's account):

vii. Awareness about crocodile behavior (good/normal/nil):

Viii. Do you go fishing (yes/no, if yes, specify mode of fishing):

viii. Have you seen crocodiles in the wild? (Yes/no):

ix. How do you avoid crocodiles now?

X. Are you thinking of evacuating from here because of this problem? (Yes/no):

xi. Would you prefer construction of a well/rain-water harvesting as an alternative source of drinking water? (Yes/no):

xii. Do you know that crocodiles are protected? (Yes/no):

xiii. How can this problem be solved?

F. Housing and infrastructure

i. Roof type (reed hut/tiled/asbestos/other):

ii. Wall type (mud/brick/reed/bamboo/other):

DESCRIPTION OF PLATES

Plate 1. *Crocodylus porosus* estimated at about 5 meters + displaying assertive body posture (head, back, and tail arched out of water); this crocodile killed and ate half of Raj Kumar (Photo K. Abdul Rehman)

Plate 2. Close up of same animals head (Photo K. Abdul Rehman)

Plate 3. Body of Raj Kumar; the croc had let go and seconds after this image recovers the body, the torso and head are recovered 3 days later (Photo K. Abdul Rehman)

Plate 4. Site of croc attack on M. Ram, Number 1 Nala, near Murugan Temple (1) (Photo N. Whitaker)

Plate 5. Injuries sustained to right leg of M. Ram (Photo Tarun Nair)

Plate 6. Site of attack on Pulin Sardhar, site of attack is directly below where Tarun Nair is sitting (orange shirt) (Photo N. Whitaker)

Plate 7. Site of attack on Ramesh, Public Works Department Employee. (Photo N. Whitaker)

Plate 8. A ca. 2.5 meter *Crocodylus porosus* seen about 200 meters upstream of where PWD employee Ramesh was attacked. (Photo N. Whitaker)

Plate 9. A board warning people about entering the water, with site of where Subrato Mandal was killed by a large saltwater croc in the background. (Photo N. Whitaker).





